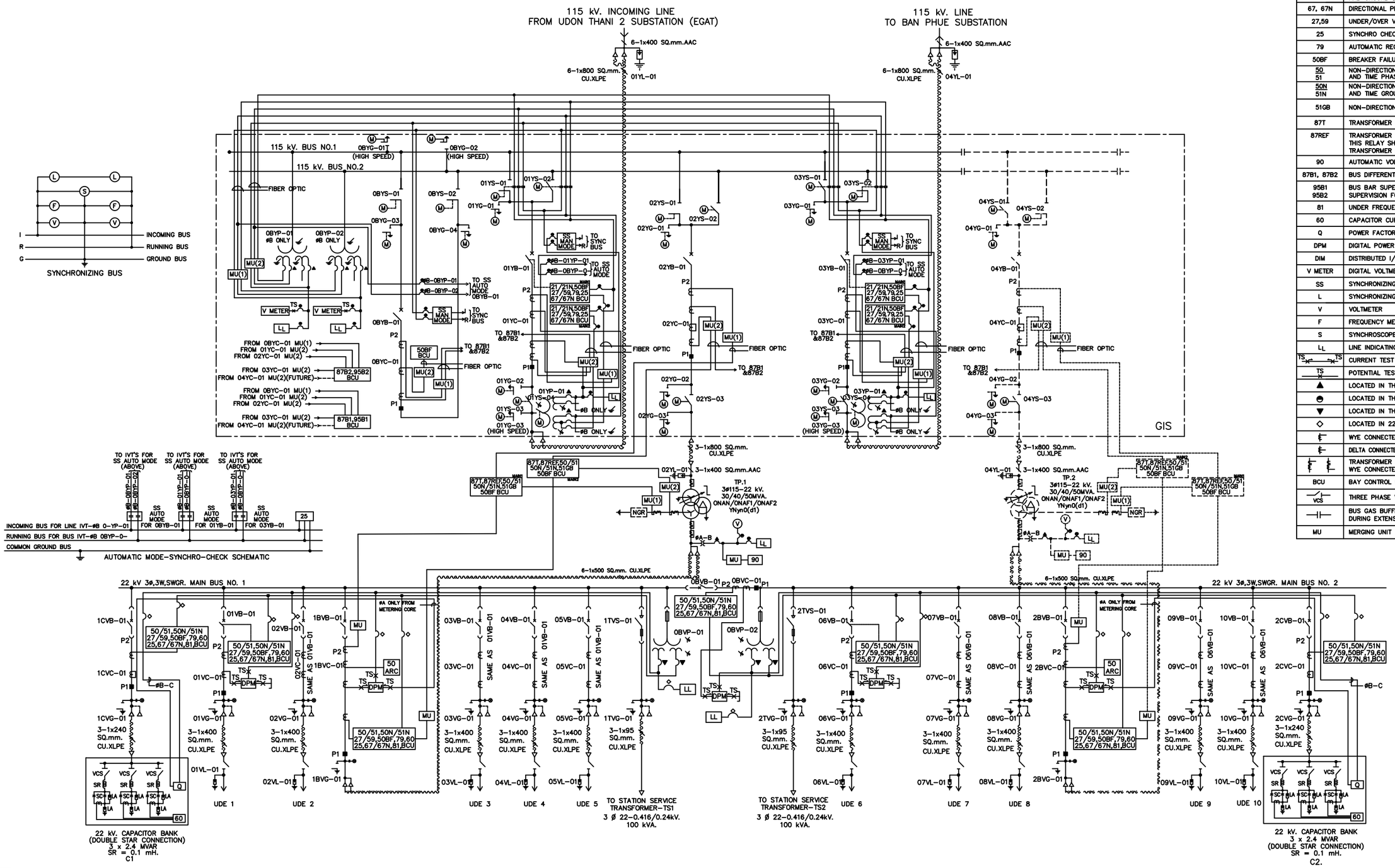
TDDP.2 UDE



DEVICES	EXPLANATION
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	SYNCHRO CHECK 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 VOLTMETER
SS	SYNCHRONIZING SWITCH,3-POSITION,AUTO-OFF-MAN
L	SYNCHRONIZING LAMP
V	VOLTMETER
F	FREQUENCY METER
S	SYNCHROSCOPE
LL	LINE INDICATING LAMP
TS 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
	DELTA CONNECTED CT OF SECONDARY WINDING (IF ANY)
	TRANSFORMER BUSHING CT OF SECONDARY WINDING, WYE CONNECTED FOR PHASE OR NEUTRAL
BCU	BAY CONTROL UNIT
VCS	THREE PHASE VACUUM SWITCH/BREAKER
	BUS GAS BUFFER MODULE (FOR DE-ENERGIZING ONLY ONE BUS DURING EXTENSION)
MU	MERGING UNIT

NOTES

1. 115 KV. IVT RATIO $\frac{115,000}{\sqrt{3}} : \frac{115}{\sqrt{3}} / 115 // \frac{115}{\sqrt{3}} / 115$ V — 50VA/0.2/1.5VF , 50VA/3P/1.5VF, SIMULTANEOUS BURDEN =100 VA.

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 A.	– FOR TRANSFORMER BAY (CORE 1)	20VA/5P20
400/300/200 : 1/1/1 A.	– FOR TRANSFORMER BAY (CORE 2-4)	20VA/0.5FS5,30VA/5P20, 30VA/5P20
1800/1500/1200/900/600/300 : 1/1/1 A.	– FOR BUS COUPLER BAY	20VA/5P20,20VA/5P20,20VA/5P20
500/200/100 : 1A	– FOR HIGH SIDE TRANSFORMER BUSHING CT	20VA/5P20 ***PARTICULAR REQUIREMENT FOR ALL 5P20 CLASS CT's CURRENT RATIO ERROR AT 100% OF RATED CURRENT < 0.5%

3. 22 KV. VT. RATIO $\frac{22000}{\sqrt{3}} : \frac{110}{\sqrt{3}} / \frac{110}{\sqrt{3}}$ V — 50VA/0.5/1.9VF , 50VA/3P/1.9VF

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
1800/900 : 1/1 A	– FOR LOW SIDE TRANSFORMER BUSHING CT	20VA/5P20 , 20VA/0.5FS5
1800/900 : 1/1 A	– FOR NEUTRAL TRANSFORMER BUSHING CT	20VA/5P20 , 20VA/5P20
600/300 : 1/1 A	– FOR OUTGOING 22 KV.	20VA/0.5FS5 , 20VA/5P20
600/300 : 1/1 A	– FOR CAPACITOR BANK	20VA/0.5FS5 , 20VA/5P20

***PARTICULAR REQUIREMENT FOR ALL 5P20 CLASS CT's CURRENT RATIO ERROR AT 100% OF RATED CURRENT < 0.5%

5. THE NEUTRAL GROUNDING RESISTORS (NGR) ARE INDICATED FOR FUTURE INSTALLATION.
6. SYNCHRONIZING SCHEMATIC
   6.1 0-YP-0- SHOWN THUS, REFER TO INCOMING IVT DESIGNATIONS.
   6.2 0BYP-0- SHOWN THUS REFERS TO RUNNING BUS IVT
   6.3 ø8 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.
   6.4 MANUAL SYNCHRONIZING BY SYNCHROSCOPE SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF METERING CORES FROM"PHASE B" FOR BOTH IVT'S.
   6.5 AUTOMATIC SYCHRONISM VERIFICATION BY SYNCHRO CHECK RELAY (25) SHALL UTILIZE INCOMING AND RUNNING SECONDARY VOLTAGES OF RELAYING CORES FROM"PHASE B" FOR BOTH IVT'S.
7. EACH DIGITAL POWER METER (DPM) SHALL BE COMMUNICATED WITH AUTOMATIC METER READING (AMR) APPLICATION SERVER VIA SWITCH NETWORK.
8. THE DEDICATED PROTECTION RELAY FOR 22 KV SWITCHGEAR SHALL BE STANDARDIZED WHICH CAN BE EITHER USED FOR INCOMING, OUTGOING FEEDERS, BUS SECTION, OR CAPACITOR BANK FEEDERS.
9. FOR 115KV SYSTEM, RELAYS SHALL BE DOUBLE MAIN PROTECTION RELAY(MAIN1&2) AND DIFFERENT PRODUCT/MANUFACTURER.
10. NETWORK TOPOLOGY OF SUBSTATION CONTROL AND PROTECTION SYSTEM IS TOPOLOGY 2
11. DOES NOT SHOW CONNECTION DETAILS OF ETHERNET SWITCH BETWEEN MERGING UNIT(MU) AND PROTECTION RELAY
12. AUTOMATIC SYNCHRO CHECK RELAY IS SUPPORT IEC61850 AND RECEIVED SIGNAL FROM MERGING UNIT(MU)

REFERENCE DRAWING
– SINGLE LINE DIAGRAM ..... DWG. NO. FA2-011/64005

UDE-M

กองออกแบบสถานีไฟฟ้า ฝ่ายงานสถานีไฟฟ้า	การไฟฟ้าส่วนภูมิภาค	ใช้แทนแบบ –
ผู้เขียน สุวิกรม ผู้สำรวจ – วิศวกร สุวิกรม หัวหน้าแผนก วรเวช ผู้อำนวยการกอง ผู้อำนวยการฝ่าย (แทน)	ผู้ว่าการ (แทน)	ถูกแทนโดยแบบ – เขียนเสร็จวันที่ 5 พ.ค. 2564 แก้แบบวันที่ – มิติเป็น – มาตราส่วน –
รองผู้ว่าการวิศวกรรม –	สถานีไฟฟ้าอุดรธานี 5 จ.อุดรธานี มิเตอร์และรีเลย์ไดอะแกรม UDON THANI 5 SUBSTATION UDON THANI PROVINCE METERING AND RELAYING DIAGRAM	แบบเลขที่ FA4-011/64015 แผ่นที่ 1 ของจำนวน 1 แผ่น