

Rockwell Automation

VITAL METALS PROCESS PLANT

PROCESS CONTROL SYSTEM

RIO CABINET 3 - 870-RIO-030

RA PROJECT: P2CA500039

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



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Rockwell Automation

VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
TITLE SHEET

Drawn by: GM Date: 07/10/22

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
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55	VITAL METALS PROCESS PLANT	RI0 CABINET 3 - 870-RI0-030	RACK 08 SLOT 01 - 5094-0W8I	2
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INDEX SHEET
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Source Codes
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SASKATCHEWAN



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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	P/N (BELDEN P/N)	CONNECTOR (AMPHENOL P/N)	TERMINATOR 75 OHM RELIANCE P/N 707204-20A AMPHENOL P/N 46650-75
RG59	417900-148A (9259)	405504-74A (31-212-1005)	
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
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:

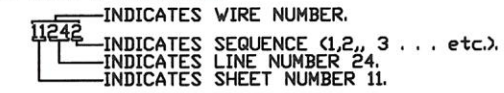
1. FOR FURTHER DRIVE INFORMATION ON INSTRUCTION MANUALS, SEE RESPECTIVE SCHEMATIC SECTIONS.
2. \perp - BUILDING GROUND TO BE GROUNDED BY CUSTOMER.
 ∇_{TE} - SYSTEM ZERO POTENTIAL NODE
 ∇_{PE} - POWER EQUIPMENT GROUND
 --- - PANEL (CHASSIS) GROUND
3. THE INTERNAL WIRING SELECTED MEETS OR EXCEEDS NEC, 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.

6. ○ - INDICATES OUTGOING TERMINAL.
□ - INDICATES TERMINAL ON ELECTRONIC ASSEMBLY PRINTED CIRCUIT BOARD (IEA) ETC.
CR - INDICATES RELAY OR CONTACTOR WITH SUPPRESSOR.

7. COIL AND CONTACT CROSS REFERENCING - NUMBERS ADJACENT TO COIL AND UNDER CONTACT INDICATE SHEET AND LINE NUMBERS.
○ - INDICATES SHEET NO. 101.
101-03 - INDICATES LINE NO. 03.
NO - INDICATES NORMALLY OPEN CONTACTS
NC - INDICATES NORMALLY CLOSED CONTACTS

- OFF-PAGE CROSS REFERENCING - NUMBERS ADJACENT TO SOURCE AND DESTINATION SYMBOLS INDICATE SHEET AND LINE NUMBERS.
FROM 1-24 1-24 - INDICATES LINE NO. 24.
TO 1-24 - INDICATES SHEET NO. 1.

8. WIRE # GENERATION



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

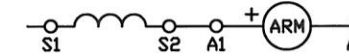
9. TYPICAL DUAL VOLTAGE MOTOR FIELD CONNECTIONS ARE SHOWN BELOW. CONSULT THE MOTOR MANUFACTURER'S INSTRUCTIONS FOR CORRECT CONNECTIONS.



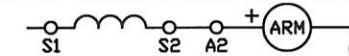
10. DC MOTOR ROTATION - CONSULT THE MOTOR MANUFACTURER'S INSTRUCTIONS FOR CORRECT CONNECTIONS.

- 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 V1)
W2 TO T2 (EUROPEAN MARKING W1)

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" it 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 (TO 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						
			DC POWER	REGULATED DC MOTOR FIELD	PER CEC AND LOCAL CODES						
CONTROL (300V MAX OR 20 AMPS)	③	S	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						
		24VAC/VDC LOGIC	PLC I/O	PER CEC AND LOCAL CODES							
MEDIUM LEVEL SIGNAL (PROCESS)	②	S	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	
			DIGITAL (LOW SPEED)	TTL							
		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	S	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	
			PLC SERIAL COMMUNICATION (> 20K BAUD)	PLC REMOTE I/O, PLC DATA HIGHWAY	TWINAXIAL CABLE BELDEN 9463 R-A 1770-CD						
			PLC SERIAL COMMUNICATION (> 5MB)	CONTROL NET	RG-6 QUAD SHIELD, COAX CABLE; A-B 1786-RG6 BELDEN 3092A						
			CAN COMMUNICATION	DEVICE - NET DRIVE - DRIVE	R-A 1485C-P1-C						
			ETHERNET		DEPENDS ON INSTALLATION						
			PLC SERIAL COMMUNICATION (> 5MB)	CONTROL-NET	FIBER OPTIC						N/A

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 1770-41
- CEC SECTION 10, GROUNDING AND BONDING
- LOCAL CODE REQUIREMENTS

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
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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 SHIELD(S) 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

- SEE A-B PUBLICATION AG2.2 FOR ADDITIONAL CONTROLNET COAX CABLE RECOMMENDATIONS.
- 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.

NOTE: FOR LEVELS 3 AND 4, THE AMPACITY RATINGS OF CONDUCTORS IN A BUNDLE MAY NOT EXCEED THE DERATING GUIDELINES OF CEC TABLE 57

NOTE: THE RESPECTIVE CIRCUITS IN A GIVEN BUNDLE MAY EXPERIENCE SOME AMOUNT OF EMI COUPLING. SOME CIRCUIT APPLICATIONS MAY DICTATE SEPARATE SPACING.

- 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.

REV.	DATE	BY	ECN/CR. NO.
A	16/09/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

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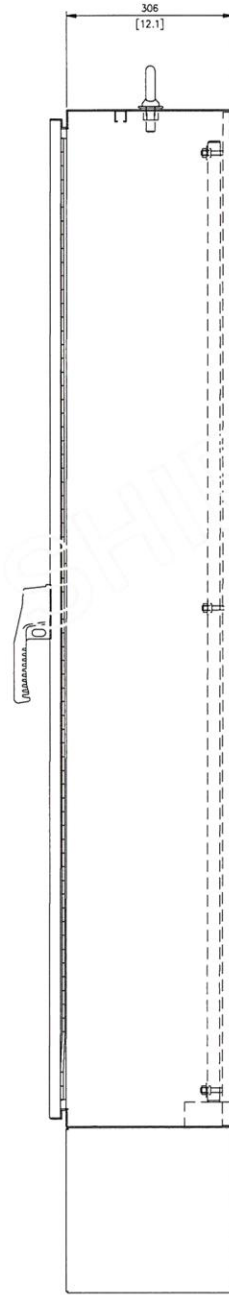
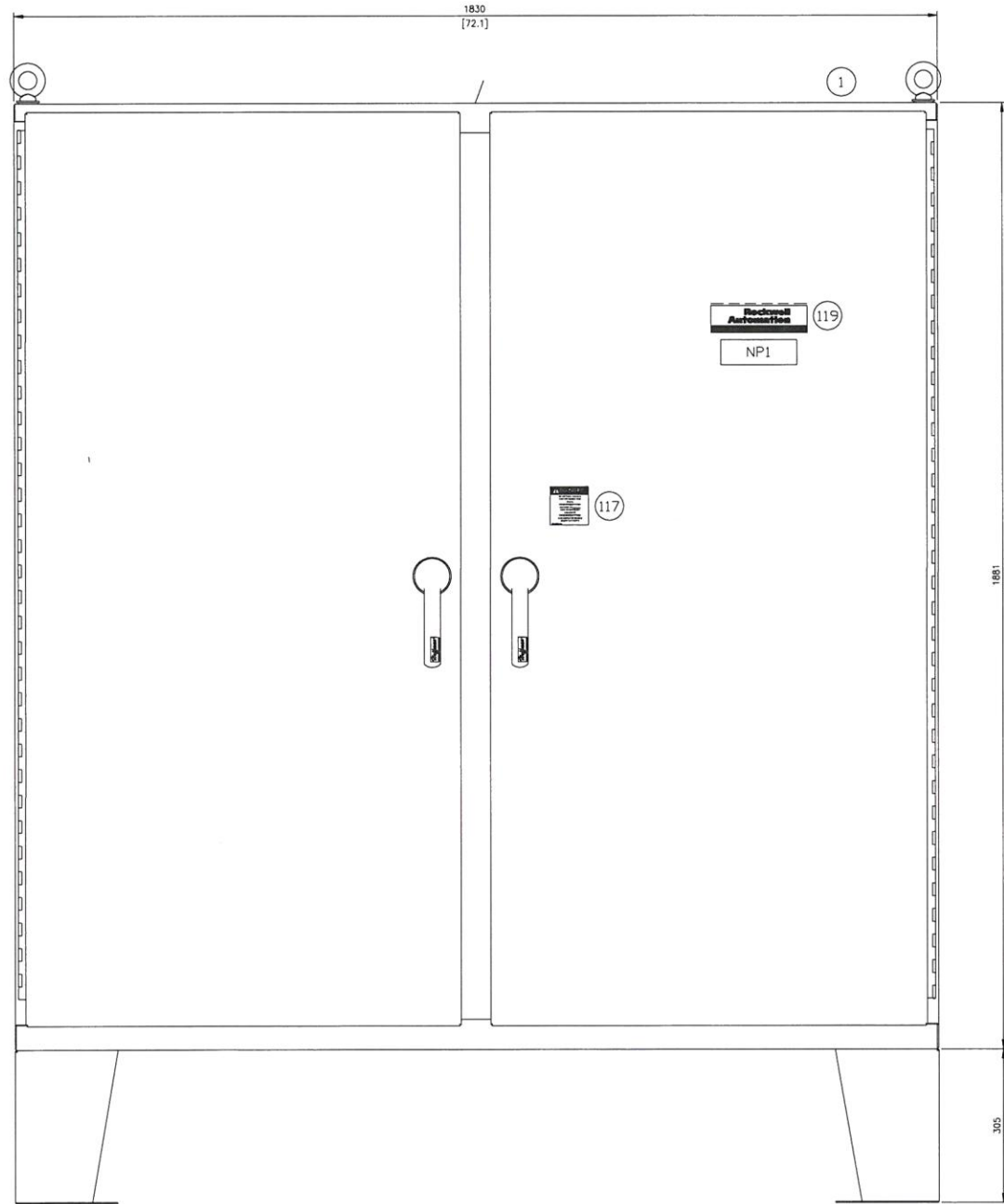
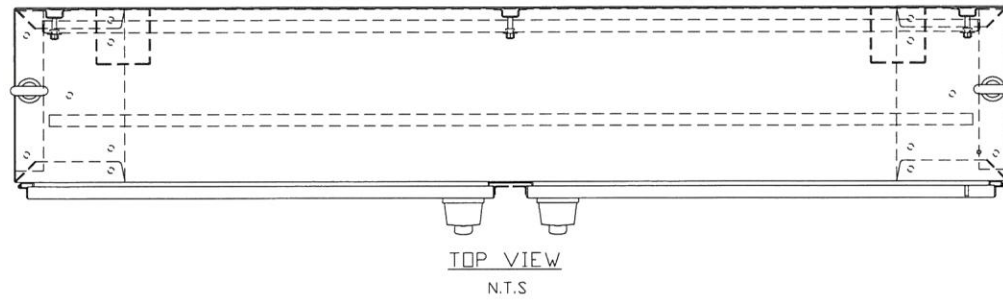
VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 WIRE CLASSIFICATION
 Drawn by: GM Date: 16/09/22

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Sheet 03 of 75 Next Sh 05
 Size D P2CA500039-0004 Ver 2



ITEM	QTY	CATALOG	DESC1	MFG
1	1	A74H7212LP3PT	TYPE 4, TWO-DOOR FLOOR MOUNT ENCLOSURE 74"(H)X72"(W)X12"(D)	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
RIO CABINET 3
870-RIO-030

ORDER NO: SERIAL NO: P2CA500039-0004
VENDOR: P2CA500039-0004 SH 10-19

ENCLOSURE TYPE: 4
FACILITY: -

WORK DUTY: HP - HEAVY DUTY: HP -
INPUT: VOLTS PH IZ AMPS
OUTPUT: VOLTS PH IZ AMPS

AUXILIARY INPUT POWER: VOLTS PH IZ AMPS
SHOCK CIRCUIT CURRENT RMS SYMMETRICAL: 10 KA
480 VOLTS MAXIMUM

Rockwell Automation
MADE IN CANADA
REF

⚠ DANGER

MORE THAN ONE LIVE CIRCUIT BEHIND THIS DOOR.
DE-ENERGIZE POWER LOCATED AT _____ BEFORE SERVICING.
FAILURE TO DE-ENERGIZE POWER CAN RESULT IN SEVERE INJURY OR DEATH.

80006-315-01 (2)

DANGER LABEL
OUTSIDE AND INSIDE
80006-315-01



NP1 - CABINET FRONT DOOR NAMEPLATE
BLACK TEXT ON WHITE LAMICOID
TEXT SIZE: 10MM

NOTES:

- FIELD CABLES BOTTOM ENTRY. POWER FEED BOTTOM ENTRY.

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number: C1983
Permission to Certify held by:
Discipline: Automation
St. Reg. No: 65605
Signature: [Signature]
Date: 2023-04-27



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



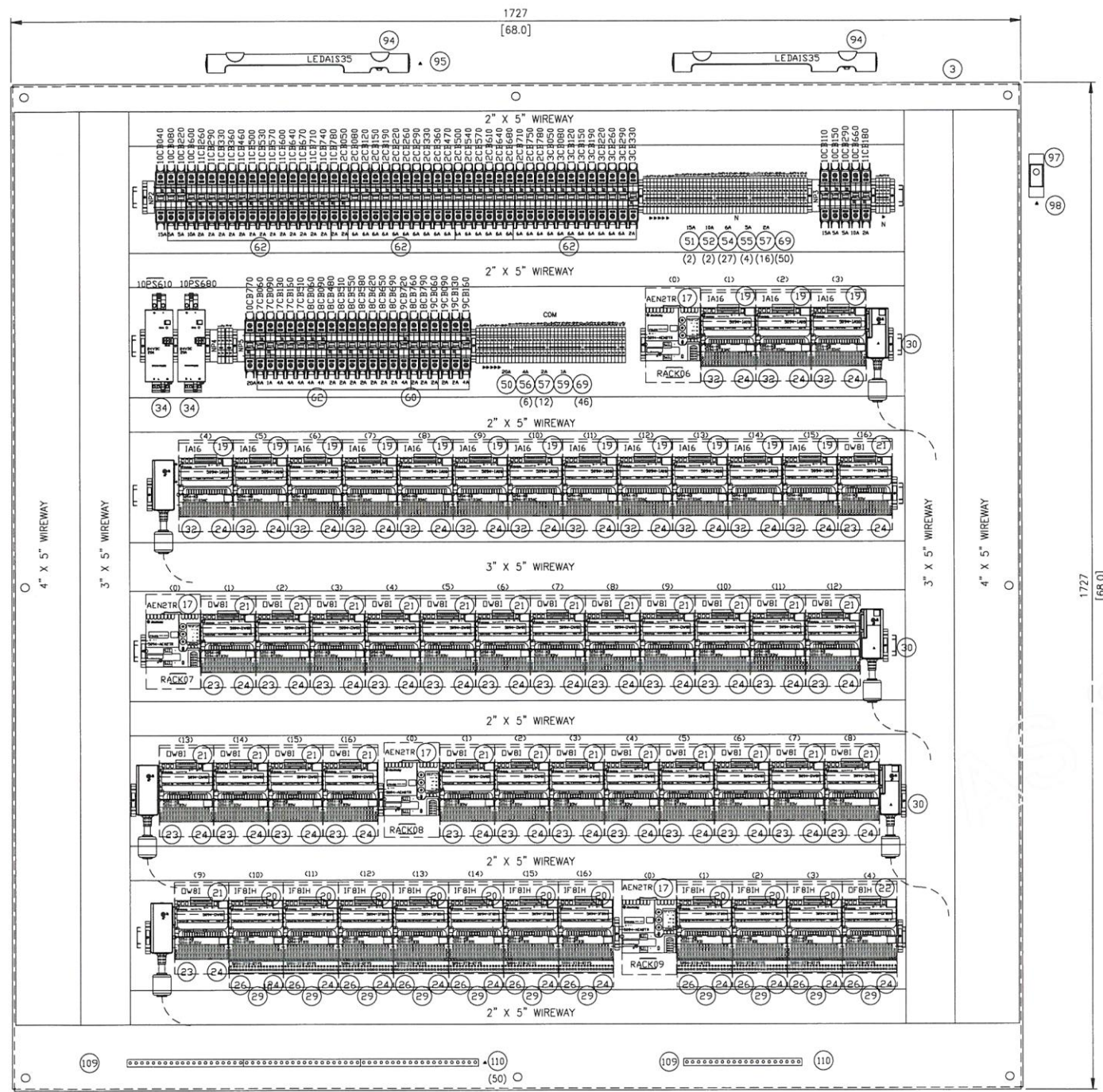
REV.	DATE	BY	ECN/CR. NO.
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C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
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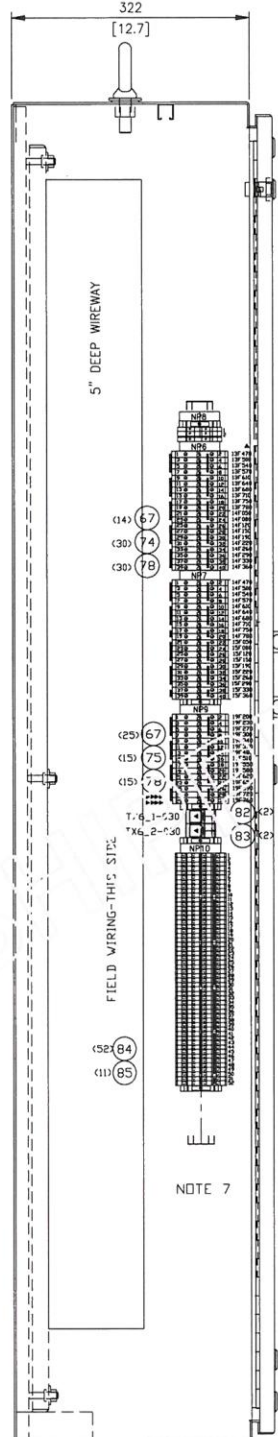
VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
CABINET LAYOUT
Drawn by: GM Date: 07/10/22

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Size D
P2CA500039-0004
Ver 2



FRONT VIEW
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	NOMINAL	MAXIMUM		
5094-AEN2TR	45.00	4		55.0				6.2	24.8
5094-IA16	29	15	16.9					11.9	178.5
5094-DWBI		26	13.7					11.94	310.4
5094-IFBIH	8.40	10	5.3	84.0				11.94	119.4
5094-OFBIH	19.20	1	19.2	19.2				12	12.0
		SUM1	55.0						
1606-XLE480ERZ	480	2			192	493.4		45.7	91.5
1489-MICXXX		70						6.8	477.8
FIELD POWER					240	900		30.7	
		TOTAL		158.2	432.0	1393.4		BTU/hr	1214.4
								Watt	355.8

ITEM	QTY	DESCRIPTION	PLATE SIZE	TEXT SIZE
NP1	1	LINE 1 LINE 2 LINE 3 PROCESS PLANT RIO CABINET 3 870-RIO-030	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 120VAC-UPS	1492-GM35	AS REQ.
NP8	1	LINE 1 LTB	1492-GM35	AS REQ.
NP9	1	LINE 1 LINE 2 TB7 24VDC	1492-GM35	AS REQ.
NP10	1	LINE 1 TB8	1492-GM35	AS REQ.

NAMEPLATES: ITEM 116, 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 LAMICOID OR STICKER - TEXT AS SHOWN ON LAYOUT.
- FUSED TWO-CIRCUIT TERMINALS INSTALLED ON CABINET RIGHT SIDE DIN-RAIL WITH STANDOFFS. LEFT SIDE IS FOR FIELD WIRING. POWER WIRES TO TERMINALS (120VAC AND 24VDC) - RUN UNDER DIN-RAIL. STANDOFFS SHOULD BE STUD-WELDED TO PREVENT MATERIAL DISCOLORATION.



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT	Sheet 06 of 75 Next Sh 07
1	17/04/23	GM	FABRICATION	RIO CABINET 3 - 870-RIO-030	Size D
2	25/04/23	GM	AS SHIPPED	PANEL LAYOUT	P2CA500039-0004
				Drawn by: GM	Date: 07/10/22
					Ver 2



ITEM	QTY	CATALOG	DESC2	DESC3	MFG
3	1	A72P72	MOUNTING PANEL, STEEL, WHITE 68"(H)x68"(W)		HOFFMAN
17	4	5094-AEN2TR	5094 ETHERNET/IP RJ45 (2) ADAPTER		RA
19	15	5094-1A16	5094 DIGITAL 16 INPUT, 120VAC		RA
20	10	5094-IF8IH	5094 ISOLATED ANALOG 8 INPUT, HART		RA
21	26	5094-DW8I	5094 RELAY 8 OUTPUT ISOLATED		RA
22	1	5094-DF8IH	5094 ISOLATE ANALOG 8 OUTPUT, HART		RA
23	26	5094-RTB3W	5094 RTB RELAY SCREW		RA
24	52	5094-MB	5094 MOUNTING BASE		RA
26	11	5094-RTB3I	5094 RTB ISOLATED SCREW		RA
29	3	5094-STB-QTY5	5094 SHIELD RTB SCREW PACK OF 5		RA
30	3	5094-CE30	5094 INTER-CONNECT CABLE 3 METER		RA
32	15	5094-RTB3AC	5094 RTB AC SCREW		RA
34	2	1606-XLE480ERZ	20A POWER SUPPLY, 24-28V DC, 480W, 100-240V AC INPUT		RA
43	2	1585J-M8C8JM-1M5	ETHERNET CABLE, 8 CONDUCT., STRAIGHT MALE, RJ45	TEAL PVC SHIELDED, 100BASE-TX, 100 MB/S, 1.5M	RA
44	3	1585J-M8C8JM-2	ETHERNET CABLE, 8 CONDUCT., STRAIGHT MALE, RJ45	TEAL PVC SHIELDED, 100BASE-TX, 100 MB/S, 2M	RA
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	2	1489-MIC100	CIRCUIT BREAKER, 1 POLE, 10A, 277VAC, 48VDC, 5-10IN		RA
54	27	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
56	8	1489-MIC040	CIRCUIT BREAKER, 1 POLE, 4A, 277VAC, 48VDC, 5-10IN		RA
57	29	1489-MIC020	CIRCUIT BREAKER, 1 POLE, 2A, 277VAC, 48VDC, 5-10IN		RA
59	1	1489-MIC010	CIRCUIT BREAKER, 1 POLE, 1A, 277VAC, 48VDC, 5-10IN		RA
60	1	1489-AMCL106	6 PINS, 6 CIRCUIT BREAKERS - 1 PHASE BUS BAR		RA
62	4	1489-AMCL118	18 PINS, 18 CIRCUIT BREAKERS - 1 PHASE BUS BAR		RA
67	8	1492-SJ8A-4	INSULATED SIDE JUMPER, 8 MM CENTER TO CENTER, 4 POLE, BLA		RA
69	99	1492-J4	TERMINAL BLOCK, BUL 1492-J, GRAY, 600 VAC/DC, 35A, 22-10AWG		RA
70	11	1492-CJ16-10	CENTER JUMPER, SCREW TYPE, 10-POLE		RA
71	27	1492-EAJ35	1492 TERMINAL BLOCK ACCESSORIES END ANCHOR, END ANCHOR		RA
72	9	1492-GM35	1492 TERMINAL BLOCK ACCESSORIES GROUP MARKER CARRIER		RA
73	2	1492-EBJ16	END BARRIER, GRAY, J16/J35 DR PART, PLATE FOR J3/J4/J6/J10		RA
74	40	1492-JD3FB120	TWO-LEVEL FUSED TERMINAL BLOCK, 5-20MM, #22-#12, 120VAC	LED INDICATION, 60-150V AC/DC	RA
75	15	1492-JD3FB24	TWO-LEVEL FUSED TERMINAL BLOCK, 5-20MM, #22-#12, 24VDC	LED INDICATION, 10-36V DC	RA
78	55	GDC-2A	5X20MM, 2A SLOW ACTING FUSE		EATON
79	2	1492-MR6X8	SNAP-IN LINKED MARKER CARD, 6 MM X 8 MM, NO TEXT, 120 MARKERS		RA
80	2	1492-MR6X12	SNAP-IN LINKED MARKER CARD, 6 MM X 12 MM, NO TEXT, 120 MARKERS		RA
82	2	CADIN1IG	MINI-COM 1-PORT DIN RAIL MOUNTING ADAPTER, GRAY		PANDUIT
83	2	CJS688TGY	MINI-COM CAT 6 ETHERNET MODULE FOR THE CADIN1IG ADAPTER		PANDUIT
84	52	1492-JD4	1492-J IEC TERMINAL BLOCK, TWO-CIRCUIT FEED-THROUGH BLOCK,	4 MM (# 26 AWG - # 10 AWG), STANDARD FEEDTHROUGH, GRAY	RA
85	11	1492-CJLJ6-10	PLUG-IN CENTER JUMPER, 6 MM CENTER TO CENTER, 10 POLE		RA
94	2	LEDA1S35	LED CABINET LIGHT 90-240 VAC, 5W		HOFFMAN
95	1	LEDA10E	LED LIGHT EXTENSION CABLE, VAC, 39.37" (1000MM), #16AWG		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	50	E-153	1/4"-28X7/16", GROUND BAR LUG		ILSCO
111					
116	6		NAMEPLATE (10x30)MM WHITE LAMICOID OR STICKER		RA
120	7	199-DR1	35MM DIN RAIL, 1M		RA
121					
121	11.5M	F2X5LG6	PANDUCT NARROW SLOT DUCT, LT GRAY, PVC, 5.1"x2.25", PK6		PANDUIT
122	6.0M	F3X5LG6	PANDUCT NARROW SLOT DUCT, LT GRAY, PVC, 5.1"x3.25", PK6		PANDUIT
122	6.0M	F4X5LG6	PANDUCT NARROW SLOT DUCT, LT GRAY, PVC, 5.1"x4.25", PK6		PANDUIT
123					
123	11.5M	C2LG6	PANDUCT C2LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x2.25", PK6		PANDUIT
124	6.0M	C3LG6	PANDUCT C3LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x3.25", PK6		PANDUIT
124	6.0M	C4LG6	PANDUCT C4LG6 FLUSH COVER, LT GRAY, PVC, 0.35"x4.25", PK6		PANDUIT
125					
125					

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



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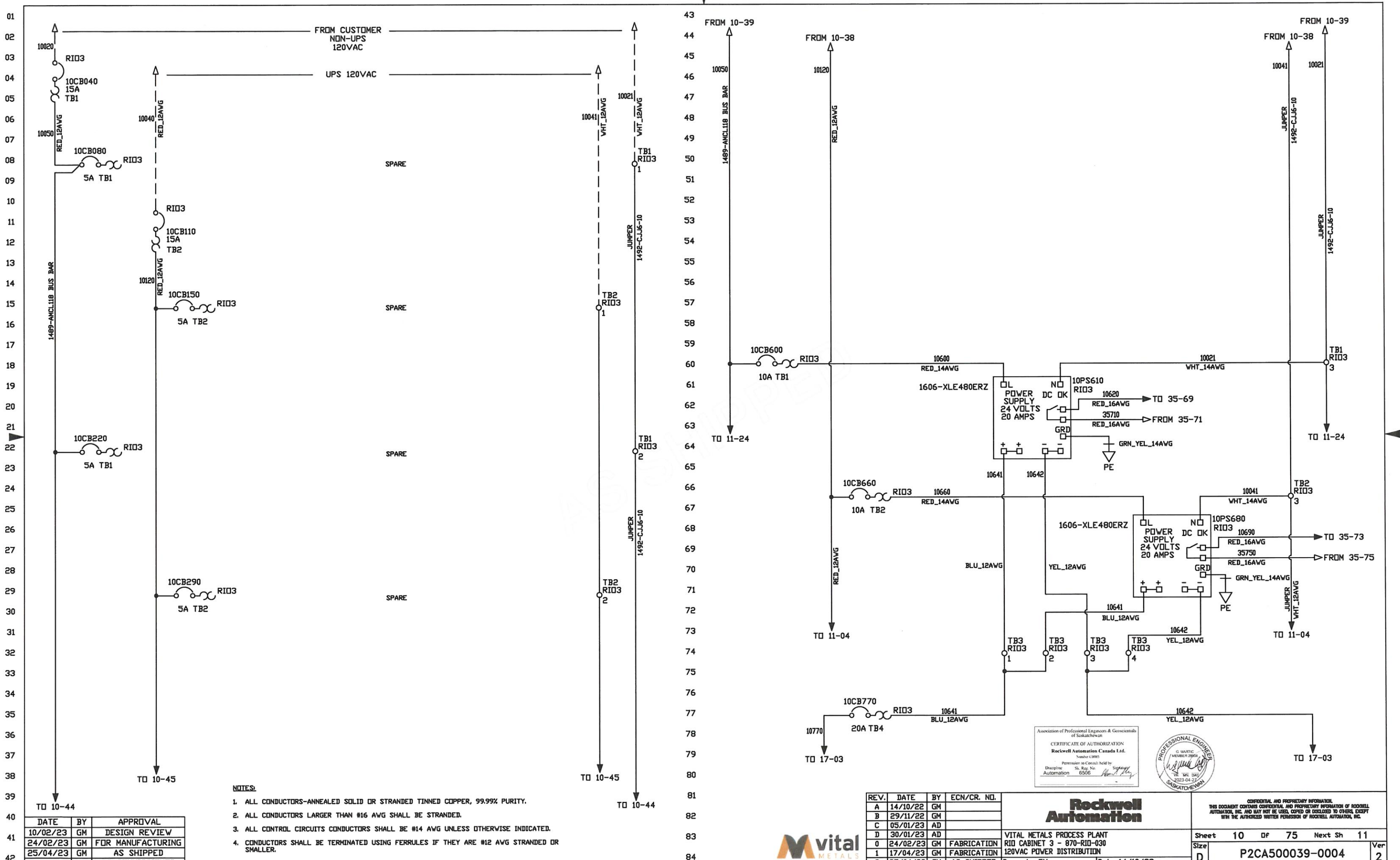
VITAL METALS PROCESS PLANT
R10 CABINET 3 - 870-R10-030
PANEL BILL OF MATERIALS
Drawn by: GM Date: 07/10/22

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: 1985
 Permission to Control held by:
 Discipline: Automation St. Reg. No. 6506
 Signature: [Signature] 2023-04-27



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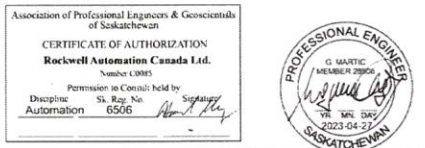
Sheet	07	Of	75	Next Sh	10	
Size	D				Ver	2
P2CA500039-0004						



- NOTES:**
1. ALL CONDUCTORS-ANNEALED SOLID OR STRANDED TINNED COPPER, 99.99% PURITY.
 2. ALL CONDUCTORS LARGER THAN #16 AWG SHALL BE STRANDED.
 3. ALL CONTROL CIRCUITS CONDUCTORS SHALL BE #14 AWG UNLESS OTHERWISE INDICATED.
 4. CONDUCTORS SHALL BE TERMINATED USING FERRULES IF THEY ARE #12 AWG STRANDED OR SMALLER.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.
A	14/10/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
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0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

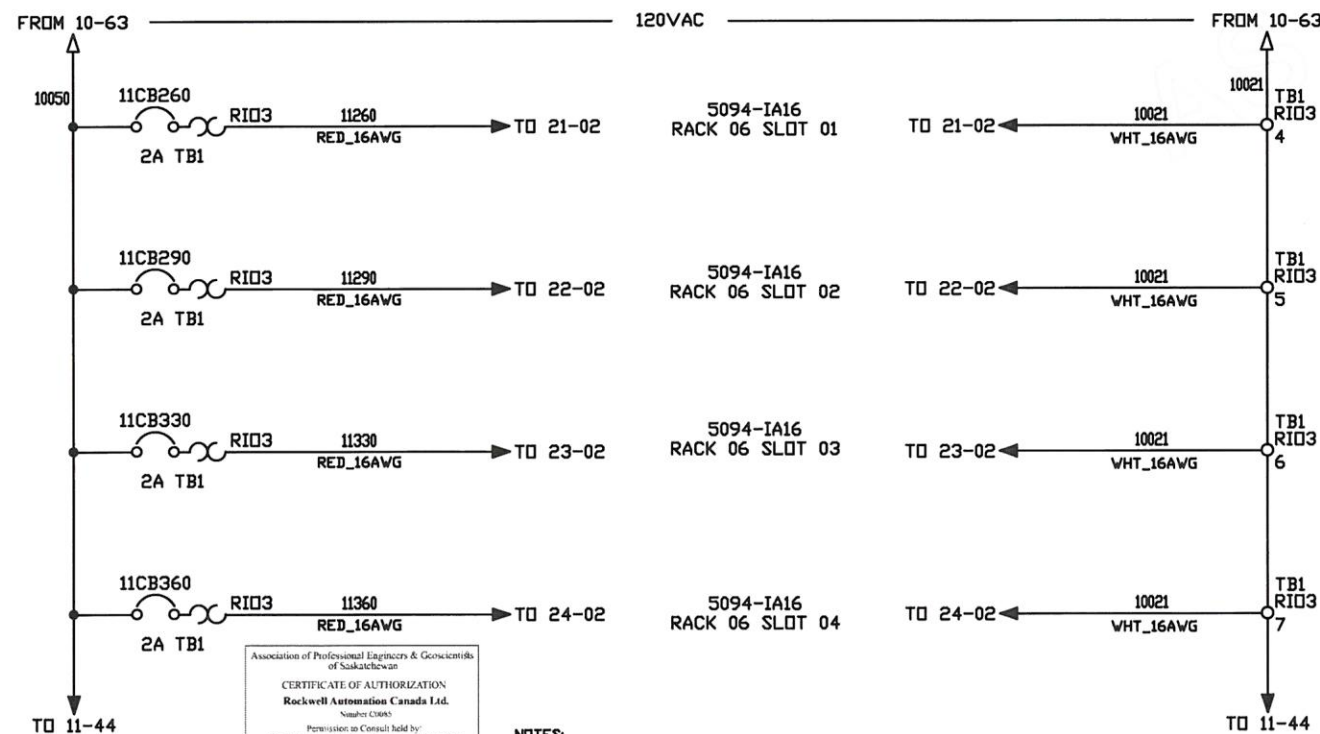
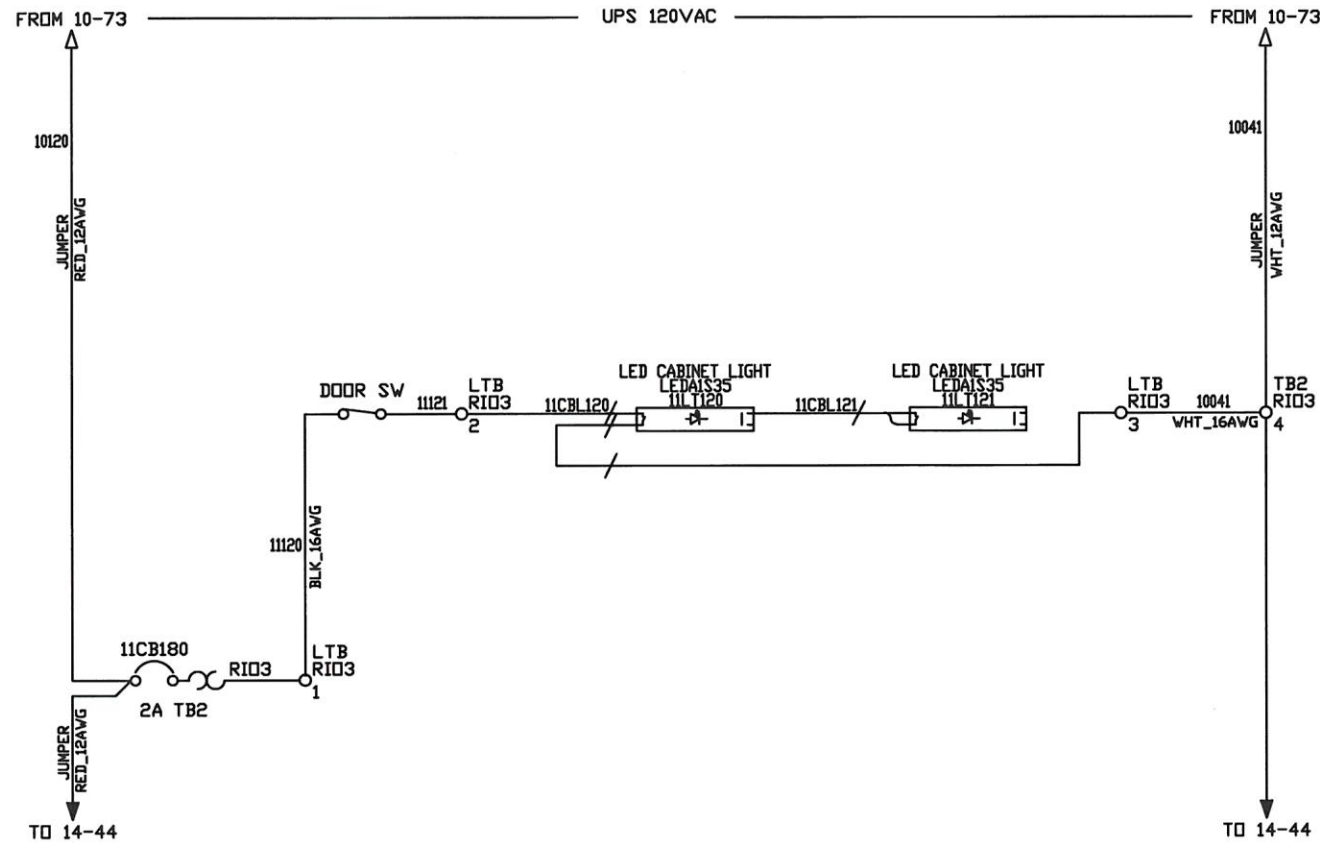


Rockwell Automation

VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
120VAC POWER DISTRIBUTION
Drawn by: GM Date: 14/10/22

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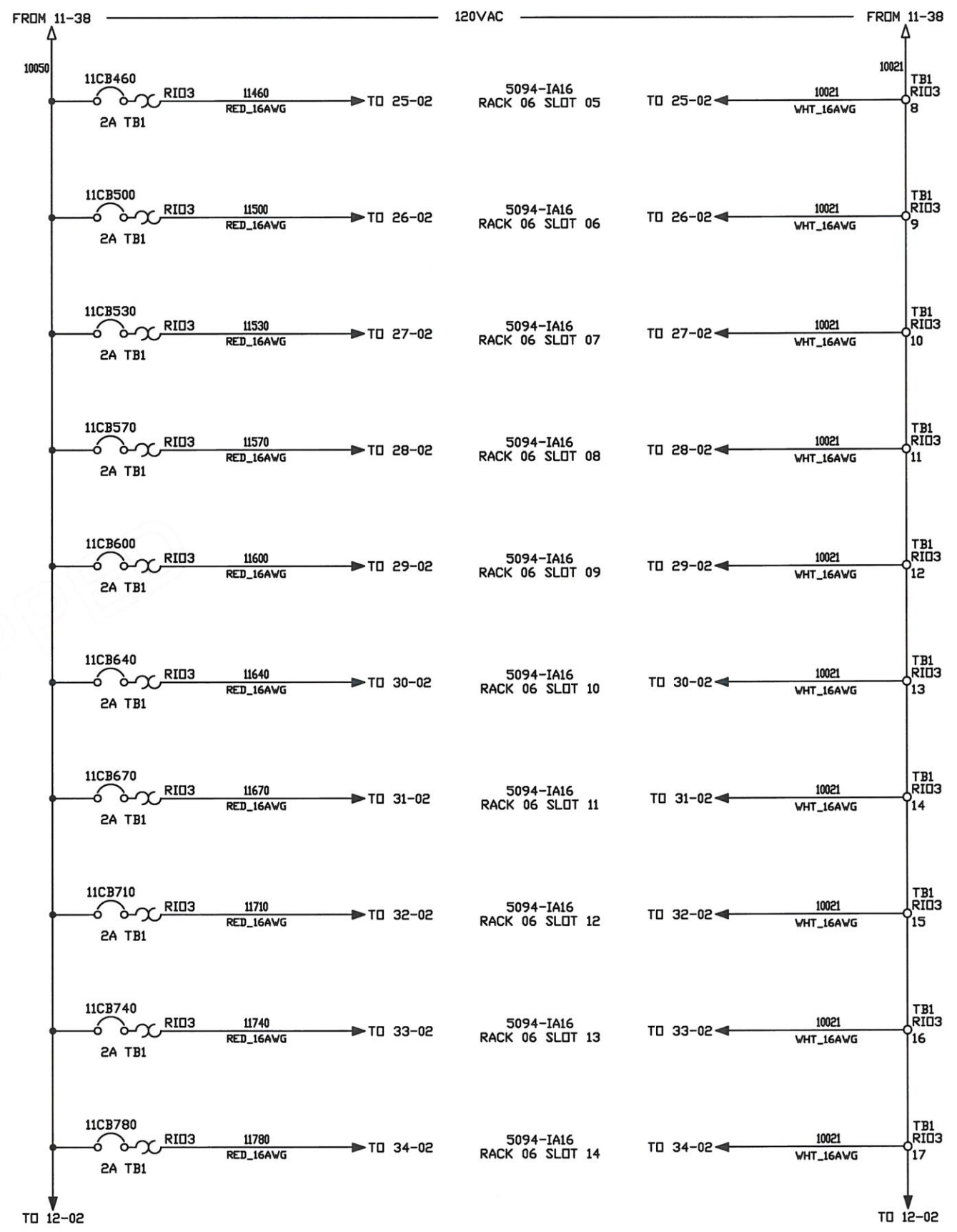
Sheet 10 of 75 Next Sh 11
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Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: C10005
 Permission to Consult held by:
 Discipline: Automation 6506
 Signature: [Signature]

- NOTES:**
1. ALL CONDUCTORS-ANNEALED SOLID OR STRANDED TINNED COPPER, 99.99% PURITY.
 2. ALL CONDUCTORS LARGER THAN #16 AWG SHALL BE STRANDED.
 3. ALL CONTROL CIRCUITS CONDUCTORS SHALL BE #14 AWG UNLESS OTHERWISE INDICATED.
 4. CONDUCTORS SHALL BE TERMINATED USING FERULES IF THEY ARE #12 AWG STRANDED OR SMALLER.

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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



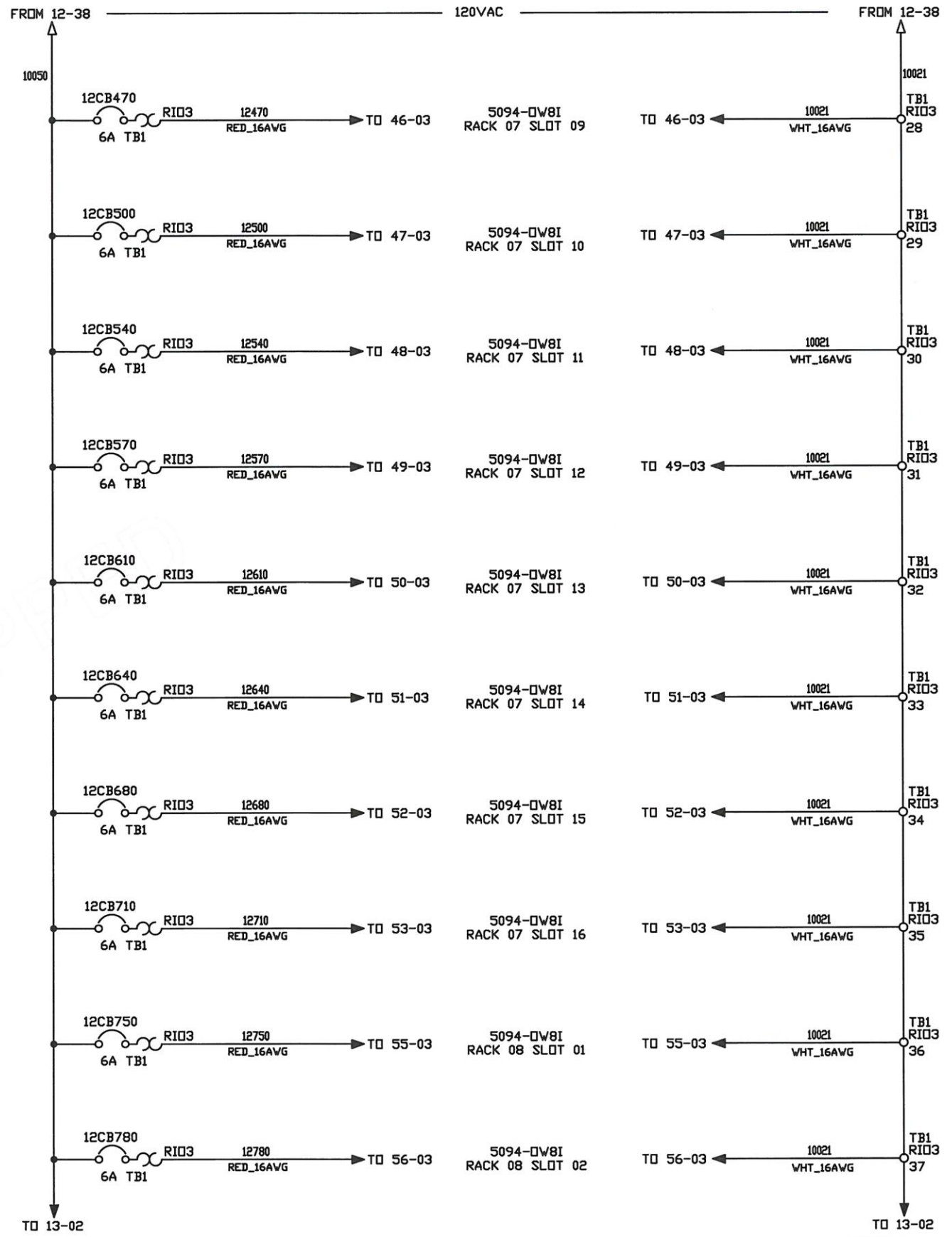
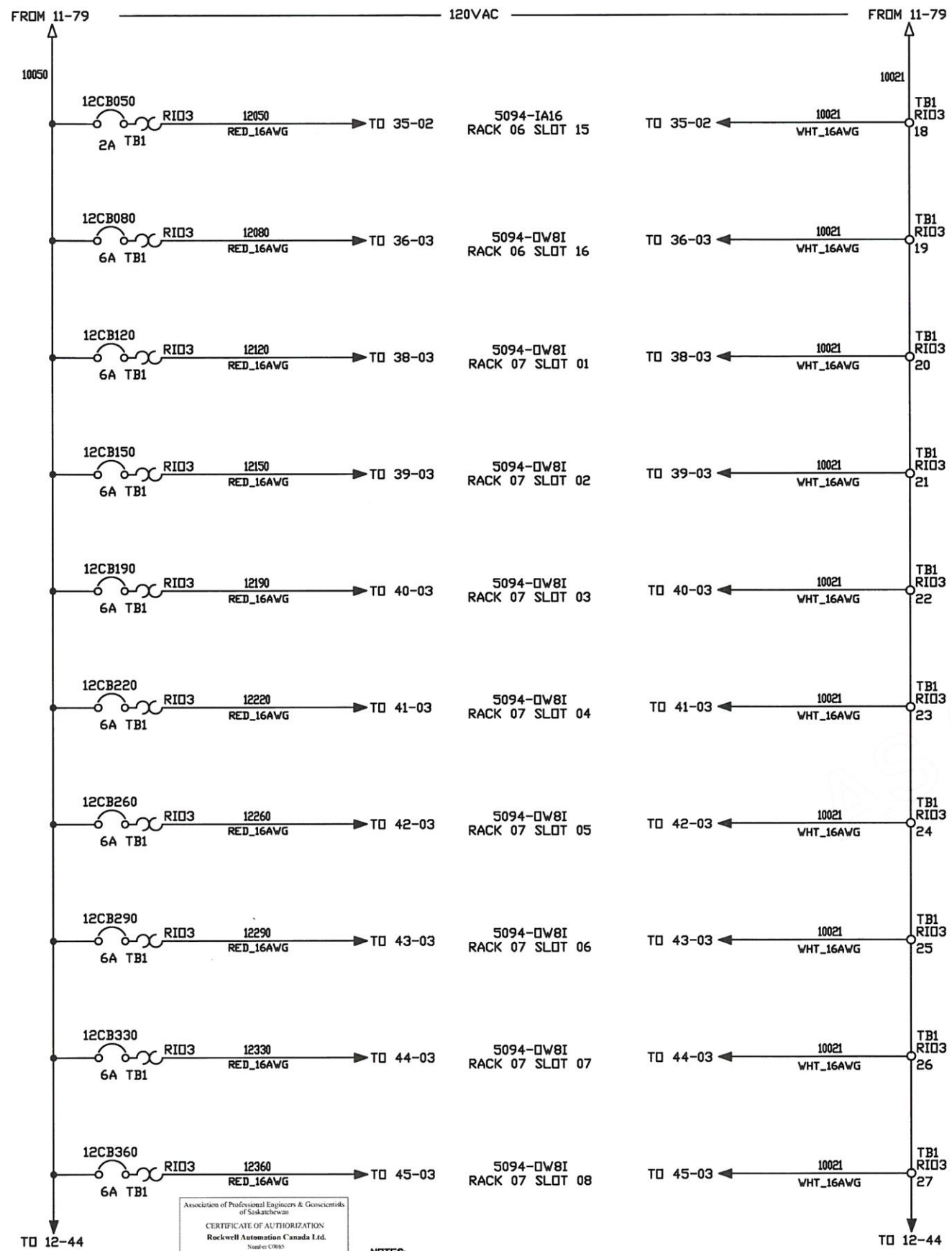
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VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 120VAC POWER DISTRIBUTION
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Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number C1885
 Permission to Create held by:
 Discipline: Automation St. Reg. No. 6506
 Signature: [Signature]

- NOTES:**
1. ALL CONDUCTORS-ANNEALED SOLID OR STRANDED TINNED COPPER, 99.99% PURITY.
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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

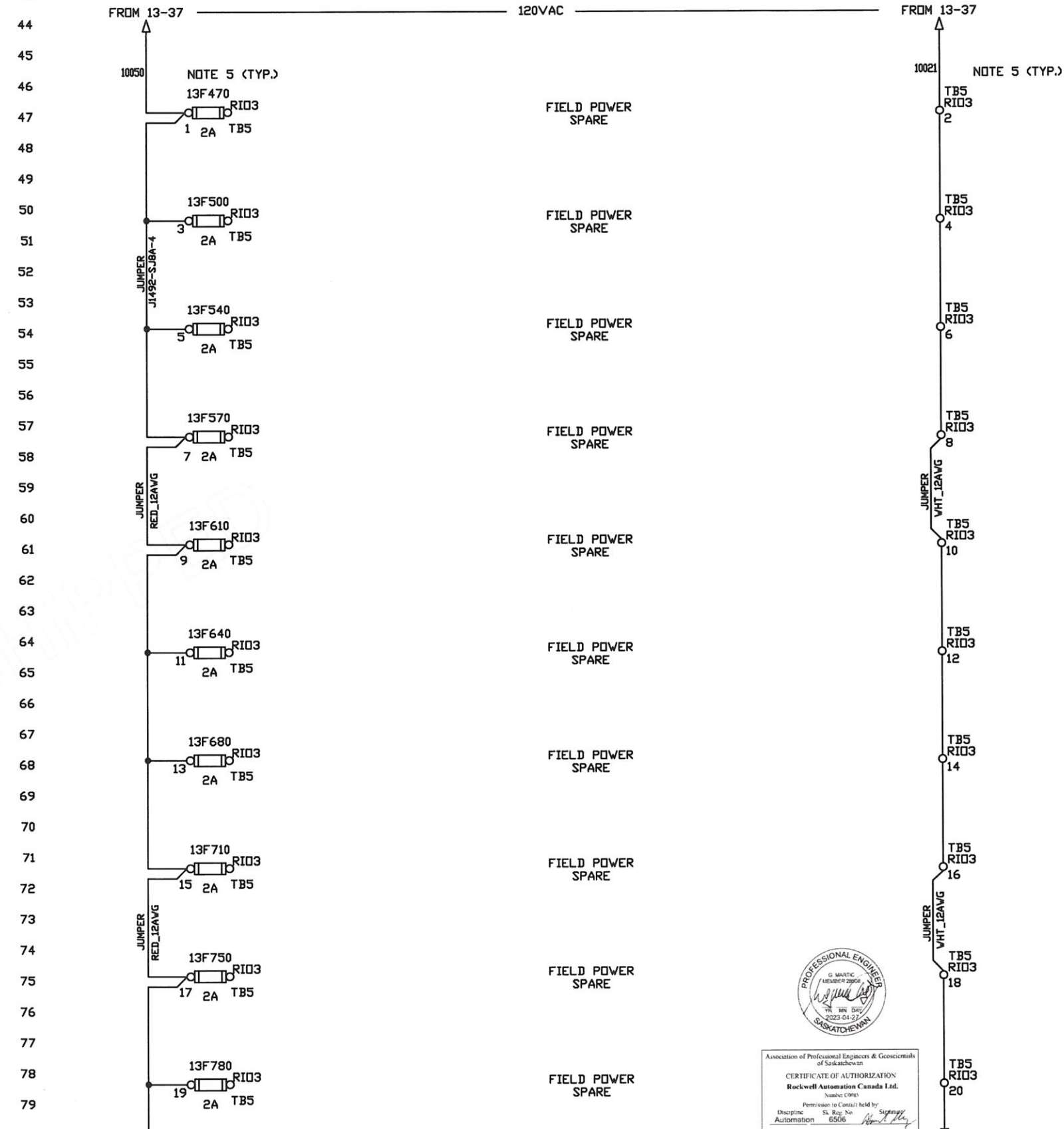
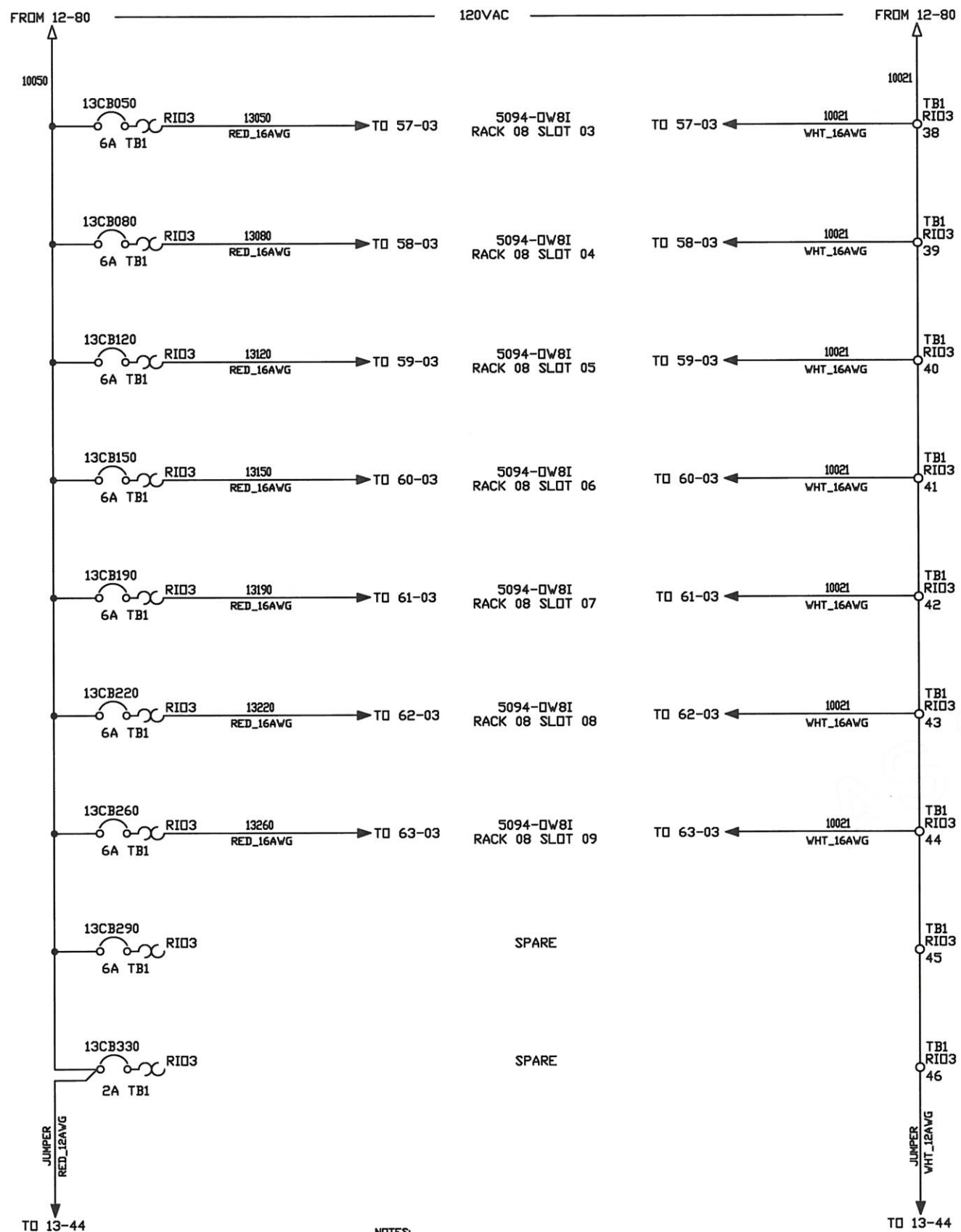


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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

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VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 120VAC POWER DISTRIBUTION
 Drawn by: GM Date: 14/10/22

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 2. ALL CONDUCTORS LARGER THAN #16 AWG SHALL BE STRANDED.
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 5. TWO-CIRCUIT FUSED TERMINAL.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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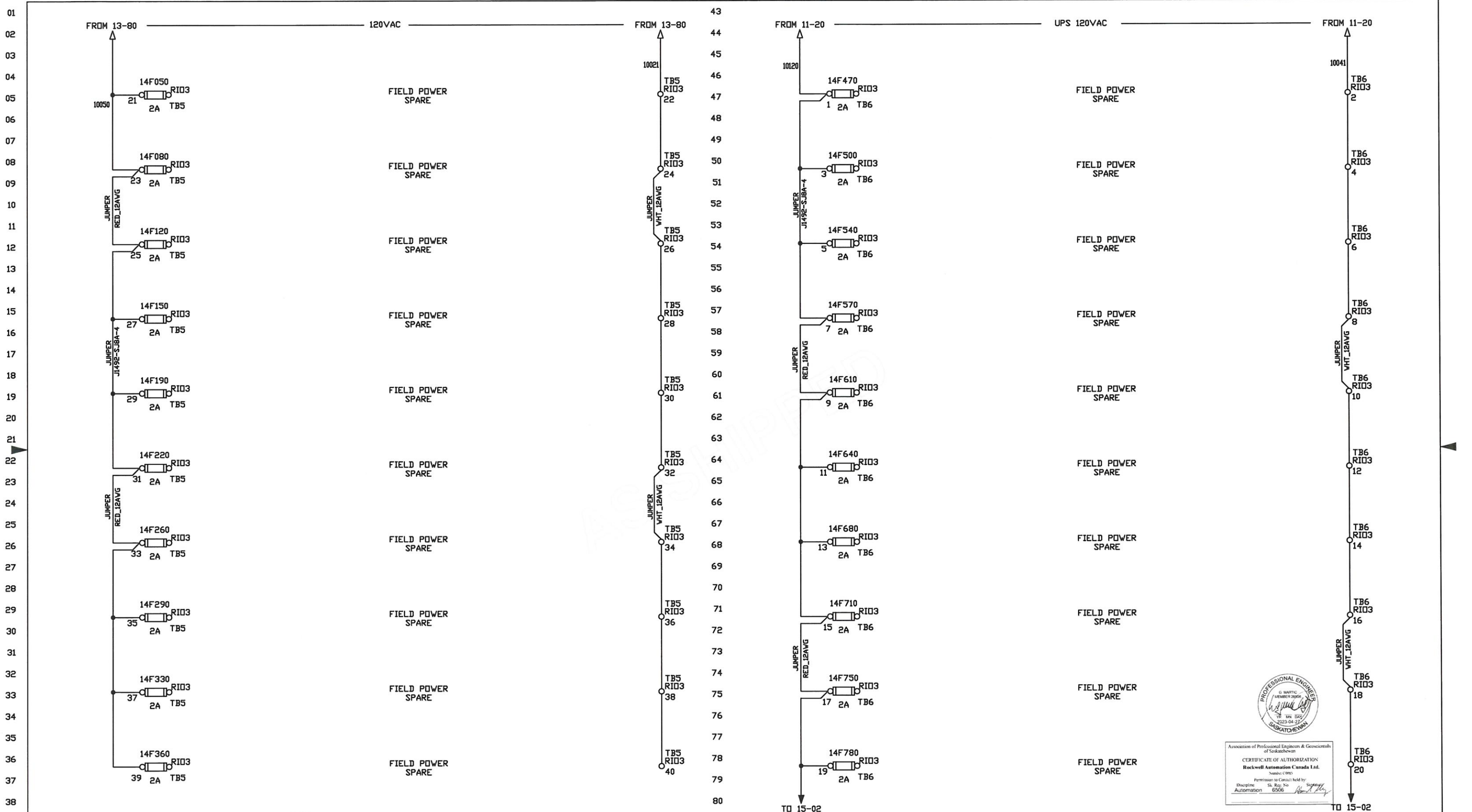
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VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 120VAC POWER DISTRIBUTION
 Drawn by: GM Date: 09/11/22



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		AS COMMISSIONED



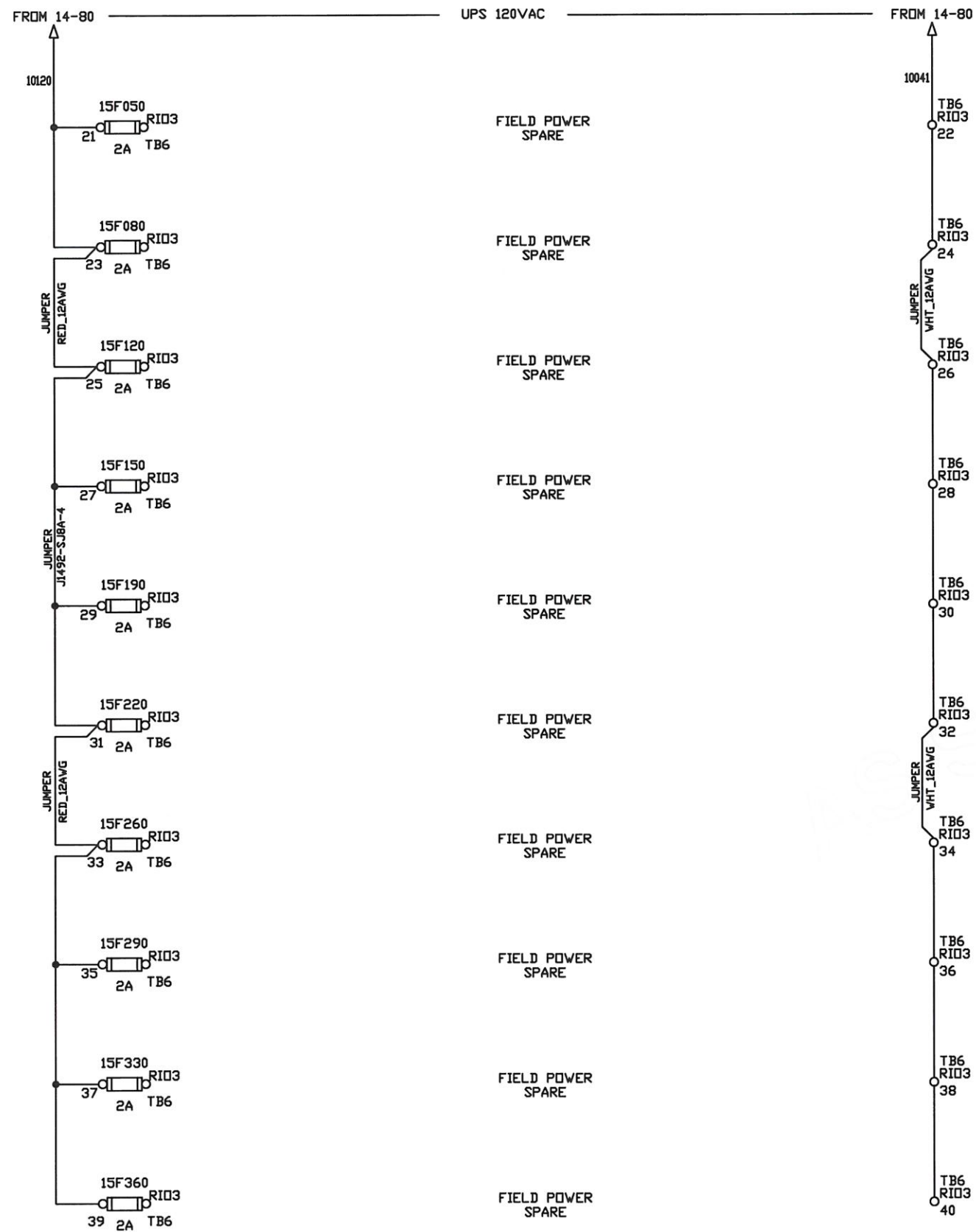
CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: 0393
 Permission to Consult held by:
 Discipline: Automation
 SA Reg. No: 6506

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2	25/04/23	GM	AS SHIPPED

Rockwell Automation

VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 120VAC POWER DISTRIBUTION
 Drawn by: GM Date: 16/09/22

Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: 0395
 Permission to Consume held by:
 Discipline: Automation St. Reg. No. 6506
 Signature: [Signature] 2023-04-27



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Rockwell Automation

VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
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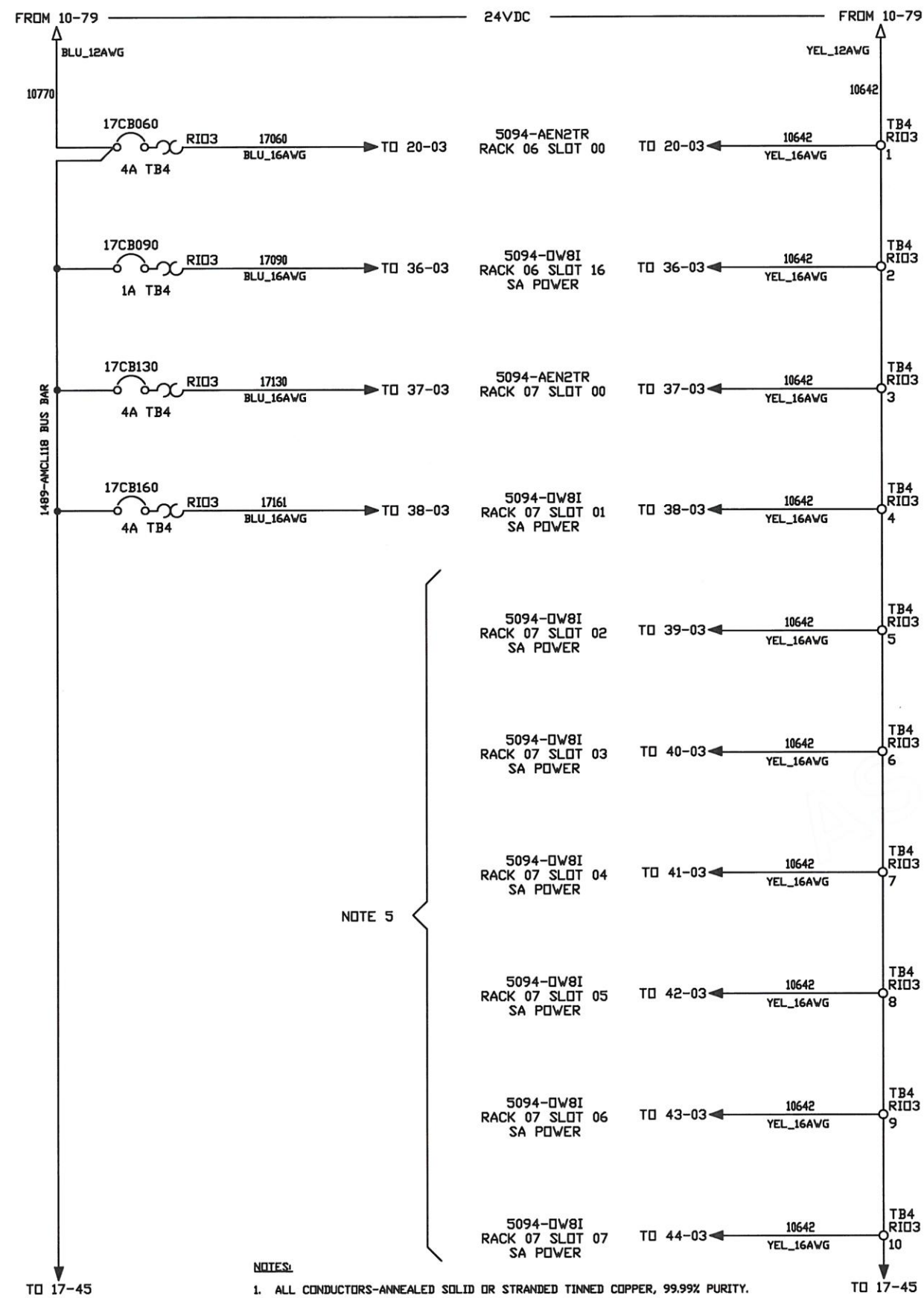
Association of Professional Engineers & Geoscientists
of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number: C1902
Permission to Carry out held by
Discipline: Automation St. Reg. No. 6506
Signature: [Signature]



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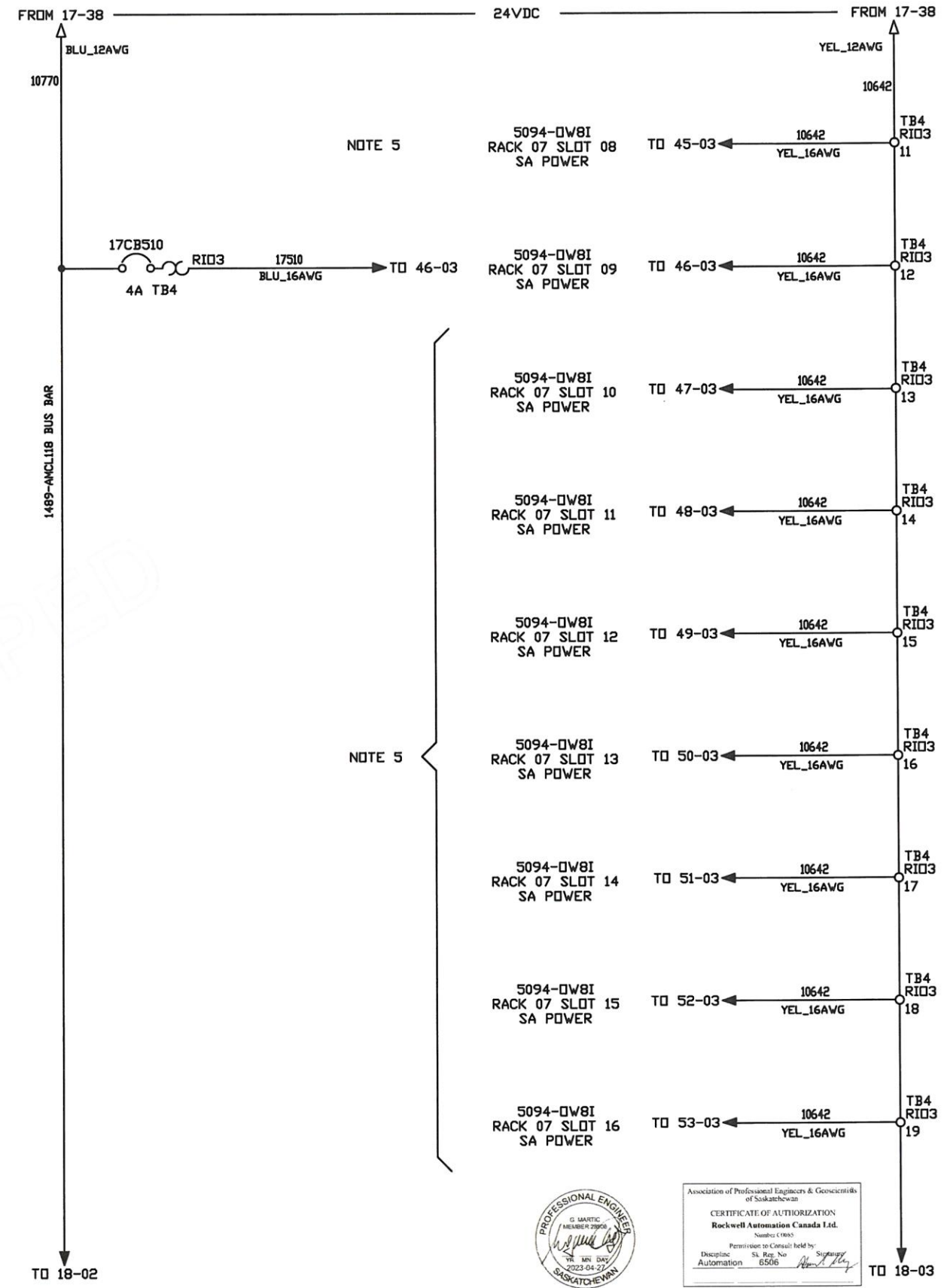
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- NOTES:**
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 5. JUMPER 24VDC FROM ONE DO MODULE TO THE NEXT DO MODULE - SEE IO WIRING.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation

Vital Metals

VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
24VDC POWER DISTRIBUTION
Drawn by: GM Date: 14/10/22

Sheet 17 of 75 Next Sh 18

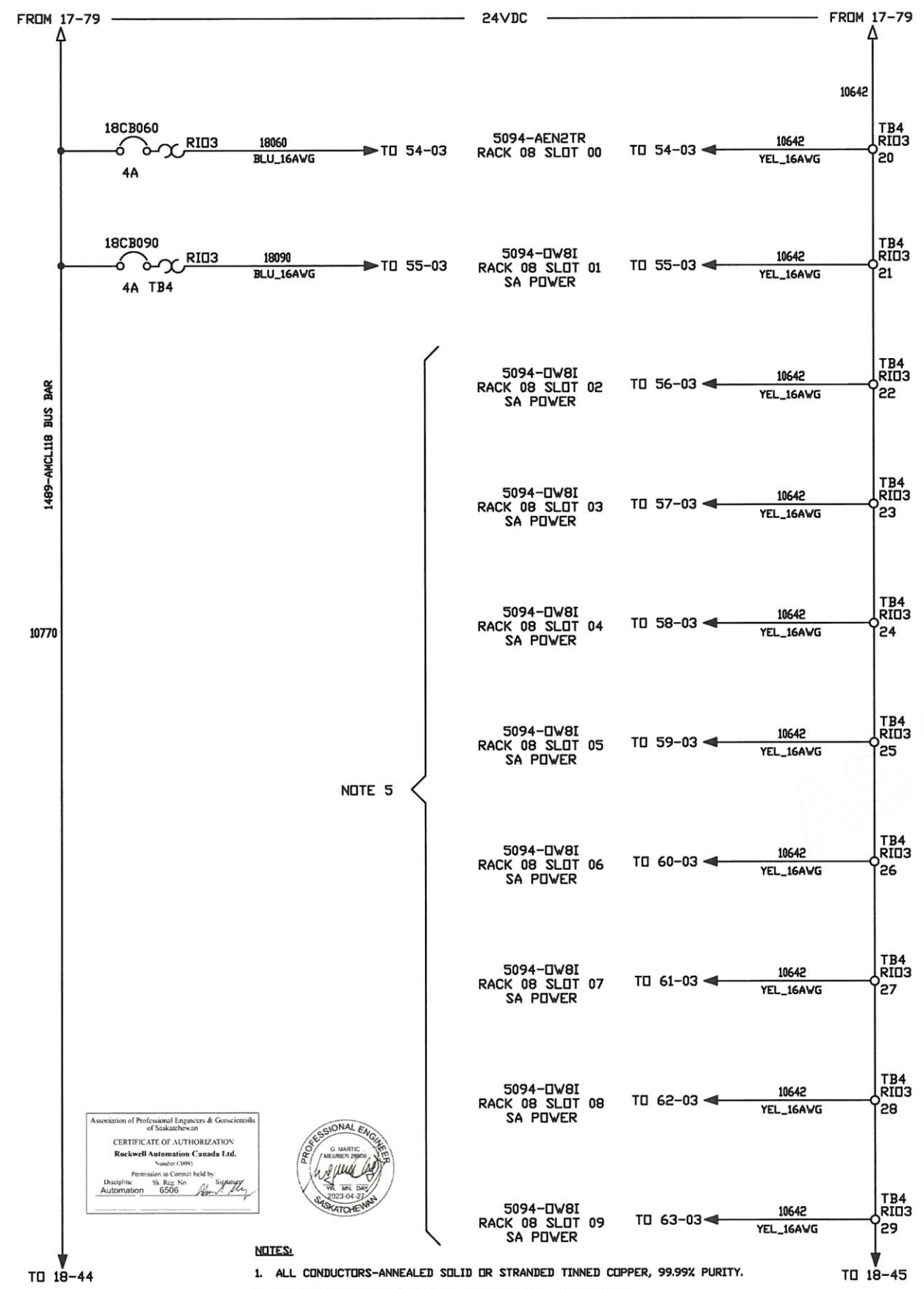
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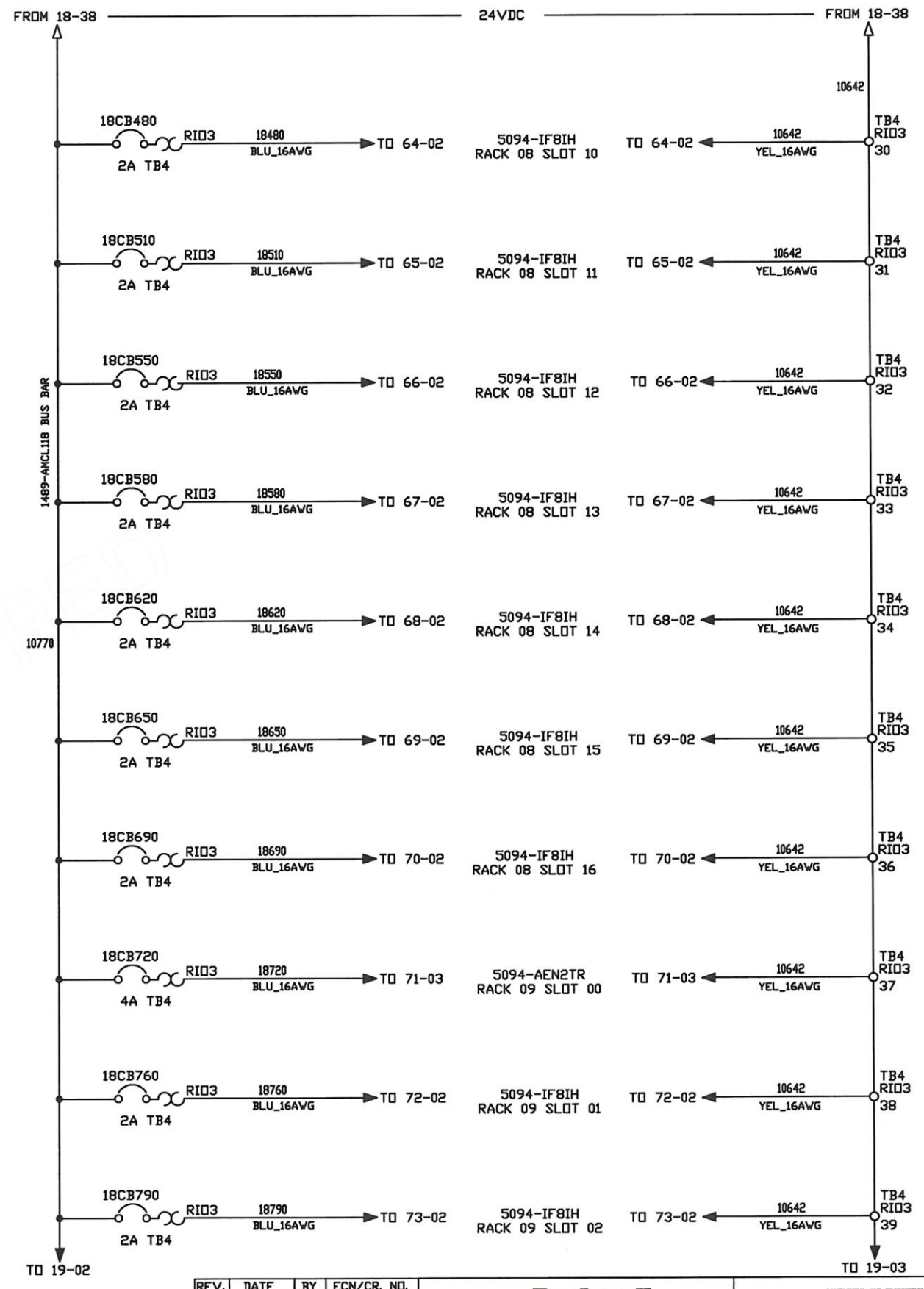


NOTE 5



- NOTES:
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25/04/23	GM	AS SHIPPED
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2	25/04/23	GM	AS SHIPPED

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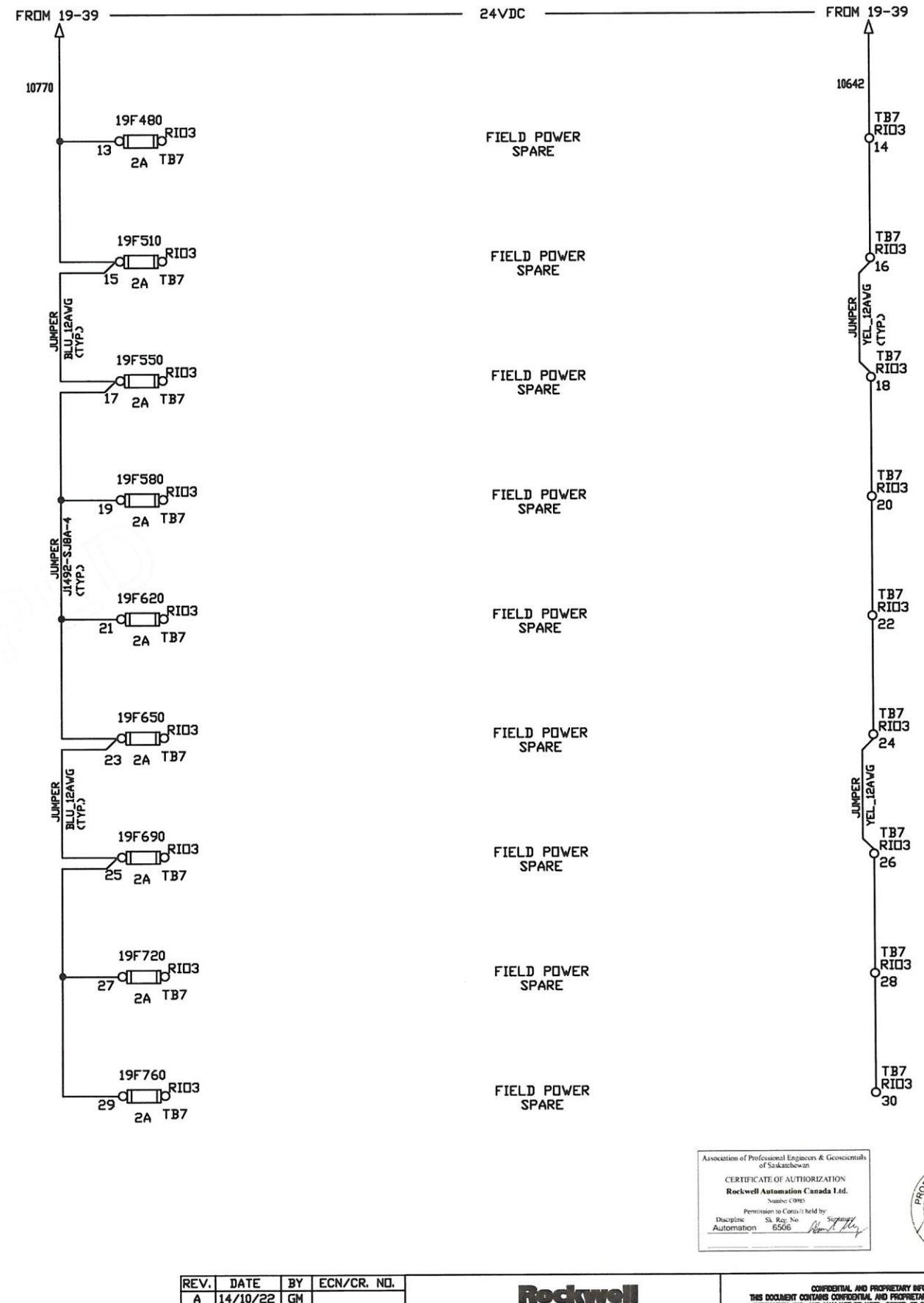
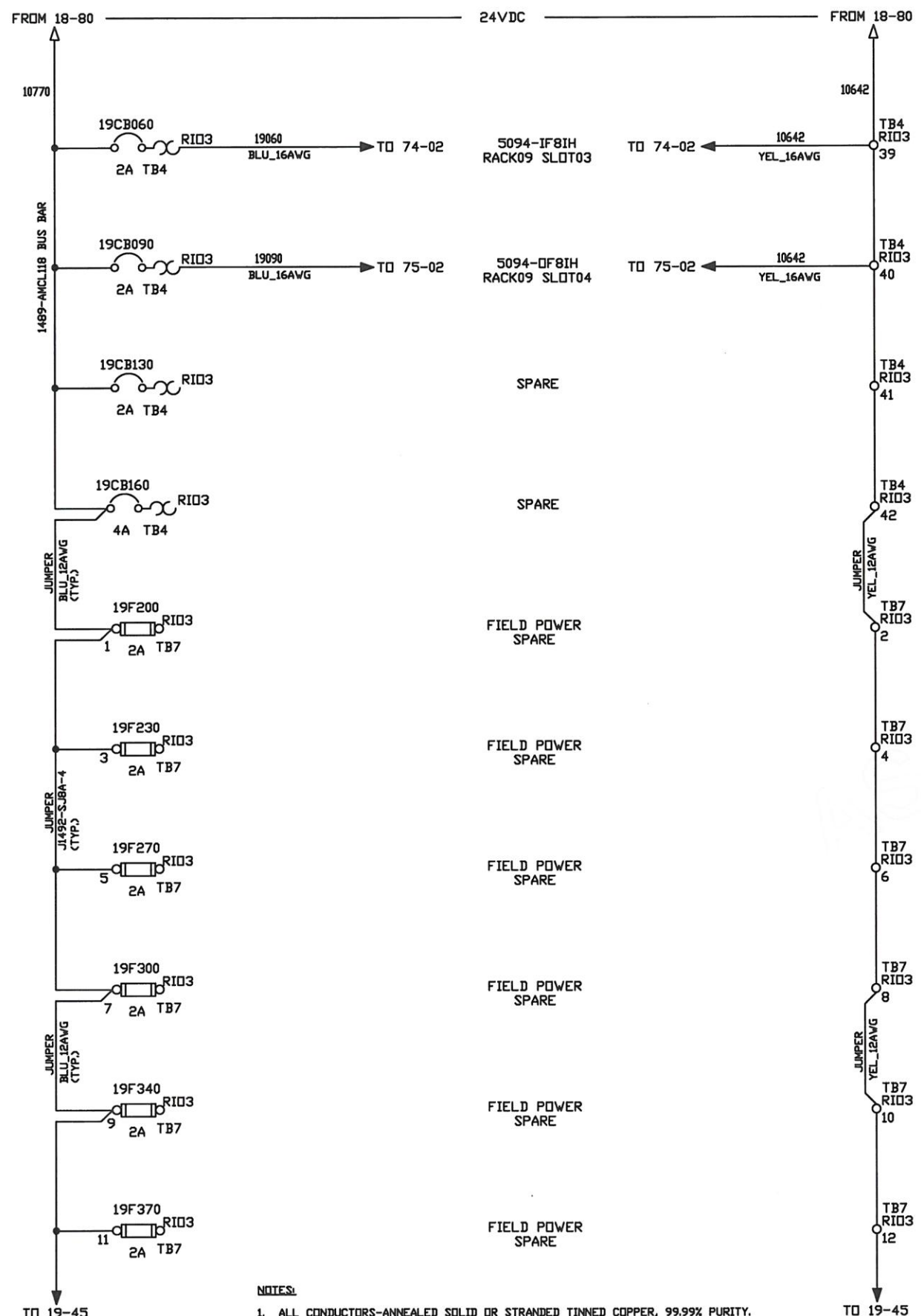
VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
24VDC POWER DISTRIBUTION

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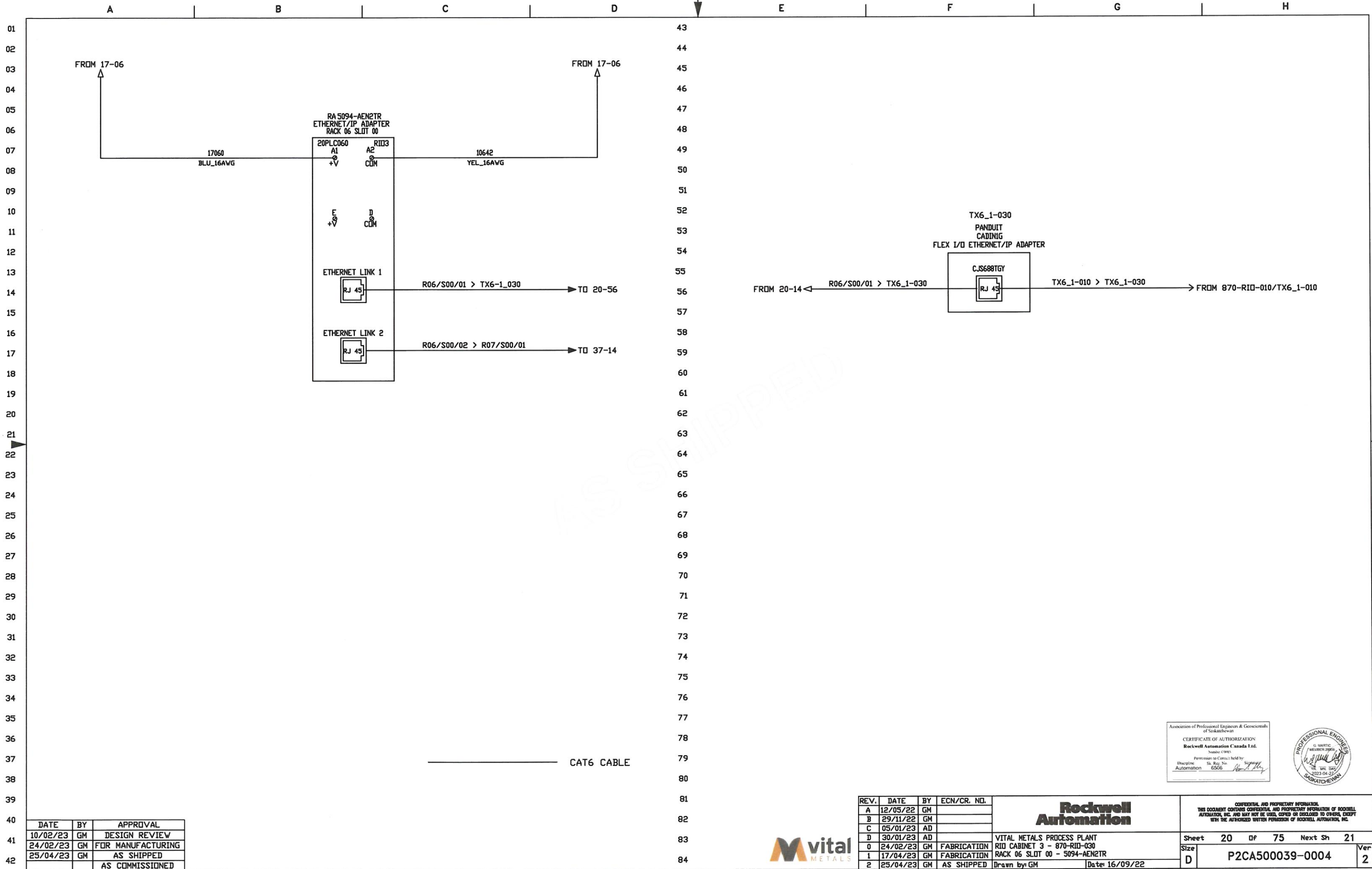
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25/04/23	GM	AS SHIPPED
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1	17/04/23	GM	FABRICATION	24VDC POWER DISTRIBUTION
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Size	D			P2CA500039-0004	Ver 2





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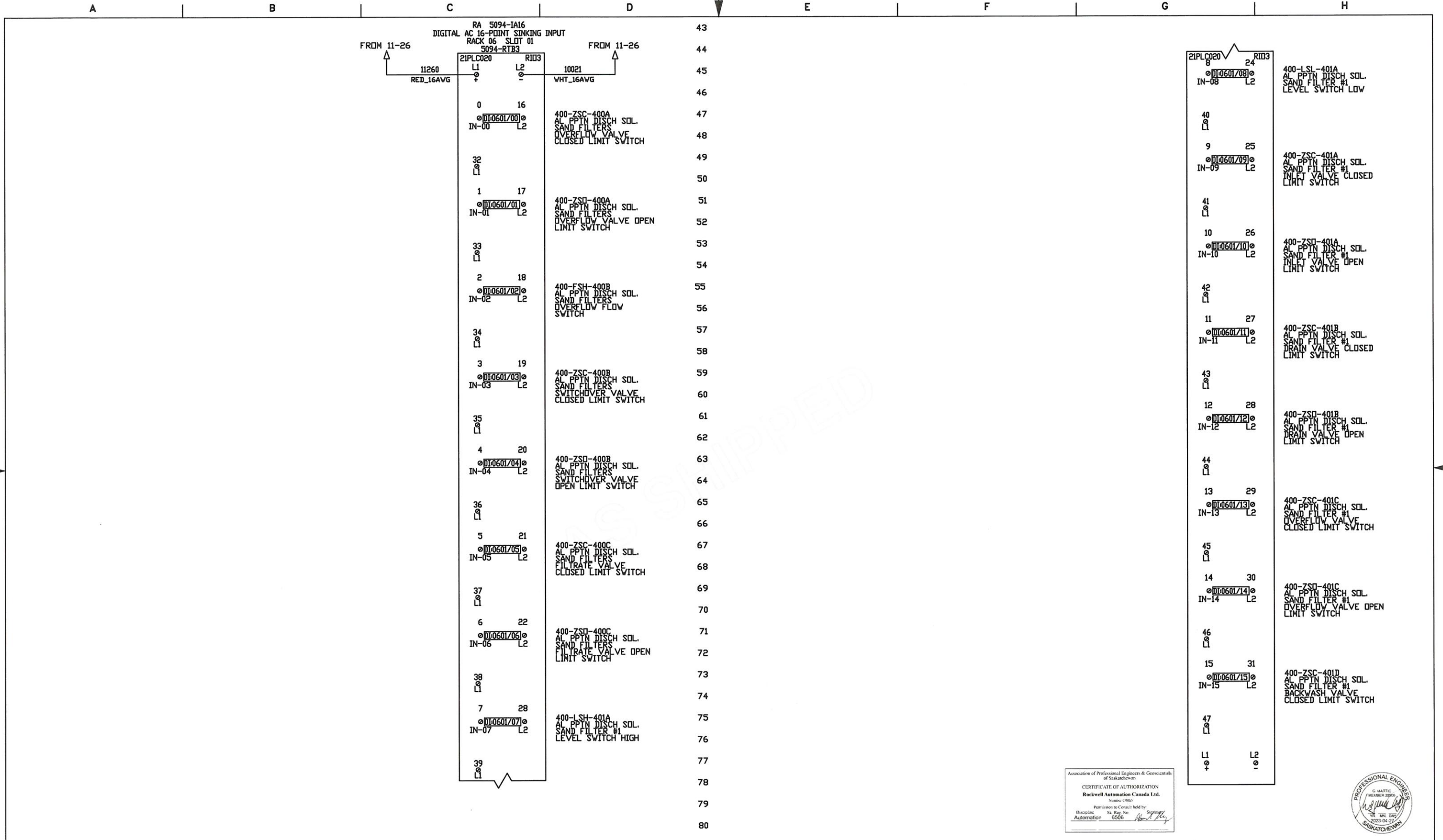
Rockwell Automation

VITAL METALS PROCESS PLANT
RII CABINET 3 - 870-RII-030
RACK 06 SLOT 00 - 5094-AEN2TR

Drawn by: GM Date: 16/09/22

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number: C905
Permission to Control held by:
Discipline: Automation St. Reg. No: 65646
Signature: [Signature] Date: 2023-04-21
SASKATCHEWAN





Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Since 1985
 Permission to Consult held by:
 Discipline: Automation, Signatory: [Signature], No. 6506, Date: 2023-04-21



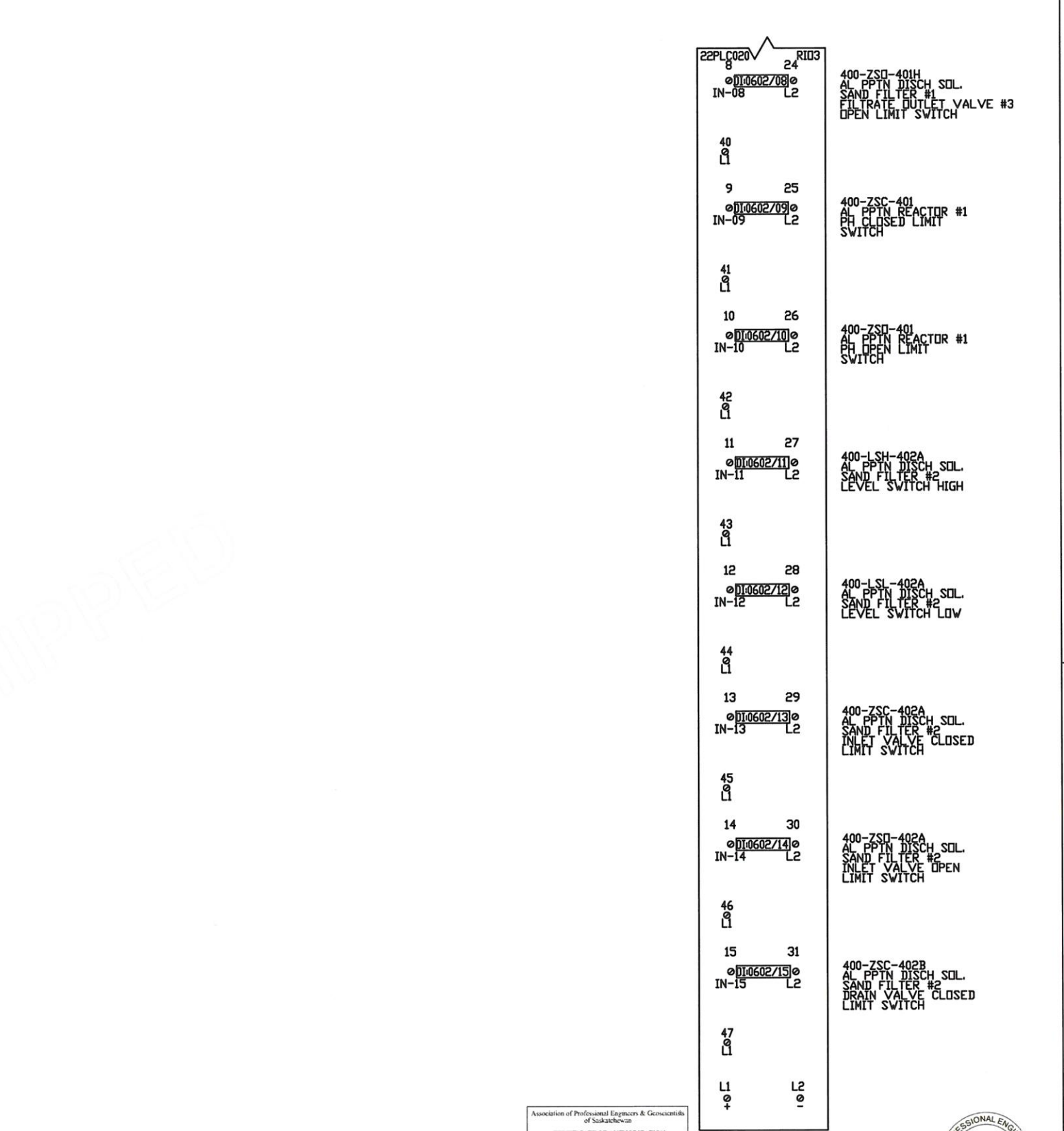
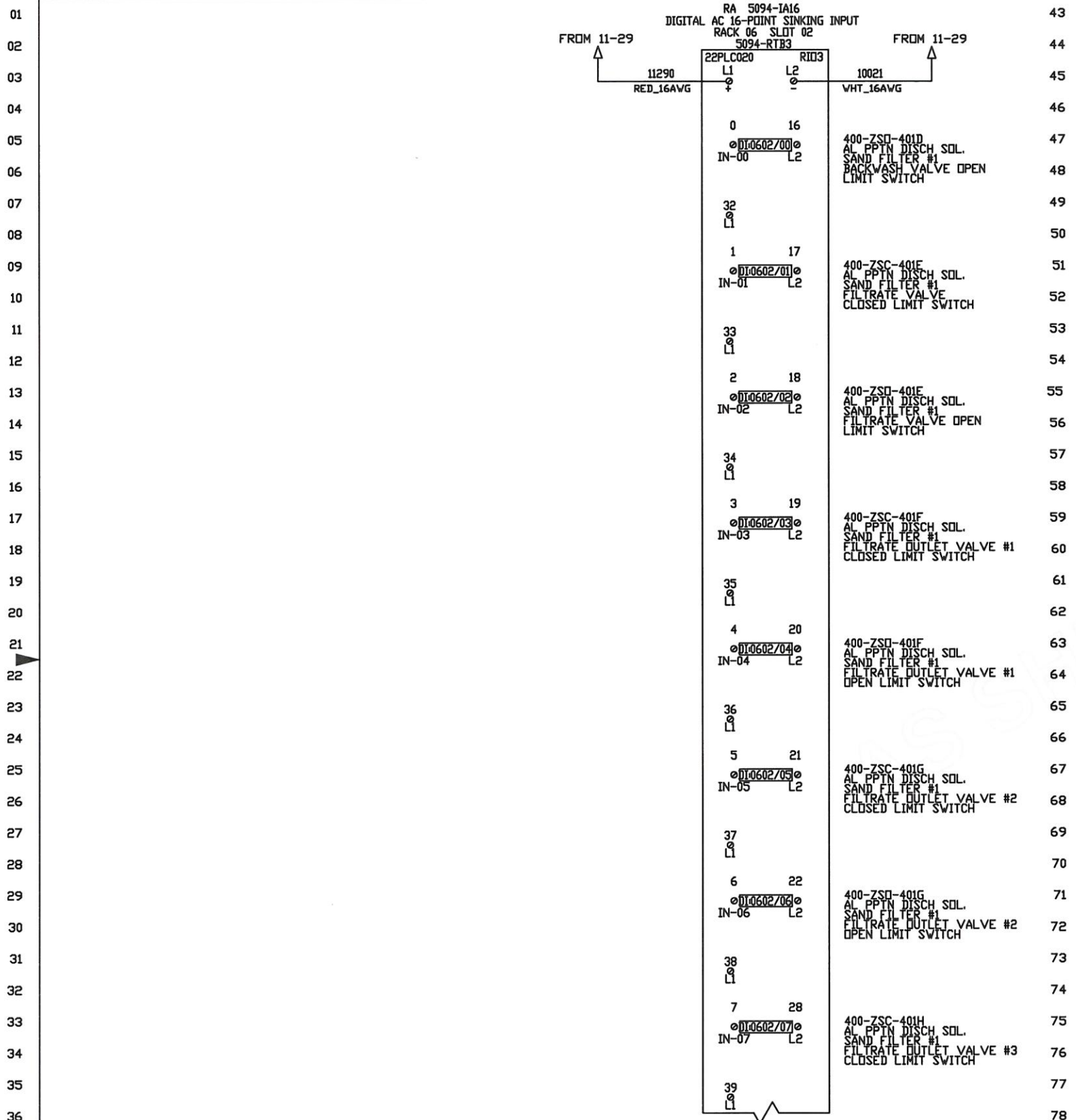
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2	25/04/23	GM	AS SHIPPED

Rockwell Automation
 VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 06 SLOT 01 - 5094-IA16
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 Sheet 21 of 75 Next Sh 22
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Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Permission to Consult held by:
 Discipline: Automation, Reg. No: 6506, Signature: [Signature], Date: 2023-04-21



DATE	BY	APPROVAL
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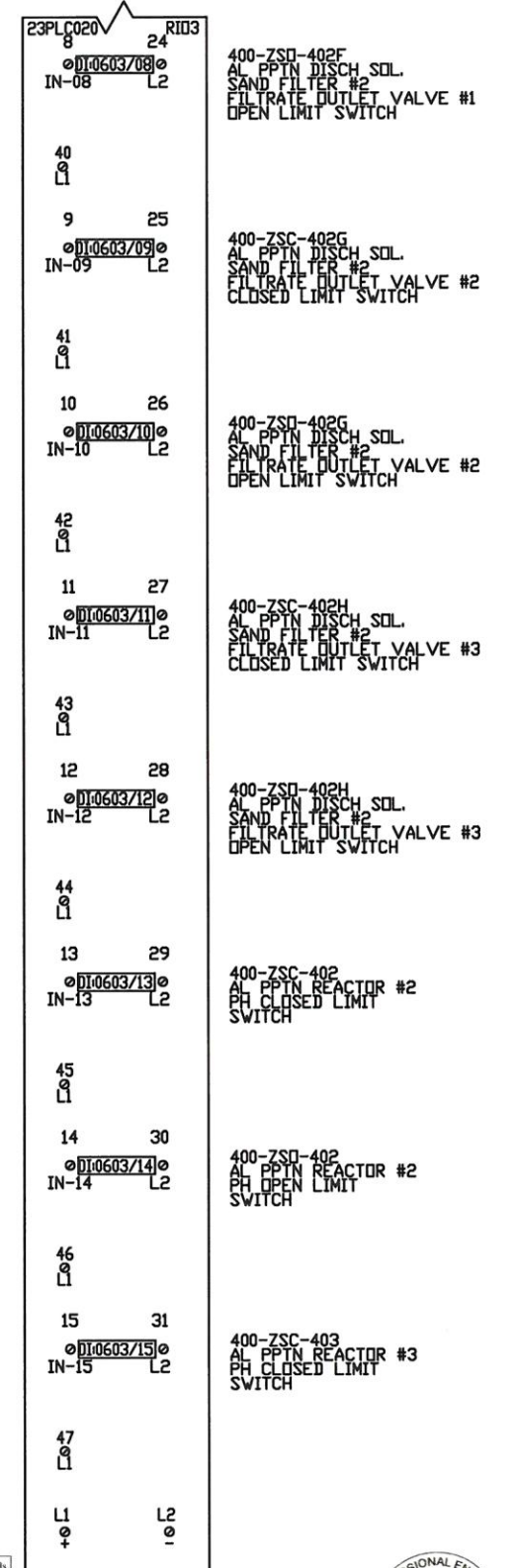
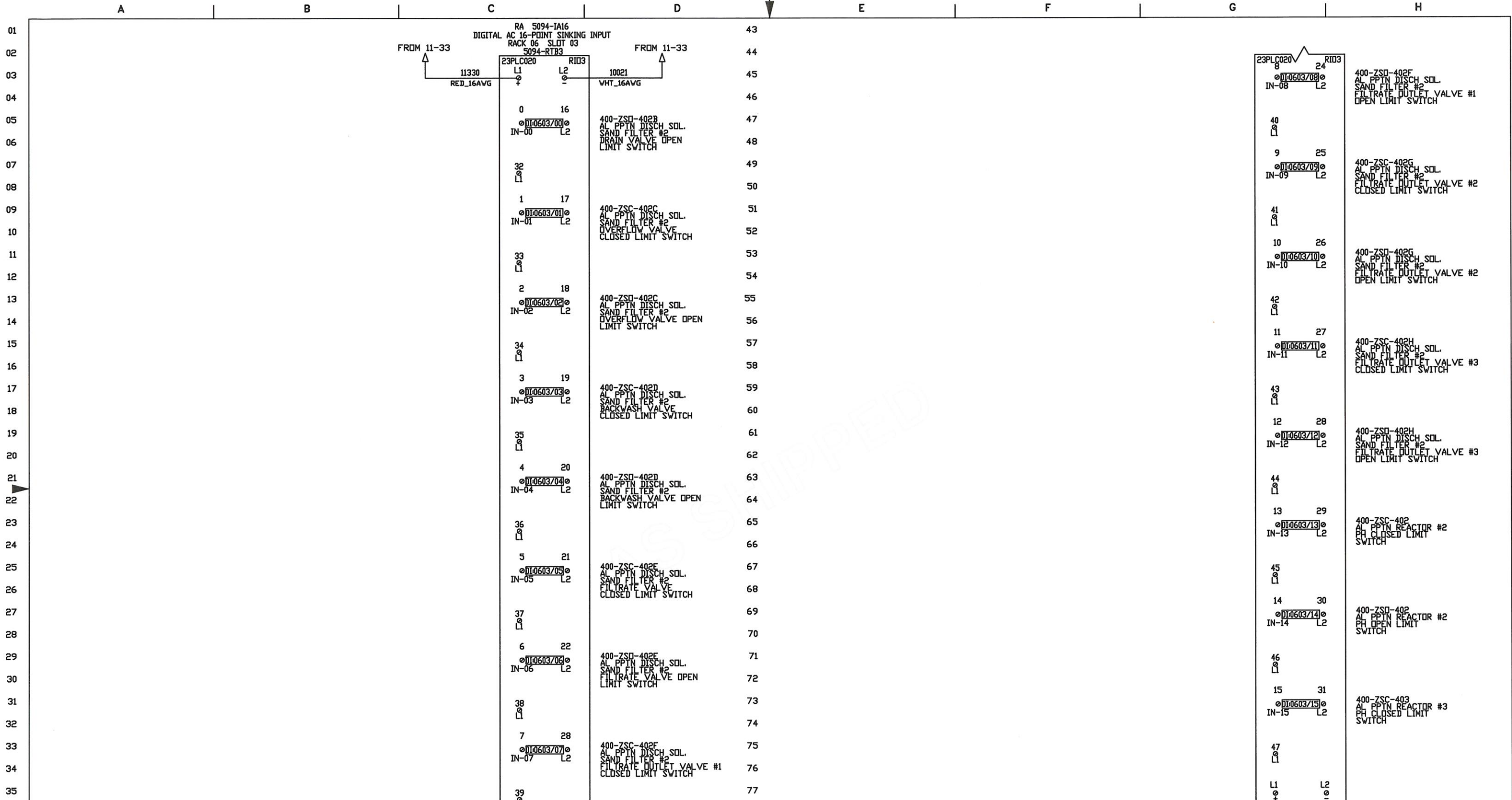
Rockwell Automation

VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 06 SLOT 02 - 5094-IA16
 Drawn by: GM Date: 16/09/22

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Sheet 22 of 75 Next Sh 23
 Size D P2CA500039-0004 Ver 2





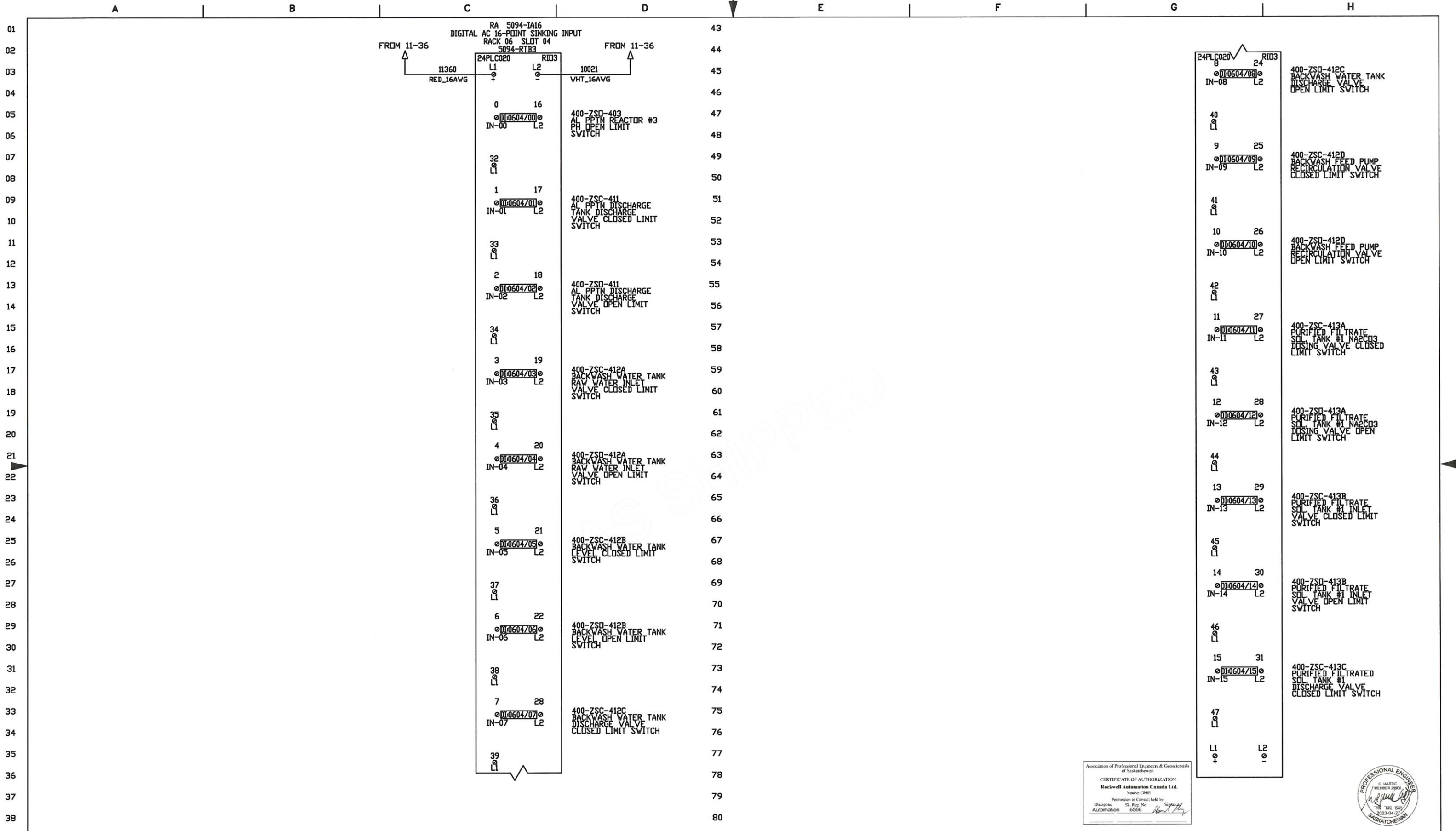
Association of Professional Engineers & Geoscientists
of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number: 4-0005
Permission to Control held by:
Description: Automation 6566
Signature: [Signature]
Date: 2023-04-21



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
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B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
				VITAL METALS PROCESS PLANT	Sheet 23 of 75 Next Sh 24
				RIO CABINET 3 - 870-RIO-030	Size D
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				Drawn by: GM	Date: 16/09/22
					Ver 2





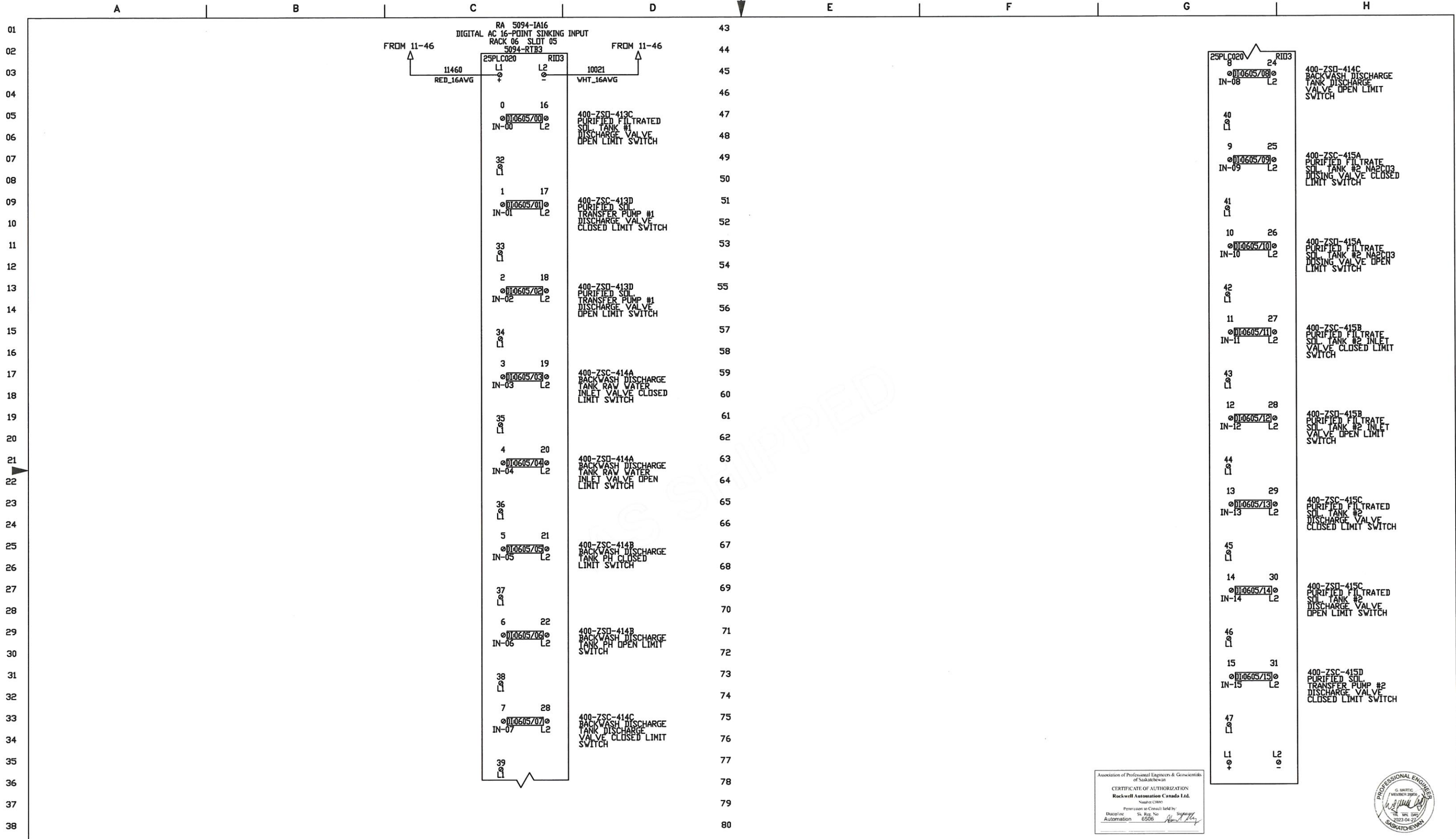
Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
Name: CORE
 Permission to Control held by:
 Discipline: Automation St. Reg. No: 6506 Signature: [Signature] Expiry Date: 2023-04-27



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.		
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D	30/01/23	AD			
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					Ver 2



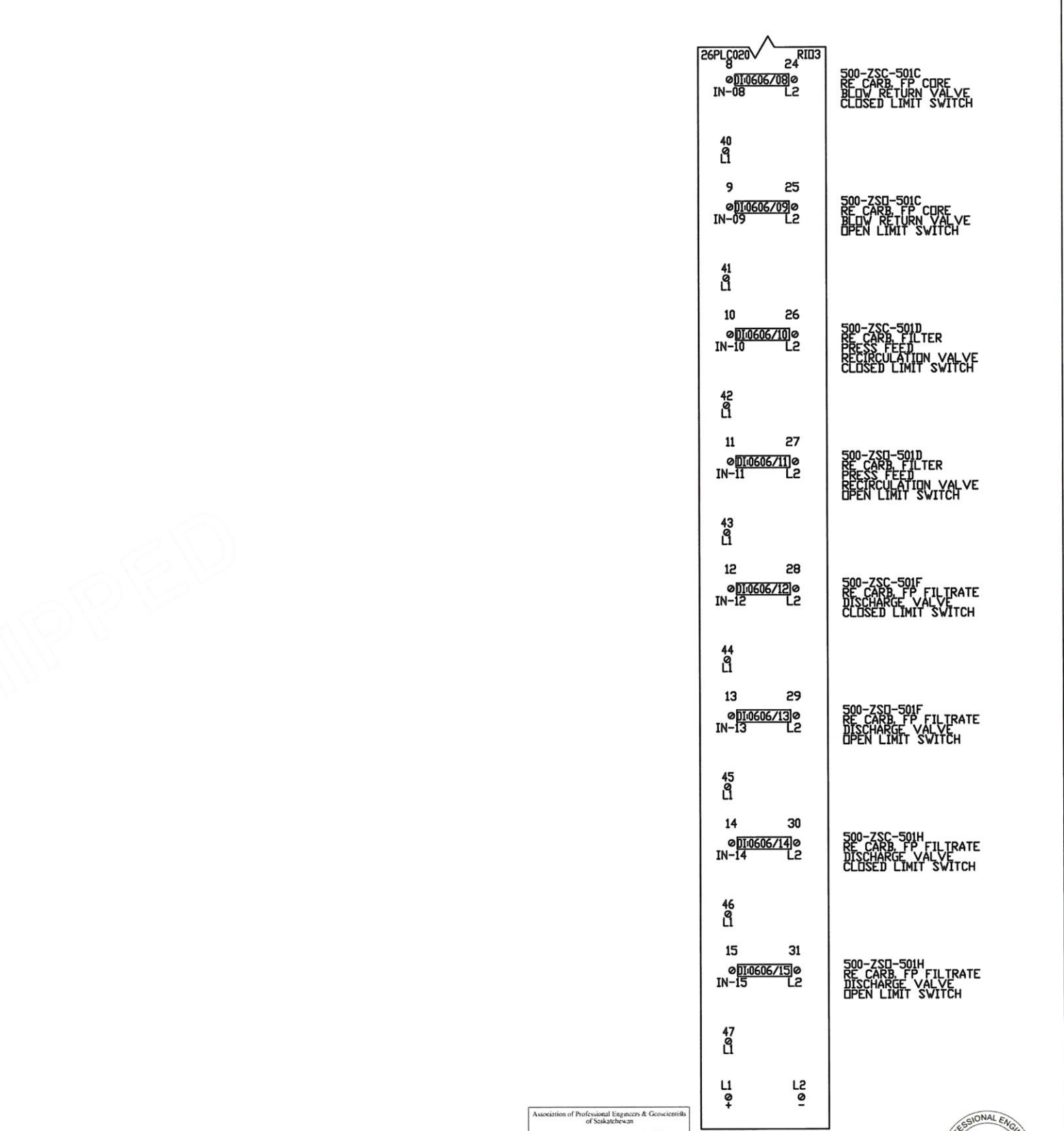
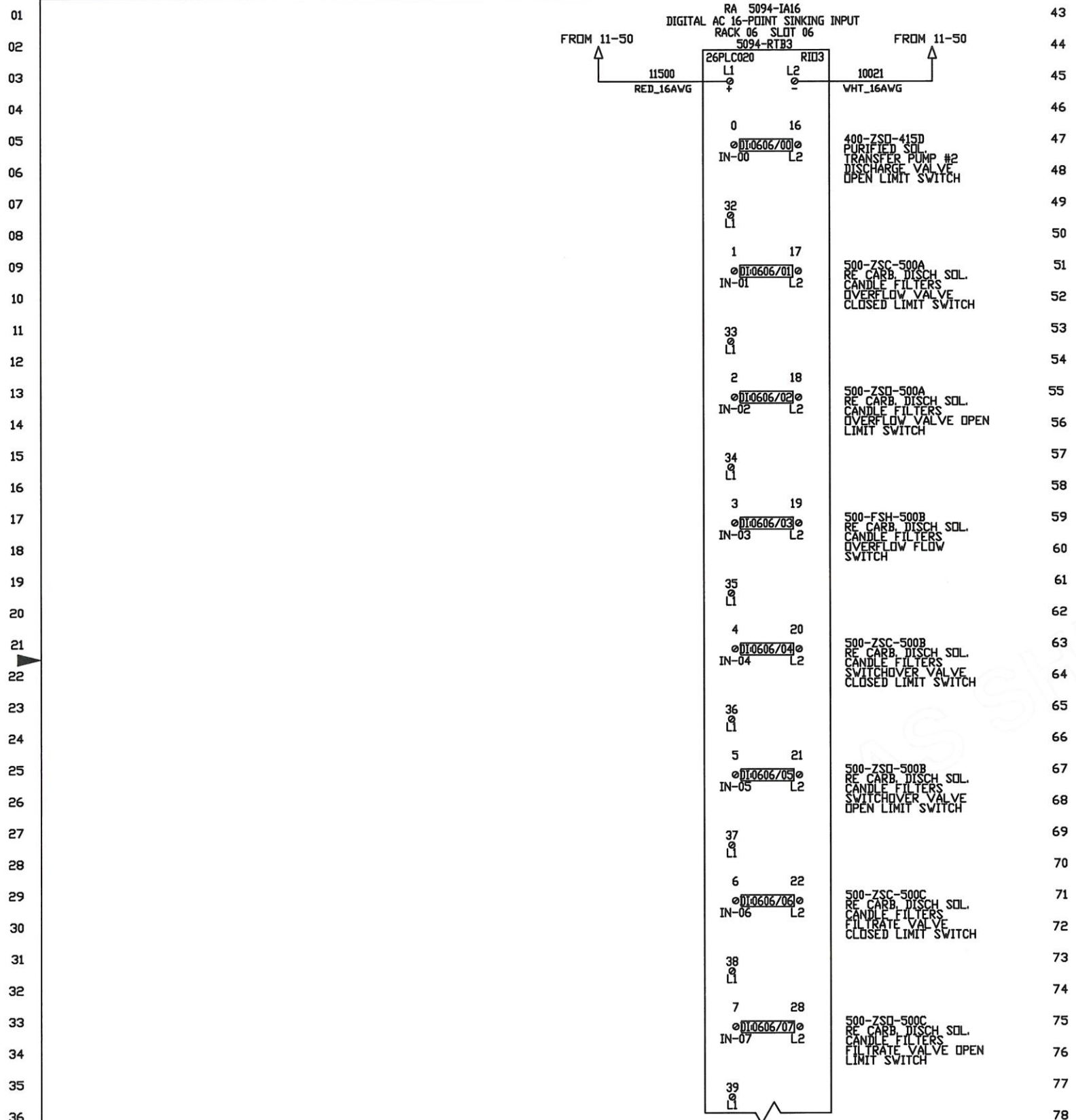


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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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B	29/11/22	GM			
C	05/01/23	AD		VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030 RACK 06 SLOT 05 - 5094-IA16	Sheet 25 of 75 Next Sh 26
D	30/01/23	AD			Size D
0	24/02/23	GM	FABRICATION	Drawn by GM	Date: 16/09/22
1	17/04/23	GM	FABRICATION		
2	25/04/23	GM	AS SHIPPED		

Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: C2065
 Permission or Consent held by:
 Discipline: Automation St. Reg. No: 6506 Signature: [Signature] Date: 2023-04-23





Terminal	Component
0	400-ZSD-415D PURIFIED SOL. TRANSFER PUMP #2 DISCHARGE VALVE OPEN LIMIT SWITCH
1	500-ZSC-500A RE CARB. DISCH. SOL. CANDLE FILTERS OVERFLOW VALVE CLOSED LIMIT SWITCH
2	500-ZSD-500A RE CARB. DISCH. SOL. CANDLE FILTERS OVERFLOW VALVE OPEN LIMIT SWITCH
3	500-FSH-500B RE CARB. DISCH. SOL. CANDLE FILTERS OVERFLOW FLOW SWITCH
4	500-ZSC-500B RE CARB. DISCH. SOL. CANDLE FILTERS SWITCHOVER VALVE CLOSED LIMIT SWITCH
5	500-ZSD-500B RE CARB. DISCH. SOL. CANDLE FILTERS SWITCHOVER VALVE OPEN LIMIT SWITCH
6	500-ZSC-500C RE CARB. DISCH. SOL. CANDLE FILTERS FILTRATE VALVE CLOSED LIMIT SWITCH
7	500-ZSD-500C RE CARB. DISCH. SOL. CANDLE FILTERS FILTRATE VALVE OPEN LIMIT SWITCH

Terminal	Component
8	500-ZSC-501C RE CARB. FP CORE BLOW RETURN VALVE CLOSED LIMIT SWITCH
9	500-ZSD-501C RE CARB. FP CORE BLOW RETURN VALVE OPEN LIMIT SWITCH
10	500-ZSC-501D RE CARB. FILTER PRESS. FEED RECIRCULATION VALVE CLOSED LIMIT SWITCH
11	500-ZSD-501D RE CARB. FILTER PRESS. FEED RECIRCULATION VALVE OPEN LIMIT SWITCH
12	500-ZSC-501F RE CARB. FP FILTRATE DISCHARGE VALVE CLOSED LIMIT SWITCH
13	500-ZSD-501F RE CARB. FP FILTRATE DISCHARGE VALVE OPEN LIMIT SWITCH
14	500-ZSC-501H RE CARB. FP FILTRATE DISCHARGE VALVE CLOSED LIMIT SWITCH
15	500-ZSD-501H RE CARB. FP FILTRATE DISCHARGE VALVE OPEN LIMIT SWITCH

Association of Professional Engineers & Geoscientists of Saskatchewan
 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Permit to act in Canada held by:
 Discipline: Automation St. Reg. No: 6506 Signature: [Signature] 2023-04-21



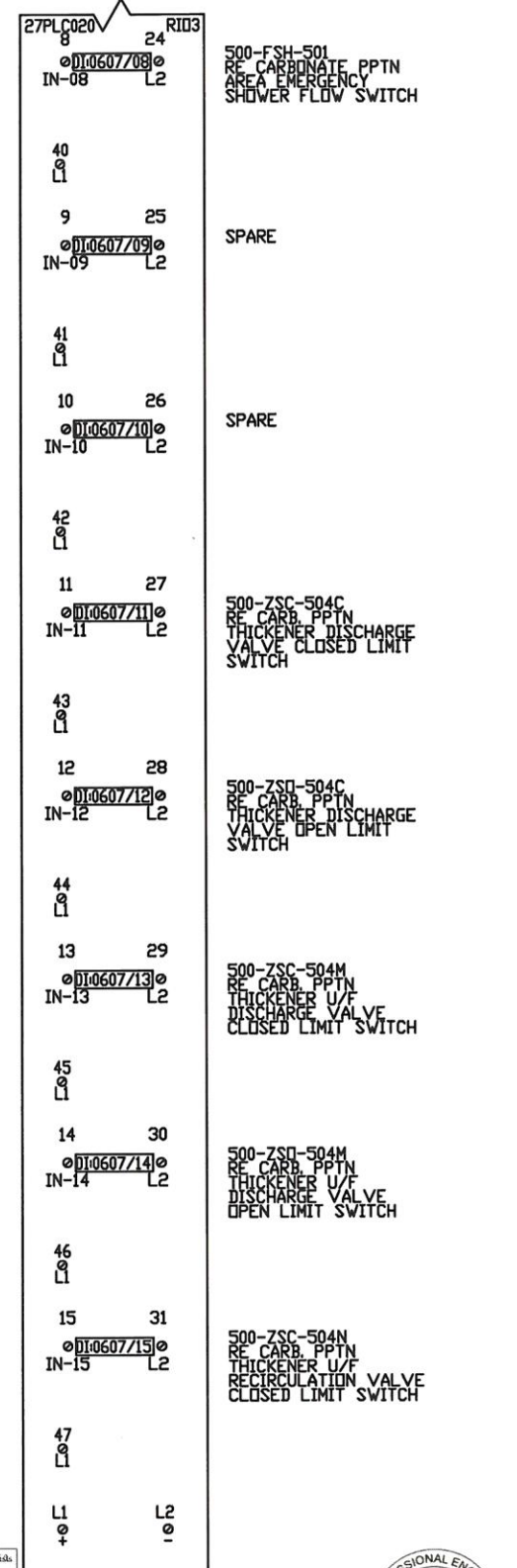
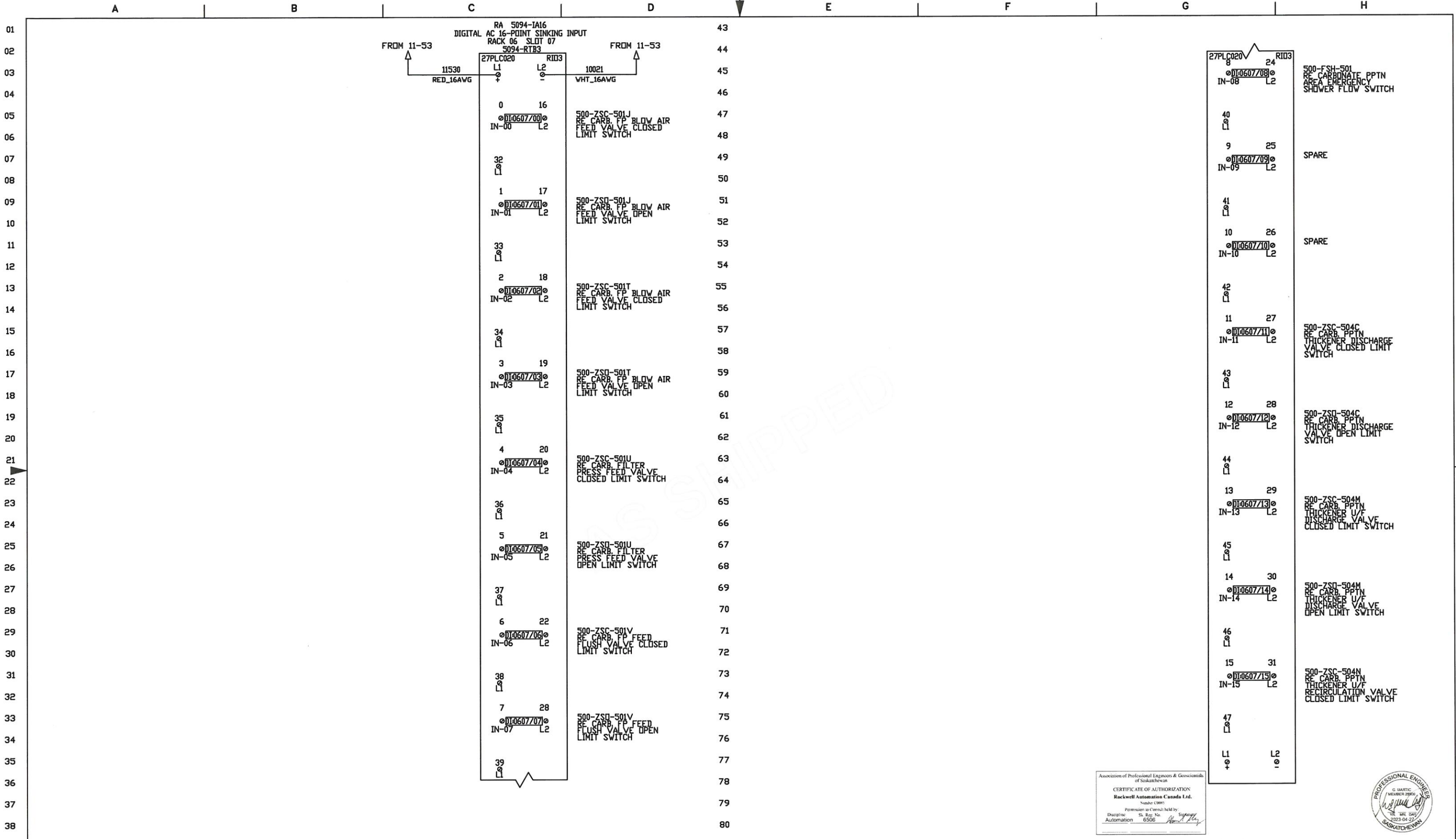
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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



REV.	DATE	BY	ECN/CR. NO.
A	12/05/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation
 VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 06 SLOT 06 - 5094-IA16
 Drawn by: GM Date: 16/09/22

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Sheet	26	Of	75
Next Sh	27		
Size	D		
	P2CA500039-0004		Ver 2



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 CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: C0981
 Permission to Certify held by:
 Discipline: Automation
 No. Reg. No.: 6506
 Signature: [Signature]



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.	
A	12/05/22	GM		Rockwell Automation VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030 RACK 06 SLOT 07 - 5094-IA16 Drawn by: GM Date: 16/09/22
B	29/11/22	GM		
C	05/01/23	AD		
D	30/01/23	AD		
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1	17/04/23	GM	FABRICATION	
2	25/04/23	GM	AS SHIPPED	



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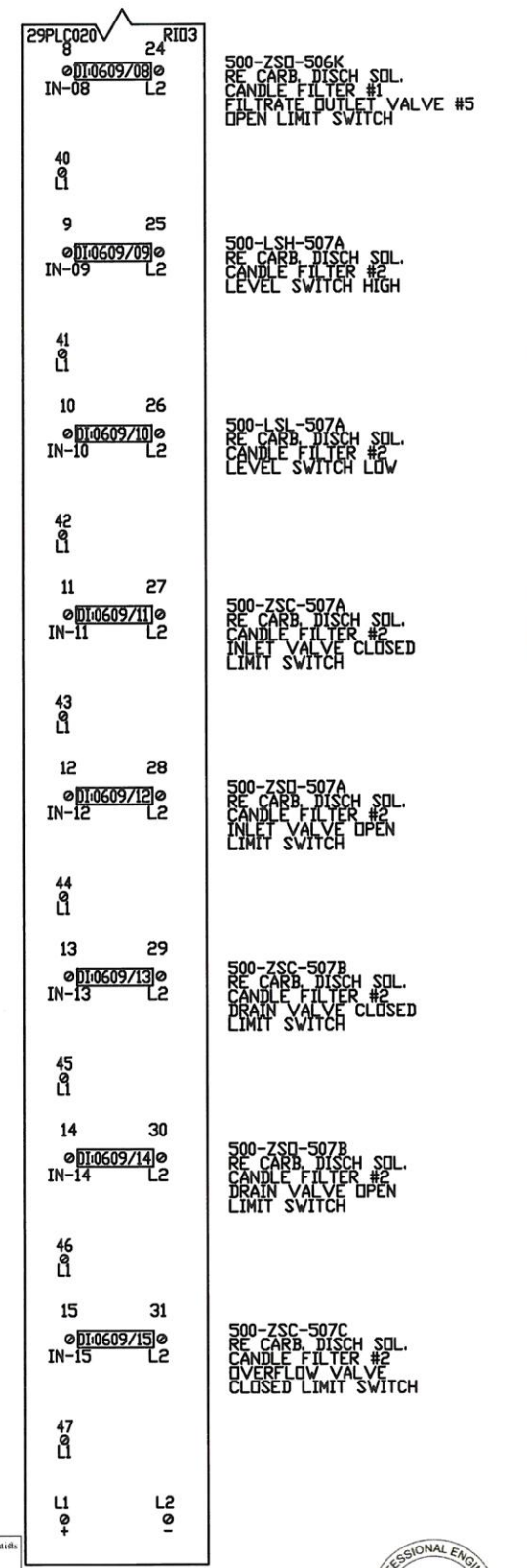
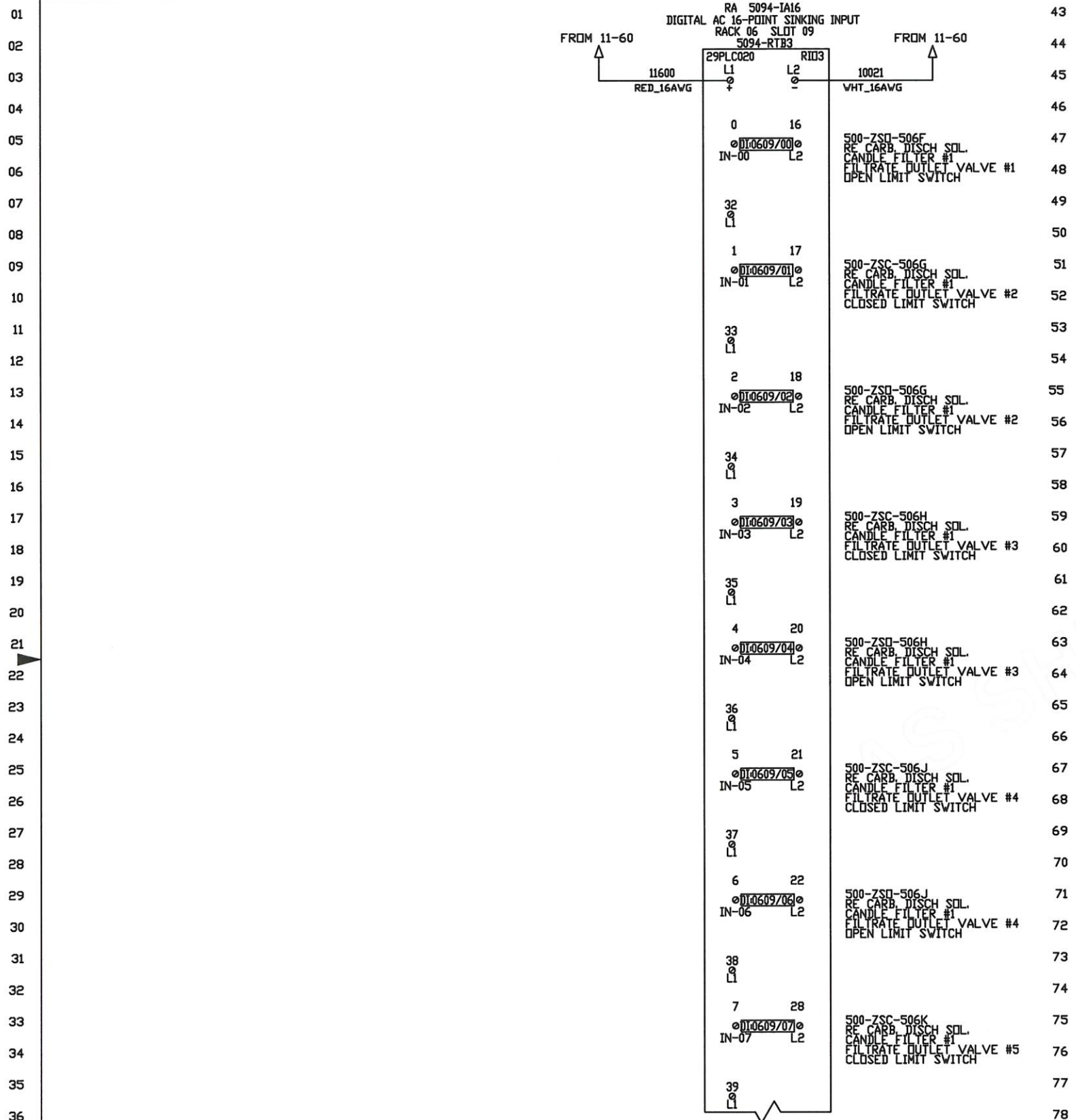
Association of Professional Engineers & Geoscientists
of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number C3903
Permitted to Control held by
Discipline: Automation 6566
Signature: [Signature]
Date: 2023-04-21



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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D	30/01/23	AD			
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				RI03 CABINET 3 - 870-RI03-030	Size D
				RACK 06 SLOT 08 - 5094-IA16	Ver 2
				1 17/04/23 GM FABRICATION	
				2 25/04/23 GM AS SHIPPED	
				Drawn by: GM	Date: 16/09/22





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Rockwell Automation Canada Ltd.
Number C1865
Permission to Create held by:
Discipline: Automation SA Reg. No: 6506 [Signature]



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10/02/23	GM	DESIGN REVIEW
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25/04/23	GM	AS SHIPPED
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0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030	Sheet 29 of 75 Next Sh 30
1	17/04/23	GM	FABRICATION	RACK 06 SLOT 09 - 5094-IA16	Size D P2CA500039-0004 Ver 2
2	25/04/23	GM	AS SHIPPED	Drawn by GM Date: 16/09/22	





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 Rockwell Automation Canada Ltd.
 Number: C0985
 Permission to Control held by:
 Discipline: Automation
 No. Reg. No. 6566
 Signature: [Signature]
 Date: 2023-04-21



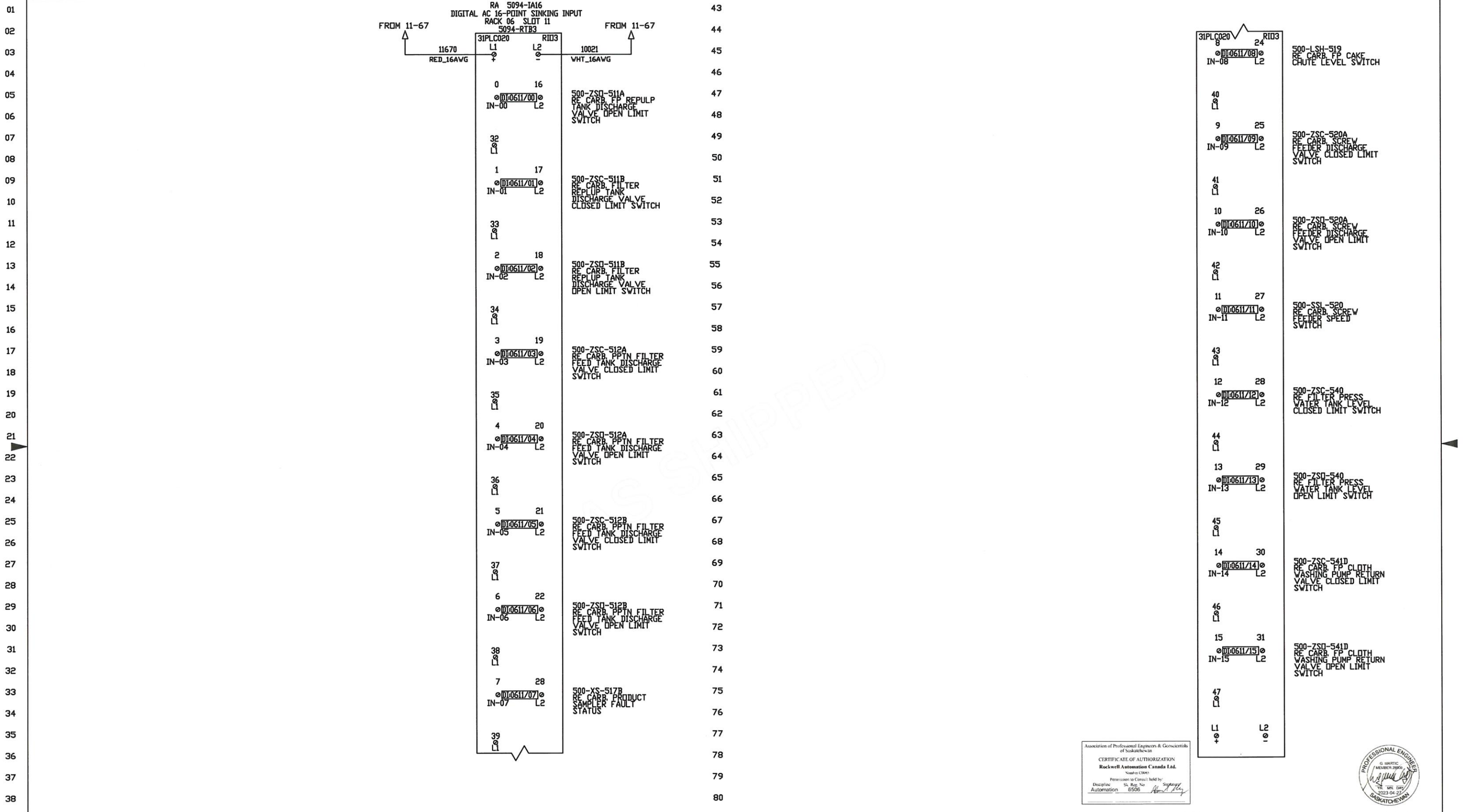
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10/02/23	GM	DESIGN REVIEW
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		AS COMMISSIONED

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B	29/11/22	GM	
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation
 VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 06 SLOT 10 - 5094-1A16
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 Sheet 30 of 75 Next Sh 31
 Size D P2CA500039-0004 Ver 2





Association of Professional Engineers & Geoscientists of Saskatchewan
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 Rockwell Automation Canada Ltd.
 Permit to Control held by:
 Discipline: Automation
 Sr. Reg. No: 6506
 Signature: [Signature]
 Date: 2023-04-27



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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
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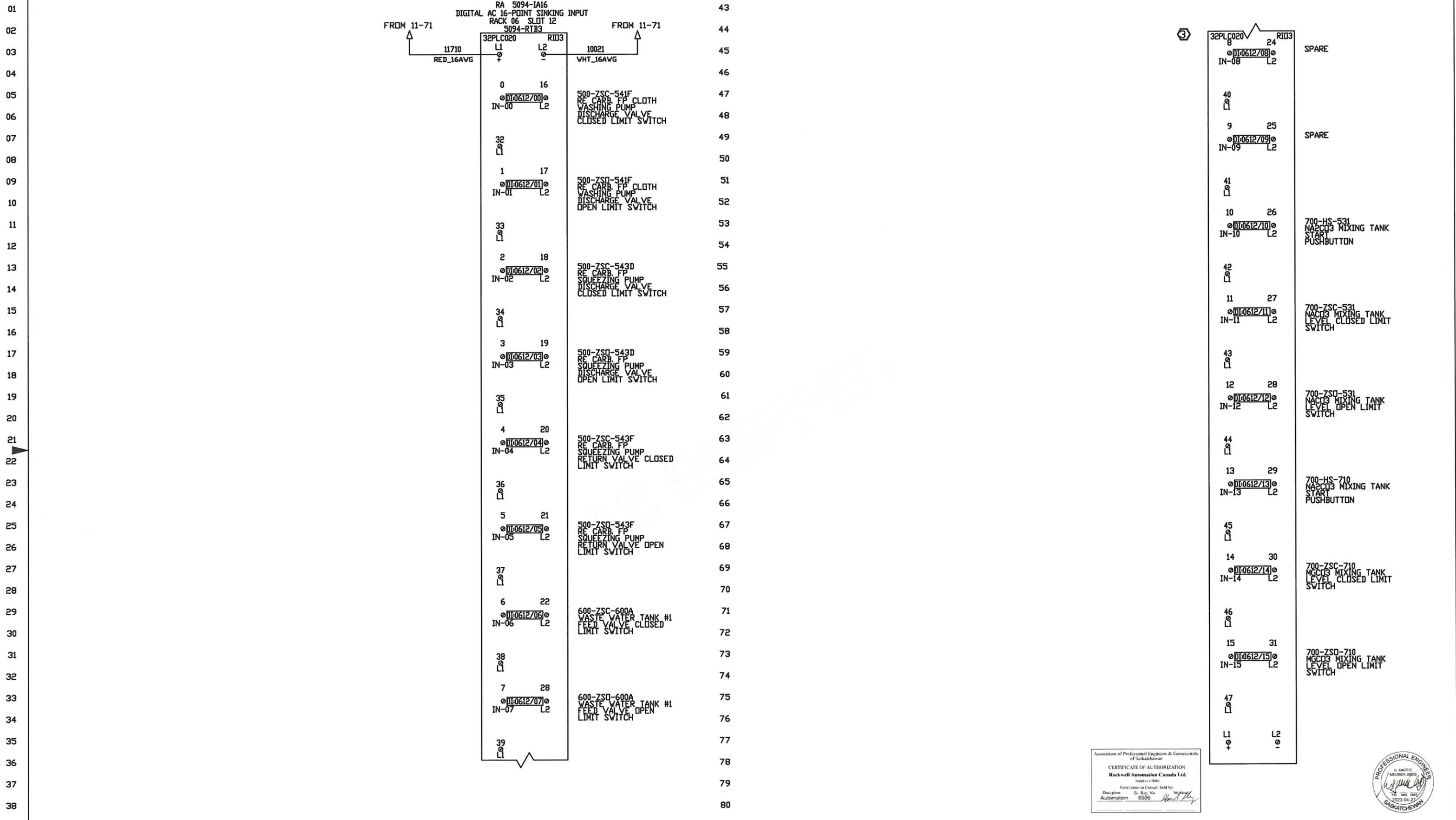
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1	17/04/23	GM	FABRICATION	RACK 06 SLOT 11 - 5094-IA16
2	25/04/23	GM	AS SHIPPED	Drawn by: GM Date: 16/09/22

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Sheet 31 of 75 Next Sh 32
 Size D P2CA500039-0004 Ver 2





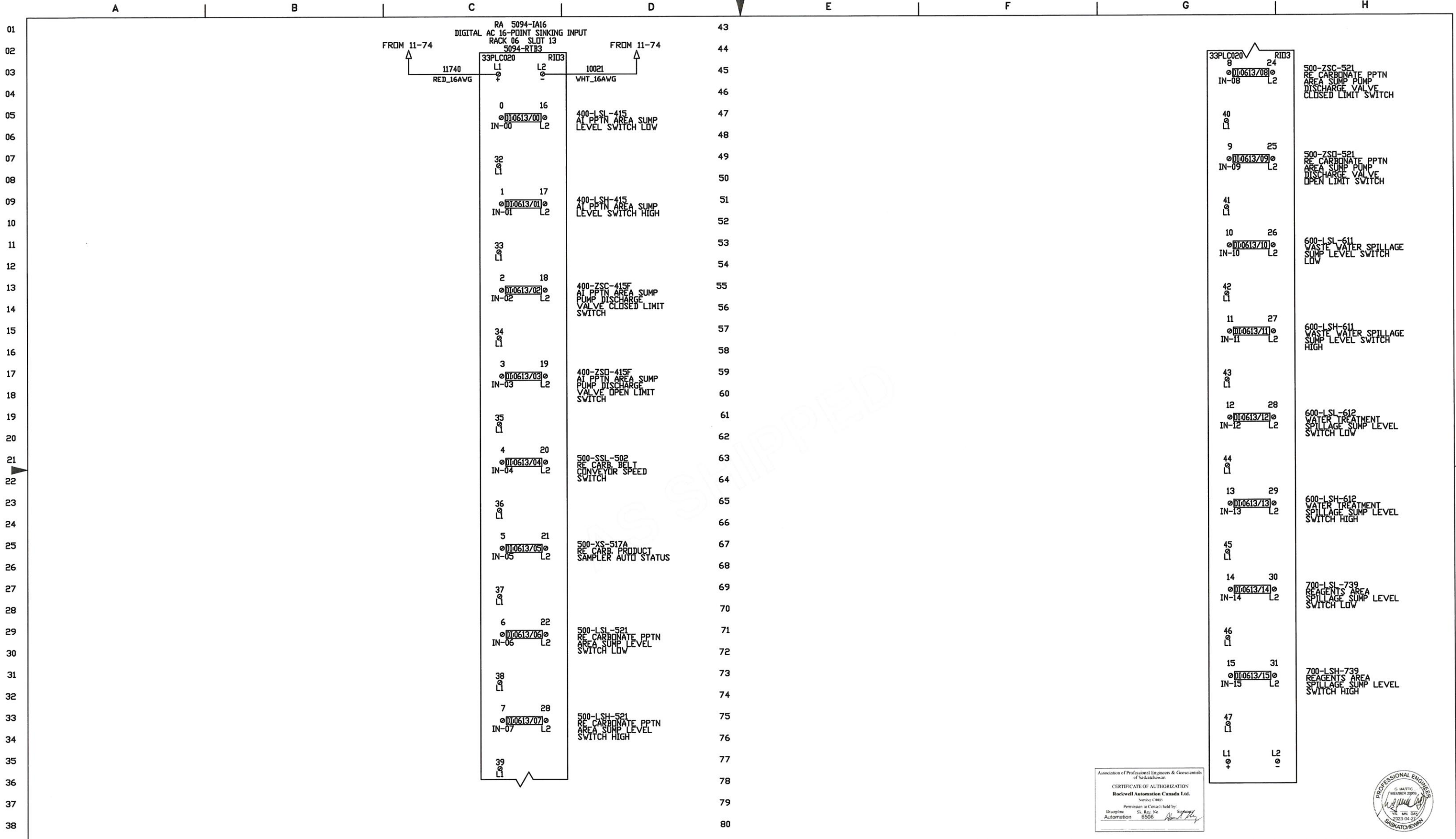
Association of Professional Engineers & Geoscientists of Saskatchewan
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 Rockwell Automation Canada Ltd.
 Number 1390
 Permission to Consult held by:
 Discipline: Automation, Sr. Reg. No. 6506, Signature: [Signature], Date: 2023-04-23



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2	25/04/23	GM	AS SHIPPED	RACK 06 SLOT 12 - 5094-IA16	P2CA500039-0004
				Drawn by GM	Ver 2





Association of Professional Engineers & Geoscientists of Saskatchewan
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 Rockwell Automation Canada Ltd.
 Name: Chris
 Permission to Control held by:
 Discipline: Automation Sl. Reg. No: 6506 Signature: [Signature] Date: 2023-04-21



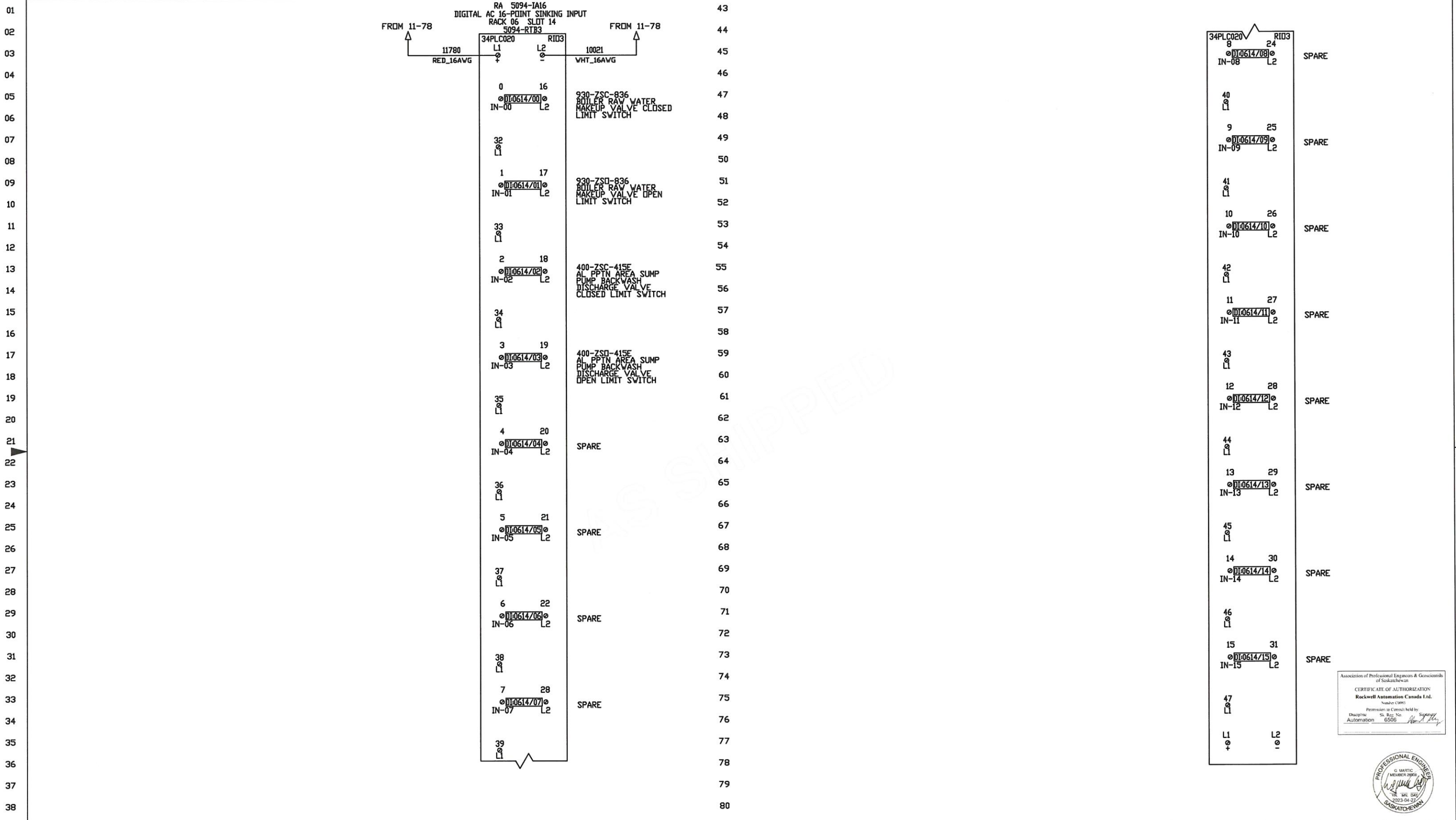
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		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.
A	12/05/22	GM	
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation
 VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 06 SLOT 13 - 5094-IA16
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 Sheet 33 of 75 Next Sh 34
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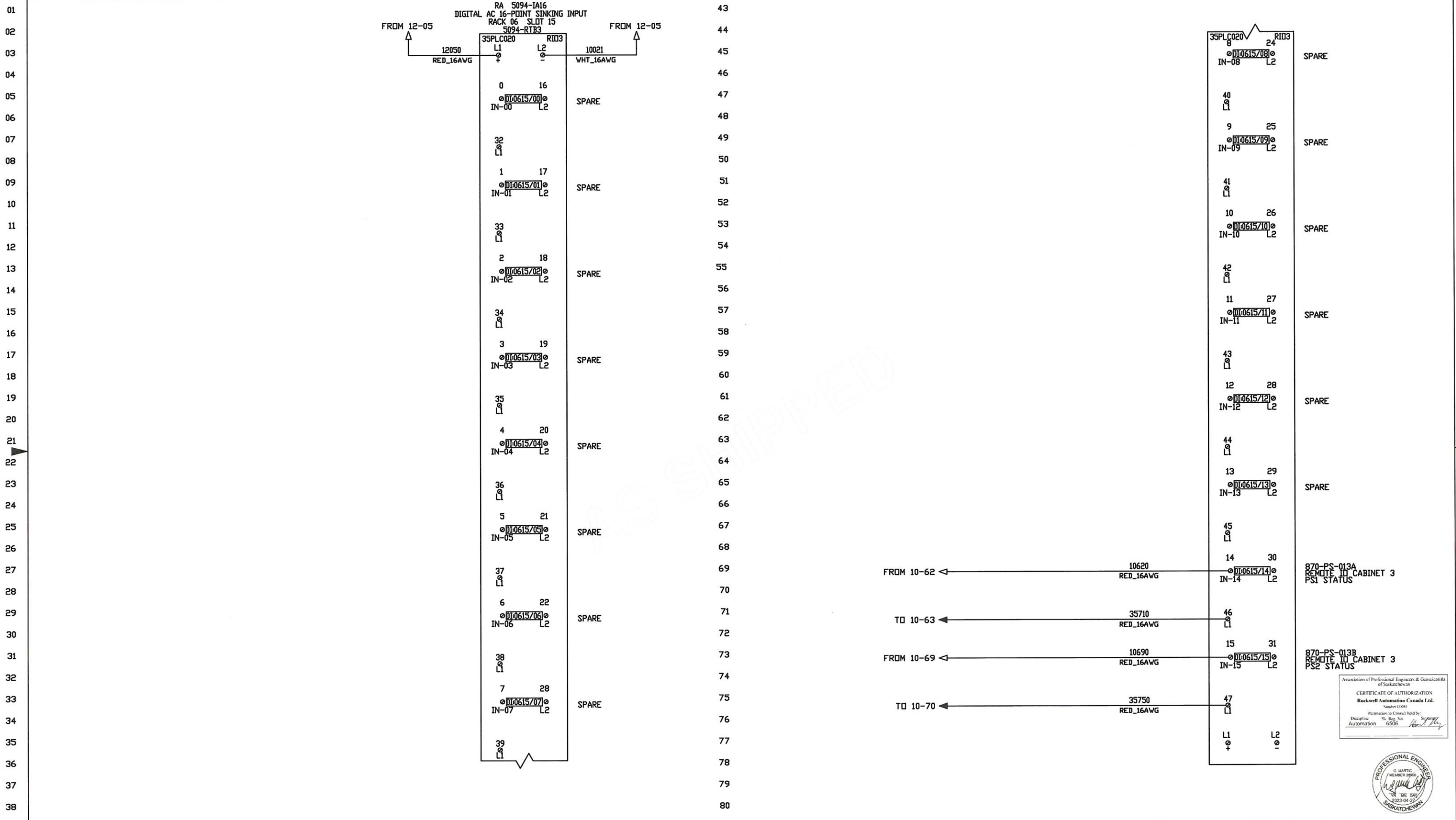
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1	17/04/23	GM	FABRICATION		Size D P2CA500039-0004 Ver 2
2	25/04/23	GM	AS SHIPPED	Drawn by: GM Date: 16/09/22	

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CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
Member CPES
 Permission to Consult Held by: *[Signature]*
 Discipline: Automation St. Reg. No. 6506





Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number 00085
Permission to Create held by:
Discipline: 6506
Automation: 6506



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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

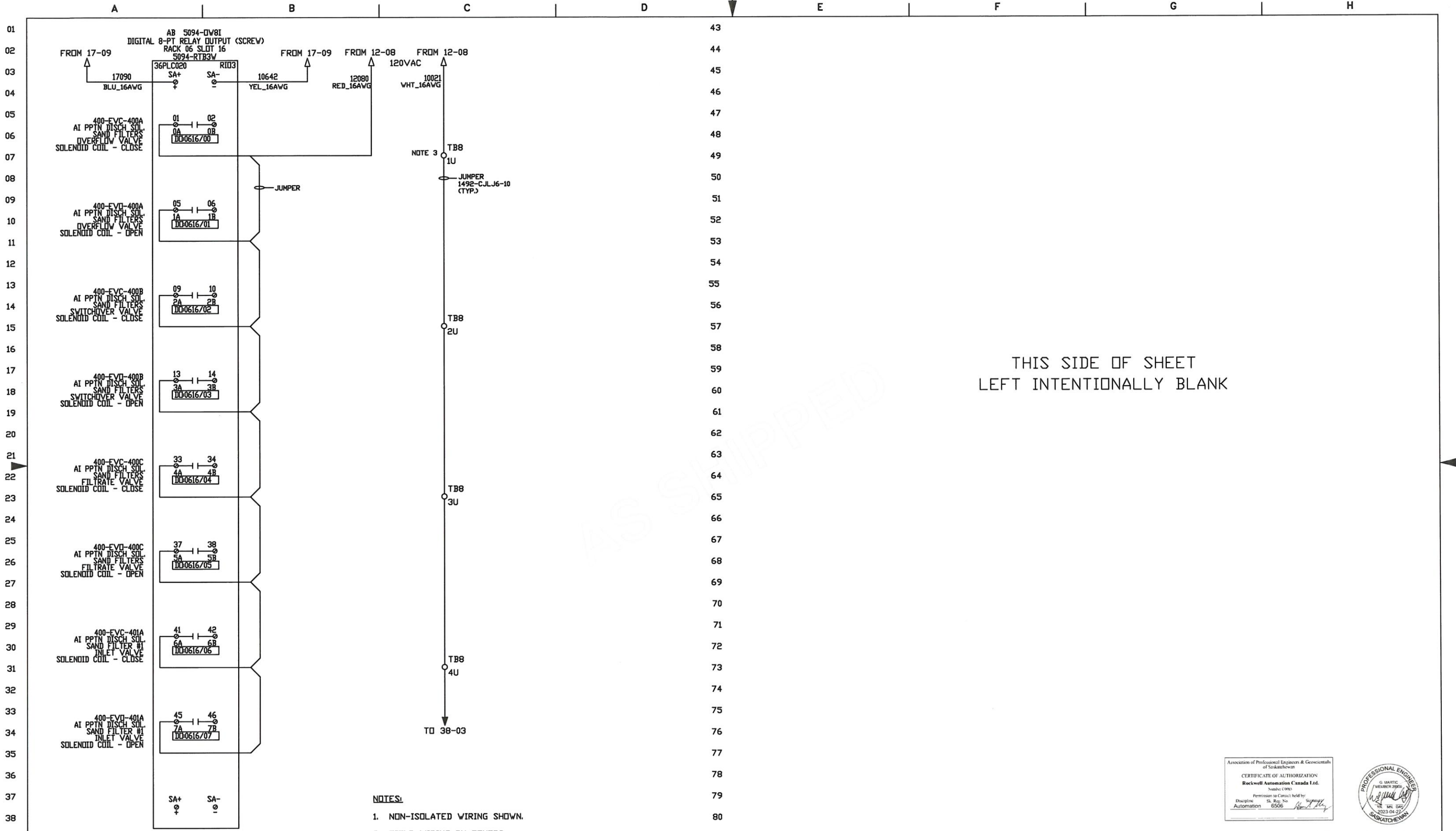


VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
RACK 06 SLOT 15 - 5094-IA16
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Sheet 35 of 75 Next Sh 36
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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

- NOTES:**
- NON-ISOLATED WIRING SHOWN.
 - FIELD WIRING BY OTHERS.
 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

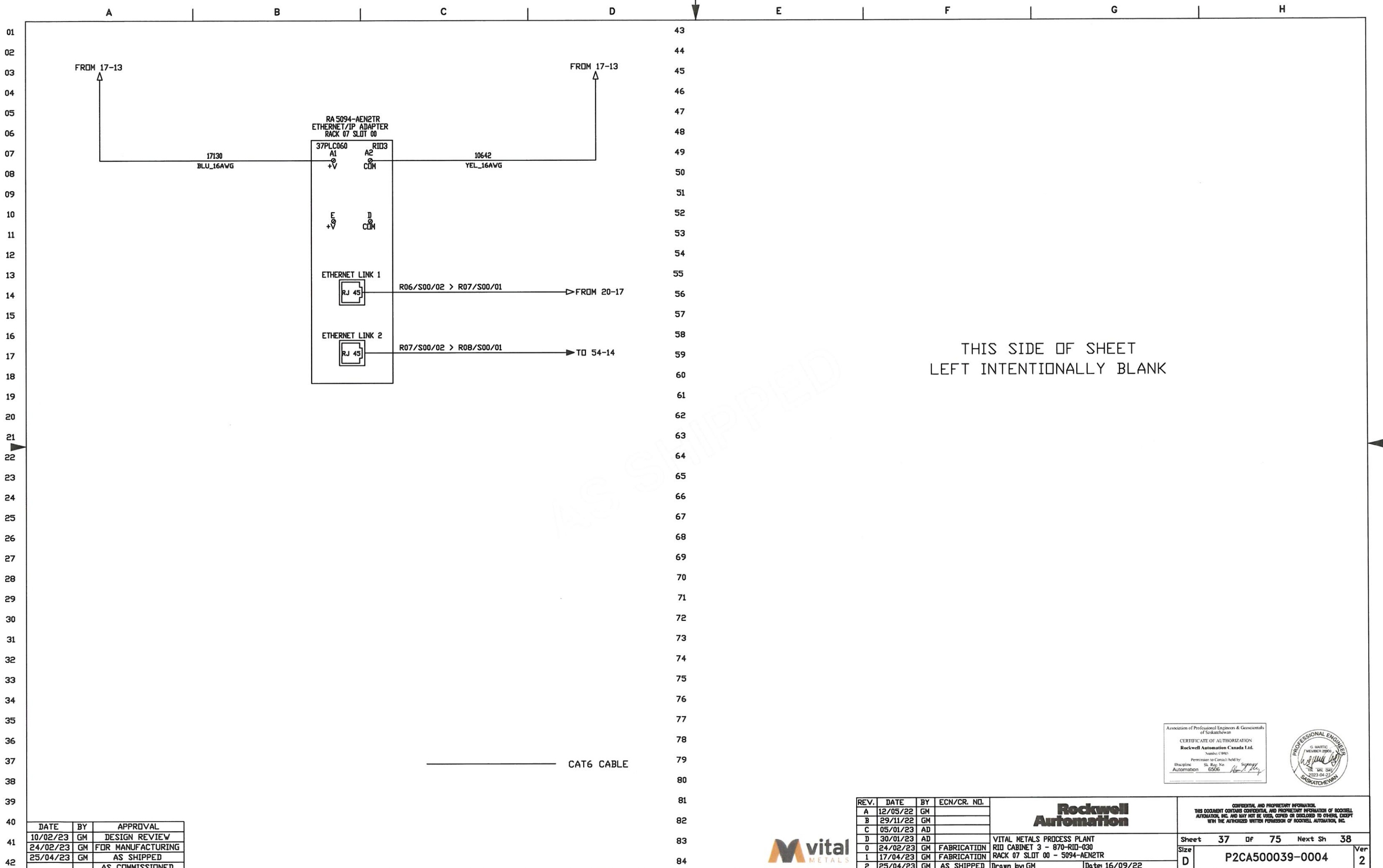
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0	24/02/23	GM	FABRICATION
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Vital Metals

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Sheet	36	of	75	Next Sh	37	
Size	D				Ver	2

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 Rockwell Automation Canada Ltd.
 Number: C993
 Permission to Certify held by:
 Discipline: SA Reg. No. 5506
 Automation



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————— CAT6 CABLE

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25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.
A	12/05/22	GM	
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2	25/04/23	GM	AS SHIPPED

Rockwell Automation

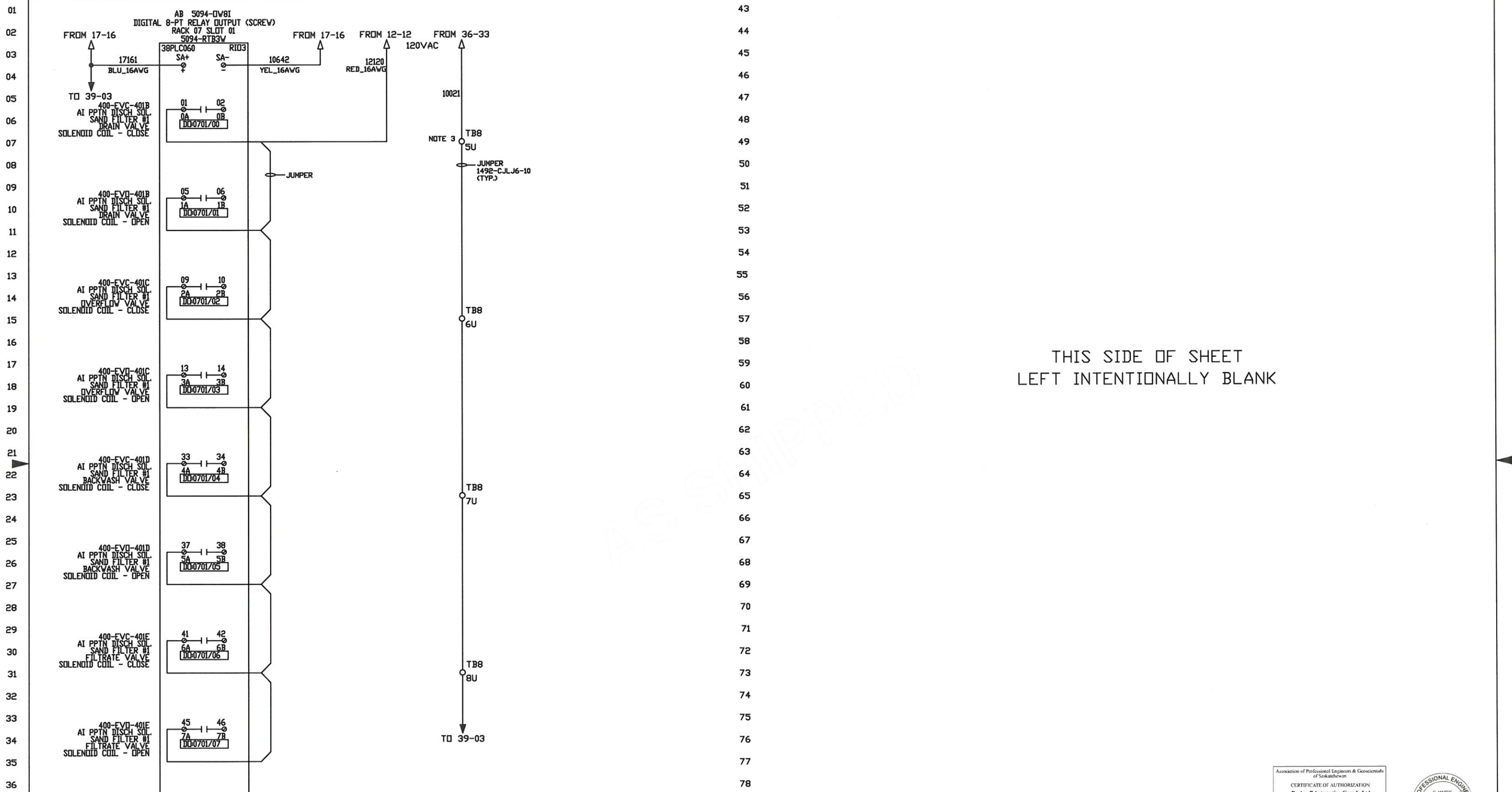
VITAL METALS PROCESS PLANT
RID CABINET 3 - 870-RID-030
RACK 07 SLOT 00 - 5094-AEN2TR

Drawn by: GM Date: 16/09/22

Association of Professional Engineers & Geoscientists of Saskatchewan
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Rockwell Automation Canada Ltd.
Number: C1983
Permission to Contract held by:
Discipline: Automation
S.S. Reg. No. 6506



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Sheet	37	of	75
Next Sh	38		
Size	P2CA500039-0004		
Ver	2		



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- NOTES:**
- NON-ISOLATED WIRING SHOWN.
 - FIELD WIRING BY OTHERS.
 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

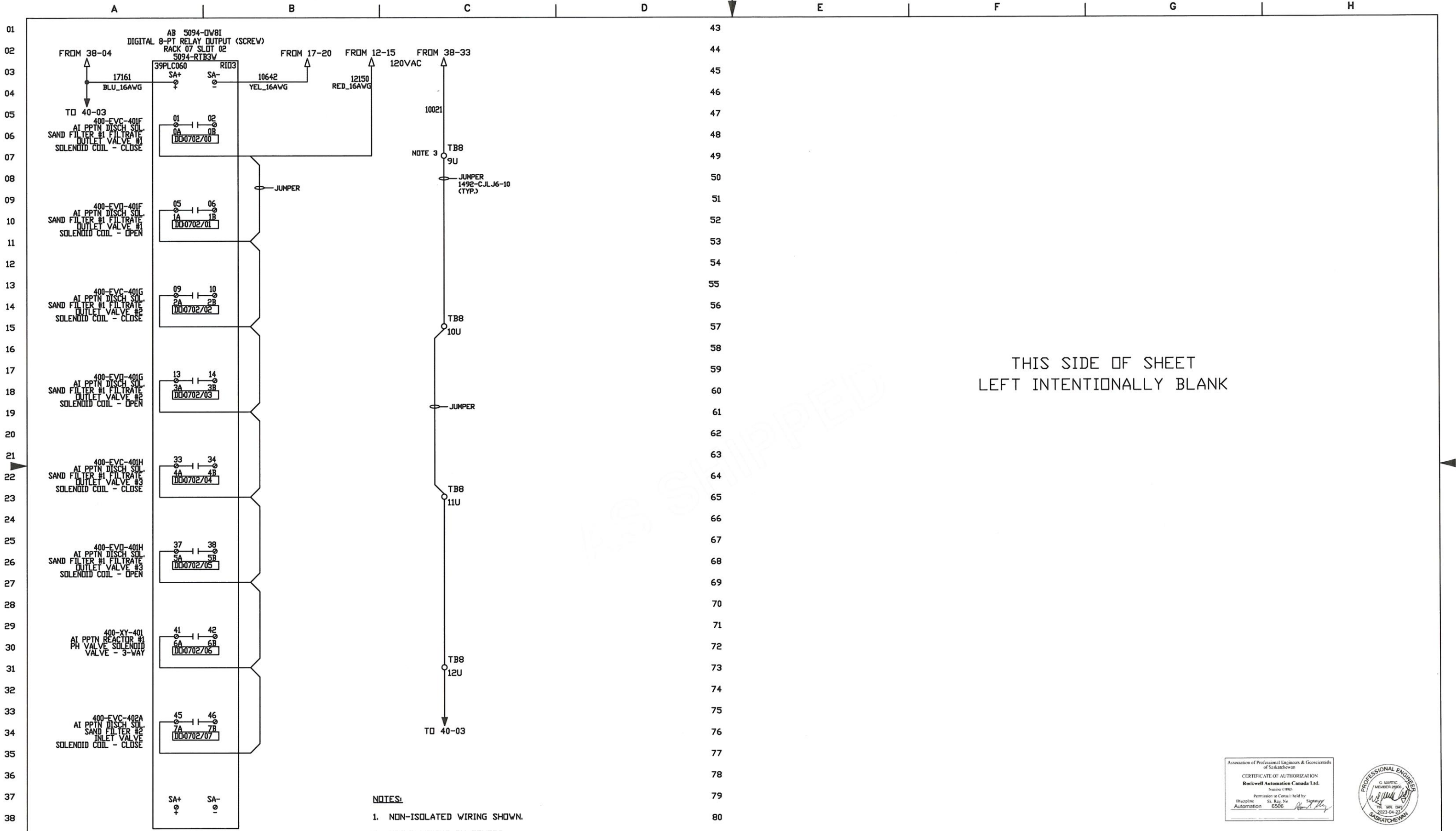
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Rockwell Automation Canada Ltd.
Number: 0195
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Discipline: St. Reg. No. 6506
Automation



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A	05/12/22	GM		Rockwell Automation	VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030 RACK 07 SLOT 01 - 5094-DV81
B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	Sheet 38 of 75 Next Sh 39	Size D P2CA500039-0004 Ver 2
1	17/04/23	GM	FABRICATION		
2	25/04/23	GM	AS SHIPPED		

Drawn by: GM Date: 16/09/22





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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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- TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
- FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
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 Rockwell Automation Canada Ltd.
 Number: C1985
 Permission to Control held by:
 Discipline: SA Reg. No. 6506
 Automation
 2023-04-27

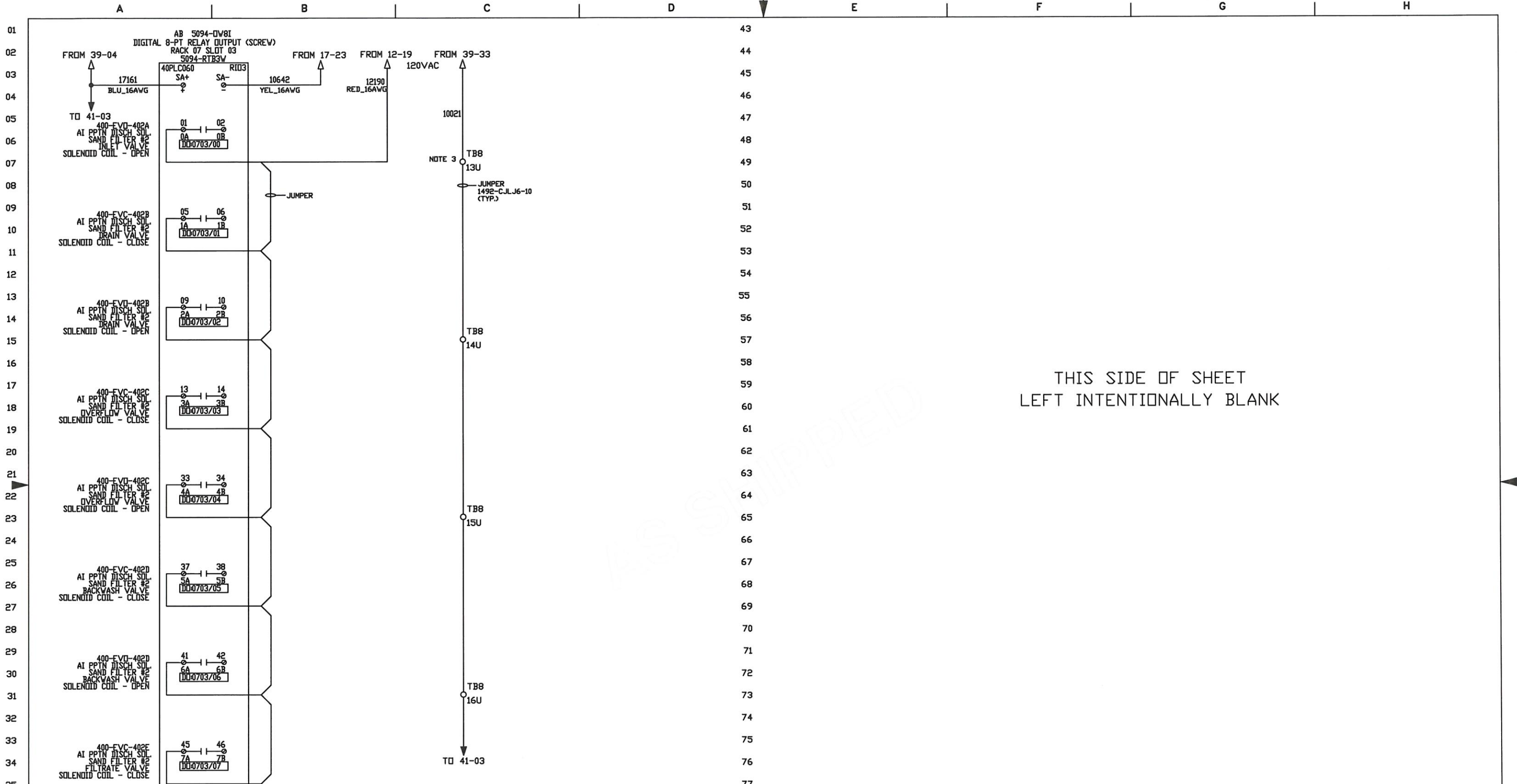


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Sheet	39	of	75	Next Sh	40	
Size	D				Ver	2



VITAL METALS PROCESS PLANT
 RID CABINET 3 - 870-RID-030
 RACK 07 SLOT 02 - 5094-DW81
 Drawn by: GM Date: 16/09/22



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25/04/23	GM	AS SHIPPED
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 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Vital Metals

<p>Rockwell Automation</p>		<p>Vital Metals</p>
<p>VITAL METALS PROCESS PLANT</p>		<p>Sheet 40 of 75 Next Sh 41</p>
<p>RID CABINET 3 - 870-RID-030</p>		<p>Size D</p>
<p>RACK 07 SLOT 03 - 5094-DV81</p>		<p>Ver 2</p>
<p>Drawn by: GM</p>		<p>Date: 16/09/22</p>
<p>P2CA500039-0004</p>		

Association of Professional Engineers & Geoscientists of Saskatchewan

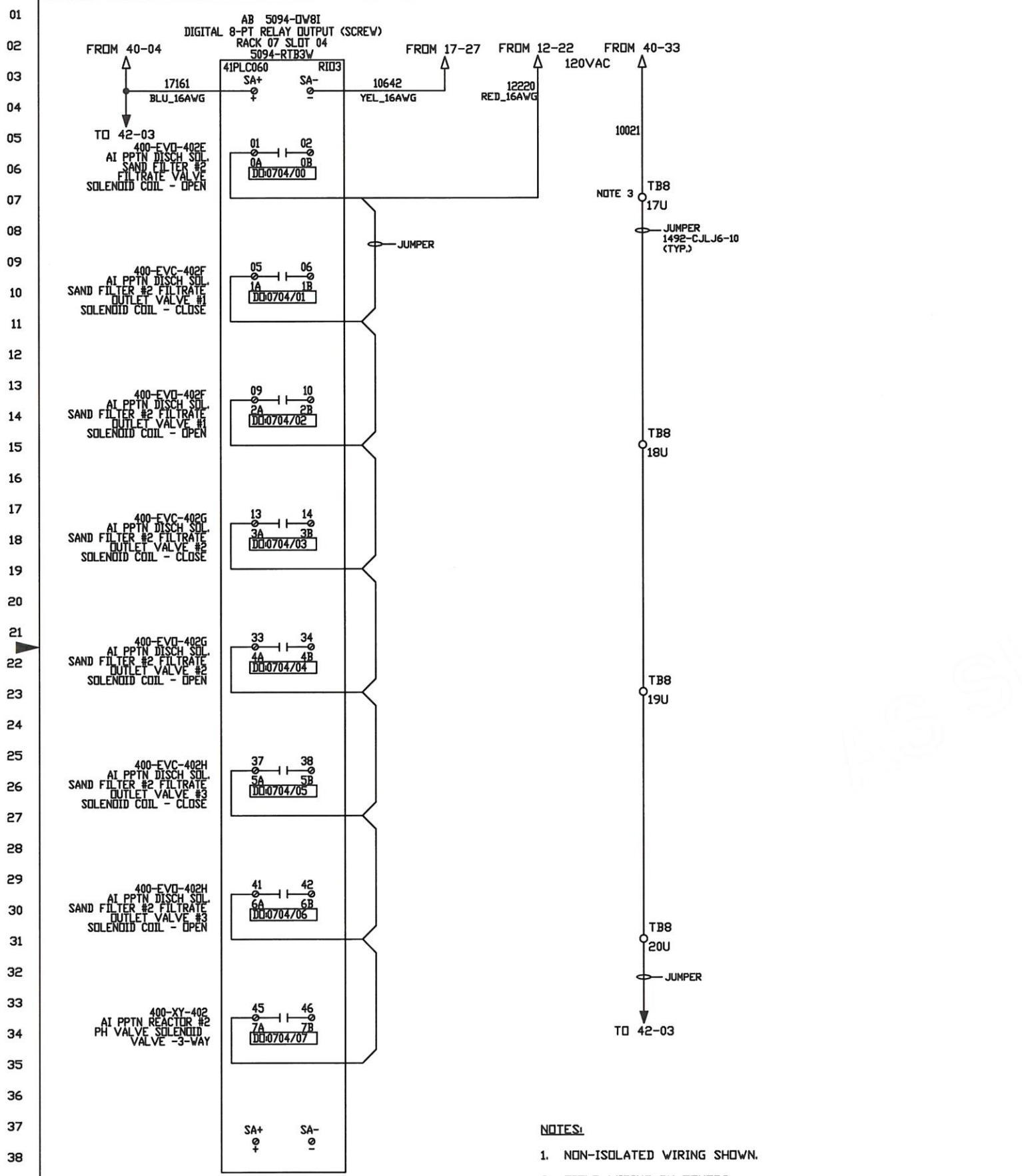
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Rockwell Automation Canada Ltd.

Number: C1983

Permission to Contact held by:

Discipline: Automation SA Reg. No: 6506



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 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

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REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
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 Rockwell Automation Canada Ltd.
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 Discipline: Automation
 SA Reg. No: 6506
 Signature: [Signature]

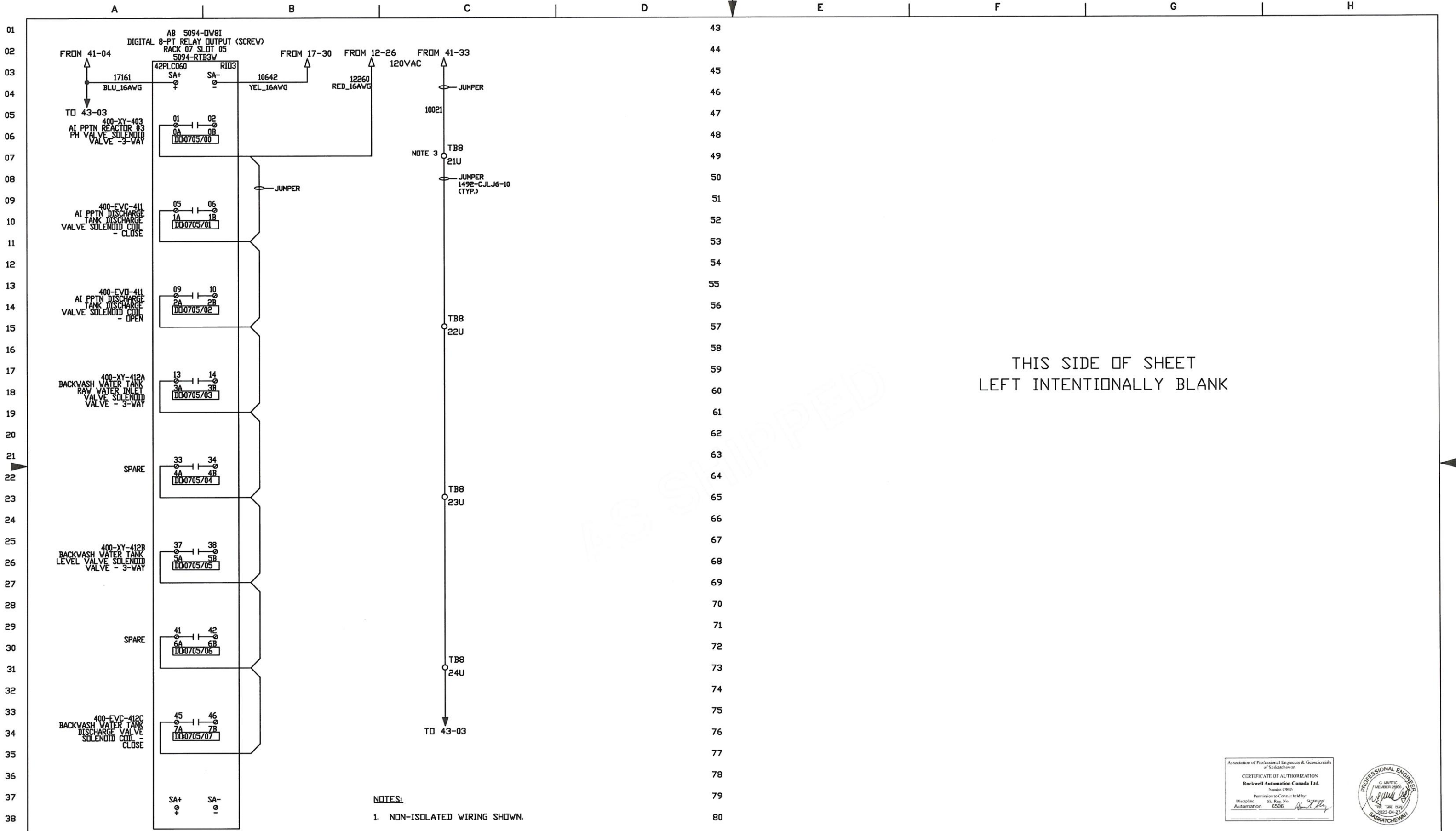


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Sheet 41 of 75 Next Sh 42
 Size D P2CA500039-0004 Ver 2



VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 07 SLOT 04 - 5094-DW81
 Drawn by: GM Date: 16/09/22



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- NOTES:**
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 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

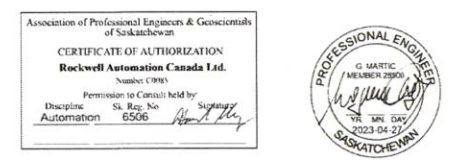
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

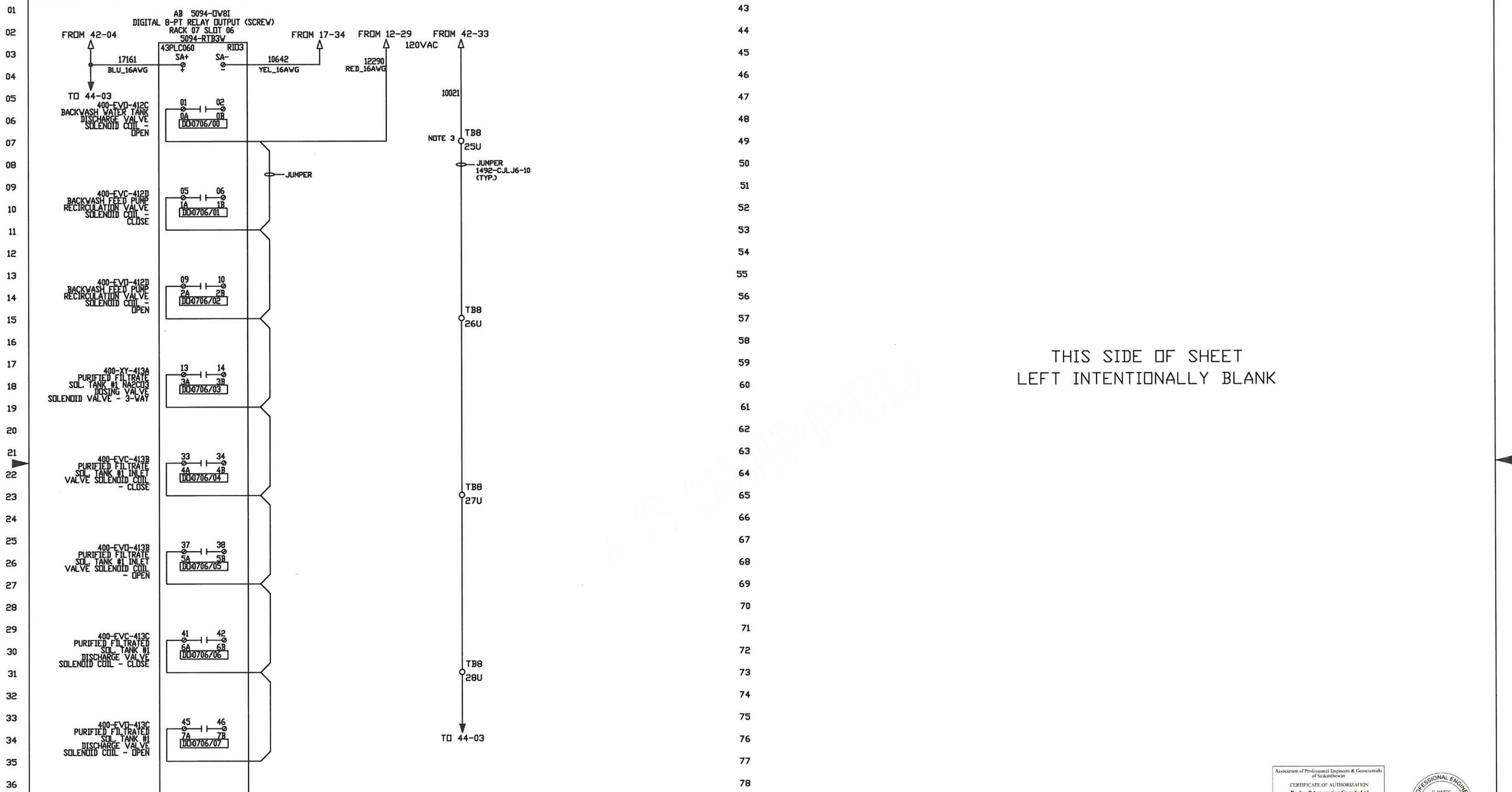
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B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	Drawn by: GM	Date: 16/09/22
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Sheet 42 of 75 Next Sh 43

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 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

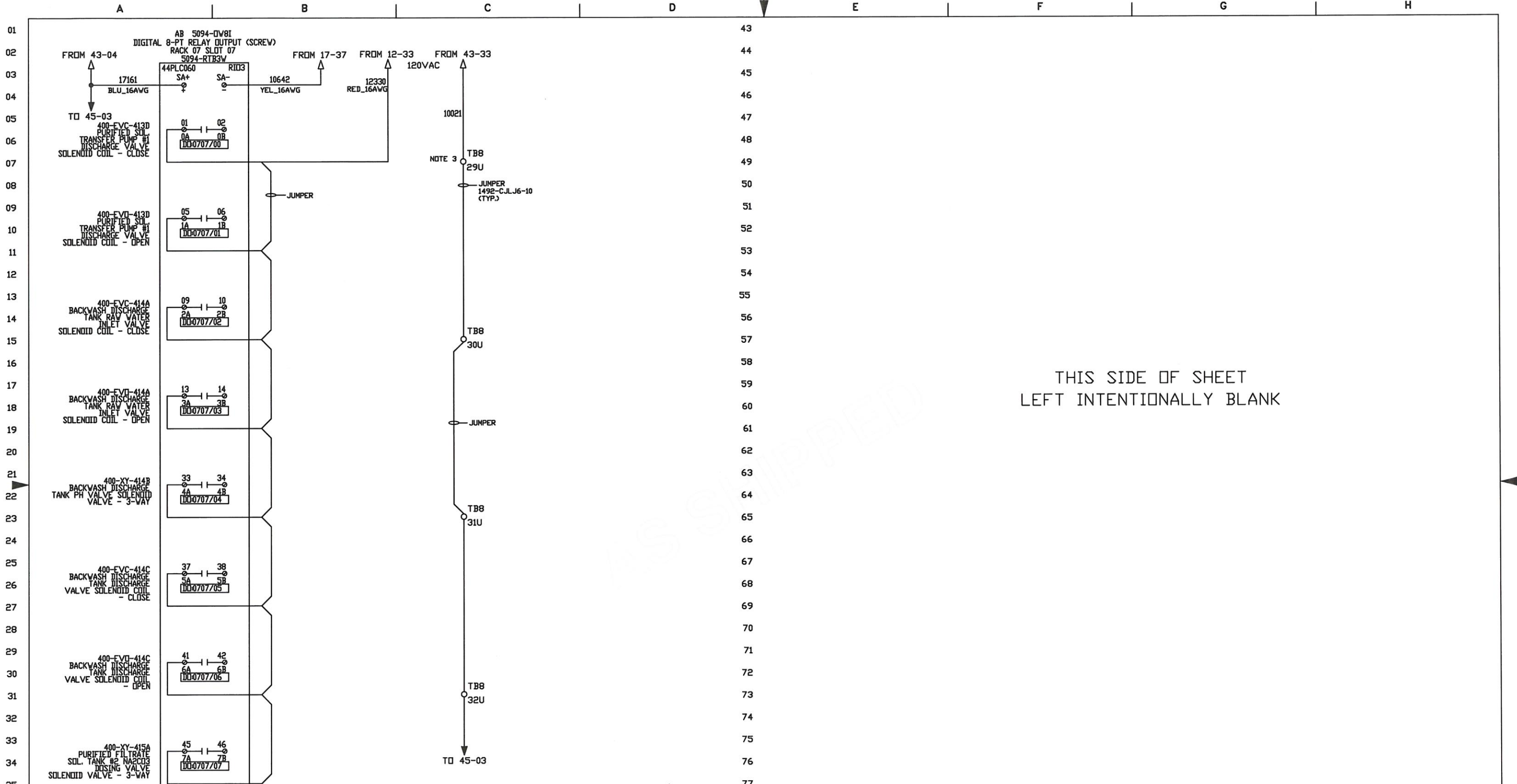
Association of Professional Engineers & Geoscientists of Saskatchewan
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 Rockwell Automation Canada Ltd.
 Number C995
 Permission to Certify held by:
 Discipline: SA Reg. No. 6506
 Automation
 Signature: [Signature]
 Date: 2023-04-27



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D	30/01/23	AD			
0	24/02/23	GM	FABRICATION		
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Sheet	43	of	75
Next Sh	44		
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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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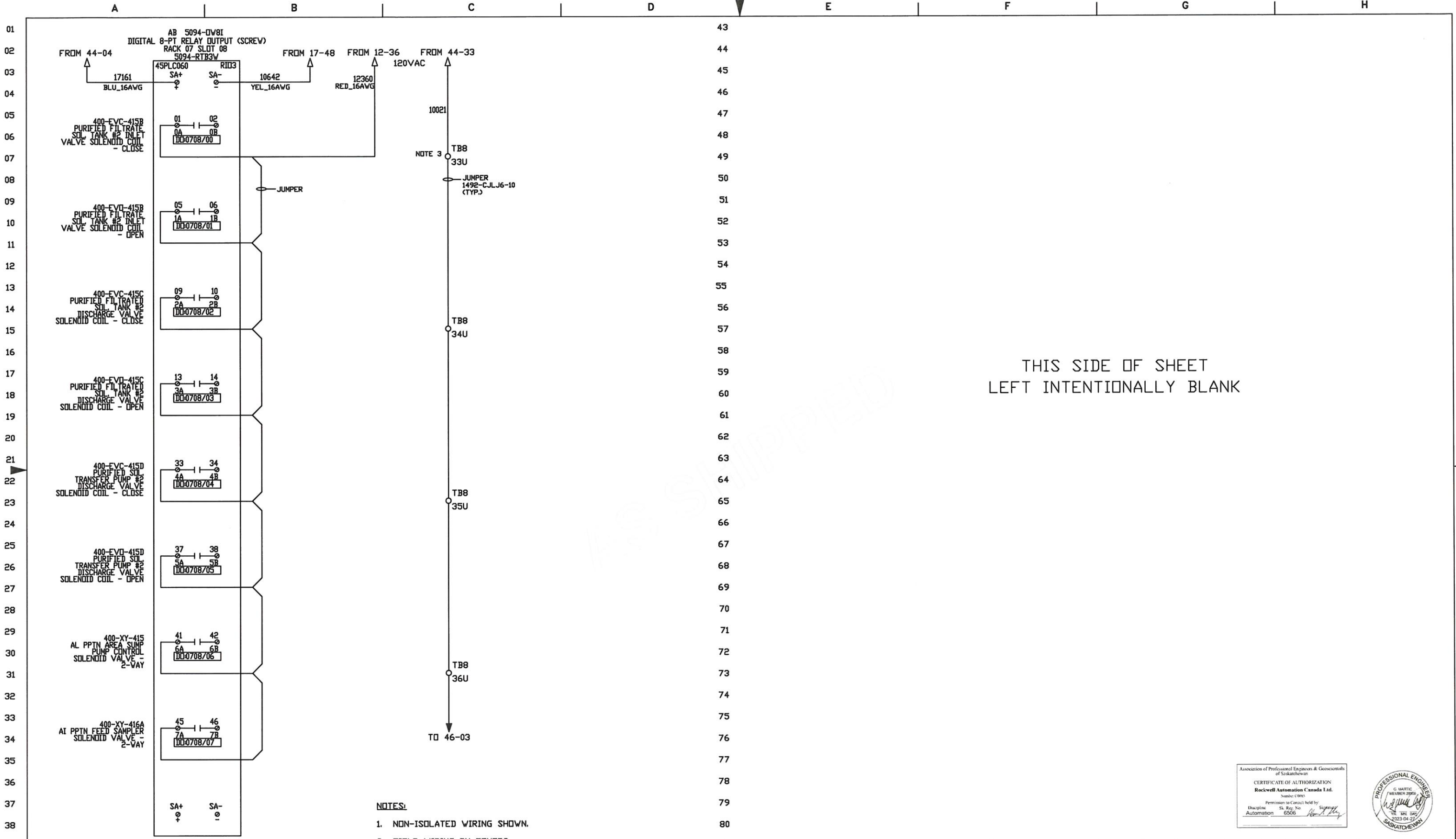
- NOTES:**
- NON-ISOLATED WIRING SHOWN.
 - FIELD WIRING BY OTHERS.
 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

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Number: C1983
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REV.	DATE	BY	ECN/CR. NO.		Sheet	44	Of	75	Next Sh	45	Ver	2
A	05/12/22	GM		Rockwell Automation	VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030 RACK 07 SLOT 07 - 5094-DW81	D	P2CA500039-0004		Date: 16/09/22			
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1	17/04/23	GM	FABRICATION									
2	25/04/23	GM	AS SHIPPED	Drawn by: GM								





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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
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25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
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2	25/04/23	GM	AS SHIPPED

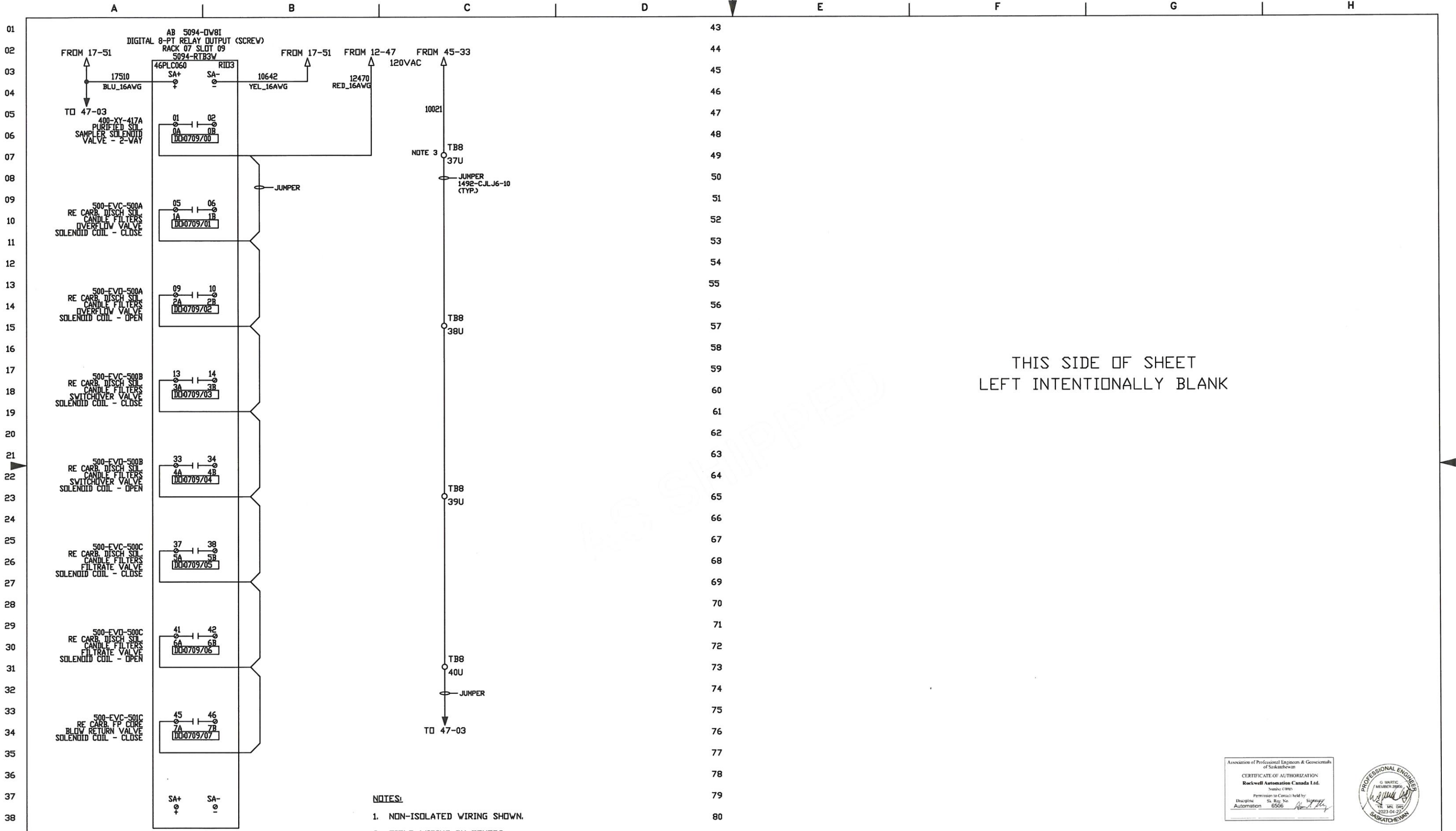
Rockwell Automation

VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
RACK 07 SLOT 08 - 5094-DV81
Drawn by: GM Date: 16/09/22

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Sheet	45	of	75
Next Sh	46		
Size	D		Ver 2
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25/04/23	GM	AS SHIPPED
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A	05/12/22	GM	
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C	05/01/23	AD	
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

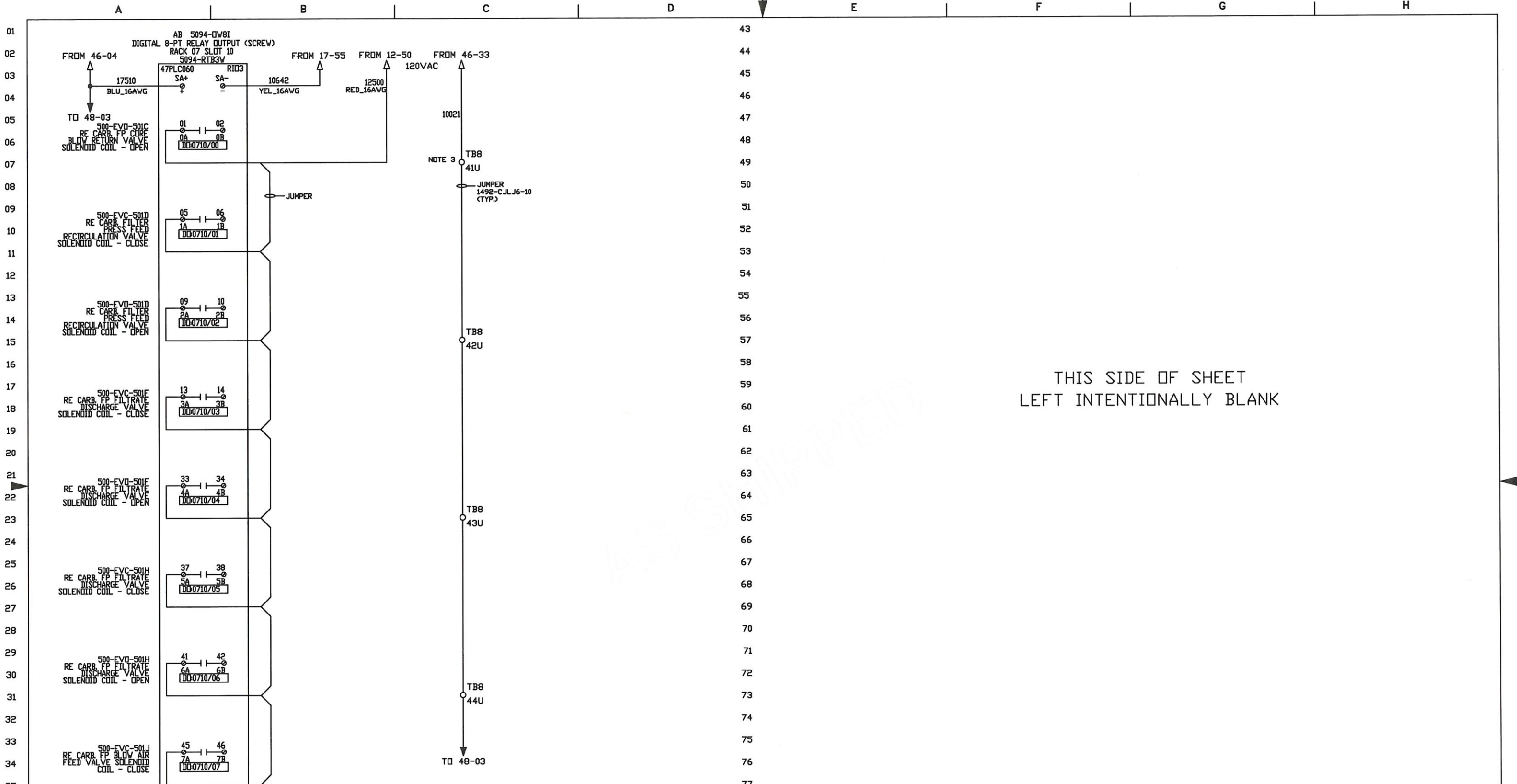
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VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 07 SLOT 09 - 5094-DV81
 Drawn by: GM Date: 16/09/22

Sheet	46	of	75	Next Sh	47	
Size	D				Ver	2
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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
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25/04/23	GM	AS SHIPPED
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A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
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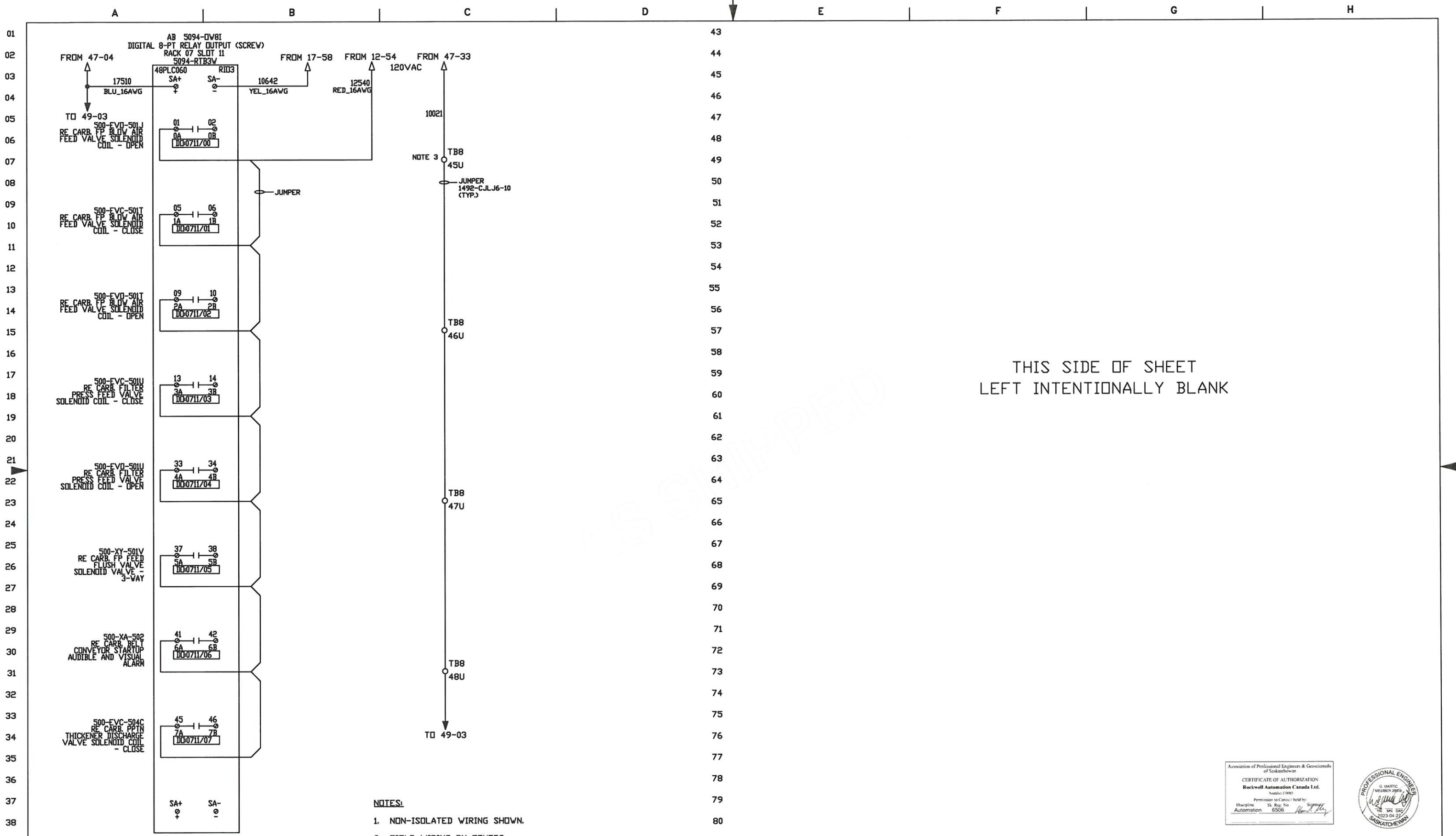
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VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
RACK 07 SLOT 10 - 5094-DV8I
Drawn by: GM Date: 16/09/22

Sheet 47 of 75 Next Sh 48
Size D P2CA500039-0004 Ver 2





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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

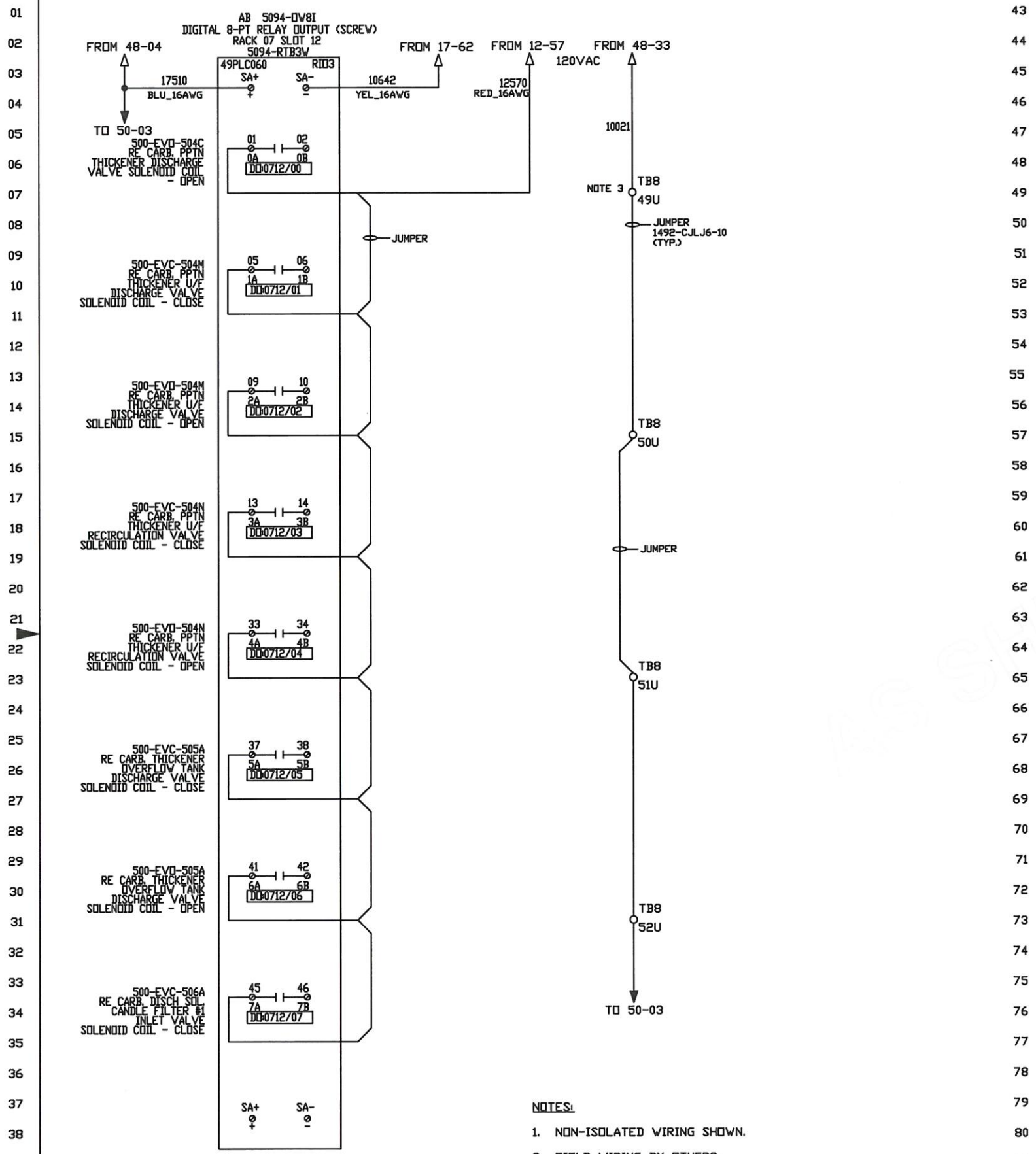
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Number: 1985
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Discipline: SA Reg. No. Automation 6506



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1	17/04/23	GM	FABRICATION	Size D	P2CA500039-0004
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Ver 2



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C	05/01/23	AD	
D	30/01/23	AD	
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation

Vital Metals

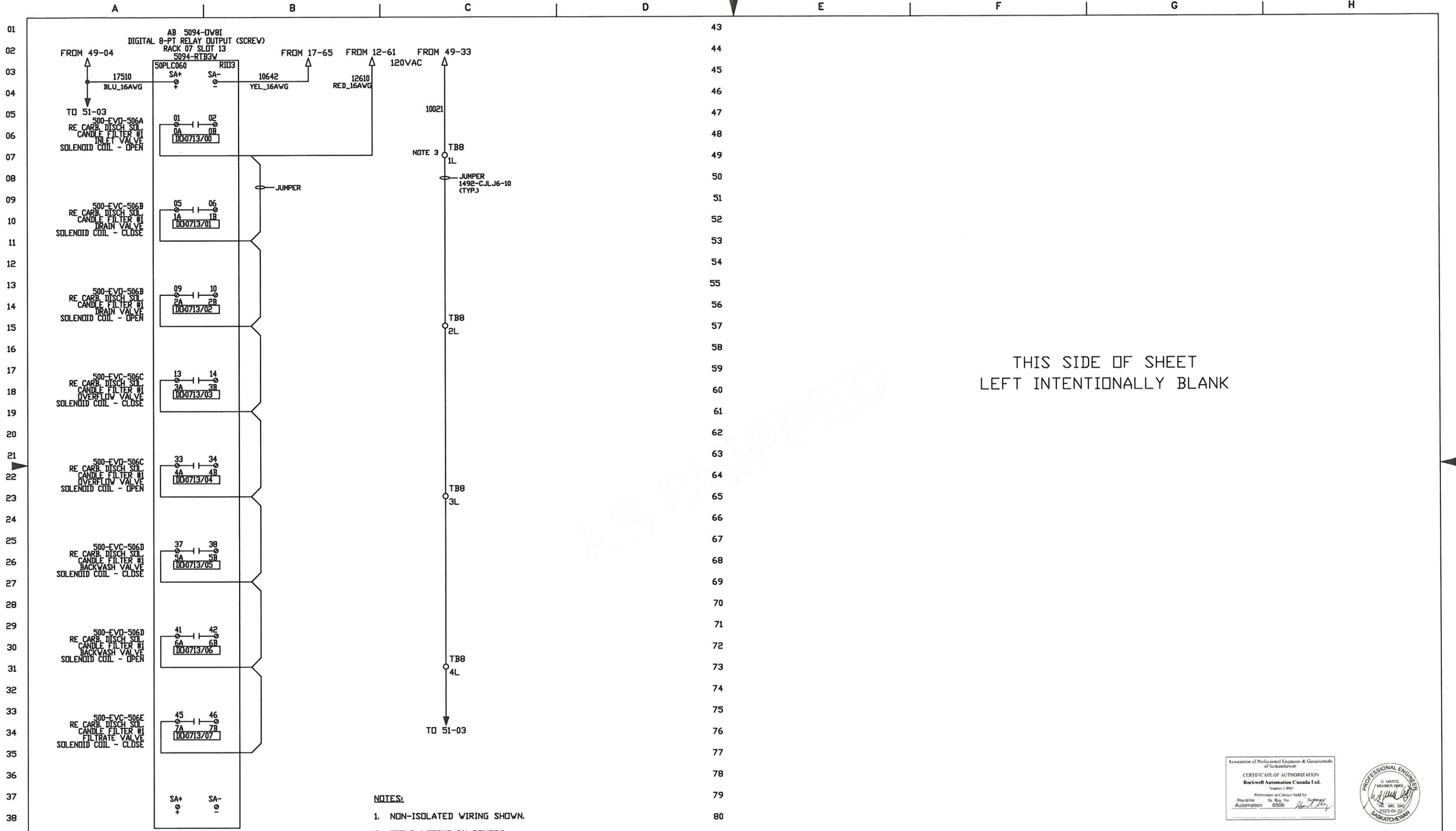
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Sheet **49** of **75** Next Sh **50**

Size **D** **P2CA500039-0004** Ver **2**

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 Discipline: Automation
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 4. FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

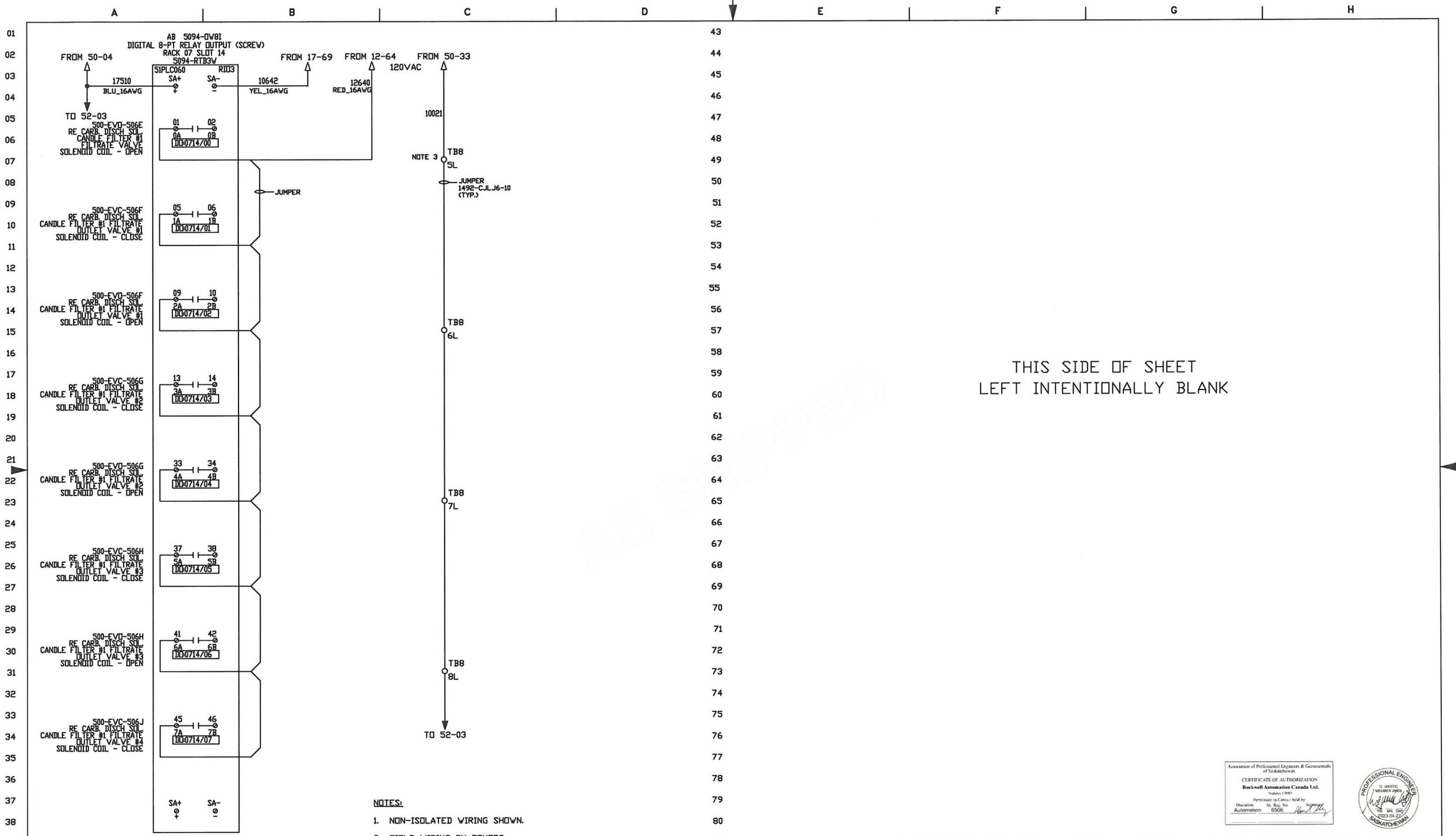
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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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Rockwell Automation Canada Ltd.
Number: 0393
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Discipline: SA, Reg. No. Automation: 6506



REV.	DATE	BY	ECN/CR. NO.		Sheet	50	of	75	Next Sh	51	Ver	2
A	05/12/22	GM		Rockwell Automation	Sheet	50	of	75	Next Sh	51	Ver	2
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2	25/04/23	GM	AS SHIPPED									





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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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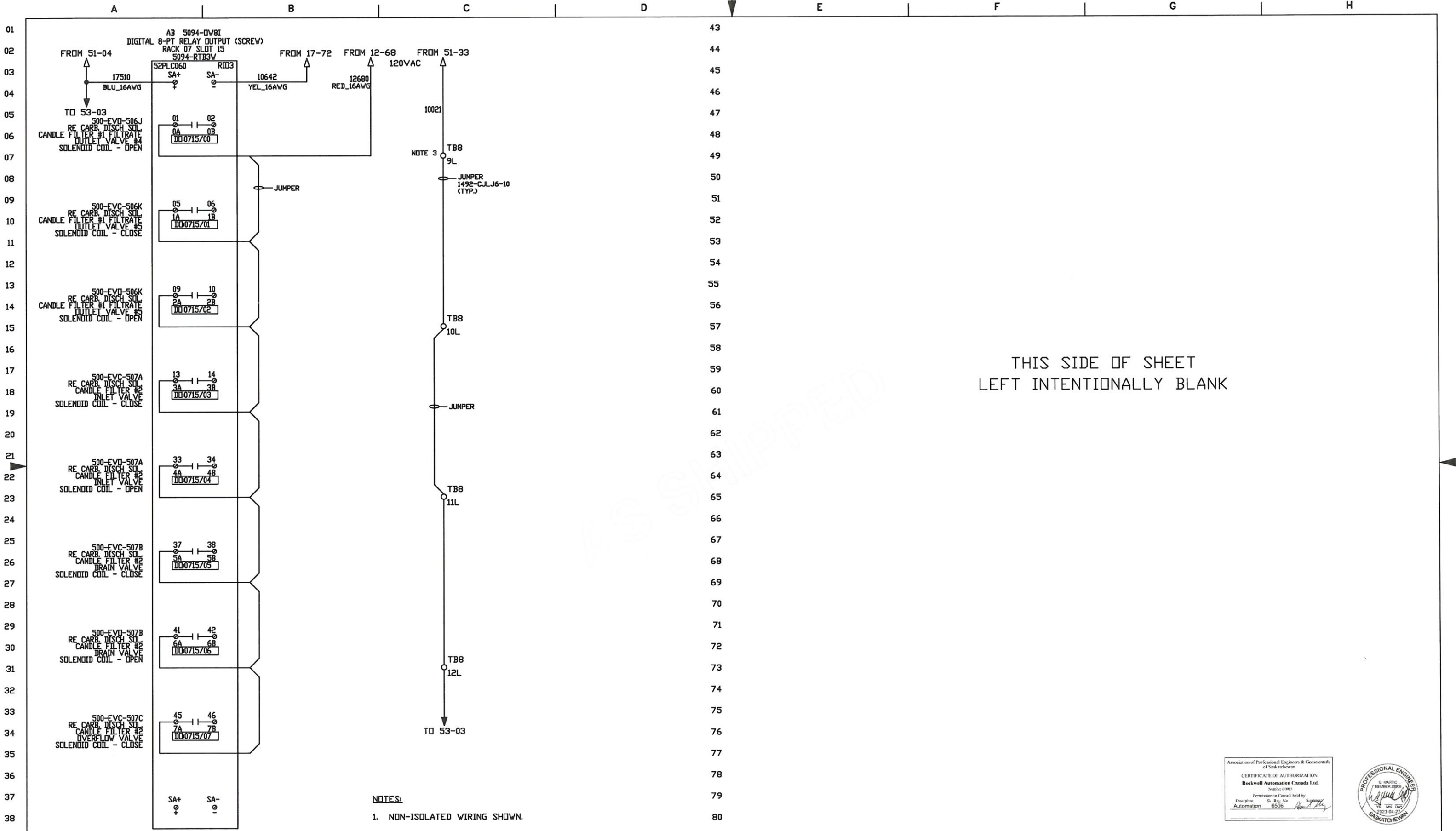
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of Saskatchewan
CERTIFICATE OF AUTHORIZATION
Rockwell Automation Canada Ltd.
Number: C1993
Permission to Certify held by:
Discipline: Automation
5506



REV.	DATE	BY	ECN/CR. NO.		
A	05/12/22	GM		Rockwell Automation	VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030 RACK 07 SLOT 14 - 5094-DW81
B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	Sheet 51 of 75	Next Sh 52
1	17/04/23	GM	FABRICATION	Size D	P2CA500039-0004
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Ver 2



Date: 16/09/22



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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

NOTES:

- NON-ISOLATED WIRING SHOWN.
- FIELD WIRING BY OTHERS.
- TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
- FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
 Rockwell Automation Canada Ltd.
 Number: C1983
 Permission to Control held by:
 Discipline: SA Reg. No. 6506
 Automation

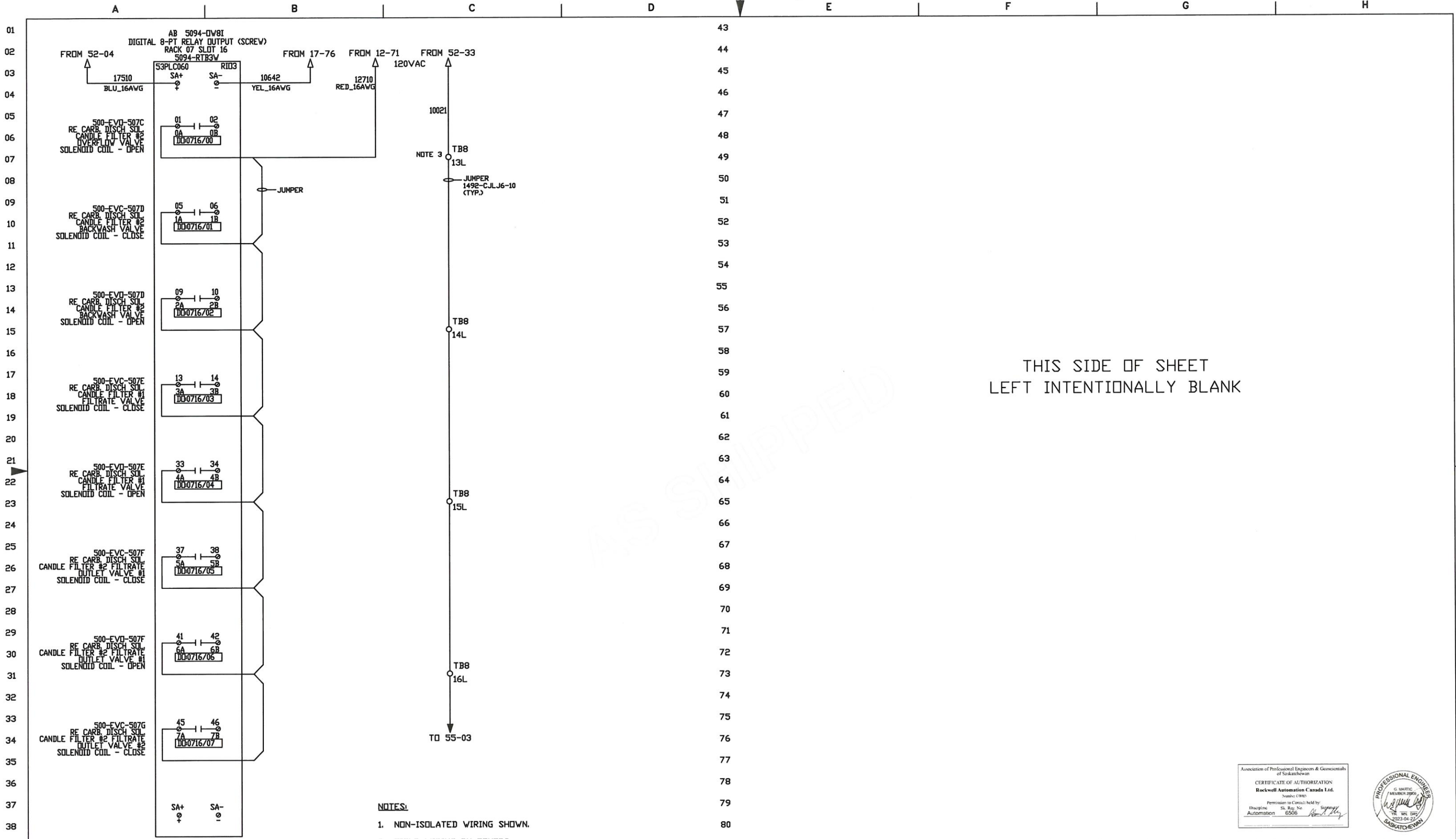


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Size	D				Ver	2
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VITAL METALS PROCESS PLANT
 RIO CABINET 3 - 870-RIO-030
 RACK 07 SLOT 15 - 5094-DV81
 Drawn by: GM Date: 16/09/22



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 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

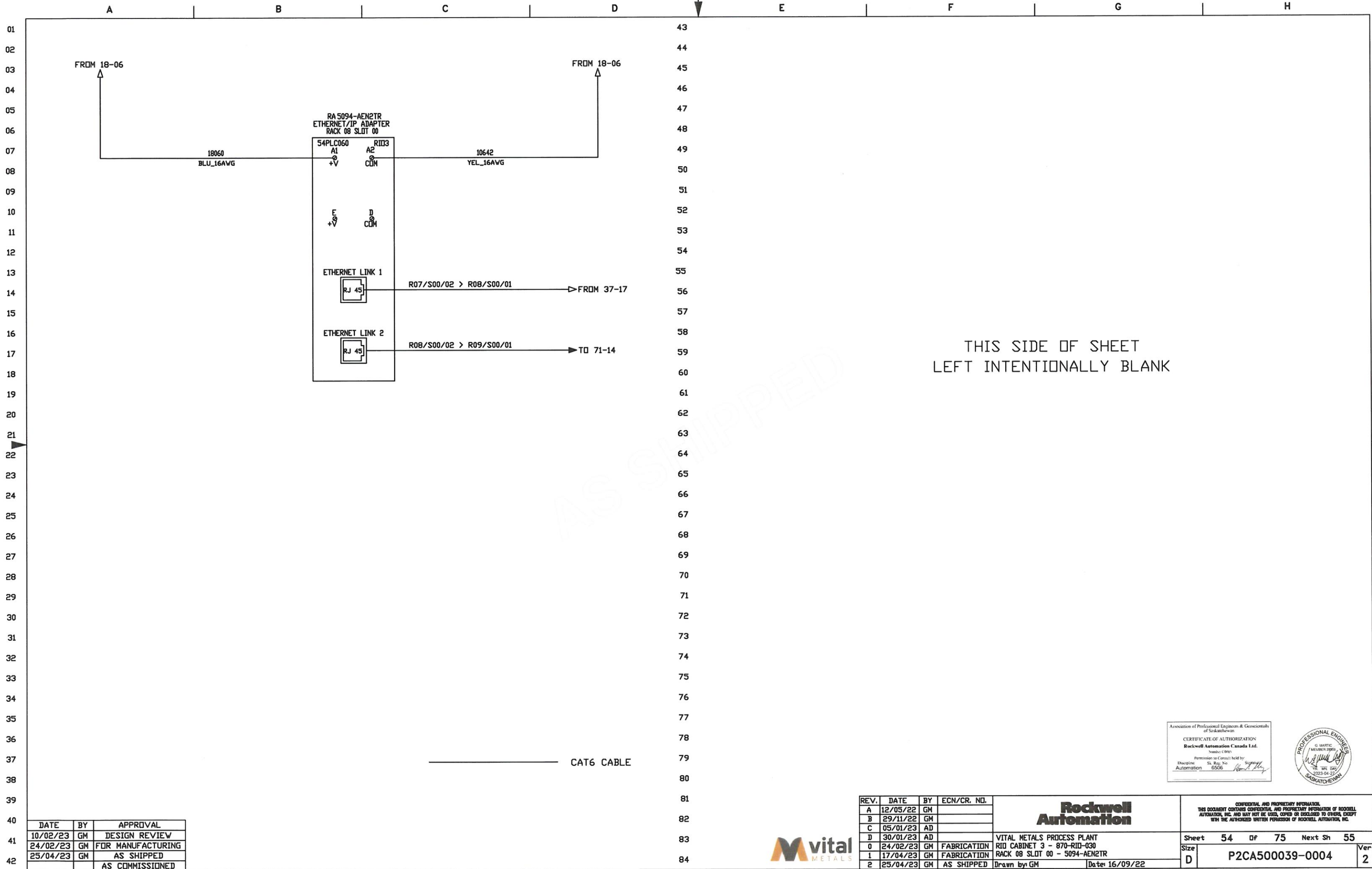
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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

Association of Professional Engineers & Geoscientists
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Number: 0393
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Discipline: Automation
S.A. Reg. No. 6506
[Signature]



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B	29/11/22	GM			
C	05/01/23	AD		VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030 RACK 07 SLOT 16 - 5094-DV81	Sheet 53 of 75 Next Sh 54
D	30/01/23	AD			Size D
0	24/02/23	GM	FABRICATION	Drawn by: GM	Date: 16/09/22
1	17/04/23	GM	FABRICATION		
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A	12/05/22	GM	
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C	05/01/23	AD	
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0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

Rockwell Automation

VITAL METALS PROCESS PLANT
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RACK 08 SLOT 00 - 5094-AEN2TR

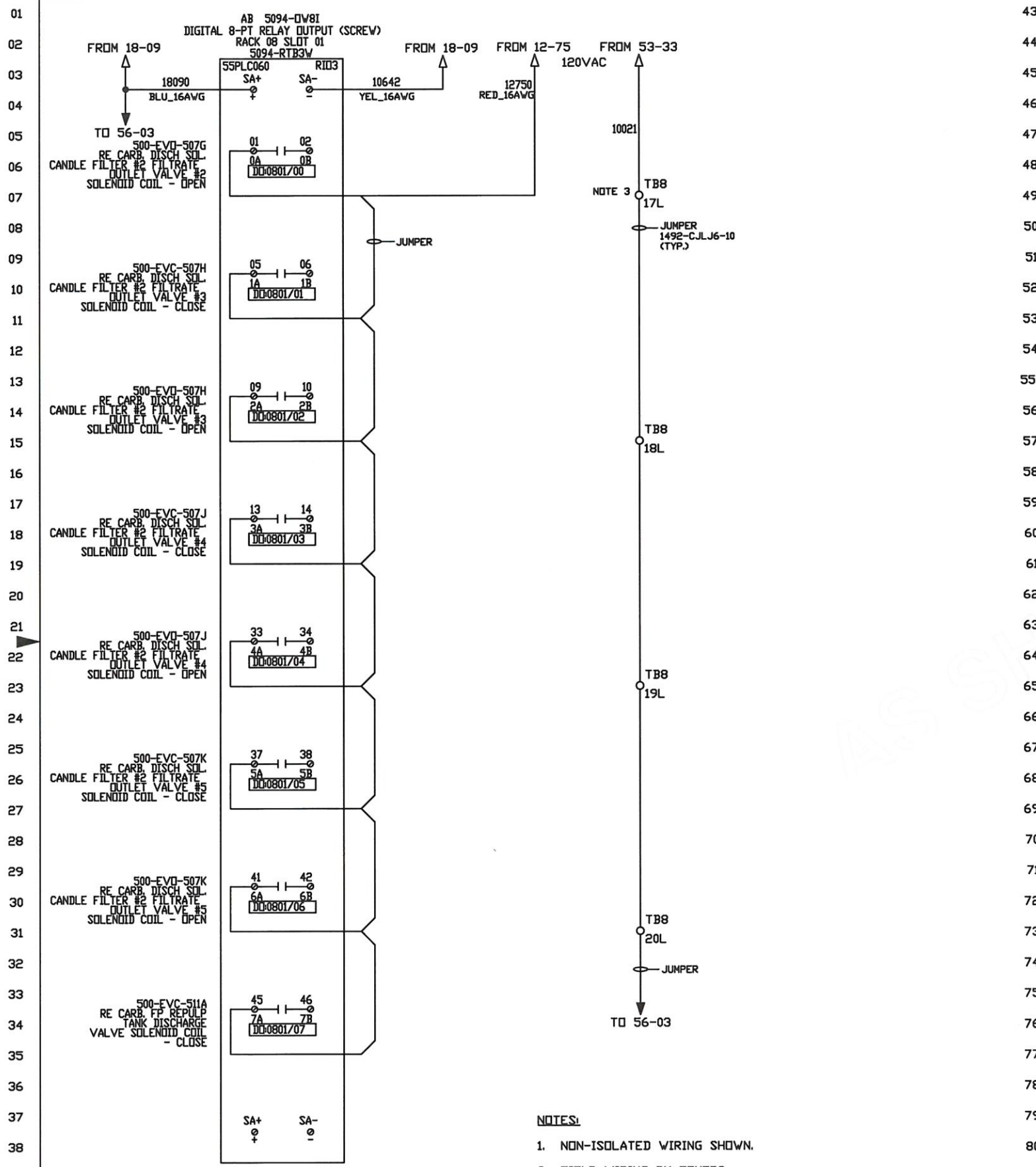
Drawn by GM Date: 16/09/22

Association of Professional Engineers & Geoscientists of Saskatchewan
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Name: GM
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Discipline: Automation St. Reg. No. 65626
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DATE	BY	APPROVAL
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24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

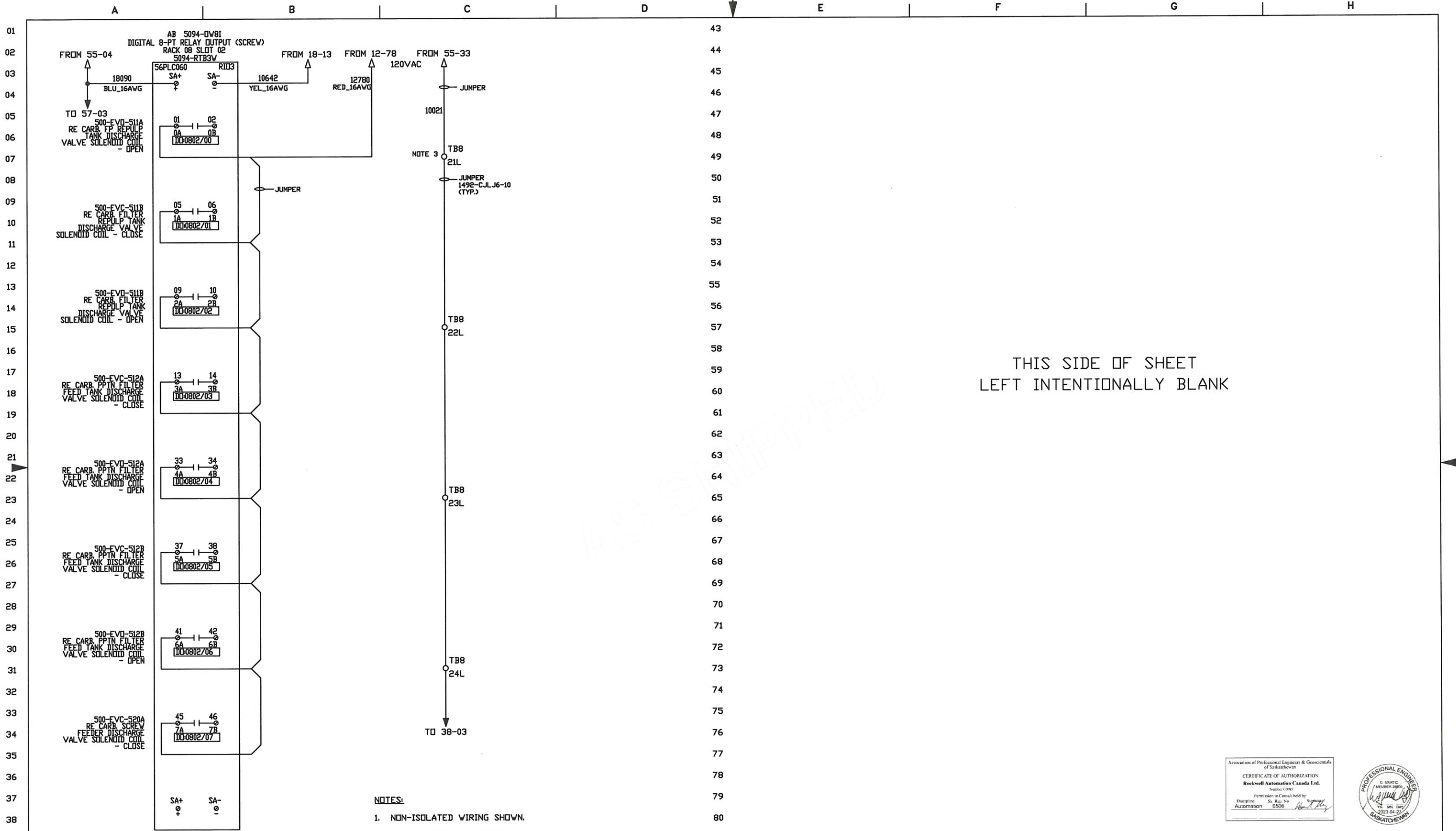
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Rockwell Automation Canada Ltd.
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Discipline: Automation
St. Reg. No. 6506
Signature: [Signature]
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REV.	DATE	BY	ECN/CR. NO.		Sheet	55	of	75	Next Sh	56	Ver	2
A	05/12/22	GM		Rockwell Automation	Sheet	55	of	75	Next Sh	56	Ver	2
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D	30/01/23	AD										
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 4. FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

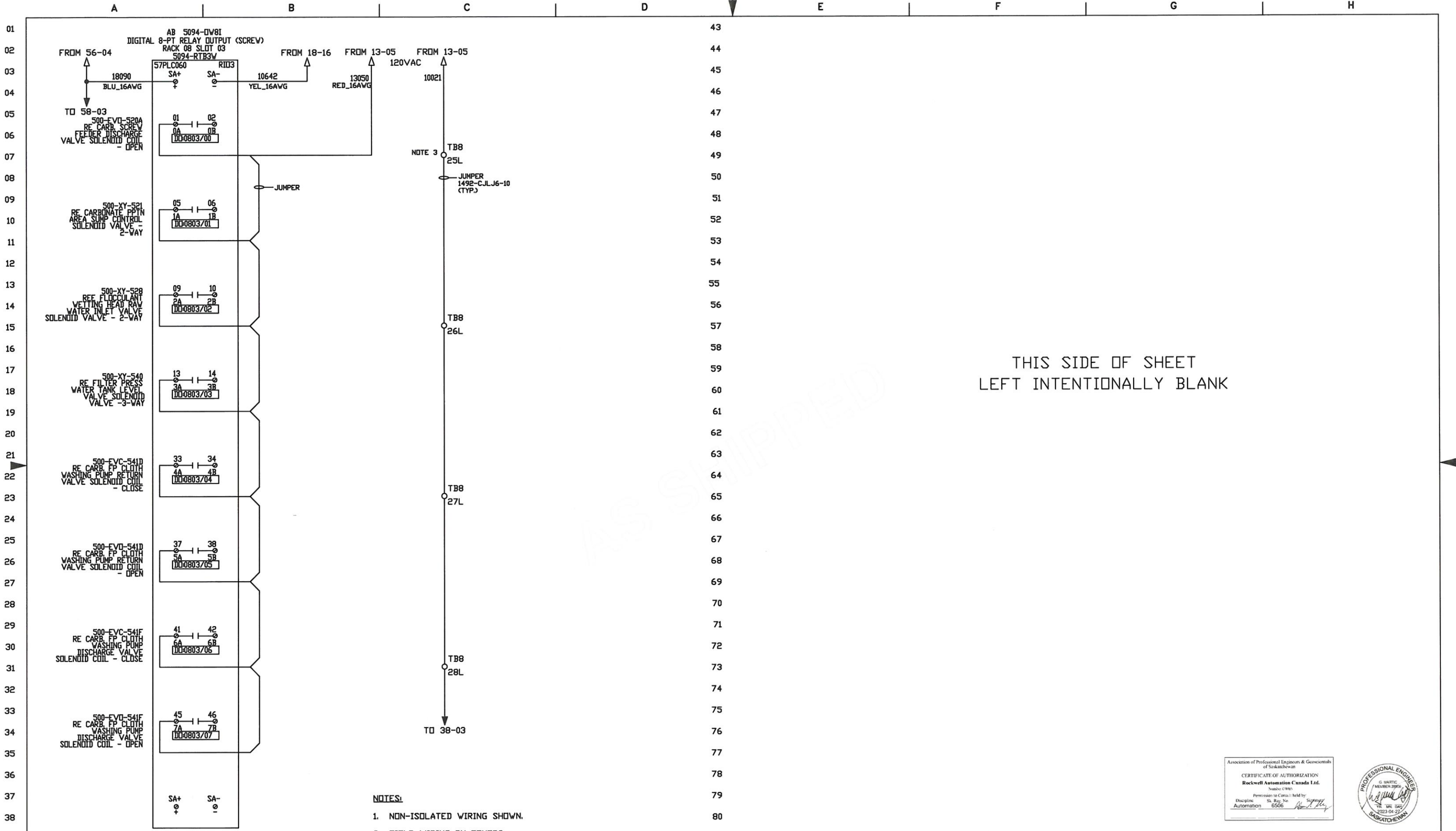
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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Education: Sr. Reg. No. 6506
Automation: *[Signature]*
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REV.	DATE	BY	ECN/CR. NO.		
A	05/12/22	GM		Rockwell Automation	CONFIDENTIAL AND PROPRIETARY INFORMATION THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS, EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION, INC.
B	29/11/22	GM			
C	05/01/23	AD		VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030	Sheet 56 of 75 Next Sh 57
D	30/01/23	AD			Size D
0	24/02/23	GM	FABRICATION	RACK 08 SLOT 02 - 5094-DV81	
1	17/04/23	GM	FABRICATION		
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Date: 16/09/22





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- FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

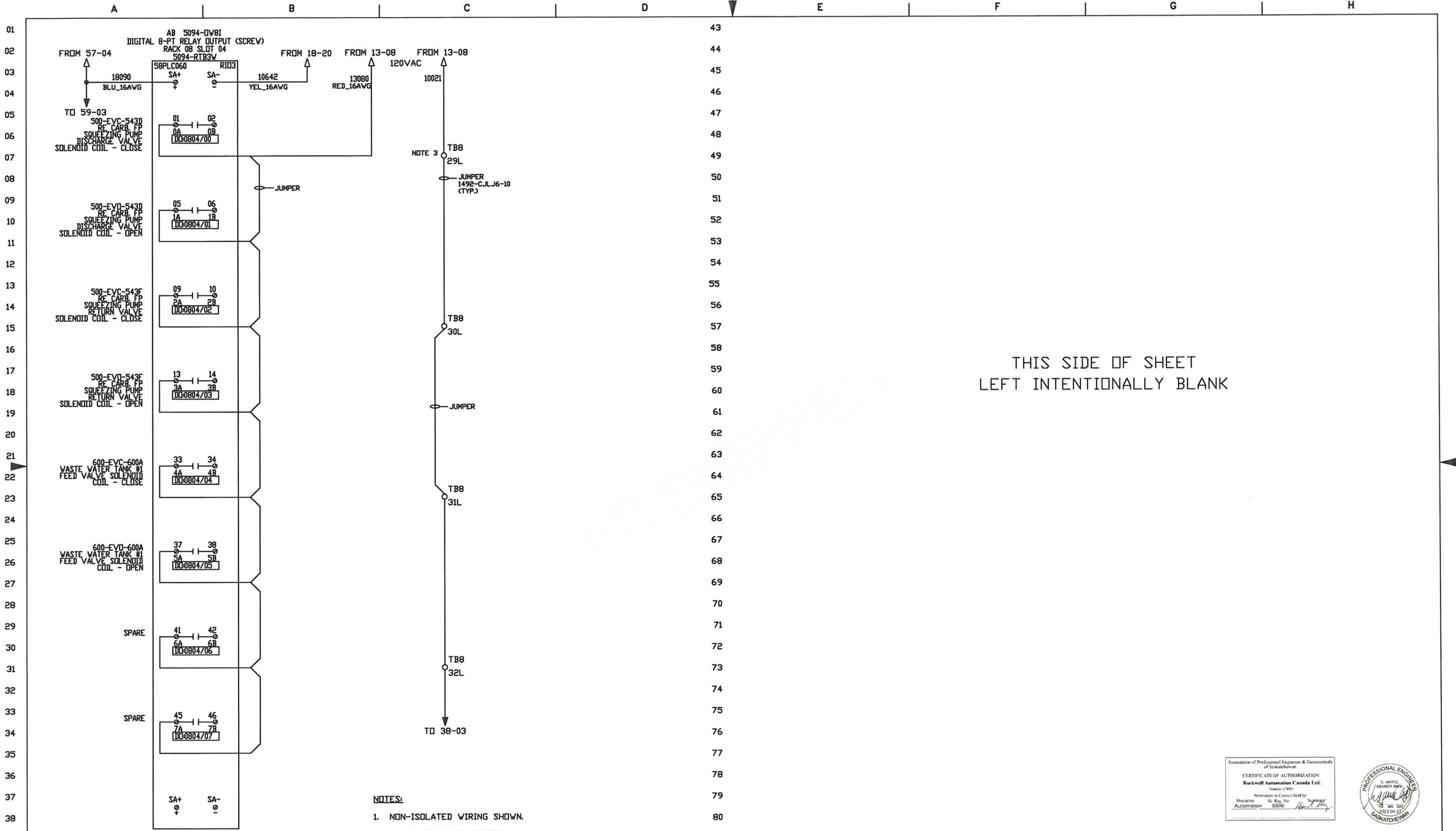
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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Automation



REV.	DATE	BY	ECN/CR. NO.		
A	05/12/22	GM		Rockwell Automation	VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030 RACK 08 SLOT 03 - 5094-DW81
B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	Sheet 57 of 75	Next Sh 58
1	17/04/23	GM	FABRICATION	Size D	P2CA500039-0004
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Ver 2

Date: 16/09/22



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 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

REV.	DATE	BY	ECN/CR. NO.
A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
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1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

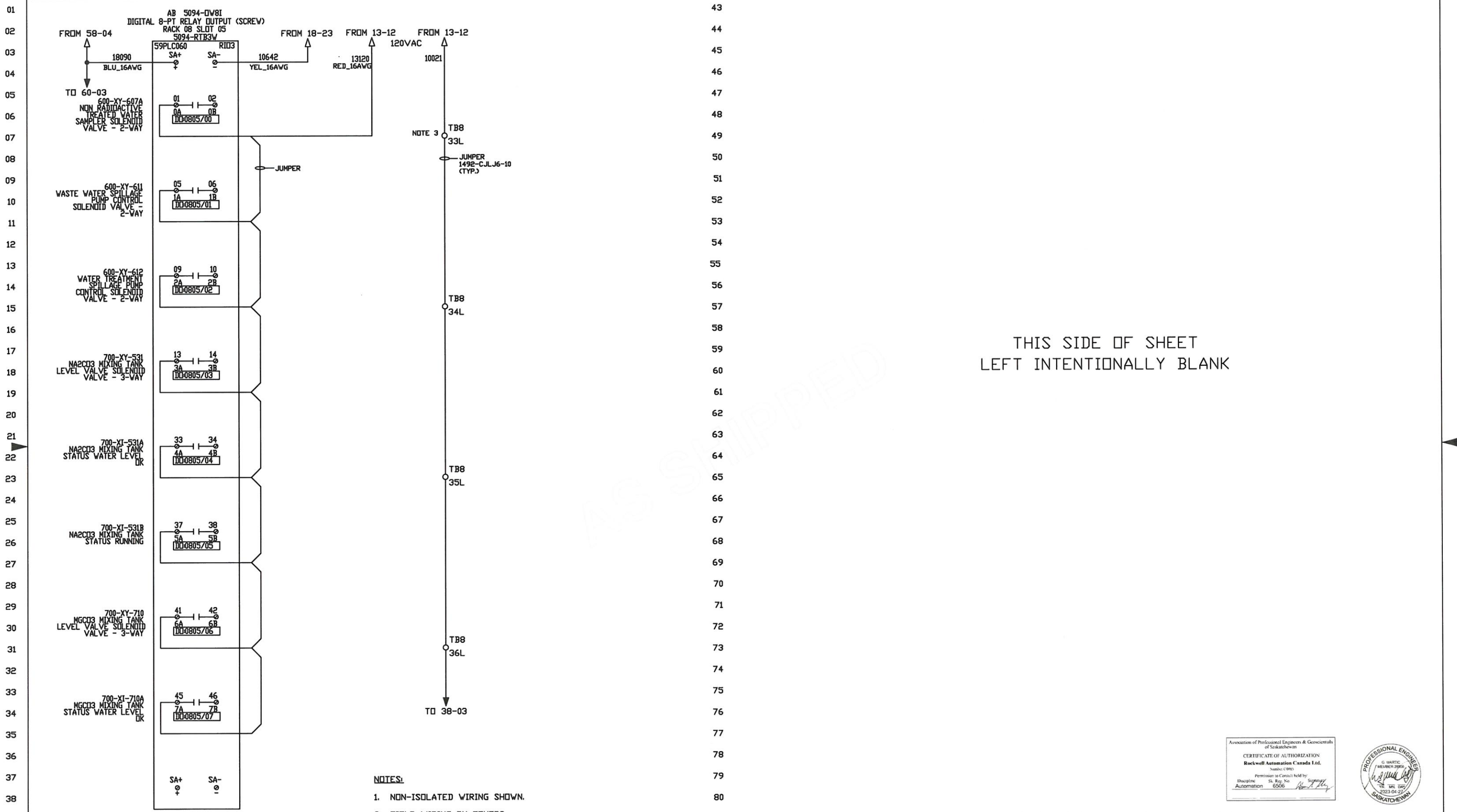


VITAL METALS PROCESS PLANT
RID CABINET 3 - 870-RID-030
RACK 08 SLOT 04 - 5094-DV81
Drawn by: GM | Date: 16/09/22

Association of Professional Engineers & Geoscientists
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Discipline: St. Reg. No. Automation: 6506
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Sheet	58	Of	75
Next Sh	59		
Size	P2CA500039-0004		Ver
D			2



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- NOTES:**
1. NON-ISOLATED WIRING SHOWN.
 2. FIELD WIRING BY OTHERS.
 3. TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 4. FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

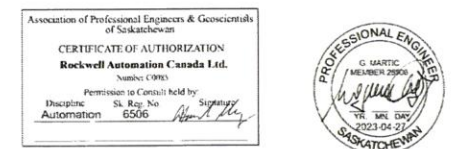
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FDR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

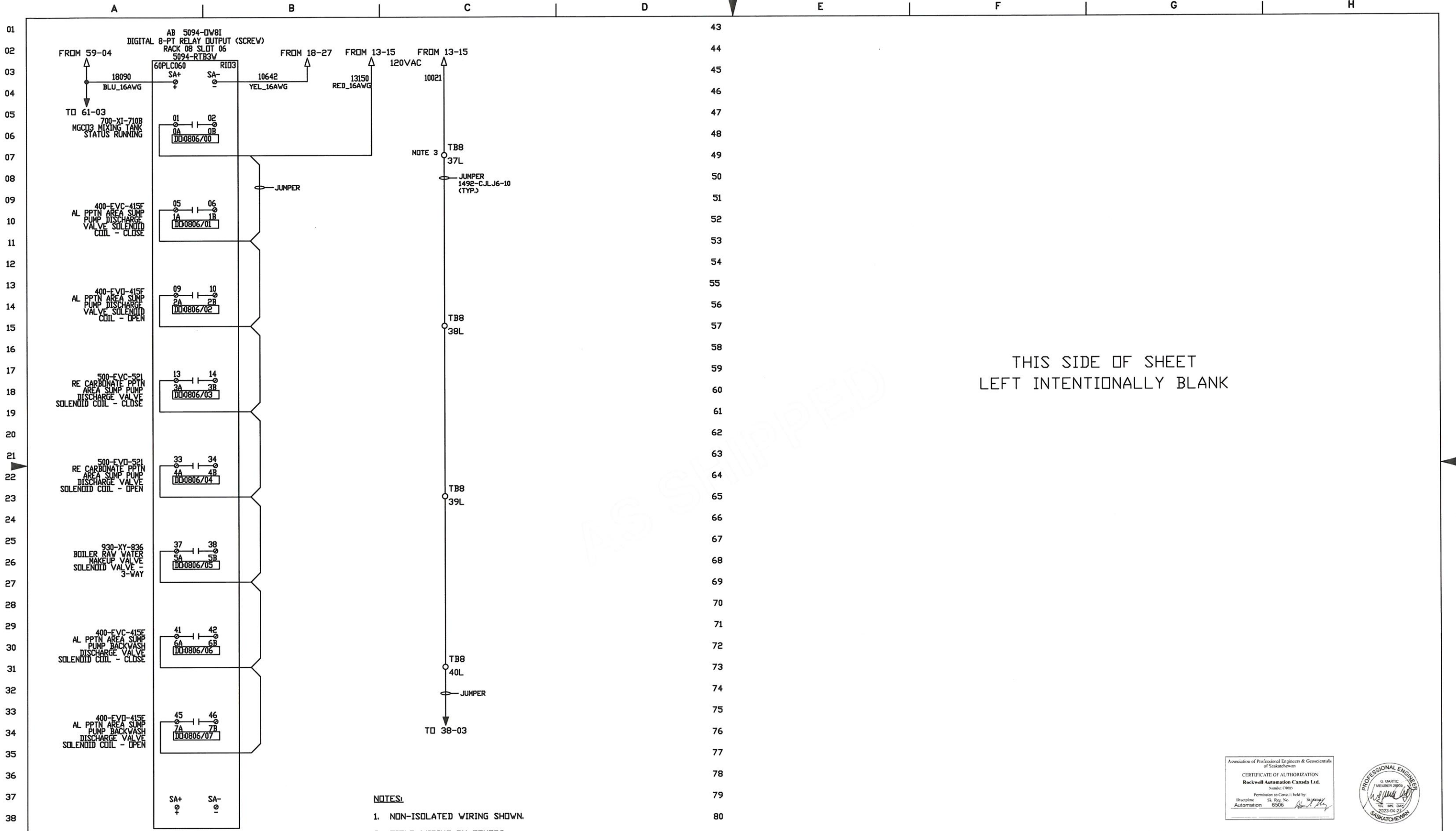
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0	24/02/23	GM	FABRICATION		
1	17/04/23	GM	FABRICATION		
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Date: 16/09/22

Sheet **59** of **75** Next Sh **60**

Size **D** P2CA500039-0004 Ver **2**

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 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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Number: C1985
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Discipline: Automation
5506

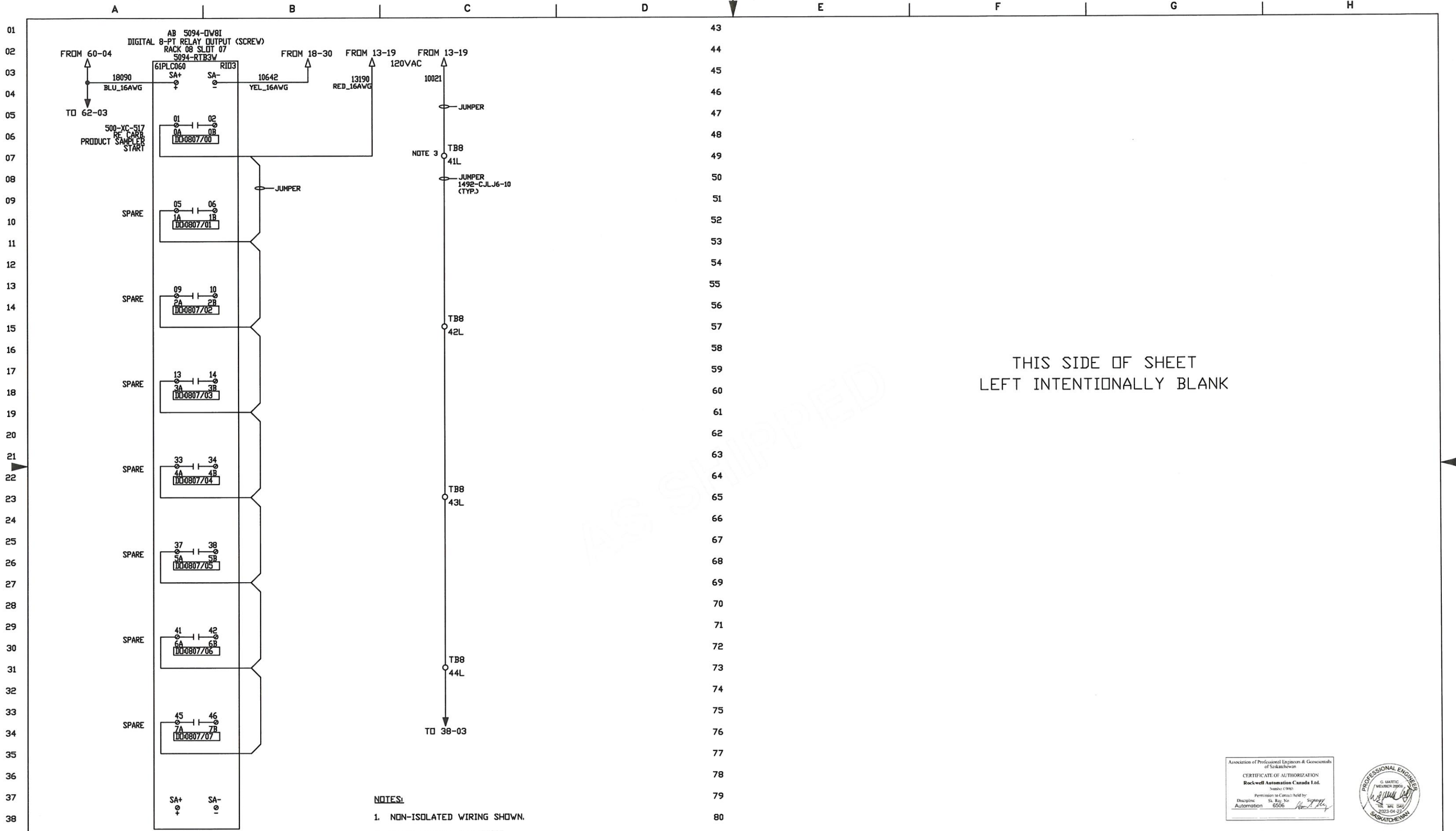


REV.	DATE	BY	ECN/CR. NO.		
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B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
0	24/02/23	GM	FABRICATION	Sheet 60 of 75	Next Sh 61
1	17/04/23	GM	FABRICATION	Size D	P2CA500039-0004
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Ver 2



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 3. TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 4. FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

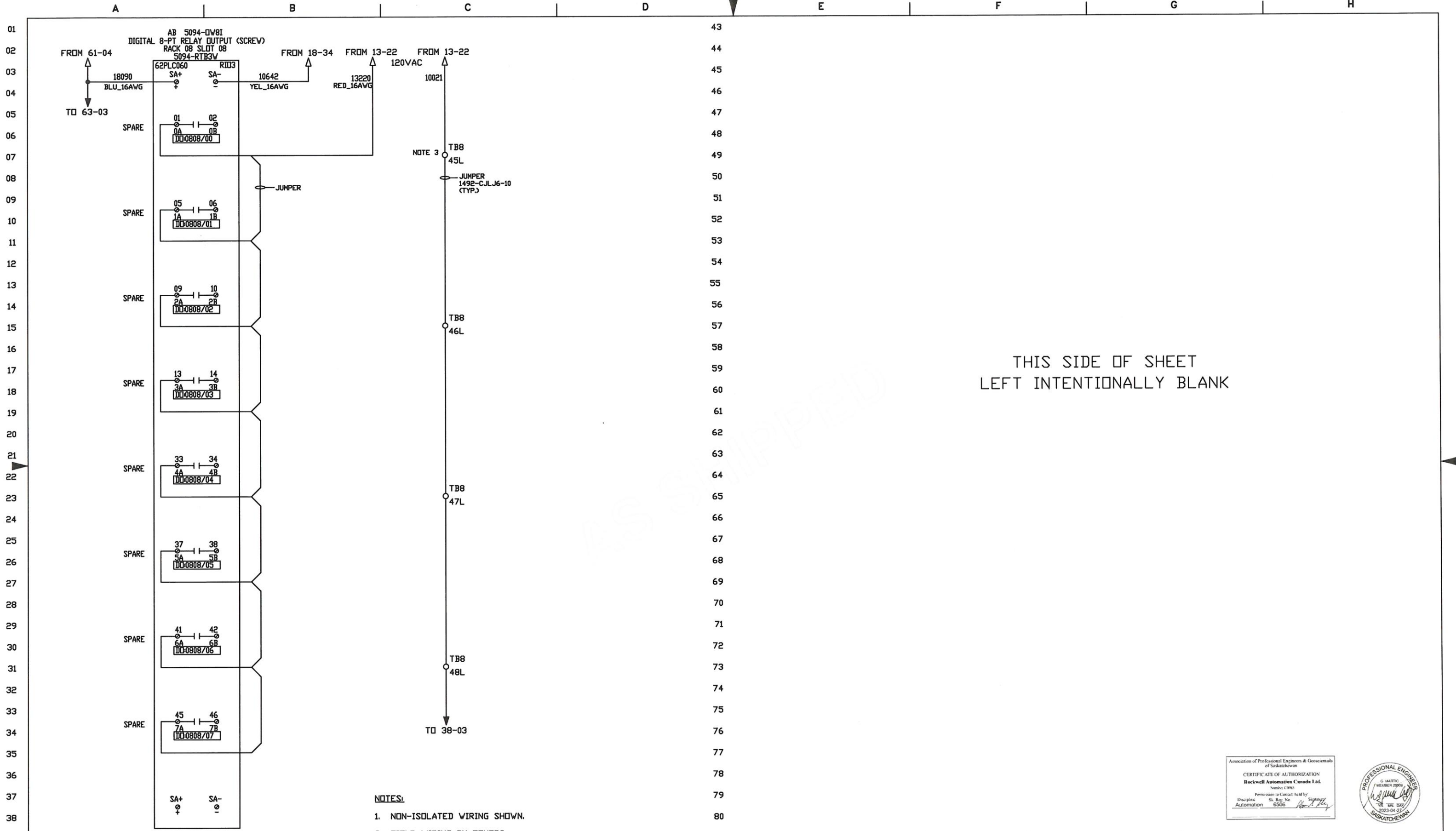
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

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Number: 1985
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Discipline: St. Reg. No. Automation: 6506



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A	05/12/22	GM			
B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
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1	17/04/23	GM	FABRICATION	RACK 08 SLOT 07 - 5094-DV81	Size D P2CA500039-0004 Ver 2
2	25/04/23	GM	AS SHIPPED	Drawn by: GM Date: 16/09/22	





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 - TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 - FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

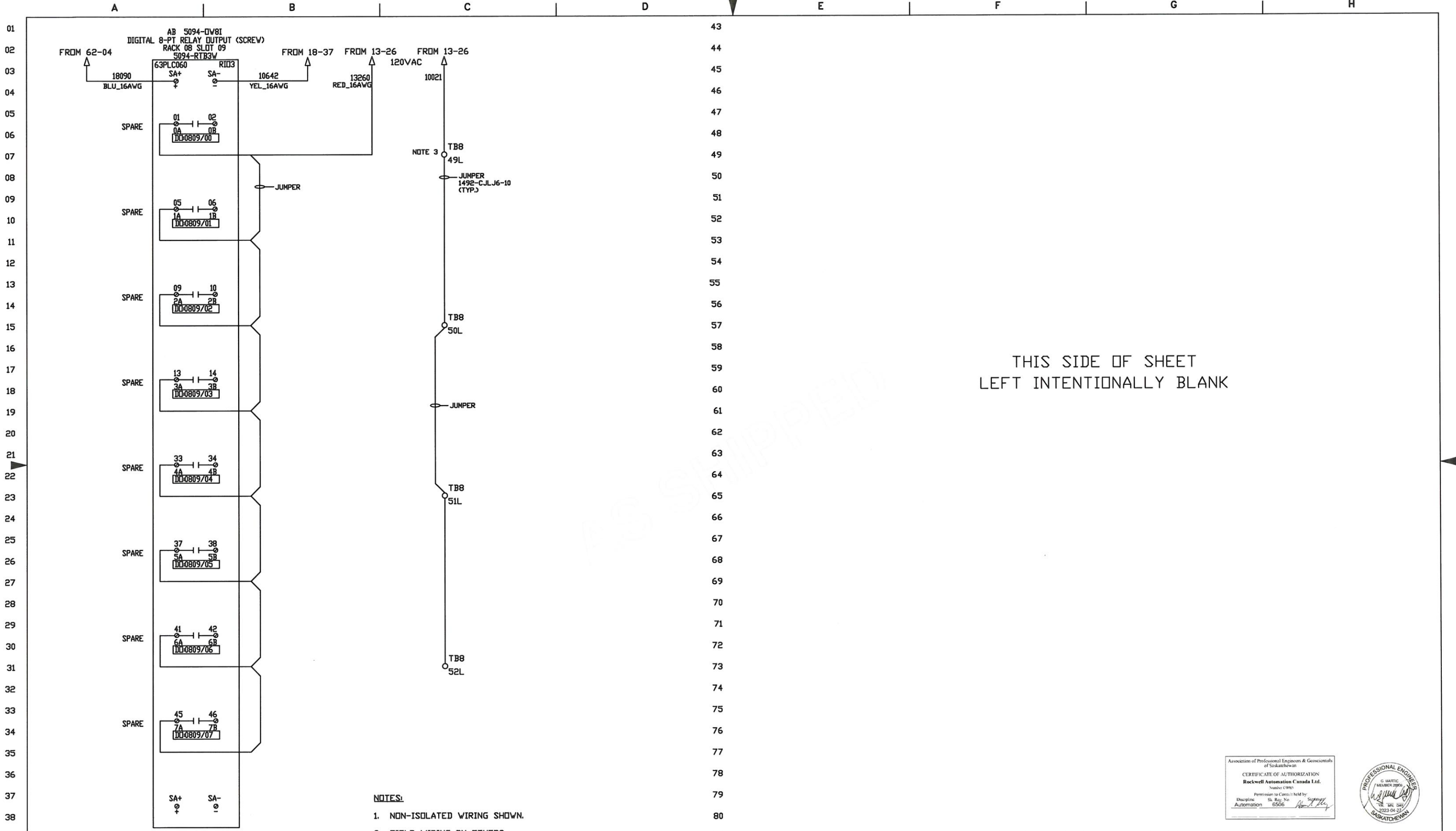
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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Number: C 0963
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Discipline: Automation
S.A. Reg. No: 6506
Signature: [Signature]
Date: 2023-04-27
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REV.	DATE	BY	ECN/CR. NO.		Sheet	62	of	75	Next Sh	63	Ver	2
A	05/12/22	GM		Rockwell Automation	Sheet	62	of	75	Next Sh	63	Ver	2
B	29/11/22	GM										
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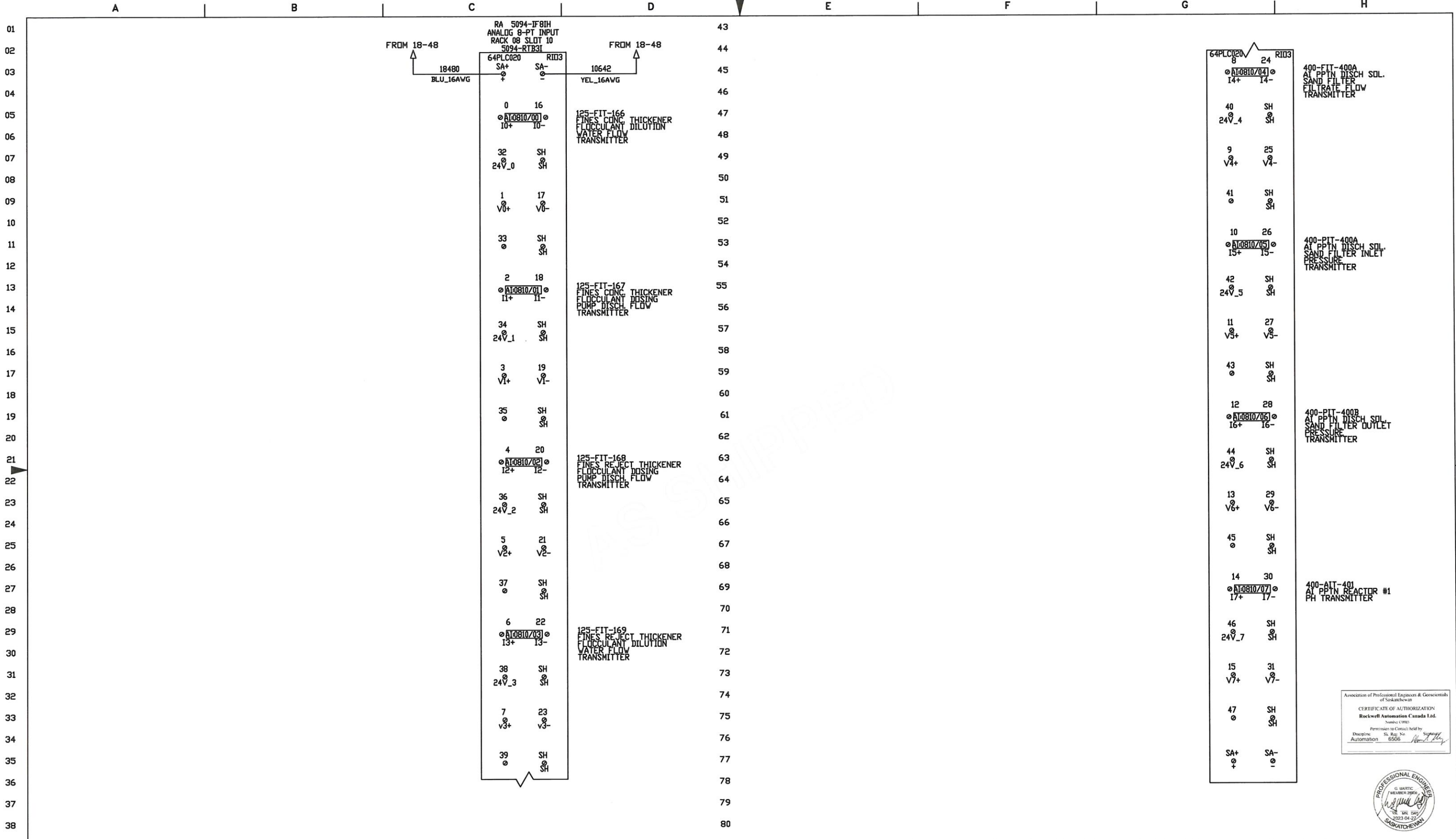
- NOTES:**
1. NON-ISOLATED WIRING SHOWN.
 2. FIELD WIRING BY OTHERS.
 3. TWO-CIRCUIT TERMINAL 1492-JD4, U/L - UPPER/LOWER.
 4. FIELD NEUTRAL WIRING-USE DOUBLE FERULES FOR TWO WIRES.

DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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1	17/04/23	GM	FABRICATION	Size D	P2CA500039-0004
2	25/04/23	GM	AS SHIPPED	Drawn by: GM	Ver 2

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Discipline: SA, Reg. No. 6506
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DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED

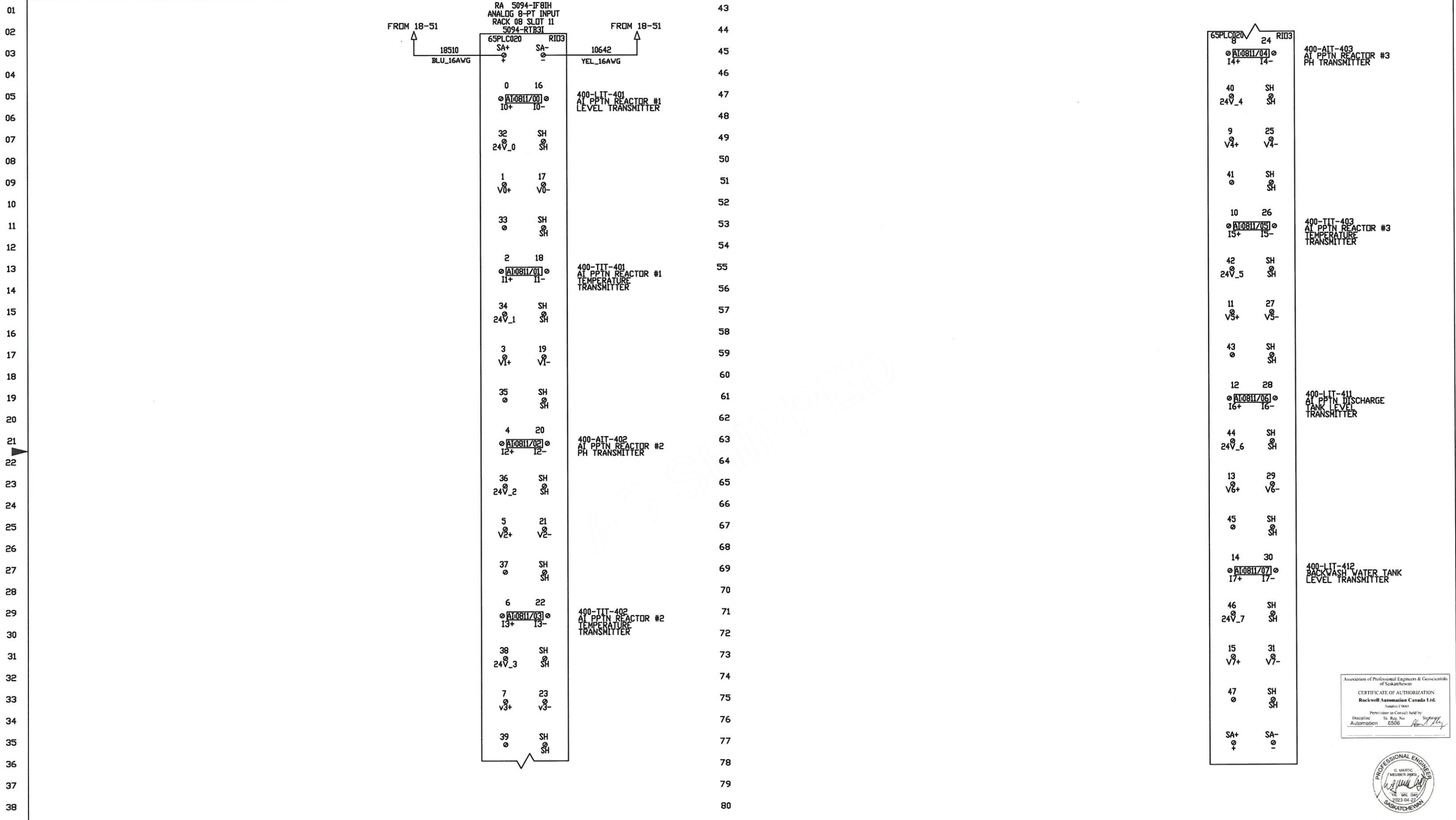
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A	05/12/22	GM		Rockwell Automation
B	29/11/22	GM		
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2	25/04/23	GM	AS SHIPPED	Drawn by: GM Date: 16/09/22

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Sheet 64 of 75 Next Sh 65
 Size D P2CA500039-0004 Ver 2



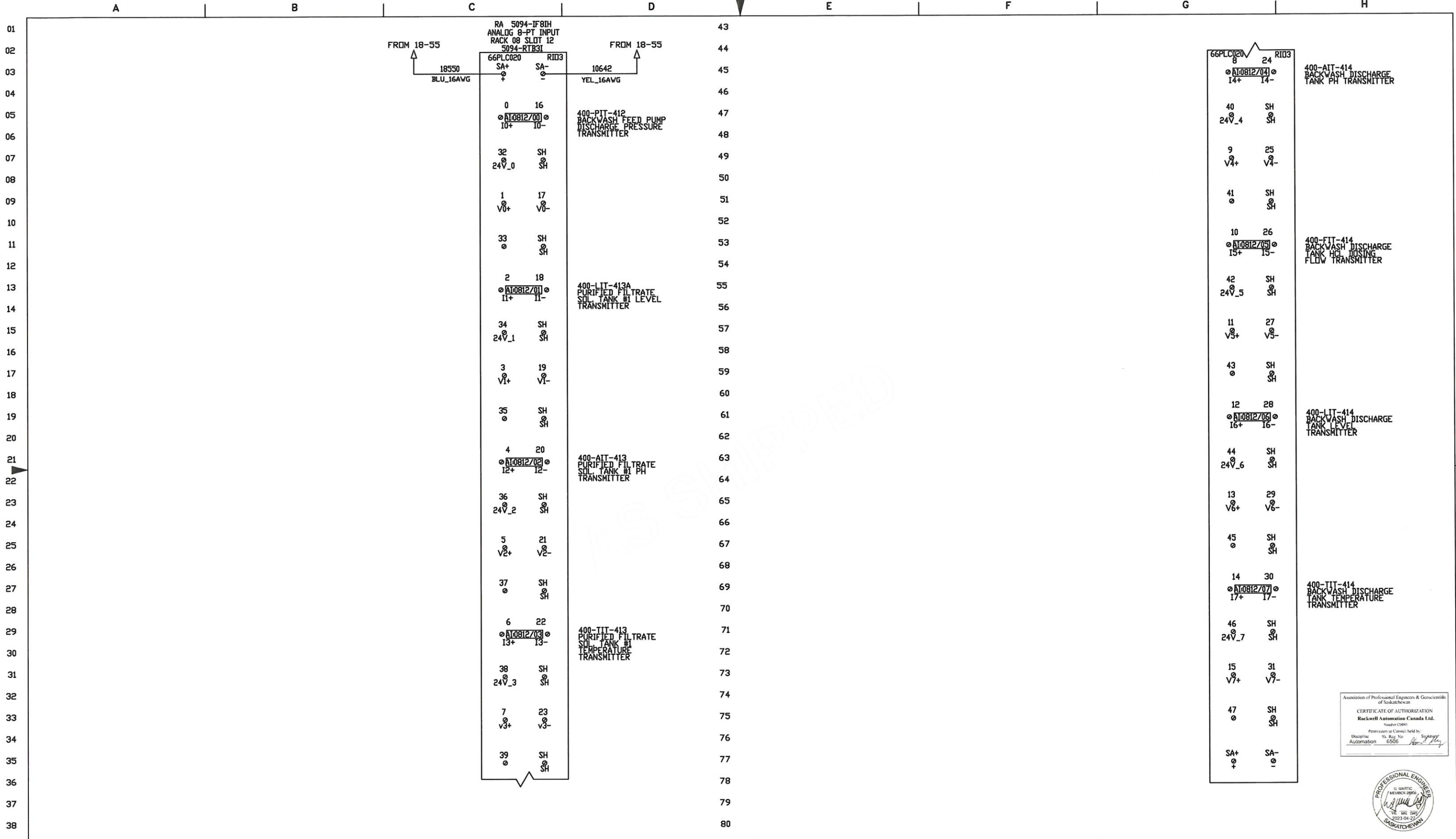
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
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REV.	DATE	BY	ECN/CR. NO.		
A	05/12/22	GM		Rockwell Automation	<small>CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS, EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION, INC.</small>
B	29/11/22	GM			
C	05/01/23	AD			
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0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030	Sheet 65 of 75 Next Sh 66
1	17/04/23	GM	FABRICATION	RACK 08 SLOT 11 - 5094-IF8IH	Size D P2CA500039-0004 Ver 2
2	25/04/23	GM	AS SHIPPED	Drawn by: GM Date: 16/09/22	



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 Discipline: Automation 6506
 Signature: [Signature]

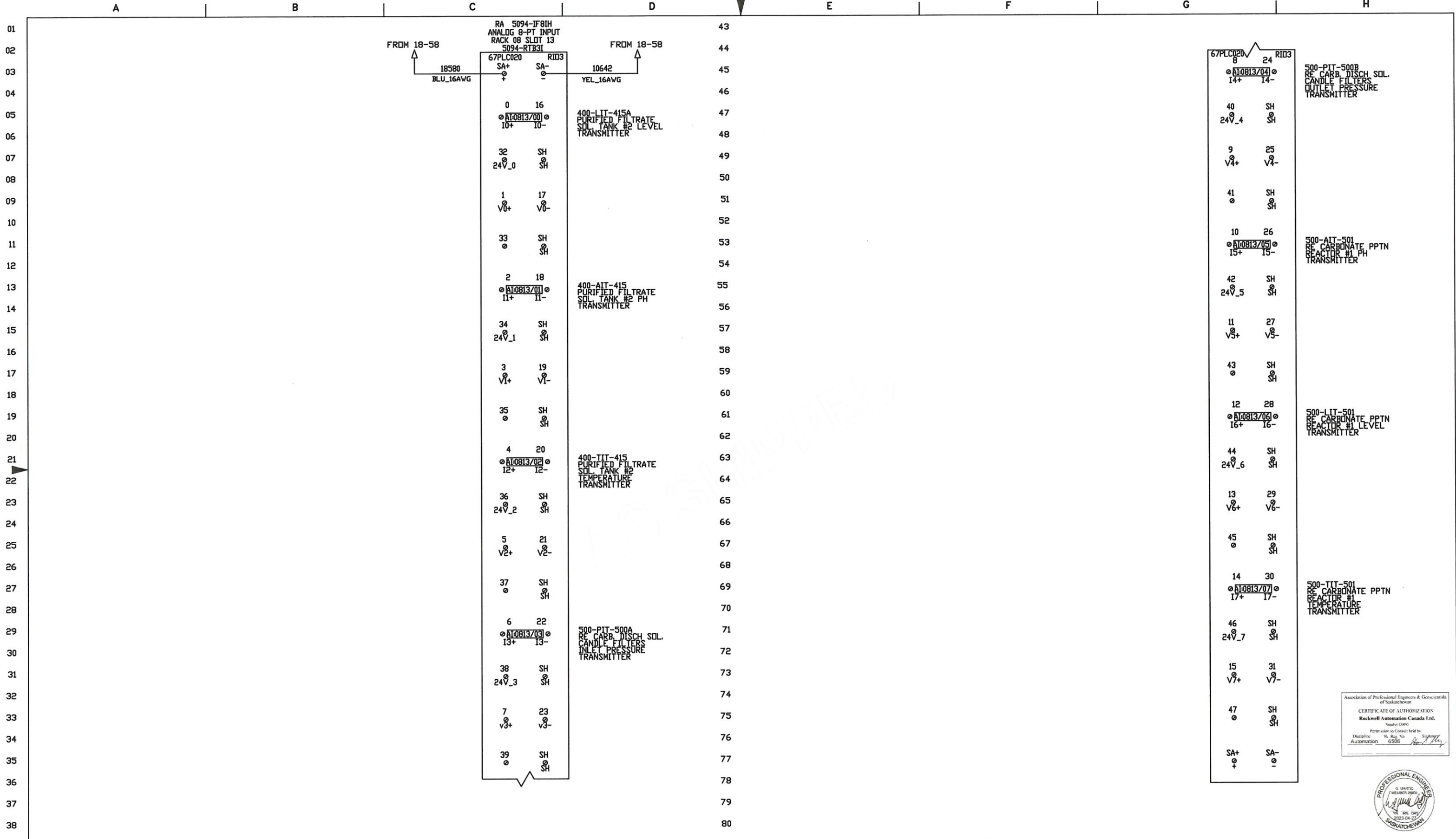




DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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A	05/12/22	GM		Rockwell Automation	<small>CONFIDENTIAL AND PROPRIETARY INFORMATION. THIS DOCUMENT CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF ROCKWELL AUTOMATION, INC. AND MAY NOT BE USED, COPIED OR DISCLOSED TO OTHERS, EXCEPT WITH THE AUTHORIZED WRITTEN PERMISSION OF ROCKWELL AUTOMATION, INC.</small>
B	29/11/22	GM			
C	05/01/23	AD			
D	30/01/23	AD			
				VITAL METALS PROCESS PLANT	Sheet 66 of 75 Next Sh 67
				RIO CABINET 3 - 870-RIO-030	Size D
				RACK 08 SLOT 12 - 5094-IF8IH	P2CA500039-0004
				Drawn by: GM	Ver 2
				Date: 16/09/22	



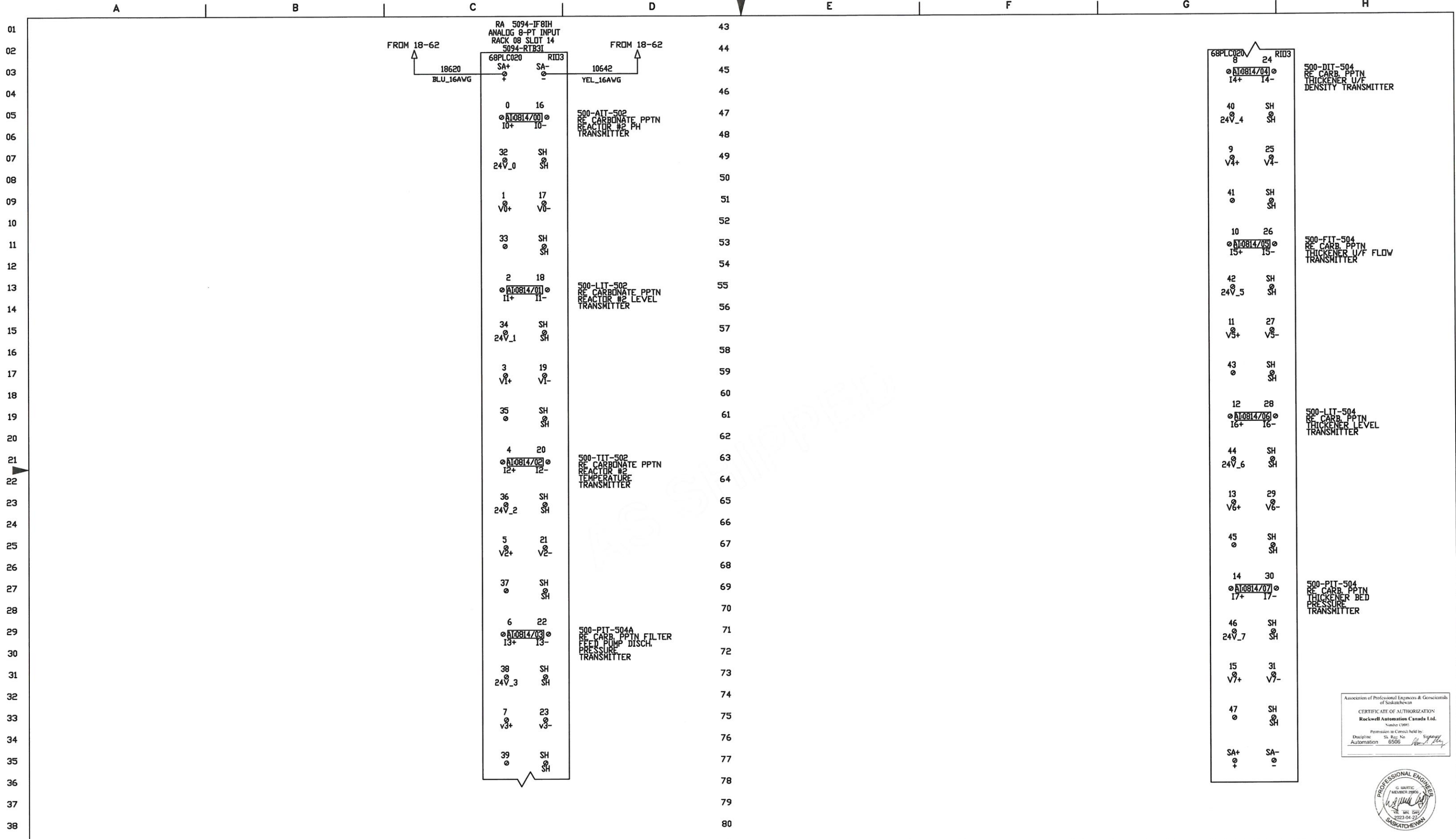


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A	05/12/22	GM		VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030 RACK 08 SLOT 13 - 5094-IF8IH		Sheet 67 of 75 Next Sh 68	
B	29/11/22	GM				Size D	
C	05/01/23	AD		Drawn by GM		Ver 2	
D	30/01/23	AD		Date: 16/09/22			
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1	17/04/23	GM	FABRICATION				
2	25/04/23	GM	AS SHIPPED				



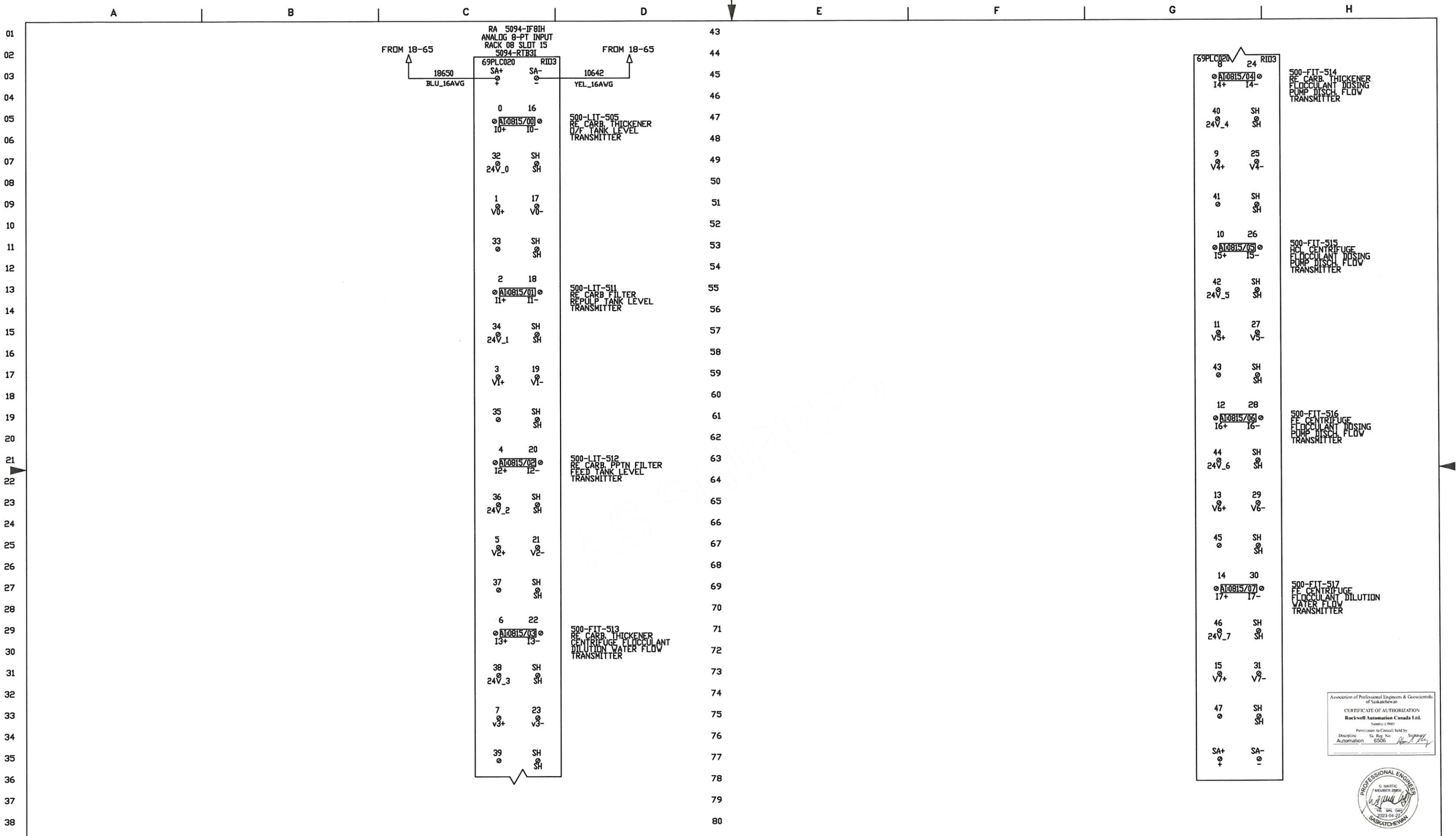


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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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A	05/12/22	GM				
B	29/11/22	GM				
C	05/01/23	AD				
D	30/01/23	AD				
0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT	Sheet 68 of 75 Next Sh 69	
1	17/04/23	GM	FABRICATION	RIID CABINET 3 - 870-RIID-030	Size D	
2	25/04/23	GM	AS SHIPPED	RACK 08 SLOT 14 - 5094-IF81H	P2CA500039-0004	
				Drawn by: GM	Date: 16/09/22	Ver 2

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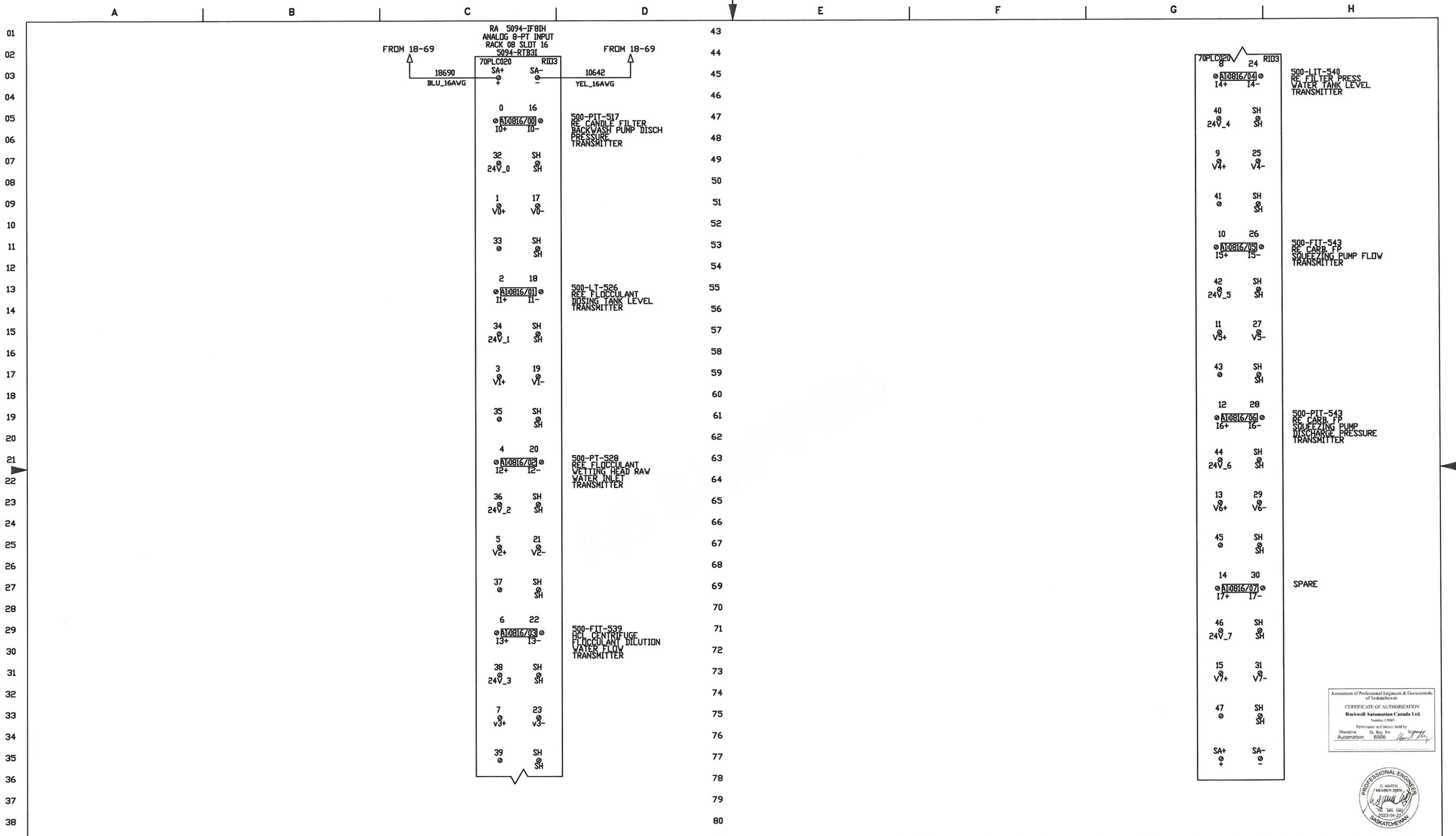


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10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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REV.	DATE	BY	ECN/CR. NO.			
A	05/12/22	GM				
B	29/11/22	GM				
C	05/01/23	AD				
D	30/01/23	AD				
0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT	Sheet 69 of 75 Next Sh 70	
1	17/04/23	GM	FABRICATION	RID CABINET 3 - 870-RID-030	Size D	
2	25/04/23	GM	AS SHIPPED	RACK 08 SLOT 15 - 5094-IF8IH	P2CA500039-0004	
				Drawn by: GM	Date: 16/09/22	Ver 2

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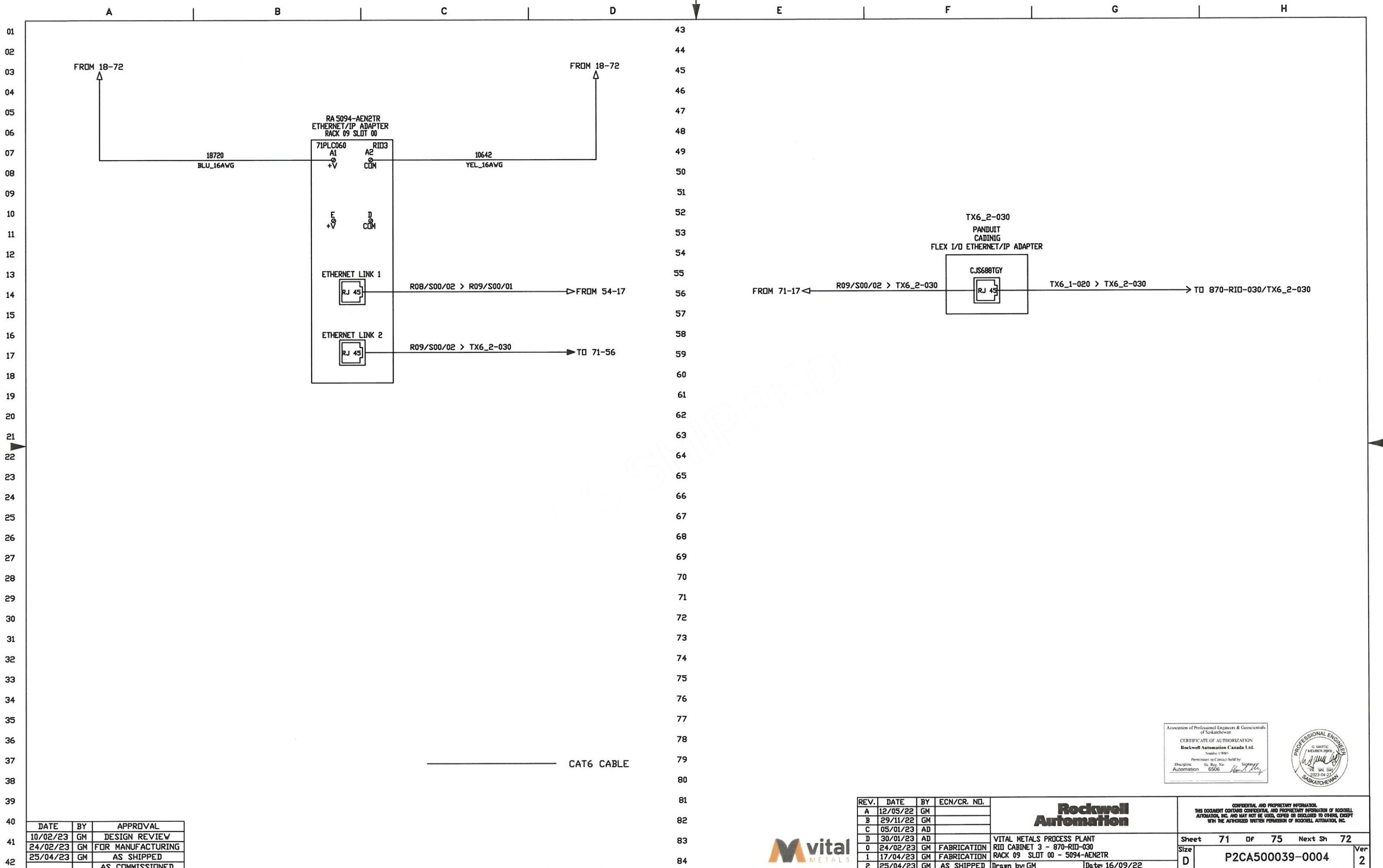
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
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REV.	DATE	BY	ECN/CR. NO.	Rockwell Automation		Sheet	70	DF	75	Next Sh	71	
A	05/12/22	GM		VITAL METALS PROCESS PLANT RID CABINET 3 - 870-RID-030 RACK 08 SLOT 16 - 5094-IF8IH		Size	D		P2CA500039-0004		Ver	2
B	29/11/22	GM				Drawn by	GM	Date	16/09/22			
C	05/01/23	AD										
D	30/01/23	AD										
0	24/02/23	GM	FABRICATION									
1	17/04/23	GM	FABRICATION									
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A	12/05/22	GM	
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C	05/01/23	AD	
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2	25/04/23	GM	AS SHIPPED

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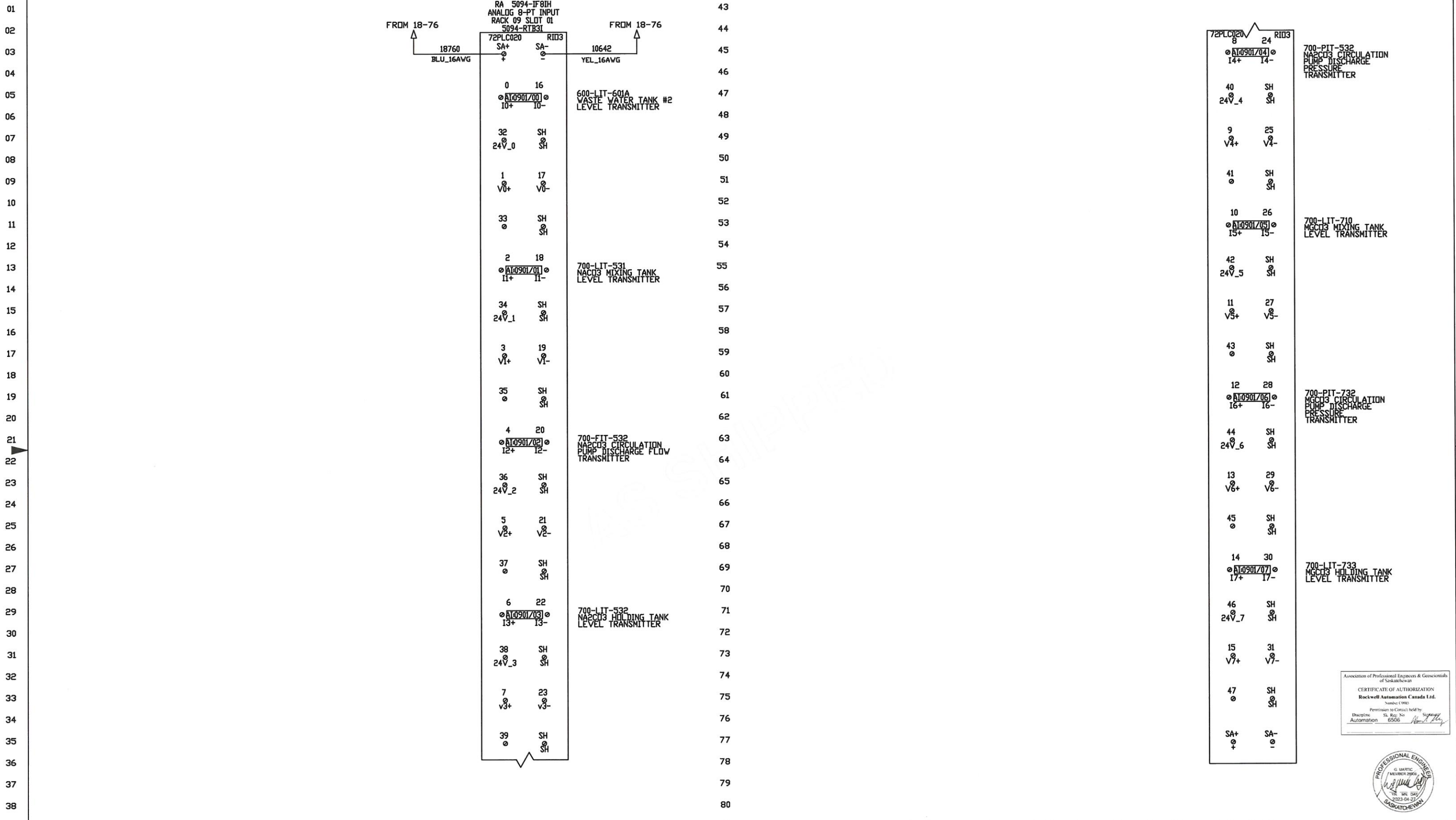
VITAL METALS PROCESS PLANT
RII CABINET 3 - 870-RII-030
RACK 09 SLOT 00 - 5094-AEN2TR

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6506
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Sheet	71	OF	75
Next Sh	72		
Size	P2CA500039-0004		
Ver	2		



DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
24/02/23	GM	FOR MANUFACTURING
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REV.	DATE	BY	ECN/CR. NO.	
A	05/12/22	GM		
B	29/11/22	GM		
C	05/01/23	AD		
D	30/01/23	AD		
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2	25/04/23	GM	AS SHIPPED	Drawn by GM Date: 16/09/22

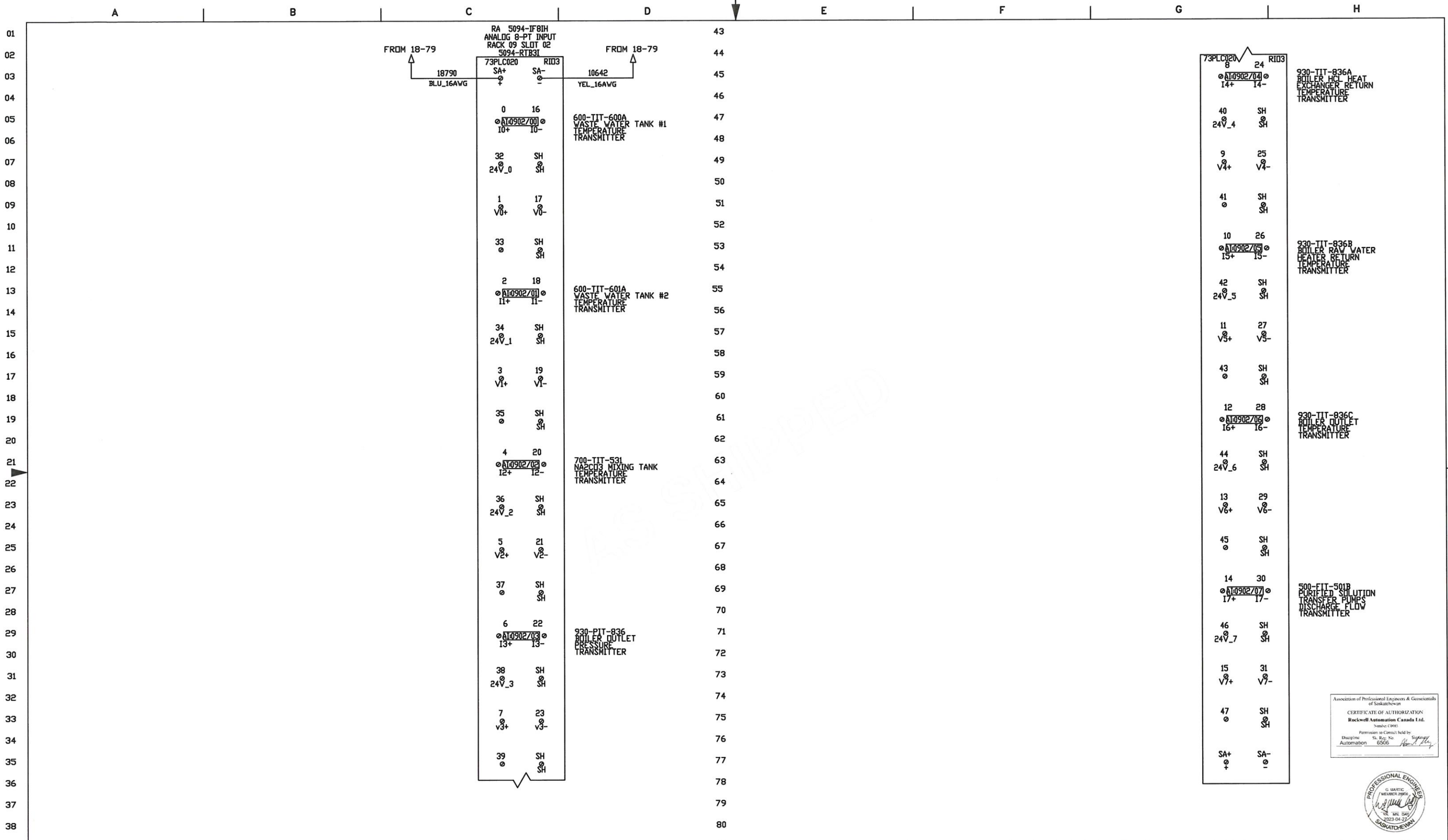
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Sheet 72 of 75 Next Sh 73

Size D P2CA500039-0004 Ver 2

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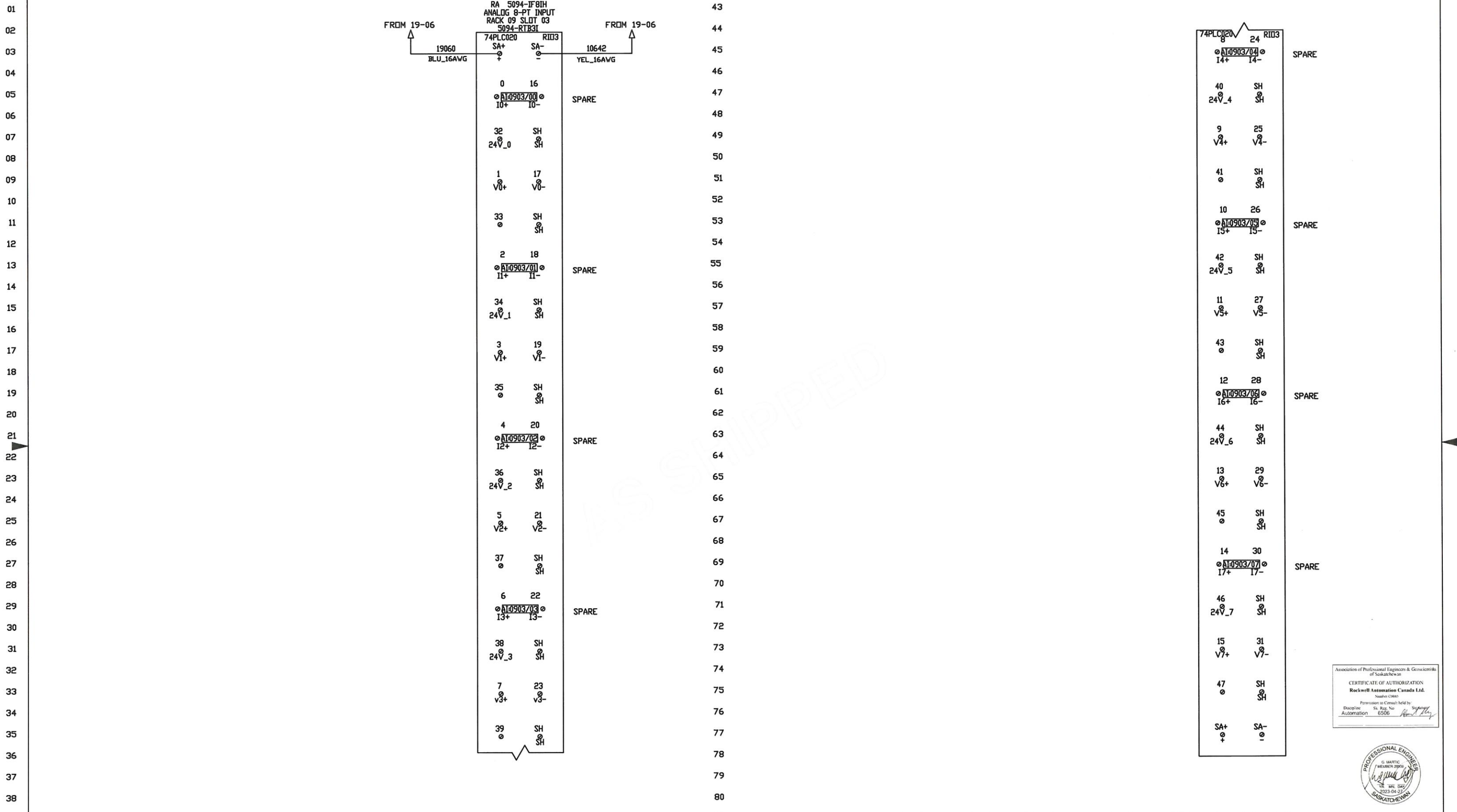
DATE	BY	APPROVAL
10/02/23	GM	DESIGN REVIEW
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REV.	DATE	BY	ECN/CR. NO.			
A	05/12/22	GM		Rockwell Automation		
B	29/11/22	GM				
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D	30/01/23	AD				
0	24/02/23	GM	FABRICATION	VITAL METALS PROCESS PLANT	Sheet 73 of 75 Next Sh 74	
1	17/04/23	GM	FABRICATION	RI0 CABINET 3 - 870-RI0-030		
2	25/04/23	GM	AS SHIPPED	RACK 09 SLOT 02 - 5094-IF8IH	Size D	
				Drawn by GM	Date: 16/09/22	Ver 2

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 St. Reg. No: 6506
 Signature: [Signature]
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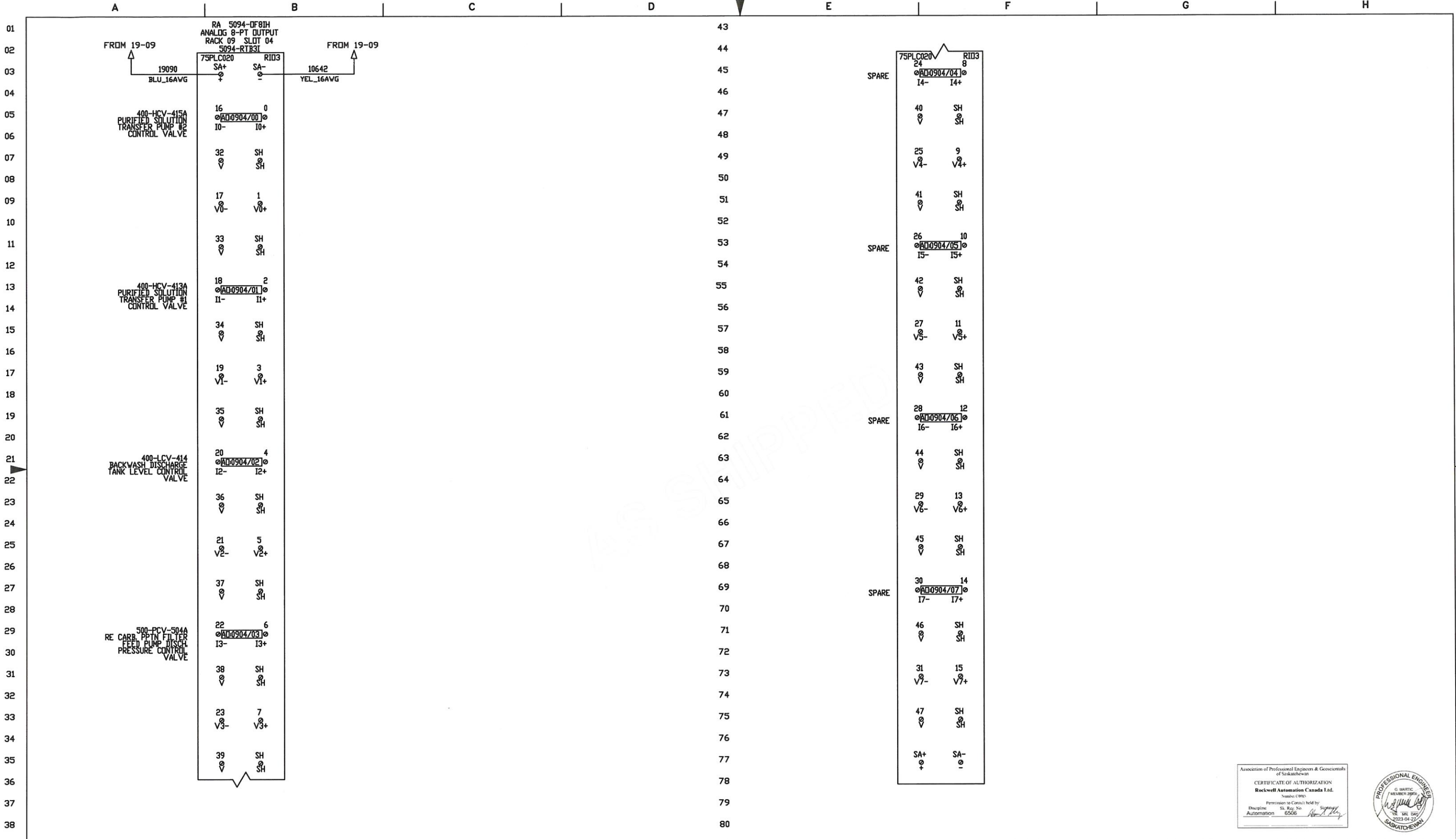
DATE	BY	APPROVAL
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24/02/23	GM	FOR MANUFACTURING
25/04/23	GM	AS SHIPPED
		AS COMMISSIONED



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A	05/12/22	GM		Rockwell Automation VITAL METALS PROCESS PLANT RIO CABINET 3 - 870-RIO-030 RACK 09 SLOT 03 - 5094-IF8IH Drawn by: GM Date: 16/09/22
B	29/11/22	GM		
C	05/01/23	AD		
D	30/01/23	AD		
0	24/02/23	GM	FABRICATION	Sheet 74 of 75 Next Sh 75 Size D P2CA500039-0004 Ver 2
1	17/04/23	GM	FABRICATION	
2	25/04/23	GM	AS SHIPPED	

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25/04/23	GM	AS SHIPPED
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A	05/12/22	GM	
B	29/11/22	GM	
C	05/01/23	AD	
D	30/01/23	AD	
0	24/02/23	GM	FABRICATION
1	17/04/23	GM	FABRICATION
2	25/04/23	GM	AS SHIPPED

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VITAL METALS PROCESS PLANT
RIO CABINET 3 - 870-RIO-030
RACK 09 SLOT 04 - 5094-DF8IH
Drawn by: GM Date: 16/09/22

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Sheet	75	Of	75
Next Sh	LAST		
Size	D		Ver
	P2CA500039-0004		2

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SA Reg. No.: 6506
Signature: *[Signature]*
Date: 2023-04-21

