

Rockwell Automation

VITAL METALS PROCESS PLANT
 PROCESS CONTROL SYSTEM
 MAIN CONTROL CABINET 870-CP-001
 RA PROJECT: P2CA500039

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
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Rockwell Automation	
VITAL METALS PROCESS PLANT MAIN CONTROL CABINET 870-CP-001 TITLE SHEET	
Drawn by: GM	Date: 16/09/22



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INDEX SHEET

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DRAWING STANDARDS:

SYMBOLS:

- REFERS TO NOTE GIVEN BELOW
- ▲ LOW POWER CONTACT
- ↻ ARROW INDICATES FUNCTION INCREASE (ALWAYS CLOCKWISE)

4) **DANGER** - THIS EQUIPMENT MAY BE AT LINE VOLTAGE EVEN WHEN NOT IN OPERATION. TO AVOID ELECTRIC SHOCK, DISCONNECT.

5) **CAUTION** - NEVER REMOVE OR INSERT ANY MODULE OR CARD WHILE THE POWER IS ON.

9) REMOVE JUMPER IF ADDITIONAL INTERLOCK IS ADDED.

13) SEPARATELY MOUNTED, SUPPLIED BY OTHERS

14) SEPARATELY MOUNTED, SUPPLIED BY ROCKWELL AUTOMATION

32) MOTOR STABILIZING FIELD, S1 AND S2, IS NOT REQUIRED FOR NORMAL OPERATION. TAPE S1 AND S2 SEPARATELY AND DO NOT USE.

33) DRIVE MOTOR CONNECTIONS AS SHOWN ARE FOR INDICATED ROTATION FACING COMMUTATOR END. FOR OPPOSITE ROTATION, INTERCHANGE A1 AND A2 CONNECTIONS IN MOTOR CONDUIT BOX.

34) TACHOMETER LEADS MUST BE CONNECTED TO GIVE THE INDICATED POLARITY.

35) IF OPPOSITE ROTATION IS DESIRED, CHANGE POLARITY OF THE COSINE SIGNAL BY INTERCHANGING THE COSINE INPUT LEADS.

36) USE TWISTED TWO - CONDUCTOR CABLE. THIS CABLE MUST BE IN A SEPARATE SIGNAL CONDUIT. IT CANNOT BE RUN WITH OTHER CONDUCTORS OR CABLES. USE RELIANCE PART NUMBER 417900-76EAD OR EQUIVALENT. REFER TO FIELD INSTALLATION AND WIRING TABLE ON NEXT SHEET FOR WIRE SPECIFICATIONS.

38) SIGNAL WIRE CABLES WITH THIS NOTE NUMBER CAN BE IN THE SAME SIGNAL CONDUIT. THEY CANNOT BE RUN WITH NON-SIGNAL WIRES. REFER TO FIELD INSTALLATION AND WIRING TABLE ON NEXT SHEET FOR WIRE SPECIFICATIONS.

38-1) REFER TO NOTE 38. THE NUMBER FOLLOWING THE NOTE 38 IDENTIFIES THE CABLES THAT MAY BE GROUPED TOGETHER IN THE SAME SIGNAL CONDUIT. FOR EXAMPLE, CABLES REFERENCED WITH NOTE 38-1 CANNOT BE RUN IN THE SAME SIGNAL CONDUIT WITH NOTE 38-2 CABLES.

40) COAXIAL CABLES WITH THIS NOTE CAN BE IN THE SAME SEPARATE SIGNAL CONDUIT. THEY CANNOT BE RUN WITH OTHER CONDUCTORS OR CABLES. FOR RECOMMENDED CABLE TYPE, REFER TO PRODUCT'S NETWORK MANUAL.

CABLE TYPE	CABLE P/N (BELDEN P/N)	CONNECTOR (AMPHENOL P/N)	TERMINATOR 75 OHM RELIANCE P/N 707204-20A
RG59	417900-148A (9259)	405504-74A (31-212-1005)	AMPHENOL P/N 46650-75
RG11	417900-149A (8238)	612293-B (6775)	

41) **DANGER** - DO NOT OPEN DISCONNECT SWITCH WHILE THE MOTOR IS ENERGIZED.

47) RESOLVER WIRES: LOW LEVEL SIGNAL WIRING. MUST BE RUN IN SEPARATE SIGNAL CONDUIT OR TRAY.

BELDEN P/N	NO. OF TWISTED PAIRS	AWG #	RECOMMENDED MAXIMUM DIST. FOR EACH RESOLVER TYPE
			a) X1 a) X2 a) X5
b) 9730	3	24	1000 FT. 1000 FT. 600 FT.

- a) DISTANCES BEYOND THOSE RECOMMENDED MAY REQUIRE ADDITIONAL TUNING. USE RELIANCE CUSTOM PANEL 0-58801
- b) MAY ONLY BE RUN IN CONDUIT, PER NEC
- c) NOTE: CONNECT CABLE SHIELD TO GROUND AT CABINET ONLY

48) FIBER-OPTIC CABLES WITH THIS NOTE MAY BE RUN WITH ANY LEVEL 1 SIGNAL WIRING. IF NECESSARY THESE CABLES MAY BE RUN WITH ANY LEVEL WIRING. SEE INSTALLATION MANUAL FOR RESTRICTIONS.

52) REFER TO TRANSFORMER NAMEPLATE FOR CONNECTIONS OF PRIMARY LEADS.

53) **DANGER** - TRANSFORMER IS CONNECTED TO LINE VOLTAGE EVEN WHEN THE A-C DISCONNECT IS OPEN.

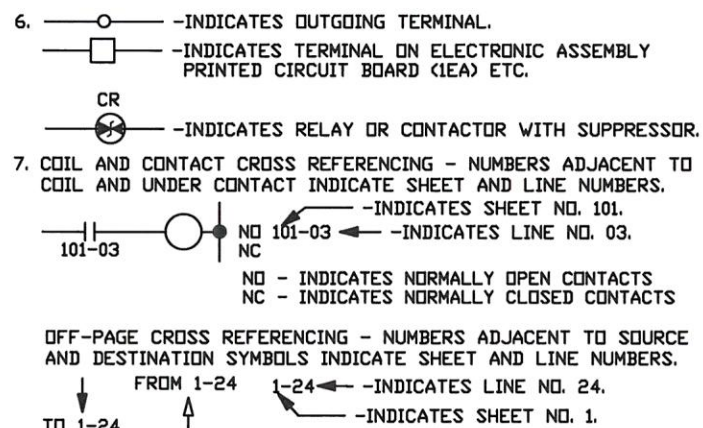
99) USER SUPPLIED PROTECTION MUST INCLUDE A DISCONNECTING DEVICE ON THE PRIMARY SIDE OF THE TRANSFORMER. PRIMARY AND SECONDARY WIRE PROTECTION FOR THE ISOLATION TRANSFORMER MUST BE PROVIDED PER NEC.

- D) MOUNTED ON DOOR.
- H) MOUNTED ON CABINET HOOD
- R) MOUNTED ON CONTROL HOUSE ROOF
- T) MOUNTED ON CABINET TRIM
- E) EXISTING EQUIPMENT

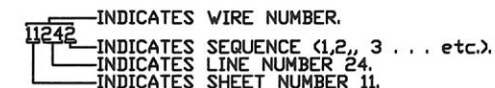
USE EXAMP. LOCATION CODES	DESCRIPTION
REM_NS	REMOTE MOUNTED - NOT SUPPLIED BY ROCKWELL AUTOMATION.
REM_S	REMOTE MOUNTED - SUPPLIED BY ROCKWELL AUTOMATION.
REM	REMOTE MOUNTED.
DS_2	MTD. ON OPERATORS STATION No. 2
PB_3	MTD. ON PUSHBUTTON STATION No. 3

GENERAL NOTES:

1. FOR FURTHER DRIVE INFORMATION ON INSTRUCTION MANUALS, SEE RESPECTIVE SCHEMATIC SECTIONS.
2. \perp - BUILDING GROUND TO BE GROUNDED BY CUSTOMER.
3. ∇_{TE} - SYSTEM ZERO POTENTIAL NODE
4. ∇_{PE} - POWER EQUIPMENT GROUND
5. ∇ - PANEL (CHASSIS) GROUND
3. THE INTERNAL WIRING SELECTED MEETS OR EXCEEDS NEC, UL, AND CSA. INTERNAL POWER AND CONTROL WIRE HAS INSULATION RATED AT 105°C OR HIGHER.
4. * - INDICATES COMPONENTS SUPPLIED BY OTHERS.
5. ④ INDICATES FIELD INSTALLED WIRES AS WELL AS THE WIRING LEVEL. WHEN ACCOMPANIED WITH THE DESIGNATION (FVC) THE WIRES/CABLE ARE PRE-SUPPLIED AT THE SOURCE CONNECTION BY ROCKWELL FOR CUSTOMER INSTALLATION AT SITE. (FVC) INDICATES FURNISHED WITH CABINET.



8. WIRE # GENERATION



INTERNAL WIRE NUMBERS MAY BE "FIXED" WITH A LINE AND SEQUENCE, BUT MAY SCHEMATICALLY SHOW A PREFIX.

9. TYPICAL DUAL VOLTAGE MOTOR FIELD CONNECTIONS ARE SHOWN BELOW. CONSULT THE MOTOR MANUFACTURER'S INSTRUCTIONS FOR CORRECT CONNECTIONS.

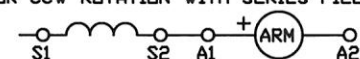


10. DC MOTOR ROTATION - CONSULT THE MOTOR MANUFACTURER'S INSTRUCTIONS FOR CORRECT CONNECTIONS.

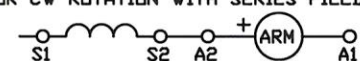
FOR CCW ROTATION FACING COMMUTATOR END:
A1 IS POSITIVE
F1 IS POSITIVE

FOR CW ROTATION FACING COMMUTATOR END:
A2 IS POSITIVE
F1 IS POSITIVE

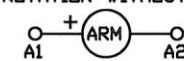
FOR CCW ROTATION WITH SERIES FIELD:



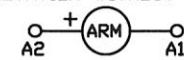
FOR CW ROTATION WITH SERIES FIELD:



FOR CCW ROTATION WITHOUT SERIES FIELD:



FOR CW ROTATION WITHOUT SERIES FIELD:



11. AC MOTOR ROTATION - CONSULT THE MOTOR MANUFACTURER'S INSTRUCTIONS FOR CORRECT CONNECTIONS.

FOR CW ROTATION VIEWED FROM MOTOR SHAFT:
INVERTER OUTPUT U2 TO T1 (EUROPEAN MARKING U1)
V2 TO T2 (EUROPEAN MARKING V1)
W2 TO T3 (EUROPEAN MARKING W1)

FOR CCW ROTATION VIEWED FROM MOTOR SHAFT:
INVERTER OUTPUT U2 TO T1 (EUROPEAN MARKING U1)
V2 TO T3 (EUROPEAN MARKING W1)
W2 TO T2 (EUROPEAN MARKING V1)

NOTE: NOT ALL AC MOTOR SUPPLIERS COMPLY WITH THE ABOVE CONVENTIONS.



COMBINATION MOTOR CONTROLLER WITH MOTOR CIRCUIT PROTECTOR

DANGER: To maintain overcurrent, short circuit and ground fault protection, the manufacturer's instructions for selecting current elements and setting the instantaneous-trip circuit breaker must be followed.

AVERTISSEMENT: Pour assurer une protection continue contre les surintensités, les courts-circuits et une mise à la terre accidentelle, il est essentiel de choisir les éléments thermiques et de régler le disjoncteur à déclenchement instantané selon la notice technique du fabricant.

Determine motor full load current and motor design type identifier from motor nameplate.

For Design B, C and D motors adjust motor circuit protector to operate at a current setting between ten (10) and thirteen (13) times the full load current. For Design E and N motors adjust motor circuit protector to operate at a current setting between thirteen (13) and seventeen (17) times the full load current.

NOTE: Motor circuit protector is set at minimum current setting when shipped from factory.

DANGER: Tripping of the instantaneous-trip circuit breaker is an indication that a fault current has been interrupted. Current carrying components of the magnetic motor controller should be examined and replaced if damaged, to provide continued protection against a risk of fire or electric shock. If burnout of the current element of an overload relay occurs, the complete overload relay must be replaced. (Refer to NEMA Standards Publication No. ICS 22 titled "Maintenance of Motor Controllers After a Fault Condition" also published as NEMA Standard Publication No. ICS 2, Part ICS 2-302.)

AVERTISSEMENT: L'ouverture du disjoncteur à déclenchement instantané indique qu'un courant de défaut a été interrompu. Les composants conducteurs de la commande magnétique du moteur doivent être inspectés et remplacés s'ils ont subi des dommages, afin d'assurer une protection continue contre le risque d'incendie et de choc électrique. En cas de défaillance de l'élément thermique d'un relais de surcharge, celui-ci doit être remplacé dans sa totalité.

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FIELD INSTALLATION AND WIRING

CATEGORY	WIRING LEVEL	SUB-GROUP	SIGNAL DEFINITION	SIGNAL EXAMPLES	CABLE TYPE	MINIMUM SPACING IN INCHES BETWEEN LEVELS (STEEL CONDUIT/TRAY)					SPACING NOTES
						4S	4	3	3S	2	
POWER (SEE NOTE 2-C FOR SPACING BELOW)	4	S	AC POWER (> 600VAC)	2.3KV 3 PHASE AC LINES	PER CEC AND LOCAL CODES	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	SEE NOTE 7	1 2 5
			AC POWER (< 600VAC)	480V 3 PHASE AC LINES	PER CEC AND LOCAL CODES	SEE NOTE 7	0	3/6	3/12	3/9	
			DC POWER	DC MOTOR ARMATURE	PER CEC AND LOCAL CODES						
CONTROL (300V MAX OR 20 AMPS)	3		115VAC/VDC LOGIC	RELAY LOGIC, PLC I/O	PER CEC AND LOCAL CODES	SEE NOTE 7	3/6	0	3/9	1/3	
			115VAC POWER	POWER SUPPLIES, INSTRUMENTS	PER CEC AND LOCAL CODES						
		S	24VAC/VDC LOGIC	PLC I/O	PER CEC AND LOCAL CODES						
MEDIUM LEVEL SIGNAL (PROCESS)	2		ANALOG SIGNALS DC SUPPLIES	REF/FEEDBACK SIGNAL, 5 TO 24VDC SUPPLIES	SHIELDED CABLE BELDEN 8770, 9418	SEE NOTE 7	3/12	3/9	0	1/1	2 3 4 5 6
			DIGITAL (LOW SPEED)	TTL							
		S	DIGITAL (HIGH SPEED)	RESOLVER, ENCODER/COUNTER I/O, PULSE TACH FEEDBACK	SHIELDED CABLE BELDEN 9730, 9773, 9892 (SEE USER MANUAL)						
		SHLD	ANALOG SIGNALS	REF/FEEDBACK SIGNALS	SHIELDED CABLE, TWISTED CONDUCTORS BELDEN 8760, 9729						
LOW LEVEL SIGNAL (COMM.)	1		SERIAL COMMUNICATION	RS232, 422 TO TERMINALS, PRINTERS	SHIELDED CABLE RS232-BELDEN 8770,8760 RS422-BELDEN 9729,9730	SEE NOTE 7	3/9	1/3	1/1	0	N/A
		S	PLC SERIAL COMMUNICATION (> 20K BAUD)	PLC REMOTE I/O, PLC DATA HIGHWAY	TWINAXIAL CABLE BELDEN 9463 R-A 1770-CD						
		C	PLC SERIAL COMMUNICATION (> 5MB)	CONTROL NET	RG-6 QUAD SHIELD, COAX CABLE, A-B 1786-RG6 BELDEN 3092A						
		D	CAN COMMUNICATION	DEVICE - NET DRIVE - DRIVE	R-A 1485C-P1-C						
		E	ETHERNET		DEPENDS ON INSTALLATION						
		F	PLC SERIAL COMMUNICATION (> 5MB)	CONTROL-NET	FIBER OPTIC						

GENERAL NOTES:

- STEEL CONDUIT IS RECOMMENDED FOR LEVELS 1 AND 2. FOR AC MOTOR CABLES, SEE NOTE 5. ALL CONDUITS CONNECTED TO THE CABINETS SHOULD BE PROPERLY SEALED TO MINIMIZE AIR OR WATER ENTRY INTO THE CABINETS. IF ALUMINUM CONDUIT IS USED, A. IT REQUIRES THE SAME MINIMUM SPACING IS USED AS THAT SHOWN FOR CABLE TRAYS. OR B. INDIVIDUAL STEEL JACKETED (STEEL MESH) CABLES ARE TO BE USED IF THE CONDUIT SPACINGS NEED BE THE SAME AS STEEL CONDUIT.
- SPACING SHOWN BETWEEN LEVELS IS THE MINIMUM REQUIRED FOR PARALLEL RUNS ≤ 400 FEET. GREATER SPACINGS SHOULD BE USED WHERE POSSIBLE.
- SHIELDS FOR SHIELDED CABLES MUST BE CONNECTED AT ONE END ONLY. THE OTHER END SHOULD BE CUT BACK AND INSULATED. SHIELDS FOR CABLES FROM A CABINET TO AN EXTERNAL DEVICE MUST BE CONNECTED AT CABINET END. SHIELDS FOR CABLES FROM ONE CABINET TO ANOTHER MUST BE CONNECTED AT THE SOURCE END CABINET. SPLICING OF SHIELDED CABLES, IF ABSOLUTELY NECESSARY, SHOULD BE DONE SUCH THAT SHIELDS REMAIN CONTINUOUS AND INSULATED FROM GROUND.

- NO. 16 AWG WIRE IS THE MINIMUM RECOMMENDED SIZE FOR CONTROL (LEVEL 3). POWER WIRE IS SELECTED BY LOAD, USING 75 DEG C WIRE RATING (LEVELS 4 AND 4S).
- ARMORED CABLE WITH A PVC OUTER JACKET IS REQUIRED TO PROVIDE THE NECESSARY ELECTRICAL SHIELDING FOR AC MOTOR CABLES CONNECTED TO A PWM INVERTER.

RECOMMENDATIONS:
METALLIC ARMOR:
BEST PERFORMANCE: SHIELDED BELDEN CABLE PER TABLE BELOW, OR CONTINUOUS CORRUGATED ALUMINUM INTERLOCKED ALUMINUM, OR INTERLOCKED STEEL
ACCEPTABLE PERFORMANCE:
CONDUCTORS:
BEST PERFORMANCE: PHASE CONDUCTORS - 3
GROUND CONDUCTORS - 3
ACCEPTABLE PERFORMANCE: PHASE CONDUCTORS - 3
GROUND CONDUCTORS - 1
THE CABLE CONNECTOR SELECTED MUST PROVIDE A GOOD ELECTRICAL CONNECTION BETWEEN THE ARMOR AND THE PE GROUND PLANE AT EACH END OF THE CABLE.

SHIELDED CABLE RECOMMENDATIONS:

BELDEN	29500	#16 AWG
BELDEN	29501	#14 AWG
BELDEN	29502	#12 AWG
BELDEN	29503	#10 AWG
BELDEN	29504	#8 AWG
BELDEN	29505	#6 AWG
BELDEN	29506	#4 AWG
BELDEN	29507	#2 AWG



DESCRIPTION - 4 CONDUCTOR TINNED COPPER, XLPE INSULATION, 600VRMS MAX, SPECIFICALLY DESIGNED FOR IGBT DRIVE APPLICATIONS. THE SHIELD SHOULD BE CONNECTED TO THE PE GROUND PLANE

SPACING NOTES:

- BOTH OUTGOING & RETURN CURRENT CARRYING CONDUCTORS ARE TO BE PULLED IN THE SAME CONDUIT OR LAYERED ADJACENT IN CABLE TRAY.
- ROUTE CABLES OF THE FOLLOWING LEVELS AS INDICATED:
A. LEVELS MUST BE RUN IN SEPARATE CONDUITS OR TRAYS.
B. INTERMIXING OF LEVELS IS NOT ALLOWED.
C. SPECIAL LEVELS 4S AND 3S MAY EXIST THAT REQUIRE SPECIFIC WIRES TO BE GROUPED FOR SPECIAL HANDLING.
D. LEVELS 1 AND 2 MAY HAVE THEIR RESPECTIVE CIRCUITS (WITHIN A GIVEN LEVEL) PULLED IN THE SAME CONDUIT OR LAYERED ADJACENT IN THE SAME CABLE TRAY.
- CONDUCTORS OF LEVELS 1 AND 2 MUST BE SHIELDED WHERE INDICATED PER THE RECOMMENDATIONS OR EQUIVALENT.
- IN CABLE TRAYS, STEEL SEPARATORS ARE ADVISABLE BETWEEN THE LEVELS.
- IF CONDUIT IS USED IT IS REQUIRED THAT IT BE CONTINUOUS AND COMPOSED OF MAGNETIC STEEL. (SEE GENERAL NOTE 1 ABOVE)
- FOR FURTHER INFORMATION ON SPACING OF PLC COMMUNICATION CABLES TO LEVEL 4, SEE R-A PLC INSTALLATION MANUAL.
- PER CEC SECTION 12, CONDUCTORS OF CIRCUITS RATED OVER 600V ARE NOT ALLOWED TO OCCUPY THE SAME CABLE, TRAY, OR CONDUIT. IT IS ACCEPTABLE FOR A TRAY TO HAVE A METAL BARRIER FOR SEPARATION.

COIL AND SOLENOID SUPPRESSION:

BEFORE UTILIZING THE CONTROL CIRCUIT POWER AVAILABLE FOR OPERATION OF CUSTOMER SUPPLIED DEVICES, THE COILS OR SOLENOIDS OF SUCH DEVICES MUST BE SUPPRESSED. THE EXTERNAL CONTROL CIRCUIT WIRING MUST BE RUN IN A SEPARATE CONDUIT THAT DOES NOT HAVE VARIABLE SIGNAL VOLTAGES OR POWER CIRCUIT VOLTAGES PRESENT. ELECTRICAL TRANSIENTS MAY CAUSE OCCASIONAL DRIVE MALFUNCTIONING.

EXAMPLE: SPACING RELATIONSHIP BETWEEN 480VAC INCOMING LEADS
a. 480VAC LEADS ARE LEVEL 4.
b. 24VDC LEADS ARE LEVEL 3.
c. FOR SEPARATE STEEL CONDUITS, THE CONDUITS ARE TO BE 3 INCHES APART.
d. IN A CABLE TRAY THE TWO GROUPS OF LEADS ARE TO BE 6 INCHES APART.

SHIELDED CABLES RECOMMENDATIONS:
BELDEN 8770 18 AWG - 3 CONDUCTOR SHIELDED
BELDEN 8760 18 AWG - 2 CONDUCTOR SHIELDED
BELDEN 9418 18 AWG - 4 CONDUCTOR SHIELDED
BELDEN 9728 24 AWG - 4 SHIELDED PAIRS (8 COND.)
BELDEN 9729 24 AWG - 2 SHIELDED PAIRS (4 COND.)
BELDEN 9730 24 AWG - 3 SHIELDED PAIRS (6 COND.)
BELDEN 9892 22 AWG - 3 SHIELDED PAIRS (6 COND.)
BELDEN 9773 18 AWG - 3 SHIELDED PAIRS (6 COND.)
BELDEN 9463 75 OHM - TWINAXIAL (2 COND.)

FIELD WIRING INSIDE ROCKWELL ENCLOSURE:

- CONNECTIONS WILL BE ONLY TO TERMINALS PROVIDED.
- WIRE LENGTH FROM ENTRY POINT TO TERMINAL BOARD TO BE AS SHORT AS POSSIBLE.
- SIGNAL WIRE MUST NOT BE LACED OR RUN WITH NON-SIGNAL WIRE AFTER ENTRY INTO THE ENCLOSURE.
- INCOMING WIRE MUST NOT BE ROUTED IN WIRE CHANNELS OR THROUGH AREAS OF POWER AND CONTROL COMPONENTS AND WIRING.
- USE LASHING BARS WHEN PROVIDED FOR CUSTOMER CONVENIENCE.

FIELD INSTALLATION GROUNDING GUIDELINES

- FOR DRIVES INSTALLATION, REFER TO 'WIRING AND GROUNDING GUIDELINES', PUBLICATION DRIVES-IN001
- FOR PLC AND I/O INSTALLATION, REFER TO 'INDUSTRIAL AUTOMATION WIRING AND GROUNDING GUIDELINES', PUBLICATION 1770-4.1
- CEC SECTION 10, GROUNDING AND BONDING
- LOCAL CODE REQUIREMENTS

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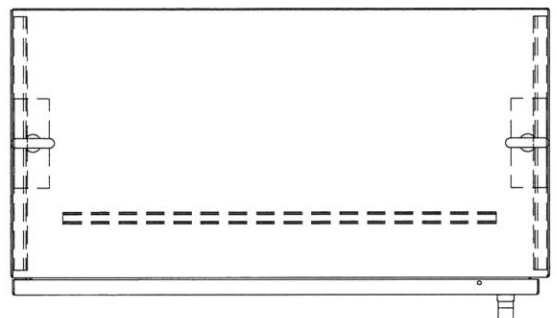
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VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
WIRE CLASSIFICATION

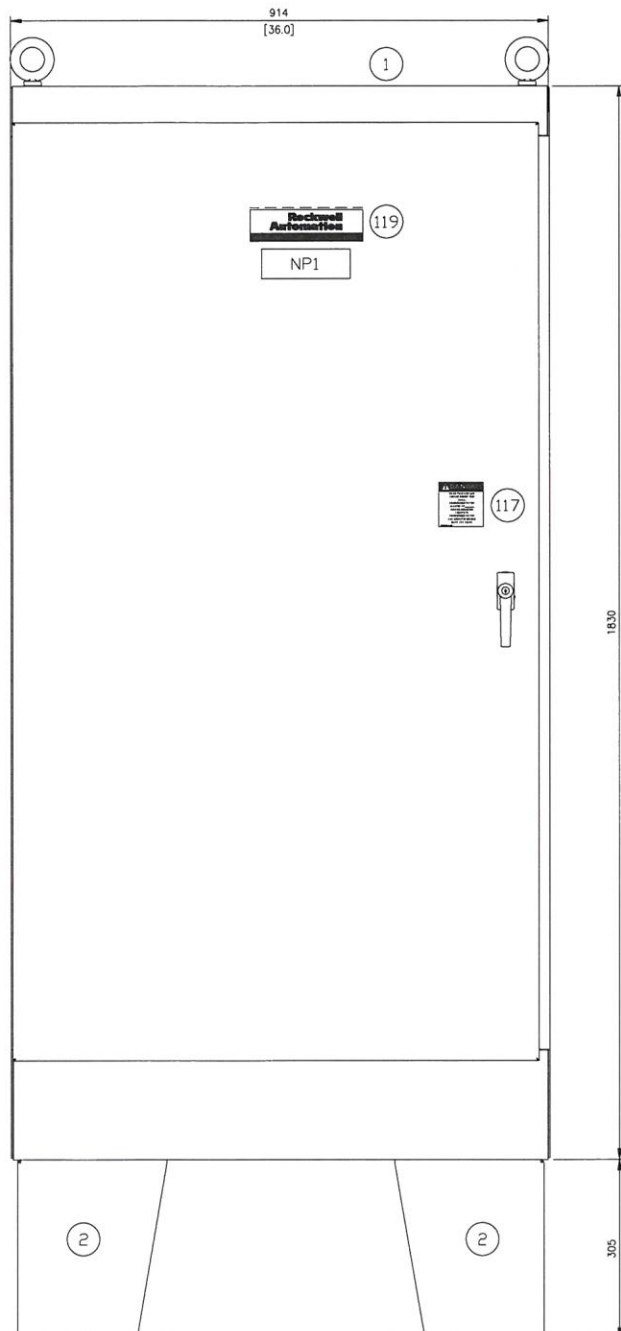
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Sheet	03	of	32
Next Sh	05		
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	P2CA500039-0001		Ver 1

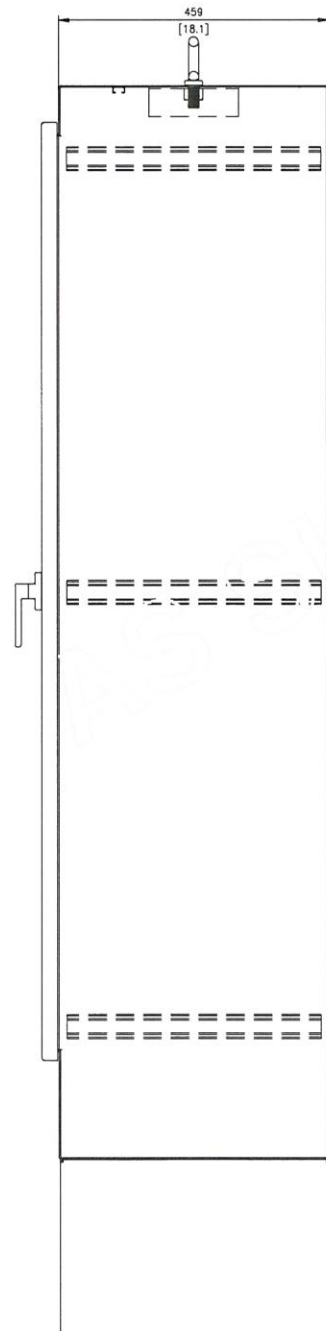




TOP LAYOUT
N.T.S.



FRONT LAYOUT
N.T.S.



RIGHT SIDE LAYOUT
N.T.S.

ITEM	QTY	CATALOG	DESC1	MFG
1	1	A723618FS	TYPE 12, FREESTANDING ENCLOSURE 72"(H)x36"(W)x18"(D)	HOFFMAN
2	1	AFK1218	FLOOR STAND KIT, 12", GRAY, STEEL	HOFFMAN
117	2	80006-315-01	WARNING LABEL	RA
118	1	80120-367-02	DATA NAMEPLATE	RA
119	1	30104-362-01	RA MONOGRAM NAMEPLATE, POLYCARBONATE, 7.5"x2.13", VELVET	RA

DATA NAMEPLATE

CAT NO: PROCESS PLANT
MAIN CONTROL CABINET
870-CP-001

ORDER NO: [] ENCLUSE TYPE: 12
FACILITY: []

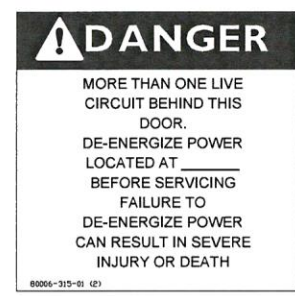
SERIAL NO: P2CA500039-0001
WORK STA: P2CA500039-0001 SH 10-12

MONITOR: [] HEAVY DUTY: []
VOLTAGE: [] PH: []
CURRENT: [] AMP: []

SHORT CIRCUIT CURRENT RMS SYMMETRICAL: 10 KA
[480] VOLTAGE NOMINAL

Rockwell Automation MADE IN CANADA REF

80120-367-02 LABEL (INSIDE)



DANGER LABEL
OUTSIDE AND INSIDE
80006-315-01



NOTES:
NP1 - CABINET FRONT DOOR NAMEPLATE
BLACK TEXT ON WHITE LAMICOID
TEXT SIZE: 10MM
1. FIELD CABLES BOTTOM ENTRY. POWER FEED BOTTOM ENTRY.

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25/04/23	GM	AS SHIPPED
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C	11/01/23	GM	
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VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
CABINET LAYOUT

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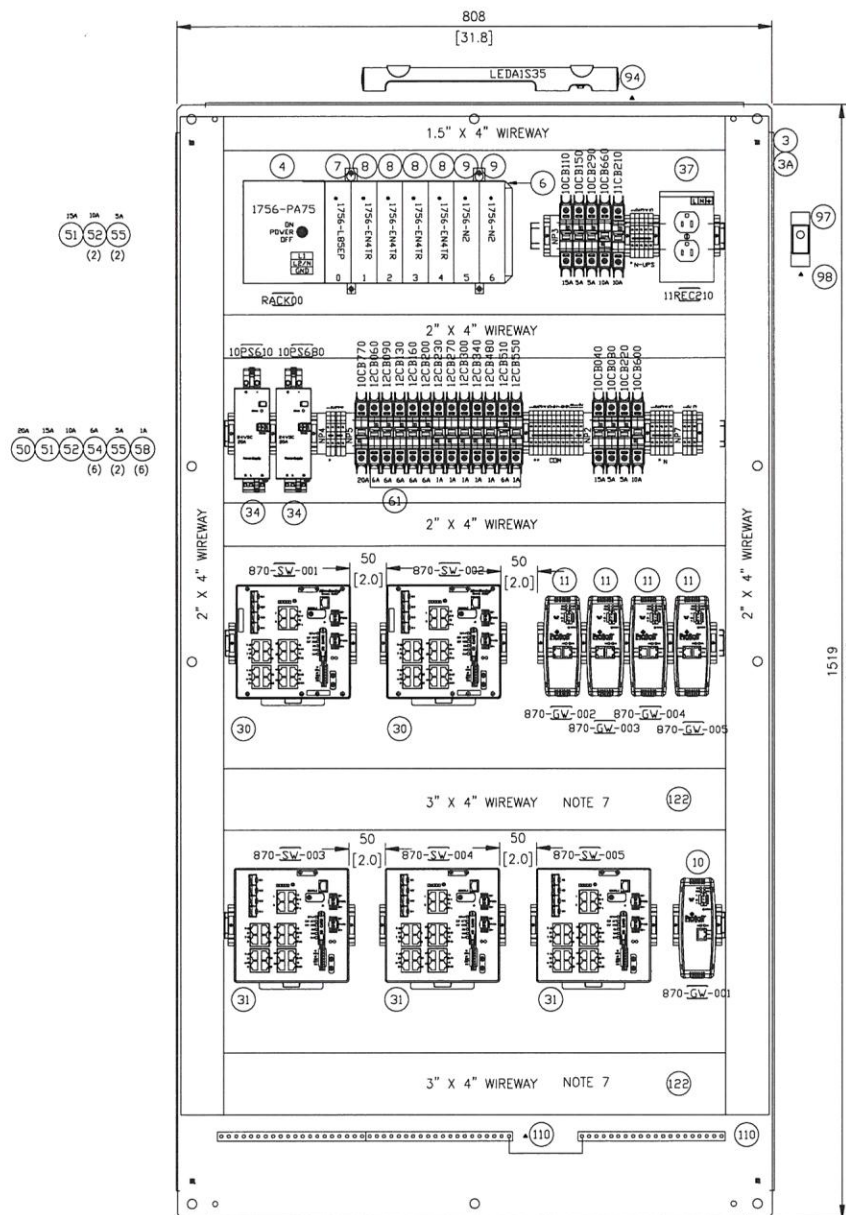
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Number: 6985
Discipline: Automation
S.A. Reg. No: 6506
Signature: []
2023-04-27
SASKATCHEWAN



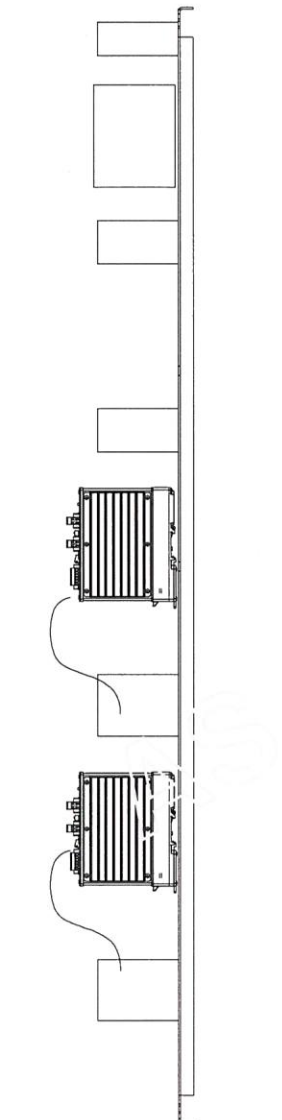
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PANEL LAYOUT
N.T.S



RIGHT SIDE VIEW
N.T.S

LOAD	VA/W	QTY	BACKPLANE CONSUMPTION W	24V CONSUMPTION W	120V UPS CONSUMPTION W		BTU/hr	BTU/hr-TOT
					NOMINAL	MAXIMUM		
1756-PA75		1			45.0		85.3	85.3
1756-A7		1					15.4	15.4
1756-L85EP	6.20	1	6.2				21.2	21.2
1756-EN4TR	6.12	4	24.5				20.9	83.6
		SUM 1	30.7					
1783-HMS16TG4CGR		40		80.0			143.3	286.7
1783-HMS16T4CGN		35		105.0			119.5	358.4
PLX31-EIP-MBTCP		7		7.0			23.9	23.9
PLX32-EIP-PND		7		28.0			23.9	95.6
1606-XLE480ERZ	480	2			264	493.4	45.7	91.5
1489-MICXXX		22					6.8	150.2
ADDITIONAL	50	1			50		30.7	30.7
		TOTAL		2200	309.0	543.4	BTU/hr->	1120.5
							Watt->	328.3

NAMEPLATE SCHEDULE					
ITEM	QTY.		DESCRIPTION	PLATE SIZE	TEXT SIZE
NP1	1	LINE 1 LINE 2 LINE 3	PROCESS PLANT MAIN CONTROL CABINET 870-CP-001	190 X 65	10 MM
NP2	1	LINE 1 LINE 2	TB1 120VAC	1492-GM35	AS REQ.
NP3	1	LINE 1 LINE 2	TB2 120VAC-UPS	1492-GM35	AS REQ.
NP4	1	LINE 1 LINE 2	TB3 24VDC	1492-GM35	AS REQ.
NP5	1	LINE 1 LINE 2	TB4 24VDC	1492-GM35	AS REQ.
NP6	1	LINE 1 LINE 2	TB5 120VAC	1492-GM35	AS REQ.
NP7	1	LINE 1 LINE 2	TB6 LTB	1492-GM35	AS REQ.
NP8	1	LINE 1 LINE 2			

NAMEPLATES: STANDARD RA, AS PER LAYOUT AND WIRING DIAGRAMS.

NOTES:

- FIELD CABLES: BOTTOM ENTRY.
- COMPONENT GROUNDING AS PER VENDOR SPECIFICATION.
- AUXILIARY LED LIGHT TERMINALS: INSTALLED LOCATION BY PANEL SHOP.
- 120VAC AND 24VDC WIRING TO BE SEPARATED.
- SEE SH.7 FOR PANEL BOM.
- EQUIPMENT NAMEPLATES: (10 X 30)MM LAMICID OR STICKER - TEXT AS SHOWN ON LAYOUT.
- ALL WIREWAYS ARE NARROW-SLOT EXCEPT WIDE-SLOT FOR CAT6 PATCH CABLES.



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Rockwell Automation

VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
PANEL LAYOUT

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ITEM	QTY	CATALOG	DESC2	DESC3	MFG
3	1	A72P36F1	MOUNTING PANEL, WHITE, 60"(H)x32"(W)		HOFFMAN
3A	1	ASPANKIT72	SEISMIC PANEL MOUNTING KIT, 72"		HOFFMAN
4	1	1756-PA75	85-265 VAC POWER SUPPLY (13 AMP @ 5V)		RA
6	1	1756-A7	7-SLOT CONTROLLOGIX CHASSIS		RA
7	1	1756-L8SEP	LOGIX5585E PROCESS CONTROLLER WITH 40 MBYTES MEMORY		RA
8	4	1756-EN4TR	ETHERNET/IP 10/100/1G HIGH PERFORMANCE BRIDGE W/ CIP	SECURITY	RA
9	2	1756-N2	CONTROLLOGIX SLOT FILLER MODULE		RA
10	1	PLX31-EIP-MBTCP	ENET/IP TO MODBUS TCP/IP COMMUNICATION GATEWAY		PROSOFT
11	4	PLX32-EIP-PND	PROSOFT ETHERNET/IP TO PROFINET GATEWAY FOR DUAL SUBNETS		PROSOFT
30	2	1783-HMS16TG4CGR	STRATIX 5400, 16 COPPER 10/100/1000 PORTS, 4 COMBD 10/100/1000	PORTS, LAYER 3 FW	RA
31	3	1783-HMS16T4CGN	STRATIX 5400, 16 CU 10/100 PORTS, 4 COMBD 10/100/1000 PORTS	LAYER 2 FW	RA
34	2	1606-XLE480ERZ	20A POWER SUPPLY, 24-28V DC, 480W, 100-240V AC INPUT		RA
37	1	1492-RECI5G	1492 DIN RAIL RECEPTACLE, 15A, GFCI		RA
41	6	1585J-M8CBJM-0M6	ETHERNET CABLE, 8 CONDUCT., STRAIGHT MALE, RJ45	TEAL PVC SHIELDED, 100BASE-TX, 100 MB/S, 0.6M	RA
42	8	1585J-M8CBJM-1	ETHERNET CABLE, 8 CONDUCT., STRAIGHT MALE, RJ45,	TEAL PVC SHIELDED, 100BASE-TX, 100 MB/S, 1M	RA
43				TEAL PVC SHIELDED, 100BASE-TX, 100 MB/S, 1.5M	RA
44	7	1585J-M8CBJM-2	ETHERNET CABLE, 8 CONDUCT., STRAIGHT MALE, RJ45		
50	1	1489-MIC200	CIRCUIT BREAKER, 1 POLE, 20A, 277VAC, 48VDC, 5-10IN		RA
51	2	1489-MIC150	CIRCUIT BREAKER, 1 POLE, 15A, 277VAC, 48VDC, 5-10IN		RA
52	3	1489-MIC100	CIRCUIT BREAKER, 1 POLE, 10A, 277VAC, 48VDC, 5-10IN		RA
54	6	1489-MIC060	CIRCUIT BREAKER, 1 POLE, 6A, 277VAC, 48VDC, 5-10IN		RA
55	4	1489-MIC050	CIRCUIT BREAKER, 1 POLE, 5A, 277VAC, 48VDC, 5-10IN		RA
58	6	1489-MIC010	CIRCUIT BREAKER, 1 POLE, 1A, 277VAC, 48VDC, 5-10IN		RA
60					
61	1	1489-AMCL112	12 PINS, 12 CIRCUIT BREAKERS - 1 PHASE BUS BAR		RA
69	29	1492-J4	TERMINAL BLOCK, BUL 1492-J, GRAY, 500 VAC/DC, 3.5A 22-10AWG		RA
70	5	1492-CJJ6-10	CENTER JUMPER, SCREW TYPE, 1J-POLE		RA
71	27	1492-EAJ35	1492 TERMINAL BLOCK ACCESSORIES END ANCHOR, END ANCHOR		RA
72	5	1492-GM35	1492 TERMINAL BLOCK ACCESSORIES GROUP MARKER CARRIER		RA
73	5	1492-EBJ16	END BARRIER, GRAY, J16/J15 DR PART, PLATE FOR J3/J4/J6/J10		RA
94	1	LEDAIS35	LED CABINET LIGHT 90-260 VAC, 5W		HOFFMAN
97	1	ALFSWD	DOOR SWITCH ASSEMBLY		HOFFMAN
98	1	LDSWITCH72	PANELITE DOOR SWITCH CABLE, 72" (1.83M)		HOFFMAN
109	1	N-87	GROUND BAR, 6-14AWG, 34.5" (876MM)		ILSCO
110	30	E-153	1/4"-28X7/16", GROUND BAR LUG		ILSCO
111					
116	14		NAMEPLATE (10x30)MM WHITE LAMICOID OR STICKER		PANEL SHOP
120	3	199-DR1	35MM DIN RAIL, 1M		RA
121					
122	1.4M	G3X4LG6	PANDUCT WIDE SLOT DUCT, LT GRAY, PVC, 4.1"x3.25", PK6		PANDUIT
123					PANDUIT
124	0.9M	F1.5X4LG6	PANDUCT NARROW SLOT DUCT, LT GRAY, PVC, 4.1"x1.75", PK6		PANDUIT
125	4.5M	F2X4LG6	PANDUCT NARROW SLOT DUCT, LT GRAY, PVC, 4.1"x2.25", PK6		PANDUIT
126	0.7M	C1.5LG6	PANDUCT C2LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x1.75", PK6		PANDUIT
127	1.4M	C2LG6	PANDUCT C3LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x2.25", PK6		PANDUIT
128	4.2M	C3LG6	PANDUCT C1LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x3.25", PK6		PANDUIT
129					
130					

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Rockwell Automation

VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
PANEL BILL OF MATERIALS

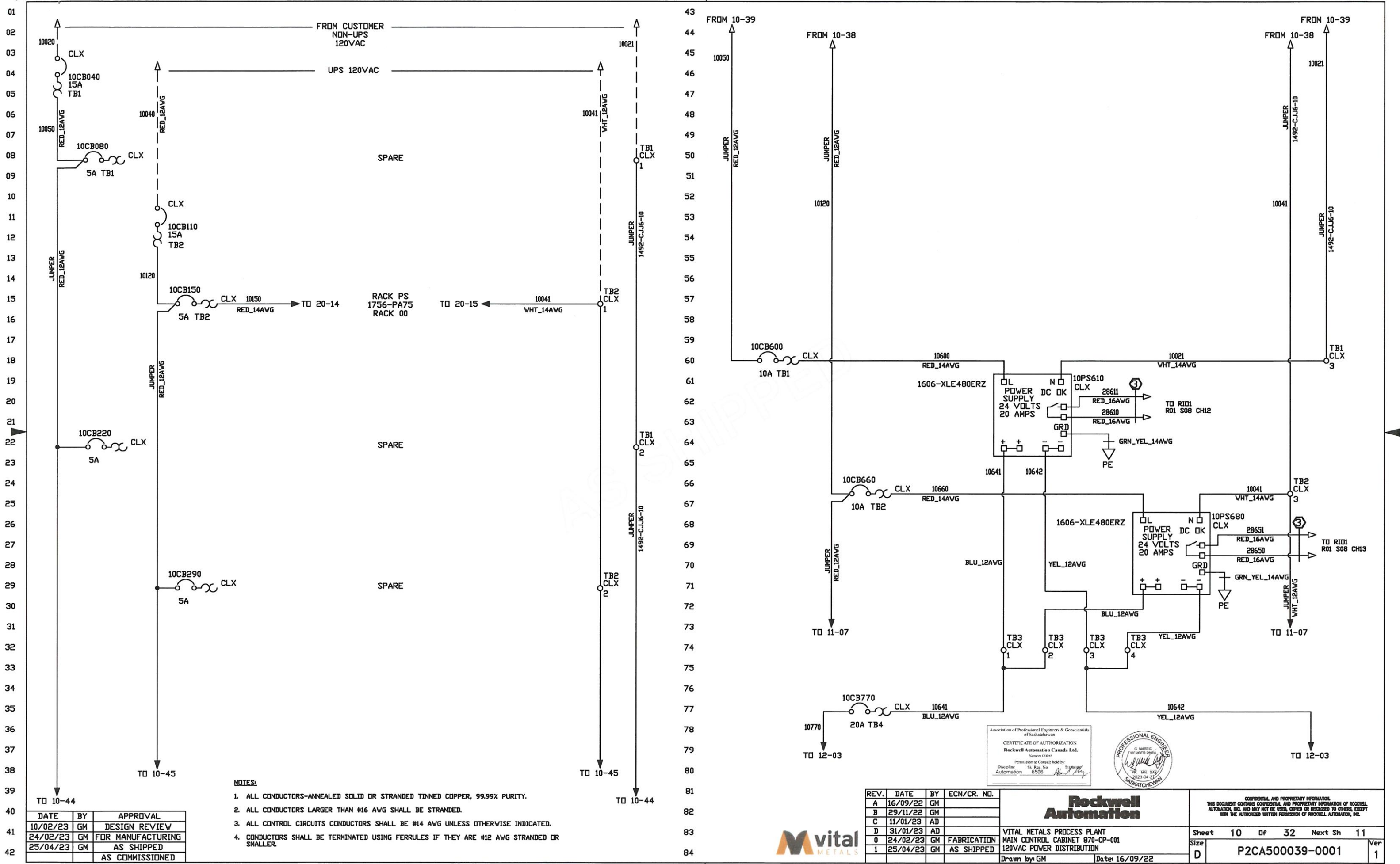
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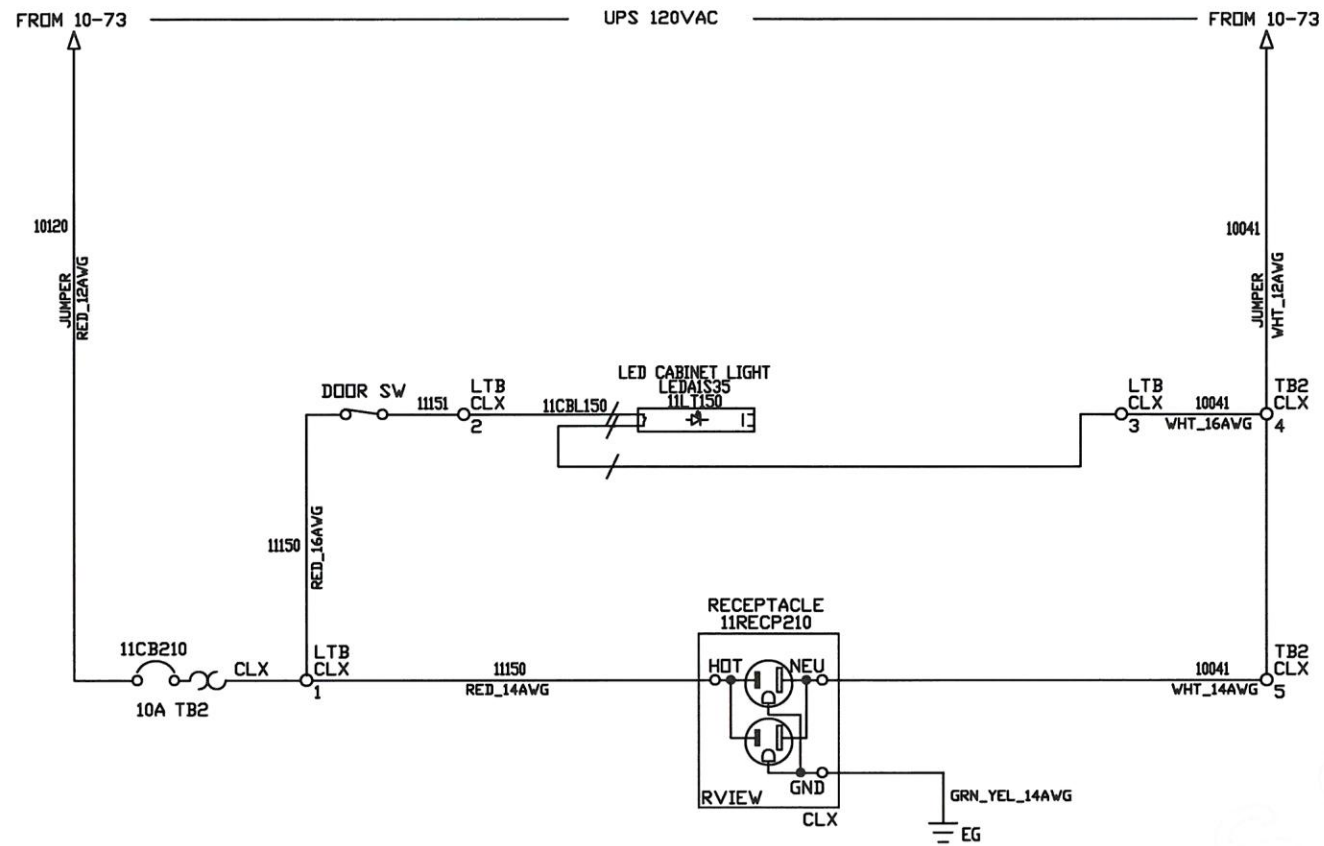
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 MAIN CONTROL CABINET 870-CP-001
 120VAC POWER DISTRIBUTION
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MAIN CONTROL CABINET 870-CP-001
120VAC POWER DISTRIBUTION

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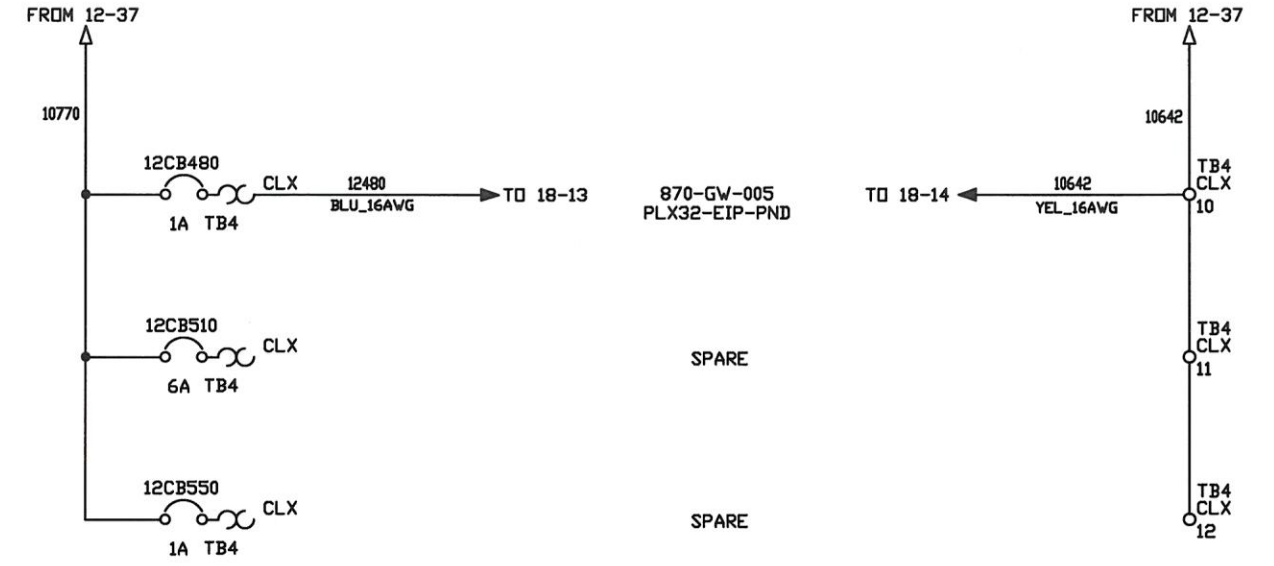
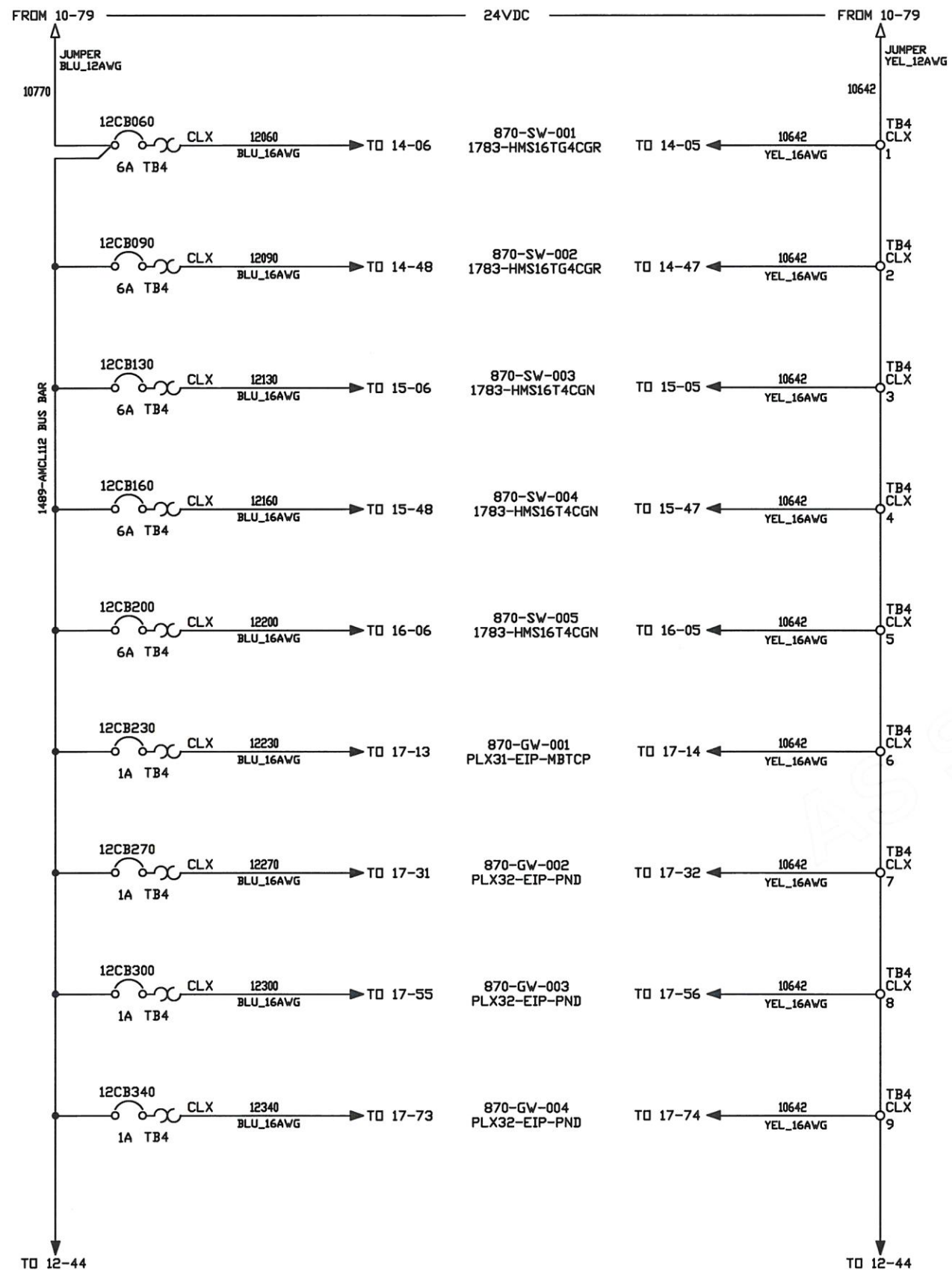
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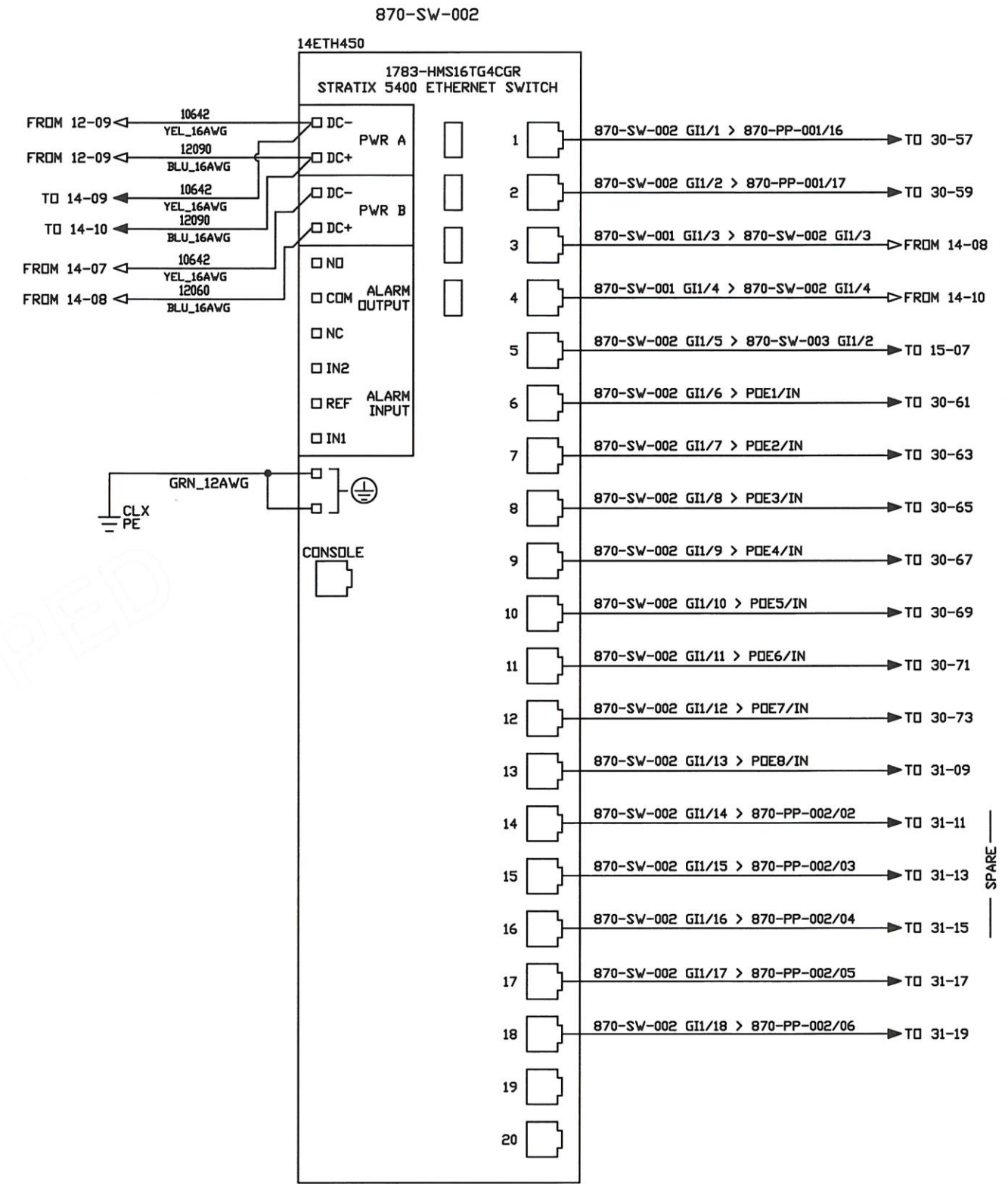
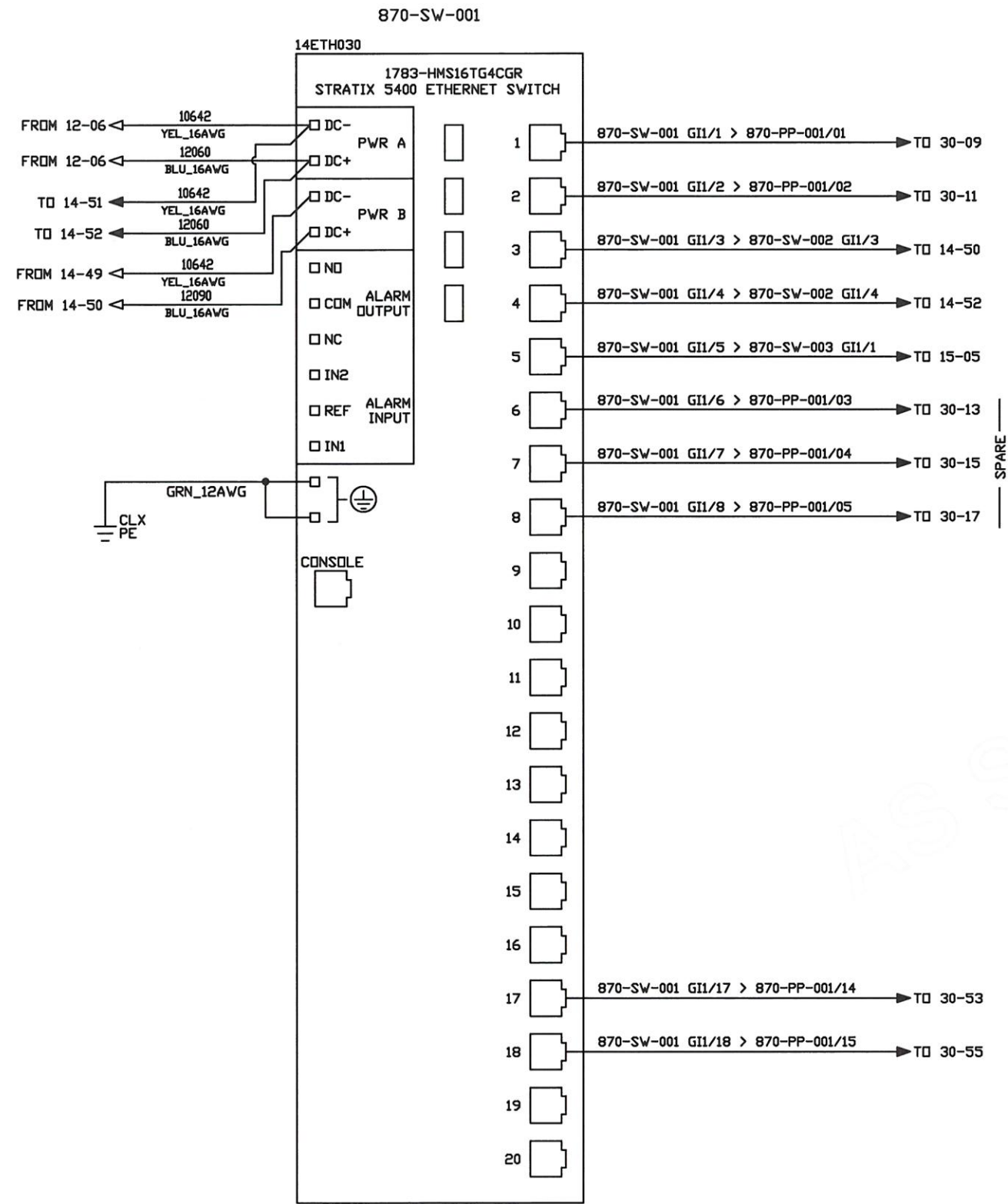
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VITAL METALS PROCESS PLANT
 MAIN CONTROL CABINET 870-CP-001
 24VDC POWER DISTRIBUTION
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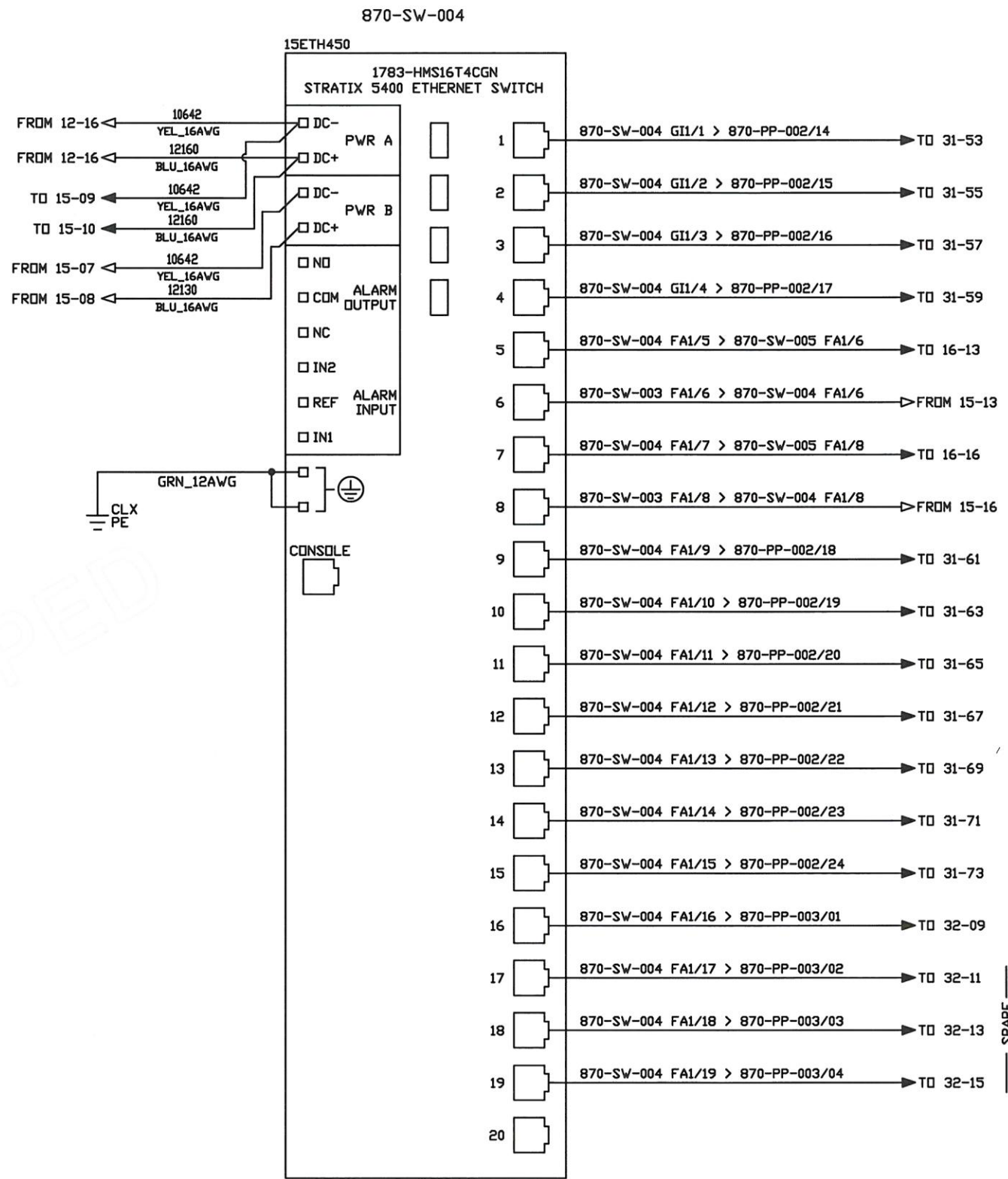
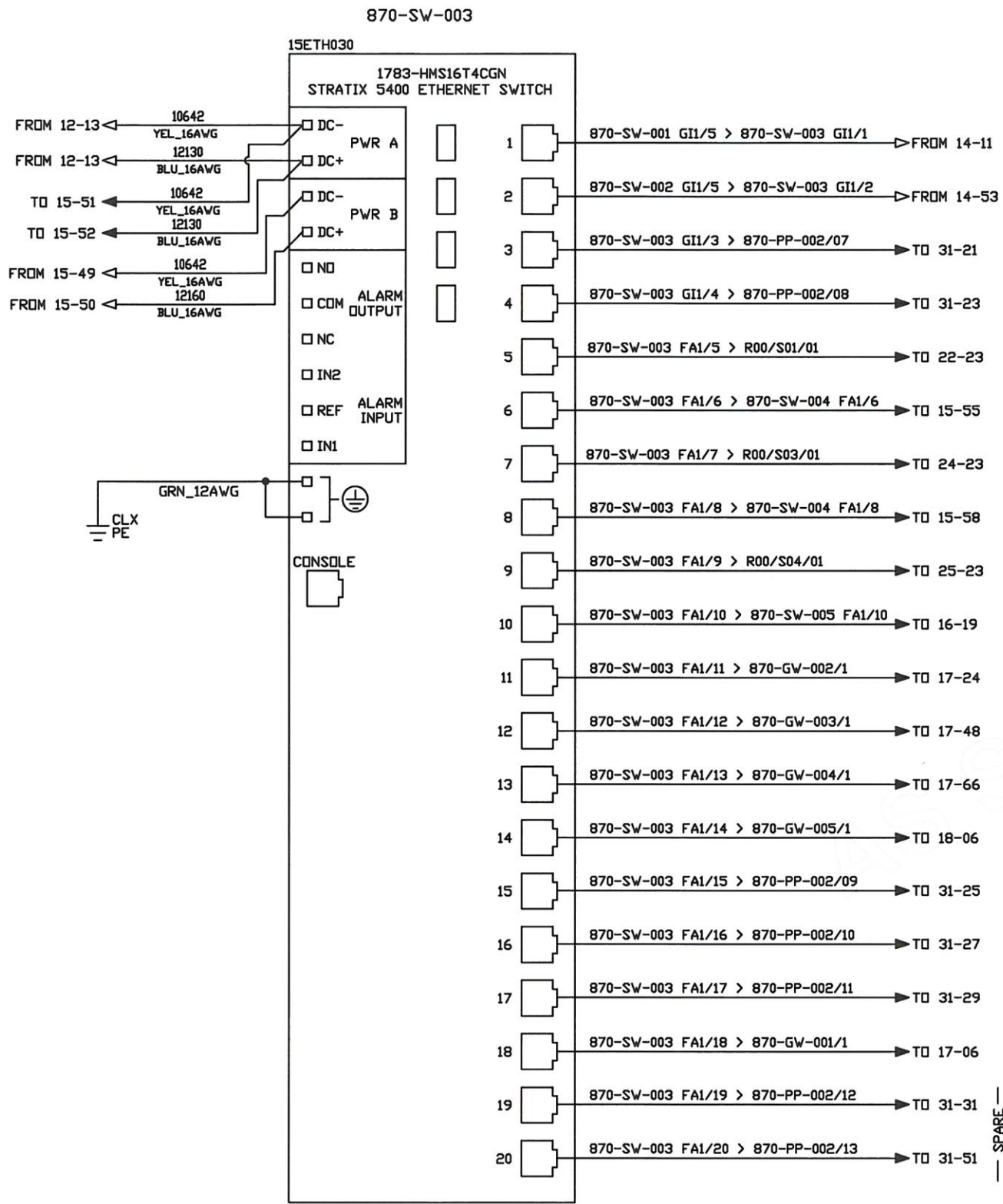
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 VITAL METALS PROCESS PLANT
 MAIN CONTROL CABINET 870-CP-001
 SWITCH 870-SW-001 & 870-SW-002
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 VITAL METALS PROCESS PLANT
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 SWITCH 870-SW-003 & 870-SW-004
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Sheet 15 of 32 Next Sh 16
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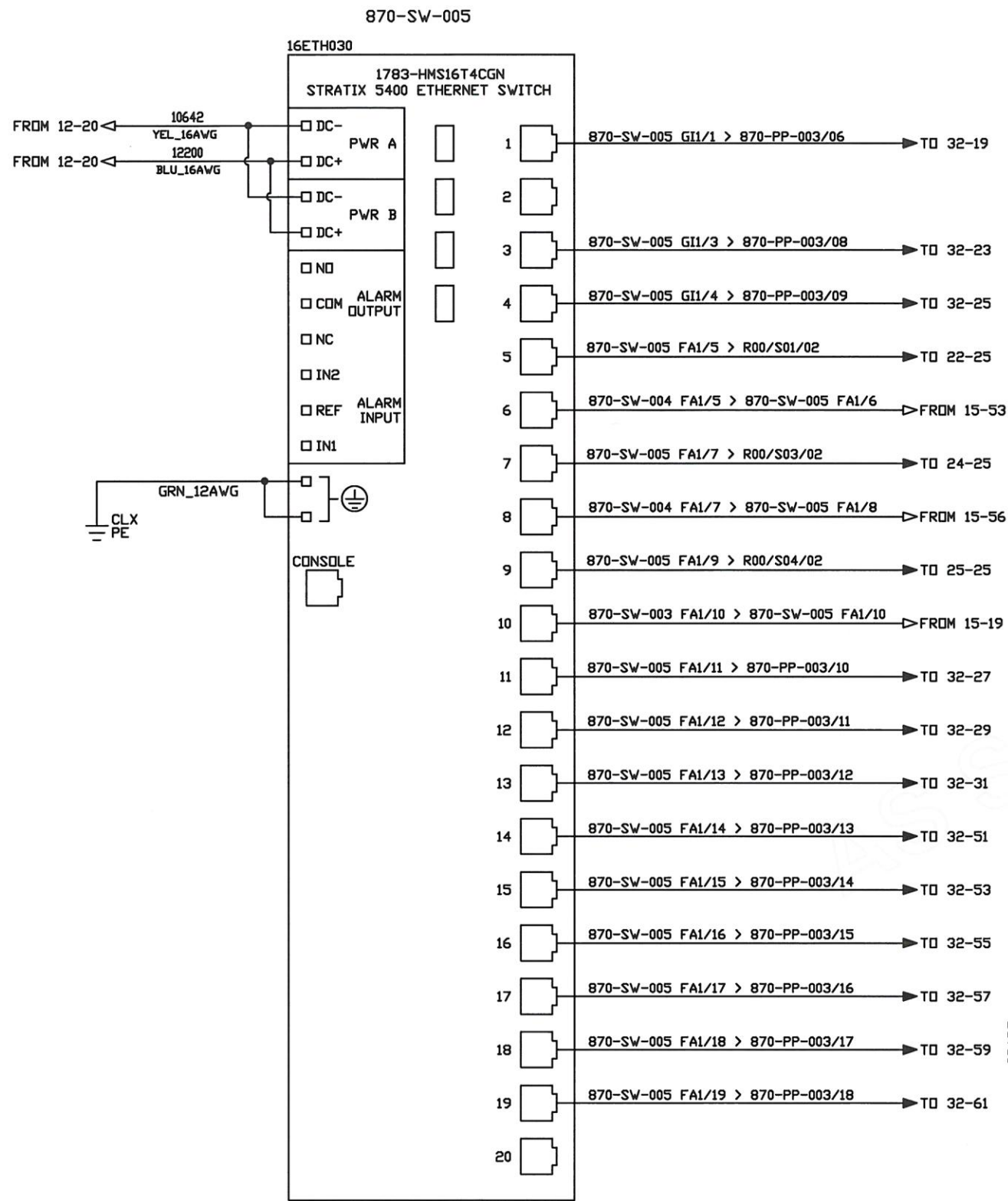


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 Number: C0985
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 Signature: [Signature] 2023-04-27
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----- FIBER OPTIC
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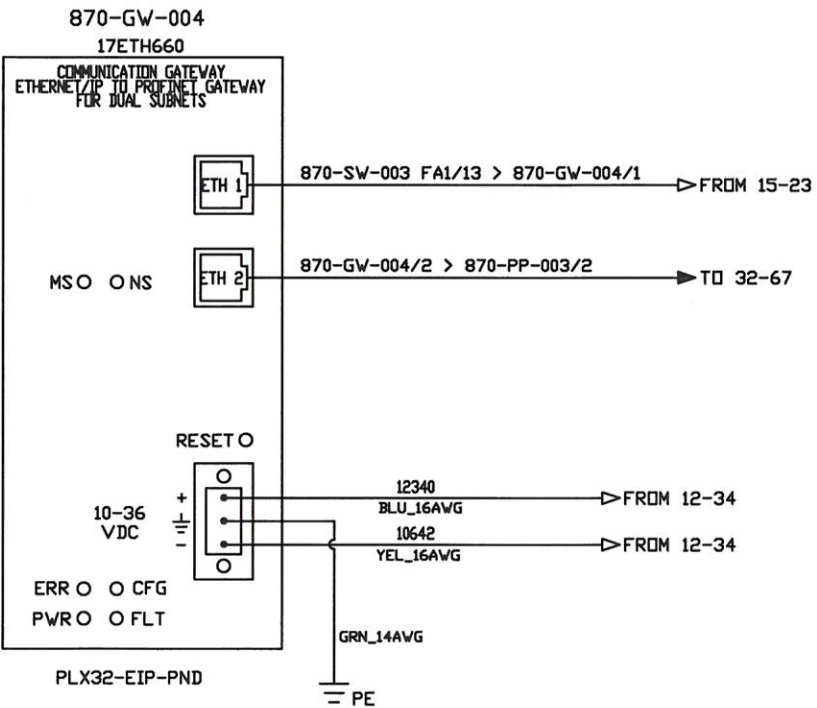
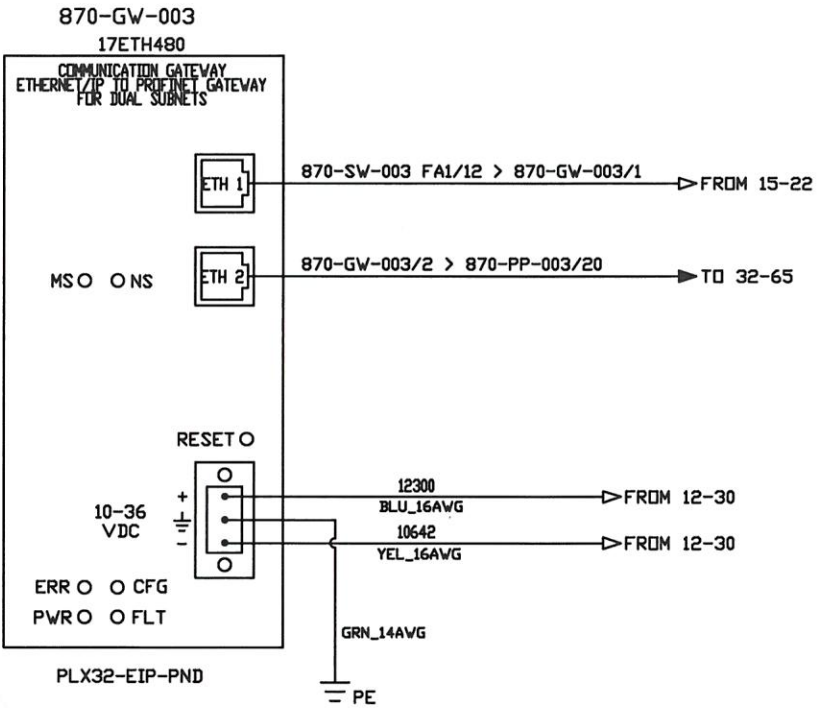
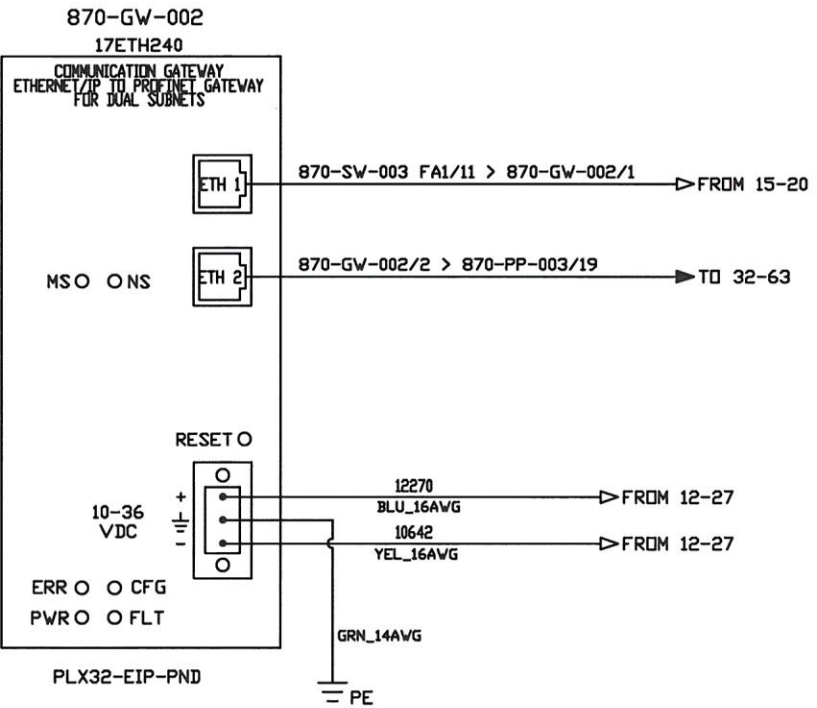
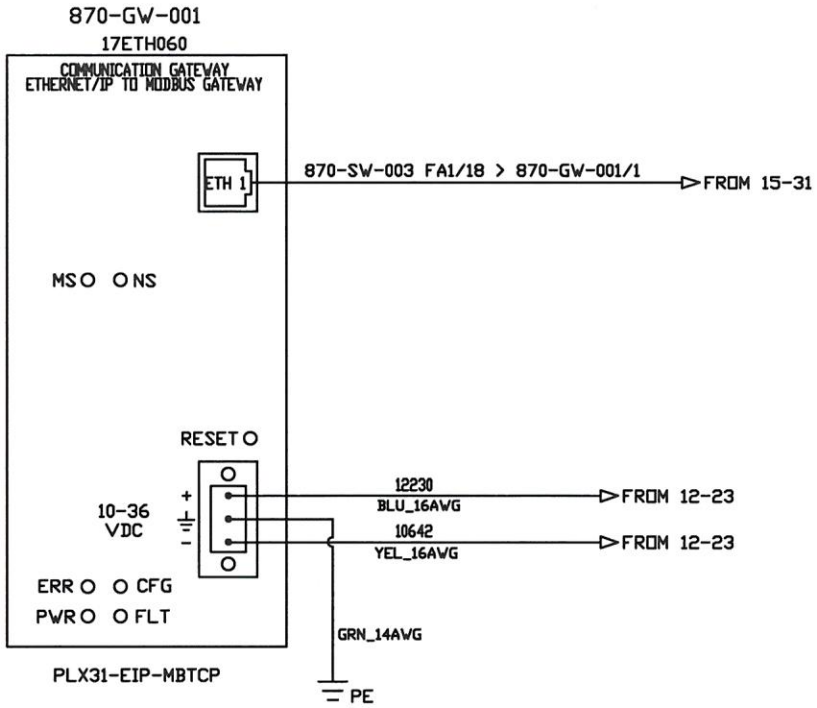
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REV.	DATE	BY	ECN/CR. NO.	Rockwell Automation		Sheet 16 of 32 Next Sh 17	Ver 1
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B	29/11/22	GM					
C	11/01/23	AD					
D	31/01/23	AD					
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1	25/04/23	GM	AS SHIPPED	SWITCH 870-SW-005			
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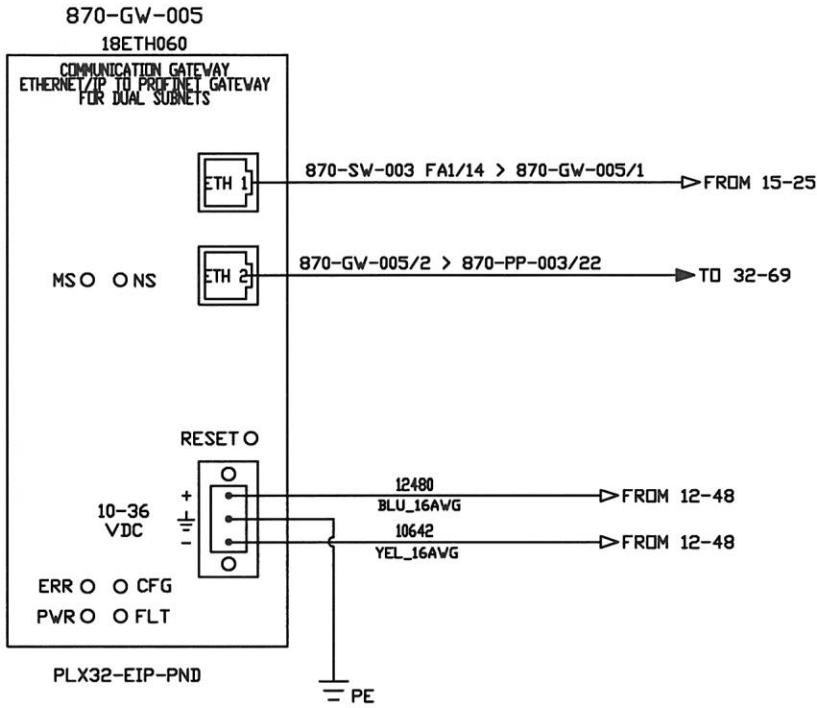
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VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
PROSOFT PLX GATEWAYS
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VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
PROSOFT PLX GATEWAYS

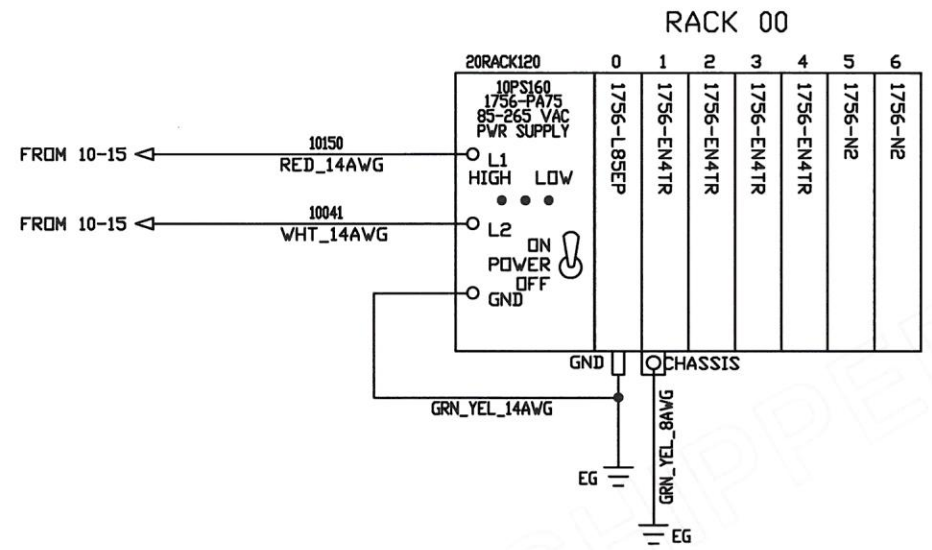
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VITAL METALS PROCESS PLANT
 MAIN CONTROL CABINET 870-CP-001
 PROCESSOR RACK

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 Name: C 0001
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 Discipline: Automation St. Reg. No. 6506 Signature: [Signature] 2023-04-27

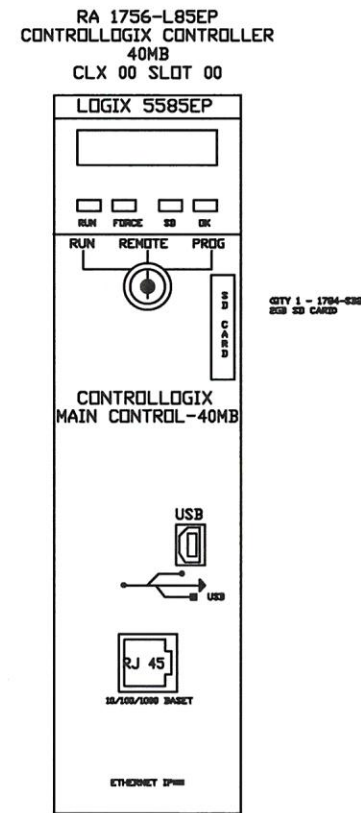


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VITAL METALS PROCESS PLANT
MAIN CONTROL CABINET 870-CP-001
CPU RACK SLOT 00 - 1756-L85EP
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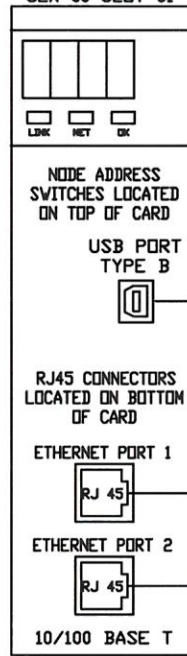
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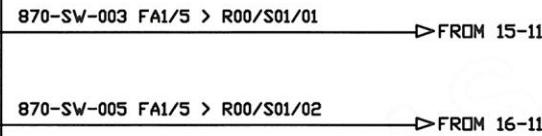
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RA 1756-EN4TR
COMMUNICATION, 8 AXIS OF MOTION
CLX ETHERNET/IP, EMBEDDED SWITCH
CLX 00 SLOT 01



RECOMMENDED PROGRAMMING CABLE:
HIGH-QUALITY USB CABLE
(WARNING: SAMTEC INC. RSP-119350 USB CABLE IS REQUIRED TO MAINTAIN HAZARDOUS LOCATION CERTIFICATIONS. BE SURE THAT POWER IS REMOVED OR THE AREA IS NONHAZARDOUS BEFORE CONNECTING OR DISCONNECTING CABLE.)
ATTENTION: THE USB CABLE IS NOT TO EXCEED 3.0 M (9.84 FT) AND MUST NOT CONTAIN HUBS.



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 Discipline: Automation
 St. Reg. No: 6506
 Signature: [Signature]
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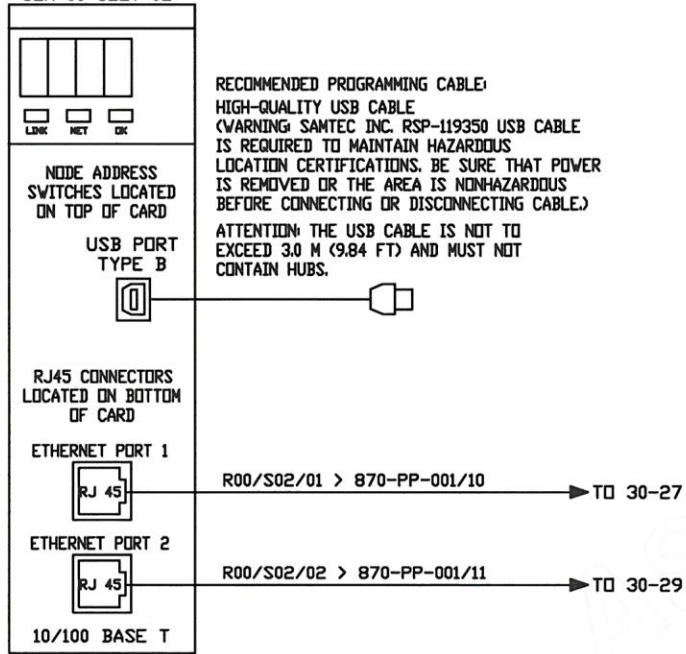
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VITAL METALS PROCESS PLANT
 MAIN CONTROL CABINET 870-CP-001
 CPU RACK SLOT 01 - 1756-EN4TR
 Drawn by: GM Date: 24/10/22

RA 1756-EN4TR
 COMMUNICATION, 8 AXIS OF MOTION
 CLX ETHERNET/IP, EMBEDDED SWITCH
 CLX 00 SLOT 02



RECOMMENDED PROGRAMMING CABLE:
 HIGH-QUALITY USB CABLE
 (WARNING: SAMTEC INC. RSP-119350 USB CABLE
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 CPU RACK SLOT 02 - 1756-EN4TR

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 Sr. Reg. No: 6506
 Signature: [Signature]
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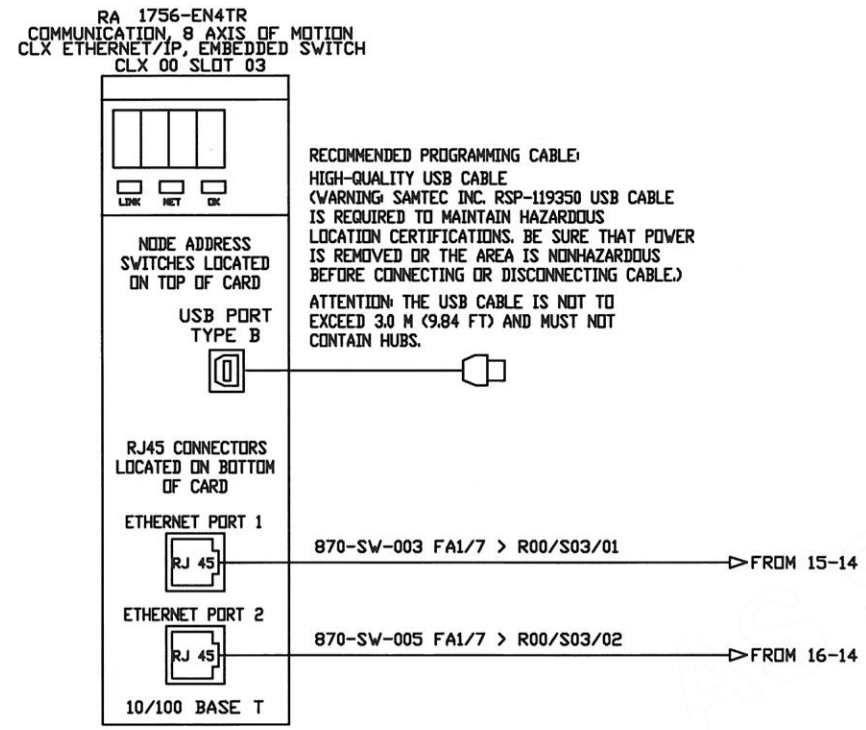
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CPU RACK SLOT 03 - 1756-EN4TR

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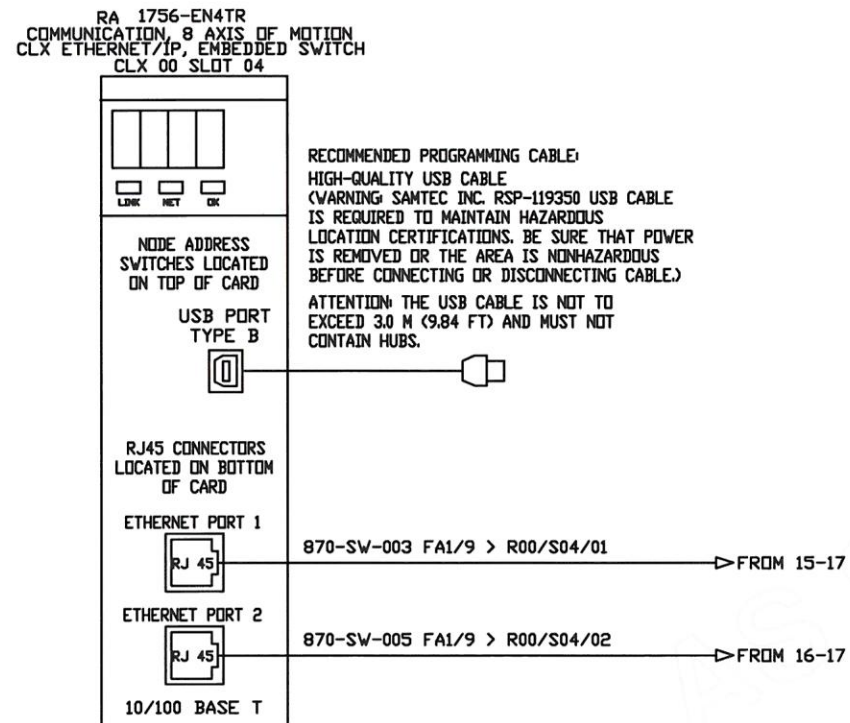


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CPU RACK SLOT 04 - 1756-EN4TR

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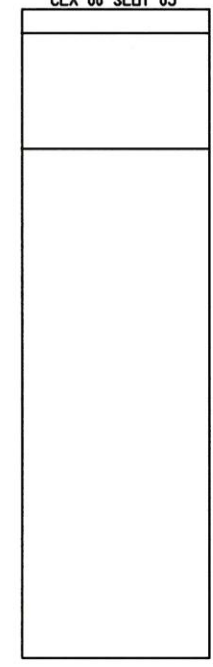
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CPU RACK SLOT 05 - 1756-N2
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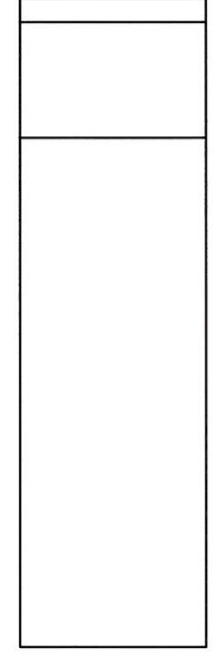
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VITAL METALS PROCESS PLANT
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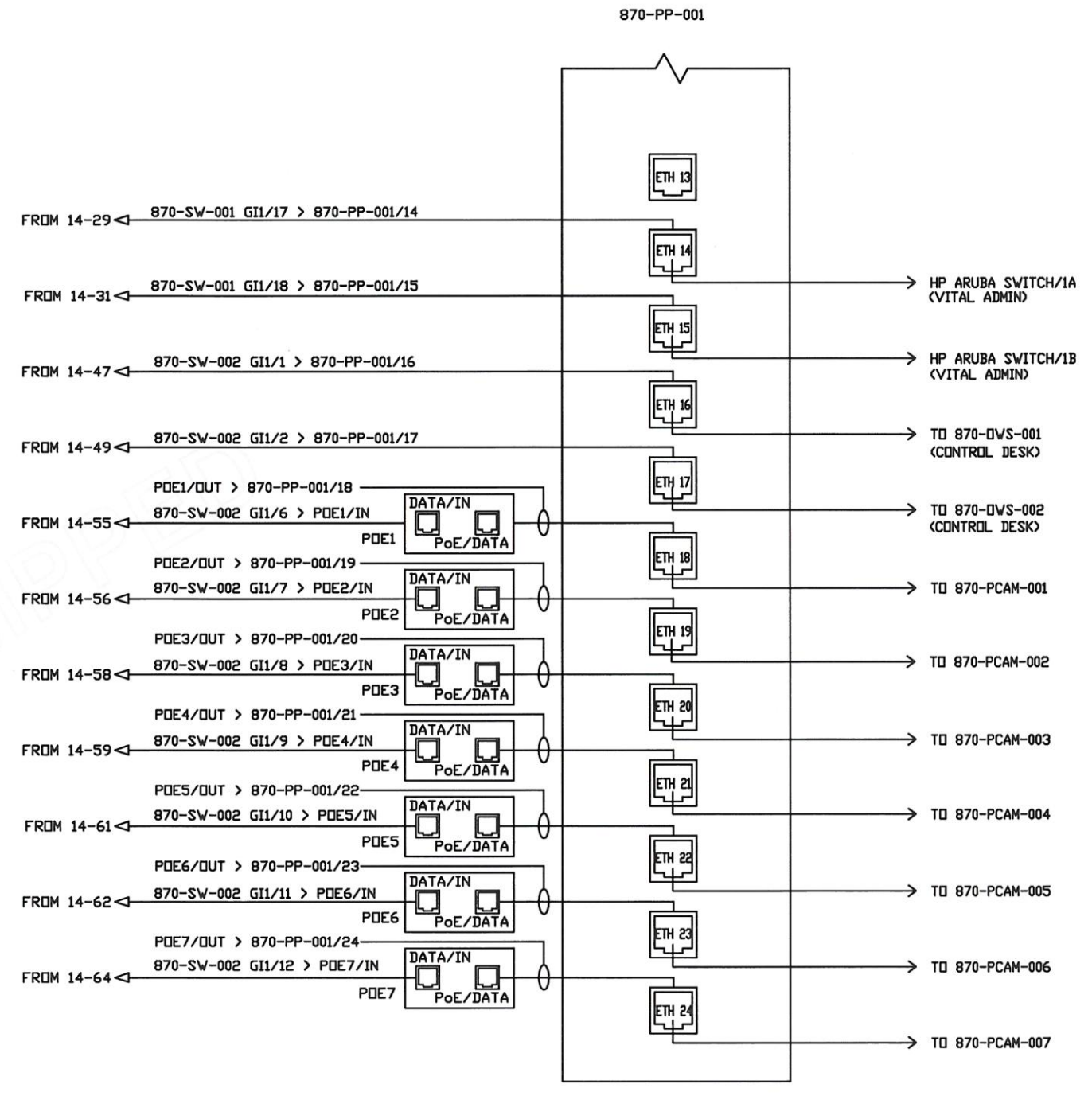
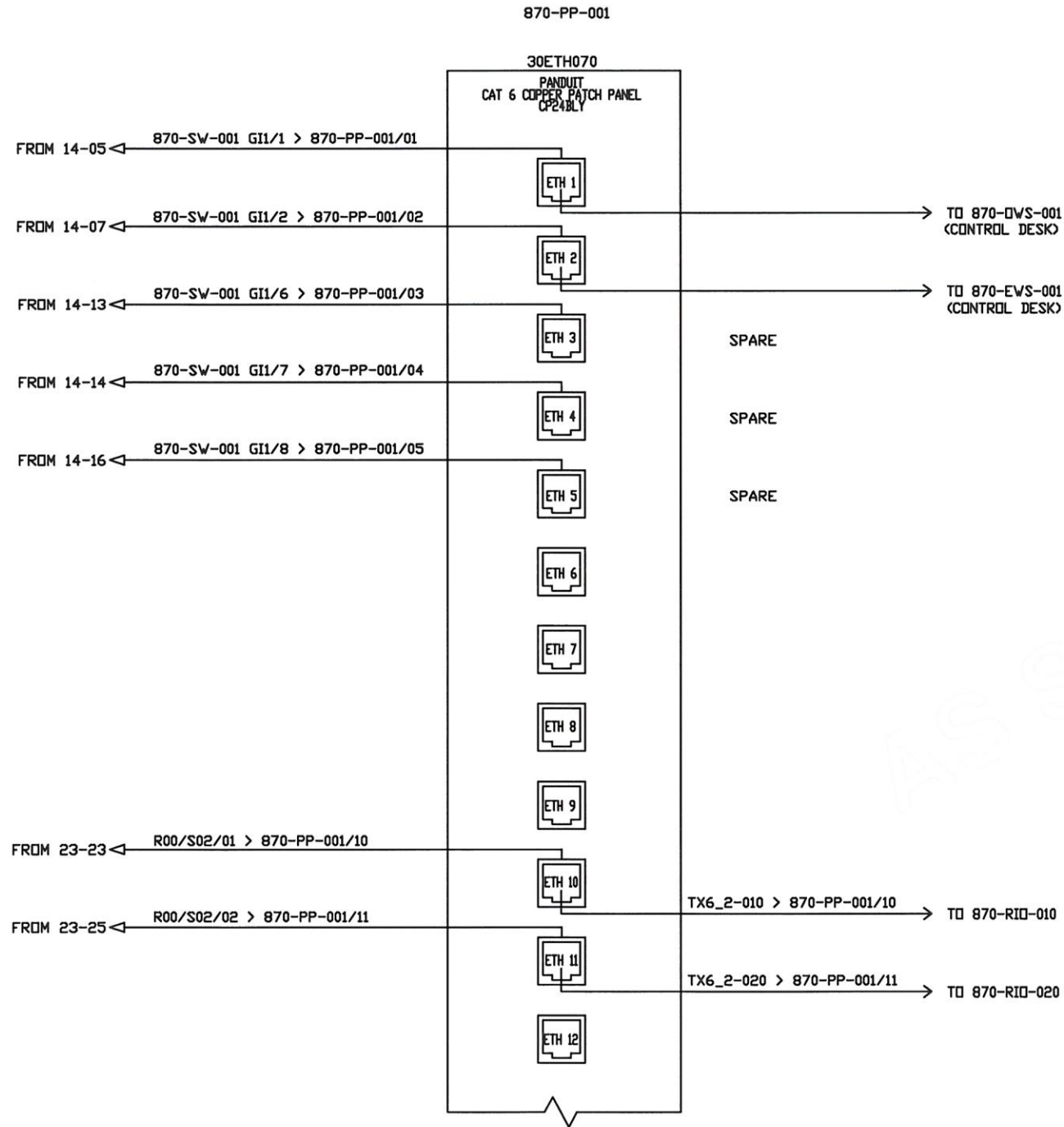
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Size	P2CA500039-0001		Ver
D			1

PATCH PANEL LOCATED IN 870-NET-001



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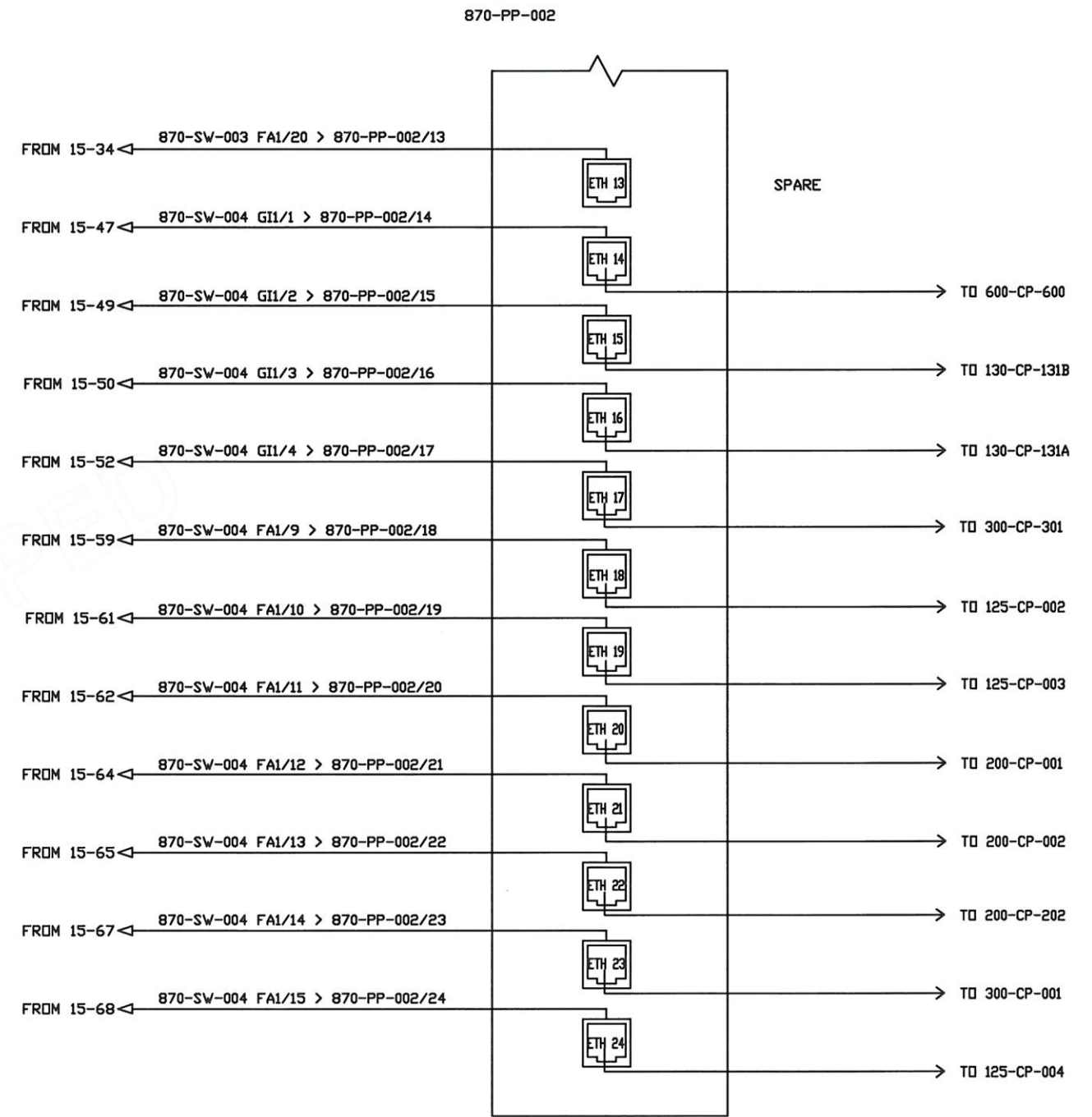
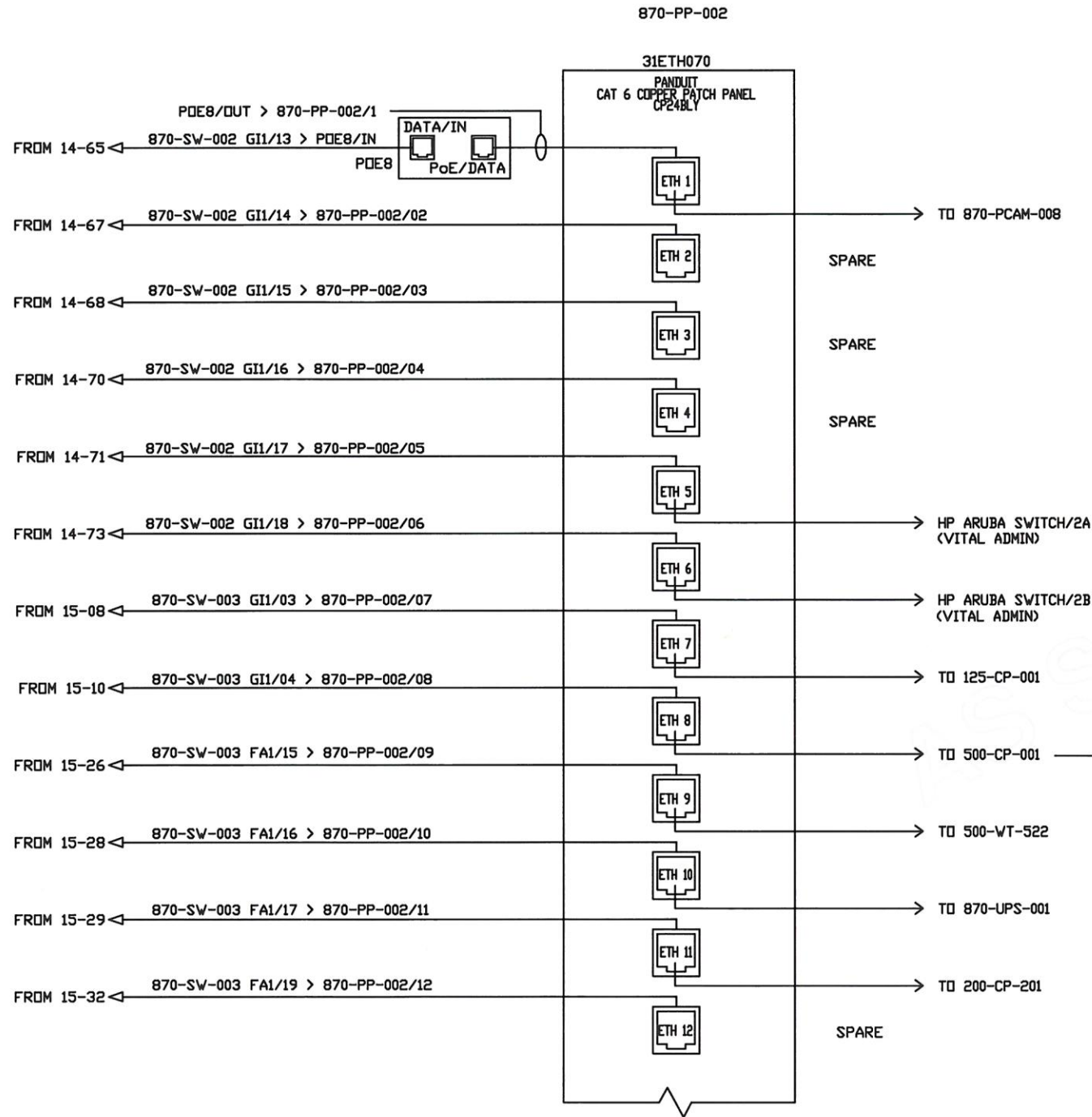


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B	29/11/22	GM	
C	11/01/23	AD	
D	31/01/23	AD	
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 PATCH PANEL 870-PP-001
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Discipline: Automation St. Reg. No. 65606
Signature: [Signature] 2023-04-27
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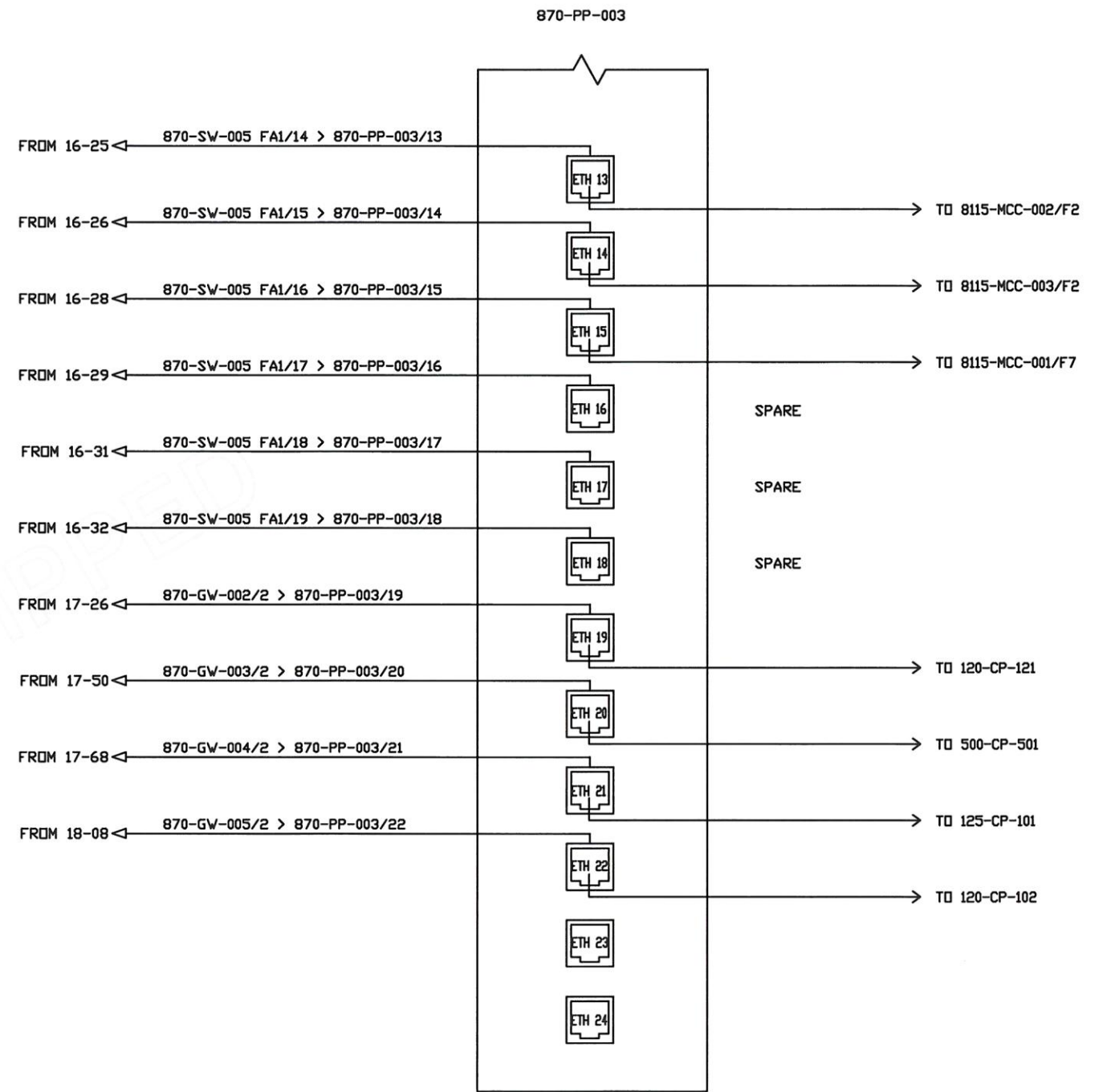
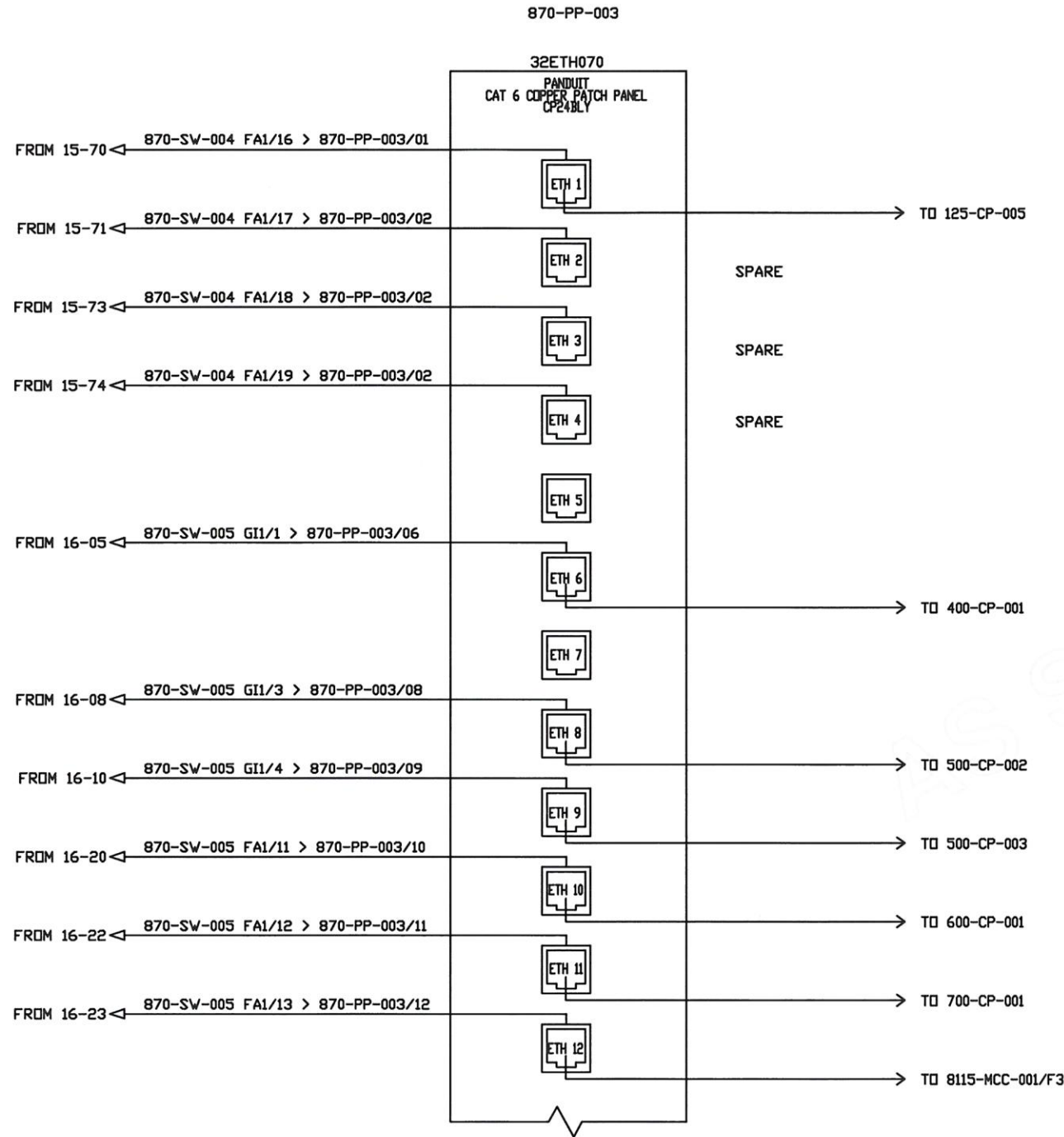


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 Automation: *[Signature]*
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