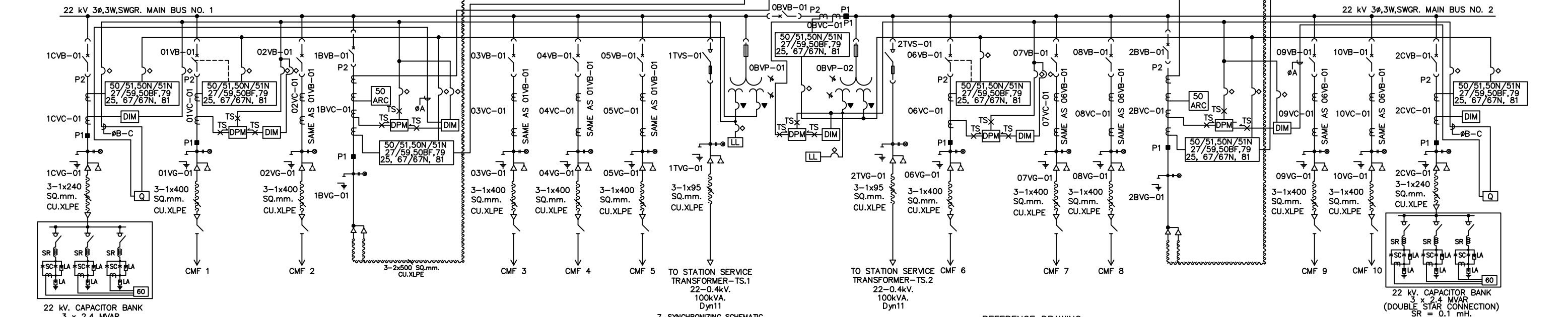


DEVICES	EXPLANATION
87L	LINE CURRENT DIFFERENTIAL RELAY
21, 21N	DISTANCE TIME-STEP PHASE AND GROUND DISTANCE RELAY
67, 67N	DIRECTIONAL PHASE AND GROUND OVERCURRENT RELAY
27, 59	UNDER/OVER VOLTAGE RELAYS
25	SYNCHROCHECK RELAY
79	AUTOMATIC RECLOSING RELAY
50BF	BREAKER FAILURE RELAY
50, 51	NON-DIRECTIONAL INSTANTANEOUS AND TIME PHASE OVERCURRENT RELAY
50N, 51N	NON-DIRECTIONAL INSTANTANEOUS AND TIME GROUND OVERCURRENT RELAY
51GB	NON-DIRECTIONAL GROUND BACKUP OVERCURRENT RELAY
87T	TRANSFORMER DIFFERENTIAL RELAY
87REF	TRANSFORMER RESTRICTED EARTH FAULT RELAY THIS RELAY SHALL BE INCORPORATED IN THE TRANSFORMER DIFFERENTIAL RELAY (87T)
90	AUTOMATIC VOLTAGE REGULATOR
87B1, 87B2	BUS DIFFERENTIAL RELAYS – LOW IMPEDANCE TYPE
95B1, 95B2	BUS BAR SUPERVISION RELAY FOR BUSWIRE SUPERVISION FOR 87B1 AND 87B2
81	UNDER FREQUENCY RELAY
60	CAPACITOR CURRENT UNBALANCE SENSING RELAY
Q	POWER FACTOR CONTROLLER
DPM	DIGITAL POWER METER
DIM	DISTRIBUTED I/O MODULE (PROVIDED IN CSCS)
V METER	DIGITAL VOLT METER
SS	SYNCHRONIZING SWITCH, 3-POSITION, AUTO-OFF-MAN
L	SYNCHRONIZING LAMP
V	VOLTMETER
F	FREQUENCY METER
S	SYNCHROSCOPE
LL	LINE INDICATING LAMP
TS	CURRENT TEST SWITCH
TS	POTENTIAL TEST SWITCH
▲	LOCATED IN THE SWITCHYARD JUNCTION BOX
●	LOCATED IN THE CONTROL AND RELAY BOARD
▼	LOCATED IN THE 22 kV SWITCHGEAR JUNCTION BOX
◇	LOCATED IN 22 kV SWITCHGEAR CONTROL PROTECTIVE CIRCUITS
⏏	WYE CONNECTED CT OF SECONDARY WINDING
Δ	DELTA CONNECTED CT OF SECONDARY WINDING (IF ANY)
⏏	TRANSFORMER BUSHING CT OF SECONDARY WINDING, WYE CONNECTED FOR PHASE OR NEUTRAL



- NOTES**
1. 115 kV. IVT RATIO  $\frac{115,000}{\sqrt{3}} : \frac{115}{\sqrt{3}} / 115 // \frac{115}{\sqrt{3}} / 115$  V
2. 115 kV. CT RATIO 1800/1500/1200/900/600/300 : 1/1/1/1 A. – FOR LINE BAY 20VA/5P20, 20VA/0.5FS5, 20VA/5P20, 20VA/5P20 1800/1500/1200/900/600/300 : 1/1/1 A. – FOR COUPLER BAY 20VA/5P20, 20VA/5P20, 20VA/5P20 1800/1500/1200/900/600/300 : 1 A. – FOR TRANSFORMER BAY (CORE1) 20VA/5P20 400/300/200 : 1/1/1 A. – FOR TRANSFORMER BAY (CORE2-4) 20VA/0.5FS5, 30VA/5P20, 30VA/5P20 50VA/0.5/1.9VF, 50VA/3P/1.9VF
3. 22 kV. VT. RATIO  $\frac{22,000}{\sqrt{3}} : \frac{110}{\sqrt{3}} / \frac{110}{\sqrt{3}}$  V
4. 22 kV. CT. RATIO 1800/1500/900 : 1/1/1/1 A – FOR INCOMING BREAKER 20VA/5P20, 20VA/0.5FS5, 20VA/5P20, 20VA/5P20 1800/1500/900 : 1/1 A – FOR TIE BREAKER 20VA/0.5FS5, 20VA/5P20 600/300 : 1/1 A – FOR OUTGOING 22 kV. 20VA/0.5FS5, 20VA/5P20 1800/900 : 1/1 A – FOR LOW SIDE TRANSFORMER BUSHING CT. 20VA/5P20, 20VA/0.5FS5 1800/900 : 1/1 A – FOR NEUTRAL BUSHING CT. 20VA/5P20, 20VA/5P20 600/300 : 1/1 A – FOR CAPACITOR BANK 20VA/0.5FS5, 20VA/5P20
5. THE NEUTRAL GROUND RESISTOR (NGR) ARE INDICATED FOR FUTURE INSTALLATION.
6. AUXILIARY CURRENT TRANSFORMERS SHOWN THUS, SHALL BE AS PARTS OF THE BUS DIFFERENTIAL RELAYS.

7. SYNCHRONIZING SCHEMATIC
- 7.1 –YP–0– SHOWN THUS, REFERS TO INCOMING IVT DESIGNATIONS.
- 7.2 BYP–0– SHOWN THUS REFERS TO RUNING BUS IVT FOR BUS No.1 OR No.2
- 7.3 0B ONLY – SHOWN THUS, REFERS TO THE SECONDARY WINDING OF IVT FOR PHASE "B" AND USING FULL TAP WINDING 115V FOR SYNCHRONIZING SYSTEM WITH ONE END OF THE WINDING CONNECTED WITH COMMON GROUND BUS.
- 7.4. MANUAL SYNCHRONIZING BY SYNCHROSCOPE SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF METERING CORES FROM "PHASE B" FOR BOTH IVT'S.
- 7.5. AUTOMATIC SYNCHRONISM VERIFICATION BY SYNCHRO CHECK RELAY(25) SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF RELAYING CORES FROM "PHASE B" FOR BOTH IVT'S.
8. THE MAIN-1 PROTECTION RELAY AND THE MAIN-2 RELAY WHICH ARE REFERED ON THIS DRAWING SHALL BE PROVIDED FROM DIFFERENT MANUFACTURER.
9. EACH DIGITAL POWER METER (DPM) SHALL BE COMMUNICATED WITH AUTOMATIC METER READING (AMR) APPLICATION SERVER VIA SWITCH NETWORK.
10. THE DEDICATED PROTECTIVE RELAY FOR 22kV SWITCHGEAR SHALL BE STANDARDIZED WHICH CAN BE EITHER USED FOR INCOMING, BUS COUPLER, OUTGOING FEEDERS OR CAPACITOR BANK FEEDER.

REFERENCE DRAWING  
– SINGLE LINE DIAGRAM ..... DWG. NO. FA3-011/62064

กองออกแบบสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แบบฉบับ
ฝ่ายงานสถานีไฟฟ้า		ถูกแทน โดยแบบ
ผู้เขียน <u>ฉัตรดิษฐ์</u>	ผู้ว่าการ (นางน)	เขียนเสร็จวันที่ 19 สค. 62
ผู้สำรวจ -		แก้แบบวันที่
วิศวกร <u>ฉัตรดิษฐ์</u>		มีมติเป็น
หัวหน้าแผนก <u>วราวุธ</u>	สถานีไฟฟ้าเชียงใหม่ 6 จ.เชียงใหม่	มาตรฐาน
ผู้อำนวยการกอง	มิเตอร์และรีเลย์ไดอะแกรม	
ผู้อำนวยการฝ่าย (นางน)		
รองผู้ว่าการวิศวกรรม	CHIANG MAI 6 SUBSTATION	แบบเลขที่ FA4-011/62093
	METERING AND RELAYING DIAGRAM	แผ่นที่ 1 ของจำนวน 1 แผ่น