



Project : Preventive Maintenance 2022 Tower A  
Inspection Date : January 25, 2022  
Inspection Product : RMU, Transformer and Low Voltage Switchboards

Inspected By  
Approved By



งานบำรุงรักษาระบบไฟฟ้าแรงสูง-แรงต่ำภายในอาคาร  
ประจำปี 2565

นำเสนอ:  
Millennium Residence Condominium

## Preventive Maintenance Report

25 January 2022

D-NINE ENGINEERING CO., LTD.



Report prepared by :

Project Leader by :

Sales :



Date  
January 25, 2022



## CONTENT

	PAGE
1. Introduction of Low Voltage Switchboards	1
2. Scope of Work	9
3. Summary Test Report	10
4. Defect Equipment	11
5. Ring Main Unit	13
6. Transformer	14
7. Main Distribution Board	18
8. Air Circuit Breaker	21
9. Mold Case Circuit Breaker	41
10. Capacitor Bank	44
11. Grounding	48
12. Photograph	49
13. Tools list	53

## Introduction of Low Voltage Switchboards

## Low Voltage Switchboards

### 1. บทนำ

1.1 สวิตช์บอร์ดไฟฟ้าต้องมีการตรวจสอบและทดสอบทั้งเมื่อทำการติดตั้งแล้วเสร็จและตามระยะเวลาที่เหมาะสม จุดประสงค์ของการตรวจสอบดูแลบำรุงรักษาเพื่อให้ระบบไฟฟ้าใช้งานได้ดีตามความต้องการ มีความเชื่อถือได้สูง และอยู่ในสภาพที่พร้อมใช้งานได้อย่างสมบูรณ์ การดำเนินการควรเป็นหน้าที่ความรับผิดชอบของเจ้าของอาคาร ผู้ดูแลระบบไฟฟ้า และผู้ทำการติดตั้ง การดำเนินงานจะต้องกระทำโดยผู้ที่มีความรู้ ความชำนาญ เพราะอุปกรณ์บางตัวมีความซับซ้อน อุปกรณ์บางตัวอาจจะชำรุดได้ภายหลังจากการทดสอบ ผู้ทำการทดสอบจึงต้องมีความรู้ ความเข้าใจเพียงพอ และมีวิธีการที่เหมาะสม

1.2 การที่จะให้อุปกรณ์ไฟฟ้าที่ติดตั้งอยู่ในตู้สวิตช์บอร์ดไฟฟ้าสามารถทำงานได้เป็นอย่างดี มีความน่าเชื่อถือได้สูง มีอายุในการใช้งานที่ยาวนาน จะต้องมีการตรวจสอบและบำรุงรักษาเป็นประจำ หรืออาจจะเรียกว่าเป็นการบำรุงรักษาในเชิงป้องกัน โดยเฉพาะในงานที่ต้องการความต่อเนื่องให้มากที่สุด การตรวจสอบและบำรุงรักษาเป็นเรื่องที่แยกกันไม่ออก และเป็นเรื่องที่จะต้องทำไปพร้อมๆกัน ซึ่งเนื้อหารายละเอียดในบทความนี้จะเป็นการกล่าวถึงการตรวจสอบและบำรุงรักษาที่ทำอย่างเป็นระบบ สามารถนำไปประยุกต์ใช้งานได้ภายในองค์กร หน่วยงาน อาคารสูง โรงงานอุตสาหกรรม เป็นต้น

### 2. คำนิยาม

2.1 การดำเนินการตรวจสอบสภาพทั่วไป

- การตรวจสอบการทำความสะอาด
- การตรวจสอบความแน่นของโบลท์ และนัทที่บริเวณจุดต่อทางไฟฟ้า เช่น บัสบาร์, เทอร์มินอลจุดต่อต่างๆทางไฟฟ้าของอุปกรณ์ไฟฟ้า

2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

Inspected By

Prepared By

Approved By

### 2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

การตรวจสอบค่าความต้านทานของฉนวนของ Main Busbar โดยอ้างอิงตามมาตรฐาน IEC 61439-2 โดยการทดสอบทั้งสิ้น 6 วงจร เช่น Line to Line (L1 – L2, L2 – L3, L3 – L1) และ Line to Neutral Ground (L1 – G, L2 – G, L3 – G) ซึ่งผลลัพธ์ที่ได้สำหรับเกณฑ์ในการยอมรับสำหรับตู้สวิตช์บอร์ดไฟฟ้าแรงต่ำจะต้องมีค่าความต้านทานไม่น้อยกว่า 1000  $\Omega/V$  โดยอ้างอิงกับพิกัดแรงดันไฟฟ้าในการทดสอบค่าความต้านทานของฉนวน โดยการจ่ายพิกัดแรงดันไฟฟ้ากระแสตรงในการทดสอบที่ไม่น้อยกว่า 500 Vdc แล้วอ่านค่าจากเครื่องมือวัดเปรียบเทียบกับค่ามาตรฐาน

- ในระหว่างการทดสอบค่าความต้านทานควรวัดค่าอุณหภูมิและความชื้นของสภาพแวดล้อมข้างเคียงในระหว่างการทดสอบ เพื่อใช้สำหรับอ้างอิงค่าความต้านทานที่วัดได้

- ก่อนการทดสอบจะต้องปลดวงจรควบคุม, วงจรอิเล็กทรอนิกส์, อุปกรณ์ป้องกันเครื่องจักรจากระบบไฟฟ้า

- ในระหว่างการทดสอบไม่ควรไปสัมผัสบริเวณตัวนำไฟฟ้าเพราะอาจจะเกิดอันตรายได้

### 2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

การตรวจสอบค่าความต้านทานหน้าสัมผัสของ Main Circuit Breaker ซึ่งจะอ้างอิงค่าความต้านทานหน้าสัมผัสตามผลิตภัณฑ์ โดยพิกัดกระแสไฟฟ้าในการทดสอบดังนี้ คือ

ข้อกำหนดในการทดสอบ

- กระแสไฟฟ้า 10Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดไม่เกิน 100A

- กระแสไฟฟ้า 100Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดเกิน 100A ขึ้นไป

การทดสอบค่าความต้านทานที่บริเวณหน้าสัมผัสของเมนคอนแทกในแต่ละเฟส จะเป็นสิ่งที่มีความสำคัญที่สามารถอธิบายได้ถึงประสิทธิภาพ คุณภาพของรอยต่อทางไฟฟ้าของเซอร์กิตเบรกเกอร์ในแต่ละเฟสค่าความต้านทานที่เปลี่ยนแปลงไปในแต่ละเฟสจะได้รับอิทธิพลและผลกระทบมาจากการเกิดกระแสไฟฟ้าลัดวงจรภายในตัวเซอร์กิตเบรกเกอร์ ซึ่งค่าความต้านทานที่วัดได้จะต้องไม่แตกต่างกันเกิน 50 % ในแต่ละเฟส

Inspected By

Prepared By

Approved By

#### 2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

จะตรวจสอบโดยอ้างอิงตามมาตรฐาน IEC 60831-1 Standards Technical Data Capacitance Value Tolerance

- -5% , +15% for unit and banks up to 100 kVAR
- 0% , +10% for unit and banks above 100 kVAR

#### 2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

การทดสอบค่าความต้านทานดินโดยทั้งนี้จะต้องอ้างอิงตามมาตรฐานดังต่อไปนี้

- NFPA & IEEE: Recommends a ground resistance value of 5.0  $\Omega$  or less.
- NEC: Make sure the system to ground is 25.0  $\Omega$  or less. In facilities with sensitive equipment, it should be 5.0  $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.
- Telecommunications Industry: Often uses 5.0  $\Omega$  or less as their value for grounding or bonding

Inspected By	Prepared By	Approved By

#### 3. วิธีการตรวจสอบและดูแลบำรุงรักษาอุปกรณ์ไฟฟ้าแรงต่ำเมื่อผ่านการใช้งาน

- การตรวจสอบสวิตช์บอร์ดไฟฟ้าภายหลังจากการใช้งานผ่านไประยะหนึ่งจะเป็นการตรวจสอบเพื่อหาจุดบกพร่อง การเสื่อมสภาพ หรือการชำรุดเสียหายของอุปกรณ์ไฟฟ้า เพื่อหาแนวทางในการบำรุงรักษาระบบไฟฟ้าต่อไปอย่างถูกวิธี ซึ่งการตรวจสอบภายหลังจากการใช้งานไปแล้วนั้นจะมีกรรมวิธีในการตรวจสอบดังต่อไปนี้คือ

- สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)
- เซอร์กิตเบรกเกอร์ (Circuit Breaker)
- คาปาซิเตอร์แบงก์ (Capacitor Bank)
- สวิตช์อัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

4.แสดงรายการตรวจสอบและดูแลบำรุงรักษาสวิตช์บอร์ดไฟฟ้าแรงต่ำ		
บริษัทไฟฟ้า	รายการตรวจสอบและทดสอบทางไฟฟ้า	
สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบอุปกรณ์เครื่องมือวัดและแสดงผล (Measurement Equipment) ตรวจสอบอุปกรณ์ป้องกัน (Protection Equipment) ตรวจสอบค่าความต้านทานฉนวน (Insulation Resistance) ตรวจสอบการทำงานของสวิตช์บอร์ดไฟฟ้า (Function Operation)	
เซอร์กิตเบรกเกอร์ (Circuit Breaker)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบและทำความสะอาดหล่อลื่นอุปกรณ์แมคคาณิก (Lubrication) ตรวจสอบและทำความสะอาดช่องดับอาร์ค (ArcChute & Lug Breaker) ตรวจสอบค่าความต้านทานฉนวนของเซอร์กิตเบรกเกอร์ (Insulation Resistance) ตรวจสอบค่าความต้านทานหน้าสัมผัสของเซอร์กิตเบรกเกอร์ (Contact Resistance) ตรวจสอบการทำงานของอุปกรณ์ป้องกันของเซอร์กิตเบรกเกอร์ (Electronic Trip Unit)	
คาปาซิเตอร์แบงก์ (Capacitor Bank)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบค่าความต้านทานฉนวนของคาปาซิเตอร์ (Insulation Resistance) ตรวจสอบค่าความประจุไฟฟ้าของคาปาซิเตอร์ (Microfarad Measurement) ตรวจสอบการทำงานของอุปกรณ์สวิตช์ซึ่งคาปาซิเตอร์ (Magnetic Contactor) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Power Factor Controller)	
สวิตช์อัตโนมัติ (ATS)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Automatic Transfer Switch)	
Inspected By	Prepared By	Approved By

5.การตรวจสอบตู้สวิตช์บอร์ดไฟฟ้า		
ลำดับ	รายการ	การตรวจสอบ
1	ขั้วต่อสาย จุดต่อสาย	จุดต่อสายทุกจุดต้องแน่น ตรวจสอบความร้อน
2	Cable Terminator	ร่องรอยการเกิดโคโรนา ตรวจสอบรอยแตกร้าวของสาย การต่อลงดินของสายชนิด
3	สายไฟฟ้า	ตรวจสอบสภาพของสายไฟฟ้า และอุปกรณ์การเดินสายภายในตู้
4	บัสบาร์	ตรวจสอบอุปกรณ์รองรับบัสบาร์ การต่อสาย ตรวจสอบความร้อนที่บริเวณรอยต่อ บัสบาร์
5	ลูกถ้วยรองรับบัสบาร์	ตรวจสอบความสกปรก ร่องรอยการชำรุด การเปลี่ยนสี รอยแตกหรือบิ่น พร้อมทั้งทำความสะอาด
6	ความเป็นฉนวนไฟฟ้า	การต่อสาย การแตกร้าวของ CT
7	การต่อลงดิน	สภาพจุดต่อลงดินที่ตู้สวิตช์เกียร์และหลักดิน วัดค่าความต้านทานดิน สภาพของสายดิน สายต่อฝาก และวัดค่าความต่อเนื่องของสายดิน
8	ฮีตเตอร์	ตรวจสอบการทำงาน ระบบการควบคุมการทำงาน
9	บริษัทเครื่องวัดทางไฟฟ้า (Measurement Equipment)	ตรวจสอบสภาพทั่วไป การชำรุด แตกหักเสียหาย การอ่านค่าพารามิเตอร์ ทางไฟฟ้า
10	Indicator Lamp	ตรวจสอบสภาพการทำงานจะต้องอยู่ในสภาพที่ใช้งานได้เป็นปกติ
11	ชุด Draw out	ตรวจสอบการถอดออก (Draw out) และการถอดเข้า (Draw in) เซอร์กิตเบรกเกอร์ จะต้องคล่องตัว ตรวจสอบกลไกการทำงานและหน้าสัมผัสต่างๆ
12	บริษัทป้องกัน (Protection Relay)	ตรวจสอบฟังก์ชันการทำงานของอุปกรณ์ป้องกันจะต้องถูกต้องและครบถ้วนการ Setting Parameter
13	สวิตช์ควบคุมต่างๆ	ตรวจสอบสภาพการทำงาน
14	เซอร์กิตเบรกเกอร์	ตรวจสอบการทำงานของระบบ Interlock การทำงานตามขั้นตอนวิธีที่กำหนด
15	ทดสอบการทำงานทางกล	ตรวจสอบความคล่องตัวในการทำงาน การหล่อลื่น
Inspected By	Prepared By	Approved By

6.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางกล )		
ลำดับ	รายการ	การตรวจสอบ
1	Arc Interrupters	ถอดทำความสะอาด ตรวจสอบความเสียหาย
2	หน้าสัมผัส (Main & arcing contact)	ตรวจสอบร่องรอยความเสียหายเนื่องจากการอาร์ก ความสกปรก ทำความสะอาด
3	Insulation (Bushing Porcelains & Other)	ตรวจสอบความเสียหายของฉนวน ตรวจสอบคราบเขม่า รอยแตกหักเสียหาย และทำความสะอาด
4	Current Part & Terminals	ตรวจสอบความเสียหาย ความร้อน การยึดแน่น
5	สายไฟฟ้า	การต่อสาย การเข้าสาย ขั้วต่อสาย
6	กลไกการทำงาน	ตรวจสอบการติดขัด สารหล่อลื่น และการทำงานทางกลต่าง
7	อุปกรณ์เสริมอื่นๆ	ตรวจสอบ Aux. device, Shock Absorbers, Bumpers, Position Indicator Latch Checking Switch, Key Lock-out,etc.
7.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางไฟฟ้า )		
ลำดับ	รายการ	การตรวจสอบ
1	Function การทำงาน	ตรวจสอบการทำงานทางไฟฟ้า เช่น Close, Open
2	Closing Coil, Shunt Release	ตรวจสอบการต่อสาย การทำงาน
3	หน้าสัมผัส	วัดค่าความต้านทานหน้าสัมผัส
4	ความต้านทานฉนวน	Insulation Test
5	Trip Unit	ตรวจสอบการทำงานและความเสียหาย
6	Setting	ตรวจสอบการปรับตั้งค่าพารามิเตอร์ต่างๆ
7	Protection Relay	ตรวจสอบการทำงานของ Protection Relay
8	การทำงาน	ตรวจสอบการทำงานของ Trip Free, Closing
Inspected By                      Prepared By                      Approved By		

8.การตรวจสอบตู้คาปาซิเตอร์แบงค์		
ลำดับ	รายการ	การตรวจสอบ
1	HRC Fuse	จะต้องอยู่ในสภาพที่สมบูรณ์ทั้ง 3 เฟส (Fuseไม่ขาด)
2	MCCB	จะต้องอยู่ในสภาพที่ใช้งานได้ (ON - OFF - Trip)
3	Power Cable	จะต้องไม่ชำรุด, ขาด หรือไหม้ ตลอดความยาวสายไฟฟ้า
4	Magnetic Contactor	ตรวจสอบการทำงานทางไฟฟ้า และขดลวดความต้านทานต้องอยู่ในสภาพที่สมบูรณ์ไม่ขาดหรือหลุดออกจากตัว Magnetic Contactor
5	Detuned Filter Reactor	จะต้องอยู่ในสภาพที่สมบูรณ์ไม่มีรอยไหม้ หรือชำรุดเสียหาย
6	Capacitor Unit	ตัวถังจะต้องไม่บวม ทะลุ หรือมีรอยไหม้ ขั้วต่อสายต้องแน่น และจะต้องลงดินผ่านสายต่อฝากทุก Step
7	Damping Resister	จะต้องติดตั้งที่ขั้วของคาปาซิเตอร์ครบทั้ง 3 ชุด
8	Thermostat / Fan	ตรวจสอบสภาพการทำงานของพัดลมระบายอากาศ โดยการจำลองสภาวะอุณหภูมิสูงเกิน พร้อมทั้งปรับตั้งค่าอุณหภูมิให้เหมาะสม
9	Power Factor Controller (PFC)	ตรวจสอบการปรับตั้งค่าทางไฟฟ้าทุกค่าพารามิเตอร์
10	Terminal Retightening Torque	ตรวจสอบความแน่นของจุดต่อต่างๆทางไฟฟ้า จะต้องแน่นตามค่าที่กำหนดของ Nut และ Bolt ในแต่ละขนาด
11	Insulation Resistance Measurement	ตรวจวัดค่าความเป็นฉนวนของคาปาซิเตอร์ในแต่ละเฟสเทียบกับกราวด์ที่ตัวถัง โดยพิกัดแรงดันไฟฟ้าที่ใช้ในการทดสอบต้องไม่น้อยกว่า 500 Vdc และค่าความต้านทานฉนวนจะต้องมีค่าที่ไม่น้อยกว่า 1 MΩ
12	Microfarad Measurement	ตรวจวัดค่าอิมพีแดนซ์ของคาปาซิเตอร์ที่ขั้วระหว่างเฟส เช่น AB, BC และ CA ซึ่งค่าที่วัดได้จะต้องมีค่าอิมพีแดนซ์อยู่ในขอบเขตที่กำหนด 5% to +15% สำหรับคาปาซิเตอร์ขนาดไม่เกิน 100 kVAR 0% to +10% สำหรับคาปาซิเตอร์ขนาดเกิน 100 kVAR
13	Current Measurement	ตรวจวัดค่ากระแสไฟฟ้าใช้งานของคาปาซิเตอร์ทั้ง 3 เฟส ซึ่งกระแสไฟฟ้าในแต่ละเฟสจะต้องมีค่าที่เท่ากันหรือใกล้เคียงกัน
Inspected By                      Prepared By                      Approved By		

## Scope of Work

### Scope of Work

#### 1. Ring Main Unit

1. Inspect physical and mechanical condition.
2. Regressing the operating mechanism.
3. MV Fuse and Fuse base Check.
4. Inspect anchorage, alignment, and grounding.
5. Trip test for protection relay and record the existing setting.
6. Verify pressure gauge.
7. Cleaning overall.

#### 2. Transformer (Dry type)

1. General inspection and cleaning.
2. Bushing condition check.
3. Grounding connection check.
4. Retighten with torque wrench (busing connection)
5. Insulation resistance.
6. Measure the resistance of each winding at the designated tap position.
7. Perform turns-ratio tests at the designated tap position.
8. Verify that cooling fans operate correctly.

#### 3. LV Switchboards

1. Cleaning all panel.
2. Retorque the busbar at main incoming and between panel.
3. Insulation test.
4. Metering check.
5. General condition check.
6. Grounding connection check.
7. Busbar check.
8. Fuse and fuse bases check.

#### 4. Air Circuit Breaker

1. Cleaning the air circuit breaker and relubricating the operating mechanism.
2. Cleaning and check Arc-chuter.
3. Insulation check.
4. Rack-in / rack-out circuit breaker.
5. Trip unit function test. (Protection unit).
6. Parameter checking and recording of protective relay.
7. Contact resistance test.

#### 5. Capacitor Bank

1. Inspect for physical damage, broken insulation.
2. Tightness of connection wiring.
3. Cleaning.
4. Operating function.
5. Capacitive or current measurement.
6. Insulation resistance.
7. Check ventilation fan.

#### 6. Lamp

1. Verify the terminal whether they are not loose.
2. Verify the control wires whether they are not discoloration due to overheating.

Summary Test Report






Preventive Maintenance 2022 Tower A  
Summary Test Report For Preventive Maintenance

No.	Panel	Description	Q'ty	Test Result	Suggestion
1	RMU	1.1 RMU	1 set	Ring Main Unit is in good condition.	
2	Transformer	2.1 TR No.1/1	1 set	6 Box Control Temp meter ไม่แสดงค่าผิดปกติ	
		2.2 TR No.1/2	1 set	6 Box Control Temp meter ไม่แสดงค่าผิดปกติ	
3	Main Distribution Board	3.1 MDB No.1/1	1 set	Power Meter ค่าปกติ (Busduct Low Zone)	
		3.2 MDB No.1/2	1 set	ค่าอุณหภูมิห้อง Control ปรกติ	
		3.3 ATS-EMDB 1	1 set	- Lamp L3 ค่าปกติ	
				- ค่าอุณหภูมิห้องปรกติ ปรกติ	
4	Air Circuit Breaker	4.1 Air Circuit Breaker	5 set	Air Circuit Breaker is in good condition.	
5	Mold Case Circuit Breaker	5.1 Mold Case Circuit Breaker	34 set	Mold Case Circuit Breaker is in good condition.	
6	Capacitor Bank	6.1 Cap bank 1/1	1 set	Capacitor Step 5,8,11 ไม่พบการพ	
		6.2 Cap bank 1/2	1 set	Capacitor Bank is in good condition.	
7	Grounding	7.1 RMU	1 set	Grounding is in good condition.	
		7.2 TR No.1/1	1 set	Grounding is in good condition.	
		7.3 TR No.1/2	1 set	Grounding is in good condition.	
		7.4 MDB No.1/1	1 set	Grounding is in good condition.	
		7.5 MDB No.1/2	1 set	Grounding is in good condition.	
		7.6 ATS-EMDB 1	1 set	Grounding is in good condition.	
		7.7 Lighting Arrester	1 set	Grounding is in good condition.	



## Defect of Equipment

### Preventive Maintenance 2022 Tower A Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
1		<b>TR No.1/1</b> - ๕ Box Control Temp มาแต่ไฟแสดงแสงสว่าง <b>TR No.1/2</b> - ๕ Box Control Temp มาแต่ไฟแสดงแสงสว่าง	ตรวจสอบการแจ้งเตือนของไฟแสดงแสงสว่าง  ตรวจสอบการแจ้งเตือนของ Power Meter ใหม่	Merlin Gerin PM710
2		<b>MDB No.1/1</b> - Power Meter ชั่วๆ (Busduct Low Zone)	ตรวจสอบการแจ้งเตือนของ Power Meter ใหม่	Merlin Gerin PM710
3		<b>MDB No.1/2</b> - ไฟสัญญาณของ Control ชั่วๆ	ตรวจสอบการแจ้งเตือนของ Control ใหม่	

Item	Equipment's	Fault list	Corrective Action	Remark
4		ATS-EMDB 1 - Lamp L3 ชั่วๆ	ตรวจเช็คและเปลี่ยน Lamp ใหม่	
5		ATS-EMDB 1 - ค่าอุณหภูมิของขดลวด ชั่วๆ	ตรวจเช็คและปรับค่า	
6		Cap bank 1/1 - Capacitor Step ที่ 5,8,11 เลื่อนสภาพ	ตรวจเช็คและเปลี่ยน Capacitor ใหม่	Schneider Varplus Can 20Kvar/400V จำนวน 6 ea

Ring Main Unit

**RING MAIN UNIT INSPECTION TEST RECORD**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower A  
**CUSTOMER** : Millennium Residence Condominium **CUBICLE NAME** : Switchgear RMU

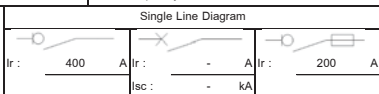
**TECHNICAL DATA DISCRPTION**

Manufacturer : NORMAFIX 24  
Type : Cela IS , CIS  
S/N : -  
Standard : CEI 60694/60298/62271

Rated Voltage (Ur) : 24 kV  
Operating Voltage (Un) : 24 kV  
Rated Power Frequency w/s (Ud) : 50 kV  
Lightning Impulse w/s (Up) : 125 kV

Rated Current (Ir) : 400/200 A  
Short Time Current (Ik) : 16 kA  
Duration of Short Circuit (tk) : 1 S  
Rated Frequency : 50 Hz

Bushing of Function Unit		1 st	2 nd	3 rd	4 th	5 th
Connection Type	Plug in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bolted	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**Visual Inspection and Function Test**

	Pass	Decline	Remark
<input checked="" type="checkbox"/> <b>1 st Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232746-1
Feeder Name : Incoming	<input checked="" type="checkbox"/>	<input type="checkbox"/>	400 A
Function Unit : 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
400 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>2 nd Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CIS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232747-2
Feeder Name : OutgoingTR1/1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100 A
Function Unit : 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>3 rd Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CIS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232748-3
Feeder Name : OutgoingTR1/2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100A
Function Unit : 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input type="checkbox"/> <b>4 th Function</b>	<input type="checkbox"/>	<input type="checkbox"/>	
- Cleaning Termination and Ring Main Unit	<input type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input type="checkbox"/>	<input type="checkbox"/>	
Feeder Name :	<input type="checkbox"/>	<input type="checkbox"/>	
Function Unit :	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input type="checkbox"/>	<input type="checkbox"/>	
A	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism

Responsibility	Tested by	Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

**Transformer**

# D-Nine Engineering

## FIELD INSPECTION AND TEST RECORD TRANSFORMER (DRY TYPE)

<b>PROJECT NAME</b> :	Preventive Maintenance 2022	<b>LOCATION</b> :	Tower A
<b>CUSTOMER</b> :	Millennium Residence Condominium	<b>FEEDER</b> :	Transformer No.1/1

### TECHNICAL DATA

Manufacture	ABB	Serial No.	1LKR080698TER
Type	Cast Resin	Type of cooling	AN/AF
Standard	IEC 60076-11	Weight	3900 kg.
Year of manufacture	2008/05	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.16/8.63 %
Vector-group symbol	Dyn11	Material	-
Rated power	1600/2240 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	38.5/53.9 A
Rated voltage LV	415/240 V	Rated current LV	2225.9/3116.3 A

### VISUAL INSPECTION AND FUNCTION TEST

- Inspection physical and mechanical condition
- Inspection alignment and grounding
- Inspection winding temperature indicator
- Clean the unit
- Verify the control alarm and trip setting on temperature indicators are as specified
- Verify that cooling fans operate
- Verify tightness of accessible bolted electrical connections
- Verify that as-left tap connections are as specified
- Verify tap changer position
- Verify the presence of surge arresters

Pass	Not pass	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

### INSULATION RESISTANCE MEASUREMENT

**Test Instruments :** Megger Model MIT515 , **Serial Number :** N/A

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	41,600	> 1,000
HV to LV	2500	42,600	> 1,000
LV to GND	1000	18,680	> 100

Humidity : 57 % , Ambient Temperature : 30.4 °C

### Function Testing and Cooling fan Testing

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. RMU


Pass	Not pass	Pass	Not pass	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

### POWER CABLE : INSULATION RESISTANCE MEASUREMENT

**Test Instruments :** Megger Model MIT515 , **Serial Number :** N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	278,000	317,000	323,000	142,800	179,600	116,000	> 2,000

Responsibility	Tested by	Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



**D-Nine**  
Engineering

FORM E2-002-0002 FORM E2-002-0002

---

**FIELD INSPECTION AND TEST RECORD**  
**TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022  
**CUSTOMER** : Millennium Residence Condominium

**LOCATION** : Tower A  
**FEEDER** : Transformer No.1/1

---

**TURN RATIO AND POLARITY MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.17	97.876	0.29	0.40	0.00	✓	
	V		97.916	0.25	0.44	0.00	✓	
	W		97.853	0.31	0.32	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

**-HV side of Xfmr**

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.735	3.745	3.759

**-LV side of Xfmr**

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
5	2.0	2.0	2.1

**TEMPERATURE MONITORING**

**Setting** :
 

**Trip**  
 = 110 °C

**Alarm**  
 = 90 °C

**Fan (On)**  
 = 75 °C

**Fan (Off)**  
 = 60 °C

**Function Testing and Cooling fan Testing**

	Pass	Not pass
1. Function Testing Operating of Cooling FAN.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Alarm Buzzer Testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Function Testing Trip TR. To RMU	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Remark** : Lamp at Control Box Temp ไม่พบแสงจ้า

* Alarm Trip ACB Main	
* Trip Trip RMU	

**Responsibility**

**Tested by**

**Witnessed by**

Company	[Signature]	Millennium Residence Condominium
Name	[Signature]	
Signature	[Signature]	
Date	[Signature]	

<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower A
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>FEEDER</b>	: Transformer No.1/2

Manufacturer	ABB	Serial No.	1LKR080692TER
Type	Cast Resin	Type of cooling	AN/AF
Standard	IEC 60076-11	Weight	3900 kg.
Year of manufacture	2008/05	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.08/8.52 %
Vector-group symbol	Dyn11	Material	-
Rated power	1600/2240 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	38.5/53.9 A
Rated voltage LV	415/240 V	Rated current LV	2225.9/3116.3 A

1. Inspection physical and mechanical condition
2. Inspection alignment and grounding
3. Inspection winding temperature indicator
4. Clean the unit
5. Verify the control alarm and trip setting on term
6. Verify that cooling fans operate
7. Verify tightness of accessible bolted electrical
8. Verify that as-let tap connections are as spec
9. Verify tap changer position
10. Verify the presence of surge arresters

[illegible]

**Test Instruments :** Megger Model MIT515 , **Serial Number :** N/A

Humidity : 56 % , Ambient Temperature : 30.4 °C

1. Function Testing Operating of Cooling FAN.
2. Alarm Buzzer Testing
3. Function Testing Trip TR. RMU

Pass	Not pass		Pass	Not pass	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

**Test Instruments :** Megger Model MIT515 , Serial Number : N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	467,000	643,000	553,000	360,000	241,000	381,000	> 2,000

Responsibility	Tested by		Witnessed by	
Company				Millennium Residence Condominium
Name				
Signature				
Date				

<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower A
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>FEEDER</b>	: Transformer No. 1/2

**Test Instruments :** Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	97.663	97.870	0.21	0.39	0.00	✓	
	V		97.922	0.27	0.47	0.00	✓	
	W		97.890	0.23	0.34	0.00	✓	

**Test Instruments :** Metrel Model MI3280 , **Serial Number :** 19241327

-LV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.667	3.664	3.684

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.0	1.7	2.0

<b>Setting</b>	:								
		<b>Trip</b>		<b>Alarm</b>		<b>Fan (On)</b>		<b>Fan (Off)</b>	
=		110 °C	=	90 °C	=	75 °C	=	60 °C	

1. Function Testing Operating of Cooling FAN.
2. Alarm Buzzer Testing
3. Function Testing Trip TR. To RMU

Pass	Not pass
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

Remark : Lamp ๑ Control Box Temp หมดไฟ

Responsibility	Tested by			Witnessed by		
Company				Millennium Residence Condominium		
Name						
Signature						
Date						

## Main Distribution Board

FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower A																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB 1/1																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; margin-top: 5px;"> <thead> <tr> <th></th> <th style="text-align: center;">Checked</th> <th style="text-align: center;">Not Checked</th> <th style="text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument :</b> Metrel Model MI3121H <b>Serial Number :</b> 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result Pass Fail																																																				
A to B	500	8,400	Passed > 1 MΩ	✓																																																				
B to C	500	7,600		✓																																																				
C to A	500	10,200		✓																																																				
A to GND	500	2,140		✓																																																				
B to GND	500	4,360		✓																																																				
C to GND	500	5,120		✓																																																				
Humidity : 56 %  Ambient Temperature : 30.4 °c																																																								
<b>Remark :</b> This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark :</b> The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark :</b> Power Meter ของ Busduct Low Zone มาตรฐาน (Merlin Gerin PM710)																																																								
Responsibility	Tested by		Witnessed by																																																					
Company			Millennium Residence Condominium																																																					
Name																																																								
Signature																																																								
Date	25 January 2022																																																							

FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower A																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB 1/2																																																						
<p><b>1. VISUAL INSPECTION</b></p> <table style="width: 100%;"> <thead> <tr> <th></th> <th style="text-align: center;">Checked</th> <th style="text-align: center;">Not Checked</th> <th style="text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<p><b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b></p> <p>Instrument : Metrel Model MI3121H      Serial Number : 16101986</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Test connection</th> <th rowspan="2">Test voltage (Vdc) , 1 min</th> <th rowspan="2">Insulation resistance (MΩ)</th> <th rowspan="2">Remark</th> <th colspan="2">Result</th> </tr> <tr> <th>Pass</th> <th>Fail</th> </tr> </thead> <tbody> <tr><td>A to B</td><td>500</td><td>14,130</td><td rowspan="6" style="text-align: center;">Passed &gt; 1 MΩ</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>B to C</td><td>500</td><td>12,590</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>C to A</td><td>500</td><td>31,600</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>A to GND</td><td>500</td><td>3,090</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>B to GND</td><td>500</td><td>6,870</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>C to GND</td><td>500</td><td>7,280</td><td style="text-align: center;">✓</td><td></td></tr> </tbody> </table> <p>Humidity : 52 %</p> <p>Ambient Temperature : 30.8 °C</p> <p><b>Remark :</b> This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.</p> <p><b>Remark :</b> The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.</p> <p><b>Remark :</b> - Lamp ไฟ L1 ช่าง - สำเนาผู้ควบคุมของ Control ช่าง</p>					Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result		Pass	Fail	A to B	500	14,130	Passed > 1 MΩ	✓		B to C	500	12,590	✓		C to A	500	31,600	✓		A to GND	500	3,090	✓		B to GND	500	6,870	✓		C to GND	500	7,280	✓														
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result																																																				
				Pass	Fail																																																			
A to B	500	14,130	Passed > 1 MΩ	✓																																																				
B to C	500	12,590		✓																																																				
C to A	500	31,600		✓																																																				
A to GND	500	3,090		✓																																																				
B to GND	500	6,870		✓																																																				
C to GND	500	7,280		✓																																																				
<b>Responsibility</b>	<b>Tested by</b>		<b>Witnessed by</b>																																																					
Company			Millennium Residence Condominium																																																					
Name																																																								
Signature																																																								
Date	20 January 2022																																																							

FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower A																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : ATS-EMDB 1																																																						
<p><b>1. VISUAL INSPECTION</b></p> <table style="width: 100%;"> <thead> <tr> <th></th> <th style="text-align: center;">Checked</th> <th style="text-align: center;">Not Checked</th> <th style="text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<p><b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b></p> <p>Instrument : Metrel Model MI3121H      Serial Number : 16101986</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Test connection</th> <th rowspan="2">Test voltage (Vdc) , 1 min</th> <th rowspan="2">Insulation resistance (MΩ)</th> <th rowspan="2">Remark</th> <th colspan="2">Result</th> </tr> <tr> <th>Pass</th> <th>Fail</th> </tr> </thead> <tbody> <tr><td>A to B</td><td>500</td><td>12,250</td><td rowspan="6" style="text-align: center;">Passed &gt; 1 MΩ</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>B to C</td><td>500</td><td>10,430</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>C to A</td><td>500</td><td>17,220</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>A to GND</td><td>500</td><td>9,550</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>B to GND</td><td>500</td><td>8,560</td><td style="text-align: center;">✓</td><td></td></tr> <tr><td>C to GND</td><td>500</td><td>8,770</td><td style="text-align: center;">✓</td><td></td></tr> </tbody> </table> <p>Humidity : 56 %</p> <p>Ambient Temperature : 30.4 °C</p> <p><b>Remark :</b> This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.</p> <p><b>Remark :</b> The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.</p> <p><b>Remark :</b> - Lamp ไฟ L3 ช่าง - บันทึกค่า ATS-EMDB 1 ผ่านบทนำผู้ควบคุมของช่าง</p>					Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result		Pass	Fail	A to B	500	12,250	Passed > 1 MΩ	✓		B to C	500	10,430	✓		C to A	500	17,220	✓		A to GND	500	9,550	✓		B to GND	500	8,560	✓		C to GND	500	8,770	✓														
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result																																																				
				Pass	Fail																																																			
A to B	500	12,250	Passed > 1 MΩ	✓																																																				
B to C	500	10,430		✓																																																				
C to A	500	17,220		✓																																																				
A to GND	500	9,550		✓																																																				
B to GND	500	8,560		✓																																																				
C to GND	500	8,770		✓																																																				
<b>Responsibility</b>	<b>Tested by</b>		<b>Witnessed by</b>																																																					
Company			Millennium Residence Condominium																																																					
Name																																																								
Signature																																																								
Date																																																								

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower A
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>DEVICE NO.</b>	: MDB No.1/1
<b>SAP NO</b>	: -	<b>FEEDER NAME.</b>	: Incoming from transformer No.1/1

TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-1 (3/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxilliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC <input checked="" type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other	
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC <input checked="" type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other	
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other	
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 220-240 VAC/VDC <input type="checkbox"/> Other	
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1	

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

**Test Instruments :** Chauvin Arnoux Model C.A 6240 , **Serial Number :** 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	14
B	10	13
C	10	16

Responsibility	Tested by	Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



FIELD INSPECTION AND TEST RECORD															
AIR CIRCUIT BREAKER															
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A													
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/1													
SAP NO : -		FEEDER NAME : Incoming from transformer No.1/1													
4. INSULATION RESISTANCE MEASUREMENT															
Test Instruments : _____ , Serial Number : _____															
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )													
Interrupter phase A	500	-	Humidity : _____ %  Ambient Temperature : _____ °C												
Interrupter phase B	500	-													
Interrupter phase C	500	-													
A-GND.	500	-													
B-GND.	500	-													
C-GND.	500	-													
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground															
5. OVERCURRENT TRIP UNIT MEASUREMENT															
Test Instruments : Full Function Test Kit , Serial Number : _____															
- Setting of overcurrent trip unit															
- Long time : Ir = 0.5 - Short time : Isd = 3 - Instantaneous : Ii = 6 - Earth fault : Ig = A (500)		- Time setting : tr = 4 s. - Time setting : tsd = 0.1 s. , Ir = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = 0.1 s. , Ir = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off													
- Operating time measurement															
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test															
Function	Test current	Should be	As found	Result	Indicator of tripping cause										
Long time	3733 A	Auto s.	26.232 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Short time	12000 A	Auto s.	0.171 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Instantaneous	24000 A	Auto s.	0.037 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Earth fault	1000 A	Auto s.	0.129 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Remark : _____															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;">Worked by</th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>						Responsibility	Worked by	Company		Name		Signature		Date	
Responsibility	Worked by														
Company															
Name															
Signature															
Date															

FIELD INSPECTION AND TEST RECORD													
AIR CIRCUIT BREAKER													
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A											
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/1											
SAP NO : -		FEEDER NAME : Busduct Low 2500A											
TECHNICAL DATA													
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.										
Type	NW25H1	Rated service breaking ( Ics )	100% kArms.										
Rated current ( In )	2500 A.	Frequency	50/60 Hz.										
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2										
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008										
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-3 (2/2)										
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole										
1. VISUAL INSPECTION AND FUNCTION TEST													
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
		<input checked="" type="checkbox"/>	_____										
2. ACCESSORIES													
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____										
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____										
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____										
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____										
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1												
3. MAIN CONTACT RESISTANCE MEASUREMENT													
Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV													
Phase	Test dc current ( A )	Contact resistance ( μΩ )											
A	10	12											
B	10	11											
C	10	15											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;">Worked by</th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>				Responsibility	Worked by	Company		Name		Signature		Date	
Responsibility	Worked by												
Company													
Name													
Signature													
Date													

FIELD INSPECTION AND TEST RECORD					
AIR CIRCUIT BREAKER					
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A			
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/1			
SAP NO : -		FEEDER NAME : Busduct Low 2500A			
<b>4. INSULATION RESISTANCE MEASUREMENT</b>					
Test Instruments : _____ , Serial Number : _____					
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )			
Interrupter phase A	500	-			
Interrupter phase B	500	-	Humidity : - %		
Interrupter phase C	500	-	Ambient Temperature : - °C		
A-GND.	500	-			
B-GND.	500	-			
C-GND.	500	-			
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground					
<b>5. OVERCURRENT TRIP UNIT MEASUREMENT</b>					
Test Instruments : Full Function Test Kit , Serial Number : _____					
- Setting of overcurrent trip unit					
- Long time : Ir = 1 - Short time : Isd = 6 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off			
- Operating time measurement					
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test					
Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	10833 A	Auto s.	0.848 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	18750 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____					
Responsibility	Tested by		Witnessed by		
Company					
Name					
Signature					
Date					

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/1 & MDB No.1/2	
SAP NO : -		FEEDER NAME : Bus TIE	
<b>TECHNICAL DATA</b>			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-2 (1/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
<b>2. ACCESSORIES</b>			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
<b>3. MAIN CONTACT RESISTANCE MEASUREMENT</b>			
Test Instruments : _____ , Serial Number : _____			
Phase	Test dc current ( A )	Contact resistance ( μf2 )	
A	10	-	
B	10	-	
C	10	-	
Responsibility	Tested by		Witnessed by
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD															
AIR CIRCUIT BREAKER															
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A													
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/1 & MDB No.1/2													
SAP NO : -		FEEDER NAME : Bus TIE													
4. INSULATION RESISTANCE MEASUREMENT															
Test Instruments : _____ , Serial Number : _____															
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )													
Interrupter phase A	500	-													
Interrupter phase B	500	-	Humidity : - %												
Interrupter phase C	500	-	Ambient Temperature : - °C												
A-GND.	500	-													
B-GND.	500	-													
C-GND.	500	-													
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground															
5. OVERCURRENT TRIP UNIT MEASUREMENT															
Test Instruments : Full Function Test Kit , Serial Number : _____															
- Setting of overcurrent trip unit															
- Long time : Ir = 1 - Short time : Isd = 3 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 8 s. - Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off													
- Operating time measurement															
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test															
Function	Test current	Should be	As found	Result	Indicator of tripping cause										
Long time	A	Auto s.	s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show										
Short time	A	Auto s.	s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show										
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show										
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show										
Remark : _____															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>						Responsibility		Company		Name		Signature		Date	
Responsibility															
Company															
Name															
Signature															
Date															

FIELD INSPECTION AND TEST RECORD																									
AIR CIRCUIT BREAKER																									
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A																							
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/2																							
SAP NO : -		FEEDER NAME : Incoming from transformer No.1/2																							
TECHNICAL DATA																									
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.																						
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.																						
Rated current ( In )	3200 A.	Frequency	50/60 Hz.																						
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2																						
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008																						
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-1 (4/4)																						
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole																						
1. VISUAL INSPECTION AND FUNCTION TEST																									
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Checked</th> <th style="width: 90%;">Remark</th> </tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> </table>		Checked	Remark	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Checked	Remark																								
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
2. ACCESSORIES																									
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____																						
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1																								
3. MAIN CONTACT RESISTANCE MEASUREMENT																									
Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV																									
Phase	Test dc current ( A )	Contact resistance ( μf2 )																							
A	10	14																							
B	10	16																							
C	10	15																							
Responsibility																									
Company																									
Name																									
Signature																									
Date																									

FIELD INSPECTION AND TEST RECORD															
AIR CIRCUIT BREAKER															
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A													
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/2													
SAP NO : -		FEEDER NAME : Incoming from transformer No.1/2													
4. INSULATION RESISTANCE MEASUREMENT															
Test Instruments : _____, Serial Number : _____															
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )													
Interrupter phase A	500	-	Humidity : _____ %  Ambient Temperature : _____ °C												
Interrupter phase B	500	-													
Interrupter phase C	500	-													
A-GND.	500	-													
B-GND.	500	-													
C-GND.	500	-													
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground															
5. OVERCURRENT TRIP UNIT MEASUREMENT															
Test Instruments : Full Function Test Kit, Serial Number : _____															
- Setting of overcurrent trip unit															
- Long time : Ir = 0.5 - Short time : Isd = 4 - Instantaneous : Ii = 6 - Earth fault : Ig = A (500)		- Time setting : tr = 4 s. - Time setting : tsd = 0.1 s., I <sub>t</sub> = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = 0.1 s., I <sub>t</sub> = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off													
- Operating time measurement															
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test															
Function	Test current	Should be	As found	Result	Indicator of tripping cause										
Long time	4800 A	Auto s.	14.887 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Short time	12800 A	Auto s.	0.144 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Instantaneous	24000 A	Auto s.	0.035 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Earth fault	1000 A	Auto s.	10.137 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Remark : _____															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td>20 January 2022</td> </tr> </table>						Responsibility		Company		Name		Signature		Date	20 January 2022
Responsibility															
Company															
Name															
Signature															
Date	20 January 2022														

FIELD INSPECTION AND TEST RECORD																									
AIR CIRCUIT BREAKER																									
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A																							
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.1/2																							
SAP NO : -		FEEDER NAME : Busduct High 2000A																							
TECHNICAL DATA																									
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.																						
Type	NW20H1	Rated service breaking ( Ics )	100% kArms.																						
Rated current ( In )	2500 A.	Frequency	50/60 Hz.																						
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2																						
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008																						
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-4 (1/2)																						
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole																						
1. VISUAL INSPECTION AND FUNCTION TEST																									
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Checked</th> <th style="width: 90%;">Remark</th> </tr> </thead> <tbody> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> </tbody> </table>		Checked	Remark	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Checked	Remark																								
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
2. ACCESSORIES																									
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____																						
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1																								
3. MAIN CONTACT RESISTANCE MEASUREMENT																									
Test Instruments : Chauvin Arnoux Model C.A 6240, Serial Number : 162470PBV																									
Phase	Test dc current ( A )	Contact resistance ( μf2 )																							
A	10	13																							
B	10	11																							
C	10	12																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>				Responsibility		Company		Name		Signature		Date													
Responsibility																									
Company																									
Name																									
Signature																									
Date																									

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower A
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>DEVICE NO.</b>	: MDB No.1/2
<b>SAP NO</b>	: ~	<b>FEEDER NAME.</b>	: Busduct High 2000A

**4. INSULATION RESISTANCE MEASUREMENT**

**Test Instruments :** \_\_\_\_\_ , **Serial Number :** \_\_\_\_\_

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )	
Interrupter phase A	500	-	Humidity : _____ %  Ambient Temperature : _____ °C
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	

**Note:** Circuit breaker in open position when measurement between interrupt contact  
 Circit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

**Test Instruments :** \_\_\_\_\_ Full Function Test Kit , **Serial Number :** \_\_\_\_\_

**- Setting of overcurrent trip unit**

- Long time : Ir = <u>1</u> - Short time : Isd = <u>6</u> - Instantaneous : Ii = <u>-</u> - Earth fault : Ig = <u>-</u>	- Time setting : tr = <u>0.5</u> s. - Time setting : tsd = <u>-</u> s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = <u>-</u> s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off
--	--

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	8667 A	Auto s.	0.864 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	15000 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

**Remark :** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower A
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>DEVICE NO.</b>	: MDB No.1/1
<b>SAP NO</b>	: -	<b>FEEDER NAME.</b>	: Capacitor Bank 1/1

TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS1000N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	1000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	140409S981-2
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect arc chutes
- Inspect auxilliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 200-250 VAC/VDC <input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC <input type="checkbox"/> 220-240 VAC/VDC <input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

**Test Instruments :** Chauvin Arnoux Model C.A 6240 , **Serial Number :** 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	41	
B	10	49	
C	10	43	

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.1/1  
SAP NO : FEEDER NAME : Capacitor Bank 1/1

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact

Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit , Serial Number :

**- Setting of overcurrent trip unit**

- Long time : Ir = 0.8	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	18.263 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.1/2  
SAP NO : FEEDER NAME : Capacitor Bank 1/2

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404095284-11 (1/1)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( μf2 )
A	10	39
B	10	37
C	10	41

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.1/2  
SAP NO : FEEDER NAME : Capacitor Bank 1/2

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

Note: Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit, Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 8 s.
- Short time : Isd = 6	- Time setting : tsd = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	A	Auto s.	s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	A	Auto s.	s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date	25 January 2022	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB1  
SAP NO : FEEDER NAME : Nomal line

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404096941-1 (4/6)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Phase	Test dc current ( A )	Contact resistance ( μf2 )
A	10	-
B	10	-
C	10	-

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		

FIELD INSPECTION AND TEST RECORD					
MOLD CASE CIRCUIT BREAKER					
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A			
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB1			
SAP NO : -		FEEDER NAME : Nomal line			
4. INSULATION RESISTANCE MEASUREMENT					
Test Instruments : _____ , Serial Number : _____					
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )			
Interrupter phase A	500	-			
Interrupter phase B	500	-	Humidity : - %		
Interrupter phase C	500	-	Ambient Temperature : - °C		
A-GND.	500	-			
B-GND.	500	-			
C-GND.	500	-			
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground					
5. OVERCURRENT TRIP UNIT MEASUREMENT					
Test Instruments : Full Function Test Kit , Serial Number : _____					
- Setting of overcurrent trip unit					
- Long time : Ir = 1 - Short time : Isd = 6 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 8 s. - Time setting : tsd = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off			
- Operating time measurement					
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test					
Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	3467 A	Auto s.	13.621 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	6000 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____					
_____					
_____					
Responsibility					
Company					
Name					
Signature					
Date					

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB1	
SAP NO : -		FEEDER NAME : Emergency line	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404096941-1 (3/6)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked Remark <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____ <input checked="" type="checkbox"/> _____	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : _____ , Serial Number : _____			
Phase	Test dc current ( A )	Contact resistance ( μf2 )	
A	10	-	
B	10	-	
C	10	-	
Remark : _____			
_____			
_____			
Responsibility			
Company			
Name			
Signature			
Date			



**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB1  
SAP NO : FEEDER NAME : Emergency line

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

Note: Circuit breaker in open position when measurement between interrupt contact

Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit, Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 8 s.
- Short time : Isd = 4	- Time setting : tsd = - s., I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s., I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	2400 A	Auto s.	29.804 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	4000 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower A  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.1/2  
SAP NO : FEEDER NAME : To ATS

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404095284-11 (1/1)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Phase	Test dc current ( A )	Contact resistance ( μΩ )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	



FIELD INSPECTION AND TEST RECORD																																			
MOLD CASE CIRCUIT BREAKER																																			
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower A																																	
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>DEVICE NO.</b> : MDB No.1/2																																	
<b>SAP NO</b> : -		<b>FEEDER NAME</b> : To ATS																																	
<b>4. INSULATION RESISTANCE MEASUREMENT</b> Test Instruments : _____ , Serial Number : _____  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Test connection</th> <th style="width: 25%;">Test voltage ( Vdc )</th> <th style="width: 25%;">Insulation resistance ( MΩ )</th> <th style="width: 25%;"></th> </tr> </thead> <tbody> <tr><td>Interrupter phase A</td><td>500</td><td>-</td><td></td></tr> <tr><td>Interrupter phase B</td><td>500</td><td>-</td><td></td></tr> <tr><td>Interrupter phase C</td><td>500</td><td>-</td><td></td></tr> <tr><td>A-GND.</td><td>500</td><td>-</td><td></td></tr> <tr><td>B-GND.</td><td>500</td><td>-</td><td></td></tr> <tr><td>C-GND.</td><td>500</td><td>-</td><td></td></tr> </tbody> </table> <div style="margin-top: 10px;">             Humidity : _____ %              Ambient Temperature : _____ °c           </div> <p><small><b>Note:</b> Circuit breaker in open position when measurement between interrupt contact              Circuit breaker in close position when measurement between phase and ground and other phase connect to ground</small></p>				Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )		Interrupter phase A	500	-		Interrupter phase B	500	-		Interrupter phase C	500	-		A-GND.	500	-		B-GND.	500	-		C-GND.	500	-					
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )																																	
Interrupter phase A	500	-																																	
Interrupter phase B	500	-																																	
Interrupter phase C	500	-																																	
A-GND.	500	-																																	
B-GND.	500	-																																	
C-GND.	500	-																																	
<b>5. OVERCURRENT TRIP UNIT MEASUREMENT</b> Test Instruments : Full Function Test Kit , Serial Number : _____  <b>- Setting of overcurrent trip unit</b> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 50%;">           - Long time : Ir = 1            - Short time : Isd = 6            - Instantaneous : Ii = -            - Earth fault : Ig = -         </td> <td style="width: 50%;">           - Time setting : tr = 8 s.            - Time setting : tsd = - s. , I<sub>t</sub><sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off             - Time setting : tg = - s. , I<sub>t</sub><sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off         </td> </tr> </tbody> </table> <b>- Operating time measurement</b> Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Function</th> <th>Test current</th> <th>Should be</th> <th>As found</th> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td>Long time</td> <td>3467 A</td> <td>Auto s.</td> <td>13.186 s.</td> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Short time</td> <td>6000 A</td> <td>Auto s.</td> <td>0.062 s.</td> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Instantaneous</td> <td>- A</td> <td>- s.</td> <td>- s.</td> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Earth fault</td> <td>- A</td> <td>- s.</td> <td>- s.</td> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table> Remark : _____ _____ _____				- Long time : Ir = 1 - Short time : Isd = 6 - Instantaneous : Ii = - - Earth fault : Ig = -	- Time setting : tr = 8 s. - Time setting : tsd = - s. , I <sub>t</sub> <sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off  - Time setting : tg = - s. , I <sub>t</sub> <sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off	Function	Test current	Should be	As found	Result	Indicator of tripping cause	Long time	3467 A	Auto s.	13.186 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	Short time	6000 A	Auto s.	0.062 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
- Long time : Ir = 1 - Short time : Isd = 6 - Instantaneous : Ii = - - Earth fault : Ig = -	- Time setting : tr = 8 s. - Time setting : tsd = - s. , I <sub>t</sub> <sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off  - Time setting : tg = - s. , I <sub>t</sub> <sup>2</sup> = <input type="checkbox"/> On <input type="checkbox"/> Off																																		
Function	Test current	Should be	As found	Result	Indicator of tripping cause																														
Long time	3467 A	Auto s.	13.186 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show																														
Short time	6000 A	Auto s.	0.062 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show																														
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show																														
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 40%;">Tested by</th> <th style="width: 45%;">Witnessed by</th> </tr> </thead> <tbody> <tr> <td>Company</td> <td>D-Nine Engineering Co., Ltd.</td> <td>Millennium Residence Condominium</td> </tr> <tr> <td>Name</td> <td>Mr.Akom Hansa</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> <td></td> </tr> <tr> <td>Date</td> <td>25 January 2022</td> <td></td> </tr> </tbody> </table>				Responsibility	Tested by	Witnessed by	Company	D-Nine Engineering Co., Ltd.	Millennium Residence Condominium	Name	Mr.Akom Hansa		Signature			Date	25 January 2022																		
Responsibility	Tested by	Witnessed by																																	
Company	D-Nine Engineering Co., Ltd.	Millennium Residence Condominium																																	
Name	Mr.Akom Hansa																																		
Signature																																			
Date	25 January 2022																																		

## Mold Case Circuit Breaker



FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER																	
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower A													
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.1/1													
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -													
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>																	
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result										
					Pass	Not Pass											
1	Cab bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
2	10PDB1/T1	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
3	25PDB1/T1	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
4	40PDB1/T1	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
5	Busduct Low	NW25H1	Square D	2500	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
6	LPP1/T1	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
7	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
8	SPARE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
9					<input type="checkbox"/>	<input type="checkbox"/>											
10					<input type="checkbox"/>	<input type="checkbox"/>											
11					<input type="checkbox"/>	<input type="checkbox"/>											
12					<input type="checkbox"/>	<input type="checkbox"/>											
13					<input type="checkbox"/>	<input type="checkbox"/>											
14					<input type="checkbox"/>	<input type="checkbox"/>											
15					<input type="checkbox"/>	<input type="checkbox"/>											
16					<input type="checkbox"/>	<input type="checkbox"/>											
17					<input type="checkbox"/>	<input type="checkbox"/>											
18					<input type="checkbox"/>	<input type="checkbox"/>											
19					<input type="checkbox"/>	<input type="checkbox"/>											
20					<input type="checkbox"/>	<input type="checkbox"/>											
21					<input type="checkbox"/>	<input type="checkbox"/>											
22					<input type="checkbox"/>	<input type="checkbox"/>											
23					<input type="checkbox"/>	<input type="checkbox"/>											
24					<input type="checkbox"/>	<input type="checkbox"/>											
25					<input type="checkbox"/>	<input type="checkbox"/>											
26					<input type="checkbox"/>	<input type="checkbox"/>											
27					<input type="checkbox"/>	<input type="checkbox"/>											
28					<input type="checkbox"/>	<input type="checkbox"/>											
29					<input type="checkbox"/>	<input type="checkbox"/>											
30					<input type="checkbox"/>	<input type="checkbox"/>											
31					<input type="checkbox"/>	<input type="checkbox"/>											
32					<input type="checkbox"/>	<input type="checkbox"/>											
33					<input type="checkbox"/>	<input type="checkbox"/>											
34					<input type="checkbox"/>	<input type="checkbox"/>											
35					<input type="checkbox"/>	<input type="checkbox"/>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 85%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td>20 January 2022</td> </tr> </table>								Responsibility		Company		Name		Signature		Date	20 January 2022
Responsibility																	
Company																	
Name																	
Signature																	
Date	20 January 2022																



FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER																	
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower A													
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.1/2													
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -													
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>																	
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result										
					Pass	Not Pass											
1	Cab bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
2	AC MCC-F/D-T1-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
3	AC MCC-F/B-T1-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
4	FOR FUTURE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
5	To ATS	NS800N	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
6	AC MCC-F/26-T1-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
7	AC MCC-F/F-T1-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
8	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
9	Busduct High	NW20H1	Square D	2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
10					<input type="checkbox"/>	<input type="checkbox"/>											
11					<input type="checkbox"/>	<input type="checkbox"/>											
12					<input type="checkbox"/>	<input type="checkbox"/>											
13					<input type="checkbox"/>	<input type="checkbox"/>											
14					<input type="checkbox"/>	<input type="checkbox"/>											
15					<input type="checkbox"/>	<input type="checkbox"/>											
16					<input type="checkbox"/>	<input type="checkbox"/>											
17					<input type="checkbox"/>	<input type="checkbox"/>											
18					<input type="checkbox"/>	<input type="checkbox"/>											
19					<input type="checkbox"/>	<input type="checkbox"/>											
20					<input type="checkbox"/>	<input type="checkbox"/>											
21					<input type="checkbox"/>	<input type="checkbox"/>											
22					<input type="checkbox"/>	<input type="checkbox"/>											
23					<input type="checkbox"/>	<input type="checkbox"/>											
24					<input type="checkbox"/>	<input type="checkbox"/>											
25					<input type="checkbox"/>	<input type="checkbox"/>											
26					<input type="checkbox"/>	<input type="checkbox"/>											
27					<input type="checkbox"/>	<input type="checkbox"/>											
28					<input type="checkbox"/>	<input type="checkbox"/>											
29					<input type="checkbox"/>	<input type="checkbox"/>											
30					<input type="checkbox"/>	<input type="checkbox"/>											
31					<input type="checkbox"/>	<input type="checkbox"/>											
32					<input type="checkbox"/>	<input type="checkbox"/>											
33					<input type="checkbox"/>	<input type="checkbox"/>											
34					<input type="checkbox"/>	<input type="checkbox"/>											
35					<input type="checkbox"/>	<input type="checkbox"/>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 85%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>								Responsibility		Company		Name		Signature		Date	
Responsibility																	
Company																	
Name																	
Signature																	
Date																	



FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
PROJECT NAME : Preventive Maintenance 2022				LOCATION : Tower A			
CUSTOMER : Millennium Residence Condominium				CUBICLE NAME : ATS-EMDB 1			
ERECTION SITE : -				FEEDER : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Normal	NS800N	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	Emergency	NS800N	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	40PED B1/T1	NBD630L	Square D	500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	LPEP1/T1	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	10PEDB1/T1	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	25PEDB1/T1	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	SN MCC-B-T1-01	NBD250L	Square D	63	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	EAC MCC-F/D-T1-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	EAC MCC-F/D-T1-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	EAC MCC-F/D-T1-03	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	EAC MCC-F/B-T1-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	EAC MCC-F/48-T1-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	EAC MCC-F/48-T1-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14	EAC MCC-F/R-T1-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15	SLDB1/T1	NBD250L	Square D	160	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16	SN MCC-B-T1-02	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
17	SN MCC-G-05	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>							
Company							
Name							
Signature							
Date	20 January 2022						

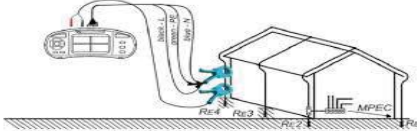
Capacitor Bank

1 of 22 of 2

FIELD INSPECTION AND TEST RECORD CAPACITOR BANK																																																																							
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower A																																																																					
CUSTOMER : Millennium Residence Condominium		CUBICLE NAME : MDB No.1/2																																																																					
ERECTION SITE : -		FEEDER : CAP BANK 1/2																																																																					
<b>TECHNICAL DATA</b> <div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><input checked="" type="checkbox"/> FUSE    <input type="checkbox"/> MCCB</p> <p>Manufacture : MRO</p> <p>Type : NH00C</p> <p>Rated current ( In ) : 100 A.</p> <p><input checked="" type="checkbox"/> MEGNETIC CONTACTOR</p> <p>Manufacture : Federal</p> <p>Type : FC-95DK21</p> <p>Rated operation voltage ( Ue ) : 400 V.</p> </div> <div style="width: 48%;"> <p><input checked="" type="checkbox"/> CAPACITOR</p> <p>Manufacture : MKS</p> <p>Type : HPC-24.2 440-3P</p> <p>Rated voltage ( Un ) : 400 V.</p> <p>Rated frequency ( fn ) : 50 Hz.</p> <p>Rated output ( Qn ) : 40 (20+20) kVar.</p> <p>Rated capacitance ( Cn ) : 397.89 μF.</p> <p>Insulation level ( Ui ) : - kV.</p> </div> </div>																																																																							
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b> <div style="display: flex;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <li>Inspect physical and mechanical condition</li> <li>Inspect alignment, grounding and clearances</li> <li>Clean the unit</li> <li>Verify tightness of accessible bolted electrical connection</li> <li>Power Factor Controller ( PFC )</li> </ul> <p>Manufacture : Mikro    Type : PFR 120    Number of output : 12</p> <p>Operating voltage : 415 V.    Current input : 5 A.    CT ratio : 3000/5</p> <p>Serial no. : 139103</p> <p>Setting : Starting current setting ( C/K ) : 0.1    Switching time between steps : 45 s.</p> <p>Power factor setting : 0.9    Switching sequences : Aut</p> <p>Voltage measurement : A - N = 234 V.    B - N = 234 V.    C - N = 235 V.</p> <p style="margin-left: 100px;">A - B = 406 V.    B - C = 404 V.    C - A = 406 V.</p> </div> <div style="width: 35%;"> <p>Check    Remark</p> <p><input checked="" type="checkbox"/>    _____</p> <p><input checked="" type="checkbox"/>    _____</p> <p><input checked="" type="checkbox"/>    _____</p> </div> </div>																																																																							
<b>2. INSULATION RESISTANCE MEASUREMENT</b> Test Instruments : Metrel Model MI3121H    Serial Number : 16101986																																																																							
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Step No.</th> <th rowspan="2">Test voltage ( Vdc )</th> <th colspan="3">Insulation Resistance ( MΩ )</th> </tr> <tr> <th>A - Gnd</th> <th>B - Gnd</th> <th>C - Gnd</th> </tr> </thead> <tbody> <tr><td>1</td><td>500</td><td>12490</td><td>13550</td><td>5100</td></tr> <tr><td>2</td><td>500</td><td>3140</td><td>3670</td><td>3450</td></tr> <tr><td>3</td><td>500</td><td>4500</td><td>3760</td><td>3240</td></tr> <tr><td>4</td><td>500</td><td>2910</td><td>2820</td><td>570</td></tr> <tr><td>5</td><td>500</td><td>232</td><td>389</td><td>247</td></tr> <tr><td>6</td><td>500</td><td>312</td><td>279</td><td>325</td></tr> <tr><td>7</td><td>500</td><td>266</td><td>139</td><td>234</td></tr> <tr><td>8</td><td>500</td><td>174</td><td>154</td><td>182</td></tr> <tr><td>9</td><td>500</td><td>196</td><td>108</td><td>116</td></tr> <tr><td>10</td><td>500</td><td>124</td><td>128</td><td>146</td></tr> <tr><td>11</td><td>500</td><td>132</td><td>128</td><td>124</td></tr> <tr><td>12</td><td>500</td><td>132</td><td>136</td><td>228</td></tr> </tbody> </table>				Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )			A - Gnd	B - Gnd	C - Gnd	1	500	12490	13550	5100	2	500	3140	3670	3450	3	500	4500	3760	3240	4	500	2910	2820	570	5	500	232	389	247	6	500	312	279	325	7	500	266	139	234	8	500	174	154	182	9	500	196	108	116	10	500	124	128	146	11	500	132	128	124	12	500	132	136	228
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )																																																																					
		A - Gnd	B - Gnd	C - Gnd																																																																			
1	500	12490	13550	5100																																																																			
2	500	3140	3670	3450																																																																			
3	500	4500	3760	3240																																																																			
4	500	2910	2820	570																																																																			
5	500	232	389	247																																																																			
6	500	312	279	325																																																																			
7	500	266	139	234																																																																			
8	500	174	154	182																																																																			
9	500	196	108	116																																																																			
10	500	124	128	146																																																																			
11	500	132	128	124																																																																			
12	500	132	136	228																																																																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="background-color: #f2f2f2;">Responsibility</th> <th style="background-color: #f2f2f2;"> </th> </tr> <tr><td>Company</td><td> </td></tr> <tr><td>Name</td><td> </td></tr> <tr><td>Signature</td><td> </td></tr> <tr><td>Date</td><td> </td></tr> </table>				Responsibility		Company		Name		Signature		Date																																																											
Responsibility																																																																							
Company																																																																							
Name																																																																							
Signature																																																																							
Date																																																																							

FIELD INSPECTION AND TEST RECORD CAPACITOR BANK																																																																																																				
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower A																																																																																																	
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.1/2																																																																																																	
ERECTION SITE : -			FEEDER : CAP BANK 1/2																																																																																																	
<b>3. CURRENT AND CAPACITANCE MEASUREMENT</b> Test Instruments : Fluke Model 179    Serial Number : 23770566																																																																																																				
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Step No.</th> <th rowspan="2">Rate Power (kVar)</th> <th rowspan="2">Rate Fuse (A)</th> <th colspan="3">Measurement Capacitance ( μF )</th> <th rowspan="2">Result</th> </tr> <tr> <th>Phase A-B</th> <th>Phase B-C</th> <th>Phase C-A</th> </tr> </thead> <tbody> <tr><td>1.</td><td>40</td><td>100</td><td>398</td><td>397</td><td>397</td><td>Passed</td></tr> <tr><td>2.</td><td>40</td><td>100</td><td>383</td><td>384</td><td>382</td><td>Passed</td></tr> <tr><td>3.</td><td>40</td><td>100</td><td>396</td><td>395</td><td>396</td><td>Passed</td></tr> <tr><td>4.</td><td>40</td><td>100</td><td>392</td><td>387</td><td>393</td><td>Passed</td></tr> <tr><td>5.</td><td>40</td><td>100</td><td>391</td><td>391</td><td>380</td><td>Passed</td></tr> <tr><td>6.</td><td>40</td><td>100</td><td>395</td><td>396</td><td>396</td><td>Passed</td></tr> <tr><td>7.</td><td>40</td><td>100</td><td>398</td><td>397</td><td>398</td><td>Passed</td></tr> <tr><td>8.</td><td>40</td><td>100</td><td>397</td><td>396</td><td>395</td><td>Passed</td></tr> <tr><td>9.</td><td>40</td><td>100</td><td>396</td><td>396</td><td>396</td><td>Passed</td></tr> <tr><td>10.</td><td>40</td><td>100</td><td>396</td><td>396</td><td>396</td><td>Passed</td></tr> <tr><td>11.</td><td>40</td><td>100</td><td>397</td><td>396</td><td>397</td><td>Passed</td></tr> <tr><td>12.</td><td>40</td><td>100</td><td>398</td><td>397</td><td>398</td><td>Passed</td></tr> </tbody> </table>							Step No.	Rate Power (kVar)	Rate Fuse (A)	Measurement Capacitance ( μF )			Result	Phase A-B	Phase B-C	Phase C-A	1.	40	100	398	397	397	Passed	2.	40	100	383	384	382	Passed	3.	40	100	396	395	396	Passed	4.	40	100	392	387	393	Passed	5.	40	100	391	391	380	Passed	6.	40	100	395	396	396	Passed	7.	40	100	398	397	398	Passed	8.	40	100	397	396	395	Passed	9.	40	100	396	396	396	Passed	10.	40	100	396	396	396	Passed	11.	40	100	397	396	397	Passed	12.	40	100	398	397	398	Passed
Step No.	Rate Power (kVar)	Rate Fuse (A)	Measurement Capacitance ( μF )			Result																																																																																														
			Phase A-B	Phase B-C	Phase C-A																																																																																															
1.	40	100	398	397	397	Passed																																																																																														
2.	40	100	383	384	382	Passed																																																																																														
3.	40	100	396	395	396	Passed																																																																																														
4.	40	100	392	387	393	Passed																																																																																														
5.	40	100	391	391	380	Passed																																																																																														
6.	40	100	395	396	396	Passed																																																																																														
7.	40	100	398	397	398	Passed																																																																																														
8.	40	100	397	396	395	Passed																																																																																														
9.	40	100	396	396	396	Passed																																																																																														
10.	40	100	396	396	396	Passed																																																																																														
11.	40	100	397	396	397	Passed																																																																																														
12.	40	100	398	397	398	Passed																																																																																														
Note: <input checked="" type="checkbox"/> = Pass <input type="checkbox"/> = Not Pass    N/A = Not applicable																																																																																																				
$kVAR_E = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{f_A}{f_R} = 40.00 \text{ kVar} \quad , \quad \text{Normal current} = \frac{40.00 \text{ kVar}}{(Vdc) \times 1.732} = 57.74 \text{ A. / Set}$ $C_{LL} = \frac{3C_n}{2} = \frac{397.89 \mu F.}{2} \text{ / Set for } \Delta \text{ Conn.} \quad , \quad \text{No. of parallel capacitors} = 1$																																																																																																				
The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ;    Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.																																																																																																				
<b>4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT</b> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Position</th> <th>Voltage measurement ( V )</th> <th>Current measurement ( A )</th> </tr> </thead> <tbody> <tr><td>Fan no. 1</td><td>-</td><td>-</td></tr> <tr><td>Fan no. 2</td><td>-</td><td>-</td></tr> <tr><td>Fan no. 3</td><td>-</td><td>-</td></tr> <tr><td>Fan no. 4</td><td>-</td><td>-</td></tr> </tbody> </table>							Position	Voltage measurement ( V )	Current measurement ( A )	Fan no. 1	-	-	Fan no. 2	-	-	Fan no. 3	-	-	Fan no. 4	-	-																																																																															
Position	Voltage measurement ( V )	Current measurement ( A )																																																																																																		
Fan no. 1	-	-																																																																																																		
Fan no. 2	-	-																																																																																																		
Fan no. 3	-	-																																																																																																		
Fan no. 4	-	-																																																																																																		
Remark : _____ _____ _____																																																																																																				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="background-color: #f2f2f2;">Responsibility</th> <th style="background-color: #f2f2f2;"> </th> </tr> <tr><td>Company</td><td> </td></tr> <tr><td>Name</td><td> </td></tr> <tr><td>Signature</td><td> </td></tr> <tr><td>Date</td><td> </td></tr> </table>							Responsibility		Company		Name		Signature		Date																																																																																					
Responsibility																																																																																																				
Company																																																																																																				
Name																																																																																																				
Signature																																																																																																				
Date																																																																																																				

## Grounding

FIELD INSPECTION AND TEST RECORD																
GROUND SYSTEM																
PROJECT NAME	: Preventive Maintenance 2022	Location	: Tower A													
CUSTOMER	: Millennium Residence Condominium	PANEL	: Electrical Room													
SAP NO	: -	FEEDER NAME	: -													
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <b>Checking Test</b> <table style="width: 100%; margin-top: 5px;"> <tr> <td style="width: 80%;">1. Cover seal visual check</td> <td style="width: 20%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 10%;"></td> </tr> <tr> <td>2. Cleaning box or joint</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>3. Visual check cable</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> <tr> <td>4. Retorque connection</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td></td> </tr> </table> </div> <div style="border: 1px solid black; padding: 5px;"> <b>Testing method</b> <div style="text-align: center; margin-top: 10px;">  </div> </div>					1. Cover seal visual check	<input checked="" type="checkbox"/>		2. Cleaning box or joint	<input checked="" type="checkbox"/>		3. Visual check cable	<input checked="" type="checkbox"/>		4. Retorque connection	<input checked="" type="checkbox"/>	
1. Cover seal visual check	<input checked="" type="checkbox"/>															
2. Cleaning box or joint	<input checked="" type="checkbox"/>															
3. Visual check cable	<input checked="" type="checkbox"/>															
4. Retorque connection	<input checked="" type="checkbox"/>															
<b>GROUNDING TEST</b> Test Instruments : Metrel Model MI3123 , Serial Number : 16410143																
NO	POINT / ROOM	AS FOUND TEST ( Ω )	Passed	Failed												
1.	RMU	0.18	✓													
2.	Transformer No. 1/1	0.05	✓													
3.	Transformer No. 1/2	0.05	✓													
4.	MDB No. 1/1	0.05	✓													
5.	MDB No. 1/2	0.05	✓													
6.	ATS-EMDB 1	0.05	✓													
7.	Lightning Aresster	0.05	✓													
8.																
9.																
10.																
11.																
12.																
13.																
14.																
15.																
<b>Remark :</b> <i>NFPA &amp; IEEE :</i> Recommends a ground resistance value of 5.0Ω or less. <i>NEC :</i> Make sure the system to ground is 25.0Ω or less. Infacilities with sensitive equipment, it should be 5.0Ω or less. (source-NEC 250.56) as their value for grounding or bonding. <i>Telecommunications Industry :</i> Often uses 5.0Ω or less as their value for grounding or bonding. <b>โปรดติดตั้ง Bar Ground เป็นระบบที่ Box Ground HV-LV</b>																
Responsibility																
Company																
Name																
Signature																
Date																

## Photograph

### ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower A

PHOTO 1



ขณะทำการ Check Voltage

PHOTO 2



ขณะทำการ Cleaning

PHOTO 3



ขณะทำการ Cleaning

PHOTO 4



ขณะทำการ Cleaning

PHOTO 5



ขณะทำการ Cleaning

PHOTO 6



ขณะทำการ Cleaning

Responsibility	
Company	
Name	
Signature	
Date	



ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower A

PHOTO 7



ขณะทำการ Check Voltage

PHOTO 8



ขณะทำการ Cleaning

PHOTO 9



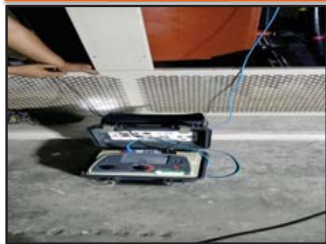
ขณะทำการ Cleaning

PHOTO 10



ขณะทำการ Check Torque

PHOTO 11



ขณะทำการทดสอบ Insulation Resistance

PHOTO 12



ขณะทำการทดสอบ Winding & Turn Ratio

Responsibility	
Company	
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower A

PHOTO 13



ขณะทำการทดสอบ Function Trip Unit

PHOTO 14



ขณะทำการทดสอบ Function Trip Unit

PHOTO 15



ขณะทำการทดสอบ Insulation Resistance

PHOTO 16



ขณะทำการทดสอบ Contact Resistance

PHOTO 17



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 18



ขณะทำการวัดความต้านทานดิน

Responsibility	
Company	
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower A

PHOTO 19



ขณะทำการ Cleaning

PHOTO 20



ขณะทำการ Cleaning

PHOTO 21



ขณะทำการมาร์คનોด

PHOTO 22



ขณะทำการ Cleaning

PHOTO 23



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 24



ขณะทำการ Check Torque

Tools List

Responsibility	
Company	
Name	
Signature	
Date	

Tools List to Test Electrical Equipment



Micro Ohmmeter/Chauvin Amoux/C.A 6240  
Contact Resistance (Air Circuit Breaker)



Insulation Tester/Megger/MIT515  
Insulation Resistance (TR,MDB)



Ground Tester/Metrel/MI3121H  
Insulation Resistance (MDB)



Multimeter/Fluke/1587FC  
Insulation Resistance (Capacitor)



Multimeter/Fluke/179  
Capacitance Measurement (Capacitor)



Ground Tester/Megger/DET4TCR2  
Windin & Turn Ratio Measurement (TR)

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		

Tools List to Test Electrical Equipment



Ground Tester/Metrel/MI3123  
Grounding Resistance (RMU,TR,MDB)



Relay Tester/Megger/Sverker 750  
Relay Testing System (RMU)



Ground Tester/Megger/DET4TCR2  
Grounding Resistance (RMU,TR,MDB)

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		



Project : Preventive Maintenance 2022 Tower B  
Inspection Date : January 26, 2022  
Inspection Product : RMU, Transformer and Low Voltage Switchboards

Inspected By :  
Approved By :

งานบำรุงรักษาระบบไฟฟ้าแรงสูง-แรงต่ำภายในอาคาร  
ประจำปี 2565

นำเสนอ:  
Millennium Residence Condominium

## Preventive Maintenance Report

26 January 2022

Report prepared by :

Project Leader by :

Sales :

Date  
January 26, 2022



## CONTENT

	PAGE
1. Introduction of Low Voltage Switchboards	1
2. Scope of Work	9
3. Summary Test Report	10
4. Defect Equipment	11
5. Ring Main Unit	14
6. Transformer	15
7. Main Distribution Board	19
8. Air Circuit Breaker	22
9. Mold Case Circuit Breaker	42
10. Capacitor Bank	45
11. Grounding	49
12. Photograph	50
13. Tools list	54

## Introduction of Low Voltage Switchboards

## Low Voltage Switchboards

### 1. บทนำ

1.1 สวิตช์บอร์ดไฟฟ้าต้องมีการตรวจสอบและทดสอบทั้งเมื่อทำการติดตั้งแล้วเสร็จและตามระยะเวลาที่เหมาะสม จุดประสงค์ของการตรวจสอบและบำรุงรักษาเพื่อให้ระบบไฟฟ้าใช้งานได้ตามความต้องการ มีความเชื่อถือได้สูง และอยู่ในสภาพที่พร้อมใช้งานได้อย่างสมบูรณ์ การดำเนินการควรเป็นหน้าที่ความรับผิดชอบของเจ้าของอาคาร ผู้ดูแลระบบไฟฟ้า และผู้ทำการติดตั้ง การดำเนินงานจะต้องกระทำโดยผู้ที่มีความรู้ ความชำนาญ เพราะอุปกรณ์บางตัวมีความซับซ้อน อุปกรณ์บางตัวอาจจะชำรุดได้ภายหลังจากการทดสอบ ผู้ทำการทดสอบจึงต้องมีความรู้ ความเข้าใจเพียงพอ และมีวิธีการที่เหมาะสม

1.2 การที่จะให้อุปกรณ์ไฟฟ้าที่ติดตั้งอยู่ในตู้สวิตช์บอร์ดไฟฟ้าสามารถทำงานได้เป็นอย่างดี มีความน่าเชื่อถือได้สูง มีอายุในการใช้งานที่ยาวนาน จะต้องมีการตรวจสอบและบำรุงรักษาเป็นประจำ หรืออาจจะเรียกว่าเป็นการบำรุงรักษาในเชิงป้องกัน โดยเฉพาะในงานที่ต้องการความต่อเนื่องให้มากที่สุด การตรวจสอบและบำรุงรักษาเป็นสิ่งที่แยกกันไม่ออก และเป็นสิ่งที่ต้องทำไปพร้อมๆกัน ซึ่งเนื้อหารายละเอียดในบทความนี้จะเป็นการกล่าวถึงการตรวจสอบและบำรุงรักษาที่ทําอย่างเป็นระบบ สามารถนำไปประยุกต์ใช้งานได้ภายในองค์กร หน่วยงาน อาคารสูง โรงงานอุตสาหกรรม เป็นต้น

### 2. คำนิยาม

2.1 การดำเนินการตรวจสอบสภาพทั่วไป

- การตรวจสอบการทำความสะอาด
- การตรวจสอบความแน่นของโบลท์ และนัทที่บริเวณจุดต่อทางไฟฟ้า เช่น บัสบาร์, เทอร์มินอลจุดต่อต่างๆทางไฟฟ้าของอุปกรณ์ไฟฟ้า

2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

Inspected By	Prepared By	Approved By

### 2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

การตรวจสอบค่าความต้านทานของฉนวนของ Main Busbar โดยอ้างอิงตามมาตรฐาน IEC 61439-2 โดยการทดสอบทั้งสิ้น 6 วงจร เช่น Line to Line (L1 – L2, L2 – L3, L3 – L1) และ Line to Neutral Ground (L1 – G, L2 – G, L3 – G) ซึ่งผลลัพธ์ที่ได้สำหรับเกณฑ์ในการยอมรับสำหรับตู้สวิตช์บอร์ดไฟฟ้าแรงต่ำจะต้องมีค่าความต้านทานไม่น้อยกว่า 1000 Ω/V โดยอ้างอิงกับพิกัดแรงดันไฟฟ้าในการทดสอบค่าความต้านทานของฉนวน โดยการจ่ายพิกัดแรงดันไฟฟ้ากระแสตรงในการทดสอบที่ไม่น้อยกว่า 500 Vdc แล้วอ่านค่าจากเครื่องมือวัดเปรียบเทียบกับค่ามาตรฐาน

- ในระหว่างการทดสอบค่าความต้านทานควรวัดค่าอุณหภูมิและความชื้นของสภาพแวดล้อมข้างเคียงในระหว่างการทดสอบ เพื่อใช้สำหรับอ้างอิงค่าความต้านทานที่วัดได้
- ก่อนการทดสอบจะต้องปลดวงจรควบคุม, วงจรอิเล็กทรอนิกส์, อุปกรณ์ป้องกันเครื่องจักร, ออกจากระบบไฟฟ้า
- ในระหว่างการทดสอบไม่ควรไปสัมผัสบริเวณตัวนำไฟฟ้าเพราะอาจจะเกิดอันตรายได้

### 2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

การตรวจสอบค่าความต้านทานหน้าสัมผัสของ Main Circuit Breaker ซึ่งจะต้องอ้างอิงค่าความต้านทานหน้าสัมผัสตามผลิตภัณฑ์ โดยพิกัดกระแสไฟฟ้าในการทดสอบดังนี้ คือ

ข้อกำหนดในการทดสอบ

- กระแสไฟฟ้า 10Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดไม่เกิน 100A
- กระแสไฟฟ้า 100Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดเกิน 100A ขึ้นไป

การทดสอบค่าความต้านทานที่บริเวณหน้าสัมผัสของเมนคอนแทกในแต่ละเฟส จะเป็นสิ่งที่มีความสำคัญที่สามารถอธิบายได้ถึงประสิทธิภาพ คุณภาพของรอยต่อทางไฟฟ้าของเซอร์กิตเบรกเกอร์ในแต่ละเฟสค่าความต้านทานที่เปลี่ยนแปลงไปในแต่ละเฟสจะได้รับอิทธิพลและผลกระทบมาจากการเกิดกระแสไฟฟ้าลัดวงจรภายในตัวเซอร์กิตเบรกเกอร์ ซึ่งค่าความต้านทานที่วัดได้จะต้องไม่แตกต่างกันเกิน 50 % ในแต่ละเฟส

Inspected By	Prepared By	Approved By

#### 2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

จะตรวจสอบโดยอ้างอิงตามมาตรฐาน IEC 60831-1 Standards Technical Data Capacitance Value Tolerance

- -5% , +15% for unit and banks up to 100 kVAR
- 0% , +10% for unit and banks above 100 kVAR

#### 2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

การทดสอบค่าความต้านทานดินโดยทั้งนี้จะอ้างอิงตามมาตรฐานดังต่อไปนี้

- NFPA & IEEE: Recommends a ground resistance value of 5.0  $\Omega$  or less.
- NEC: Make sure the system to ground is 25.0  $\Omega$  or less. In facilities with sensitive equipment, it should be 5.0  $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.
- Telecommunications Industry: Often uses 5.0  $\Omega$  or less as their value for grounding or bonding

Inspected By	Prepared By	Approved By

#### 3. วิธีการตรวจสอบและดูแลบำรุงรักษาอุปกรณ์ไฟฟ้าแรงต่ำเมื่อผ่านการใช้งาน

- การตรวจสอบสวิตช์บอร์ดไฟฟ้าภายหลังจากการใช้งานผ่านไประยะหนึ่งจะเป็นการตรวจสอบเพื่อหาจุดบกพร่อง การเสื่อมสภาพ หรือการชำรุดเสียหายของอุปกรณ์ไฟฟ้า เพื่อหาแนวทางในการบำรุงรักษาสวิตช์ไฟฟ้าต่อไปอย่างถูกวิธี ซึ่งการตรวจสอบภายหลังจากการใช้งานไปแล้วนั้นจะมีกรรมวิธีในการตรวจสอบดังต่อไปนี้คือ

- สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)
- เซอร์กิตเบรกเกอร์ (Circuit Breaker)
- คาปาซิเตอร์แบงก์ (Capacitor Bank)
- สวิตช์อัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By



4.แสดงรายการตรวจสอบและดูแลบำรุงรักษาสวิตช์บอร์ดไฟฟ้าแรงต่ำ		
บริษัทไฟฟ้า	รายการตรวจสอบและทดสอบทางไฟฟ้า	
สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบอุปกรณ์เครื่องมือวัดและแสดงผล (Measurement Equipment) ตรวจสอบอุปกรณ์ป้องกัน (Protection Equipment) ตรวจสอบค่าความต้านทานฉนวน (Insulation Resistance) ตรวจสอบการทำงานของสวิตช์บอร์ดไฟฟ้า (Function Operation)	
เซอร์กิตเบรกเกอร์ (Circuit Breaker)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบและทำความสะอาดหล่อลื่นอุปกรณ์แมคคาณิก (Lubrication) ตรวจสอบและทำความสะอาดช่องดับอาร์ค (ArcChute & Lug Breaker) ตรวจสอบค่าความต้านทานฉนวนของเซอร์กิตเบรกเกอร์ (Insulation Resistance) ตรวจสอบค่าความต้านทานหน้าสัมผัสของเซอร์กิตเบรกเกอร์ (Contact Resistance) ตรวจสอบการทำงานของอุปกรณ์ป้องกันของเซอร์กิตเบรกเกอร์ (Electronic Trip Unit)	
คาปาซิเตอร์แบงก์ (Capacitor Bank)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบค่าความต้านทานฉนวนของคาปาซิเตอร์ (Insulation Resistance) ตรวจสอบค่าความประจุไฟฟ้าของคาปาซิเตอร์ (Microfarad Measurement) ตรวจสอบการทำงานของอุปกรณ์สวิตช์ซึ่งคาปาซิเตอร์ (Magnetic Contactor) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Power Factor Controller)	
สวิตช์อัตโนมัติ (ATS)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Automatic Transfer Switch)	
Inspected By	Prepared By	Approved By

5.การตรวจสอบตู้สวิตช์บอร์ดไฟฟ้า		
ลำดับ	รายการ	การตรวจสอบ
1	ขั้วต่อสาย จุดต่อสาย	จุดต่อสายทุกจุดต้องแน่น ตรวจสอบความร้อน
2	Cable Terminator	ร่องรอยการเกิดโคโรนา ตรวจสอบรอยแตกร้าวของสาย การต่อลงดินของสายชนิด
3	สายไฟฟ้า	ตรวจสอบสภาพของสายไฟฟ้า และอุปกรณ์การเดินสายภายในตู้
4	บัสบาร์	ตรวจสอบอุปกรณ์รองรับบัสบาร์ การต่อสาย ตรวจสอบความร้อนที่บริเวณรอยต่อ บัสบาร์
5	ลูกถ้วยรองรับบัสบาร์	ตรวจสอบความสกปรก ร่องรอยการชำรุด การเปลี่ยนสี รอยแตกหรือบิ่น พร้อมทั้งทำความสะอาด
6	ความเป็นฉนวนไฟฟ้า	การต่อสาย การแตกร้าวของ CT
7	การต่อลงดิน	สภาพจุดต่อลงดินที่ตู้สวิตช์เกียร์และหลักดิน วัดค่าความต้านทานดิน สภาพของสายดิน สายต่อฝาก และวัดค่าความถี่ของสายดิน
8	ฮีตเตอร์	ตรวจสอบการทำงาน ระบบการควบคุมการทำงาน
9	บริษัทเครื่องวัดทางไฟฟ้า (Measurement Equipment)	ตรวจสอบสภาพทั่วไป การชำรุด แตกหักเสียหาย การอ่านค่าพารามิเตอร์ ทางไฟฟ้า
10	Indicator Lamp	ตรวจสอบสภาพการทำงานจะต้องอยู่ในสภาพที่ใช้งานได้เป็นปกติ
11	ชุด Draw out	ตรวจสอบการถอดออก (Draw out) และการถอดเข้า (Draw in) เซอร์กิตเบรกเกอร์ จะต้องคล่องตัว ตรวจสอบกลไกการทำงานและหน้าสัมผัสต่างๆ
12	บริษัทป้องกัน (Protection Relay)	ตรวจสอบฟังก์ชันการทำงานของอุปกรณ์ป้องกันจะต้องถูกต้องและครบถ้วนการ Setting Parameter
13	สวิตช์ควบคุมต่างๆ	ตรวจสอบสภาพการทำงาน
14	เซอร์กิตเบรกเกอร์	ตรวจสอบการทำงานของระบบ Interlock การทำงานตามขั้นตอนวิธีที่กำหนด
15	ทดสอบการทำงานทางกล	ตรวจสอบความคล่องตัวในการทำงาน การหล่อลื่น
Inspected By	Prepared By	Approved By



6.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางกล )		
ลำดับ	รายการ	การตรวจสอบ
1	Arc Interrupters	ถอดทำความสะอาด ตรวจสอบความเสียหาย
2	หน้าสัมผัส (Main & arcing contact)	ตรวจสอบร่องรอยความเสียหายเนื่องจากการอาร์ก ความสกปรก ทำความสะอาด
3	Insulation (Bushing Porcelains & Other)	ตรวจสอบความเสียหายของฉนวน ตรวจสอบร้าวรอยแตกหักเสียหาย และทำความสะอาด
4	Current Part & Terminals	ตรวจสอบความเสียหาย ความร้อน การยึดแน่น
5	สายไฟฟ้า	การต่อสาย การเข้าสาย ขั้วต่อสาย
6	กลไกการทำงาน	ตรวจสอบการติดขัด สารหล่อลื่น และการทำงานทางกลต่าง
7	อุปกรณ์เสริมอื่นๆ	ตรวจสอบ Aux. device, Shock Absorbers, Bumpers, Position Indicator Latch Checking Switch, Key Lock-out,etc.
7.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางไฟฟ้า )		
ลำดับ	รายการ	การตรวจสอบ
1	Function การทำงาน	ตรวจสอบการทำงานทางไฟฟ้า เช่น Close, Open
2	Closing Coil, Shunt Release	ตรวจสอบการต่อสาย การทำงาน
3	หน้าสัมผัส	วัดค่าความต้านทานหน้าสัมผัส
4	ความต้านทานฉนวน	Insulation Test
5	Trip Unit	ตรวจสอบการทำงานและความเสียหาย
6	Setting	ตรวจสอบการปรับตั้งค่าพารามิเตอร์ต่างๆ
7	Protection Relay	ตรวจสอบการทำงานของ Protection Relay
8	การทำงาน	ตรวจสอบการทำงานของ Trip Free, Closing
Inspected By      Prepared By      Approved By		

8.การตรวจสอบตู้คาปาซิเตอร์แบงค์		
ลำดับ	รายการ	การตรวจสอบ
1	HRC Fuse	จะต้องอยู่ในสภาพที่สมบูรณ์ทั้ง 3 เฟส (Fuseไม่ขาด)
2	MCCB	จะต้องอยู่ในสภาพที่ใช้งานได้ (ON - OFF - Trip)
3	Power Cable	จะต้องไม่ชำรุด, ขาด หรือไหม้ ตลอดความยาวสายไฟฟ้า
4	Magnetic Contactor	ตรวจสอบการทำงานทางไฟฟ้า และขดลวดความต้านทานต้องอยู่ในสภาพที่สมบูรณ์ไม่ขาดหรือหลุดออกจากตัว Magnetic Contactor
5	Detuned Filter Reactor	จะต้องอยู่ในสภาพที่สมบูรณ์ไม่มีรอยไหม้ หรือชำรุดเสียหาย
6	Capacitor Unit	ตัวถังจะต้องไม่บวม ทะลุ หรือมีรอยไหม้ ขั้วต่อสายต้องแน่น และจะต้องลงดินผ่านสายต่อฝากทุก Step
7	Damping Resister	จะต้องติดตั้งที่ขั้วของคาปาซิเตอร์ครบทั้ง 3 ชุด
8	Thermostat / Fan	ตรวจสอบสภาพการทำงานของพัดลมระบายอากาศ โดยการจำลองสภาวะอุณหภูมิสูงเกิน พร้อมทั้งปรับตั้งค่าอุณหภูมิให้เหมาะสม
9	Power Factor Controller (PFC)	ตรวจสอบการปรับตั้งค่าทางไฟฟ้าทุกค่าพารามิเตอร์
10	Terminal Retightening Torque	ตรวจสอบความแน่นของจุดต่อต่างๆทางไฟฟ้า จะต้องแน่นตามค่าที่กำหนดของ Nut และ Bolt ในแต่ละขนาด
11	Insulation Resistance Measurement	ตรวจวัดค่าความเป็นฉนวนของคาปาซิเตอร์ในแต่ละเฟสเทียบกับกราวด์ที่ตัวถัง โดยพิกัดแรงดันไฟฟ้าที่ใช้ในการทดสอบต้องไม่น้อยกว่า 500 Vdc และค่าความต้านทานฉนวนจะต้องมีค่าที่ไม่น้อยกว่า 1 MΩ
12	Microfarad Measurement	ตรวจวัดค่าอิมพีแดนซ์ของคาปาซิเตอร์ที่ขั้วระหว่างเฟส เช่น AB, BC และ CA ซึ่งค่าที่วัดได้จะต้องมีค่าอิมพีแดนซ์อยู่ในขอบเขตที่กำหนด 5% to +15% สำหรับคาปาซิเตอร์ขนาดไม่เกิน 100 kVAR 0% to +10% สำหรับคาปาซิเตอร์ขนาดเกิน 100 kVAR
13	Current Measurement	ตรวจวัดค่ากระแสไฟฟ้าใช้งานของคาปาซิเตอร์ทั้ง 3 เฟส ซึ่งกระแสไฟฟ้าในแต่ละเฟสจะต้องมีค่าที่เท่ากันหรือใกล้เคียงกัน
Inspected By      Prepared By      Approved By		

## Scope of Work

### Scope of Work

#### 1. Ring Main Unit

1. Inspect physical and mechanical condition.
2. Regressing the operating mechanism.
3. MV Fuse and Fuse base Check.
4. Inspect anchorage, alignment, and grounding.
5. Trip test for protection relay and record the existing setting.
6. Verify pressure gauge.
7. Cleaning overall.

#### 2. Transformer (Dry type)

1. General inspection and cleaning.
2. Bushing condition check.
3. Grounding connection check.
4. Retighten with torque wrench (busing connection)
5. Insulation resistance.
6. Measure the resistance of each winding at the designated tap position.
7. Perform turns-ratio tests at the designated tap position.
8. Verify that cooling fans operate correctly.

#### 3. LV Switchboards

1. Cleaning all panel.
2. Retorque the busbar at main incoming and between panel.
3. Insulation test.
4. Metering check.
5. General condition check.
6. Grounding connection check.
7. Busbar check.
8. Fuse and fuse bases check.

#### 4. Air Circuit Breaker

1. Cleaning the air circuit breaker and relubricating the operating mechanism.
2. Cleaning and check Arc-chuter.
3. Insulation check.
4. Rack-in / rack-out circuit breaker.
5. Trip unit function test. (Protection unit).
6. Parameter checking and recording of protective relay.
7. Contact resistance test.

#### 5. Capacitor Bank

1. Inspect for physical damage, broken insulation.
2. Tightness of connection wiring.
3. Cleaning.
4. Operating function.
5. Capacitive or current measurement.
6. Insulation resistance.
7. Check ventilation fan.

#### 6. Lamp

1. Verify the terminal whether they are not loose.
2. Verify the control wires whether they are not discoloration due to overheating.




Summary Test Report






Preventive Maintenance 2022 Tower B  
Summary Test Report For Preventive Maintenance

No.	Panel	Description	Q'ty	Test Result	Suggestion
1	RMU	1.1 RMU	1 set	Ring Main Unit is in good condition.	
		2.2 TR No.2/1	1 set	- <span>ဖော့ကတညးလၢအံၤစ့ၤ 1 နီၤ (ဂရုၤ HV ဖါၤ W)</span> - <span>Function Trip RMU ဖုၤလၢ် Wiling</span>	
		2.2 TR No.2/2	1 set	Transformer is in good condition.	
3	Main Distribution Board	3.1 MDB No.2/1	1 set	<span>Lamp ဖါၤ L1 ယး L3 နီၤအံၤ</span>	
		3.2 MDB No.2/2	1 set	- <span>Power Meter နီၤအံၤ</span> - <span>စီၤစံၤလၢၤ Control ဟ့ၢ်ကတညးအံၤ</span>	
		3.3 ATS-EMDB 2	1 set	<span>Voltmeter Analog နီၤအံၤ</span>	
4	Air Circuit Breaker	4.1 Air Circuit Breaker	5 set	Air Circuit Breaker is in good condition.	
5	Mold Case Circuit Breaker	5.1 Mold Case Circuit Breaker	30 set	Mold Case Circuit Breaker is in good condition.	
6	Capacitor Bank	6.1 Cap bank 2/1	1 set	Capacitor Bank is in good condition.	
		6.2 Cap bank 2/2	1 set	<span>Capacitor Step ၁ 2 ယး 3 လံၤလၢၤအံၤ</span>	
7	Grounding	7.1 RMU	1 set	Grounding is in good condition.	
		7.2 TR No.2/1	1 set	Grounding is in good condition.	
		7.3 TR No.2/2	1 set	Grounding is in good condition.	
		7.4 MDB No.2/1	1 set	Grounding is in good condition.	
		7.5 MDB No.2/2	1 set	Grounding is in good condition.	
		7.6 ATS-EMDB 2	1 set	Grounding is in good condition.	
		7.7 Lightning Arrester	1 set	Grounding is in good condition.	

Defect of Equipment

Item	Equipment's	Fault list	Corrective Action	Remark
1		TR No.2/1 - ฟลลอสแตเตอร์ 1 ตัว (ตัว HV และ W)	ตรวจสอบการเชื่อมต่อฟลลอสแตเตอร์	
2		TR No.2/1 - Function Trip RMU 1 ตัว Wiring	ตรวจสอบ Wiring ส่วนนี้	
3		MDB No.2/1 - Lamp 4 ตัว L1 และ L3 1 ตัว	ตรวจสอบการเชื่อมต่อ Lamp ใหม่	

### Preventive Maintenance 2022 Tower B Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
4		MDB No.2/2 - Power Meter ชำรุด	ตรวจสอบการแสดงผลของ Power Meter ใหม่	Merlin Gerin PM710
5		MDB No.2/2 - ช่างดูแล Control panel ชำรุด	ตรวจสอบการแสดงผล	
6		ATS-EMDB 2 - Voltmeter Analog ชำรุด	ตรวจสอบการแสดงผลของ Voltmeter Analog ใหม่	

### Preventive Maintenance 2022 Tower B Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
7		Cap bank 2/2 - Capacitor Step ที่ 2 และ 3 ไม่สามารถ	ตรวจสอบการแสดงผลของ Capacitor ใหม่	Schneider Varplus Can 20Kvar/400V จำนวน 4 ea

## Ring Main Unit

D-Nine Engineering																					
<b>RING MAIN UNIT INSPECTION TEST RECORD</b>																					
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower B																			
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>CUBICLE NAME</b> : Switchgear RMU																			
<b>TECHNICAL DATA DISCRPTION</b>																					
Manufacturer : NORMAFIX 24		Rated Voltage (Ur) : 24 kV	Rated Current (Ir) : 400/200 A																		
Type : Cela IS		Operating Voltage (Un) : 24 kV	Short Time Current (Ik) : 16 kA																		
S/N : -		Rated Power Frequency w/s (Ud) : 50 kV	Duration of Short Circuit (tk) : 1 S																		
Standard : CEI 60694/60298/62271		Lightning Impulse w/s (Up) : 125 kV	Rated Frequency : 50 Hz																		
Bushing of Function Unit		Single Line Diagram																			
<table border="1"> <tr> <td></td> <td>1 st</td> <td>2 nd</td> <td>3 rd</td> <td>4 th</td> <td>5 th</td> </tr> <tr> <td>Connection Type</td> <td>Plug in</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td></td> <td>Bolted</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>			1 st	2 nd	3 rd	4 th	5 th	Connection Type	Plug in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Bolted	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
	1 st	2 nd	3 rd	4 th	5 th																
Connection Type	Plug in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
	Bolted	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																
<b>Visual Inspection and Function Test</b>		<b>Pass</b>	<b>Decline</b>																		
<input checked="" type="checkbox"/> <b>1 st Function</b>																					
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/> DS IS																		
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/> SN : 32232740-1																		
Feeder Name : Incoming		<input checked="" type="checkbox"/>	<input type="checkbox"/> 400 A																		
Function Unit : 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/> 230 Vac																		
400 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism																		
<input checked="" type="checkbox"/> <b>2 nd Function</b>																					
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/> CIS																		
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/> SN : 32232741-2																		
Feeder Name : OutgoingTR2/1		<input checked="" type="checkbox"/>	<input type="checkbox"/> HRC Fuse 100 A																		
Function Unit : 2		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/> 230 Vac																		
200 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism																		
<input checked="" type="checkbox"/> <b>3 rd Function</b>																					
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/> CIS																		
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/> SN : 32232742-3																		
Feeder Name : OutgoingTR2/2		<input checked="" type="checkbox"/>	<input type="checkbox"/> HRC Fuse 100A																		
Function Unit : 3		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/> 230 Vac																		
200 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism																		
<input type="checkbox"/> <b>4 th Function</b>																					
- Cleaning Termination and Ring Main Unit		<input type="checkbox"/>	<input type="checkbox"/>																		
- Grease and Lubricant Mechanism Operation		<input type="checkbox"/>	<input type="checkbox"/>																		
Feeder Name :		<input type="checkbox"/>	<input type="checkbox"/>																		
Function Unit :		<input type="checkbox"/>	<input type="checkbox"/>																		
Rated Current of Function		<input type="checkbox"/>	<input type="checkbox"/>																		
A		<input type="checkbox"/>	<input type="checkbox"/>																		
Protection Relay Type		<input type="checkbox"/>	<input type="checkbox"/>																		
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism																		
<b>Responsibility</b>		<b>Tested by</b>	<b>Witnessed by</b>																		
Company			Millennium Residence Condominium																		
Name																					
Signature																					
Date																					

## Transformer

FIELD INSPECTION AND TEST RECORD TRANSFORMER (DRY TYPE)																																															
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B																																													
CUSTOMER : Millennium Residence Condominium		FEEDER : Transformer No.2/1																																													
<b>TECHNICAL DATA</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <table border="0" style="width: 100%;"> <tr><td>Manufacture</td><td style="border-bottom: 1px solid black;">ABB</td></tr> <tr><td>Type</td><td style="border-bottom: 1px solid black;">Cast Rasin</td></tr> <tr><td>Standard</td><td style="border-bottom: 1px solid black;">IEC60076-11</td></tr> <tr><td>Year of manufacture</td><td style="border-bottom: 1px solid black;">2008/05</td></tr> <tr><td>Rated frequency</td><td style="border-bottom: 1px solid black;">50 Hz</td></tr> <tr><td>Vector-group symbol</td><td style="border-bottom: 1px solid black;">Dyn11</td></tr> <tr><td>Rated power</td><td style="border-bottom: 1px solid black;">1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td style="border-bottom: 1px solid black;">24000 V</td></tr> <tr><td>Rated voltage LV</td><td style="border-bottom: 1px solid black;">415/240 V</td></tr> </table> </td> <td style="width: 50%; vertical-align: top;"> <table border="0" style="width: 100%;"> <tr><td>Serial No.</td><td style="border-bottom: 1px solid black;">1LKR080697TER</td></tr> <tr><td>Type of cooling</td><td style="border-bottom: 1px solid black;">AN/AF</td></tr> <tr><td>Weight</td><td style="border-bottom: 1px solid black;">3900 kg.</td></tr> <tr><td>Insulation Class</td><td style="border-bottom: 1px solid black;">F</td></tr> <tr><td>Impedance</td><td style="border-bottom: 1px solid black;">6.12/8.97 %</td></tr> <tr><td>Material</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Protection</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Rated current HV</td><td style="border-bottom: 1px solid black;">38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td style="border-bottom: 1px solid black;">2225.9/3116.3 A</td></tr> </table> </td> </tr> </table>				<table border="0" style="width: 100%;"> <tr><td>Manufacture</td><td style="border-bottom: 1px solid black;">ABB</td></tr> <tr><td>Type</td><td style="border-bottom: 1px solid black;">Cast Rasin</td></tr> <tr><td>Standard</td><td style="border-bottom: 1px solid black;">IEC60076-11</td></tr> <tr><td>Year of manufacture</td><td style="border-bottom: 1px solid black;">2008/05</td></tr> <tr><td>Rated frequency</td><td style="border-bottom: 1px solid black;">50 Hz</td></tr> <tr><td>Vector-group symbol</td><td style="border-bottom: 1px solid black;">Dyn11</td></tr> <tr><td>Rated power</td><td style="border-bottom: 1px solid black;">1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td style="border-bottom: 1px solid black;">24000 V</td></tr> <tr><td>Rated voltage LV</td><td style="border-bottom: 1px solid black;">415/240 V</td></tr> </table>	Manufacture	ABB	Type	Cast Rasin	Standard	IEC60076-11	Year of manufacture	2008/05	Rated frequency	50 Hz	Vector-group symbol	Dyn11	Rated power	1600/2240 kVA	Rated voltage HV	24000 V	Rated voltage LV	415/240 V	<table border="0" style="width: 100%;"> <tr><td>Serial No.</td><td style="border-bottom: 1px solid black;">1LKR080697TER</td></tr> <tr><td>Type of cooling</td><td style="border-bottom: 1px solid black;">AN/AF</td></tr> <tr><td>Weight</td><td style="border-bottom: 1px solid black;">3900 kg.</td></tr> <tr><td>Insulation Class</td><td style="border-bottom: 1px solid black;">F</td></tr> <tr><td>Impedance</td><td style="border-bottom: 1px solid black;">6.12/8.97 %</td></tr> <tr><td>Material</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Protection</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Rated current HV</td><td style="border-bottom: 1px solid black;">38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td style="border-bottom: 1px solid black;">2225.9/3116.3 A</td></tr> </table>	Serial No.	1LKR080697TER	Type of cooling	AN/AF	Weight	3900 kg.	Insulation Class	F	Impedance	6.12/8.97 %	Material	-	Protection	-	Rated current HV	38.5/53.9 A	Rated current LV	2225.9/3116.3 A						
<table border="0" style="width: 100%;"> <tr><td>Manufacture</td><td style="border-bottom: 1px solid black;">ABB</td></tr> <tr><td>Type</td><td style="border-bottom: 1px solid black;">Cast Rasin</td></tr> <tr><td>Standard</td><td style="border-bottom: 1px solid black;">IEC60076-11</td></tr> <tr><td>Year of manufacture</td><td style="border-bottom: 1px solid black;">2008/05</td></tr> <tr><td>Rated frequency</td><td style="border-bottom: 1px solid black;">50 Hz</td></tr> <tr><td>Vector-group symbol</td><td style="border-bottom: 1px solid black;">Dyn11</td></tr> <tr><td>Rated power</td><td style="border-bottom: 1px solid black;">1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td style="border-bottom: 1px solid black;">24000 V</td></tr> <tr><td>Rated voltage LV</td><td style="border-bottom: 1px solid black;">415/240 V</td></tr> </table>	Manufacture	ABB	Type	Cast Rasin	Standard	IEC60076-11	Year of manufacture	2008/05	Rated frequency	50 Hz	Vector-group symbol	Dyn11	Rated power	1600/2240 kVA	Rated voltage HV	24000 V	Rated voltage LV	415/240 V	<table border="0" style="width: 100%;"> <tr><td>Serial No.</td><td style="border-bottom: 1px solid black;">1LKR080697TER</td></tr> <tr><td>Type of cooling</td><td style="border-bottom: 1px solid black;">AN/AF</td></tr> <tr><td>Weight</td><td style="border-bottom: 1px solid black;">3900 kg.</td></tr> <tr><td>Insulation Class</td><td style="border-bottom: 1px solid black;">F</td></tr> <tr><td>Impedance</td><td style="border-bottom: 1px solid black;">6.12/8.97 %</td></tr> <tr><td>Material</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Protection</td><td style="border-bottom: 1px solid black;">-</td></tr> <tr><td>Rated current HV</td><td style="border-bottom: 1px solid black;">38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td style="border-bottom: 1px solid black;">2225.9/3116.3 A</td></tr> </table>	Serial No.	1LKR080697TER	Type of cooling	AN/AF	Weight	3900 kg.	Insulation Class	F	Impedance	6.12/8.97 %	Material	-	Protection	-	Rated current HV	38.5/53.9 A	Rated current LV	2225.9/3116.3 A										
Manufacture	ABB																																														
Type	Cast Rasin																																														
Standard	IEC60076-11																																														
Year of manufacture	2008/05																																														
Rated frequency	50 Hz																																														
Vector-group symbol	Dyn11																																														
Rated power	1600/2240 kVA																																														
Rated voltage HV	24000 V																																														
Rated voltage LV	415/240 V																																														
Serial No.	1LKR080697TER																																														
Type of cooling	AN/AF																																														
Weight	3900 kg.																																														
Insulation Class	F																																														
Impedance	6.12/8.97 %																																														
Material	-																																														
Protection	-																																														
Rated current HV	38.5/53.9 A																																														
Rated current LV	2225.9/3116.3 A																																														
<b>VISUAL INSPECTION AND FUNCTION TEST</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 80%;"></th> <th style="width: 5%; text-align: center;">Pass</th> <th style="width: 5%; text-align: center;">Not pass</th> <th style="width: 10%;"></th> </tr> <tr><td>1. Inspection physical and mechanical condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>2. Inspection alignment and grounding</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>3. Inspection winding temperature indicator</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>4. Clean the unit</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>5. Verify the control alarm and trip setting on temperature indicators are as specified</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>6. Verify that cooling fans operate</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>7. Verify tightness of accessible bolted electrical connections</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>8. Verify that as-left tap connections are as specified</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>9. Verify tap changer position</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>10. Verify the presence of surge arresters</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> </table>					Pass	Not pass		1. Inspection physical and mechanical condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>		2. Inspection alignment and grounding	<input checked="" type="checkbox"/>	<input type="checkbox"/>		3. Inspection winding temperature indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>		4. Clean the unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>		5. Verify the control alarm and trip setting on temperature indicators are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>		6. Verify that cooling fans operate	<input checked="" type="checkbox"/>	<input type="checkbox"/>		7. Verify tightness of accessible bolted electrical connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>		8. Verify that as-left tap connections are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>		9. Verify tap changer position	<input checked="" type="checkbox"/>	<input type="checkbox"/>		10. Verify the presence of surge arresters	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
	Pass	Not pass																																													
1. Inspection physical and mechanical condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
2. Inspection alignment and grounding	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
3. Inspection winding temperature indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
4. Clean the unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
5. Verify the control alarm and trip setting on temperature indicators are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
6. Verify that cooling fans operate	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
7. Verify tightness of accessible bolted electrical connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
8. Verify that as-left tap connections are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
9. Verify tap changer position	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
10. Verify the presence of surge arresters	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																													
<b>INSULATION RESISTANCE MEASUREMENT</b> Test Instruments : Megger Model MIT515 , Serial Number : N/A <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th style="width: 20%;">Test connection</th> <th style="width: 15%;">Test voltage (Vdc)</th> <th style="width: 25%;">Insulation resistance (MΩ)</th> <th style="width: 40%;">Criteria (MΩ)</th> </tr> <tr> <td>HV to GND</td> <td>2500</td> <td>31,800</td> <td>&gt; 1,000</td> </tr> <tr> <td>HV to LV</td> <td>2500</td> <td>33,100</td> <td>&gt; 1,000</td> </tr> <tr> <td>LV to GND</td> <td>1000</td> <td>12,120</td> <td>&gt; 100</td> </tr> </table> <p style="margin-top: 10px;">Humidity : 65 % , Ambient Temperature : 30.7 °c</p>				Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)	HV to GND	2500	31,800	> 1,000	HV to LV	2500	33,100	> 1,000	LV to GND	1000	12,120	> 100																												
Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)																																												
HV to GND	2500	31,800	> 1,000																																												
HV to LV	2500	33,100	> 1,000																																												
LV to GND	1000	12,120	> 100																																												
<b>Function Testing and Cooling fan Testing</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;"></th> <th style="width: 5%; text-align: center;">Pass</th> <th style="width: 5%; text-align: center;">Not pass</th> <th style="width: 10%;"></th> <th style="width: 5%; text-align: center;">Pass</th> <th style="width: 5%; text-align: center;">Not pass</th> <th style="width: 10%;"></th> </tr> <tr><td>1. Function Testing Operating of Cooling FAN.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>2. Alarm Buzzer Testing</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> <tr><td>3. Function Testing Trip TR. RMU</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="border-bottom: 1px solid black;"></td></tr> </table>					Pass	Not pass		Pass	Not pass		1. Function Testing Operating of Cooling FAN.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		2. Alarm Buzzer Testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>		3. Function Testing Trip TR. RMU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>																	
	Pass	Not pass		Pass	Not pass																																										
1. Function Testing Operating of Cooling FAN.	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>																																										
2. Alarm Buzzer Testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>																																										
3. Function Testing Trip TR. RMU	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>																																										
<b>POWER CABLE : INSULATION RESISTANCE MEASUREMENT</b> Test Instruments : Megger Model MIT515 , Serial Number : N/A <table style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <tr> <th style="width: 10%;">Test voltage (Vdc)</th> <th style="width: 10%;">A-B</th> <th style="width: 10%;">B-C</th> <th style="width: 10%;">C-A</th> <th style="width: 10%;">A-N</th> <th style="width: 10%;">B-N</th> <th style="width: 10%;">C-N</th> <th style="width: 20%;">Criteria (MΩ)</th> </tr> <tr> <td>5000</td> <td>77,200</td> <td>139,600</td> <td>99,400</td> <td>33,800</td> <td>60,800</td> <td>87,100</td> <td>&gt; 2,000</td> </tr> </table>				Test voltage (Vdc)	A-B	B-C	C-A	A-N	B-N	C-N	Criteria (MΩ)	5000	77,200	139,600	99,400	33,800	60,800	87,100	> 2,000																												
Test voltage (Vdc)	A-B	B-C	C-A	A-N	B-N	C-N	Criteria (MΩ)																																								
5000	77,200	139,600	99,400	33,800	60,800	87,100	> 2,000																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 40%;">Tested by</th> <th style="width: 45%;">Witnessed by</th> </tr> <tr> <td>Company</td> <td></td> <td>Millennium Residence Condominium</td> </tr> <tr> <td>Name</td> <td></td> <td></td> </tr> <tr> <td>Signature</td> <td></td> <td></td> </tr> <tr> <td>Date</td> <td></td> <td></td> </tr> </table>				Responsibility	Tested by	Witnessed by	Company		Millennium Residence Condominium	Name			Signature			Date																															
Responsibility	Tested by	Witnessed by																																													
Company		Millennium Residence Condominium																																													
Name																																															
Signature																																															
Date																																															

## FIELD INSPECTION AND TEST RECORD TRANSFORMER (DRY TYPE)

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.2/1

### TURN RATIO AND POLARITY MEASUREMENT

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.943	0.22	0.51	0.00	✓	
	V		98.006	0.16	0.54	0.00	✓	
	W		97.931	0.23	0.41	0.00	✓	

### WINDING RESISTANCE MEASUREMENT

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.713	3.725	3.734

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	1.9	2.0	1.9

### TEMPERATURE MONITORING

Setting :  
Trip = 110 °C Alarm = 90 °C Fan (On) = 75 °C Fan (Off) = 60 °C

### Function Testing and Cooling fan Testing

- |   |                                     |                                     |
|---|-------------------------------------|-------------------------------------|
| 1. Function Testing Operating of Cooling FAN. | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 2. Alarm Buzzer Testing                       | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| 3. Function Testing Trip TR. To RMU           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Remark : - พัดลมทบทแปลงแรงดัน 1 ตัว (ด้าน HV เฟส W)  
- Function Trip RMU ไม่ไ้ Wiring

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		

## FIELD INSPECTION AND TEST RECORD TRANSFORMER (DRY TYPE)

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.2/2

### TECHNICAL DATA

Manufacture	ABB	Serial No.	1LKR080695TER
Type	Cast Rasin	Type of cooling	AN/AF
Standard	IEC60076-11	Weight	3900 kg.
Year of manufacture	2008/05	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.14/8.60 %
Vector-group symbol	Dyn11	Material	-
Rated power	1600/2240 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	38.5/53.9 A
Rated voltage LV	415/240 V	Rated current LV	2225.9/3116.3 A

### VISUAL INSPECTION AND FUNCTION TEST

- |   | Pass                                | Not pass                 |
|---|-------------------------------------|--------------------------|
| 1. Inspection physical and mechanical condition   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Inspection alignment and grounding   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Inspection winding temperature indicator   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Clean the unit   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Verify the control alarm and trip setting on temperature indicators are as specified | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 6. Verify that cooling fans operate   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 7. Verify tightness of accessible bolted electrical connections                         | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Verify that as-left tap connections are as specified                                 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 9. Verify tap changer position  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 10. Verify the presence of surge arresters  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### INSULATION RESISTANCE MEASUREMENT

Test Instruments : Megger Model MIT515 , Serial Number : N/A

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	29,400	> 1,000
HV to LV	2500	33,400	> 1,000
LV to GND	1000	283	> 100

Humidity : 52 % , Ambient Temperature : 30 °C

### Function Testing and Cooling fan Testing

- |   | Pass                                | Not pass                 | Pass                                | Not pass                 |
|---|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| 1. Function Testing Operating of Cooling FAN. | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Alarm Buzzer Testing                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Function Testing Trip TR. RMU              | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### POWER CABLE : INSULATION RESISTANCE MEASUREMENT

Test Instruments : Megger Model MIT515 , Serial Number : N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	268,000	653,000	434,000	142,100	175,000	161,000	> 2,000

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		





D-Nine Engineering Co., Ltd. (Head Office)  
11/119 Moo. 18 Soi. Lamlukka 31, Kukot, Lamlukka,  
Pathumthani 12130  
Tel. : 02-531-3651 Fax. : 02-531-3651

**FIELD INSPECTION AND TEST RECORD**  
**TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower B  
**CUSTOMER** : Millennium Residence Condominium **FEEDER** : Transformer No.2/2

**TURN RATIO AND POLARITY MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.881	0.28	0.43	0.00	✓	
	V		97.948	0.22	0.48	0.00	✓	
	W		97.931	0.23	0.38	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.640	3.726	3.714

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.2	2.1	2.1

**TEMPERATURE MONITORING**

**Setting** :

**Trip** = 110 °C **Alarm** = 90 °C **Fan (On)** = 75 °C **Fan (Off)** = 60 °C

**Function Testing and Cooling fan Testing**

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. To RMU

**Pass** **Not pass**

☒ ☐  
☒ ☐  
☒ ☐

**Remark** :  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**Main Distribution Board**



FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower B																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.2/1																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Checked</th> <th style="text-align: center;">Not Checked</th> <th style="text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result Pass   Fail																																																				
A to B	500	494	Passed > 1 MΩ	<input checked="" type="checkbox"/>																																																				
B to C	500	219		<input checked="" type="checkbox"/>																																																				
C to A	500	630		<input checked="" type="checkbox"/>																																																				
A to GND	500	527		<input checked="" type="checkbox"/>																																																				
B to GND	500	385		<input checked="" type="checkbox"/>																																																				
C to GND	500	262		<input checked="" type="checkbox"/>																																																				
Humidity : 64 % Ambient Temperature : 30.9 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out. <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : Lamp หลอด L1 และ L3 ชำรุด																																																								
<b>Responsibility</b>																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								



FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower B																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.2/2																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="text-align: center;">Checked</th> <th style="text-align: center;">Not Checked</th> <th style="text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	Result Pass   Fail																																																				
A to B	500	2,340	Passed > 1 MΩ	<input checked="" type="checkbox"/>																																																				
B to C	500	3,060		<input checked="" type="checkbox"/>																																																				
C to A	500	632		<input checked="" type="checkbox"/>																																																				
A to GND	500	353		<input checked="" type="checkbox"/>																																																				
B to GND	500	294		<input checked="" type="checkbox"/>																																																				
C to GND	500	363		<input checked="" type="checkbox"/>																																																				
Humidity : 64 % Ambient Temperature : 31.9 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out. <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : - Power Meter ชำรุด (Merlin Gerin PM710) - แผงตู้ควบคุม Control ภายนอกชำรุด																																																								
<b>Responsibility</b>																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								



FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower B																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : ATS-EMDB 2																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	2,230	Passed > 1 MΩ	✓																																																				
B to C	500	2,800		✓																																																				
C to A	500	2,910		✓																																																				
A to GND	500	1,320		✓																																																				
B to GND	500	1,180		✓																																																				
C to GND	500	1,900		✓																																																				
Humidity : 64 %  Ambient Temperature : 31.9 °C																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : Voltmeter Analog <span style="color: red;">វ៉ុល્ટ</span>																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%; text-align: center;">Responsibility</th> <th style="width: 85%;"></th> </tr> </thead> <tbody> <tr><td style="text-align: center;">Company</td><td></td></tr> <tr><td style="text-align: center;">Name</td><td></td></tr> <tr><td style="text-align: center;">Signature</td><td></td></tr> <tr><td style="text-align: center;">Date</td><td></td></tr> </tbody> </table>						Responsibility		Company		Name		Signature		Date																																										
Responsibility																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

**Air Circuit Breaker**

## FIELD INSPECTION AND TEST RECORD

### AIR CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/1  
SAP NO : FEEDER NAME : Incoming from transformer No.2/1

#### TECHNICAL DATA

Manufacture : SQUARE D Ultimate breaking capacity ( Icu ) : 65 kArms.  
Type : NW32H1 Rated service breaking ( Ics ) : 100% kArms.  
Rated current ( I<sub>n</sub> ) : 3200 A Frequency : 50/60 Hz.  
Rated insulation voltage ( U<sub>i</sub> ) : 1000 V Standard : IEC 60947-2  
Impulse withstand voltage ( U<sub>imp</sub> ) : 12 kV Year of manufacture : 2008  
Rated operation voltage ( U<sub>e</sub> ) : 220/440 V Serial no. : 1404095620-1 (2/4)  
The Breaker in its frame ☒ Fix ☐ Draw-out Pole ☒ 3 Pole ☐ 4 Pole

#### 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

#### Checked

#### Remark

<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

#### 2. ACCESSORIES

1.1 Under voltage trip device ☐ 100/250 VAC/VDC ☒ 200-250 VAC/VDC ☐ Other \_\_\_\_\_  
1.2 Shunt trip device ☐ 100/250 VAC/VDC ☒ 200-250 VAC/VDC ☐ Other \_\_\_\_\_  
1.3 Closing coil ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other \_\_\_\_\_  
1.4 Motor charger device ☐ 100/250 VAC/VDC ☐ 220-240 VAC/VDC ☐ Other \_\_\_\_\_  
1.5 Electronic Trip Device ☐ 2.0 ☐ 2.0 A ☐ 2.0 E ☒ 6.0 A ☐ 6.0 E ☐ WS1

#### 3. MAIN CONTACT RESISTANCE MEASUREMENT

Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	11
B	10	16
C	10	13

Responsibility	
Company	
Name	
Signature	
Date	

## FIELD INSPECTION AND TEST RECORD

### AIR CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/1  
SAP NO : FEEDER NAME : Incoming from transformer No.2/1

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

Note: Circuit breaker in open position when measurement between interrupt contact

Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

#### 5. OVERCURRENT TRIP UNIT MEASUREMENT

Test Instruments : Full Function Test Kit , Serial Number : -

##### - Setting of overcurrent trip unit

- Long time : I<sub>r</sub> = 0.8  
- Short time : I<sub>sd</sub> = 4  
- Instantaneous : I<sub>i</sub> = 6  
- Earth fault : I<sub>g</sub> = A (500)  
- Time setting : t<sub>r</sub> = 4 s.  
- Time setting : t<sub>sd</sub> = 0.4 s. , I<sub>t</sub> = ☒ On ☐ Off  
- Time setting : t<sub>g</sub> = 0.4 s. , I<sub>t</sub> = ☒ On ☐ Off

##### - Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	7680 A	Auto s.	15.211 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	14720 A	Auto s.	1.536 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	24000 A	Auto s.	0.037 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	1000 A	Auto s.	0.580 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show

Remark : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1	
SAP NO : -		FEEDER NAME : Busduct Low 2500A	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW25H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	2500 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404095620-3 (1/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	12	
B	10	13	
C	10	13	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1	
SAP NO : -		FEEDER NAME : Busduct Low 2500A	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 3 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 8 s. - Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	5833 A	Auto s.	55.271 s.
Short time	9375 A	Auto s.	0.052 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Result</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Indicator of tripping cause</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Pass</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not pass</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
Remark :			
Responsibility			
Company			
Name			
Signature			
Date	20 January 2022		

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1 & MDB No.2/2	
SAP NO : -		FEEDER NAME : Bus TIE	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404095620-2 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date	26 January 2022		

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1 & MDB No.2/2	
SAP NO : -		FEEDER NAME : Bus TIE	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 4 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 8 s. - Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	9600 A	Auto s.	29.337 s.
Short time	16000 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass Indicator of tripping cause : <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show			
Remark :  			
Responsibility			
Company			
Name			
Signature			
Date			
Witnessed by			
Company	Millennium Residence Condominium		
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/2	
SAP NO : -		FEEDER NAME : Incoming from transformer No.2/2	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404095620-1 (1/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	12	
B	10	13	
C	10	14	
Responsibility			
Company			Witnessed by
Name			Millennium Residence Condominium
Signature			
Date			

FIELD INSPECTION AND TEST RECORD													
AIR CIRCUIT BREAKER													
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B											
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/2											
SAP NO : -		FEEDER NAME : Incoming from transformer No.2/2											
4. INSULATION RESISTANCE MEASUREMENT													
Test Instruments : - , Serial Number : -													
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )											
Interrupter phase A	500	-											
Interrupter phase B	500	-											
Interrupter phase C	500	-											
A-GND.	500	-	Humidity : - %										
B-GND.	500	-	Ambient Temperature : - °C										
C-GND.	500	-											
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground													
5. OVERCURRENT TRIP UNIT MEASUREMENT													
Test Instruments : Full Function Test Kit , Serial Number : -													
- Setting of overcurrent trip unit													
- Long time : Ir = 0.5 - Short time : Isd = 4 - Instantaneous : li = 6 - Earth fault : Ig = A (500)		- Time setting : tr = 4 s. - Time setting : tsd = 0.1 s. , I <sup>2</sup> t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = 0.1 s. , I <sup>2</sup> t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off											
- Operating time measurement													
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test													
Function	Test current	Should be	As found										
Long time	4800 A	Auto s.	14.619 s.										
Short time	12800 A	Auto s.	0.148 s.										
Instantaneous	24000 A	Auto s.	0.036 s.										
Earth fault	1000 A	Auto s.	0.144 s.										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table>				Result	Indicator of tripping cause	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Result	Indicator of tripping cause												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
Remark : _____													
Responsibility													
Company			Witnessed by										
Name			Millennium Residence Condominium										
Signature													
Date													

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/2	
SAP NO : -		FEEDER NAME : Busduct High 2000A	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW20H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	2000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404095620-4 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	12	
B	10	13	
C	10	12	
Responsibility			
Company			Witnessed by
Name			Millennium Residence Condominium
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/2	
SAP NO : -		FEEDER NAME : Busduct High 2000A	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 3 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 8 s. - Time setting : tsd = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	4667 A	Auto s.	49.746 s.
Short time	7500 A	Auto s.	0.048 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass Indicator of tripping cause : <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show			
Remark : _____ _____ _____			
Responsibility			
Company			Witnessed by
Name			Millennium Residence Condominium
Signature			
Date			





FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 2/1	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS1000N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	1000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	380/415 V.	Serial no.	1404088546-3 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company		Witnessed by Millennium Residence Condominium	
Name			
Signature			
Date			



FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower B	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.2/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 2/1	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
<ul style="list-style-type: none"> <li>- Long time : Ir = 0.8</li> <li>- Short time : Isd = 3</li> <li>- Instantaneous : Ii = -</li> <li>- Earth fault : Ig = -</li> </ul>		<ul style="list-style-type: none"> <li>- Time setting : tr = 8 s.</li> <li>- Time setting : tsd = - s , Ir<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off</li> <li>- Time setting : tg = - s , Ir<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off</li> </ul>	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1867 A	Auto s.	54.598 s.
Short time	3000 A	Auto s.	0.054 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
			Result
			<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input type="checkbox"/> Pass <input type="checkbox"/> Not pass
			Indicator of tripping cause
			<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
			<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
			<input type="checkbox"/> Show <input type="checkbox"/> Not show
			<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____			
_____			
_____			
Responsibility			
Company		Witnessed by Millennium Residence Condominium	
Name			
Signature			
Date			

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/2  
SAP NO : FEEDER NAME : Capacitor Bank 2/2

**TECHNICAL DATA**

Manufacture : SQUARE D Ultimate breaking capacity ( Icu ) : 50 kArms.  
Type : NS1000N Rated service breaking ( Ics ) : 100% kArms.  
Rated current ( I<sub>n</sub> ) : 1000 A Frequency : 50/60 Hz.  
Rated insulation voltage ( U<sub>i</sub> ) : 800 V Standard : IEC 60947-3  
Impulse withstand voltage ( U<sub>imp</sub> ) : 8 kV Year of manufacture : 2008  
Rated operation voltage ( U<sub>e</sub> ) : 380/415 V Serial no. : 1404095981-2 (1/3)  
The Breaker in its frame ☒ Fix ☐ Draw-out Pole ☒ 3 Pole ☐ 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( μΩ )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	20 January 2022

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/2  
SAP NO : FEEDER NAME : Capacitor Bank 2/2

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit , Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : I <sub>r</sub> = 0.8	- Time setting : I <sub>r</sub> = 8 s.
- Short time : I <sub>sd</sub> = 3	- Time setting : I <sub>sd</sub> = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : I <sub>i</sub> = -	
- Earth fault : I <sub>g</sub> = -	- Time setting : I <sub>g</sub> = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1867 A	Auto s.	50.681 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	3000 A	Auto s.	0.047 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB2  
SAP NO : FEEDER NAME : Normal Line

**TECHNICAL DATA**

Manufacture : SQUARE D Ultimate breaking capacity ( Icu ) : 50 kArms.  
Type : NS800N Rated service breaking ( Ics ) : 75% kArms.  
Rated current ( In ) : 800 A Frequency : 50/60 Hz.  
Rated insulation voltage ( Ui ) : 750 V Standard : IEC 60947-3  
Impulse withstand voltage ( Uimp ) : 8 kV Year of manufacture : 2008  
Rated operation voltage ( Ue ) : 380/415 V Serial no. : 1404097444-1 (2/4)  
The Breaker in its frame ☒ Fix ☐ Draw-out Pole ☒ 3 Pole ☐ 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked Remark  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒

**2. ACCESSORIES**

1.1 Under voltage trip device ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.2 Shunt trip device ☐ 100/250 VAC/VDC ☒ 200-250 VAC/VDC ☐ Other  
1.3 Closing coil ☐ 100/250 VAC/VDC ☒ 200-250 VAC/VDC ☐ Other  
1.4 Motor charger device ☐ 100/250 VAC/VDC ☒ 220-240 VAC/VDC ☐ Other  
1.5 Electronic Trip Device ☒ 2.0 ☐ 2.0 A ☐ 2.0 E ☐ 6.0 A ☐ 6.0 E ☐ WS1

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB2  
SAP NO : FEEDER NAME : Normal Line

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit , Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : Ir = 1  
- Short time : Isd = 3  
- Instantaneous : Ii = -  
- Earth fault : Ig = -  
- Time setting : tr = 8 s.  
- Time setting : tsd = - s. , Ir = ☐ On ☐ Off  
- Time setting : tg = - s. , Ir = ☐ On ☐ Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1867 A	Auto s.	53.678 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	3000 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :

Responsibility	
Company	
Name	
Signature	
Date	

1 of 220f2

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/2  
SAP NO : FEEDER NAME : To ATS

**TECHNICAL DATA**

Manufacture SQUARE D Ultimate breaking capacity ( Icu ) 50 kArms.  
Type NS800N Rated service breaking ( Ics ) 100% kArms.  
Rated current ( In ) 800 A. Frequency 50/60 Hz.  
Rated insulation voltage ( Ui ) 800 V. Standard IEC 60947-3  
Impulse withstand voltage ( Uimp ) 8 kV. Year of manufacture 2008  
Rated operation voltage ( Ule ) 380/415 V. Serial no. 1404097479-2 (2/2)  
The Breaker in its frame ☒ Fix ☐ Draw-out Pole ☒ 3 Pole ☐ 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked Remark  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒  
☒

**2. ACCESSORIES**

1.1 Under voltage trip device ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.2 Shunt trip device ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.3 Closing coil ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.4 Motor charger device ☐ 100/250 VAC/VDC ☐ 220-240 VAC/VDC ☐ Other  
1.5 Electronic Trip Device ☒ 2.0 ☐ 2.0 A ☐ 2.0 E ☐ 6.0 A ☐ 6.0 E ☐ WS1

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.2/2  
SAP NO : FEEDER NAME : To ATS

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit , Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : Ir = 1  
- Short time : Isd = 3  
- Instantaneous : Ii = -  
- Earth fault : Ig = -  
- Time setting : tr = 8 s.  
- Time setting : tsd = - s. , Ir't = ☐ On ☐ Off  
- Time setting : tg = - s. , Ir't = ☐ On ☐ Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1867 A	Auto s.	51.355 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	3000 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :

Responsibility	
Company	
Name	
Signature	
Date	



## Mold Case Circuit Breaker

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower B			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.2/1			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Cap bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	10PDB1/T2	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	25PDB1/T2	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	40PDB1/T2	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	LPP1/T2	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	SPARE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	Busduct Low	NW25H1	Square D	2500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9					<input type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>		<b>Witnessed by</b>					
Company				Millennium Residence Condominium			
Name							
Signature							
Date							

### FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium CUBICLE NAME : MDB No.2/2  
ERECTION SITE : - FEEDER : -

**VISUAL INSPECTION AND FUNCTION TEST**  
1. Mold case Circuit breaker undamaged and clean  
2. All Fastenings checked

Checked  
☒  
☒

No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Busduct High	NW20H1	Square D	2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	SN MCC26-T2-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	AC MCC-F/F-T2-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	To ATS	NS800N	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	AC MCC-F/D-T2-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	AC MCC-F/B-T2-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	FOR FUTURE AIR	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9					<input type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

### FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower B  
CUSTOMER : Millennium Residence Condominium CUBICLE NAME : ATS-EMDB 2  
ERECTION SITE : - FEEDER : -

**VISUAL INSPECTION AND FUNCTION TEST**  
1. Mold case Circuit breaker undamaged and clean  
2. All Fastenings checked

Checked  
☒  
☒

No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	40PEDB1/T2	NBD250L	Square D	500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	LPEP1/T2	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	10PEDB1/T2	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	25PEDB1/T2	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	SN MCC-B-T2-01	NBD250L	Square D	63	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	EAC MCC-F/D-T2-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	EAC MCC-F/D-T2-03	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	EAC MCC-F/D-T2-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	EAC MCC-F/B-T2-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	EAC MCC-F/48-T2-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	EAC MCC-F/48-T2-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	EA MCC-F/R-T2-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	SLDB1/T2	NBD250L	Square D	160	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14	SN MCC-B-T2-02	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

## Capacitor Bank

FIELD INSPECTION AND TEST RECORD					
CAPACITOR BANK					
<b>PROJECT NAME</b> : Preventive Maintenance 2022			<b>LOCATION</b> : Tower B		
<b>CUSTOMER</b> : Millennium Residence Condominium			<b>CUBICLE NAME</b> : MDB No.2/1		
<b>ERECTION SITE</b> : -			<b>FEEDER</b> : CAP BANK 2/1		
<b>TECHNICAL DATA</b>					
<input checked="" type="checkbox"/> <b>FUSE</b> <input type="checkbox"/> <b>MCCB</b>		<input checked="" type="checkbox"/> <b>CAPACITOR</b>			
Manufacture	MRO	Manufacture	MKS		
Type	NH00C	Type	HPC-24.2 440-3P		
Rated current ( In )	100 A.	Rated voltage ( Un )	400 V.		
<input checked="" type="checkbox"/> <b>MEGNETIC CONTACTOR</b>		Rated frequency ( fn )	50 Hz.		
Manufacture	Federal	Rated output ( Qn )	40 (20+20) kVar.		
Type	FC-95DK21	Rated capacitance ( Cn )	397.89 μF.		
Rated operation voltage ( Ue )	400 V.	Insulation level ( Ui )	- kV.		
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>					
<ul style="list-style-type: none"> <li>- Inspect physical and machanical condition</li> <li>- Inspect alignment, grounding and clearances</li> <li>- Clean the unit</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Power Factor Controller ( PFC )</li> </ul>		<b>Check</b> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	<b>Remark</b>    		
Manufacture	Mikro	Type	PFR 120	Number of output	12
Operating voltage	415 V.	Current input	5 A.	CT ratio	3000/5
Serial no.	139101				
Setting : Starting current setting ( C/K )	0.1	Switching time between steps	5 s.		
Power factor setting	0.95	Switching sequences	Aut		
Voltage measurement	A - N = 235 V.    B - N = 236 V.    C - N = 235 V. A - B = 406 V.    B - C = 405 V.    C - A = 406 V.				
<b>2. INSULATION RESISTANCE MEASUREMENT</b>					
Test Instruments : Fluke Model 1587FC , Serial Number : 45580041					
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )			
		A - Gnd	B - Gnd	C - Gnd	
1	500	192.8	643	556	
2	500	305	250	325	
3	500	340	325	212	
4	500	426	486	93.7	
5	500	203	397	195.6	
6	500	273	245	237	
7	500	349	309	309	
8	500	269	255	202	
9	500	79.1	107.2	57	
10	500	89.5	65.9	59.6	
11	500	57.4	39.3	100.5	
12	500	36.1	37.8	38.2	
<b>Responsibility</b>				<b>Witnessed by</b>	
Company	Millennium Residence Condominium				
Name					
Signature					
Date					



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower B			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.2/1			
ERECTION SITE : -			FEEDER : CAP BANK 2/1			
3. CURRENT AND CAPACITANCE MEASUREMENT						
Test Instruments : Fluke Model 179, Serial Number : 23770566						
Step No.	Rate Power (kVar)	Rate Fuse (A)	Measurement Capacitance ( μF )			Result
			Phase A-B	Phase B-C	Phase C-A	
1.	40	100	397	397	396	Passed
2.	40	100	396	397	394	Passed
3.	40	100	396	396	397	Passed
4.	40	100	398	398	399	Passed
5.	40	100	397	397	397	Passed
6.	40	100	397	396	398	Passed
7.	40	100	396	396	397	Passed
8.	40	100	396	395	396	Passed
9.	40	100	396	396	396	Passed
10.	40	100	399	399	398	Passed
11.	40	100	397	396	396	Passed
12.	40	100	397	397	396	Passed
<b>Note:</b> <input checked="" type="checkbox"/> = Pass, <input type="checkbox"/> = Not Pass, <b>N/A</b> = Not applicable						
$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{f_A}{f_R} = 40.00 \text{ kVar}, \text{ Normal current} = \frac{40.00 \text{ kVar}}{(V_{dc}) \times 1.732} = 57.74 \text{ A. / Set}$ $C_{LL} = \frac{3C_R}{2} = 397.89 \text{ } \mu\text{F. / Set for } \Delta \text{ Conn.}, \text{ No. of parallel capacitors} = 1$ $= 397.89 \text{ } \mu\text{F. @ 1 Set}$						
The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.						
4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT						
Position	Voltage measurement ( V )	Current measurement ( A )				
Fan no. 1	-	-				
Fan no. 2	-	-				
Fan no. 3	-	-				
Fan no. 4	-	-				
<b>Remark :</b> _____ _____ _____						
Responsibility						
Company						
Name						
Signature						
Date						

FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower B			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.2/2			
ERECTION SITE : -			FEEDER : CAP BANK 2/2			
TECHNICAL DATA						
<input checked="" type="checkbox"/> FUSE <input type="checkbox"/> MCCB <input checked="" type="checkbox"/> CAPACITOR						
Manufacture		MRO	Manufacture		MKS	
Type		NH00C	Type		HPC-24.2 440-3P	
Rated current ( In )		100 A.	Rated voltage ( Un )		400 V.	
<input checked="" type="checkbox"/> MEGNETIC CONTACTOR			Rated frequency ( fn )		50 Hz.	
Manufacture		Federal	Rated output ( Qn )		40 (20+20) kVar.	
Type		FC-95DK21	Rated capacitance ( Cn )		397.89 μF.	
Rated operation voltage ( Ue )		400 V.	Insulation level ( Ui )		- kV.	
1. VISUAL INSPECTION AND FUNCTION TEST						
					<b>Check</b>	<b>Remark</b>
- Inspect physical and machanical condition					<input checked="" type="checkbox"/>	
- Inspect alignment, grounding and clearances					<input checked="" type="checkbox"/>	
- Clean the unit					<input checked="" type="checkbox"/>	
- Verify tightness of accessible bolted electrical connection					<input checked="" type="checkbox"/>	
- Power Factor Controller ( PFC )						
Manufacture		Mikro	Type	PFR 120	Number of output	12
Operating voltage		415 V.	Current input	5 A.	CT ratio	3000/5
Serial no.		139105				
Setting : Starting current setting ( C/K )		0.1	Switching time between steps		5 s.	
Power factor setting		0.95	Switching sequences		Aut	
Voltage measurement : A - N		= 234 V.	B - N		= 235 V.	C - N = 235 V.
A - B		= 406 V.	B - C		= 406 V.	C - A = 406 V.
2. INSULATION RESISTANCE MEASUREMENT						
Test Instruments : Fluke Model 1587FC, Serial Number : 45580041						
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )				
		A - Gnd	B - Gnd	C - Gnd		
1	500	77	93.4	178.9		
2	500	208	282	212		
3	500	213	211	35.3		
4	500	136.4	191.3	68.4		
5	500	90.5	107.1	144.3		
6	500	99	97.5	52.4		
7	500	52.2	70.2	83.2		
8	500	86.3	85.9	62.9		
9	500	55.5	57.9	69.6		
10	500	71.1	68.7	83		
11	500	88.8	85.4	81.9		
12	500	83	83	84.3		
Responsibility						
Company						
Name						
Signature						
Date						



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower B			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.2/2			
ERECTION SITE : -			FEEDER : CAP BANK 2/2			
<b>3. CURRENT AND CAPACITANCE MEASUREMENT</b> Test Instruments : Fluke Model 179 , Serial Number : 23770566						
Step No.	Rate Power	Rate Fuse	Measurement Capacitance ( μF )			Result
	(kVar)	(A)	Phase A-B	Phase B-C	Phase C-A	
1.	40	100	398	396	397	Passed
2.	40	100	371	374	391	Failed
3.	40	100	353	265	351	Failed
4.	40	100	396	393	396	Passed
5.	40	100	397	396	397	Passed
6.	40	100	397	397	401	Passed
7.	40	100	395	395	395	Passed
8.	40	100	398	397	397	Passed
9.	40	100	396	396	396	Passed
10.	40	100	397	398	398	Passed
11.	40	100	397	399	398	Passed
12.	40	100	399	398	399	Passed
Note:  = Pass ,  = Not Pass ,  = Not applicable						
$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{f_A}{f_R} = 40.00 \text{ kVar} , \text{ Normal current} = \frac{40.00 \text{ kVar}}{(Vdc) \times 1.732} = 57.74 \text{ A. / Set}$ $C_{LL} = \frac{3C_R}{2} = 397.89 \text{ μF. / Set for } \Delta \text{ Conn.} , \text{ No. of parallel capacitors} = 1$ $= 397.89 \text{ μF. @ 1 Set}$						
The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.						
<b>4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT</b>						
Position	Voltage measurement ( V )	Current measurement ( A )				
Fan no. 1	-	-				
Fan no. 2	-	-				
Fan no. 3	-	-				
Fan no. 4	-	-				
Remark : Capacitor Step ที่ 2 และ 3 เสื่อมสภาพ _____ _____						
Responsibility	Tested by		Witnessed by			
Company			nium			
Name						
Signature						
Date						

**Grounding**



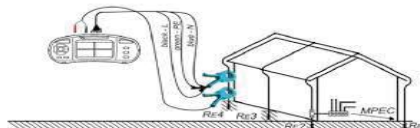
FIELD INSPECTION AND TEST RECORD			
GROUND SYSTEM			
PROJECT NAME	: Preventive Maintenance 2022	Location	: Tower B
CUSTOMER	: Millennium Residence Condominium	PANEL	: Electrical Room
SAP NO	: -	FEEDER NAME	: -

**Checking Test**

1. Cover seal visual check
2. Cleaning box or joint
3. Visual check cable
4. Retorque connection

<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____

**Testing method**



**GROUNDING TEST**

Test Instruments : Metrel Model MI3123 , Serial Number : 16410143

NO	POINT / ROOM	AS FOUND TEST ( $\Omega$ )	Passed	Failed
1.	RMU	0.10	✓	
2.	Transformer No.2/1	1.33	✓	
3.	Transformer No.2/2	0.10	✓	
4.	MDB No.2/1	0.04	✓	
5.	MDB No.2/2	0.05	✓	
6.	ATS-EMDB 2	0.04	✓	
7.	Lightning Aresster	0.10	✓	
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

**Remark :**

**NFPA & IEEE :** Recommends a ground resistance value of 5.0 $\Omega$  or less.

**NEC :** Make sure the system to ground is 25.0 $\Omega$  or less. Infacilities with sensitive equipment, it should be 5.0 $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.

**Telecommunications Industry :** Often uses 5.0 $\Omega$  or less as their value for grounding or bonding.

Responsibility	
Company	
Name	
Signature	
Date	20 January 2022

**Photograph**

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower B

PHOTO 1



ขณะทำการ Check Voltage

PHOTO 2



ขณะทำการ Cleaning

PHOTO 3



ขณะทำการ Cleaning

PHOTO 4



ขณะทำการ Cleaning

PHOTO 5



ขณะทำการขันแปนจุดต่อทางไฟฟ้า

PHOTO 6



ขณะทำการมาร์คน๊อต

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower B

PHOTO 7



ขณะทำการทดสอบ Insulation Resistance

PHOTO 8



ขณะทำการ Cleaning

PHOTO 9



ขณะทำการ Cleaning

PHOTO 10



ขณะทำการ Cleaning

PHOTO 11



ขณะทำการทดสอบ Windin & Turn Ratio

PHOTO 12



ขณะทำการ Check Torque

Responsibility	Tested by	Witnessed by
Company		
Name		
Signature		
Date		

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower B

PHOTO 13



ขณะทำการ Cleaning

PHOTO 14



ขณะทำการ Cleaning

PHOTO 15



ขณะทำการวัดค่า Capacitance

PHOTO 16



ขณะทำการทดสอบ Contact Resistance

PHOTO 17



ขณะทำการทดสอบ Function Trip Unit

PHOTO 18



ขณะทำการทดสอบ Function Trip Unit

Responsibility	
Company	
Name	
Signature	
Date	20 January 2022

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower B

PHOTO 19



ขณะทำการ Cleaning

PHOTO 20



ขณะทำการ Cleaning

PHOTO 21



ขณะทำการ Check Torque

PHOTO 22



ขณะทำการมาร์คน็อต

PHOTO 23



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 24



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

Responsibility	
Company	
Name	
Signature	
Date	

## Tools List

## Tools List to Test Electrical Equipment

A yellow and black micro ohmmeter with a digital display and test leads.

Micro Ohmmeter/Chauvin Arnoux/C.A 6240  
Contact Resistance (Air Circuit Breaker)

A yellow and black digital multimeter with a large display and a stand.

Multimeter/Fluke/1587FC  
Insulation Resistance (Capacitor)

A grey and black insulation tester with a large display and test leads.

Insulation Tester/Megger/MIT515  
Insulation Resistance (TR,MDB)

A yellow and black digital multimeter with a large display and test leads.

Multimeter/Fluke/179  
Capacitance Measurement (Capacitor)

A blue and white ground tester with a large display and test leads.

Ground Tester/Metrel/MI3121H  
Insulation Resistance (MDB)

A green and black ground tester with a large display and test leads.

Ground Tester/Megger/DET4TCR2  
Windin & Turn Ratio Measurement (TR)

### Responsibility

Company

Name

Signature

Date

### Witnessed by

Millennium Residence Condominium



Tools List to Test Electrical Equipment



Ground Tester/Metrel/MI3123  
Grounding Resistance (RMU,TR,MDB)



Ground Tester/Megger/DET4TCR2  
Grounding Resistance (RMU,TR,MDB)



Relay Tester/Megger/Sverker 750  
Relay Testing System (RMU)

Responsibility		Witnessed by	
Company		Millennium Residence Condominium	
Name			
Signature			
Date			



Project : Preventive Maintenance 2022 Tower C  
 Inspection Date : January 27, 2022  
 Inspection Product : RMU, Transformer and Low Voltage Switchboards  
 Inspected By : M  
 Approved By : M

งานบำรุงรักษาระบบไฟฟ้าแรงสูง-แรงต่ำภายในอาคาร  
ประจำปี 2565

นำเสนอ:  
Millennium Residence Condominium

Preventive Maintenance Report  
27 January 2022

K

Report prepared by :

Project Leader by :

Sales :

Date  
January 27, 2022

CONTENT

	PAGE
1. Introduction of Low Voltage Switchboards	1
2. Scope of Work	9
3. Summary Test Report	10
4. Defect Equipment	11
5. Ring Main Unit	13
6. Transformer	14
7. Main Distribution Board	18
8. Air Circuit Breaker	21
9. Mold Case Circuit Breaker	41
10. Capacitor Bank	44
11. Grounding	48
12. Photograph	49
13. Tools list	53



## Introduction of Low Voltage Switchboards

### Low Voltage Switchboards

#### 1. บทนำ

1.1 สวิตช์บอร์ดไฟฟ้าต้องมีการตรวจสอบและทดสอบทั้งเมื่อทำการติดตั้งแล้วเสร็จและตามระยะเวลาที่เหมาะสม จุดประสงค์ของการตรวจสอบและบำรุงรักษาเพื่อให้ระบบไฟฟ้าใช้งานได้ดีตามความต้องการ มีความเชื่อถือได้สูง และอยู่ในสภาพที่พร้อมใช้งานได้อย่างสมบูรณ์ การดำเนินการควรเป็นหน้าที่ความรับผิดชอบของเจ้าของอาคาร ผู้ดูแลระบบไฟฟ้า และผู้ทำการติดตั้ง การดำเนินการจะต้องกระทำโดยผู้ที่มีความรู้ ความชำนาญ เพราะอุปกรณ์บางตัวมีความซับซ้อน อุปกรณ์บางตัวอาจจะชำรุดได้ภายหลังจากการทดสอบ ผู้ทำการทดสอบจึงต้องมีความรู้ ความเข้าใจเพียงพอ และมีวิธีการที่เหมาะสม

1.2 การที่จะให้อุปกรณ์ไฟฟ้าที่ติดตั้งอยู่ในตู้สวิตช์บอร์ดไฟฟ้าสามารถทำงานได้เป็นอย่างดี มีความน่าเชื่อถือได้สูง มีอายุในการใช้งานที่ยาวนาน จะต้องมี การตรวจสอบและบำรุงรักษาเป็นประจำ หรืออาจจะเรียกว่าเป็นการบำรุงรักษาในเชิงป้องกัน โดยเฉพาะในงานที่ต้องการความต่อเนื่องให้มากที่สุด การตรวจสอบและบำรุงรักษาเป็นเรื่องที่แยกกันไม่ออก และเป็นเรื่องที่จะต้องทำไปพร้อมๆ กัน ซึ่งเนื้อหารายละเอียดในบทความนี้จะเป็นการกล่าวถึงการตรวจสอบและบำรุงรักษาที่ทำอย่างเป็นระบบ สามารถนำไปประยุกต์ใช้งานได้ภายในองค์กร หน่วยงาน อาคารสูง โรงงานอุตสาหกรรม เป็นต้น

#### 2. คำนิยาม

2.1 การดำเนินการตรวจสอบสภาพทั่วไป

- การตรวจสอบการทำความสะอาด
- การตรวจสอบความแน่นของโบลท์ และนัทที่บริเวณจุดต่อทางไฟฟ้า เช่น บัสบาร์, เทอร์มินัลจุดต่อต่างๆทางไฟฟ้าของอุปกรณ์ไฟฟ้า

2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

## 2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

การตรวจสอบค่าความต้านทานของฉนวนของ Main Busbar โดยอ้างอิงตามมาตรฐาน IEC 61439-2 โดยการทดสอบทั้งสิ้น 6 วงจร เช่น Line to Line (L1 – L2, L2 – L3, L3 – L1) และ Line to Neutral Ground (L1 – G, L2 – G, L3 – G) ซึ่งผลลัพธ์ที่ได้สำหรับเกณฑ์ในการยอมรับสำหรับตู้สวิตช์บอร์ดไฟฟ้าแรงต่ำจะต้องมีค่าความต้านทานไม่น้อยกว่า 1000  $\Omega/V$  โดยอ้างอิงกับพิกัดแรงดันไฟฟ้าในการทดสอบค่าความต้านทานของฉนวน โดยการจ่ายพิกัดแรงดันไฟฟ้ากระแสตรงในการทดสอบที่ไม่น้อยกว่า 500 Vdc แล้วอ่านค่าจากเครื่องมือวัดเปรียบเทียบกับค่ามาตรฐาน

- ในระหว่างการทดสอบค่าความต้านทานควรวัดค่าอุณหภูมิและความชื้นของสภาพแวดล้อมข้างเคียงในระหว่างการทดสอบ เพื่อใช้สำหรับอ้างอิงค่าความต้านทานที่วัดได้
- ก่อนการทดสอบจะต้องปลดวงจรควบคุม, วงจรอิเล็กทรอนิกส์, อุปกรณ์ป้องกันแลร์รี่ ออกจากระบบไฟฟ้า
- ในระหว่างการทดสอบไม่ควรไปสัมผัสบริเวณตัวนำไฟฟ้าเพราะอาจจะเกิดอันตรายได้

## 2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

การตรวจสอบค่าความต้านทานหน้าสัมผัสของ Main Circuit Breaker ซึ่งอ้างอิงค่าความต้านทานหน้าสัมผัสตามผลิตภัณฑ์ โดยพิกัดกระแสไฟฟ้าในการทดสอบดังนี้ คือ

ข้อกำหนดในการทดสอบ

- กระแสไฟฟ้า 10A dc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดไม่เกิน 100A
- กระแสไฟฟ้า 100A dc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดเกิน 100A ขึ้นไป

การทดสอบค่าความต้านทานที่บริเวณหน้าสัมผัสของเมนคอนแทคในแต่ละเฟส จะเป็นสิ่งที่มีความสำคัญที่สามารถอธิบายได้ถึงประสิทธิภาพ คุณภาพของรอยต่อทางไฟฟ้าของเซอร์กิตเบรกเกอร์ในแต่ละเฟสค่าความต้านทานที่เปลี่ยนแปลงไปในแต่ละเฟสจะได้รับอิทธิพลและผลกระทบมาจากการเกิดกระแสไฟฟ้าลัดวงจรภายในตัวเซอร์กิตเบรกเกอร์ ซึ่งค่าความต้านทานที่วัดได้จะต้องไม่แตกต่างกันเกิน 50 % ในแต่ละเฟส

Inspected By	Prepared By	Approved By

## 2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

จะตรวจสอบโดยอ้างอิงตามมาตรฐาน IEC 60831-1 Standards Technical Data Capacitance Value Tolerance

- -5% , +15% for unit and banks up to 100 kVAR
- 0% , +10% for unit and banks above 100 kVAR

## 2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

การทดสอบค่าความต้านทานดินโดยทั้งนี้จะต้องอ้างอิงตามมาตรฐานดังต่อไปนี้

- NFPA & IEEE: Recommends a ground resistance value of 5.0  $\Omega$  or less.
- NEC: Make sure the system to ground is 25.0  $\Omega$  or less. In facilities with sensitive equipment, it should be 5.0  $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.
- Telecommunications Industry: Often uses 5.0  $\Omega$  or less as their value for grounding or bonding

Inspected By	Prepared By	Approved By

### 3. วิธีการตรวจสอบและดูแลบำรุงรักษาอุปกรณ์ไฟฟ้าแรงต่ำเมื่อผ่านการใช้งาน

- การตรวจสอบสวิตช์บอร์ดไฟฟ้าภายหลังจากการใช้งานผ่านไประยะหนึ่งจะเป็นการตรวจสอบเพื่อหาจุดบกพร่อง การเสื่อมสภาพ หรือการชำรุดเสียหายของอุปกรณ์ไฟฟ้า เพื่อหาแนวทางในการบำรุงรักษาบริเวณที่ไฟฟ้าต่อไปอย่างถูกวิธี ซึ่งการตรวจสอบภายหลังจากการใช้งานไปแล้วนั้นจะมีกรรมวิธีในการตรวจสอบดังต่อไปนี้คือ

- สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)
- เซอร์กิตเบรกเกอร์ (Circuit Breaker)
- คาปาซิเตอร์แบงก์ (Capacitor Bank)
- สวิตช์อัตโนมัติ (Automatic Transfer Switch)


### 4. แสดงรายการตรวจสอบและดูแลบำรุงรักษาสวิตช์บอร์ดไฟฟ้าแรงต่ำ

บริเวณไฟฟ้า	รายการตรวจสอบและทดสอบทางไฟฟ้า
สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบอุปกรณ์เครื่องมือวัดและแสดงผล (Measurement Equipment) ตรวจสอบอุปกรณ์ป้องกัน (Protection Equipment) ตรวจสอบค่าความต้านทานฉนวน (Insulation Resistance) ตรวจสอบการทำงานของสวิตช์บอร์ดไฟฟ้า (Function Operation)
เซอร์กิตเบรกเกอร์ (Circuit Breaker)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบและทำความสะอาดหล่อลื่นอุปกรณ์แม่เหล็ก (Lubrication) ตรวจสอบและทำความสะอาดช่องตัดอาร์ค (ArcChute & Lug Breaker) ตรวจสอบค่าความต้านทานฉนวนของเซอร์กิตเบรกเกอร์ (Insulation Resistance) ตรวจสอบค่าความต้านทานหน้าสัมผัสของเซอร์กิตเบรกเกอร์ (Contact Resistance) ตรวจสอบการทำงานของอุปกรณ์ป้องกันของเซอร์กิตเบรกเกอร์ (Electronic Trip Unit)
คาปาซิเตอร์แบงก์ (Capacitor Bank)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบค่าความต้านทานฉนวนของคาปาซิเตอร์ (Insulation Resistance) ตรวจสอบค่าความประจุไฟฟ้าของคาปาซิเตอร์ (Microfarad Measurement) ตรวจสอบการทำงานของอุปกรณ์สวิตช์ซึ่งคาปาซิเตอร์ (Magnetic Contactor) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Power Factor Controller)
สวิตช์อัตโนมัติ (ATS)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

5.การตรวจสอบตู้สวิตช์บอร์ดไฟฟ้า		
ลำดับ	รายการ	การตรวจสอบ
1	ขั้วต่อสาย จุดต่อสาย	จุดต่อสายทุกจุดต้องแน่น ตรวจสอบความร้อน
2	Cable Terminator	ร่องรอยการเกิดโคโรนา ตรวจสอบรอยแตกร้าวของสาย การต่อลงดินของสายซิลด์
3	สายไฟฟ้า	ตรวจสอบสภาพของสายไฟฟ้า และอุปกรณ์การเดินสายภายในตู้
4	บัสบาร์	ตรวจสอบอุปกรณ์รองรับบัสบาร์ การต่อสาย ตรวจสอบความร้อนที่บริเวณรอยต่อ บัสบาร์
5	ลูกถ้วยรองรับบัสบาร์	ตรวจสอบความสกปรก ร่องรอยการชำรุด การเปลี่ยนสี รอยแตกหรือบิ่น พร้อมทั้งทำความสะอาด
6	ความเป็นฉนวนไฟฟ้า	การต่อสาย การแตกร้าวของ CT
7	การต่อลงดิน	สภาพจุดต่อลงดินที่ตู้สวิตช์เกียร์และหลักดิน วัดค่าความต้านทานดิน สภาพของสายดิน สายต่อฝาก และวัดค่าความต่อเนื่องของสายดิน
8	ฮีตเตอร์	ตรวจสอบการทำงาน ระบบการควบคุมการทำงาน
9	บริษัทเครื่องวัดทางไฟฟ้า (Measurement Equipment)	ตรวจสอบสภาพทั่วไป การชำรุด แตกหักเสียหาย การอ่านค่าพารามิเตอร์ ทางไฟฟ้า
10	Indicator Lamp	ตรวจสอบสภาพการทำงานจะต้องอยู่ในสภาพที่ใช้งานได้เป็นปกติ
11	ชุด Draw out	ตรวจสอบการถอดออก (Draw out) และการถอดเข้า (Draw in) เซอร์กิตเบรกเกอร์ จะต้องคล่องตัว ตรวจสอบกลไกการทำงานและหน้าสัมผัสต่างๆ
12	บริษัทป้องกัน (Protection Relay)	ตรวจสอบฟังก์ชันการทำงานของอุปกรณ์ป้องกันจะต้องถูกต้องและครบถ้วนการ Setting Parameter
13	สวิตช์ควบคุมต่างๆ	ตรวจสอบสภาพการทำงาน
14	เซอร์กิตเบรกเกอร์	ตรวจสอบการทำงานของระบบ Interlock การทำงานตามขั้นตอนวิธีที่กำหนด
15	ทดสอบการทำงานทางกล	ตรวจสอบความคล่องตัวในการทำงาน การหล่อลื่น
Inspected By		Prepared By

6.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางกล )		
ลำดับ	รายการ	การตรวจสอบ
1	Arc Interrupters	ถอดทำความสะอาด ตรวจสอบความเสียหาย
2	หน้าสัมผัส (Main & arcing contact)	ตรวจสอบร่องรอยความเสียหายเนื่องจากการอาร์ก ความสกปรก ทำความสะอาด
3	Insulation (Bushing Porcelains & Other)	ตรวจสอบความเสียหายของฉนวน ตรวจสอบร้าวรอยแตกหักเสียหาย และทำความสะอาด
4	Current Part & Terminals	ตรวจสอบความเสียหาย ความร้อน การยึดแน่น
5	สายไฟฟ้า	การต่อสาย การเข้าสาย ขั้วต่อสาย
6	กลไกการทำงาน	ตรวจสอบการติดขัด สารหล่อลื่น และการทำงานทางกลต่าง
7	อุปกรณ์เสริมอื่นๆ	ตรวจสอบ Aux. device, Shock Absorbers, Bumpers, Position Indicator Latch Checking Switch, Key Lock-out,etc.
7.การตรวจสอบเซอร์กิตเบรกเกอร์ ( การตรวจสอบทางไฟฟ้า )		
ลำดับ	รายการ	การตรวจสอบ
1	Function การทำงาน	ตรวจสอบการทำงานทางไฟฟ้า เช่น Close, Open
2	Closing Coil, Shunt Release	ตรวจสอบการต่อสาย การทำงาน
3	หน้าสัมผัส	วัดค่าความต้านทานหน้าสัมผัส
4	ความต้านทานฉนวน	Insulation Test
5	Trip Unit	ตรวจสอบการทำงานและความเสียหาย
6	Setting	ตรวจสอบการปรับตั้งค่าพารามิเตอร์ต่างๆ
7	Protection Relay	ตรวจสอบการทำงานของ Protection Relay
8	การทำงาน	ตรวจสอบการทำงานของ Trip Free, Closing
Inspected By		Prepared By

## Scope of Work

8.การตรวจสอบตู้คาปาซิเตอร์แบงค์		
ลำดับ	รายการ	การตรวจสอบ
1	HRC Fuse	จะต้องอยู่ในสภาพที่สมบูรณ์ทั้ง 3 เฟส (Fuse ไม่ขาด)
2	MCCB	จะต้องอยู่ในสภาพที่ใช้งานได้ (ON - OFF - Trip)
3	Power Cable	จะต้องไม่ชำรุด, ขาด หรือไหม้ ตลอดความยาวสายไฟฟ้า
4	Magnetic Contactor	ตรวจสอบการทำงานทางไฟฟ้า และขดลวดความต้านทานต้องอยู่ในสภาพที่สมบูรณ์ไม่ขาดหรือหลุดออกจากตัว Magnetic Contactor
5	Detuned Filter Reactor	จะต้องอยู่ในสภาพที่สมบูรณ์ไม่มีรอยไหม้ หรือชำรุดเสียหาย
6	Capacitor Unit	ตัวถังจะต้องไม่บวม ทะลุ หรือมีรอยไหม้ ขั้วต่อสายต้องแน่น และจะต้องลงดินผ่านสายต่อฝากทุก Step
7	Damping Resister	จะต้องติดตั้งที่ขั้วของคาปาซิเตอร์ครบทั้ง 3 ชุด
8	Thermostat / Fan	ตรวจสอบสภาพการทำงานของพัดลมระบายอากาศ โดยการจำลองสภาวะอุณหภูมิสูงเกิน พร้อมทั้งปรับตั้งค่าอุณหภูมิให้เหมาะสม
9	Power Factor Controller (PFC)	ตรวจสอบการปรับตั้งค่าทางไฟฟ้าทุกค่าพารามิเตอร์
10	Terminal Retightening Torque	ตรวจสอบความแน่นของจุดต่อต่างๆทางไฟฟ้า จะต้องแน่นตามค่าที่กำหนดของ Nut และ Bolt ในแต่ละขนาด
11	การวัดค่าความเป็นฉนวน Insulation Resistance Measurement	ตรวจวัดค่าความเป็นฉนวนของคาปาซิเตอร์ในแต่ละเฟสเทียบกราวด์ที่ตัวถัง โดยพิกัดแรงดันไฟฟ้าที่ใช้ในการทดสอบต้องไม่น้อยกว่า 500 Vdc และค่าความต้านทานฉนวนจะต้องมีค่าที่ไม่น้อยกว่า 1 MΩ
12	การตรวจวัดค่าประจุไฟฟ้า Microfarad Measurement	ตรวจวัดค่าอิมพีแดนซ์ของคาปาซิเตอร์ที่ขั้วระหว่างเฟส เช่น AB, BC และ CA ซึ่งค่าที่วัดได้จะต้องมีค่าอิมพีแดนซ์อยู่ในขอบเขตที่กำหนด 5% to +15% สำหรับคาปาซิเตอร์ขนาดไม่เกิน 100 kVAR 0% to +10% สำหรับคาปาซิเตอร์ขนาดเกิน 100 kVAR
13	การตรวจวัดค่ากระแสไฟฟ้า Current Measurement	ตรวจวัดค่ากระแสไฟฟ้าใช้งานของคาปาซิเตอร์ทั้ง 3 เฟส ซึ่งกระแสไฟฟ้าในแต่ละเฟสจะต้องมีค่าที่เท่ากันหรือใกล้เคียงกัน
Inspected By		Prepared By
Approved By		

## Scope of Work

### 1. Ring Main Unit

1. Inspect physical and mechanical condition.
2. Regressing the operating mechanism.
3. MV Fuse and Fuse base Check.
4. Inspect anchorage, alignment, and grounding.
5. Trip test for protection relay and record the existing setting.
6. Verify pressure gauge.
7. Cleaning overall.

### 2. Transformer (Dry type)

1. General inspection and cleaning.
2. Bushing condition check.
3. Grounding connection check.
4. Retighten with torque wrench (busing connection)
5. Insulation resistance.
6. Measure the resistance of each winding at the designated tap position.
7. Perform turns-ratio tests at the designated tap position.
8. Verify that cooling fans operate correctly.

### 3. LV Switchboards

1. Cleaning all panel.
2. Retorque the busbar at main incoming and between panel.
3. Insulation test.
4. Metering check.
5. General condition check.
6. Grounding connection check.
7. Busbar check.
8. Fuse and fuse bases check.

### 4. Air Circuit Breaker

1. Cleaning the air circuit breaker and relubricating the operating mechanism.
2. Cleaning and check Arc-chuter.
3. Insulation check.
4. Rack-in / rack-out circuit breaker.
5. Trip unit function test. (Protection unit).
6. Parameter checking and recording of protective relay.
7. Contact resistance test.

### 5. Capacitor Bank

1. Inspect for physical damage, broken insulation.
2. Tightness of connection wiring.
3. Cleaning.
4. Operating function.
5. Capacitive or current measurement.
6. Insulation resistance.
7. Check ventilation fan.

### 6. Lamp

1. Verify the terminal whether they are not loose.
2. Verify the control wires whether they are not discoloration due to overheating.

## Summary Test Report



No.	Panel	Description	Q'ty	Test Result	Suggestion
1	RMU	1.1 RMU	1 set	Ring Main Unit is in good condition.	
2	Transformer	2.1 TR No.3/1	1 set	Lamp Power & Control 3/1 (ok)	
		2.2 TR No.3/2	1 set	Lamp Power and Lamp Fan & Control 3/2 (ok)	
3	Main Distribution Board	3.1 MDB No.3/1	1 set	Voltmeter Analog 3/1	
		3.2 MDB No.3/2	1 set	Main Distribution Board is in good condition.	
		3.3 ATS-EMDB 3	1 set	- Voltmeter Analog 3/3	
				- Lamp 1/2 L2 & 3 EMERGENCY 3/3	
4	Air Circuit Breaker	4.1 Air Circuit Breaker	6 set	Air Circuit Breaker is in good condition.	
5	Mold Case Circuit Breaker	5.1 Mold Case Circuit Breaker	32 set	Mold Case Circuit Breaker is in good condition.	
6	Capacitor Bank	6.1 Cap bank 3/1	1 set	Capacitor Bank is in good condition.	
		6.2 Cap bank 3/2	1 set	Capacitor Bank is in good condition.	
7	Grounding	7.1 RMU	1 set	Grounding is in good condition.	
		7.2 TR No.3/1	1 set	Grounding is in good condition.	
		7.3 TR No.3/2	1 set	Grounding is in good condition.	
		7.4 MDB No.3/1	1 set	Grounding is in good condition.	
		7.5 MDB No.3/2	1 set	Grounding is in good condition.	
		7.6 ATS-EMDB 3	1 set	Grounding is in good condition.	
		7.7 Lightning Arrester	1 set	Grounding is in good condition.	

Defect of Equipment

## Preventive Maintenance 2022 Tower C Defect Equipment and its status Report


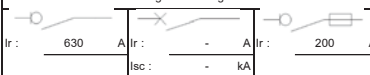
Item	Equipment's	Fault list	Corrective Action	Remark
1		TR No.3/1 - Lamp Power & Control ชั่ว (ผิดปกติ)	ตรวจสอบและเปลี่ยน Lamp ใหม่	
2		TR No.3/2 - Lamp Power ว่าง Lamp Fan & Control ชั่ว (ผิดปกติ)	ตรวจสอบและเปลี่ยน Lamp ใหม่	
3		MDB No.3/1 - Voltmeter Analog ชั่ว	ตรวจสอบและเปลี่ยน Voltmeter Analog ใหม่	

## Preventive Maintenance 2022 Tower C Defect Equipment and its status Report


Item	Equipment's	Fault list	Corrective Action	Remark
4		ATS-EMDB 3 - Voltmeter Analog ชั่ว	ตรวจสอบและเปลี่ยน Voltmeter Analog ใหม่	
5		ATS-EMDB 3 - Lamp ว่าง L2 & EMERGENCY ชั่ว	ตรวจสอบและเปลี่ยน Lamp ใหม่	
6		ชั้น 34 High Zone - ตัวตัด Breaker ที่ Plug in ชั่ว	ตรวจสอบและเปลี่ยน Breaker ใหม่	



## Ring Main Unit

			
<b>RING MAIN UNIT INSPECTION TEST RECORD</b>			
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower C	
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>CUBICLE NAME</b> : Switchgear RMU	
<b>TECHNICAL DATA DISCRPTION</b>			
Manufacturer : ORMAZABAL		Rated Voltage (Ur) :	24 kV
Type : GAE 630		Operating Voltage (Un) :	24 kV
S/N : -		Rated Power Frequency w/s (Ud) :	50 kV
Standard : -		Lightning Impulse w/s (Up) :	125 kV
		Rated Current (Ir) :	630/200 A
		Short Time Current (Ik) :	20 kA
		Duration of Short Circuit (tk) :	1 S
		Rated Frequency :	50 Hz
Bushing of Function Unit Connection Type		1 st 2 nd 3 rd 4 th 5 th Plug in <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Bolted <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Single Line Diagram 
<b>Visual Inspection and Function Test</b>		<b>Pass</b>	<b>Decline</b>
<input checked="" type="checkbox"/> <b>1 st Function</b>			
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Feeder Name : Incoming		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Function Unit : 1		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/>
630 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release <input type="checkbox"/>			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>2 nd Function</b>			
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Feeder Name : OutgoingTR3/1		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Function Unit : 2		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/>
200 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release <input type="checkbox"/>			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>3 rd Function</b>			
- Cleaning Termination and Ring Main Unit		<input checked="" type="checkbox"/>	<input type="checkbox"/>
- Grease and Lubricant Mechanism Operation		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Feeder Name : OutgoingTR3/2		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Function Unit : 3		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Rated Current of Function		<input checked="" type="checkbox"/>	<input type="checkbox"/>
200 A		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Protection Relay Type		<input checked="" type="checkbox"/>	<input type="checkbox"/>
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release <input type="checkbox"/>			<input type="checkbox"/> Motor Mechanism
<input type="checkbox"/> <b>4 th Function</b>			
- Cleaning Termination and Ring Main Unit		<input type="checkbox"/>	<input type="checkbox"/>
- Grease and Lubricant Mechanism Operation		<input type="checkbox"/>	<input type="checkbox"/>
Feeder Name :		<input type="checkbox"/>	<input type="checkbox"/>
Function Unit :		<input type="checkbox"/>	<input type="checkbox"/>
Rated Current of Function		<input type="checkbox"/>	<input type="checkbox"/>
A		<input type="checkbox"/>	<input type="checkbox"/>
Protection Relay Type		<input type="checkbox"/>	<input type="checkbox"/>
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release <input type="checkbox"/>			<input type="checkbox"/> Motor Mechanism
<b>Responsibility</b>			
Company			
Name			
Signature			
Date			

## Transformer



**D-Nine**  
Engineering

---

**FIELD INSPECTION AND TEST RECORD**  
**TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022  
**CUSTOMER** : Millennium Residence Condominium

**LOCATION** : Tower C  
**FEEDER** : Transformer No.3/1

---

**TECHNICAL DATA**

<table style="width: 100%; border-collapse: collapse;"> <tr><td>Manufacture</td><td>ABB</td></tr> <tr><td>Type</td><td>Cast Rasin</td></tr> <tr><td>Standard</td><td>IEC 60076-11</td></tr> <tr><td>Year of manufacture</td><td>2008/05</td></tr> <tr><td>Rated frequency</td><td>50 Hz</td></tr> <tr><td>Vector-group symbol</td><td>Dyn11</td></tr> <tr><td>Rated power</td><td>1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td>24000 V</td></tr> <tr><td>Rated voltage LV</td><td>415/240 V</td></tr> </table>	Manufacture	ABB	Type	Cast Rasin	Standard	IEC 60076-11	Year of manufacture	2008/05	Rated frequency	50 Hz	Vector-group symbol	Dyn11	Rated power	1600/2240 kVA	Rated voltage HV	24000 V	Rated voltage LV	415/240 V	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Serial No.</td><td>1LKR080696TER</td></tr> <tr><td>Type of cooling</td><td>AN/AF</td></tr> <tr><td>Weight</td><td>3900 kg.</td></tr> <tr><td>Insulation Class</td><td>F</td></tr> <tr><td>Impedance</td><td>6.11/8.56 %</td></tr> <tr><td>Material</td><td>-</td></tr> <tr><td>Protection</td><td>-</td></tr> <tr><td>Rated current HV</td><td>38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td>2225.9/3116.3 A</td></tr> </table>	Serial No.	1LKR080696TER	Type of cooling	AN/AF	Weight	3900 kg.	Insulation Class	F	Impedance	6.11/8.56 %	Material	-	Protection	-	Rated current HV	38.5/53.9 A	Rated current LV	2225.9/3116.3 A
Manufacture	ABB																																				
Type	Cast Rasin																																				
Standard	IEC 60076-11																																				
Year of manufacture	2008/05																																				
Rated frequency	50 Hz																																				
Vector-group symbol	Dyn11																																				
Rated power	1600/2240 kVA																																				
Rated voltage HV	24000 V																																				
Rated voltage LV	415/240 V																																				
Serial No.	1LKR080696TER																																				
Type of cooling	AN/AF																																				
Weight	3900 kg.																																				
Insulation Class	F																																				
Impedance	6.11/8.56 %																																				
Material	-																																				
Protection	-																																				
Rated current HV	38.5/53.9 A																																				
Rated current LV	2225.9/3116.3 A																																				

**VISUAL INSPECTION AND FUNCTION TEST**

	Pass	Not pass	
1. Inspection physical and mechanical condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
2. Inspection alignment and grounding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3. Inspection winding temperature indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
4. Clean the unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
5. Verify the control alarm and trip setting on temperature indicators are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
6. Verify that cooling fans operate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
7. Verify tightness of accessible bolted electrical connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
8. Verify that as-left tap connections are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
9. Verify tap changer position	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
10. Verify the presence of surge arresters	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

**INSULATION RESISTANCE MEASUREMENT**  
**Test Instruments** : Megger Model MIT515 , **Serial Number** : N/A
 

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	37,900	> 1,000
HV to LV	2500	35,300	> 1,000
LV to GND	1000	2,180	> 100

Humidity : 58 % , Ambient Temperature : 30.9 °c

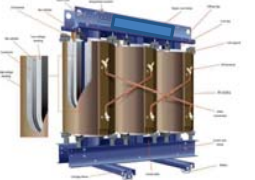
**Function Testing and Cooling fan Testing**

	Pass	Not pass		Pass	Not pass	
1. Function Testing Operating of Cooling FAN.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
2. Alarm Buzzer Testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
3. Function Testing Trip TR. RMU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

**POWER CABLE : INSULATION RESISTANCE MEASUREMENT**  
**Test Instruments** : Megger Model MIT515 , **Serial Number** : N/A
 

Test voltage (Vdc)	A-B	B-C	C-A	A-N	B-N	C-N	Criteria (MΩ)
5000	170,100	215,000	239,000	73,100	66,400	94,700	> 2,000

Responsibility	
Company	
Name	
Signature	
Date	



**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower C  
**CUSTOMER** : Millennium Residence Condominium **FEEDER** : Transformer No.3/1

**TURN RATIO AND POLARITY MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.955	0.21	0.51	0.00	✓	
	V		98.035	0.13	0.53	0.00	✓	
	W		98.018	0.15	0.45	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

**Test Instruments** : Metrel Model MI3280 , **Serial Number** : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.728	3.705	3.738

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.2	2.2	2.2

**TEMPERATURE MONITORING**

**Setting** :  
Trip = 110 °C Alarm = 90 °C Fan (On) = 75 °C Fan (Off) = 60 °C

**Function Testing and Cooling fan Testing**

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. To RMU

**Pass** ☒ **Not pass** ☐  
☒ ☐  
☐ (ไม่เสียงบด RMU)

**Remark** : Lamp Power ๔ Control ๓๓๓๔ (๕๕๕๕)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	Tested by	Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower C  
**CUSTOMER** : Millennium Residence Condominium **FEEDER** : Transformer No.3/2

**TECHNICAL DATA**

Manufacture	ABB	Serial No.	1LKR080693TER
Type	Cast Rasin	Type of cooling	AN/AF
Standard	IEC 60076-11	Weight	3900 kg.
Year of manufacture	2008/05	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.10/8.54 %
Vector-group symbol	Dyn11	Material	-
Rated power	1600/2240 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	38.5/53.9 A
Rated voltage LV	415/240 V	Rated current LV	2225.9/3116.3 A

**VISUAL INSPECTION AND FUNCTION TEST**

- Inspection physical and mechanical condition
- Inspection alignment and grounding
- Inspection winding temperature indicator
- Clean the unit
- Verify the control alarm and trip setting on temperature indicators are as specified
- Verify that cooling fans operate
- Verify tightness of accessible bolted electrical connections
- Verify that as-left tap connections are as specified
- Verify tap changer position
- Verify the presence of surge arresters

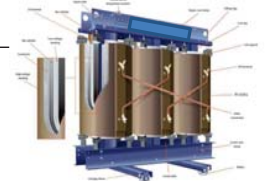
**Pass** ☒ **Not pass** ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐

**INSULATION RESISTANCE MEASUREMENT**

**Test Instruments** : Megger Model MIT515 , **Serial Number** : N/A

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	32,200	> 1,000
HV to LV	2500	39,700	> 1,000
LV to GND	1000	1,930	> 100

Humidity : 58 % , Ambient Temperature : 30.9 °C



**Function Testing and Cooling fan Testing**

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. RMU

**Pass** ☒ **Not pass** ☐ **Pass** ☒ **Not pass** ☐  
☒ ☐ ☒ ☐  
☒ ☐ ☒ ☐

**POWER CABLE : INSULATION RESISTANCE MEASUREMENT**

**Test Instruments** : Megger Model MIT515 , **Serial Number** : N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	165,500	111,100	179,900	90,100	70,700	58,600	> 2,000

Responsibility	Tested by	Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower C  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.3/2

**TURN RATIO AND POLARITY MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.939	0.22	0.46	0.00	✓	
	V		97.879	0.28	0.41	0.00	✓	
	W		97.899	0.26	0.32	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

-HV side of Xfmr

-LV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.663	3.686	3.679

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.1	2.2	2.2

**TEMPERATURE MONITORING**

Setting :

Trip = 110 °C Alarm = 90 °C Fan (On) = 75 °C Fan (Off) = 60 °C

**Function Testing and Cooling fan Testing**

Pass

Not pass

- Function Testing Operating of Cooling FAN. ☒ ☐
- Alarm Buzzer Testing ☒ ☐
- Function Testing Trip TR. To RMU ☒ ☐ (ไม่สั่งปลด RMU)

Remark : - Lamp Power และ Lamp Fan ๓ Control ๒ชุด (สั่งเบรก)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

**Main Distribution Board**

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower C																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.3/1																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	8,300	Passed > 1 MΩ																																																					
B to C	500	4,000																																																						
C to A	500	3,070																																																						
A to GND	500	1,040																																																						
B to GND	500	3,050																																																						
C to GND	500	1,860																																																						
Humidity : 60 % Ambient Temperature : 31 °C																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out. <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test. <b>Remark</b> : Voltmeter Analog																																																								
<b>Responsibility</b>																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower C																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.3/2																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	5,220	Passed > 1 MΩ																																																					
B to C	500	5,040																																																						
C to A	500	4,430																																																						
A to GND	500	2,810																																																						
B to GND	500	3,650																																																						
C to GND	500	2,300																																																						
Humidity : 58 % Ambient Temperature : 31.1 °C																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out. <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test. <b>Remark</b> :																																																								
<b>Responsibility</b>																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								



FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower C																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : ATS-EMDB 3																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	40,100	Passed > 1 MΩ	✓																																																				
B to C	500	40,200		✓																																																				
C to A	500	46,300		✓																																																				
A to GND	500	22,600		✓																																																				
B to GND	500	12,900		✓																																																				
C to GND	500	25,400		✓																																																				
Humidity : 58 %  Ambient Temperature : 31.2 °C																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : - Voltmeter Analog ๖๓๕๕ - Lamp ไฟฟ้า L2 ๓๖ EMERGENCY ๖๓๕๕																																																								
<b>Responsibility</b>																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

**Air Circuit Breaker**

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1	
SAP NO : -		FEEDER NAME : Incoming from transformer No.3/1	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-2 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	15	
B	10	13	
C	10	14	
Responsibility			
Company			
Name			
Signature			
Date	27 January 2022		

FIELD INSPECTION AND TEST RECORD													
AIR CIRCUIT BREAKER													
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C											
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1											
SAP NO : -		FEEDER NAME : Incoming from transformer No.3/1											
4. INSULATION RESISTANCE MEASUREMENT													
Test Instruments : - , Serial Number : -													
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )											
Interrupter phase A	500	-											
Interrupter phase B	500	-											
Interrupter phase C	500	-											
A-GND.	500	-	Humidity : - %										
B-GND.	500	-	Ambient Temperature : - °C										
C-GND.	500	-											
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground													
5. OVERCURRENT TRIP UNIT MEASUREMENT													
Test Instruments : Full Function Test Kit , Serial Number : -													
- Setting of overcurrent trip unit													
- Long time : Ir = 0.5 - Short time : Isd = 4 - Instantaneous : Ii = 6 - Earth fault : Ig = A (500)		- Time setting : tr = 4 s. - Time setting : tsd = 0.1 s. , I <sup>2</sup> t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = 0.1 s. , I <sup>2</sup> t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off											
- Operating time measurement													
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test													
Function	Test current	Should be	As found										
Long time	4800 A	Auto s.	14.728 s.										
Short time	12800 A	Auto s.	0.147 s.										
Instantaneous	24000 A	Auto s.	0.037 s.										
Earth fault	1000 A	Auto s.	0.138 s.										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table>				Result	Indicator of tripping cause	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Result	Indicator of tripping cause												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
Remark : _____													
Responsibility													
Company													
Name													
Signature													
Date													

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1	
SAP NO : -		FEEDER NAME : Busduct Low 2500A	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW25H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	2500 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-3 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> <div style="width: 20px; height: 10px; background-color: #d3d3d3; margin-right: 5px;"></div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	13	
B	10	15	
C	10	13	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1	
SAP NO : -		FEEDER NAME : Busduct Low 2500A	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : -		Serial Number : -	
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
<p><b>Note:</b> Circuit breaker in open position when measurement between interrupt contact</p> <p>Circuit breaker in close position when measurement between phase and ground and other phase connect to ground</p>			<p>Humidity : - %</p> <p>Ambient Temperature : - °C</p>
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit		Serial Number : -	
- Setting of overcurrent trip unit			
<ul style="list-style-type: none"> <li>- Long time : Ir = 1</li> <li>- Short time : Isd = 5</li> <li>- Instantaneous : Ii = -</li> <li>- Earth fault : Ig = -</li> </ul>		<ul style="list-style-type: none"> <li>- Time setting : tr = 4 s.</li> <li>- Time setting : tsd = - s., I<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off</li> <li>- Time setting : tg = - s., I<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off</li> </ul>	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	9167 A	Auto s.	9.788 s.
Short time	15625 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
<p>Result: <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</p> <p>Indicator of tripping cause: <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</p>			
<p>Remark : _____</p> <p>_____</p> <p>_____</p>			
Responsibility			
Company			
Name			
Signature			
Date			



FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1 & MDB No.3/2	
SAP NO : -		FEEDER NAME : Bus TIE	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-1 (3/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
		<input type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1 & MDB No.3/2	
SAP NO : -		FEEDER NAME : Bus TIE	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
Humidity : - %			
Ambient Temperature : - °C			
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 5 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 4 s. - Time setting : tsd = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	11733 A	Auto s.	9.638 s.
Short time	20000 A	Auto s.	0.049 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Indicator of tripping cause	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
<b>Remark :</b>			
Responsibility			
Company			
Name			
Signature			
Date			

## FIELD INSPECTION AND TEST RECORD

## AIR CIRCUIT BREAKER

PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: MDB No.3/2
SAP NO	: -	FEEDER NAME	: Incoming from transformer No.3/2

## TECHNICAL DATA

Manufacturer	SQUARE D	Ultimate breaking capacity ( Icu )	65	kArms.
Type	NW32H1	Rated service breaking ( Ics )	100%	kArms.
Rated current ( In )	3200	Frequency	50/60	Hz.
Rated insulation voltage ( Ui )	1000	Standard	IEC 60947-2	
Impulse withstand voltage ( Uimp )	12	Year of manufacture	2008	
Rated operation voltage ( Ue )	220/440	Serial no.	140409827-1	
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole	

## 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect air chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

[illegible]

## 2. ACCESSORIES

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E	<input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E	<input type="checkbox"/> WS1

### 3. MAIN CONTACT RESISTANCE MEASUREMENT

**Test Instruments :** Chauvin Arnoux Model C.A 6240 , **Serial Number :** 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	10
B	10	14
C	10	14

<b>Responsibility</b>		<b>Witnessed by</b>
Company		Millennium Residence Condominium
Name		
Signature		
Date		

## FIELD INSPECTION AND TEST RECORD

## AIR CIRCUIT BREAKER

<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Tower C
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>DEVICE NO.</b>	: MDB No.3/2
<b>SAP NO</b>	: -	<b>FEEDER NAME</b>	: Incoming from transformer No.3/2

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : \_\_\_\_\_, Serial Number : \_\_\_\_\_

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : \_\_\_\_\_ %

Ambient Temperature :        -        °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

## 5. OVERCURRENT TRIP UNIT MEASUREMENT

**Test Instruments :** Full Function Test Kit , **Serial Number :** -

### - Setting of overcurrent trip unit

- Long time :  $t_r = \frac{0.5}{}$  s.  
 - Short time :  $t_{sd} = \frac{4}{}$  s.  
 - Instantaneous :  $t_i = \frac{6}{}$  s.  
 - Earth fault :  $t_g = A(500)$  s.

- Time setting :  $t_r = \frac{4}{}$  s.  
 - Time setting :  $t_{sd} = \frac{0.1}{}$  s. ,  $i^2t =$  ☒ On ☐ Off  
 - Time setting :  $t_g = 0.1$  s. ,  $i^2t =$  ☒ On ☐ Off

- Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current		Should be		As found		Result		Indicator of tripping cause	
Long time	4800	A	Auto	s.	14.737	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Short time	12800	A	Auto	s.	0.148	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Instantaneous	24000	A	Auto	s.	0.037	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Earth fault	1000	A	Auto	s.	0.138	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show

Remark : \_\_\_\_\_

Responsibility		
Company		
Name		
Signature		
Date		

## FIELD INSPECTION AND TEST RECORD

### AIR CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower C  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.3/2  
SAP NO : FEEDER NAME : Busduct High 2000A

#### TECHNICAL DATA

Manufacture : SQUARE D Ultimate breaking capacity ( Icu ) : 65 kArms.  
Type : NW20H1 Rated service breaking ( Ics ) : 100% kArms.  
Rated current ( I<sub>n</sub> ) : 2000 A Frequency : 50/60 Hz.  
Rated insulation voltage ( U<sub>i</sub> ) : 1000 V Standard : IEC 60947-2  
Impulse withstand voltage ( U<sub>imp</sub> ) : 12 kV Year of manufacture : 2008  
Rated operation voltage ( U<sub>e</sub> ) : 220/440 V Serial no. : 1404078864-4  
The Breaker in its frame ☒ Fix ☐ Draw-out Pole ☒ 3 Pole ☐ 4 Pole

#### 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked Remark

<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

#### 2. ACCESSORIES

1.1 Under voltage trip device ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.2 Shunt trip device ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.3 Closing coil ☐ 100/250 VAC/VDC ☐ 200-250 VAC/VDC ☐ Other  
1.4 Motor charger device ☐ 100/250 VAC/VDC ☐ 220-240 VAC/VDC ☐ Other  
1.5 Electronic Trip Device ☐ 2.0 ☒ 2.0 A ☐ 2.0 E ☐ 6.0 A ☐ 6.0 E ☐ WS1

#### 3. MAIN CONTACT RESISTANCE MEASUREMENT

Test Instruments : Chauvin Arnoux Model C.A 6240 Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	16
B	10	17
C	10	19

Responsibility	
Company	
Name	
Signature	
Date	

## FIELD INSPECTION AND TEST RECORD

### AIR CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower C  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : MDB No.3/2  
SAP NO : FEEDER NAME : Busduct High 2000A

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

Note: Circuit breaker in open position when measurement between interrupt contact

Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

#### 5. OVERCURRENT TRIP UNIT MEASUREMENT

Test Instruments : Full Function Test Kit Serial Number :

##### - Setting of overcurrent trip unit

- Long time : I<sub>r</sub> = 1  
- Short time : I<sub>sd</sub> = 5  
- Instantaneous : I<sub>i</sub> = -  
- Earth fault : I<sub>g</sub> = -  
- Time setting : t<sub>r</sub> = 4 s.  
- Time setting : t<sub>sd</sub> = - s., I<sub>r</sub>t = ☐ On ☐ Off  
- Time setting : t<sub>g</sub> = - s., I<sub>r</sub>t = ☐ On ☐ Off

##### - Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	7333 A	Auto s.	9.635 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	12500 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :

Responsibility	
Company	
Name	
Signature	
Date	

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/2	
SAP NO : -		FEEDER NAME : MAIN IN (To ATS)	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW08H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-4
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/2	
SAP NO : -		FEEDER NAME : MAIN IN (To ATS)	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 5 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 4 s. - Time setting : tsd = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	2933 A	Auto s.	9.506 s.
Short time	5000 A	Auto s.	0.062 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Result</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Indicator of tripping cause</div> </div>			
Long time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	
Short time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	
Instantaneous	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	
Earth fault	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	
Remark :			
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 3/1	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS1000N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	1000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	380/415 V.	Serial no.	1404090252-4 (4/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower C	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.3/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 3/1	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 0.8 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1067 A	Auto s.	16.212 s.
Short time	1500 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show <input type="checkbox"/> Pass <input type="checkbox"/> Not pass <input type="checkbox"/> Show <input type="checkbox"/> Not show <input type="checkbox"/> Pass <input type="checkbox"/> Not pass <input type="checkbox"/> Show <input type="checkbox"/> Not show		
Remark : _____			
Responsibility			
Company			
Name			
Signature			
Date			

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower C  
**CUSTOMER** : Millennium Residence Condominium **DEVICE NO.** : MDB No.3/2  
**SAP NO** : **FEEDER NAME** : Capacitor Bank 3/2

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50	kArms.
Type	NS1000N	Rated service breaking ( Ics )	100%	kArms.
Rated current ( In )	1000 A.	Frequency	50/60	Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3	
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008	
Rated operation voltage ( Ule )	380/415 V.	Serial no.	1404095284-12	
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole	

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

**Test Instruments** : Chauvin Arnoux Model C.A 6240 **Serial Number** : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower C  
**CUSTOMER** : Millennium Residence Condominium **DEVICE NO.** : MDB No.3/2  
**SAP NO** : **FEEDER NAME** : Capacitor Bank 3/2

**4. INSULATION RESISTANCE MEASUREMENT**

**Test Instruments** : **Serial Number** :

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note**: Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

**Test Instruments** : Full Function Test Kit **Serial Number** :

**- Setting of overcurrent trip unit**

- Long time : Ir = 0.8	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir't = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : li = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir't = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	16.230 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

**Remark** :

Responsibility	
Company	
Name	
Signature	
Date	

## FIELD INSPECTION AND TEST RECORD

### MOLD CASE CIRCUIT BREAKER

PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: ATS-EMDB 3
SAP NO	: -	FEEDER NAME.	: Normal Line

## TECHNICAL DATA

Manufacturer	SQUARE D		Ultimate breaking capacity ( Icu )	50	kArms.
Type	NS800N		Rated service breaking ( Ics )	75%	kArms.
Rated current ( In )	800	A.	Frequency	50/60	Hz.
Rated insulation voltage ( Ui )	750	V.	Standard	IEC 60947-3	
Impulse withstand voltage ( Uimp )	8	kV.	Year of manufacture	2008	
Rated operation voltage ( Ue )	380/415	V.	Serial no.	1404096941-1	
The Breaker in its frame	<input checked="" type="checkbox"/> Fix	<input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole	<input type="checkbox"/> 4 Pole

## 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxilliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

[illegible]

## 2. ACCESSORIES

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E	<input type="checkbox"/> WS1	

### 3. MAIN CONTACT RESISTANCE MEASUREMENT

**Test Instruments :** Chauvin Arnoux Model C.A 6240 , **Serial Number :** 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	-
B	10	-
C	10	-

<b>Responsibility</b>		<b>Witnessed by</b>
Company		Millennium Residence Condominium
Name		
Signature		
Date		



## FIELD INSPECTION AND TEST RECORD

### MOLD CASE CIRCUIT BREAKER

PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: ATS-EMDB 3
SAP NO	: "	FEEDER NAME.	: Normal Line

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : \_\_\_\_\_, Serial Number : \_\_\_\_\_

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : \_\_\_\_\_ %

Ambient Temperature :      -      °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

## 5. OVERCURRENT TRIP UNIT MEASUREMENT

**Test Instruments :** Full Function Test Kit, **Serial Number :** -

- Setting of overcurrent trip unit

- Long time	: $t_r = \underline{1}$	- Time setting	: $t_r = \underline{8}$ s.
- Short time	: $t_{sd} = \underline{3}$	- Time setting	: $t_{sd} = \underline{\quad}$ s. , $t^2_t = \square$ On <input type="checkbox"/> Off
- Instantaneous	: $t_i = \underline{-}$		
- Earth fault	: $t_g = \underline{-}$	- Time setting	: $t_g = \underline{-}$ s. , $t^2_t = \square$ On <input type="checkbox"/> Off

- Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current		Should be		As found		Result		Indicator of tripping cause	
Long time	1867	A	Auto	s.	50.489	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Short time	3000	A	Auto	s.	0.049	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Instantaneous	-	A	-	s.	-	s.	<input type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input type="checkbox"/> Show	<input type="checkbox"/> Not show
Earth fault	-	A	-	s.	-	s.	<input type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input type="checkbox"/> Show	<input type="checkbox"/> Not show

Remark : \_\_\_\_\_

<b>Responsibility</b>			<b>Witnessed by</b>
Company			Millennium Residence Condominium
Name			
Signature			
Date			

## FIELD INSPECTION AND TEST RECORD

### MOLD CASE CIRCUIT BREAKER

PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: ATS-EMDB 3
SAP NO	: "	FEEDER NAME.	: Emergency Line

## TECHNICAL DATA

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50	kArms.
Type	NS800N	Rated service breaking ( Ics )	75%	kArms.
Rated current ( In )	800 A.	Frequency	50/60	Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3	
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008	
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404096941-1	
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole	

## 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect air chutes
- Inspect auxiliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

[illegible]

## 2. ACCESSORIES

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0	<input type="checkbox"/> 2.0 A	<input type="checkbox"/> 2.0 E
		<input type="checkbox"/> 6.0 A	<input type="checkbox"/> 6.0 E
			<input type="checkbox"/> WS1

### 3. MAIN CONTACT RESISTANCE MEASUREMENT

**Test Instruments :** Chauvin Arnoux Model C.A 6240 , Serial Number : 162470PBV

Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )
A	10	-
B	10	-
C	10	-

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



## FIELD INSPECTION AND TEST RECORD

### MOLD CASE CIRCUIT BREAKER

PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: ATS-EMDB 3
SAP NO	: *	FEEDER NAME.	: Emergency Line

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : \_\_\_\_\_ - \_\_\_\_\_, Serial Number : \_\_\_\_\_ - \_\_\_\_\_

Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

## 5. OVERCURRENT TRIP UNIT MEASUREMENT

**Test Instruments :** Full Function Test Kit , **Serial Number :** -

- Setting of overcurrent trip unit

- Long time	: tr = <u>1</u>	- Time setting	: tr = <u>8</u> s.	
- Short time	: tsd = <u>3</u>	- Time setting	: tsd = <u>-</u> s.	$i^2t$ = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous	: li = <u>-</u>			
- Earth fault	: lg = <u>-</u>	- Time setting	: tg = <u>-</u> s.	$i^2t$ = <input type="checkbox"/> On <input type="checkbox"/> Off

- Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current		Should be		As found		Result		Indicator of tripping cause	
Long time	1867	A	Auto	s.	51.597	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Short time	3000	A	Auto	s.	0.054	s.	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show	<input type="checkbox"/> Not show
Instantaneous	-	A	-	s.	-	s.	<input type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input type="checkbox"/> Show	<input type="checkbox"/> Not show
Earth fault	-	A	-	s.	-	s.	<input type="checkbox"/> Pass	<input type="checkbox"/> Not pass	<input type="checkbox"/> Show	<input type="checkbox"/> Not show

Remark : \_\_\_\_\_

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



## Mold Case Circuit Breaker

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower C			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.3/1			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Cap bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	10PDB1/T3	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	25PDB1/T3	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	40PDB1/T3	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	LPP1/T3	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	SPARE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	Busduct Low	NW25H1	Square D	2500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9					<input type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>							
Company							
Name							
Signature							
Date							

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower C			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.3/2			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Cap bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	AC MCC-F/D-T3-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	AC MCC-F/B-T3-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	FOR FUTURE AIR	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	Busduct High	NW20H1	Square D	2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	SN MCC26-T3-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	AC MCC-F/F-T3-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	MAIN IN (To ATS)	NW08H1	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>							
Company							
Name							
Signature							
Date							

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower C			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : ATS-EMDB 3			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	40PEDB1/T1	NBD630H	Square D	500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	LPEP1/T3	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	10PEDB1/T3	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	25PEDB1/T3	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	SN MCC-B-T3-01	NBD250L	Square D	63	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	EAC MCC-F/D-T3-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	EAC MCC-F/D-T3-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	EAC MCC-F/D-T3-03	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9	EAC MCC-F/B-T3-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10	EAC MCC-F/48-T3-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
11	EAC MCC-F/48-T3-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12	EAC MCC-F/R-T3-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
13	SLDB1/T3	NBD250L	Square D	160	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
14	SN MCC-B-T3-02	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
15	SN MCC-G-05	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>							
Company							
Name							
Signature							
Date							

FIELD INSPECTION AND TEST RECORD					
CAPACITOR BANK					
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower C		
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.3/1		
ERECTION SITE : *			FEEDER : CAP BANK 3/1		
TECHNICAL DATA					
<input checked="" type="checkbox"/> FUSE <input type="checkbox"/> MCCB			<input checked="" type="checkbox"/> CAPACITOR		
Manufacture		MRO	Manufacture		MKS
Type		NH00C	Type		HPC-24.2 440-3P
Rated current ( In )		100 A.	Rated voltage ( Un )		400 V.
<input checked="" type="checkbox"/> MEGNETIC CONTACTOR			Rated frequency ( fn ) <div style="float: right;">50 Hz.</div>		
Manufacture		Federal	Rated output ( Qn )		40 (20+20) kVar.
Type		FC-95DK21	Rated capacitance ( Cn )		397.89 µF.
Rated operation voltage ( Ue )		400 V.	Insulation level ( Ui )		- kV.
1. VISUAL INSPECTION AND FUNCTION TEST					
<ul style="list-style-type: none"> <li>Inspect physical and mechanical condition</li> <li>Inspect alignment, grounding and clearances</li> <li>Clean the unit</li> <li>Verify tightness of accessible bolted electrical connection</li> <li>Power Factor Controller ( PFC )</li> </ul>			Check <div style="display: flex; flex-direction: column; align-items: center;"> <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div>		Remark <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; height: 15px;"></div>
Manufacture		Mikro	Type		PFR 120
Operating voltage		400 V.	Current input		5 A.
Serial no.		139109	Number of output		12
Setting : Starting current setting ( C/K )		0.1	CT ratio		3000/5
Power factor setting		0.95	Switching time between steps		45/30 s.
			Switching sequences		Aut
Voltage measurement : A - N =		235 V.	B - N =		236 V.
A - B =		404 V.	B - C =		405 V.
			C - N =		235 V.
			C - A =		406 V.
2. INSULATION RESISTANCE MEASUREMENT					
Test Instruments : Fluke Model 1587FC			Serial Number : 45580041		
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )			
		A - Gnd	B - Gnd	C - Gnd	
1	500	158.6	343	276	
2	500	321	253	359	
3	500	287	406	410	
4	500	501	674	546	
5	500	125.8	191.7	172.1	
6	500	243	193.4	143	
7	500	122.7	151.3	133.7	
8	500	163.9	165.3	103.9	
9	500	78.3	133.5	117.6	
10	500	167.1	239	679	
11	500	38.6	51.6	65.3	
12	500	67.2	66	72.5	
Responsibility					Witnessed by
Company					Millennium Residence Condominium
Name					
Signature					
Date					



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK			
PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	CUBICLE NAME	: MDB No.3/1
ERECTION SITE	: -	FEEDER	: CAP BANK 3/1

### 3. CURRENT AND CAPACITANCE MEASUREMENT

Test Instruments : Fluke Model 179 , Serial Number : 23770566

Step No.	Rate Power (kVar)	Rate Fuse (A)	Measurement Capacitance ( μF )			Result
			Phase A-B	Phase B-C	Phase C-A	
1.	40	100	397	396	398	Passed
2.	40	100	398	397	397	Passed
3.	40	100	397	397	397	Passed
4.	40	100	398	398	398	Passed
5.	40	100	398	398	397	Passed
6.	40	100	397	397	397	Passed
7.	40	100	397	396	397	Passed
8.	40	100	398	397	396	Passed
9.	40	100	399	397	398	Passed
10.	40	100	397	398	398	Passed
11.	40	100	397	398	397	Passed
12.	40	100	398	398	397	Passed

Note: ☒ = Pass , ☐ = Not Pass , N/A = Not applicable

$$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{f_A}{f_R} = 40.00 \text{ kVar} , \text{ Normal current} = \frac{40.00 \text{ kVar}}{(V_{dc}) \times 1.732} = 57.74 \text{ A. / Set}$$

$$C_{LL} = \frac{3C_n}{2} = \frac{397.89 \mu F}{2} \text{ / Set for } \Delta \text{ Conn.} , \text{ No. of parallel capacitors} = 1$$

$$= 397.89 \mu F. @ 1 \text{ Set}$$

The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.

### 4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT

Position	Voltage measurement ( V )	Current measurement ( A )
Fan no. 1	-	-
Fan no. 2	-	-
Fan no. 3	-	-
Fan no. 4	-	-

Remark : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK			
PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower C
CUSTOMER	: Millennium Residence Condominium	CUBICLE NAME	: MDB No.3/2
ERECTION SITE	: -	FEEDER	: CAP BANK 3/2

### TECHNICAL DATA

<input checked="" type="checkbox"/> FUSE	<input type="checkbox"/> MCCB	<input checked="" type="checkbox"/> CAPACITOR
Manufacture	MRO	Manufacture
Type	NH00C	Type
Rated current ( In )	100 A.	Rated voltage ( Un )
<input checked="" type="checkbox"/> MEGNETIC CONTACTOR		Rated frequency ( fn )
Manufacture	Federal	Rated output ( Qn )
Type	FC-95DK21	Rated capacitance ( Cn )
Rated operation voltage ( Ue )	400 V.	Insulation level ( Ui )

### 1. VISUAL INSPECTION AND FUNCTION TEST

<ul style="list-style-type: none"> <li>- Inspect physical and machanical condition</li> <li>- Inspect alignment, grounding and clearances</li> <li>- Clean the unit</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Power Factor Controller ( PFC )</li> </ul>	Check <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	Remark _____ _____ _____ _____
--	---	--

Manufacture	Mikro	Type	PFR 120	Number of output	12
Operating voltage	400 V.	Current input	5 A.	CT ratio	3000/5
Serial no.	139107				
Setting : Starting current setting ( C/K )	0.1	Switching time between steps	45/30 s.		
Power factor setting	0.95	Switching sequences	3000/5		
Voltage measurement : A - N	= 234 V.	B - N	= 234 V.	C - N	= 235 V.
A - B	= 406 V.	B - C	= 405 V.	C - A	= 405 V.

### 2. INSULATION RESISTANCE MEASUREMENT

Test Instruments : Fluke Model 1587FC , Serial Number : 45580041

Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )		
		A - Gnd	B - Gnd	C - Gnd
1	500	145.6	178.6	220
2	500	678	503	232
3	500	357	220	179.4
4	500	105.6	177.8	207
5	500	347	212	613
6	500	717	434	231
7	500	358	169.3	285
8	500	217	137.8	67.9
9	500	62.5	66.9	63.5
10	500	63.5	67.2	76.2
11	500	123.2	103.4	128.9
12	500	107.7	107.6	139.8

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower C			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.3/2			
ERECTION SITE : -			FEEDER : CAP BANK 3/2			
<b>3. CURRENT AND CAPACITANCE MEASUREMENT</b>						
Test Instruments : Fluke Model 179 , Serial Number : 23770566						
Step No.	Rate Power	Rate Fuse	Measurement Capacitance ( μF )			Result
	(kVar)	(A)	Phase A-B	Phase B-C	Phase C-A	
1.	40	100	396	396	397	Passed
2.	40	100	395	397	395	Passed
3.	40	100	396	396	395	Passed
4.	40	100	401	398	398	Passed
5.	40	100	397	397	398	Passed
6.	40	100	397	397	397	Passed
7.	40	100	395	397	397	Passed
8.	40	100	398	397	398	Passed
9.	40	100	397	396	397	Passed
10.	40	100	398	398	397	Passed
11.	40	100	397	396	396	Passed
12.	40	100	398	398	398	Passed
<b>Note:</b> <input checked="" type="checkbox"/> = Pass , <input type="checkbox"/> = Not Pass , <b>N/A</b> = Not applicable						
$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{I_A}{I_R} = 40.00 \text{ kVar} , \text{ Normal current } = \frac{40.00 \text{ kVar}}{(Vdc) \times 1.732} = 57.74 \text{ A. / Set}$ $C_{LL} = \frac{3C_R}{2} = \frac{397.89 \mu F}{2} = 198.945 \mu F \text{ / Set for } \Delta \text{ Conn. , No. of parallel capacitors } = 1$						
The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.						
<b>4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT</b>						
Position	Voltage measurement ( V )	Current measurement ( A )				
Fan no. 1	-	-				
Fan no. 2	-	-				
Fan no. 3	-	-				
Fan no. 4	-	-				
Remark : _____ _____ _____						
<b>Responsibility</b>						
Company						
Name						
Signature						
Date						

**Grounding**



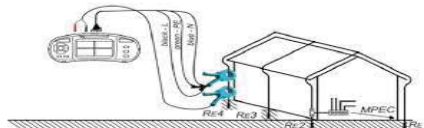
FIELD INSPECTION AND TEST RECORD			
GROUND SYSTEM			
PROJECT NAME	: Preventive Maintenance 2022	Location	: Tower C
CUSTOMER	: Millennium Residence Condominium	PANEL	: Electrical Room
SAP NO	: -	FEEDER NAME	: -

**Checking Test**

1. Cover seal visual check
2. Cleaning box or joint
3. Visual check cable
4. Retorque connection

<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input type="checkbox"/>	_____

**Testing method**



**GROUNDING TEST**

Test Instruments : Metrel Model MI3123 , Serial Number : 16410143

NO	POINT / ROOM	AS FOUND TEST ( Ω )	Passed	Failed
1.	RMU	1.70	✓	
2.	Transformer No.3/1	0.04	✓	
3.	Transformer No.3/2	0.03	✓	
4.	MDB No.3/1	0.03	✓	
5.	MDB No.3/2	0.04	✓	
6.	ATS-EMDB 3	0.03	✓	
7.	Lightning Aresster	1.28	✓	
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

**Remark :**

*NFPA & IEEE* : Recommends a ground resistance value of 5.0Ω or less.

*NEC* : Make sure the system to ground is 25.0Ω or less. Infacilities with sensitive equipment, it should be 5.0Ω or less. (source-NEC 250.56) as their value for grounding or bonding.

*Telecommunications Industry* : Often uses 5.0Ω or less as their value for grounding or bonding.

Responsibility			
Company			
Name			
Signature			
Date			

**Photograph**

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower C

PHOTO 1



ขณะทำการ Check Voltage

PHOTO 2



ขณะทำการ Cleaning

PHOTO 3



ขณะทำการ Cleaning

PHOTO 4



ขณะทำการทดสอบ Insulation Resistance

PHOTO 5



ขณะทำการมาร์คโน้ด

PHOTO 6



ขณะทำการวัดค่าความต้านทานดิน

Responsibility	
Company	
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower C

PHOTO 7



ขณะทำการ Check Voltage

PHOTO 8



ขณะทำการ Cleaning

PHOTO 9



ขณะทำการ Cleaning

PHOTO 10



ขณะทำการทดสอบ Contact Resistance

PHOTO 11



ขณะทำการ Check Torque

PHOTO 12



ขณะทำการทดสอบ Function Trip Unit

Responsibility	
Company	
Name	
Signature	
Date	



ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower C

PHOTO 13



ขณะทำการ Cleaning

PHOTO 14



ขณะทำการ Cleaning

PHOTO 15



ขณะทำการ Cleaning

PHOTO 16



ขณะทำการ Cleaning

PHOTO 17



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 18



ขณะทำการ Cleaning

Responsibility	
Company	
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower C

PHOTO 19



ขณะทำการ Cleaning

PHOTO 20



ขณะทำการ Cleaning

PHOTO 21



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 22



ขณะทำการ Cleaning

PHOTO 23



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 24



ขณะทำการ Check Torque

Responsibility	
Company	
Name	
Signature	
Date	



## Tools List

Tools List to Test Electrical Equipment	
	
Micro Ohmmeter/Chauvin Amoux/C.A 6240 Contact Resistance (Air Circuit Breaker)	Multimeter/Fluke/1587FC Insulation Resistance (Capacitor)
	
Insulation Tester/Megger/MIT515 Insulation Resistance (TR,MDB)	Multimeter/Fluke/179 Capacitance Measurement (Capacitor)
	
Ground Tester/Metrel/MI3121H Insulation Resistance (MDB)	Ground Tester/Megger/DET4TCR2 Windin & Turn Ratio Measurement (TR)
<b>Responsibility</b>	
Company	
Name	
Signature	
Date	

Tools List to Test Electrical Equipment



Ground Tester/Metrel/MI3123  
Grounding Resistance (RMU,TR,MDB)



Ground Tester/Megger/DET4TCR2  
Grounding Resistance (RMU,TR,MDB)



Relay Tester/Megger/Sverker 750  
Relay Testing System (RMU)

Responsibility	
Company	
Name	
Signature	
Date	



Project : Preventive Maintenance 2022 Tower D  
 Inspection Date : January 28, 2022  
 Inspection Product : RMU,Transformer and Low Voltage Switchboards

Inspected By  
 Approved By

งานบำรุงรักษาระบบไฟฟ้าแรงสูง-แรงต่ำภายในอาคาร  
ประจำปี 2565

นำเสนอ:  
Millennium Residence Condominium

Preventive Maintenance Report  
28 January 2022

Report prepared by :

Project Leader by :

Sales :

Date  
January 28, 2022

CONTENT

	PAGE
1. Introduction of Low Voltage Switchboards	1
2. Scope of Work	9
3. Summary Test Report	10
4. Defect Equipment	11
5. Ring Main Unit	17
6. Transformer	18
7. Main Distribution Board	22
8. Air Circuit Breaker	25
9. Mold Case Circuit Breaker	45
10. Capacitor Bank	48
11. Grounding	52
12. Photograph	53
13. Tools list	57

## Introduction of Low Voltage Switchboards

### Low Voltage Switchboards

#### 1. บทนำ

1.1 สวิตช์บอร์ดไฟฟ้าต้องมีการตรวจสอบและทดสอบทั้งเมื่อทำการติดตั้งแล้วเสร็จและตามระยะเวลาที่เหมาะสม จุดประสงค์ของการตรวจสอบดูแลบำรุงรักษาเพื่อให้ระบบไฟฟ้าใช้งานได้ดีตามความต้องการ มีความเชื่อถือได้สูง และอยู่ในสภาพที่พร้อมใช้งานได้อย่างสมบูรณ์ การดำเนินการควรเป็นหน้าที่ความรับผิดชอบของเจ้าของอาคาร ผู้ดูแลระบบไฟฟ้า และผู้ทำการติดตั้ง การดำเนินการจะต้องกระทำโดยผู้ที่มีความรู้ ความชำนาญ เพราะอุปกรณ์บางตัวมีความซับซ้อน อุปกรณ์บางตัวอาจจะชำรุดได้ภายหลังจากการทดสอบ ผู้ทำการทดสอบจึงต้องมีความรู้ ความเข้าใจเพียงพอ และมีวิธีการที่เหมาะสม

1.2 การที่จะให้อุปกรณ์ไฟฟ้าที่ติดตั้งอยู่ในตู้สวิตช์บอร์ดไฟฟ้าสามารถทำงานได้เป็นอย่างดี มีความน่าเชื่อถือได้สูง มีอายุในการใช้งานที่ยาวนาน จะต้องมี การตรวจสอบและบำรุงรักษาเป็นประจำ หรืออาจจะเรียกว่าเป็นการบำรุงรักษาในเชิงป้องกัน โดยเฉพาะในงานที่ต้องการความต่อเนื่องให้มากที่สุด การตรวจสอบและบำรุงรักษาเป็นเรื่องที่แยกกันไม่ออก และเป็นเรื่องที่จะต้องทำไปพร้อม ๆ กัน ซึ่งเนื้อหารายละเอียดในบทความนี้จะเป็นการกล่าวถึงการตรวจสอบและบำรุงรักษาที่ทำอย่างเป็นระบบ สามารถนำไปประยุกต์ใช้งานได้ภายในองค์กร หน่วยงาน อาคารสูง โรงงานอุตสาหกรรม เป็นต้น

#### 2. คำนิยาม

2.1 การดำเนินการตรวจสอบสภาพทั่วไป

- การตรวจสอบการทำความสะอาด
- การตรวจสอบความแน่นของโบลท์ และนัทที่บริเวณจุดต่อทางไฟฟ้า เช่น บัสบาร์, เทอร์มินอลจุดต่อต่าง ๆ ทางไฟฟ้าของอุปกรณ์ไฟฟ้า

2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

Inspected By

Prepared By

Approved By

## 2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

การตรวจสอบค่าความต้านทานของฉนวนของ Main Busbar โดยอ้างอิงตามมาตรฐาน IEC 61439-2 โดยการทดสอบทั้งสิ้น 6 วงจร เช่น Line to Line (L1 – L2, L2 – L3, L3 – L1) และ Line to Neutral Ground (L1 – G, L2 – G, L3 – G) ซึ่งผลลัพธ์ที่ได้สำหรับเกณฑ์ในการยอมรับสำหรับตู้สวิตช์บอร์ดไฟฟ้าแรงต่ำจะต้องมีค่าความต้านทานไม่น้อยกว่า 1000  $\Omega/V$  โดยอ้างอิงกับพิกัดแรงดันไฟฟ้าในการทดสอบค่าความต้านทานของฉนวน โดยการจ่ายพิกัดแรงดันไฟฟ้ากระแสตรงในการทดสอบที่ไม่น้อยกว่า 500 Vdc แล้วอ่านค่าจากเครื่องมือวัดเปรียบเทียบกับค่ามาตรฐาน

- ในระหว่างการทดสอบค่าความต้านทานควรวัดค่าอุณหภูมิและความชื้นของสภาพแวดล้อมข้างเคียงในระหว่างการทดสอบ เพื่อใช้สำหรับอ้างอิงค่าความต้านทานที่วัดได้
- ก่อนการทดสอบจะต้องปลดวงจรควบคุม, วงจรอิเล็กทรอนิกส์, อุปกรณ์ป้องกันแลร์จ ออกจากระบบไฟฟ้า
- ในระหว่างการทดสอบไม่ควรไปสัมผัสบริเวณตัวนำไฟฟ้าเพราะอาจจะเกิดอันตรายได้

## 2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

การตรวจสอบค่าความต้านทานหน้าสัมผัสของ Main Circuit Breaker ซึ่งอ้างอิงค่าความต้านทานหน้าสัมผัสตามผลิตภัณฑ์ โดยพิกัดกระแสไฟฟ้าในการทดสอบดังนี้ คือ

ข้อกำหนดในการทดสอบ

- กระแสไฟฟ้า 10Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดไม่เกิน 100A
- กระแสไฟฟ้า 100Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดเกิน 100A ขึ้นไป

การทดสอบค่าความต้านทานที่บริเวณหน้าสัมผัสของเมนคอนแทคในแต่ละเฟส จะเป็นสิ่งที่มีความสำคัญที่สามารถอธิบายได้ถึงประสิทธิภาพ คุณภาพของรอยต่อทางไฟฟ้าของเซอร์กิตเบรกเกอร์ในแต่ละเฟสค่าความต้านทานที่เปลี่ยนแปลงไปในแต่ละเฟสจะได้รับอิทธิพลและผลกระทบมาจากการเกิดกระแสไฟฟ้าลัดวงจรภายในตัวเซอร์กิตเบรกเกอร์ ซึ่งค่าความต้านทานที่วัดได้จะต้องไม่แตกต่างกันเกิน 50 % ในแต่ละเฟส

Inspected By	Prepared By	Approved By

## 2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

จะตรวจสอบโดยอ้างอิงตามมาตรฐาน IEC 60831-1 Standards Technical Data Capacitance Value Tolerance

- -5% , +15% for unit and banks up to 100 kVAR
- 0% , +10% for unit and banks above 100 kVAR

## 2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

การทดสอบค่าความต้านทานดินโดยทั้งนี้จะต้องอ้างอิงตามมาตรฐานดังต่อไปนี้

- NFPA & IEEE: Recommends a ground resistance value of 5.0  $\Omega$  or less.
- NEC: Make sure the system to ground is 25.0  $\Omega$  or less. In facilities with sensitive equipment, it should be 5.0  $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.
- Telecommunications Industry: Often uses 5.0  $\Omega$  or less as their value for grounding or bonding

Inspected By	Prepared By	Approved By

### 3. วิธีการตรวจสอบและดูแลบำรุงรักษาอุปกรณ์ไฟฟ้าแรงต่ำเมื่อผ่านการใช้งาน

- การตรวจสอบสวิตช์บอร์ดไฟฟ้าภายหลังจากการใช้งานผ่านไประยะหนึ่งจะเป็นการตรวจสอบเพื่อหาจุดบกพร่อง การเสื่อมสภาพ หรือการชำรุดเสียหายของอุปกรณ์ไฟฟ้า เพื่อหาแนวทางในการบำรุงรักษาบริเวณที่ไฟฟ้าต่อไปอย่างถูกวิธี ซึ่งการตรวจสอบภายหลังจากการใช้งานไปแล้วนั้นจะมีกรรมวิธีในการตรวจสอบดังต่อไปนี้คือ

- สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)
- เซอร์กิตเบรกเกอร์ (Circuit Breaker)
- คาปาซิเตอร์แบงก์ (Capacitor Bank)
- สวิตช์อัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

### 4. แสดงรายการตรวจสอบและดูแลบำรุงรักษาสวิตช์บอร์ดไฟฟ้าแรงต่ำ

บริเวณไฟฟ้า	รายการตรวจสอบและทดสอบทางไฟฟ้า
สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบอุปกรณ์เครื่องมือวัดและแสดงผล (Measurement Equipment) ตรวจสอบอุปกรณ์ป้องกัน (Protection Equipment) ตรวจสอบค่าความต้านทานฉนวน (Insulation Resistance) ตรวจสอบการทำงานของสวิตช์บอร์ดไฟฟ้า (Function Operation)
เซอร์กิตเบรกเกอร์ (Circuit Breaker)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบและทำความสะอาดหล่อลื่นอุปกรณ์แม่เหล็ก (Lubrication) ตรวจสอบและทำความสะอาดช่องตัดอาร์ค (ArcChute & Lug Breaker) ตรวจสอบค่าความต้านทานฉนวนของเซอร์กิตเบรกเกอร์ (Insulation Resistance) ตรวจสอบค่าความต้านทานหน้าสัมผัสของเซอร์กิตเบรกเกอร์ (Contact Resistance) ตรวจสอบการทำงานของอุปกรณ์ป้องกันของเซอร์กิตเบรกเกอร์ (Electronic Trip Unit)
คาปาซิเตอร์แบงก์ (Capacitor Bank)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบค่าความต้านทานฉนวนของคาปาซิเตอร์ (Insulation Resistance) ตรวจสอบค่าความประจุไฟฟ้าของคาปาซิเตอร์ (Microfarad Measurement) ตรวจสอบการทำงานของอุปกรณ์สวิตช์ซึ่งคาปาซิเตอร์ (Magnetic Contactor) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Power Factor Controller)
สวิตช์อัตโนมัติ (ATS)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

ลำดับ	รายการ	การตรวจสอบ
1	ขั้วต่อสาย จุดต่อสาย	จุดต่อสายทุกจุดต้องแน่น ตรวจสอบความร้อน
2	Cable Terminator	ร่องรอยการเกิดโอโซน ตรวจสอบรอยแตกกร้าวของสาย การต่อลงดินของสายชิลด์
3	สายไฟฟ้า	ตรวจสอบสภาพของสายไฟฟ้า และอุปกรณ์การเดินสายภายในตู้
4	บัสบาร์	ตรวจสอบอุปกรณ์รองรับบัสบาร์ การต่อสาย ตรวจสอบความร้อนที่บริเวณรอยต่อบัสบาร์
5	ลูกถ้วยรองรับบัสบาร์	ตรวจสอบความสกปรก ร่องรอยการชำรุด การเปลี่ยนสี รอยแตกหรือบิ่น พร้อมทั้งค่าความสะอาด
6	ความเป็นฉนวนไฟฟ้า	การต่อสาย การแตกกร้าวของ CT
7	การต่อลงดิน	สภาพจุดต่อลงดินที่ตู้สวิตช์เกียร์และหลักดิน วัดค่าความต้านทานดิน สภาพของสายดิน สายต่อฝาก และวัดค่าความต่อเนื่องของสายดิน
8	ซีดเดอร์	ตรวจสอบการทำงาน ระบบการควบคุมการทำงาน
9	บริษัทเครื่องวัดทางไฟฟ้า (Measurement Equipment)	ตรวจสอบสภาพทั่วไป การชำรุด แตกหักเสียหาย การอ่านค่าพารามิเตอร์ ทางไฟฟ้า
10	Indicator Lamp	ตรวจสอบสภาพการทำงานจะต้องอยู่ในสภาพที่ใช้งานได้เป็นปกติ
11	ชุด Draw out	ตรวจสอบการถอดออก (Draw out) และการถอดเข้า (Draw in) เซอร์กิตเบรกเกอร์ จะต้องคล่องตัว ตรวจสอบกลไกการทำงานและหน้าสัมผัสต่างๆ
12	บริษัทป้องกัน (Protection Relay)	ตรวจสอบฟังก์ชันการทำงานของอุปกรณ์ป้องกันจะต้องถูกต้องและครบถ้วนการ Setting Parameter
13	สวิตช์ควบคุมต่างๆ	ตรวจสอบสภาพการทำงาน
14	เซอร์กิตเบรกเกอร์	ตรวจสอบการทำงานของระบบ Interlock การทำงานตามขั้นตอนวิธีที่กำหนด
15	ทดสอบการทำงานทางกล	ตรวจสอบความคล่องตัวในการทำงาน การหล่อลื่น

**Approved By**

ลำดับ	รายการ	การตรวจสอบ
1	Arc Interrupters	ถอดทำความสะอาด ตรวจสอบความเสียหาย
2	หน้าสัมผัส (Main & arcing contact)	ตรวจสอบร่องรอยความเสียหายเนื่องจากการอาร์ก ความสกปรก ทำความสะอาด
3	Insulation (Bushing Porcelains & Other)	ตรวจสอบความเสียหายของฉนวน ตรวจสอบราบเขม่า รอยแตกหักเสียหาย และทำความสะอาด
4	Current Part & Terminals	ตรวจสอบความเสียหาย ความร้อน การยึดแน่น
5	สายไฟฟ้า	การต่อสาย การเข้าสาย ขั้วต่อสาย
6	กลไกการทำงาน	ตรวจสอบการติดขัด สารหล่อลื่น และการทำงานทางกลต่าง
7	อุปกรณ์เสริมอื่นๆ	ตรวจสอบ Aux. device, Shock Absorbers, Bumpers, Position Indicator Latch Checking Switch, Key Lock-out, etc.

ลำดับ	รายการ	การตรวจสอบ
1	Function การทำงาน	ตรวจสอบการทำงานทางไฟฟ้า เช่น Close, Open
2	Closing Coil, Shunt Release	ตรวจสอบการต่อสาย การทำงาน
3	หน้าสัมผัส	วัดค่าความต้านทานหน้าสัมผัส
4	ความต้านทานฉนวน	Insulation Test
5	Trip Unit	ตรวจสอบการทำงานและความเสียหาย
6	Setting	ตรวจสอบการปรับตั้งค่าพารามิเตอร์ต่างๆ
7	Protection Relay	ตรวจสอบการทำงานของ Protection Relay
8	การทำงาน	ตรวจสอบการทำงานของ Trip Free, Closing

Approved By

8.การตรวจสอบตู้คาปาซิเตอร์แบงค์								
ลำดับ	รายการ	การตรวจสอบ						
1	HRC Fuse	จะต้องอยู่ในสภาพที่สมบูรณ์ทั้ง 3 เฟส (Fuse ไม่ขาด)						
2	MCCB	จะต้องอยู่ในสภาพที่ใช้งานได้ (ON - OFF - Trip)						
3	Power Cable	จะต้องไม่ชำรุด, ขาด หรือไหม้ ตลอดความยาวสายไฟฟ้า						
4	Magnetic Contactor	ตรวจสอบการทำงานทางไฟฟ้า และขดลวดความต้านทานต้องอยู่ในสภาพที่สมบูรณ์ไม่ขาดหรือหลุดออกจากตัว Magnetic Contactor						
5	Detuned Filter Reactor	จะต้องอยู่ในสภาพที่สมบูรณ์ไม่มีรอยไหม้ หรือชำรุดเสียหาย						
6	Capacitor Unit	ตัวถังจะต้องไม่บวม ทะลุ หรือมีรอยไหม้ ขั้วต่อสายต้องแน่น และจะต้องลงดินผ่านสายต่อฝากทุก Step						
7	Damping Resister	จะต้องติดตั้งที่ขั้วของคาปาซิเตอร์ครบทั้ง 3 ชุด						
8	Thermostat / Fan	ตรวจสอบสภาพการทำงานของพัดลมระบายอากาศ โดยการจำลองสภาวะอุณหภูมิสูงเกิน พร้อมทั้งปรับตั้งค่าอุณหภูมิให้เหมาะสม						
9	Power Factor Controller (PFC)	ตรวจสอบการปรับตั้งค่าทางไฟฟ้าทุกค่าพารามิเตอร์						
10	Terminal Retightening Torque	ตรวจสอบความแน่นของจุดต่อต่างๆทางไฟฟ้า จะต้องแน่นตามค่าที่กำหนดของ Nut และ Bolt ในแต่ละขนาด						
11	การวัดค่าความเป็นฉนวน Insulation Resistance Measurement	ตรวจวัดค่าความเป็นฉนวนของคาปาซิเตอร์ในแต่ละเฟสเทียบกราวด์ที่ตัวถัง โดยพิกัดแรงดันไฟฟ้าที่ใช้ในการทดสอบต้องไม่น้อยกว่า 500 Vdc และค่าความต้านทานฉนวนจะต้องมีค่าที่ไม่น้อยกว่า 1 MΩ						
12	การตรวจวัดค่าประจุไฟฟ้า Microfarad Measurement	ตรวจวัดค่าอิมพีแดนซ์ของคาปาซิเตอร์ที่ขั้วระหว่างเฟส เช่น AB, BC และ CA ซึ่งค่าที่วัดได้จะต้องมีค่าอิมพีแดนซ์อยู่ในขอบเขตที่กำหนด 5% to +15% สำหรับคาปาซิเตอร์ขนาดไม่เกิน 100 kVAR 0% to +10% สำหรับคาปาซิเตอร์ขนาดเกิน 100 kVAR						
13	การตรวจวัดค่ากระแสไฟฟ้า Current Measurement	ตรวจวัดค่ากระแสไฟฟ้าใช้งานของคาปาซิเตอร์ทั้ง 3 เฟส ซึ่งกระแสไฟฟ้าในแต่ละเฟสจะต้องมีค่าที่เท่ากันหรือใกล้เคียงกัน						
<table border="1"> <tr> <th>Inspected By</th><th>Prepared By</th><th>Approved By</th></tr> <tr> <td colspan="3" style="height: 50px;"></td></tr> </table>			Inspected By	Prepared By	Approved By			
Inspected By	Prepared By	Approved By						

## Scope of Work



## Scope of Work

### 1. Ring Main Unit

1. Inspect physical and mechanical condition.
2. Regressing the operating mechanism.
3. MV Fuse and Fuse base Check.
4. Inspect anchorage, alignment, and grounding.
5. Trip test for protection relay and record the existing setting.
6. Verify pressure gauge.
7. Cleaning overall.

### 2. Transformer (Dry type)

1. General inspection and cleaning.
2. Bushing condition check.
3. Grounding connection check.
4. Retighten with torque wrench (busing connection)
5. Insulation resistance.
6. Measure the resistance of each winding at the designated tap position.
7. Perform turns-ratio tests at the designated tap position.
8. Verify that cooling fans operate correctly.

### 3. LV Switchboards

1. Cleaning all panel.
2. Retorque the busbar at main incoming and between panel.
3. Insulation test.
4. Metering check.
5. General condition check.
6. Grounding connection check.
7. Busbar check.
8. Fuse and fuse bases check.

### 4. Air Circuit Breaker

1. Cleaning the air circuit breaker and relubricating the operating mechanism.
2. Cleaning and check Arc-chuter.
3. Insulation check.
4. Rack-in / rack-out circuit breaker.
5. Trip unit function test. (Protection unit).
6. Parameter checking and recording of protective relay.
7. Contact resistance test.

### 5. Capacitor Bank

1. Inspect for physical damage, broken insulation.
2. Tightness of connection wiring.
3. Cleaning.
4. Operating function.
5. Capacitive or current measurement.
6. Insulation resistance.
7. Check ventilation fan.

### 6. Lamp

1. Verify the terminal whether they are not loose.
2. Verify the control wires whether they are not discoloration due to overheating.

## Summary Test Report

**Preventive Maintenance 2022 Tower D**  
**Summary Test Report For Preventive Maintenance**

No.	Panel	Description	Q'ty	Test Result	Suggestion
1	RMU	1.1 RMU	1 set	Ring Main Unit is in good condition.	
		2.1 TR No.4/1	1 set	- Lamp power (มีไฟ) ว่าง	
		2.2 TR No.4/2	1 set	- Alarm Buzzer ว่าง (ไม่ส่งเสียงแจ้งเตือน) - Temp Control ว่าง	
2	Transformer			- ว่าง Lamp Power, Fan, Alarm, Trip ว่าง	
3	Main Distribution Board	3.1 MDB No.4/1	1 set	Energy Meter Busduct Low ไม่เกิน Fuse Control 3 ea	
		3.2 MDB No.4/2	1 set	- มานพ่วงตู้ว่าง Control Main ว่าง	
				- มานพ่วงตู้ว่าง Control Meter Energy ว่าง	
				- Voltmeter Analog ว่าง	
		3.3 ATS-EMDB 4	1 set	มานพ่วงตู้ว่าง Control Main ว่าง	
4	Air Circuit Breaker	4.1 Air Circuit Breaker	6 set	Air Circuit Breaker is in good condition.	
5	Mold Case Circuit Breaker	5.1 Mold Case Circuit Breaker	33 set	Mold Case Circuit Breaker is in good condition.	
6	Capacitor Bank	6.1 Cap bank 4/1	1 set	Capacitor Step ที่ 3 เสื่อมสภาพ	
				- พัดลมระบายอากาศเสื่อมสภาพ 2 ตัว	
		6.2 Cap bank 4/2	1 set	Capacitor Step ที่ 1,3,7 เสื่อมสภาพ	
				- พัดลมระบายอากาศเสื่อมสภาพ 2 ตัว	
7	Grounding	7.1 RMU	1 set	Grounding is in good condition.	
		7.2 TR No.4/1	1 set	Grounding is in good condition.	
		7.3 TR No.4/2	1 set	Grounding is in good condition.	
		7.4 MDB No.4/1	1 set	Grounding is in good condition.	
		7.5 MDB No.4/2	1 set	Grounding is in good condition.	
		7.6 ATS-EMDB 4	1 set	Grounding is in good condition.	
		7.7 Lightning Arrester	1 set	Grounding is in good condition.	


Defect of Equipment

## Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
1		TR No.4/1 - Lamp power (สัญญาณ) ชั่วๆ	ตรวจสอบการทำงานของ Lamp ไขว้	
2		TR No.4/1 - Alarm Buzzer ชั่วๆ (ไม่ส่งเสียงแจ้งเตือน)	ตรวจสอบการทำงานของ Alarm Buzzer ไขว้	
3		TR No.4/2 - Temp Control ชั่วๆ	ตรวจสอบการทำงานของ Temp Control ไขว้	ORION ITALIA TR-42




11

## Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
4		TR No.4/2 - ไขว้ Lamp Power, Fan, Alarm, Trip ชั่วๆ	ตรวจสอบการทำงานของ Lamp ไขว้	
5		MDB No.4/1 - Energy Meter Busduct Low Voltage Fuse Control (3 ไขว้)	ตรวจสอบการตัดต่อ Fuse Control	
6		MDB No.4/2 - ควบคุมการทำงาน Control Main ชั่วๆ	ตรวจสอบการทำงานของระบบควบคุม	



12

### Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
7		<b>MDB No.4/2</b> - บานพลังงาน Control Meter Energy 4/2 ฟ้า	ควรทำการวางเก็บงานพันหุ้ม	
8		<b>MDB No.4/2</b> - Voltmeter Analog ฟ้า	ควรทำการวางแบบเปลี่ยน Voltmeter Analog ใหม่	
9		<b>ATS-EMDB 4</b> - บานพลังงาน Control Main ฟ้า	ควรทำการวางเก็บงานพันหุ้ม	

13

### Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
10		<b>Cap bank 4/1</b> - Capacitor Step ที่ 3 เสียเสถียร	ควรทำการวางแบบเปลี่ยน Capacitor ใหม่	Schneider Varplus Can 20Kvar/400V จำนวน 2 ea
11		<b>Cap bank 4/1</b> - ฟอสเตอร์บนภาคเปลี่ยนเสถียร 2 ตัว	ควรทำการวางแบบเปลี่ยน ฟอสเตอร์ภาคใหม่	
12		<b>Cap bank 4/2</b> - Capacitor Step ที่ 1,3,7 เสียเสถียร	ควรทำการวางแบบเปลี่ยน Capacitor ใหม่	Schneider Varplus Can 20Kvar/400V จำนวน 6 ea

14

## Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
13		Cap bank 4/2 - พัดลมระบายอากาศเดินสาย 2 ตัว	ตรวจหาการวางแผนเปลี่ยน พัดลมระบายอากาศ ใหม่	
14		Plug in ชั้น 13 - ตัวปิด Breaker ขาด	ตรวจหาการวางแผนเปลี่ยน Breaker ใหม่	
15		Plug in ชั้น 19 - ตัวปิด Breaker ขาด	ตรวจหาการวางแผนเปลี่ยน Breaker ใหม่	

## Preventive Maintenance 2022 Tower D Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
16		Plug in ชั้น 26 - ตัวปิด Breaker ขาด	ตรวจหาการวางแผนเปลี่ยน Breaker ใหม่	
17		Plug in ชั้น 35 - ตัวปิด Breaker ขาด	ตรวจหาการวางแผนเปลี่ยน Breaker ใหม่	
18		Plug in ชั้น 42 - ตัวปิด Breaker ขาด	ตรวจหาการวางแผนเปลี่ยน Breaker ใหม่	



### RING MAIN UNIT INSPECTION TEST RECORD

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Tower D  
**CUSTOMER** : Millennium Residence Condominium **CUBICLE NAME** : Switchgear RMU

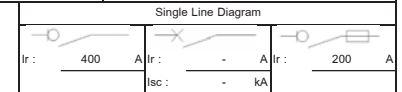
#### TECHNICAL DATA DISCRPTION

Manufacturer : NORMAFIX 24  
Type : Cela IS , CIS  
S/N : -  
Standard : CEI 60694/60298/62271

Rated Voltage (Ur) : 24 kV  
Operating Voltage (Un) : 24 kV  
Rated Power Frequency w/s (Ud) : 50 kV  
Lightning Impulse w/s (Up) : 125 kV

Rated Current (Ir) : 400/200 A  
Short Time Current (Ik) : 16 kA  
Duration of Short Circuit (tk) : 1 S  
Rated Frequency : 50 Hz

Bushing of Function Unit		1 st	2 nd	3 rd	4 th	5 th
Connection Type	Plug in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bolted	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



#### Visual Inspection and Function Test

	Pass	Decline	Remark
<input checked="" type="checkbox"/> <b>1 st Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232749-1
Feeder Name : Incoming	<input checked="" type="checkbox"/>	<input type="checkbox"/>	400 A
- Verification Voltage Presence Indicator System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Function Unit : 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
400 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Operation (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>2 nd Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CIS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232750-2
Feeder Name : OutgoingTR4/1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100 A
- Verification Voltage Presence Indicator System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Function Unit : 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Operation (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>3 rd Function</b>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CIS
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232751-3
Feeder Name : OutgoingTR4/2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100A
- Verification Voltage Presence Indicator System	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Function Unit : 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Operation (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input type="checkbox"/> <b>4 th Function</b>	<input type="checkbox"/>	<input type="checkbox"/>	
- Cleaning Termination and Ring Main Unit	<input type="checkbox"/>	<input type="checkbox"/>	
- Grease and Lubricant Mechanism Operation	<input type="checkbox"/>	<input type="checkbox"/>	
Feeder Name :	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Voltage Presence Indicator System	<input type="checkbox"/>	<input type="checkbox"/>	
Function Unit :	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification the SF6 Gas Indicator	<input type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input type="checkbox"/>	<input type="checkbox"/>	
A	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Operation (In / Out)	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Mechanical Interlocks (In / Out)	<input type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input type="checkbox"/>	<input type="checkbox"/>	
- Verification Ground Bus Connection	<input type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism

Responsibility	
Company	
Name	
Signature	
Date	

Ring Main Unit

## Transformer

<b>FIELD INSPECTION AND TEST RECORD</b> <b>TRANSFORMER (DRY TYPE)</b>																																							
<b>PROJECT NAME</b> : Preventive Maintenance 2022	<b>LOCATION</b> : Tower D																																						
<b>CUSTOMER</b> : Millennium Residence Condominium	<b>FEEDER</b> : Transformer No.4/1																																						
<b>TECHNICAL DATA</b>																																							
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%;"> <table border="0"> <tr><td>Manufacture</td><td>ABB</td></tr> <tr><td>Type</td><td>Cast Rasin</td></tr> <tr><td>Standard</td><td>IEC 60076-11</td></tr> <tr><td>Year of manufacture</td><td>2008/05</td></tr> <tr><td>Rated frequency</td><td>50 Hz</td></tr> <tr><td>Vector-group symbol</td><td>Dyn11</td></tr> <tr><td>Rated power</td><td>1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td>24000 V</td></tr> <tr><td>Rated voltage LV</td><td>415/240 V</td></tr> </table> </td> <td style="width: 50%;"> <table border="0"> <tr><td>Serial No.</td><td>1LKR080699TER</td></tr> <tr><td>Type of cooling</td><td>AN/AF</td></tr> <tr><td>Weight</td><td>3900 kg.</td></tr> <tr><td>Insulation Class</td><td>F</td></tr> <tr><td>Impedance</td><td>6.17/8.64 %</td></tr> <tr><td>Material</td><td>-</td></tr> <tr><td>Protection</td><td>-</td></tr> <tr><td>Rated current HV</td><td>38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td>2225.9/3116.3 A</td></tr> </table> </td> </tr> </table>	<table border="0"> <tr><td>Manufacture</td><td>ABB</td></tr> <tr><td>Type</td><td>Cast Rasin</td></tr> <tr><td>Standard</td><td>IEC 60076-11</td></tr> <tr><td>Year of manufacture</td><td>2008/05</td></tr> <tr><td>Rated frequency</td><td>50 Hz</td></tr> <tr><td>Vector-group symbol</td><td>Dyn11</td></tr> <tr><td>Rated power</td><td>1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td>24000 V</td></tr> <tr><td>Rated voltage LV</td><td>415/240 V</td></tr> </table>	Manufacture	ABB	Type	Cast Rasin	Standard	IEC 60076-11	Year of manufacture	2008/05	Rated frequency	50 Hz	Vector-group symbol	Dyn11	Rated power	1600/2240 kVA	Rated voltage HV	24000 V	Rated voltage LV	415/240 V	<table border="0"> <tr><td>Serial No.</td><td>1LKR080699TER</td></tr> <tr><td>Type of cooling</td><td>AN/AF</td></tr> <tr><td>Weight</td><td>3900 kg.</td></tr> <tr><td>Insulation Class</td><td>F</td></tr> <tr><td>Impedance</td><td>6.17/8.64 %</td></tr> <tr><td>Material</td><td>-</td></tr> <tr><td>Protection</td><td>-</td></tr> <tr><td>Rated current HV</td><td>38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td>2225.9/3116.3 A</td></tr> </table>	Serial No.	1LKR080699TER	Type of cooling	AN/AF	Weight	3900 kg.	Insulation Class	F	Impedance	6.17/8.64 %	Material	-	Protection	-	Rated current HV	38.5/53.9 A	Rated current LV	2225.9/3116.3 A	
<table border="0"> <tr><td>Manufacture</td><td>ABB</td></tr> <tr><td>Type</td><td>Cast Rasin</td></tr> <tr><td>Standard</td><td>IEC 60076-11</td></tr> <tr><td>Year of manufacture</td><td>2008/05</td></tr> <tr><td>Rated frequency</td><td>50 Hz</td></tr> <tr><td>Vector-group symbol</td><td>Dyn11</td></tr> <tr><td>Rated power</td><td>1600/2240 kVA</td></tr> <tr><td>Rated voltage HV</td><td>24000 V</td></tr> <tr><td>Rated voltage LV</td><td>415/240 V</td></tr> </table>	Manufacture	ABB	Type	Cast Rasin	Standard	IEC 60076-11	Year of manufacture	2008/05	Rated frequency	50 Hz	Vector-group symbol	Dyn11	Rated power	1600/2240 kVA	Rated voltage HV	24000 V	Rated voltage LV	415/240 V	<table border="0"> <tr><td>Serial No.</td><td>1LKR080699TER</td></tr> <tr><td>Type of cooling</td><td>AN/AF</td></tr> <tr><td>Weight</td><td>3900 kg.</td></tr> <tr><td>Insulation Class</td><td>F</td></tr> <tr><td>Impedance</td><td>6.17/8.64 %</td></tr> <tr><td>Material</td><td>-</td></tr> <tr><td>Protection</td><td>-</td></tr> <tr><td>Rated current HV</td><td>38.5/53.9 A</td></tr> <tr><td>Rated current LV</td><td>2225.9/3116.3 A</td></tr> </table>	Serial No.	1LKR080699TER	Type of cooling	AN/AF	Weight	3900 kg.	Insulation Class	F	Impedance	6.17/8.64 %	Material	-	Protection	-	Rated current HV	38.5/53.9 A	Rated current LV	2225.9/3116.3 A		
Manufacture	ABB																																						
Type	Cast Rasin																																						
Standard	IEC 60076-11																																						
Year of manufacture	2008/05																																						
Rated frequency	50 Hz																																						
Vector-group symbol	Dyn11																																						
Rated power	1600/2240 kVA																																						
Rated voltage HV	24000 V																																						
Rated voltage LV	415/240 V																																						
Serial No.	1LKR080699TER																																						
Type of cooling	AN/AF																																						
Weight	3900 kg.																																						
Insulation Class	F																																						
Impedance	6.17/8.64 %																																						
Material	-																																						
Protection	-																																						
Rated current HV	38.5/53.9 A																																						
Rated current LV	2225.9/3116.3 A																																						
<b>VISUAL INSPECTION AND FUNCTION TEST</b>																																							
<ol style="list-style-type: none"> <li>1. Inspection physical and mechanical condition</li> <li>2. Inspection alignment and grounding</li> <li>3. Inspection winding temperature indicator</li> <li>4. Clean the unit</li> <li>5. Verify the control alarm and trip setting on temperature indicators are as specified</li> <li>6. Verify that cooling fans operate</li> <li>7. Verify tightness of accessible bolted electrical connections</li> <li>8. Verify that as-left tap connections are as specified</li> <li>9. Verify tap changer position</li> <li>10. Verify the presence of surge arresters</li> </ol>	<table border="0" style="width: 100%;"> <tr> <th style="text-align: center;">Pass</th> <th style="text-align: center;">Not pass</th> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	Pass	Not pass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																		
Pass	Not pass																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<b>INSULATION RESISTANCE MEASUREMENT</b>																																							
<b>Test Instruments</b> : Megger Model MIT515 , Serial Number : N/A																																							
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th>Test connection</th> <th>Test voltage (Vdc)</th> <th>Insulation resistance (MΩ)</th> <th>Criteria (MΩ)</th> </tr> </thead> <tbody> <tr> <td>HV to GND</td> <td>2500</td> <td>32,400</td> <td>&gt; 1,000</td> </tr> <tr> <td>HV to LV</td> <td>2500</td> <td>32,300</td> <td>&gt; 1,000</td> </tr> <tr> <td>LV to GND</td> <td>1000</td> <td>546</td> <td>&gt; 100</td> </tr> </tbody> </table>	Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)	HV to GND	2500	32,400	> 1,000	HV to LV	2500	32,300	> 1,000	LV to GND	1000	546	> 100																							
Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)																																				
HV to GND	2500	32,400	> 1,000																																				
HV to LV	2500	32,300	> 1,000																																				
LV to GND	1000	546	> 100																																				
Humidity : 64 % , Ambient Temperature : 30.7 °c																																							
<b>Function Testing and Cooling fan Testing</b>																																							
<ol style="list-style-type: none"> <li>1. Function Testing Operating of Cooling FAN.</li> <li>2. Alarm Buzzer Testing</li> <li>3. Function Testing Trip TR. RMU</li> </ol>	<table border="0" style="width: 100%;"> <tr> <th style="text-align: center;">Pass</th> <th style="text-align: center;">Not pass</th> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> </table>	Pass	Not pass	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>																														
Pass	Not pass																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
<b>POWER CABLE : INSULATION RESISTANCE MEASUREMENT</b>																																							
<b>Test Instruments</b> : Megger Model MIT515 , Serial Number : N/A																																							
<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th rowspan="2">Test voltage (Vdc)</th> <th colspan="6">Insulation resistance (MΩ)</th> <th rowspan="2">Criteria (MΩ)</th> </tr> <tr style="background-color: #f2f2f2;"> <th>A-B</th> <th>B-C</th> <th>C-A</th> <th>A-N</th> <th>B-N</th> <th>C-N</th> </tr> </thead> <tbody> <tr> <td>5000</td> <td>140,100</td> <td>165,000</td> <td>150,100</td> <td>69,400</td> <td>36,900</td> <td>35,500</td> <td>&gt; 2,000</td> </tr> </tbody> </table>		Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)	A-B	B-C	C-A	A-N	B-N	C-N	5000	140,100	165,000	150,100	69,400	36,900	35,500	> 2,000																
Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)																																
	A-B	B-C	C-A	A-N	B-N	C-N																																	
5000	140,100	165,000	150,100	69,400	36,900	35,500	> 2,000																																
<b>Responsibility</b>																																							
Company																																							
Name																																							
Signature																																							
Date																																							

**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower D  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.4/1

**TURN RATIO AND POLARITY MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.949	0.21	0.47	0.00	✓	
	V		98.008	0.16	0.52	0.00	✓	
	W		97.931	0.23	0.38	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.725	3.724	3.740

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.0	2.1	2.1

**TEMPERATURE MONITORING**

Setting :  
Trip = 110 °C Alarm = 90 °C Fan (On) = 75 °C Fan (Off) = 60 °C

**Function Testing and Cooling fan Testing**

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. To RMU

Pass Not pass  
☒ ☐  
☒ ☐  
☒ ☐

Remark :  
 - Lamp power (ไฟส่องสว่าง) ☒  
 - Alarm Buzzer (สัญญาณเตือนภัย) ☒  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower D  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.4/2

**TECHNICAL DATA**

Manufacture	ABB	Serial No.	1LKR080694TER
Type	Cast Resin	Type of cooling	AN/AF
Standard	IEC 60076-11	Weight	3900 kg.
Year of manufacture	2008/05	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.13/8.59 %
Vector-group symbol	Dyn11	Material	-
Rated power	1600/2240 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	38.5/53.9 A
Rated voltage LV	415/240 V	Rated current LV	2225.9/3116.3 A

**VISUAL INSPECTION AND FUNCTION TEST**

- Inspection physical and mechanical condition
- Inspection alignment and grounding
- Inspection winding temperature indicator
- Clean the unit
- Verify the control alarm and trip setting on temperature indicators are as specified
- Verify that cooling fans operate
- Verify tightness of accessible bolted electrical connections
- Verify that as-left tap connections are as specified
- Verify tap changer position
- Verify the presence of surge arresters

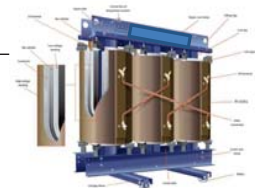
Pass Not pass  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐  
☒ ☐

**INSULATION RESISTANCE MEASUREMENT**

Test Instruments : Megger Model MIT515 , Serial Number : N/A

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	32,900	> 1,000
HV to LV	2500	39,800	> 1,000
LV to GND	1000	1,804	> 100

Humidity : 61 % , Ambient Temperature : 31.5 °C



**Function Testing and Cooling fan Testing**

- Function Testing Operating of Cooling FAN.
- Alarm Buzzer Testing
- Function Testing Trip TR. RMU

Pass Not pass Pass Not pass  
☒ ☐ ☒ ☐  
☒ ☐ ☒ ☐  
☒ ☐ ☒ ☐

**POWER CABLE : INSULATION RESISTANCE MEASUREMENT**

Test Instruments : Megger Model MIT515 , Serial Number : N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	350,000	525,000	176,600	508,000	523,000	490,000	> 2,000

Responsibility	
Company	
Name	
Signature	
Date	



**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Tower D  
CUSTOMER : Millennium Residence Condominium FEEDER : Transformer No.4/2

**TURN RATIO AND POLARITY MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	100.170	97.970	0.19	0.51	0.00	✓	
	V		97.898	0.28	0.40	0.00	✓	
	W		97.903	0.26	0.53	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	5	3.718	3.712	3.726

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.0	2.0	2.0

**TEMPERATURE MONITORING**

Setting :  
Trip = 110 °C Alarm = 90 °C Fan (On) = 75 °C Fan (Off) = 60 °C

**Function Testing and Cooling fan Testing**

- |   |                                     |                          |
|---|-------------------------------------|--------------------------|
|   | <b>Pass</b>                         | <b>Not pass</b>          |
| 1. Function Testing Operating of Cooling FAN. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Alarm Buzzer Testing                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Function Testing Trip TR. To RMU           | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Remark :  
- Temp Control (אָנ/אָף) Fuse Control (אָנ/אָף) Out put טאָט  
- Lamp Power, Fan, Alarm, Trip אָנ/אָף

Responsibility	
Company	
Name	
Signature	
Date	

**Main Distribution Board**

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower D																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.4/1																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	6,400	Passed > 1 MΩ	✓																																																				
B to C	500	5,930		✓																																																				
C to A	500	7,110		✓																																																				
A to GND	500	4,450		✓																																																				
B to GND	500	3,910		✓																																																				
C to GND	500	3,530		✓																																																				
Humidity : 64 %  Ambient Temperature : 30.7 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : Energy Meter Busduct Low 1 and Fuse Control 3 ea																																																								
Responsibility																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower D																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB No.4/2																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	1,480	Passed > 1 MΩ	✓																																																				
B to C	500	1,140		✓																																																				
C to A	500	953		✓																																																				
A to GND	500	619		✓																																																				
B to GND	500	917		✓																																																				
C to GND	500	402		✓																																																				
Humidity : 61 %  Ambient Temperature : 31.6 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : - ภาชนะไฟฟ้า Control Main 1 ชุด - ภาชนะไฟฟ้า Control Meter Energy 1 ชุด - Voltmeter Analog 1 ชุด																																																								
Responsibility																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								



FIELD INSPECTION AND TEST RECORD																																																								
LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Tower D																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : ATS-EMDB 4																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	14,610	Passed > 1 MΩ																																																					
B to C	500	12,570																																																						
C to A	500	14,980																																																						
A to GND	500	3,930																																																						
B to GND	500	537																																																						
C to GND	500	13,040																																																						
Humidity : 61 %  Ambient Temperature : 32.2 °C																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.																																																								
<b>Remark</b> : <span style="color: red;">หมายเหตุผู้ทดลอง Control Main ว่างๆ</span>																																																								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%; text-align: center;">Responsibility</th> <th style="width: 85%;"></th> </tr> </thead> <tbody> <tr><td style="text-align: center;">Company</td><td></td></tr> <tr><td style="text-align: center;">Name</td><td></td></tr> <tr><td style="text-align: center;">Signature</td><td></td></tr> <tr><td style="text-align: center;">Date</td><td></td></tr> </tbody> </table>					Responsibility		Company		Name		Signature		Date																																											
Responsibility																																																								
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

Air Circuit Breaker

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1	
SAP NO : -		FEEDER NAME : Incoming from transformer No.4/1	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404096827-1 (2/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	13	
B	10	14	
C	10	14	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1	
SAP NO : -		FEEDER NAME : Incoming from transformer No.4/1	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
<ul style="list-style-type: none"> <li>- Long time : Ir = 0.5</li> <li>- Short time : Isd = 4</li> <li>- Instantaneous : Ii = 6</li> <li>- Earth fault : Ig = A (500)</li> </ul>		<ul style="list-style-type: none"> <li>- Time setting : tr = 4 s.</li> <li>- Time setting : tsd = 0.1 s. , I<sup>2</sup>t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off</li> <li>- Time setting : tg = 0.1 s. , I<sup>2</sup>t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off</li> </ul>	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	4800 A	Auto s.	14.264 s.
Short time	12800 A	Auto s.	0.145 s.
Instantaneous	24000 A	Auto s.	0.036 s.
Earth fault	1000 A	Auto s.	0.138 s.
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass		
Indicator of tripping cause	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show		
Long time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show		
Short time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show		
Instantaneous	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show		
Earth fault	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show		
Remark :			
Responsibility			
Company			
Name			
Signature			
Date			
Witnessed by			
Millennium Residence Condominium			

1 of 22 of 2

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1 & MDB No.4/2	
SAP NO : -		FEEDER NAME : Bus TIE	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-2 (1/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1 & MDB No.4/2	
SAP NO : -		FEEDER NAME : Bus TIE	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	4267 A	Auto s.	15.979 s.
Short time	6000 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
			Result
			<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
			<input type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input type="checkbox"/> Show <input type="checkbox"/> Not show
			<input type="checkbox"/> Pass <input type="checkbox"/> Not pass
			<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____			
_____			
_____			
Responsibility			
Company			
Name			
Signature			
Date			



FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : Incoming from transformer No.4/2	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW32H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	3200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404096827-1 (1/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST		Checked Remark	
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	15	
B	10	12	
C	10	13	
Responsibility		Witnessed by	
Company		Millennium Residence Condominium	
Name			
Signature			
Date			



FIELD INSPECTION AND TEST RECORD													
AIR CIRCUIT BREAKER													
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D											
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2											
SAP NO : -		FEEDER NAME : Incoming from transformer No.4/2											
4. INSULATION RESISTANCE MEASUREMENT													
Test Instruments : - , Serial Number : -													
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )											
Interrupter phase A	500	-											
Interrupter phase B	500	-											
Interrupter phase C	500	-											
A-GND.	500	-	Humidity : - %										
B-GND.	500	-	Ambient Temperature : - °C										
C-GND.	500	-											
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground													
5. OVERCURRENT TRIP UNIT MEASUREMENT													
Test Instruments : Full Function Test Kit , Serial Number : -													
- Setting of overcurrent trip unit													
<ul style="list-style-type: none"> <li>- Long time : Ir = 0.5</li> <li>- Short time : Isd = 4</li> <li>- Instantaneous : Ii = 6</li> <li>- Earth fault : Ig = A (500)</li> </ul>		<ul style="list-style-type: none"> <li>- Time setting : tr = 4 s.</li> <li>- Time setting : tsd = 0.1 s. , I<sup>2</sup>t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off</li> <li>- Time setting : tg = 0.1 s. , I<sup>2</sup>t = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off</li> </ul>											
- Operating time measurement													
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test													
Function	Test current	Should be	As found										
Long time	4800 A	Auto s.	14.264 s.										
Short time	12800 A	Auto s.	0.145 s.										
Instantaneous	24000 A	Auto s.	0.036 s.										
Earth fault	1000 A	Auto s.	0.130 s.										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table>				Result	Indicator of tripping cause	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Result	Indicator of tripping cause												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
Remark : _____													
_____													
_____													
Responsibility		Witnessed by											
Company													
Name													
Signature													
Date													

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : Busduct High 2000A	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW20H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	2000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	220/440 V.	Serial no.	1404093683-3 (1/1)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	17	
B	10	18	
C	10	17	
Responsibility			
Company	D-Nine Engineering Co., Ltd.		Millennium Residence Condominium
Name	Mr.Akom Hansa		
Signature			
Date	28 January 2022		

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : Busduct High 2000A	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	2667 A	Auto s.	15.655 s.
Short time	3750 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
		Result	Indicator of tripping cause
		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
		<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
		<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____			
_____			
_____			
Responsibility			
Company	D-Nine Engineering Co., Ltd.		Millennium Residence Condominium
Name	Mr.Akom Hansa		
Signature			
Date	28 January 2022		



FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : To ATS	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	65 kArms.
Type	NW08H1	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	1000 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	12 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	220/440 V.	Serial no.	1404096827-4 (1/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input checked="" type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	14	
B	10	13	
C	10	15	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD													
AIR CIRCUIT BREAKER													
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D											
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2											
SAP NO : -		FEEDER NAME : To ATS											
4. INSULATION RESISTANCE MEASUREMENT													
Test Instruments : - , Serial Number : -													
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )											
Interrupter phase A	500	-											
Interrupter phase B	500	-											
Interrupter phase C	500	-											
A-GND.	500	-	Humidity : - %										
B-GND.	500	-	Ambient Temperature : - °C										
C-GND.	500	-											
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground													
5. OVERCURRENT TRIP UNIT MEASUREMENT													
Test Instruments : Full Function Test Kit , Serial Number : -													
- Setting of overcurrent trip unit													
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off											
- Operating time measurement													
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test													
Function	Test current	Should be	As found										
Long time	1067 A	Auto s.	14.739 s.										
Short time	1500 A	Auto s.	0.049 s.										
Instantaneous	- A	- s.	- s.										
Earth fault	- A	- s.	- s.										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table>				Result	Indicator of tripping cause	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Result	Indicator of tripping cause												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show												
<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show												
<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show												
Remark : _____													
Responsibility													
Company													
Name													
Signature													
Date													
Witnessed by													
Company	Millennium Residence Condominium												
Name													
Signature													
Date													

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 4/1	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS1000N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	1000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	380/415 V.	Serial no.	1404077079-2 (1/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/1	
SAP NO : -		FEEDER NAME : Capacitor Bank 4/1	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 0.8 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1067 A	Auto s.	17.046 s.
Short time	1500 A	Auto s.	0.054 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Result</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Indicator of tripping cause</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Pass</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not pass</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Show</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Not show</div> </div>			
Remark :			
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : Capacitor Bank 4/2	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS1000N	Rated service breaking ( Ics )	100% kArms.
Rated current ( In )	1000 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	800 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404095982-1 (4/6)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date	28 January 2022		

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : MDB No.4/2	
SAP NO : -		FEEDER NAME : Capacitor Bank 4/2	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 0.8 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , I <sub>t</sub> = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1067 A	Auto s.	15.221 s.
Short time	1500 A	Auto s.	0.054 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Result</div> </div>			
<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Indicator of tripping cause</div> </div>			
Long time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	
Short time	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	
Instantaneous	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	
Earth fault	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	
Remark :			
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB 4	
SAP NO : -		FEEDER NAME : Normal Line	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ule )	380/415 V.	Serial no.	1404097444-1 (4/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB 4	
SAP NO : -		FEEDER NAME : Normal Line	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	Humidity : - %
B-GND.	500	-	Ambient Temperature : - °C
C-GND.	500	-	
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , Ir <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1067 A	Auto s.	16.295 s.
Short time	1500 A	Auto s.	0.053 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass Indicator of tripping cause : <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show			
Remark :			
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB 4	
SAP NO : -		FEEDER NAME : Emergency Line	
TECHNICAL DATA			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404097444-1 (1/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
1. VISUAL INSPECTION AND FUNCTION TEST			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxiliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Checked</div> </div>	<div style="display: flex; align-items: center;"> <div style="width: 20px; height: 20px; border: 1px solid black; margin-right: 5px;"></div> <div>Remark</div> </div>
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
		<input checked="" type="checkbox"/>	
2. ACCESSORIES			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
3. MAIN CONTACT RESISTANCE MEASUREMENT			
Test Instruments : Chauvin Arnoux Model C.A 6240		Serial Number : 162470PBV	
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility			
Company			
Name			
Signature			
Date			

FIELD INSPECTION AND TEST RECORD			
MOLD CASE CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Tower D	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB 4	
SAP NO : -		FEEDER NAME : Emergency Line	
4. INSULATION RESISTANCE MEASUREMENT			
Test Instruments : - , Serial Number : -			
Test connection	Test voltage ( Vdc )	Insulation resistance ( M $\Omega$ )	
Interrupter phase A	500	-	
Interrupter phase B	500	-	
Interrupter phase C	500	-	
A-GND.	500	-	
B-GND.	500	-	
C-GND.	500	-	
			Humidity : - %
			Ambient Temperature : - °C
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground			
5. OVERCURRENT TRIP UNIT MEASUREMENT			
Test Instruments : Full Function Test Kit , Serial Number : -			
- Setting of overcurrent trip unit			
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : li = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s. , I <sup>2</sup> t = <input type="checkbox"/> On <input type="checkbox"/> Off	
- Operating time measurement			
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test			
Function	Test current	Should be	As found
Long time	1067 A	Auto s.	16.921 s.
Short time	1500 A	Auto s.	0.054 s.
Instantaneous	- A	- s.	- s.
Earth fault	- A	- s.	- s.
			<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass <input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show <input type="checkbox"/> Pass <input type="checkbox"/> Not pass <input type="checkbox"/> Show <input type="checkbox"/> Not show <input type="checkbox"/> Pass <input type="checkbox"/> Not pass <input type="checkbox"/> Show <input type="checkbox"/> Not show
<b>Remark :</b>			
Responsibility			
Company			
Name			
Signature			
Date			



## Mold Case Circuit Breaker

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower D			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.4/1			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Cap bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	10PDB1/T4	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	25PDB1/T4	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	40PDB1/T4	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	LPP1/T4	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	SPARE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8	Busduct Low	NW25H1	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9					<input type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>							
Company							
Name							
Signature							
Date							



FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER																	
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower D													
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB No.4/2													
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -													
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>																	
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result										
					Pass	Not Pass											
1	To ATS	NW08H1	Square D	800	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
2	SN MCC26-T4-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
3	AC MCC-F/F-T4-01	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
4	FOUNT AIN SOI 16	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
5	SPARE	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
6	Busduct High	NW20H1	Square D	2000	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
7	AC MCC-F/B-T4-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
8	AC MCC-F/D-T4-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
9	FOR FUTURE AIR	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
10	Cap bank	NS1000N	Square D	1000	<input checked="" type="checkbox"/>	<input type="checkbox"/>											
11					<input type="checkbox"/>	<input type="checkbox"/>											
12					<input type="checkbox"/>	<input type="checkbox"/>											
13					<input type="checkbox"/>	<input type="checkbox"/>											
14					<input type="checkbox"/>	<input type="checkbox"/>											
15					<input type="checkbox"/>	<input type="checkbox"/>											
16					<input type="checkbox"/>	<input type="checkbox"/>											
17					<input type="checkbox"/>	<input type="checkbox"/>											
18					<input type="checkbox"/>	<input type="checkbox"/>											
19					<input type="checkbox"/>	<input type="checkbox"/>											
20					<input type="checkbox"/>	<input type="checkbox"/>											
21					<input type="checkbox"/>	<input type="checkbox"/>											
22					<input type="checkbox"/>	<input type="checkbox"/>											
23					<input type="checkbox"/>	<input type="checkbox"/>											
24					<input type="checkbox"/>	<input type="checkbox"/>											
25					<input type="checkbox"/>	<input type="checkbox"/>											
26					<input type="checkbox"/>	<input type="checkbox"/>											
27					<input type="checkbox"/>	<input type="checkbox"/>											
28					<input type="checkbox"/>	<input type="checkbox"/>											
29					<input type="checkbox"/>	<input type="checkbox"/>											
30					<input type="checkbox"/>	<input type="checkbox"/>											
31					<input type="checkbox"/>	<input type="checkbox"/>											
32					<input type="checkbox"/>	<input type="checkbox"/>											
33					<input type="checkbox"/>	<input type="checkbox"/>											
34					<input type="checkbox"/>	<input type="checkbox"/>											
35					<input type="checkbox"/>	<input type="checkbox"/>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 85%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td>28 January 2022</td> </tr> </table>								Responsibility		Company		Name		Signature		Date	28 January 2022
Responsibility																	
Company																	
Name																	
Signature																	
Date	28 January 2022																



FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER																						
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Tower D																		
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : ATS-EMDB 4																		
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -																		
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>																						
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result															
					Pass	Not Pass																
1	40PEDB1/T4	NBD630L	Square D	500	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
2	LPEP1/T4	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
3	10PEDB1/T4	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
4	25PEDB1/T4	NBD250L	Square D	50	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
5	SN MCC-B-T4-01	NBD250L	Square D	63	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
6	EAC MCC-F/D-T4-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
7	EAC MCC-F/D-T4-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
8	EAC MCC-F/D-T4-03	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
9	EAC MCC-F/B-T4-01	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
10	EAC MCC-F/48-T4-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
11	EAC MCC-F/48-T4-02	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
12	EAC MCC-F/R-T4-01	NBD250L	Square D	40	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
13	SLDB1/T4	NBD250L	Square D	160	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
14	SN MCC-B-T4-02	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
15	SN MCC-G-05	NBD250L	Square D	25	<input checked="" type="checkbox"/>	<input type="checkbox"/>																
16					<input type="checkbox"/>	<input type="checkbox"/>																
17					<input type="checkbox"/>	<input type="checkbox"/>																
18					<input type="checkbox"/>	<input type="checkbox"/>																
19					<input type="checkbox"/>	<input type="checkbox"/>																
20					<input type="checkbox"/>	<input type="checkbox"/>																
21					<input type="checkbox"/>	<input type="checkbox"/>																
22					<input type="checkbox"/>	<input type="checkbox"/>																
23					<input type="checkbox"/>	<input type="checkbox"/>																
24					<input type="checkbox"/>	<input type="checkbox"/>																
25					<input type="checkbox"/>	<input type="checkbox"/>																
26					<input type="checkbox"/>	<input type="checkbox"/>																
27					<input type="checkbox"/>	<input type="checkbox"/>																
28					<input type="checkbox"/>	<input type="checkbox"/>																
29					<input type="checkbox"/>	<input type="checkbox"/>																
30					<input type="checkbox"/>	<input type="checkbox"/>																
31					<input type="checkbox"/>	<input type="checkbox"/>																
32					<input type="checkbox"/>	<input type="checkbox"/>																
33					<input type="checkbox"/>	<input type="checkbox"/>																
34					<input type="checkbox"/>	<input type="checkbox"/>																
35					<input type="checkbox"/>	<input type="checkbox"/>																
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 45%;"></th> <th style="width: 40%;">Witnessed by</th> </tr> <tr> <td>Company</td> <td></td> <td>Millennium Residence Condominium</td> </tr> <tr> <td>Name</td> <td></td> <td></td> </tr> <tr> <td>Signature</td> <td></td> <td></td> </tr> <tr> <td>Date</td> <td></td> <td></td> </tr> </table>								Responsibility		Witnessed by	Company		Millennium Residence Condominium	Name			Signature			Date		
Responsibility		Witnessed by																				
Company		Millennium Residence Condominium																				
Name																						
Signature																						
Date																						



## Capacitor Bank

FIELD INSPECTION AND TEST RECORD														
CAPACITOR BANK														
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower D											
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.4/1											
ERECTION SITE : -			FEEDER : CAP BANK 4/1											
<b>TECHNICAL DATA</b>														
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input checked="" type="checkbox"/> <b>FUSE</b>    <input type="checkbox"/> <b>MCCB</b> </div> <div style="width: 45%;"> <input checked="" type="checkbox"/> <b>CAPACITOR</b> </div> </div>														
Manufacture		MRO	Manufacture		MKS									
Type		NH00	Type		HPC-24.2 440-3P									
Rated current ( In )		100 A.	Rated voltage ( Un )		400 V.									
<input checked="" type="checkbox"/> <b>MEGNETIC CONTACTOR</b>			Rated frequency ( fn )		50 Hz.									
Manufacture		Federal	Rated output ( Qn )		40 (20+20) kVar.									
Type		FC-95DK21	Rated capacitance ( Cn )		397.89 μF.									
Rated operation voltage ( Ue )		400 V.	Insulation level ( Ui )		- kV.									
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>														
<ul style="list-style-type: none"> <li>- Inspect physical and machanical condition</li> <li>- Inspect alignment, grounding and clearances</li> <li>- Clean the unit</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Power Factor Controller ( PFC )</li> </ul>			<b>Check</b>		<b>Remark</b>									
			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		    									
Manufacture		Mikro	Type	PFR 120	Number of output	12								
Operating voltage		400 V.	Current input	5 A.	CT ratio	3000/5								
Serial no.		139141												
Setting : Starting current setting ( C/K )		0.1	Switching time between steps		6/10 s.									
Power factor setting		0.95	Switching sequences		Aut									
Voltage measurement		A - N = 235 V.    B - N = 234 V.    C - N = 235 V. A - B = 405 V.    B - C = 405 V.    C - A = 405 V.												
<b>2. INSULATION RESISTANCE MEASUREMENT</b>														
Test Instruments : Fluke Model 1587FC , Serial Number : 45580041														
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )												
		A - Gnd	B - Gnd	C - Gnd										
1	500	229	243	98.7										
2	500	196.9	245	424										
3	500	215	303	162.2										
4	500	178.3	797	798										
5	500	122.2	128.7	203										
6	500	170.2	170.1	192.2										
7	500	239	736	102.7										
8	500	94.8	90.8	98.8										
9	500	192	187.9	194.2										
10	500	321	190.5	376										
11	500	175.8	815	769										
12	500	264	377	149.9										
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #ffcc99;">Responsibility</th> <th></th> </tr> </thead> <tbody> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </tbody> </table>					Responsibility		Company		Name		Signature		Date	
Responsibility														
Company														
Name														
Signature														
Date														



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower D			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.4/1			
ERECTION SITE : -			FEEDER : CAP BANK 4/1			
3. CURRENT AND CAPACITANCE MEASUREMENT						
Test Instruments : Fluke Model 179 , Serial Number : 23770566						
Step No.	Rate Power (kVar)	Rate Fuse (A)	Measurement Capacitance ( μF )			Result
			Phase A-B	Phase B-C	Phase C-A	
1.	40	100	395	398	396	Passed
2.	40	100	396	396	395	Passed
3.	40	100	393	353	266	Failed
4.	40	100	399	398	399	Passed
5.	40	100	397	397	397	Passed
6.	40	100	397	399	398	Passed
7.	40	100	398	396	398	Passed
8.	40	100	398	398	399	Passed
9.	40	100	398	398	399	Passed
10.	40	100	397	397	397	Passed
11.	40	100	396	397	396	Passed
12.	40	100	398	397	397	Passed
<b>Note:</b> <input checked="" type="checkbox"/> = Pass , <input type="checkbox"/> = Not Pass , N/A = Not applicable						
$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{f_A}{f_R} = 40.00 \text{ kVar} , \text{ Normal current} = \frac{40.00 \text{ kVar}}{(V_{dc}) \times 1.732} = 57.74 \text{ A. / Set}$ $C_{LL} = \frac{3C_n}{2} = 397.89 \text{ μF. / Set for } \Delta \text{ Conn.} , \text{ No. of parallel capacitors} = 1$ $= 397.89 \text{ μF. @ } 1 \text{ Set}$						
The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.						
4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT						
Position	Voltage measurement ( V )	Current measurement ( A )				
Fan no. 1	-	-				
Fan no. 2	-	-				
Fan no. 3	-	-				
Fan no. 4	-	-				
<b>Remark :</b> - Capacitor Step ที่ 3 เลื่อนสภาพ - พัดลมระบายอากาศเสื่อมสภาพ 2 ตัว						
Responsibility						
Company						
Name						
Signature						
Date						

FIELD INSPECTION AND TEST RECORD CAPACITOR BANK						
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Tower D			
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB No.4/2			
ERECTION SITE : -			FEEDER : CAP BANK 4/2			
TECHNICAL DATA						
<input checked="" type="checkbox"/> FUSE <input type="checkbox"/> MCCB <input checked="" type="checkbox"/> CAPACITOR						
Manufacture		MRO	Manufacture		MKS	
Type		NH00	Type		HPC-24.2 440-3P	
Rated current ( In )		100 A.	Rated voltage ( Un )		400 V.	
<input checked="" type="checkbox"/> MEGNETIC CONTACTOR			Rated frequency ( fn )		50 Hz.	
Manufacture		Federal	Rated output ( Qn )		40 (20+20) kVar.	
Type		FC-95DK21	Rated capacitance ( Cn )		397.89 μF.	
Rated operation voltage ( Ue )		400 V.	Insulation level ( Ui )		- kV.	
1. VISUAL INSPECTION AND FUNCTION TEST						
<ul style="list-style-type: none"> <li>Inspect physical and machanical condition</li> <li>Inspect alignment, grounding and clearances</li> <li>Clean the unit</li> <li>Verify tightness of accessible bolted electrical connection</li> <li>Power Factor Controller ( PFC )</li> </ul>			<b>Check</b> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>		<b>Remark</b> _____ _____ _____ _____	
Manufacture		Mikro	Type	PFR 120	Number of output 12	
Operating voltage		400 V.	Current input	5 A.	CT ratio 3000/5	
Serial no.		139094				
Setting : Starting current setting ( C/K )		0.1	Switching time between steps		45/30 s.	
Power factor setting		0.95	Switching sequences		Aut	
Voltage measurement : A - N		= 236 V.	B - N		= 235 V.	C - N = 235 V.
A - B		= 406 V.	B - C		= 406 V.	C - A = 405 V.
2. INSULATION RESISTANCE MEASUREMENT						
Test Instruments : Fluke Model 1587FC , Serial Number : 45580041						
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )				
		A - Gnd	B - Gnd	C - Gnd		
1	500	427	652	708		
2	500	779	256	268		
3	500	319	306	300		
4	500	133.6	238	321		
5	500	217	475	429		
6	500	282	247	306		
7	500	245	317	220		
8	500	353	232	273		
9	500	270	364	217		
10	500	236	362	348		
11	500	358	271	365		
12	500	192.5	277	167.8		
Responsibility						
Company						
Name						
Signature						
Date						



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK			
PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Tower D
CUSTOMER	: Millennium Residence Condominium	CUBICLE NAME	: MDB No.4/2
ERECTION SITE	: -	FEEDER	: CAP BANK 4/2

### 3. CURRENT AND CAPACITANCE MEASUREMENT

Test Instruments : Fluke Model 179 , Serial Number : 23770566

Step No.	Rate Power	Rate Fuse	Measurement Capacitance ( μF )			Result
	(kVar)	(A)	Phase A-B	Phase B-C	Phase C-A	
1.	40	100	352	265	354	Failed
2.	40	100	397	397	398	Passed
3.	40	100	267	353	355	Failed
4.	40	100	396	397	396	Passed
5.	40	100	397	397	396	Passed
6.	40	100	397	397	398	Passed
7.	40	100	360	282	360	Failed
8.	40	100	395	396	396	Passed
9.	40	100	397	397	398	Passed
10.	40	100	397	397	397	Passed
11.	40	100	397	398	398	Passed
12.	40	100	396	396	396	Passed

Note: ☒ = Pass , ☐ = Not Pass , N/A = Not applicable

$$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{I_A}{I_R} = 40.00 \text{ kVar} , \text{ Normal current} = \frac{40.00 \text{ kVar}}{(V_{dc}) \times 1.732} = 57.74 \text{ A. / Set}$$

$$C_{LL} = \frac{3C_R}{2} = \frac{397.89 \mu F}{2} = 198.945 \mu F. / \text{ Set for } \Delta \text{ Conn.} , \text{ No. of parallel capacitors} = 1$$

$$= 198.945 \mu F. @ 1 \text{ Set}$$

The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 378.00 μF to 437.68 μF or 54.85 A. to 63.51 A.

### 4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT

Position	Voltage measurement ( V )	Current measurement ( A )
Fan no. 1	-	-
Fan no. 2	-	-
Fan no. 3	-	-
Fan no. 4	-	-

Remark : - Capacitor Step ที่ 1.3.7 เส้นสาย  
- พัดลมระบายอากาศเส้นสาย 2 ตัว

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

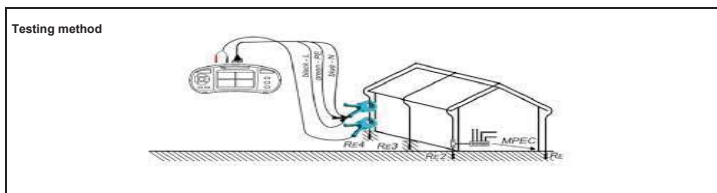
Grounding



FIELD INSPECTION AND TEST RECORD			
GROUND SYSTEM			
PROJECT NAME	: Preventive Maintenance 2022	Location	: Tower D
CUSTOMER	: Millennium Residence Condominium	PANEL	: Electrical Room
SAP NO	: -	FEEDER NAME	: -

**Checking Test**

1. Cover seal visual check	<input checked="" type="checkbox"/>	_____
2. Cleaning box or joint	<input checked="" type="checkbox"/>	_____
3. Visual check cable	<input checked="" type="checkbox"/>	_____
4. Retorque connection	<input checked="" type="checkbox"/>	_____



**GROUNDING TEST**

Test Instruments : Metrel Model MI3123 , Serial Number : 16410143

NO	POINT / ROOM	AS FOUND TEST ( $\Omega$ )	Passed	Failed
1.	LBS	0.06	✓	
2.	Transformer No.4/1	0.03	✓	
3.	Transformer No.4/2	0.02	✓	
4.	MDB No.4/1	0.02	✓	
5.	MDB No.4/2	0.04	✓	
6.	ATS-EMDB 4	0.03	✓	
7.	Lightning Aresster	0.05	✓	
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

**Remark :**

**NFPA & IEEE :** Recommends a ground resistance value of 5.0 $\Omega$  or less.

**NEC :** Make sure the system to ground is 25.0 $\Omega$  or less. Infacilities with sensitive equipment, it should be 5.0 $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.

**Telecommunications Industry :** Often uses 5.0 $\Omega$  or less as their value for grounding or bonding.

Responsibility	
Company	
Name	
Signature	
Date	

Photograph

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower D

PHOTO 1



ขณะทำการ Check Voltage

PHOTO 2



ขณะทำการ Check Voltage

PHOTO 3



ขณะทำการ Cleaning

PHOTO 4



ขณะทำการ Cleaning

PHOTO 5



ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

PHOTO 6

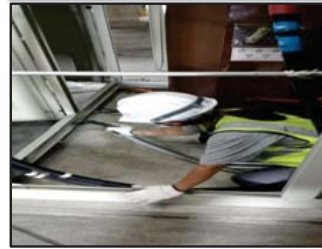


ขณะทำการขันแน่นจุดต่อทางไฟฟ้า

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower D

PHOTO 7



ขณะทำการ Cleaning

PHOTO 8



ขณะทำการ Cleaning

PHOTO 9



ขณะทำการมาร์คหน้า

PHOTO 10



ขณะทำการ Check Torque

PHOTO 11



ขณะทำการทดสอบ Insulation Resistance

PHOTO 12



ขณะทำการทดสอบ Insulation Resistance

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower D

PHOTO 13



ขณะทำการ Check Voltage

PHOTO 14



ขณะทำการวัดค่า Capacitance

PHOTO 15



ขณะทำการทดสอบ Function Trip Unit

PHOTO 16



ขณะทำการทดสอบ Function Trip Unit

PHOTO 17



ขณะทำการทดสอบ Insulation Resistance

PHOTO 18



ขณะทำการวัดค่าความต้านทานดิน

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Tower D

PHOTO 19



ขณะทำการ Cleaning

PHOTO 20



ขณะทำการ Cleaning

PHOTO 21



ขณะทำการ Cleaning

PHOTO 22



ขณะทำการ Cleaning

PHOTO 23



ขณะทำการ Check Torque

PHOTO 24



ขณะทำการ Check Torque

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

## Tools List

## Tools List to Test Electrical Equipment

A yellow and black micro ohmmeter with a digital display and two test leads.

Micro Ohmmeter/Chauvin Arnoux/C.A 6240  
Contact Resistance (Air Circuit Breaker)

A yellow and black digital multimeter with a large LCD screen and a carrying case.

Multimeter/Fluke/1587FC  
Insulation Resistance (Capacitor)

A grey and black insulation tester with a large analog scale and two test leads.

Insulation Tester/Megger/MIT515  
Insulation Resistance (TR,MDB)

A yellow and black digital multimeter with a large LCD screen and two test leads.

Multimeter/Fluke/179  
Capacitance Measurement (Capacitor)

A blue and white ground tester with a digital display and two test leads.

Ground Tester/Metrel/MI3121H  
Insulation Resistance (MDB)

A green and black ground tester with a digital display, two test leads, and a carrying case.

Ground Tester/Megger/DET4TCR2  
Windin & Turn Ratio Measurement (TR)

### Responsibility

Company  
Name  
Signature  
Date

### Witnessed by

Millennium Residence Condominium



Tools List to Test Electrical Equipment



Ground Tester/Metrel/MI3123  
Grounding Resistance (RMU,TR,MDB)



Ground Tester/Megger/DET4TCR2  
Grounding Resistance (RMU,TR,MDB)



Relay Tester/Megger/Sverker 750  
Relay Testing System (RMU)

Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		



Project : Preventive Maintenance 2022 Club House  
 Inspection Date : January 24, 2022  
 Inspection Product : RMU,Transformer and Low Voltage Switchboards  
 Inspected By :   
 Approved By :

งานบำรุงรักษาระบบไฟฟ้าแรงสูง-แรงต่ำภายในอาคาร  
ประจำปี 2565

นำเสนอ:  
Millennium Residence Condominium

Preventive Maintenance Report  
24 January 2022

Report prepared by :

Project Leader by :

Sales :

Date  
January 24, 2022

CONTENT

	PAGE
1. Introduction of Low Voltage Switchboards	1
2. Scope of Work	9
3. Summary Test Report	10
4. Defect Equipment	11
5. Ring Main Unit	13
6. Protection Relay	15
7. Transformer	19
8. Main Distribution Board	21
9. Air Circuit Breaker	23
10. Mold Case Circuit Breaker	43
11. Capacitor Bank	45
12. Grounding	47
13. Photograph	48
14. Tools list	52



## Introduction of Low Voltage Switchboards

### Low Voltage Switchboards

#### 1. บทนำ

1.1 สวิตช์บอร์ดไฟฟ้าต้องมีการตรวจสอบและทดสอบทั้งเมื่อทำการติดตั้งแล้วเสร็จและตามระยะเวลาที่เหมาะสม จุดประสงค์ของการตรวจสอบดูแลบำรุงรักษาเพื่อให้ระบบไฟฟ้าใช้งานได้ดีตามความต้องการ มีความเชื่อถือได้สูง และอยู่ในสภาพที่พร้อมใช้งานได้อย่างสมบูรณ์ การดำเนินการควรเป็นหน้าที่ความรับผิดชอบของเจ้าของอาคาร ผู้ดูแลระบบไฟฟ้า และผู้ทำการติดตั้ง การดำเนินการจะต้องกระทำโดยผู้ที่มีความรู้ ความชำนาญ เพราะอุปกรณ์บางตัวมีความซับซ้อน อุปกรณ์บางตัวอาจจะชำรุดได้ภายหลังจากการทดสอบ ผู้ทำการทดสอบจึงต้องมีความรู้ ความเข้าใจเพียงพอ และมีวิธีการที่เหมาะสม

1.2 การที่จะให้อุปกรณ์ไฟฟ้าที่ติดตั้งอยู่ในตู้สวิตช์บอร์ดไฟฟ้าสามารถทำงานได้เป็นอย่างดี มีความน่าเชื่อถือได้สูง มีอายุในการใช้งานที่ยาวนาน จะต้องมี การตรวจสอบและบำรุงรักษาเป็นประจำ หรืออาจจะเรียกว่าเป็นการบำรุงรักษาในเชิงป้องกัน โดยเฉพาะในงานที่ต้องการความต่อเนื่องให้ได้มากที่สุด การตรวจสอบและบำรุงรักษาเป็นเรื่องที่แยกกันไม่ออก และเป็นเรื่องที่จะต้องทำไปพร้อมๆกัน ซึ่งเนื้อหารายละเอียดในบทความนี้จะเป็นการกล่าวถึงการตรวจสอบและบำรุงรักษาที่ทำอย่างเป็นระบบ สามารถนำไปประยุกต์ใช้งานได้ภายในองค์กร หน่วยงาน อาคารสูง โรงงานอุตสาหกรรม เป็นต้น

#### 2. คำนิยาม

2.1 การดำเนินการตรวจสอบสภาพทั่วไป

- การตรวจสอบการทำความสะอาด
- การตรวจสอบความแน่นของโบลท์ และนัทที่บริเวณจุดต่อทางไฟฟ้า เช่น บัสบาร์, เทอร์มินัลจุดต่อต่างๆทางไฟฟ้าของอุปกรณ์ไฟฟ้า

2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

Inspected By

Prepared By

Approved By

## 2.2 การตรวจสอบค่าความต้านทานของฉนวน (Insulation Resistance Measurement)

การตรวจสอบค่าความต้านทานของฉนวนของ Main Busbar โดยอ้างอิงตามมาตรฐาน IEC 61439-2 โดยการทดสอบทั้งสิ้น 6 วงจร เช่น Line to Line (L1 – L2, L2 – L3, L3 – L1) และ Line to Neutral Ground (L1 – G, L2 – G, L3 – G) ซึ่งผลลัพธ์ที่ได้สำหรับเกณฑ์ในการยอมรับสำหรับตัววัดขั้วขั้วไฟฟ้าแรงต่ำจะต้องมีค่าความต้านทานไม่น้อยกว่า 1000  $\Omega/V$  โดยอ้างอิงกับพิกัดแรงดันไฟฟ้าในการทดสอบค่าความต้านทานของฉนวน โดยการจ่ายพิกัดแรงดันไฟฟ้ากระแสตรงในการทดสอบที่ไม่น้อยกว่า 500 Vdc แล้วอ่านค่าจากเครื่องมือวัดเปรียบเทียบกับค่ามาตรฐาน

- ในระหว่างการทดสอบค่าความต้านทานควรวัดค่าอุณหภูมิและความชื้นของสภาพแวดล้อมข้างเคียงในระหว่างการทดสอบ เพื่อใช้สำหรับอ้างอิงค่าความต้านทานที่วัดได้

- ก่อนการทดสอบจะต้องปลดวงจรควบคุม, วงจรอิเล็กทรอนิกส์, อุปกรณ์ป้องกันแลร์จ ออกจากระบบไฟฟ้า
- ในระหว่างการทดสอบไม่ควรไปสัมผัสบริเวณตัวนำไฟฟ้าเพราะอาจจะเกิดอันตรายได้

## 2.3 การตรวจสอบค่าความต้านทานหน้าสัมผัส (Contact Resistance Measurement)

การตรวจสอบค่าความต้านทานหน้าสัมผัสของ Main Circuit Breaker ซึ่งอ้างอิงค่าความต้านทานหน้าสัมผัสตามผลิตภัณฑ์ โดยพิกัดกระแสไฟฟ้าในการทดสอบดังนี้ คือ

ข้อกำหนดในการทดสอบ

- กระแสไฟฟ้า 10Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดไม่เกิน 100A
- กระแสไฟฟ้า 100Adc สำหรับทดสอบเซอร์กิตเบรกเกอร์ขนาดเกิน 100A ขึ้นไป

การทดสอบค่าความต้านทานที่บริเวณหน้าสัมผัสของเมนคอนแทคในแต่ละเฟส จะเป็นสิ่งที่มีความสำคัญที่สามารถอธิบายได้ถึงประสิทธิภาพ คุณภาพของรอยต่อทางไฟฟ้าของเซอร์กิตเบรกเกอร์ในแต่ละเฟสค่าความต้านทานที่เปลี่ยนแปลงไปในแต่ละเฟสจะได้รับอิทธิพลและผลกระทบมาจากการเกิดกระแสไฟฟ้าลัดวงจรภายในตัวเซอร์กิตเบรกเกอร์ ซึ่งค่าความต้านทานที่วัดได้จะต้องไม่แตกต่างกันเกิน 50 % ในแต่ละเฟส

Inspected By	Prepared By	Approved By

## 2.4 การตรวจวัดค่าประจุไฟฟ้า (Microfarad) ของคาปาซิเตอร์

จะตรวจสอบโดยอ้างอิงตามมาตรฐาน IEC 60831-1 Standards Technical Data Capacitance Value Tolerance

- -5% , +15% for unit and banks up to 100 kVAR
- 0% , +10% for unit and banks above 100 kVAR

## 2.5 การทดสอบค่าความต้านทาน ณ บริเวณจุดต่อลงดิน (Ground Resistance Measurement)

การทดสอบค่าความต้านทานดินโดยทั้งนี้จะต้องอ้างอิงตามมาตรฐานดังต่อไปนี้

- NFPA & IEEE: Recommends a ground resistance value of 5.0  $\Omega$  or less.
- NEC: Make sure the system to ground is 25.0  $\Omega$  or less. In facilities with sensitive equipment, it should be 5.0  $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.
- Telecommunications Industry: Often uses 5.0  $\Omega$  or less as their value for grounding or bonding

Inspected By	Prepared By	Approved By

### 3. วิธีการตรวจสอบและดูแลบำรุงรักษาอุปกรณ์ไฟฟ้าแรงต่ำเมื่อผ่านการใช้งาน

- การตรวจสอบสวิตช์บอร์ดไฟฟ้าภายหลังจากการใช้งานผ่านไประยะหนึ่งจะเป็นการตรวจสอบเพื่อหาจุดบกพร่อง การเสื่อมสภาพ หรือการชำรุดเสียหายของอุปกรณ์ไฟฟ้า เพื่อหาแนวทางในการบำรุงรักษาบริเวณที่ไฟฟ้าต่อไปอย่างถูกวิธี ซึ่งการตรวจสอบภายหลังจากการใช้งานไปแล้วนั้นจะมีกรรมวิธีในการตรวจสอบดังต่อไปนี้คือ

- สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)
- เซอร์กิตเบรกเกอร์ (Circuit Breaker)
- คาปาซิเตอร์แบงก์ (Capacitor Bank)
- สวิตช์อัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

### 4. แสดงรายการตรวจสอบและดูแลบำรุงรักษาสวิตช์บอร์ดไฟฟ้าแรงต่ำ

บริเวณไฟฟ้า	รายการตรวจสอบและทดสอบทางไฟฟ้า
สวิตช์บอร์ดไฟฟ้าแรงต่ำ (LV Switchboards)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบอุปกรณ์เครื่องมือวัดและแสดงผล (Measurement Equipment) ตรวจสอบอุปกรณ์ป้องกัน (Protection Equipment) ตรวจสอบค่าความต้านทานฉนวน (Insulation Resistance) ตรวจสอบการทำงานของสวิตช์บอร์ดไฟฟ้า (Function Operation)
เซอร์กิตเบรกเกอร์ (Circuit Breaker)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบและทำความสะอาดหล่อลื่นอุปกรณ์แม่เหล็ก (Lubrication) ตรวจสอบและทำความสะอาดช่องตัดอาร์ค (ArcChute & Lug Breaker) ตรวจสอบค่าความต้านทานฉนวนของเซอร์กิตเบรกเกอร์ (Insulation Resistance) ตรวจสอบค่าความต้านทานหน้าสัมผัสของเซอร์กิตเบรกเกอร์ (Contact Resistance) ตรวจสอบการทำงานของอุปกรณ์ป้องกันของเซอร์กิตเบรกเกอร์ (Electronic Trip Unit)
คาปาซิเตอร์แบงก์ (Capacitor Bank)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบค่าความต้านทานฉนวนของคาปาซิเตอร์ (Insulation Resistance) ตรวจสอบค่าความประจุไฟฟ้าของคาปาซิเตอร์ (Microfarad Measurement) ตรวจสอบการทำงานของอุปกรณ์สวิตช์ซึ่งคาปาซิเตอร์ (Magnetic Contactor) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Power Factor Controller)
สวิตช์อัตโนมัติ (ATS)	ตรวจสอบและทำความสะอาดทั่วไปทั้งภายในภายนอก (Cleaning) ตรวจสอบบริเวณจุดต่อต่างๆทางไฟฟ้า (Retightening torque) ตรวจสอบการทำงานของอุปกรณ์ควบคุมอัตโนมัติ (Automatic Transfer Switch)

Inspected By	Prepared By	Approved By

ลำดับ	รายการ	การตรวจสอบ
1	ขั้วต่อสาย จุดต่อสาย	จุดต่อสายทุกจุดต้องแน่น ตรวจสอบความร้อน
2	Cable Terminator	ร่องรอยการเกิดโคโรนา ตรวจสอบรอยแตกฉนวนของสาย การต่อลงดินของสายชิลด์
3	สายไฟฟ้า	ตรวจสอบสภาพของสายไฟฟ้า และอุปกรณ์การเดินสายภายในตู้
4	บัสบาร์	ตรวจสอบอุปกรณ์รองรับบัสบาร์ การต่อสาย ตรวจสอบความร้อนที่บริเวณรอยต่อบัสบาร์
5	ลูกถ้วยรองรับบัสบาร์	ตรวจสอบความสกปรก ร่องรอยการชำรุด การเปลี่ยน สีรอยแตกหรือร้าว พร้อมทั้งทำความสะอาด
6	ความเป็นฉนวนไฟฟ้า	การต่อสาย การแตกฉนวนของ CT
7	การต่อลงดิน	สภาพจุดต่อลงดินที่ตู้สวิตช์เกียร์และปลักดิน วัดค่าความต้านทานดิน สภาพของสายดิน สายต่อฝาก และวัดค่าความต่อเนื่องของสายดิน
8	ฮีตเตอร์	ตรวจสอบการทำงาน ระบบการควบคุมการทำงาน
9	บริษัทเครื่องวัดทางไฟฟ้า (Measurement Equipment)	ตรวจสอบสภาพทั่วไป การชำรุด แตกหักเสียหาย การอ่านค่าพารามิเตอร์ ทางไฟฟ้า
10	Indicator Lamp	ตรวจสอบสภาพการทำงานจะต้องอยู่ในสภาพที่ใช้งานได้เป็นปกติ
11	ชุด Draw out	ตรวจสอบการถอดออก (Draw out) และการถอดเข้า (Draw in) เซอร์กิตเบรกเกอร์ จะต้องคล่องตัว ตรวจสอบกลไกการทำงานและหน้าสัมผัสต่างๆ
12	บริษัทป้องกัน (Protection Relay)	ตรวจสอบฟังก์ชันการทำงานของอุปกรณ์ป้องกันจะต้องถูกต้องและครบถ้วนการ Setting Parameter
13	สวิตช์ควบคุมต่างๆ	ตรวจสอบสภาพการทำงาน
14	เซอร์กิตเบรกเกอร์	ตรวจสอบการทำงานของระบบ Interlock การทำงานตามขั้นตอนวิธีที่กำหนด
15	ทดสอบการทำงานทางกล	ตรวจสอบความคล่องตัวในการทำงาน การหล่อลื่น

Approved By

ลำดับ	รายการ	การตรวจสอบ
1	Arc Interrupters	ถอดทำความสะอาด ตรวจสอบความเสียหาย
2	หน้าสัมผัส (Main & arcing contact)	ตรวจสอบร่องรอยความเสียหายเนื่องจากการอาร์ก ความสกปรก ทำความสะอาด
3	Insulation (Bushing Porcelains & Other)	ตรวจสอบความเสียหายของฉนวน ตรวจสอบคราบเขม่า รอยแตกหักเสียหาย และทำความสะอาด
4	Current Part & Terminals	ตรวจสอบความเสียหาย ความร้อน การยึดแน่น
5	สายไฟฟ้า	การต่อสาย การเข้าสาย ขั้วต่อสาย
6	กลไกการทำงาน	ตรวจสอบการติดขัด สารหล่อลื่น และการทำงานทางกลต่าง
7	อุปกรณ์เสริมอื่นๆ	ตรวจสอบ Aux. device, Shock Absorbers, Bumpers, Position Indicator Latch Checking Switch, Key Lock-out, etc.

ลำดับ	รายการ	การตรวจสอบ
1	Function การทำงาน	ตรวจสอบการทำงานทางไฟฟ้า เช่น Close, Open
2	Closing Coil, Shunt Release	ตรวจสอบการต่อสาย การทำงาน
3	หน้าสัมผัส	วัดค่าความต้านทานหน้าสัมผัส
4	ความต้านทานฉนวน	Insulation Test
5	Trip Unit	ตรวจสอบการทำงานและความเสียหาย
6	Setting	ตรวจสอบการปรับตั้งค่าพารามิเตอร์ต่างๆ
7	Protection Relay	ตรวจสอบการทำงานของ Protection Relay
8	การทำงาน	ตรวจสอบการทำงานของ Trip Free, Closing

Approved By

## Scope of Work

8.การตรวจสอบตู้คาปาซิเตอร์แบงค์		
ลำดับ	รายการ	การตรวจสอบ
1	HRC Fuse	จะต้องอยู่ในสภาพที่สมบูรณ์ทั้ง 3 เฟส (Fuse ไม่ขาด)
2	MCCB	จะต้องอยู่ในสภาพที่ใช้งานได้ (ON - OFF - Trip)
3	Power Cable	จะต้องไม่ชำรุด, ขาด หรือไหม้ ตลอดความยาวสายไฟฟ้า
4	Magnetic Contactor	ตรวจสอบการทำงานทางไฟฟ้า และขดลวดความต้านทานต้องอยู่ในสภาพที่สมบูรณ์ไม่ขาดหรือหลุดออกจากตัว Magnetic Contactor
5	Detuned Filter Reactor	จะต้องอยู่ในสภาพที่สมบูรณ์ไม่มีรอยไหม้ หรือชำรุดเสียหาย
6	Capacitor Unit	ตัวถังจะต้องไม่บวม ทะลุ หรือมีรอยไหม้ ขั้วต่อสายต้องแน่น และจะต้องลงดินผ่านสายต่อฝากทุก Step
7	Damping Resister	จะต้องติดตั้งที่ขั้วของคาปาซิเตอร์ครบทั้ง 3 ชุด
8	Thermostat / Fan	ตรวจสอบสภาพการทำงานของพัดลมระบายอากาศ โดยการจำลองสภาวะอุณหภูมิสูงเกิน พร้อมทั้งปรับตั้งค่าอุณหภูมิให้เหมาะสม
9	Power Factor Controller (PFC)	ตรวจสอบการปรับตั้งค่าทางไฟฟ้าทุกค่าพารามิเตอร์
10	Terminal Retightening Torque	ตรวจสอบความแน่นของจุดต่อต่างๆทางไฟฟ้า จะต้องแน่นตามค่าที่กำหนดของ Nut และ Bolt ในแต่ละขนาด
11	การวัดค่าความเป็นฉนวน Insulation Resistance Measurement	ตรวจวัดค่าความเป็นฉนวนของคาปาซิเตอร์ในแต่ละเฟสเทียบกราวด์ที่ตัวถัง โดยพิกัดแรงดันไฟฟ้าที่ใช้ในการทดสอบต้องไม่น้อยกว่า 500 Vdc และค่าความต้านทานฉนวนจะต้องมีค่าที่ไม่น้อยกว่า 1 MΩ
12	การตรวจวัดค่าประจุไฟฟ้า Microfarad Measurement	ตรวจวัดค่าอิมพีแดนซ์ของคาปาซิเตอร์ที่ขั้วระหว่างเฟส เช่น AB, BC และ CA ซึ่งค่าที่วัดได้จะต้องมีค่าอิมพีแดนซ์อยู่ในขอบเขตที่กำหนด 5% to +15% สำหรับคาปาซิเตอร์ขนาดไม่เกิน 100 kVAR 0% to +10% สำหรับคาปาซิเตอร์ขนาดเกิน 100 kVAR
13	การตรวจวัดค่ากระแสไฟฟ้า Current Measurement	ตรวจวัดค่ากระแสไฟฟ้าใช้งานของคาปาซิเตอร์ทั้ง 3 เฟส ซึ่งกระแสไฟฟ้าในแต่ละเฟสจะต้องมีค่าที่เท่ากันหรือใกล้เคียงกัน
Inspected By		Prepared By
		Approved By

## Scope of Work

### 1. Ring Main Unit

1. Inspect physical and mechanical condition.
2. Regressing the operating mechanism.
3. MV Fuse and Fuse base Check.
4. Inspect anchorage, alignment, and grounding.
5. Trip test for protection relay and record the existing setting.
6. Verify pressure gauge.
7. Cleaning overall.

### 2. Transformer (Dry type)

1. General inspection and cleaning.
2. Bushing condition check.
3. Grounding connection check.
4. Retighten with torque wrench (busing connection)
5. Insulation resistance.
6. Measure the resistance of each winding at the designated tap position.
7. Perform turns-ratio tests at the designated tap position.
8. Verify that cooling fans operate correctly.

### 3. LV Switchboards

1. Cleaning all panel.
2. Retorque the busbar at main incoming and between panel.
3. Insulation test.
4. Metering check.
5. General condition check.
6. Grounding connection check.
7. Busbar check.
8. Fuse and fuse bases check.

### 4. Air Circuit Breaker

1. Cleaning the air circuit breaker and relubricating the operating mechanism.
2. Cleaning and check Arc-chuter.
3. Insulation check.
4. Rack-in / rack-out circuit breaker.
5. Trip unit function test. (Protection unit).
6. Parameter checking and recording of protective relay.
7. Contact resistance test.

### 5. Capacitor Bank

1. Inspect for physical damage, broken insulation.
2. Tightness of connection wiring.
3. Cleaning.
4. Operating function.
5. Capacitive or current measurement.
6. Insulation resistance.
7. Check ventilation fan.

### 6. Lamp

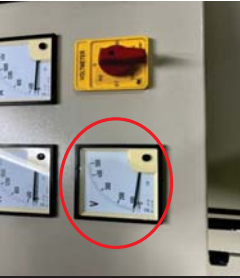


1. Verify the terminal whether they are not loose.
2. Verify the control wires whether they are not discoloration due to overheating.

## Summary Test Report

No.	Panel	Description	Q'ty	Test Result	Suggestion
1	RMU	1.1 RMU	2 set	Ring Main Unit is in good condition.	
2	Protection Relay	2.1 Protection Relay	4 set	Protection Relay is in good condition.	
3	Transformer	3.1 TR 5	1 set	Transformer is in good condition.	
4	Main Distribution Board	4.1 MDB 5 4.2 ATS-EMDB 5	1 set 1 set	Voltmeter Analog 3770 Voltmeter Analog 3770	
5	Air Circuit Breaker	5.1 Air Circuit Breaker	3 set	- ACB Feeder MDB No.5 is in good condition. - ACB Feeder GCP1 Main-CB Battery Micrologic 1.65A/20kV - ACB Feeder GCP2 Main-CB Battery Micrologic 1.65A/20kV	
6	Mold Case Circuit Breaker	6.1 Mold Case Circuit Breaker	24 set	Mold Case Circuit Breaker is in good condition.	
7	Capacitor Bank	7.1 Cap bank 5	1 set	Capacitor Bank is in good condition.	
8	Grounding	8.1 RMU 8.2 TR 5 8.3 MDB 5 8.4 ATS-EMDB 5 8.5 Lightning Arrester	1 set 1 set 1 set 1 set 1 set	Grounding is in good condition. Grounding is in good condition. Grounding is in good condition. Grounding is in good condition. Grounding is in good condition.	

**Defect of Equipment**

### Preventive Maintenance 2022 Club House Defect Equipment and its status Report




Item	Equipment's	Fault list	Corrective Action	Remark
1		MDB 5 - Voltmeter Analog ช้าๆ	ควรทำการซ่อมเปลี่ยน Voltmeter Analog ใหม่	
2		ATS-EMDB 5 - Voltmeter Analog ช้าๆ	ควรทำการซ่อมเปลี่ยน Voltmeter Analog ใหม่	
3		GCP 1 ACB Feeder GCP1 Main-CB - Battery Micrologic เลื่อนค่าพ	ควรทำการซ่อมเปลี่ยน Battery Micrologic ใหม่	

### Preventive Maintenance 2022 Club House Defect Equipment and its status Report

Item	Equipment's	Fault list	Corrective Action	Remark
4		GCP 2 ACB Feeder GCP2 Main-CB - Battery Micrologic เลื่อนค่าพ	ควรทำการซ่อมเปลี่ยน Battery Micrologic ใหม่	



<b>PROJECT NAME</b>	: Preventive Maintenance 2022	<b>LOCATION</b>	: Club House
<b>CUSTOMER</b>	: Millennium Residence Condominium	<b>CUBICLE NAME</b>	: Switchgear RMU

Single Line Diagram		
		
Ir : 400 A	Ir : - A	Ir : 200 A
	Isc : - kA	

Responsibility	
Company	
Name	
Signature	
Date	24 Januari y 2022



**RING MAIN UNIT INSPECTION TEST RECORD**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Club House  
**CUSTOMER** : Millennium Residence Condominium **CUBICLE NAME** : Switchgear RMU

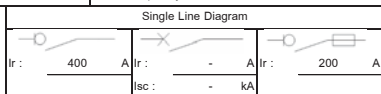
**TECHNICAL DATA DISCRPTION**

Manufacturer : NORMAFIX 24  
Type : Cela IS , DC  
S/N : -  
Standard : CEI 60694/60298/62271

Rated Voltage (Ur) : 24 kV  
Operating Voltage (Un) : 24 kV  
Rated Power Frequency w/s (Ud) : 50 kV  
Lightning Impulse w/s (Up) : 125 kV

Rated Current (Ir) : 400/200 A  
Short Time Current (Ik) : 16 kA  
Duration of Short Circuit (tk) : 1 S  
Rated Frequency : 50 Hz

Bushing of Function Unit		1 st	2 nd	3 rd	4 th	5 th
Connection Type	Plug in	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Bolted	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



**Visual Inspection and Function Test**

	Pass	Decline	Remark
<input checked="" type="checkbox"/> <b>1 st Function</b>			
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DS
- Grease and Lubicant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232533
Feeder Name : Incoming	<input checked="" type="checkbox"/>	<input type="checkbox"/>	400 A
Function Unit : 1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
400 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>2 nd Function</b>			
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DC
- Grease and Lubicant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232534-2
Feeder Name : Outgoing T3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100 A
Function Unit : 2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>3 rd Function</b>			
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	DC
- Grease and Lubicant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232535-3
Feeder Name : Outgoing T4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100A
Function Unit : 3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism
<input checked="" type="checkbox"/> <b>4 th Function</b>			
- Cleaning Termination and Ring Main Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	CIS
- Grease and Lubicant Mechanism Operation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	SN : 32232536-4
Feeder Name : TR Carpark	<input checked="" type="checkbox"/>	<input type="checkbox"/>	HRC Fuse 100A
Function Unit : 4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rated Current of Function	<input checked="" type="checkbox"/>	<input type="checkbox"/>	230 Vac
200 A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protection Relay Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Option in Function <input type="checkbox"/> Shunt Release <input type="checkbox"/> Under Volage Release			<input type="checkbox"/> Motor Mechanism

Responsibility	
Company	
Name	
Signature	
Date	

**Protection Relay**



## FIELD INSPECTION AND TEST RECORD PROTECTION RELAY

**Project Name** : Preventive Maintenance 2022 **Location** : Club House  
**Customer** : Millennium Residence Condominium **Cubicle Name** : Outgoing T1  
**Erection Site** : - **Feeder** : -

### TECHNICAL DATA

Manufacture VAMP  
Type of VIP VAMP 40  
Serial no. 006777 CT Ratio 200/5 A

### 1. VISUAL INSPECTION AND FUNCTION TEST

- Check all wiring correctly
- Check tightness of connections
- Functional operation
- Relay undamaged and clean.

Checked



Note

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 2. OVERCURRENT PROTECTION SETTING

Setting :

#### Phase Overcurrent

I> I / Is = 0.39xIn 78 A IEC EI K = 0.05

Time =

I>> Is = 1.1xIn 220A DT = 0.05 Sec.

Function	Current Injection (A)	Should be ( sec )	Operating Time ( Sec )		
			Phase A	Phase B	Phase C
I >	2xls = 3.90	1.330	1.306	1.294	1.271
	5xls =				
I >>	1.2xls = 6.60	0.050	0.071	0.073	0.075

(Test via CT turn 10 round)

### 3. TEST TRIP FUNCTION BETWEEN VIP AND MITOP RESULT :

☒ Pass  
☐ Not pass

### 4. TEST RESULT :

☒ Pass  
☐ Not pass

Remark : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Test instrument : Single phase test set Sverker 750



## FIELD INSPECTION AND TEST RECORD PROTECTION RELAY

**Project Name** : Preventive Maintenance 2022 **Location** : Club House  
**Customer** : Millennium Residence Condominium **Cubicle Name** : Outgoing T2  
**Erection Site** : - **Feeder** : -

### TECHNICAL DATA

Manufacture VAMP  
Type of VIP VAMP 40  
Serial no. 006775 CT Ratio 200/5 A

### 1. VISUAL INSPECTION AND FUNCTION TEST

- Check all wiring correctly
- Check tightness of connections
- Functional operation
- Relay undamaged and clean.

Checked



Note

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 2. OVERCURRENT PROTECTION SETTING

Setting :

#### Phase Overcurrent

I> I / Is = 0.39xIn 78 A IEC EI K = 0.05

Time =

I>> Is = 1.1xIn 220A DT = 0.05 Sec.

Function	Current Injection (A)	Should be ( sec )	Operating Time ( Sec )		
			Phase A	Phase B	Phase C
I >	2xls = 3.90	1.330	1.316	1.289	1.300
	5xls =				
I >>	1.2xls = 6.60	0.050	0.073	0.073	0.071

(Test via CT turn 10 round)

### 3. TEST TRIP FUNCTION BETWEEN VIP AND MITOP RESULT :

☒ Pass  
☐ Not pass

### 4. TEST RESULT :

☒ Pass  
☐ Not pass

Remark : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Test instrument : Single phase test set Sverker 750



## FIELD INSPECTION AND TEST RECORD PROTECTION RELAY

**Project Name** : Preventive Maintenance 2022 **Location** : Club House  
**Customer** : Millennium Residence Condominium **Cubicle Name** : Outgoing T3  
**Erection Site** : - **Feeder** : -

### TECHNICAL DATA

Manufacture VAMP  
Type of VIP VAMP 40  
Serial no. 006774 CT Ratio 200/5 A

### 1. VISUAL INSPECTION AND FUNCTION TEST

- Check all wiring correctly
- Check tightness of connections
- Functional operation
- Relay undamaged and clean.

Checked



Note

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 2. OVERCURRENT PROTECTION SETTING

Setting :

#### Phase Overcurrent

I> I / Is = 0.39xIn 78 A IEC EI K = 0.05

Time =

I>> Is = 1.1xIn 220A DT = 0.05 Sec.

Function	Current Injection (A)	Should be ( sec )	Operating Time ( Sec )		
			Phase A	Phase B	Phase C
I >	2xls = 3.90	1.330	1.306	1.404	1.372
	5xls =				
I >>	1.2xls = 6.60	0.050	0.067	0.069	0.072

(Test via CT turn 10 round)

### 3. TEST TRIP FUNCTION BETWEEN VIP AND MITOP RESULT :

- ☒ Pass  
☐ Not pass

### 4. TEST RESULT :

- ☒ Pass  
☐ Not pass

Remark : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Test instrument : Single phase test set Sverker 750



## FIELD INSPECTION AND TEST RECORD PROTECTION RELAY

**Project Name** : Preventive Maintenance 2022 **Location** : Club House  
**Customer** : Millennium Residence Condominium **Cubicle Name** : Outgoing T4  
**Erection Site** : - **Feeder** : -

### TECHNICAL DATA

Manufacture VAMP  
Type of VIP VAMP 40  
Serial no. 01-0015 CT Ratio 200/5 A

### 1. VISUAL INSPECTION AND FUNCTION TEST

- Check all wiring correctly
- Check tightness of connections
- Functional operation
- Relay undamaged and clean.

Checked



Note

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 2. OVERCURRENT PROTECTION SETTING

Setting :

#### Phase Overcurrent

I> I / Is = 0.39xIn 78 A IEC EI K = 0.05

Time =

I>> Is = 1.1xIn 220A DT = 0.05 Sec.

Function	Current Injection (A)	Should be ( sec )	Operating Time ( Sec )		
			Phase A	Phase B	Phase C
I >	2xls = 3.90	1.330	1.306	1.310	1.306
	5xls =				
I >>	1.2xls = 6.60	0.050	0.074	0.072	0.069

(Test via CT turn 10 round)

### 3. TEST TRIP FUNCTION BETWEEN VIP AND MITOP RESULT :

- ☒ Pass  
☐ Not pass


### 4. TEST RESULT :

- ☒ Pass  
☐ Not pass

Remark : \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Test instrument : Single phase test set Sverker 750

## Transformer



**D-Nine**  
Engineering

---

**FIELD INSPECTION AND TEST RECORD**  
**TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022  
**CUSTOMER** : Millennium Residence Condominium

**LOCATION** : Club House  
**FEEDER** : Transformer 5

---

**TECHNICAL DATA**

Manufacture	ABB	Serial No.	1LKR081633TER
Type	Cast Rasin	Type of cooling	AN/AF
Standard	IEC60076-11	Weight	2700 kg.
Year of manufacture	2008/09	Insulation Class	F
Rated frequency	50 Hz	Impedance	6.17/8.64 %
Vector-group symbol	Dyn11	Material	-
Rated power	1000/1400 kVA	Protection	-
Rated voltage HV	24000 V	Rated current HV	24.1/33.7 A
Rated voltage LV	415/240 V	Rated current LV	1387.9/1943.0 A

**VISUAL INSPECTION AND FUNCTION TEST**

	Pass	Not pass	
1. Inspection physical and mechanical condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Inspection alignment and grounding	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Inspection winding temperature indicator	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Clean the unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5. Verify the control alarm and trip setting on temperature indicators are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6. Verify that cooling fans operate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7. Verify tightness of accessible bolted electrical connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8. Verify that as-left tap connections are as specified	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
9. Verify tap changer position	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
10. Verify the presence of surge arresters	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**INSULATION RESISTANCE MEASUREMENT**  
**Test Instruments :** Megger Model MIT515 , **Serial Number :** N/A

Test connection	Test voltage (Vdc)	Insulation resistance (MΩ)	Criteria (MΩ)
HV to GND	2500	25,100	> 1,000
HV to LV	2500	24,750	> 1,000
LV to GND	1000	2,410	> 100

Humidity : 55 %
Ambient Temperature : 30 °c

**Function Testing and Cooling fan Testing**

	Pass	Not pass	
1. Function Testing Operating of Cooling FAN.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Alarm Buzzer Testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Function Testing Trip TR. To RMU	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

**POWER CABLE : INSULATION RESISTANCE MEASUREMENT**  
**Test Instruments :** Megger Model MIT515 , **Serial Number :** N/A

Test voltage (Vdc)	Insulation resistance (MΩ)						Criteria (MΩ)
	A-B	B-C	C-A	A-N	B-N	C-N	
5000	250,100	246,000	223,700	156,200	149,000	132,400	> 2,000

Responsibility	
Company	
Name	
Signature	
Date	





**FIELD INSPECTION AND TEST RECORD  
TRANSFORMER (DRY TYPE)**

**PROJECT NAME** : Preventive Maintenance 2022      **LOCATION** : Club House  
**CUSTOMER** : Millennium Residence Condominium      **FEEDER** : Transformer 5

**TURN RATIO AND POLARITY MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

Tap	Phase	Calculated Ratio	Ratio	%Err.	I(mA)	Phdev.	Result	
							Pass	Fail
2	U	97.663	97.551	0.13	1.01	0.00	✓	
	V		97.549	0.12	1.05	0.00	✓	
	W		97.552	0.13	0.88	0.00	✓	

**WINDING RESISTANCE MEASUREMENT**

Test Instruments : Metrel Model MI3280 , Serial Number : 19241327

-HV side of Xfmr

Tap.	I (A)	1U-1V	1V-1W	1W-1U
		R (Ω)		
2	1	8.887	8.891	8.906

-LV side of Xfmr

I (A)	2U-N	2V-N	2W-N
	R (mΩ)		
1	2.4	2.4	2.4

**TEMPERATURE MONITORING**

Setting :  
 Trip = 110 °C      Alarm = 90 °C      Fan (On) = 75 °C      Fan (Off) = 60 °C

**Function Testing and Cooling fan Testing**

- |   |                                     |                          |
|---|-------------------------------------|--------------------------|
| 1. Function Testing Operating of Cooling FAN. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Alarm Buzzer Testing                       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Function Testing Trip TR. To RMU           | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Remark : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**Main Distribution Board**

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Club House																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : MDB 5																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	54,200	Passed > 1 MΩ																																																					
B to C	500	39,700																																																						
C to A	500	33,600																																																						
A to GND	500	8,900																																																						
B to GND	500	7,500																																																						
C to GND	500	8,020																																																						
Humidity : 55 %  Ambient Temperature : 30 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.  <b>Remark</b> : Voltmeter Analog 240V																																																								
Responsibility	Tested by	Witnessed by																																																						
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

FIELD INSPECTION AND TEST RECORD LV SWITCHBOARD																																																								
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Club House																																																						
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>PANEL</b> : ATS-EMDB 5																																																						
<b>1. VISUAL INSPECTION</b> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Checked</th> <th style="width: 10%; text-align: center;">Not Checked</th> <th style="width: 10%; text-align: center;">N/A</th> </tr> </thead> <tbody> <tr><td>1. Cubicle undamaged and cleaned</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>2. Name plate data is compliance with drawing and specification</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>3. Insulation test</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>4. Metering check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>5. Wiring control connect check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>6. General condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>7. Grounding condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>8. Busbar check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>9. All fastenings checked</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>10. Visual Check capacitor bank condition</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>11. Magnetic contactor condition check</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> <tr><td>12. Fuse and fuse bases check.</td><td style="text-align: center;"><input checked="" type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td><td style="text-align: center;"><input type="checkbox"/></td></tr> </tbody> </table>						Checked	Not Checked	N/A	1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Checked	Not Checked	N/A																																																					
1. Cubicle undamaged and cleaned	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
2. Name plate data is compliance with drawing and specification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
3. Insulation test	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
4. Metering check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
5. Wiring control connect check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
6. General condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
7. Grounding condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
8. Busbar check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
9. All fastenings checked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
10. Visual Check capacitor bank condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
11. Magnetic contactor condition check	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
12. Fuse and fuse bases check.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>																																																					
<b>2. INSULATION RESISTANCE BUSBAR MEASUREMENT</b> <b>Instrument</b> : Metrel Model MI3121H <b>Serial Number</b> : 16101986																																																								
Test connection	Test voltage (Vdc) , 1 min	Insulation resistance (MΩ)	Remark	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;">Result</th> </tr> <tr> <th style="width: 50%; text-align: center;">Pass</th> <th style="width: 50%; text-align: center;">Fail</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> <tr><td style="text-align: center;">✓</td><td style="text-align: center;"></td></tr> </tbody> </table>	Result		Pass	Fail	✓		✓		✓		✓		✓		✓																																					
Result																																																								
Pass	Fail																																																							
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
✓																																																								
A to B	500	52,100	Passed > 1 MΩ																																																					
B to C	500	35,800																																																						
C to A	500	32,300																																																						
A to GND	500	9,200																																																						
B to GND	500	8,100																																																						
C to GND	500	7,500																																																						
Humidity : 55 %  Ambient Temperature : 30 °c																																																								
<b>Remark</b> : This operation consists in checking test voltage value of the power circuit in accordance with the IEC standards 60439-1 paragraph 8.3.4. An insulation measurement using an insulation measuring device at a voltage of at least 500 VDC shall be carried out.  <b>Remark</b> : The test is deemed satisfactory if the insulation resistance between circuits and exposed conductive parts is at least 1000Ω / V per circuit referred to the nominal voltage to earth of these circuits. Should be done before and after the Dielectric test to verify that there has been no deterioration of the insulation during the test.  <b>Remark</b> : Voltmeter Analog 240V																																																								
Responsibility	Tested by	Witnessed by																																																						
Company																																																								
Name																																																								
Signature																																																								
Date																																																								

## Air Circuit Breaker

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Club House	
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>DEVICE NO.</b> : MDB 5	
<b>SAP NO</b> : -		<b>FEEDER NAME</b> : Incoming from transformer 5	
<b>TECHNICAL DATA</b>			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	- kArms.
Type	NW16N1	Rated service breaking ( Ics )	- kArms.
Rated current ( In )	1600 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	220/440 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	- kV.	Year of manufacture	-
Rated operation voltage ( Ue )	- V.	Serial no.	1404095620-5 (1/1)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>		<b>Checked</b>	<b>Remark</b>
- Inspect physical and mechanical condition		<input checked="" type="checkbox"/>	
- Inspect alignment and grounding		<input checked="" type="checkbox"/>	
- Inspect are chutes		<input checked="" type="checkbox"/>	
- Inspect auxliary and limit switch		<input checked="" type="checkbox"/>	
- Inspect moving and stationary contacts		<input checked="" type="checkbox"/>	
- Clean the unit		<input checked="" type="checkbox"/>	
- Lubrication on moving and sliding surface		<input checked="" type="checkbox"/>	
- Verify operation of charging mechanism		<input checked="" type="checkbox"/>	
- Verify tightness of accessible bolted electrical connection		<input checked="" type="checkbox"/>	
- Verify racking mechanism operation		<input checked="" type="checkbox"/>	
- Verify correct operation of :		<input checked="" type="checkbox"/>	
<b>2. ACCESSORIES</b>			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input checked="" type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
<b>3. MAIN CONTACT RESISTANCE MEASUREMENT</b>			
Test Instruments : _____ , Serial Number : _____			
Phase	Test dc current ( A )	Contact resistance ( $\mu\Omega$ )	
A	10	-	
B	10	-	
C	10	-	
<b>Responsibility</b>			
Company			
Name			
Signature			
Date			



FIELD INSPECTION AND TEST RECORD															
AIR CIRCUIT BREAKER															
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Club House													
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>DEVICE NO.</b> : MDB 5													
<b>SAP NO</b> : -		<b>FEEDER NAME</b> : Incoming from transformer 5													
<b>4. INSULATION RESISTANCE MEASUREMENT</b>															
Test Instruments : _____ , Serial Number : _____															
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )													
Interrupter phase A	500	-													
Interrupter phase B	500	-	Humidity : - %												
Interrupter phase C	500	-	Ambient Temperature : - °C												
A-GND.	500	-													
B-GND.	500	-													
C-GND.	500	-													
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground															
<b>5. OVERCURRENT TRIP UNIT MEASUREMENT</b>															
Test Instruments : Full Function Test Kit , Serial Number : _____															
- Setting of overcurrent trip unit															
- Long time : Ir = 0.7 - Short time : Isd = 4 - Instantaneous : Ii = 6 - Earth fault : Ig = A (500)		- Time setting : tr = 4 s. - Time setting : tsd = 0.1 s. , Ir = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = 0.1 s. , Ir = <input checked="" type="checkbox"/> On <input type="checkbox"/> Off													
- Operating time measurement															
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test															
Function	Test current	Should be	As found	Result	Indicator of tripping cause										
Long time	3360 A	Auto s.	14.203 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Short time	7040 A	Auto s.	0.262 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Instantaneous	12000 A	Auto s.	0.037 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Earth fault	1000 A	Auto s.	0.130 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show										
Remark : _____															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>						Responsibility		Company		Name		Signature		Date	
Responsibility															
Company															
Name															
Signature															
Date															

FIELD INSPECTION AND TEST RECORD																									
AIR CIRCUIT BREAKER																									
<b>PROJECT NAME</b> : Preventive Maintenance 2022		<b>LOCATION</b> : Club House																							
<b>CUSTOMER</b> : Millennium Residence Condominium		<b>DEVICE NO.</b> : Generator Board.																							
<b>SAP NO</b> : -		<b>FEEDER NAME</b> : GCP1 Main-CB																							
<b>TECHNICAL DATA</b>																									
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	- kArms.																						
Type	NW12N1	Rated service breaking ( Ics )	- kArms.																						
Rated current ( In )	1200 A.	Frequency	50/60 Hz.																						
Rated insulation voltage ( Ui )	220/440 V.	Standard	IEC 60947-2																						
Impulse withstand voltage ( Uimp )	- kV.	Year of manufacture	-																						
Rated operation voltage ( Ue )	- V.	Serial no.	1404095620-6 (1/2)																						
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole																						
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>																									
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Checked</th> <th style="width: 90%;">Remark</th> </tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> <tr><td><input checked="" type="checkbox"/></td><td></td></tr> </table>		Checked	Remark	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
Checked	Remark																								
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<input checked="" type="checkbox"/>																									
<b>2. ACCESSORIES</b>																									
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																						
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____																						
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1																								
<b>3. MAIN CONTACT RESISTANCE MEASUREMENT</b>																									
Test Instruments : _____ , Serial Number : _____																									
Phase	Test dc current ( A )	Contact resistance ( μΩ )																							
A	10	-																							
B	10	-																							
C	10	-																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">Responsibility</th> <th style="width: 90%;"></th> </tr> <tr> <td>Company</td> <td></td> </tr> <tr> <td>Name</td> <td></td> </tr> <tr> <td>Signature</td> <td></td> </tr> <tr> <td>Date</td> <td></td> </tr> </table>				Responsibility		Company		Name		Signature		Date													
Responsibility																									
Company																									
Name																									
Signature																									
Date																									

FIELD INSPECTION AND TEST RECORD					
AIR CIRCUIT BREAKER					
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Club House			
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : Generator Board.			
SAP NO : -		FEEDER NAME : GCP1 Main-CB			
<b>4. INSULATION RESISTANCE MEASUREMENT</b>					
Test Instruments : _____, Serial Number : _____					
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )			
Interrupter phase A	500	-			
Interrupter phase B	500	-	Humidity : - %		
Interrupter phase C	500	-	Ambient Temperature : - °C		
A-GND.	500	-			
B-GND.	500	-			
C-GND.	500	-			
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground					
<b>5. OVERCURRENT TRIP UNIT MEASUREMENT</b>					
Test Instruments : Full Function Test Kit, Serial Number : _____					
- Setting of overcurrent trip unit					
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off			
- Operating time measurement					
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test					
Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1667 A	Auto s.	14.895 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	2344 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
<b>Remark :</b> Battery Micrologic เสื่อมสภาพ _____ _____ _____					
Responsibility	Tested by		Witnessed by		
Company			Millennium Residence Condominium		
Name					
Signature					
Date					

FIELD INSPECTION AND TEST RECORD			
AIR CIRCUIT BREAKER			
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Club House	
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : Generator Board.	
SAP NO : -		FEEDER NAME : GCP2 Main-CB	
<b>TECHNICAL DATA</b>			
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	- kArms.
Type	NW12N1	Rated service breaking ( Ics )	- kArms.
Rated current ( In )	1200 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	220/440 V.	Standard	IEC 60947-2
Impulse withstand voltage ( Uimp )	- kV.	Year of manufacture	-
Rated operation voltage ( Ue )	- V.	Serial no.	1404095620-6 (2/2)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole
<b>1. VISUAL INSPECTION AND FUNCTION TEST</b>			
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		Checked	Remark
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
		<input checked="" type="checkbox"/>	_____
<b>2. ACCESSORIES</b>			
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		
<b>3. MAIN CONTACT RESISTANCE MEASUREMENT</b>			
Test Instruments : _____, Serial Number : _____			
Phase	Test dc current ( A )	Contact resistance ( μΩ )	
A	10	-	
B	10	-	
C	10	-	
Responsibility	Tested by		Witnessed by
Company			Millennium Residence Condominium
Name			
Signature			
Date			

## FIELD INSPECTION AND TEST RECORD

### AIR CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : GCP2 Main-CB

#### 4. INSULATION RESISTANCE MEASUREMENT

Test Instruments : , Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

Note: Circuit breaker in open position when measurement between interrupt contact

Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

#### 5. OVERCURRENT TRIP UNIT MEASUREMENT

Test Instruments : Full Function Test Kit, Serial Number :

##### - Setting of overcurrent trip unit

- Long time : Ir = 1	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

##### - Operating time measurement

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1667 A	Auto s.	15.304 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	2344 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark : Battery Micrologic เสื่อมสภาพ

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

## FIELD INSPECTION AND TEST RECORD

### MOLD CASE CIRCUIT BREAKER

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : GCP3

#### TECHNICAL DATA

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404095285-1 (5/7)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

#### 1. VISUAL INSPECTION AND FUNCTION TEST

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

#### 2. ACCESSORIES

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

#### 3. MAIN CONTACT RESISTANCE MEASUREMENT

Test Instruments : , Serial Number :

Phase	Test dc current ( A )	Contact resistance ( μΩ )
A	10	-
B	10	-
C	10	-

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

20f21 of 2

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB 5  
SAP NO : FEEDER NAME : Nomal line.

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit , Serial Number :

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	16.178 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : ATS-EMDB 5  
SAP NO : FEEDER NAME : Emergency line.

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404096941-1 (2/6)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input checked="" type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Phase	Test dc current ( A )	Contact resistance ( μf2 )
A	10	-
B	10	-
C	10	-

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	



FIELD INSPECTION AND TEST RECORD					
MOLD CASE CIRCUIT BREAKER					
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Club House			
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : ATS-EMDB 5			
SAP NO : -		FEEDER NAME : Emergency line.			
4. INSULATION RESISTANCE MEASUREMENT					
Test Instruments : _____ , Serial Number : _____					
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )			
Interrupter phase A	500	-	Humidity : - %  Ambient Temperature : - °C		
Interrupter phase B	500	-			
Interrupter phase C	500	-			
A-GND.	500	-			
B-GND.	500	-			
C-GND.	500	-			
<b>Note:</b> Circuit breaker in open position when measurement between interrupt contact Circuit breaker in close position when measurement between phase and ground and other phase connect to ground					
5. OVERCURRENT TRIP UNIT MEASUREMENT					
Test Instruments : Full Function Test Kit , Serial Number : _____					
- Setting of overcurrent trip unit					
- Long time : Ir = 1 - Short time : Isd = 1.5 - Instantaneous : Ii = - - Earth fault : Ig = -		- Time setting : tr = 0.5 s. - Time setting : tsd = - s , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off - Time setting : tg = - s , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off			
- Operating time measurement					
Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test					
Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	16.246 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Remark : _____ _____ _____					
Responsibility		Witnessed by			
Company		Millennium Residence Condominium			
Name					
Signature					
Date					



FIELD INSPECTION AND TEST RECORD																											
MOLD CASE CIRCUIT BREAKER																											
PROJECT NAME : Preventive Maintenance 2022		LOCATION : Club House																									
CUSTOMER : Millennium Residence Condominium		DEVICE NO. : Generator Board.																									
SAP NO : -		FEEDER NAME : Tower To ATS 1																									
TECHNICAL DATA																											
Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.																								
Type	NS800N	Rated service breaking ( Ics )	75% kArms.																								
Rated current ( In )	800 A.	Frequency	50/60 Hz.																								
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3																								
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008																								
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404073241-4 (1/3)																								
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole																								
1. VISUAL INSPECTION AND FUNCTION TEST																											
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment and grounding</li> <li>- Inspect are chutes</li> <li>- Inspect auxliary and limit switch</li> <li>- Inspect moving and stationary contacts</li> <li>- Clean the unit</li> <li>- Lubrication on moving and sliding surface</li> <li>- Verify operation of charging mechanism</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Verify racking mechanism operation</li> <li>- Verify correct operation of :</li> </ul>		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Checked</th> <th style="width: 50%;">Remark</th> </tr> </thead> <tbody> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> <tr><td><input checked="" type="checkbox"/></td><td>_____</td></tr> </tbody> </table>				Checked	Remark	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____	<input checked="" type="checkbox"/>	_____
Checked	Remark																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
<input checked="" type="checkbox"/>	_____																										
2. ACCESSORIES																											
1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																								
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																								
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other _____																								
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other _____																								
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1																										
3. MAIN CONTACT RESISTANCE MEASUREMENT																											
Test Instruments : _____ , Serial Number : _____																											
Phase	Test dc current ( A )	Contact resistance ( μf2 )																									
A	10	-																									
B	10	-																									
C	10	-																									
Remark : _____ _____ _____																											
Responsibility		Witnessed by																									
Company		Millennium Residence Condominium																									
Name																											
Signature																											
Date																											

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : Tower To ATS 1

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit, Serial Number :

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	15.446 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : Tower To ATS 2

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404098365-2 (1/4)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Phase	Test dc current ( A )	Contact resistance ( μf2 )
A	10	-
B	10	-
C	10	-

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : Tower To ATS 2

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit, Serial Number : -

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s. , Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	16.353 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.053 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

PROJECT NAME : Preventive Maintenance 2022 LOCATION : Club House  
CUSTOMER : Millennium Residence Condominium DEVICE NO. : Generator Board.  
SAP NO : FEEDER NAME : Tower To ATS 3

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404077079-3 (2/5)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number : -

Phase	Test dc current ( A )	Contact resistance ( μΩ )
A	10	-
B	10	-
C	10	-

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	



**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Club House  
**CUSTOMER** : Millennium Residence Condominium **DEVICE NO.** : Generator Board.  
**SAP NO** : **FEEDER NAME** : Tower To ATS 3

**4. INSULATION RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )
Interrupter phase A	500	-
Interrupter phase B	500	-
Interrupter phase C	500	-
A-GND.	500	-
B-GND.	500	-
C-GND.	500	-

Humidity : - %

Ambient Temperature : - °C

**Note:** Circuit breaker in open position when measurement between interrupt contact  
Circuit breaker in close position when measurement between phase and ground and other phase connect to ground

**5. OVERCURRENT TRIP UNIT MEASUREMENT**

Test Instruments : Full Function Test Kit, Serial Number :

**- Setting of overcurrent trip unit**

- Long time : Ir = 1	- Time setting : tr = 0.5 s.
- Short time : Isd = 1.5	- Time setting : tsd = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off
- Instantaneous : Ii = -	
- Earth fault : Ig = -	- Time setting : tg = - s., Ir = <input type="checkbox"/> On <input type="checkbox"/> Off

**- Operating time measurement**

Type of test : ☐ Primary inject test ☒ Secondary inject test

Function	Test current	Should be	As found	Result	Indicator of tripping cause
Long time	1067 A	Auto s.	15.897 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show

Remark :  
\_\_\_\_\_  
\_\_\_\_\_

Responsibility	
Company	
Name	
Signature	
Date	

**FIELD INSPECTION AND TEST RECORD**  
**MOLD CASE CIRCUIT BREAKER**

**PROJECT NAME** : Preventive Maintenance 2022 **LOCATION** : Club House  
**CUSTOMER** : Millennium Residence Condominium **DEVICE NO.** : Generator Board.  
**SAP NO** : **FEEDER NAME** : Tower To ATS 4

**TECHNICAL DATA**

Manufacture	SQUARE D	Ultimate breaking capacity ( Icu )	50 kArms.
Type	NS800N	Rated service breaking ( Ics )	75% kArms.
Rated current ( In )	800 A.	Frequency	50/60 Hz.
Rated insulation voltage ( Ui )	750 V.	Standard	IEC 60947-3
Impulse withstand voltage ( Uimp )	8 kV.	Year of manufacture	2008
Rated operation voltage ( Ue )	380/415 V.	Serial no.	1404097559-2 (3/3)
The Breaker in its frame	<input checked="" type="checkbox"/> Fix <input type="checkbox"/> Draw-out	Pole	<input checked="" type="checkbox"/> 3 Pole <input type="checkbox"/> 4 Pole

**1. VISUAL INSPECTION AND FUNCTION TEST**

- Inspect physical and mechanical condition
- Inspect alignment and grounding
- Inspect are chutes
- Inspect auxliary and limit switch
- Inspect moving and stationary contacts
- Clean the unit
- Lubrication on moving and sliding surface
- Verify operation of charging mechanism
- Verify tightness of accessible bolted electrical connection
- Verify racking mechanism operation
- Verify correct operation of :

Checked	Remark
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/>	

**2. ACCESSORIES**

1.1 Under voltage trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.2 Shunt trip device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.3 Closing coil	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 200-250 VAC/VDC	<input type="checkbox"/> Other
1.4 Motor charger device	<input type="checkbox"/> 100/250 VAC/VDC	<input type="checkbox"/> 220-240 VAC/VDC	<input type="checkbox"/> Other
1.5 Electronic Trip Device	<input checked="" type="checkbox"/> 2.0 <input type="checkbox"/> 2.0 A <input type="checkbox"/> 2.0 E <input type="checkbox"/> 6.0 A <input type="checkbox"/> 6.0 E <input type="checkbox"/> WS1		

**3. MAIN CONTACT RESISTANCE MEASUREMENT**

Test Instruments : , Serial Number :

Phase	Test dc current ( A )	Contact resistance ( μf2 )
A	10	-
B	10	-
C	10	-

Responsibility	
Company	
Name	
Signature	
Date	



FIELD INSPECTION AND TEST RECORD																																	
MOLD CASE CIRCUIT BREAKER																																	
PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Club House																														
CUSTOMER	: Millennium Residence Condominium	DEVICE NO.	: Generator Board.																														
SAP NO	: -	FEEDER NAME	: Tower To ATS 4																														
<b>4. INSULATION RESISTANCE MEASUREMENT</b> Test Instruments : _____ , Serial Number : _____  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Test connection</th> <th style="width: 25%;">Test voltage ( Vdc )</th> <th style="width: 25%;">Insulation resistance ( MΩ )</th> <th style="width: 25%;"></th> </tr> </thead> <tbody> <tr><td>Interrupter phase A</td><td>500</td><td>-</td><td></td></tr> <tr><td>Interrupter phase B</td><td>500</td><td>-</td><td></td></tr> <tr><td>Interrupter phase C</td><td>500</td><td>-</td><td></td></tr> <tr><td>A-GND.</td><td>500</td><td>-</td><td></td></tr> <tr><td>B-GND.</td><td>500</td><td>-</td><td></td></tr> <tr><td>C-GND.</td><td>500</td><td>-</td><td></td></tr> </tbody> </table> <div style="margin-top: 10px;">             Humidity : _____ %              Ambient Temperature : _____ °C           </div> <p><small><b>Note:</b> Circuit breaker in open position when measurement between interrupt contact              Circuit breaker in close position when measurement between phase and ground and other phase connect to ground</small></p>				Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )		Interrupter phase A	500	-		Interrupter phase B	500	-		Interrupter phase C	500	-		A-GND.	500	-		B-GND.	500	-		C-GND.	500	-			
Test connection	Test voltage ( Vdc )	Insulation resistance ( MΩ )																															
Interrupter phase A	500	-																															
Interrupter phase B	500	-																															
Interrupter phase C	500	-																															
A-GND.	500	-																															
B-GND.	500	-																															
C-GND.	500	-																															
<b>5. OVERCURRENT TRIP UNIT MEASUREMENT</b> Test Instruments : Full Function Test Kit , Serial Number : _____  <div style="border: 1px solid black; padding: 5px;"> <b>- Setting of overcurrent trip unit</b>  <div style="display: flex; justify-content: space-between;"> <div>           - Long time : Ir = 1            - Short time : Isd = 1.5            - Instantaneous : Ii = -            - Earth fault : Ig = -         </div> <div>           - Time setting : tr = 0.5 s.            - Time setting : tsd = - s. , I<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off             - Time setting : tg = - s. , I<sup>2</sup>t = <input type="checkbox"/> On <input type="checkbox"/> Off         </div> </div> </div> <div style="margin-top: 10px;"> <b>- Operating time measurement</b>            Type of test : <input type="checkbox"/> Primary inject test <input checked="" type="checkbox"/> Secondary inject test         </div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Function</th> <th>Test current</th> <th>Should be</th> <th>As found</th> <th>Result</th> <th>Indicator of tripping cause</th> </tr> </thead> <tbody> <tr> <td>Long time</td> <td>1067 A</td> <td>Auto s.</td> <td>16.754 s.</td> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Short time</td> <td>1500 A</td> <td>Auto s.</td> <td>0.054 s.</td> <td><input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Instantaneous</td> <td>- A</td> <td>- s.</td> <td>- s.</td> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> <tr> <td>Earth fault</td> <td>- A</td> <td>- s.</td> <td>- s.</td> <td><input type="checkbox"/> Pass <input type="checkbox"/> Not pass</td> <td><input type="checkbox"/> Show <input type="checkbox"/> Not show</td> </tr> </tbody> </table> <div style="margin-top: 20px;"> <b>Remark :</b> _____            _____            _____         </div>				Function	Test current	Should be	As found	Result	Indicator of tripping cause	Long time	1067 A	Auto s.	16.754 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show	Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show	Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show
Function	Test current	Should be	As found	Result	Indicator of tripping cause																												
Long time	1067 A	Auto s.	16.754 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show																												
Short time	1500 A	Auto s.	0.054 s.	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input checked="" type="checkbox"/> Show <input type="checkbox"/> Not show																												
Instantaneous	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show																												
Earth fault	- A	- s.	- s.	<input type="checkbox"/> Pass <input type="checkbox"/> Not pass	<input type="checkbox"/> Show <input type="checkbox"/> Not show																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Responsibility</th> <th style="width: 85%;"></th> </tr> </thead> <tbody> <tr><td>Company</td><td></td></tr> <tr><td>Name</td><td></td></tr> <tr><td>Signature</td><td></td></tr> <tr><td>Date</td><td></td></tr> </tbody> </table>				Responsibility		Company		Name		Signature		Date																					
Responsibility																																	
Company																																	
Name																																	
Signature																																	
Date																																	

## Mold Case Circuit Breaker

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Club House			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : MDB 5			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	10PDB1/T5	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2	25PDB1/T5	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3	40PDB1/T5	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4	Busduct Low	NW25H1	Square D	2500	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
5	LPP1/T5	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
6	SPARE	NBD250L	Square D	200	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
7	SPARE	NBD250L	Square D	100	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
8					<input type="checkbox"/>	<input type="checkbox"/>	
9					<input type="checkbox"/>	<input type="checkbox"/>	
10					<input type="checkbox"/>	<input type="checkbox"/>	
11					<input type="checkbox"/>	<input type="checkbox"/>	
12					<input type="checkbox"/>	<input type="checkbox"/>	
13					<input type="checkbox"/>	<input type="checkbox"/>	
14					<input type="checkbox"/>	<input type="checkbox"/>	
15					<input type="checkbox"/>	<input type="checkbox"/>	
16					<input type="checkbox"/>	<input type="checkbox"/>	
17					<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>				<b>Witnessed by</b>			
Company				Millennium Residence Condominium			
Name							
Signature							
Date							

FIELD INSPECTION AND TEST RECORD MOLD CASE CIRCUIT BREAKER							
<b>PROJECT NAME</b> : Preventive Maintenance 2022				<b>LOCATION</b> : Club House			
<b>CUSTOMER</b> : Millennium Residence Condominium				<b>CUBICLE NAME</b> : ATIS-EMDB 5			
<b>ERECTION SITE</b> : -				<b>FEEDER</b> : -			
<div style="display: flex; justify-content: space-between;"> <div> <b>VISUAL INSPECTION AND FUNCTION TEST</b>            1. Mold case Circuit breaker undamaged and clean            2. All Fastenings checked         </div> <div style="text-align: right;"> <b>Checked</b>  <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> </div>							
No.	Load Name	Model	Brand	Rated Current (A)	Test trip		Result
					Pass	Not Pass	
1	Normal	NS800N	Square D	800	<input type="checkbox"/>	<input type="checkbox"/>	
2	Emergency	NS800N	Square D	800	<input type="checkbox"/>	<input type="checkbox"/>	
3	40PED B1/T5	NBD630L	Square D	500	<input type="checkbox"/>	<input type="checkbox"/>	
4	LPEP1/T5	NBD250L	Square D	50	<input type="checkbox"/>	<input type="checkbox"/>	
5	10PEDB1/T5	NBD250L	Square D	50	<input type="checkbox"/>	<input type="checkbox"/>	
6	25PEDB1/T5	NBD250L	Square D	50	<input type="checkbox"/>	<input type="checkbox"/>	
7	SN MCC-B-T5-01	NBD250L	Square D	63	<input type="checkbox"/>	<input type="checkbox"/>	
8	EAC MCC-F/D-T5-01	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
9	EAC MCC-F/D-T5-02	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
10	EAC MCC-F/D-T5-03	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
11	EAC MCC-F/B-T5-01	NBD250L	Square D	25	<input type="checkbox"/>	<input type="checkbox"/>	
12	EAC MCC-F/48-T5-01	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
13	EAC MCC-F/48-T5-02	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
14	EAC MCC-F/R-T5-01	NBD250L	Square D	40	<input type="checkbox"/>	<input type="checkbox"/>	
15	SLDB1/T5	NBD250L	Square D	160	<input type="checkbox"/>	<input type="checkbox"/>	
16	SN MCC-B-T5-02	NBD250L	Square D	25	<input type="checkbox"/>	<input type="checkbox"/>	
17	SN MCC-G-05	NBD250L	Square D	25	<input type="checkbox"/>	<input type="checkbox"/>	
18					<input type="checkbox"/>	<input type="checkbox"/>	
19					<input type="checkbox"/>	<input type="checkbox"/>	
20					<input type="checkbox"/>	<input type="checkbox"/>	
21					<input type="checkbox"/>	<input type="checkbox"/>	
22					<input type="checkbox"/>	<input type="checkbox"/>	
23					<input type="checkbox"/>	<input type="checkbox"/>	
24					<input type="checkbox"/>	<input type="checkbox"/>	
25					<input type="checkbox"/>	<input type="checkbox"/>	
26					<input type="checkbox"/>	<input type="checkbox"/>	
27					<input type="checkbox"/>	<input type="checkbox"/>	
28					<input type="checkbox"/>	<input type="checkbox"/>	
29					<input type="checkbox"/>	<input type="checkbox"/>	
30					<input type="checkbox"/>	<input type="checkbox"/>	
31					<input type="checkbox"/>	<input type="checkbox"/>	
32					<input type="checkbox"/>	<input type="checkbox"/>	
33					<input type="checkbox"/>	<input type="checkbox"/>	
34					<input type="checkbox"/>	<input type="checkbox"/>	
35					<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responsibility</b>				<b>Witnessed by</b>			
Company				Millennium Residence Condominium			
Name							
Signature							
Date							

FIELD INSPECTION AND TEST RECORD					
CAPACITOR BANK					
PROJECT NAME : Preventive Maintenance 2022			LOCATION : Club House		
CUSTOMER : Millennium Residence Condominium			CUBICLE NAME : MDB 5		
ERECTION SITE : -			FEEDER : CAP BANK		
TECHNICAL DATA					
<input checked="" type="checkbox"/> FUSE <input type="checkbox"/> MCCB			<input checked="" type="checkbox"/> CAPACITOR		
Manufacture		Mikro	Manufacture		MKS
Type		NH00	Type		HPC-30.3 440-3P
Rated current ( In )		125 A.	Rated voltage ( Un )		400 V.
<input checked="" type="checkbox"/> MEGNETIC CONTACTOR			Rated frequency ( fn )      50 Hz.		
Manufacture		Federal	Rated output ( On )		50 (25+25) kVar.
Type		FC-95DK21	Rated capacitance ( Cn )		497.36 µF.
Rated operation voltage ( Ue )		400 V.	Insulation level ( Ui )		kV.
1. VISUAL INSPECTION AND FUNCTION TEST					
<ul style="list-style-type: none"> <li>- Inspect physical and mechanical condition</li> <li>- Inspect alignment, grounding and clearances</li> <li>- Clean the unit</li> <li>- Verify tightness of accessible bolted electrical connection</li> <li>- Power Factor Controller ( PFC )</li> </ul>			Check      Remark		
			<input checked="" type="checkbox"/>		_____
			<input checked="" type="checkbox"/>		_____
			<input checked="" type="checkbox"/>		_____
			<input checked="" type="checkbox"/>		_____
Manufacture		Mikro	Type		PFR
Operating voltage		380-415 V.	Current input		5 A.
Serial no.		103091	Number of output		6
Setting : Starting current setting ( C/K )		0.23	CT ratio		-
Power factor setting		0.90	Switching time between steps		45 s.
			Switching sequences		-
Voltage measurement : A - N =		236 V.	B - N =		237 V.
A - B =		409 V.	B - C =		411 V.
			C - A =		410 V.
2. INSULATION RESISTANCE MEASUREMENT					
Test Instruments : Fluke Model 1587FC , Serial Number : 45580041					
Step No.	Test voltage ( Vdc )	Insulation Resistance ( MΩ )			
		A - Gnd	B - Gnd	C - Gnd	
1	500	201	192.8	229	
2	500	179	226	224	
3	500	80	94	103	
4	500	102	147	124	
5	500	56	54.2	56.9	
6	500	55	58.4	61.5	
7					
8					
9					
10					
11					
12					
WITNESSED					
Responsibility		Witnessed by			
Company		Millennium Residence Condominium			
Name					
Signature					
Date					



FIELD INSPECTION AND TEST RECORD CAPACITOR BANK			
PROJECT NAME	: Preventive Maintenance 2022	LOCATION	: Club House
CUSTOMER	: Millennium Residence Condominium	CUBICLE NAME	: MDB 5
ERECTION SITE	: -	FEEDER	: CAP BANK

### 3. CURRENT AND CAPACITANCE MEASUREMENT

Test Instruments : \_\_\_\_\_, Fluke Model 179, Serial Number : 23770566

Step No.	Rate Power	Rate Fuse	Measurement Capacitance ( μF )			Result
	(kVar)	(A)	Phase A-B	Phase B-C	Phase C-A	
1.	50	125	487	487	487	Passed
2.	50	125	486	483	487	Passed
3.	50	125	487	487	488	Passed
4.	50	125	487	487	487	Passed
5.	50	125	486	489	487	Passed
6.	50	125	479	479	479	Passed
7.						
8.						
9.						
10.						
11.						
12.						

Note: ☒ = Pass, ☐ = Not Pass, N/A = Not applicable

$$kVAR_R = kVAR_R \times \frac{V_A^2}{V_R^2} \times \frac{I_A}{I_R} = 50.00 \text{ kVar}, \text{ Normal current} = \frac{50.00 \text{ kVar}}{(V_{dc}) \times 1.732} = 72.17 \text{ A. / Set}$$

$$C_{LL} = \frac{3C_R}{2} = \frac{497.36 \mu F}{2} = 248.68 \mu F. / \text{Set for } \Delta \text{ Conn.}, \text{ No. of parallel capacitors} = \frac{72.17 \text{ A}}{248.68 \mu F} = 1$$

The capacitance shall not differ from the rated capacitance by more than -5% to + 10% for capacitor units and banks up to 3 Mvar total rating refer to IEC 60870-1 ; Tolerances : 472.49 μF to 547.10 μF or 68.56 A. to 79.39 A.

### 4. VOLTAGE AND CURRENT OF COOLING FAN MEASUREMENT

Position	Voltage measurement ( V )	Current measurement ( A )
Fan no. 1	-	-
Fan no. 2	-	-
Fan no. 3	-	-
Fan no. 4	-	-

Remark : \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibility	Witnessed by
Company	Millennium Residence Condominium
Name	
Signature	
Date	

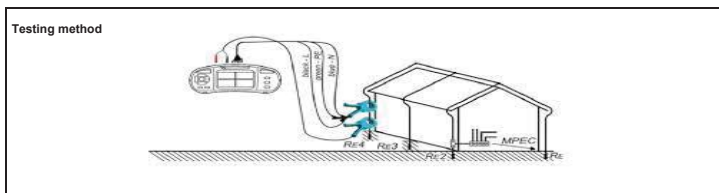
**Grounding**



FIELD INSPECTION AND TEST RECORD			
GROUND SYSTEM			
PROJECT NAME	: Preventive Maintenance 2022	Location	: Club House
CUSTOMER	: Millennium Residence Condominium	PANEL	: Electrical Room
SAP NO	: -	FEEDER NAME	: -

**Checking Test**

1. Cover seal visual check	<input checked="" type="checkbox"/>	_____
2. Cleaning box or joint	<input checked="" type="checkbox"/>	_____
3. Visual check cable	<input checked="" type="checkbox"/>	_____
4. Retorque connection	<input checked="" type="checkbox"/>	_____



**GROUNDING TEST**

Test Instruments : Metrel Model MI3123 , Serial Number : 16410143

NO	POINT / ROOM	AS FOUND TEST ( $\Omega$ )	Passed	Failed
1.	RMU	0.86	✓	
2.	Transformer 5	0.28	✓	
3.	MDB 5	0.14	✓	
4.	ATS-EMDB 5	0.14	✓	
5.	Lightning Aresster	0.26	✓	
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

**Remark :**

**NFPA & IEEE :** Recommends a ground resistance value of 5.0 $\Omega$  or less.

**NEC :** Make sure the system to ground is 25.0 $\Omega$  or less. Infacilities with sensitive equipment, it should be 5.0 $\Omega$  or less. (source-NEC 250.56) as their value for grounding or bonding.

**Telecommunications Industry :** Often uses 5.0 $\Omega$  or less as their value for grounding or bonding.

Responsibility	
Company	
Name	
Signature	
Date	

Photograph

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Club House

PHOTO 1



ขณะทำการ Check Voltage

PHOTO 2



ขณะทำการ Check Voltage

PHOTO 3



ขณะทำการทดสอบ Protection Relay

PHOTO 4



ขณะทำการทดสอบ Protection Relay

PHOTO 5



ขณะทำการ Cleaning

PHOTO 6



ขณะทำการ Cleaning

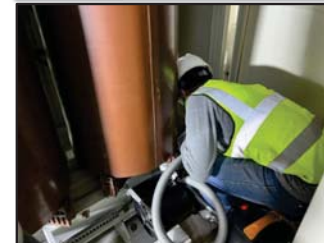
ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Club House

PHOTO 7



ขณะทำการ Cleaning

PHOTO 8



ขณะทำการ Cleaning

PHOTO 9



ขณะทำการทดสอบ Insulation Resistance

PHOTO 10



ขณะทำการ Check Torque

PHOTO 11



ขณะทำการทดสอบ Windin & Turn Ratio

PHOTO 12



ขณะทำการทดสอบ Windin & Turn Ratio

Responsibility	
Company	
Name	
Signature	
Date	

Responsibility	
Company	
Name	
Signature	
Date	



ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Club House

PHOTO 13



ขณะทำการ Cleaning

PHOTO 14



ขณะทำการ Cleaning

PHOTO 15



ขณะทำการ Cleaning

PHOTO 16



ขณะทำการ Cleaning

PHOTO 17



ขณะทำการ Cleaning

PHOTO 18



ขณะทำการ Cleaning

Responsibility	
Company	
Name	
Signature	
Date	

ขั้นตอนการทำความสะอาดและทดสอบอุปกรณ์ไฟฟ้า Club House

PHOTO 19



ขณะทำการทดสอบ Function Trip Unit

PHOTO 20



ขณะทำการทดสอบ Function Trip Unit

PHOTO 21



ขณะทำการทดสอบ Insulation Resistance

PHOTO 22



ขณะทำการทดสอบ Insulation Resistance

PHOTO 23



ขณะทำการทดสอบ Insulation Resistance

PHOTO 24



ขณะทำการวัดค่าความต้านทานดิน

Responsibility	
Company	
Name	
Signature	
Date	



## Tools List

Tools List to Test Electrical Equipment		
	Micro Ohmmeter/Chauvin Amoux/C.A 6240 Contact Resistance (Air Circuit Breaker)	
	Insulation Tester/Megger/MIT515 Insulation Resistance (TR,MDB)	
		
	Ground Tester/Metrel/MI3121H Insulation Resistance (MDB)	Ground Tester/Megger/DET4TCR2 Windin & Turn Ratio Measurement (TR)
Responsibility		Witnessed by
Company		Millennium Residence Condominium
Name		
Signature		
Date		

Tools List to Test Electrical Equipment



Ground Tester/Metrel/MI3123  
Grounding Resistance (RMU,TR,MDB)



Ground Tester/Megger/DET4TCR2  
Grounding Resistance (RMU,TR,MDB)



Relay Tester/Megger/Sverker 750  
Relay Testing System (RMU)

Responsibility	
Company	
Name	
Signature	
Date	