

PROJECT NOTES

1. SCORE, FINISH ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY FOR THE INSTALLATION OF THE COMPLETE ELECTRICAL AND CONTROLS SYSTEM AS SPECIFIED HEREIN AND SHOWN ON THE CONTRACT DRAWINGS.

2. APPLICABLE CODES, ALL WIRING, MATERIALS AND INSTALLATIONS, UNLESS OTHERWISE NOTED, SHALL BE SUPPLIED BY THE CONTRACTOR, AND SHALL COMPLY WITH NATIONAL ELECTRICAL CODE, NFPA, AND APPLICABLE STATE AND LOCAL CODES.

3. PERMITS: THE CONTRACTOR SHALL INCLUDE IN HIS BID PRICE THE PERMIT OF ALL NECESSARY PERMITS. HE SHALL FURNISH THE OWNER PROOF TO THE FINAL PERMIT A CERTIFICATE FROM THE ELECTRICAL INSPECTION DEPARTMENT HAVING JURISDICTION OF THE LOCAL INSPECTION WORKSHEETS AS REQUIREMENTS OF THE LOCAL INSPECTION AUTHORITIES AND/OR THE NATIONAL BOARD OF FIRE UNDERWRITERS.

4. MATERIALS AND SUBSTITUTIONS: THE CONTRACTOR SHALL SUBMIT A LIST OF ELECTRICAL MATERIAL MANUFACTURERS TO THE ENGINEER FOR APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT PERMISSION OF THE OWNER IN WRITING. ALL FURNISHED MATERIALS AND EQUIPMENT SHALL BE NEW AND UNAGED FIRST-QUALITY PRODUCTS OF REPUTABLE MANUFACTURERS REGULARLY EMPLOYED IN THE MANUFACTURE OF SUCH PRODUCTS.

5. SCHEDULING: THE CONTRACTOR SHALL COORDINATE WITH THE OWNER FOR ALL SCHEDULING OF WORK.

6. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.

7. GROUNDING: ALL SYSTEMS SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, ANY AND ALL STATE AND LOCAL CODES, THE ULTIMITY, AND SPECIAL SYSTEMS AND EQUIPMENT AS REQUIRED.

8. THE CONTRACTOR SHALL VISIT THE SITE AND CAREFULLY EXAMINE ALL EXISTING CONDITIONS THAT MAY AFFECT HIS BID.

9. WHEN MOUNTING ELECTRICAL WORK IN AREAS SUBJECT TO PEDESTRIAN TRAFFIC, CONTRACTOR SHALL MAINTAIN EXISTING HEADROOM CLEARANCES.

10. ALL ELECTRICAL MATERIALS AND EQUIPMENT SHALL BE UL LISTED AND SHALL CONFORM TO FACTORY MODEL STANDARDS AS APPLICABLE.

11. EQUIPMENT LOCATIONS: LOCATIONS OF ALL ELECTRICAL EQUIPMENT & CONDUIT ARE SHOWN DIMENSIONALLY. EXACT LOCATIONS TO BE DETERMINED IN FIELD BY CONTRACTOR.

12. GUARANTEE: THE ENTIRE ELECTRICAL INSTALLATION, MATERIAL, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF SYSTEM ACCEPTANCE.

13. CONTRACTOR SHALL ADHERE TO ALL SAFETY REGULATIONS AND PROCEDURES REQUIRED BY THE PROJECT FACILITY.

14. THE OWNER OR HIS REPRESENTATIVE SHALL HAVE THE FINAL DETERMINATION IN ALL MATTERS AND INTERFERENCES REGARDING THE REQUIREMENTS OF THE CONTRACT DRAWINGS. ANY DEVIATIONS FROM THE DRAWINGS MUST BE APPROVED IN WRITING BY THE OWNER OR HIS REPRESENTATIVE.

15. THE CONTRACTOR SHALL KEEP THE WORK SITE AND SURROUNDING AREA FREE FROM ACCUMULATION OF WASTE MATERIALS GENERATED BY WORK PERFORMED UNDER THIS CONTRACT. SUCH DEBRIS SHALL BE REMOVED FROM THE WORK SITE, HAULED OFF THE PREMISES, AND DISPOSED OF IN A LEGAL MANNER ON A DAILY BASIS.

16. ANY DAMAGE DONE BY THE CONTRACTOR TO WORK ALREADY IN PLACE SHALL BE REPAIRED TO THE OWNER'S SATISFACTION AT THE EXPENSE OF THE CONTRACTOR.
17. CONTRACTOR SHALL PROVIDE MAN-LIFTS AS REQUIRED TO PERFORM HIS WORK.

18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAGGING ALL EQUIPMENT AND CONDUCTIONS IN ACCORDANCE WITH PLANT STANDARDS. MOTORS SHALL BE TAGGED AT BOTH THE MOTOR AND DISCONNECT SWITCH LOCATIONS.

19. CONTRACTOR SHALL NOT DISCONNECT ANY EXISTING MECHANICAL OR ELECTRICAL SYSTEMS AND SHALL NOT CUT ANY EXISTING STRUCTURAL MEMBERS WITHOUT WRITTEN APPROVAL FROM THE OWNER OR HIS REPRESENTATIVE.

20. NORMAL OPERATIONS WILL BE CONDUCTED BY THE OWNER'S PERSONNEL. IN WORK AREAS INVOLVING CONTRACT WORK DURING THE EXECUTION OF THIS CONTRACT, CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITY WITH THE OWNER OR HIS REPRESENTATIVE TO MINIMIZE OPERATIONAL DISRUPTIONS.

21. CONTRACTOR SHALL WORK WITH PROJECT ENGINEER TO ENSURE ALL I/O POINTS ARE CONFIRMED TO WORK PROPERLY DURING I/O CHECKOUT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE ALL DEVICES OPERATE AS INTENDED DURING I/O CHECKOUT.

22. CONTRACTOR SHALL VERIFY THAT CONDUIT FILL MAXIMUMS ARE NOT EXCEEDED WHEN EXISTING CONDUIT SYSTEMS ARE RE-UTILIZED FOR NEW WORK. EXISTING CONDUITS MUST BE IN GOOD CONDITION IN ORDER TO BE RE-UTILIZED.

23. THE CONTRACTOR IS RESPONSIBLE FOR ASSURING PROPER OPERATION OF ALL DOWNSTREAM, PASS-THRU SERVICE UPON START-UP.

24. CONTRACTOR SHALL COORDINATE WITH PROJECT ENGINEER BEFORE HE HAS OR SHUT-DOWN FOR LOCK-OUT OF POWER AND CONTROL CIRCUITS.

25. CONTRACTOR SHALL INSTALL WIRING, CONDUIT AND DEVICES IN CONJUNCTION WITH PROTECT DRAWINGS AND MANUFACTURERS RECOMMENDATIONS.

26. ALL WIRING TERMINATIONS AT CONTROL PANELS, INSTRUMENTS AND FIELD DEVICES SHALL BE BY CONTRACTOR IN ACCORDANCE WITH MANUFACTURERS' DOCUMENTS AND PROJECT DRAWINGS.

27. ALL CONDUIT BODIES, FITTINGS, AND BOXES USED IN WET LOCATIONS ARE REQUIRED TO BE THREADED AND OF THE RAINWIGHT TYPE. CONDUITS EXPOSED TO WEATHER ARE REQUIRED TO HAVE RAINWIGHT FITTINGS AND DRAINHOLES. THERE IS TO BE NO CONDUITS ENTERING THE TOP OF EQUIPMENT, REGARDLESS OF LOCATION.

28. ALL BOUL HOLES REQUIRED IN NEW OR EXISTING STRUCTURAL STEEL SHALL BE DRILLED.

29. CONTRACTOR SHALL PROVIDE ALL CABLE LUGS AS REQUIRED FOR CABLE CONNECTIONS TO SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, MOTOR CONTROL CENTERS, MOTOR STARTER PANELS, TRANSFORMERS AND DISCONNECT SWITCHES.
- INSTRUMENTATION SYMBOLS
- |  |                                    |     |                           |     |                                    |
|--|------------------------------------|-----|---------------------------|-----|------------------------------------|
|  | EMERGENCY STOP PUSHBUTTON          | LT  | LEVEL TRANSMITTER         | FSH | FLOW SWITCH (H-HIGH, L-LOW)        |
|  | LOCAL FIELD MOUNTED INSTRUMENT     | PT  | PRESSURE TRANSMITTER      | FSH | PRESSURE SWITCH (H-HIGH, L-LOW)    |
|  | LEVEL INDICATING CONTROLLER        | TT  | TEMPERATURE TRANSMITTER   | LSH | LEVEL SWITCH (H-HIGH, L-LOW)       |
|  | SOLENOID VALVE                     | WT  | WEIGHT TRANSMITTER        | ZSS | ZERO SPEED SWITCH                  |
|  | PNEUMATIC OR HYDRAULIC OPER. VALVE | VT  | VIBRATION TRANSMITTER     | ZS  | POSITION LIMIT SWITCH              |
|  | DIFFERENTIAL PRESSURE TRANSMITTER  | ZSO | VALVE OPEN LIMIT SWITCH   | TSH | TEMPERATURE SWITCH (H-HIGH, L-LOW) |
|  | FLOW TRANSMITTER                   | ZSC | VALVE CLOSED LIMIT SWITCH | TE  | TEMPERATURE ELEMENT                |
- ELECTRICAL LEGEND
- | ⑦         | SEE NOTE OF SAME NUMBER                                   |
|-----------|---|
| —         | NEW WORK  |
| —         | EXISTING TO REMAIN  |
| —         | EXISTING TO BE REMOVED (AS NOTED)                         |
| MOT-TE-A2 | MOTOR CONTROL CENTER BRANCH CIRCUIT BREAKER DESIGNATION   |
|           | CIRCUIT BREAKER   |
|           | FUSE  |
|           | JUNCTION BOX  |
|           | MOTOR, HORSEPOWER AS INDICATED                            |
|           | MOTOR CONNECTOR AND OVERLOAD PROTECTION                   |
|           | DISCONNECT SWITCH, FUSED, NEMA 12 ENCLOSURE (OR AS NOTED) |
|           | EXISTING CONTROL PANEL                                    |
|           | NEW CONTROL PANEL   |
|           | INSTRUMENT OR FIELD DEVICE                                |
- IDENTIFICATION LETTERS
- | FIRST-LETTER                     |                         | SUCCEEDING-LETTERS          |                          |                       |
|----------------------------------|-------------------------|-----------------------------|--------------------------|-----------------------|
| MEASURED OR INITIATING VARIABLE  | FUNCTION                | READOUT OR PASSIVE FUNCTION | OUTPUT / ACTIVE FUNCTION | MODIFIER              |
| A ANALYSIS                       |                         | ALARM                       |                          | USER'S CHOICE         |
| B BURNER, COMBUSTION             |                         | USER'S CHOICE               | USER'S CHOICE            | USER'S CHOICE         |
| C CONDUCTIVITY                   |                         |                             | CONTROLLER               | CLOSE                 |
| D DENSITY                        | DIFFERENTIAL            |                             |                          | DEVIATION             |
| E VOLTAGE                        |                         | SENSOR (PRIMARY ELEMENT)    |                          |                       |
| F FLOW, FLOW RATE                |                         | RATIO (FRACTION)            |                          |                       |
| G USER'S RATE                    |                         | GLASS, VIEWING DEVICE       |                          | HIGH                  |
| H HAND                           |                         |                             |                          |                       |
| I CURRENT (ELECTRICAL)           | SCAN                    |                             |                          | INDICATE              |
| J POWER                          |                         |                             |                          |                       |
| K TIME, TIME SCHEDULE            | TIME RATE OF CHANGE     |                             |                          |                       |
| L LEVEL                          |                         | LIGHT                       |                          | LOW                   |
| M USER'S CHOICE                  | MOMENTARY               |                             |                          | MIDDLE, INTERMEDIATE  |
| N USER'S CHOICE                  |                         | USER'S CHOICE               | USER'S CHOICE            | USER'S CHOICE         |
| O USER'S CHOICE                  | OFFICE, RESTRICTION     |                             |                          | OPEN                  |
| P PRESSURE, VACUUM               | POINT (TEST) CONNECTION |                             |                          |                       |
| Q QUANTITY                       | INTEGRATE, TOTALIZE (4) |                             |                          | RUN                   |
| R RADIATION                      |                         | RECORD                      |                          |                       |
| S SPEED, FREQUENCY               |                         |                             | SWITCH                   |                       |
| T TEMPERATURE                    |                         |                             | TRANSMIT                 |                       |
| U MULTIFUNCTION                  |                         | MULTIFUNCTION               | MULTIFUNCTION            | MULTIFUNCTION         |
| V VIBRATION, MECHANICAL ANALYSIS |                         |                             | VALVE, DAMPER, LOUVER    |                       |
| W WEIGHT, FORCE                  |                         | WELL                        |                          |                       |
| X EVENT, STATE OR PRESENCE       | X AXIS                  | UNCLASSIFIED                | RELAY, CONVERT           | UNCLASSIFIED          |
| Y POSITION, DIMENSION            | Y AXIS                  |                             | DRAWER, ACTUATOR         |                       |
| Z                                | Z AXIS                  |                             |                          | FINAL CONTROL ELEMENT |
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- GENERAL NOTES
1. INSTRUMENTS TO BE INSTALLED INTO PROCESS LINES OR ON PROCESS VESSELS WILL BE INSTALLED BY CONTRACTOR. CONTRACTOR SHALL BE RESPONSIBLE FOR ELECTRICAL FIELD DEVICE MOUNTING, AS DEFINED ON THESE CONTRACT DRAWINGS.

2. SUGGESTED CONDUIT ROUTINGS ARE SHOWN ON THE CONDUIT AND CABLE BLOCK DIAGRAM IF PART OF THE DRAWING PACKAGE. CONTRACTOR SHOULD SURVEY AREA FOR MOST DESIRABLE ROUTINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR MOST EFFICIENT ROUTINE INSTALLATION.

3. ALL CONDUIT AND FITTINGS SHALL BE GALVANIZED RIGID STEEL. MINIMUM CONDUIT SIZE FOR ALL CONDUITS SHALL BE 3/4".

4. ROUTE CONDUITS IN GROUPS WHERE POSSIBLE IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO THE STRUCTURE.

5. CONTRACTOR TO ADHERE TO THE FOLLOWING CODE REGARDING AC WIRING: BLACK - POWER HOT; RED - SIGNAL HOT & SIGNAL INPUT; WHITE - NEUTRAL; GREEN - GROUND, FOR EXTERNAL SOURCE VOLTAGE WIRING, YELLOW CONDUCTORS SHALL BE USED.

6. CONTRACTOR TO ADHERE TO THE FOLLOWING CODE REGARDING DC WIRING: BLUE - POSITIVE; DC HOT; WHITE WITH BLUE TRACER - NEGATIVE; DC COMMON.

7. FINAL CONDUIT CONNECTIONS AT INSTRUMENTS AND FIELD DEVICES TO BE LIQUID-TIGHT FLEXIBLE CONDUIT WITH MINIMUM AND MAXIMUM LENGTHS OF 18" AND 36" RESPECTIVELY.

8. ALL WIRES SHALL BE DELIVERED DIRECTLY BETWEEN TERMINATING ENTRIES. INTERMEDIATE SPLICING OF WIRES IS NOT PERMITTED.

9. ALL INSTRUMENTS TO WHICH SHIELDED CABLE SHALL BE ROUTED SHALL HAVE THE SHIELD GROUNDED AT THE SOURCE CONTROL PANEL. THE SHIELD SHALL NOT BE CONNECTED AT THE INSTRUMENT, BUT SHALL BE ELECTRICALLY TIED BACK AT THE INSTRUMENT TO ENSURE NO CONNECTION WITH INSTRUMENT WIRES OR INSTRUMENT ENCASMENT.

10. ALL CONDUITS SHALL ENTER FIELD CONTROL PANELS AND JUNCTION BOXES FROM THE BOTTOM OR SIDE WHEREVER POSSIBLE. ALL CONDUITS AND CONNECTIONS MUST BE IDENTIFIED BY THE PROJECT MANAGER.

11. PULL BOXES AND JUNCTION BOXES FURNISHED BY CONTRACTOR SHALL BE NEMA 12 UNLESS OTHERWISE NOTED.

12. FOR ALL WIRING TERMINATIONS, NO MORE THAN TWO WIRES SHALL BE CONNECTED TO ONE TERMINAL. FOR ALL WIRING, A PERMANENT WIRE MARKER ENGRAVED WITH A MACHINE, PRINTED WIRE NUMBER SHALL BE PERMANENTLY APPLIED TO EACH WIRE AT BOTH ENDS. EACH TERMINAL BLOCK SHALL BE CLEARLY IDENTIFIED.

13. EACH INSTRUMENT AND FIELD DEVICE SHALL BE PERMANENTLY LABELED BY CONTRACTOR USING 1/4" x 2 1/2" PERENNIAL TAGS, BLACK LETTERING ON WHITE BACKGROUND.

14. QUANTITIES OF WIRES/CABLES SHOWN ON CONDUIT BLOCK DIAGRAMS REPRESENT A MINIMUM. SPARE CABLES SHALL BE ROUTED WHEREVER POSSIBLE. ALL SPARES SHALL BE CLEARLY MARKED. AT A MINIMUM, 4 SPARE WIRES/CABLES SHALL BE ROUTED TO FURTHEST TEE IN CONDUIT RUN.

15. WIRING WITHIN PANELS SHALL BE INSTALLED IN A NEAT AND ORGANIZED MANNER, UTILIZING THE WIRES WHERE APPROPRIATE.

16. ALL CABLE LENGTHS FROM FIELD TO PANELS SHALL BE LONG ENOUGH TO PERMIT WIRING TO REACH ANY TERMINAL BLOCK WITHIN PANEL. ASSOCIATED FIELD CABLES SHALL BE ROUTED ALONG BOTTOM OF PANEL INTERIOR AND UP TO THE FIELD DOCK OR TERMINAL BLOCKS FROM BOTTOM OF PANEL.

17. ALL COMPONENTS MOUNTED BY CONTRACTOR IN EXISTING PANELS AND NEW PANELS SHALL BE PERMANENTLY LABELED.

18. WIRE AND CABLE STRANDED TYPE THIN INSULATION, 600 VOLT, COPPER CONDUCTORS COLOR CODED, MINIMUM SIZE #14 AWG FOR INDIVIDUAL CONDUCTORS, 300 VOLT, #18 AWG FOR SHIELDED PAGES. MULTI-CONDUCTOR CABLES SHALL BE UL LISTED FOR CABLE TYP USE. ALL WIRING LEAVING POWER OR CONTROL CABINETS SHALL BE UL LISTED FOR CABLE TYP USE.

19. FINAL CONNECTIONS: FLEXIBLE LIQUID-TIGHT GALVANIZED STEEL CONDUIT SHALL BE USED FOR ALL CONNECTIONS TO MOTORS AND FIELD DEVICES (MINIMUM 3 FT. SAME SIZE AS BRANCH CIRCUIT CONDUIT).

20. FIELD BRUSHES IN CONDUIT SHALL HAVE ROUNDS NO LESS THAN THAT OF MANUFACTURED ELBOW OF SAME SIZE OR THE ALLOWABLE BENDING RADIUS OF THE INSTALLED CONDUCTOR. HEATING SHALL NOT BE UTILIZED TO MAKE BENDS.

21. ALL CONDUIT BODIES, FITTINGS, AND BOXES USED IN WET LOCATIONS ARE REQUIRED TO BE THREADED AND OF THE RAINWIGHT TYPE. CONDUITS EXPOSED TO WEATHER ARE REQUIRED TO HAVE RAIN TIGHT FITTINGS AND DRAINHOLES.

22. SEALING FITTINGS AND APPROVED SEALING COMPOUND SHALL BE INSTALLED IN ALL UNDERGROUND CONDUITS AND FOR ALL WIRING IN CLASSIFIED AREAS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

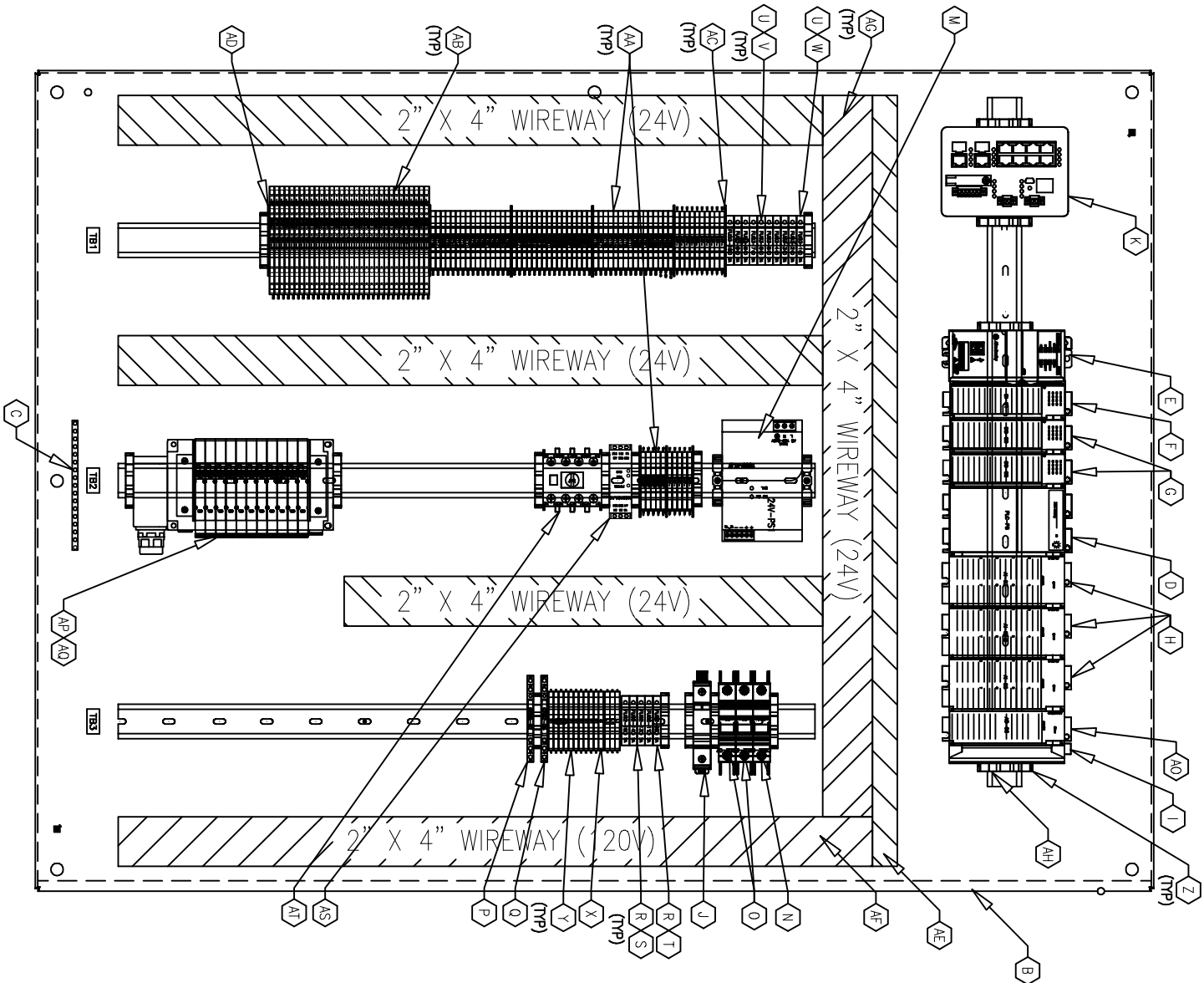
23. CONDUIT FITTINGS AND JUNCTION BOXES SHALL BE SUITABLE FOR THE AREA CLASSIFICATION IN WHICH THEY ARE TO BE INSTALLED. ELECTRICAL INSTALLATIONS SHALL CONFORM TO AREA CLASSIFICATIONS DESIGNATED. ALL AREAS ARE ASSIGNED TO BE CLASSIFIED AS NON-HAZARDOUS.
- |  |  |  |  |                  |  |  |  |                   |  |
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| BY: _____  |  |  |  | BY: _____        |  |  |  | DWG #             |  |
| BY: _____  |  |  |  | BY: _____        |  |  |  | REV               |  |
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## BILL OF MATERIAL - PLC PANEL

ITEM	QTY	CATALOG	MFG	DESCRIPTION
A	1	W5483616SS	HOFFMAN	WALL-MOUNT ENCLOSURE
B	1	A48P36	HOFFMAN	BACK FLANGE
C	1	PK15GTA	SQUARED	GROUND BAR 15 POSITIONS
D	1	1769-P44	AB	1769 COMPACT LOGIX POWER SUPPLY
E	1	1769-133ER	AB	COMPACT LOGIX PROCESSOR
F	1	1769-1016	AB	COMPACT LOGIX SERIES DC INPUT MODULE
G	2	1769-0816	AB	COMPACT LOGIX SERIES DC OUTPUT MODULE
H	3	1769-1F8	AB	COMPACT LOGIX SERIES ANALOG INPUT MODULE
I	1	1769-ECR	AB	RIGHT END CAP
J	1	4983-DC120-05	AB	FILTER AND SURGE PROTECTIVE DEVICE 120V 5AMP
K	1	1783-BMS10CGN	AB	ETHERNET 8 PORT MANAGED SWITCH
L	1	P-R0-F2R0	GRACEPORT	RECEPTACLE & ETHERNET PORT
M	1	1606-KLE490E	AB	POWER SUPPLY 24VDC400W
N	1	1489-M1C150	AB	CIRCUIT BREAKER, BULLETIN 1489 SERIES, 15A
O	2	1489-M10080	AB	CIRCUIT BREAKER, BULLETIN 1489 SERIES, 6A
P	2	700-HLT1Z4	AB	HL TYPE TERMINAL BLOCK RELAY
Q	1	700-HLT1U1	AB	HL TYPE TERMINAL BLOCK RELAY
R	5	1492-WPB4250	AB	SCREW CONNECTION TERMINAL BLOCK
S	4	GMA5A	BUSSMANN	FUSE - CLASS GMA
T	1	GMA5A	BUSSMANN	FUSE - CLASS GMA
U	10	1492-WFB424	AB	SCREW CONNECTION TERMINAL BLOCK
V	9	GMA2A	BUSSMANN	FUSE - CLASS GMA
W	1	GMA4A	BUSSMANN	FUSE - CLASS GMA
X	1	1492-J3-G	AB	SCREW CONNECTION TERMINAL BLOCK
Y	13	1492-J3	AB	SCREW CONNECTION TERMINAL BLOCK
Z	AS REQ.	1492-FAJ35	AB	END ANCHOR
AA	68	1492-J03	AB	SCREW CONNECTION TWO TIER TERMINAL BLOCK
AB	32	1492-WTF3	AB	SCREW CONNECTION THREE TIER TERMINAL BLOCK
AC	8	1492-EBUD3	AB	END BARRIER, TWO TIER
AD	1	1492-EBTF3	AB	END BARRIER, THREE TIER
AE	AS REQ.	PANEL SHOP	-	WIREWAY, 1" x 4" WHITE
AF	AS REQ.	PANEL SHOP	-	WIREWAY, 2" x 4" WHITE
AG	AS REQ.	PANEL SHOP	-	WIREWAY, 2" x 4" LIGHT GRAY
AH	AS REQ.	PANEL SHOP	-	DIN RAIL
AI	1	PANEL SHOP	-	NAME PLATE,(SEE DETAIL "A")
AJ	1	PANEL SHOP	-	NAME PLATE,(SEE DETAIL "B")
AK	1	800HC-FRXT64S	AB	E-STOP, PUSH BUTTON
AL	1	800H-W690	AB	E-STOP, 30 MM 800H YELLOW RING
AM	1	800HC-AR2D1	AB	E-STOP, RESET BUTTON
AN	1	2711P-T10C22ABP	AB	HML 10" PANELVIEW (SEE DETAIL "C")
AO	1	1769-0F8C	C	COMPACT LOGIX SERIES ANALOG OUTPUT MODULE
AP	1	SS5V3-10L12-10U-N7A	SMC	BASE, SOLENOID VALVE
AQ	10	ST3A00-SUFT	SMC	VALVE, SOLENOID
AR	1	CNFKSS	HOFFMAN	FOOT KIT
AS	1	440R-N23119	AB	SAFETY RELAY
AT	1	100S-C12E404C	AB	SAFETY CONTRACTOR

## DRAWING NOTES

1. REFER TO SHEET 101 FOR GENERAL NOTES AND LEGENDS.
2. THE PLC PANEL DISPLAYED ON THIS DRAWING AND ALL OF ITS CONTENTS SHALL BE FURNISHED BY THE PANEL BUILDER UNLESS OTHERWISE NOTED.
3. PANEL BUILDER SHALL INSTALL ALL PANEL INTERIOR AND EXTERIOR DEVICES AS SHOWN ON DRAWING. PANEL BUILDER SHALL BE RESPONSIBLE FOR ALL INTERNAL PANEL WIRING AS DETAILED ON DRAWINGS.
4. 480 VAC WIRING, 120 VAC & 240VC WIRING SHALL BE ROUTED IN SEPARATE WIRE DUCTS. IF WIRING MUST CROSS OTHER UTILITIES WIRING, IT SHOULD DO SO AT RIGHT ANGLES. WHITE WIRE DUCT SHALL BE USED FOR 120 VAC WIRING. DARK GRAY DUCT SHALL BE USED FOR 480 VAC WIRING. LIGHT GRAY DUCT SHALL BE USED FOR 24 VDC WIRING.
5. ALL INTERNAL, 120 VAC PANEL WIRING SHALL BE #16 AWG - BLACK FOR POWER HOT, RED FOR SIGNAL, WHITE FOR NEUTRAL, GREEN FOR GROUND, YELLOW WIRING SHALL BE USED FOR ALL INTERNAL PANEL WIRING CARRYING POWER FROM SOURCES EXTERNAL TO PANEL. REFER TO PANEL WIRING SCHEMATICS FOR SPECIFIC WIRING FOR WHICH YELLOW CONDUCTORS ARE REQUIRED. ALL 480 VAC PANEL WIRING SHALL BLACK, APPROPRIATELY SIZED FOR THE LOAD IT SERVES.
6. CONTRACTOR SHALL ADHERE TO THE FOLLOWING CODE REGARDING 240VC WIRING: INDIVIDUAL CONDUCTORS SHALL BE BLUE FOR 240VC, BLUE WITH WHITE TRACER FOR 240VC-1, SHIELDED SIGNAL Pairs SHALL BE RED FOR 240VC-1, BLACK FOR 240VC-2.
7. EACH COMPONENT SHOWN ON BACK PANEL SHALL BE PERMANENTLY LABELED.
8. BACK PANEL COMPONENT LOCATION DIMENSIONS ARE APPROXIMATE. PANEL BUILDER MAY ALTER PLACEMENT OF COMPONENTS PENDING APPROVAL BY PROJECT ENGINEER.
9. EACH TERMINAL BLOCK NUMBER SHALL BE CLEARLY IDENTIFIED.
10. CONTRACTOR SHALL PROVIDE A MINIMUM OF 20% SPARE TERMINAL BLOCKS OF EACH TYPE USED IN PANEL.
11. ALL WIRES SHALL BE DELIVERED DIRECTLY BETWEEN TERMINATING ENTITIES. INTERMEDIATE SPLICING OF WIRES IS NOT PERMITTED.
12. WIRING WITHIN PANEL SHALL BE INSTALLED IN A NEAT AND ORGANIZED MANNER, UTILIZING IT-EMAPS WHERE APPROPRIATE.
13. NO MORE THAN TWO WIRES SHALL BE CONNECTED TO ONE TERMINAL. A PERMANENT WIRE MARKER ENGRAVED WITH A MACHINE PRINTED WIRE NUMBER SHALL BE PERMANENTLY AFFIXED TO EACH WIRE AT BOTH ENDS.
14. ALL INTERNAL AND FIELD CABLES SHALL BE PERMANENTLY AND CLEARLY LABELED WITH LOOP AND CHANNEL DESIGNATIONS AT BOTH ENDS.
15. ALL CABLE LENGTHS FROM FIELD SHALL BE LONG ENOUGH TO REACH ANY TERMINAL BLOCK WITHIN THE PANEL.

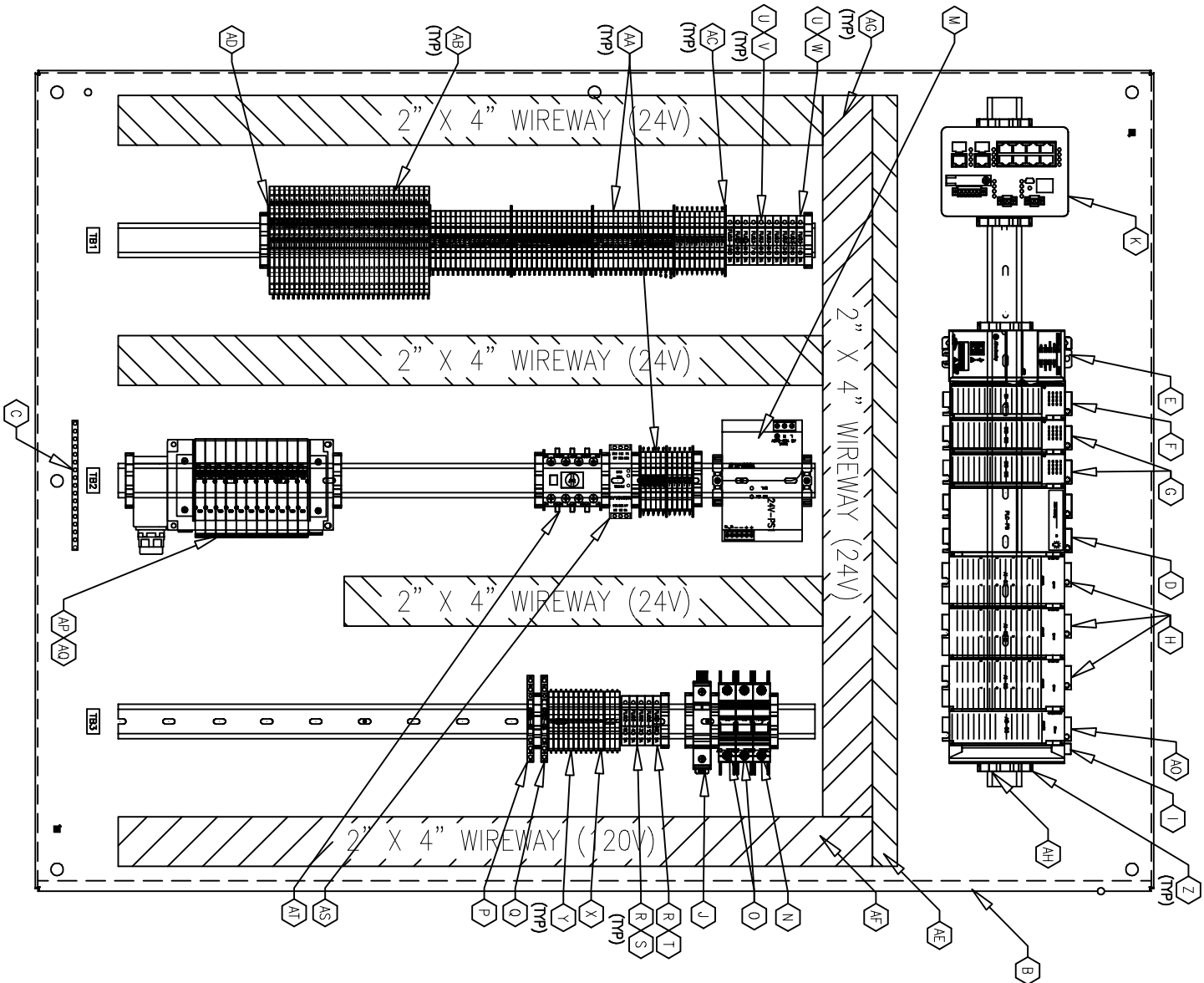


## BILL OF MATERIAL - PLC PANEL

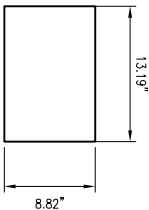
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B	1	A48P36	HOFFMAN	BACK FLANGE
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I	1	1769-ECR	AB	RIGHT END CAP
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AP	1	SS5V3-10L12-10U-N7A	SMC	BASE, SOLENOID VALVE
AQ	10	ST3A00-SUFT	SMC	VALVE, SOLENOID
AR	1	CNFKSS	HOFFMAN	FOOT KIT
AS	1	440R-N23119	AB	SAFETY RELAY
AT	1	100S-C1ZE404C	AB	SAFETY CONTACTOR

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### **DETAIL "C" - HMI CUT OUT**

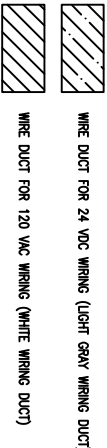


**MATERIAL:**  
4" H x 12" W LAMINATED PHENOLIC NAMEPLATE.  
1" HIGH BLACK LETTERING ON WHITE BACKGROUND.  
ALL EDGES TO BE BEVELED.

**NOT TO SCALE**

## CONVENTIONS

**MATERIAL:**  
1" x 2.5" LAMINATED PHENOLIC NAMEPLATE.  
1/2" HIGH BLACK LETTERING ON WHITE BACKGROUND.  
ALL EDGES TO BE BEVELED.



### DETAIL "B" - E-STOP RESET

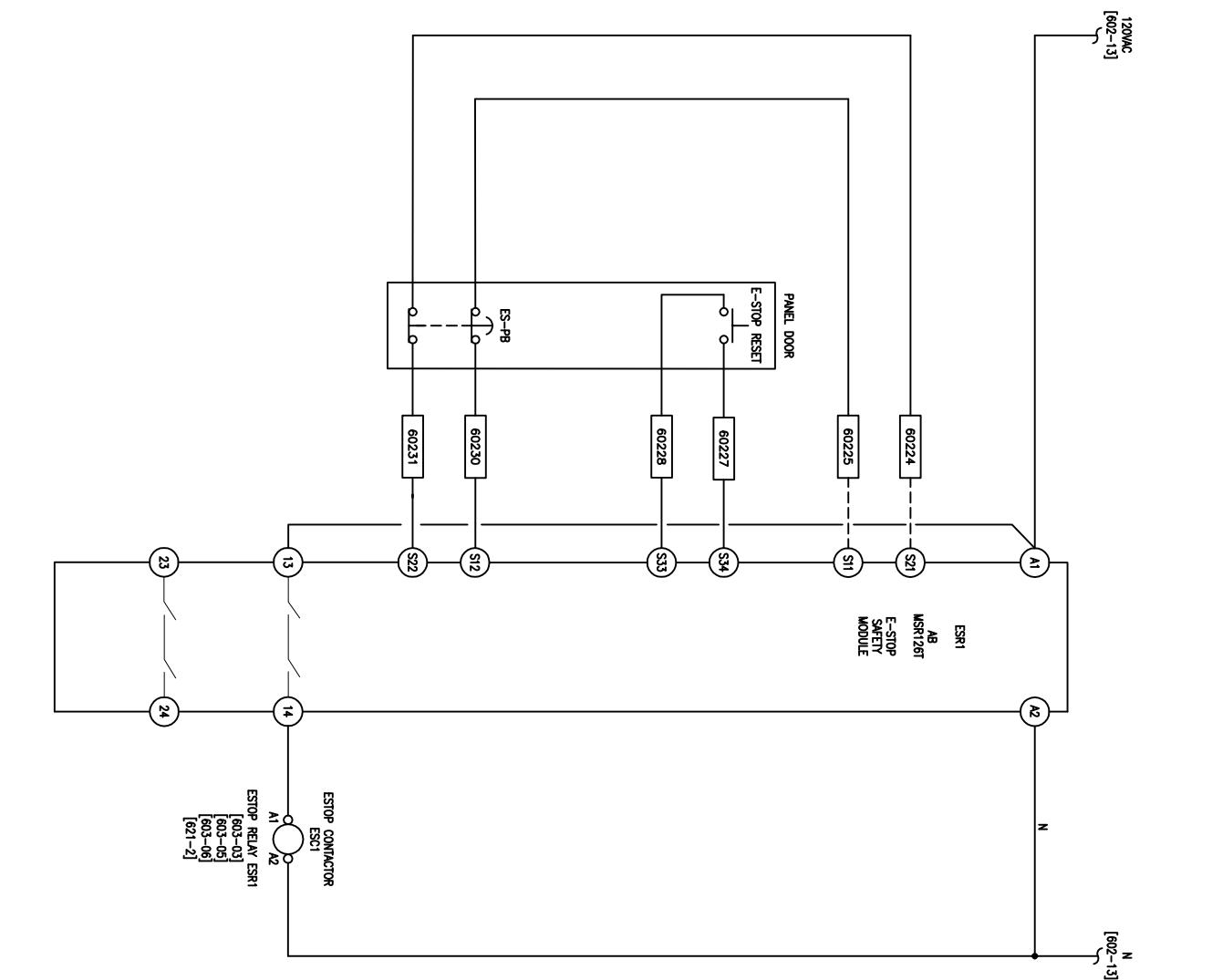
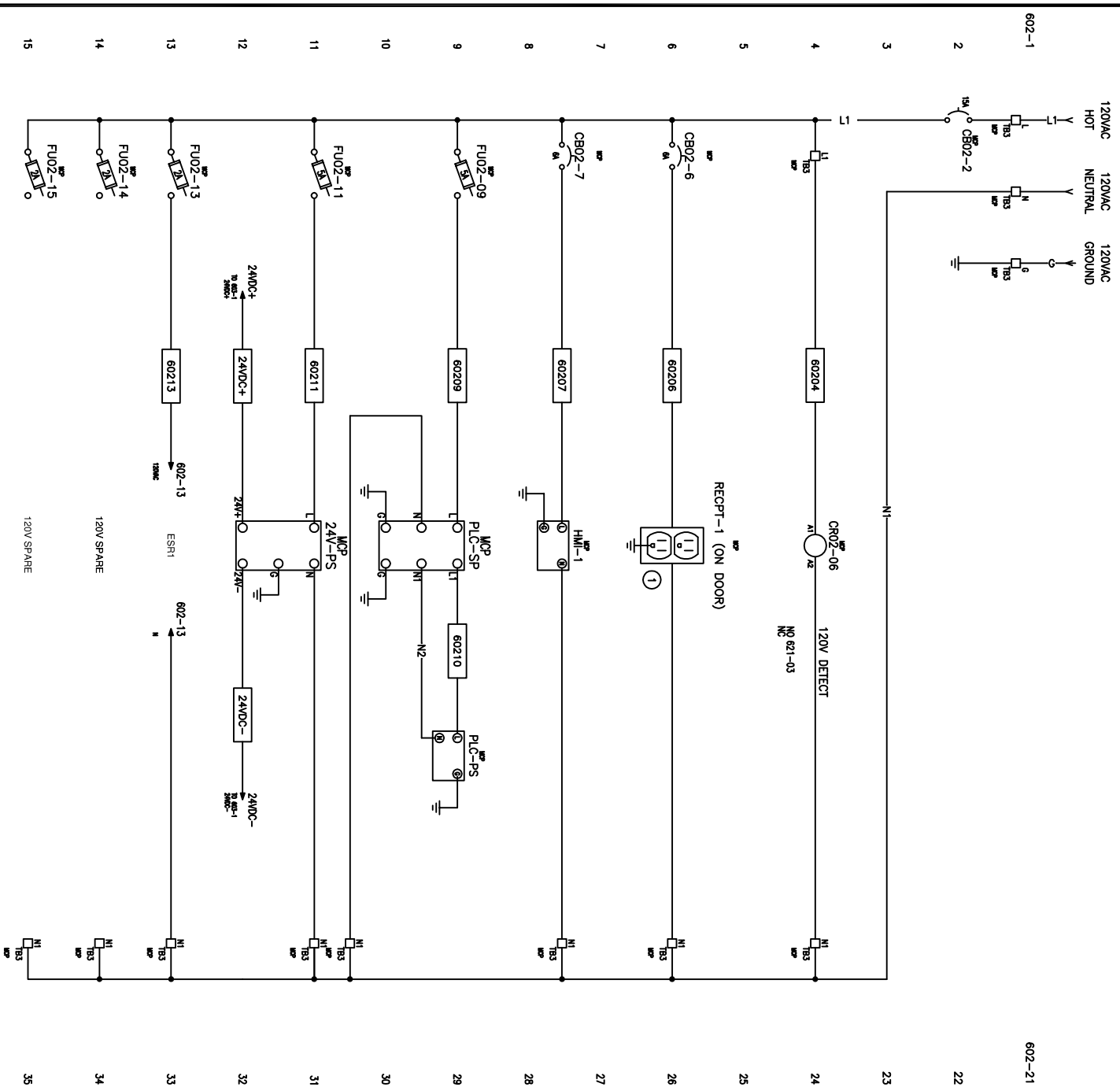
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ITEM NUMBER	DRAWING NOTE
A	1

## **MCP FRONT PANEL LAYOUT**

## **MCP FRONT PANEL LAYOUT**

<p><b>Confidential &amp; Incomplete</b></p> <p>This document is the property of Caloris Engineering, LLC. It contains confidential information, which Caloris Engineering, LLC considers to be a confidential matter. All information contained herein shall not be disclosed to third parties without the written consent of Caloris Engineering, LLC. Upon request by Caloris Engineering, LLC, this document and all attachments shall be returned to said Engineering, LLC.</p>			
		FOR:	
	BY: _____	SCALE	NTS
	BY: _____	DRAWN	BMS
		CHECK	
		APPR	06-06-20
		CAL	
		MEAT FUNCTIONAL FOODS WINNED MB	
		MAIN CONTROL PANEL LAYOUT & BOM	
		DWG #	REV
		E877-601	B
		 <p><b>CALORIS</b> Engineering</p> <p>Thermal Process Systems   16000 NW 10th Street   Portland, OR 97209 (503) 822-5500</p>	
<p><b>A</b> RELEASED FOR CONSTRUCTION</p> <p>BY: BMS 05-11-20</p>		<p><b>B</b> WINNING</p> <p>05-14-20</p>	



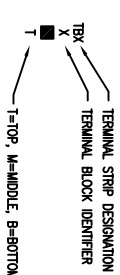
## GENERAL NOTES

1. REFER TO SHEET 101 FOR ASSOCIATED PROJECT NOTES AND SYMBOLS.

## **DRAWING NOTES**

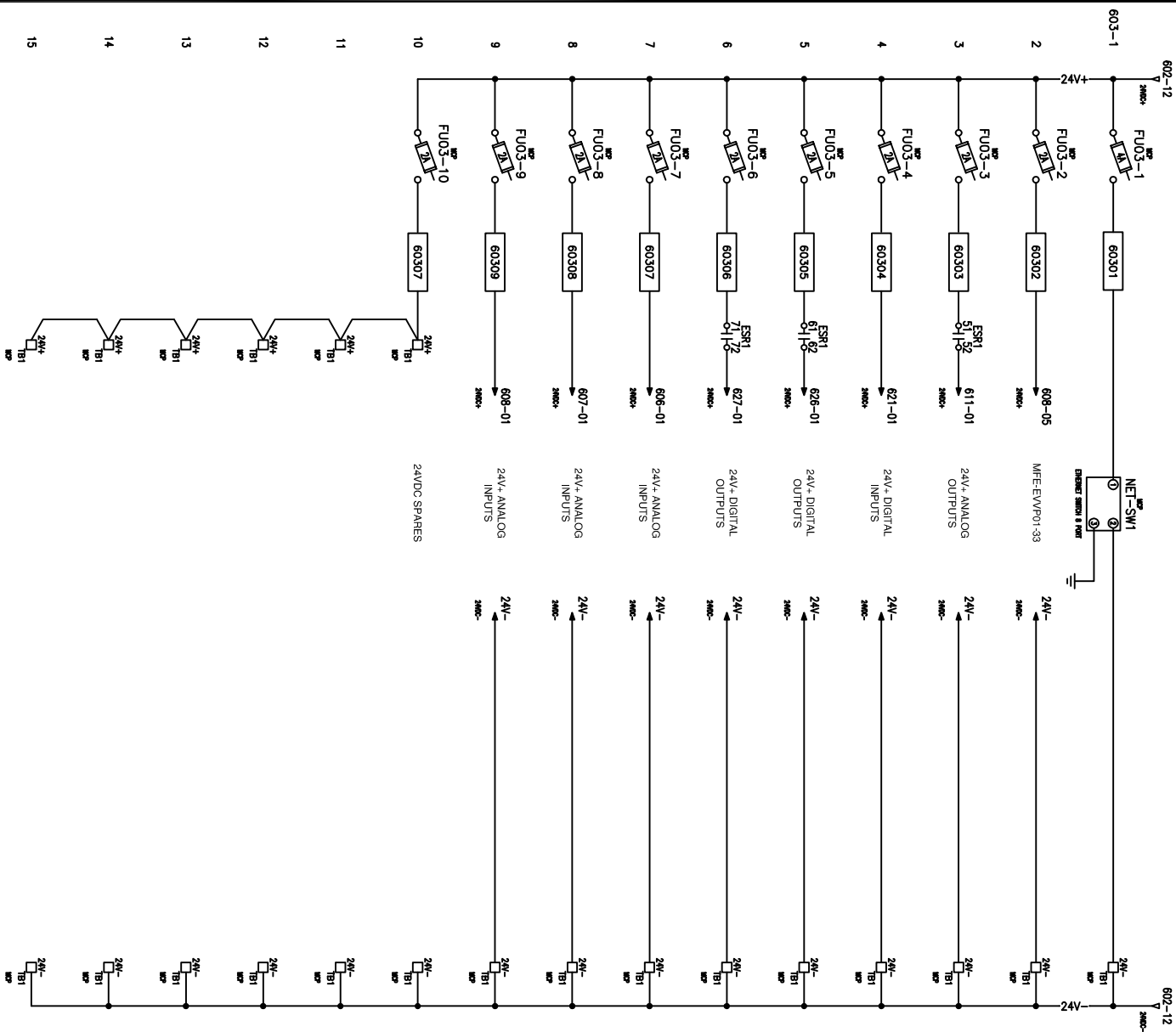
① RECEPTACLE TO BE LABELED "FOR COMPUTER USE ONLY".

## **CONVENTIONS**



- | ①         | DRAWING NOTE REFERENCE |
|-----------|------------------------|
| [XXXX-XX] | LINE NUMBER REFERENCE  |
| _____     | INTERNAL PANEL WIRING  |
| _____     | EXTERNAL FIELD WIRING  |
| -----     | FIELD WIRING NUMBER    |
| M101.1    |                        |

[illegible]

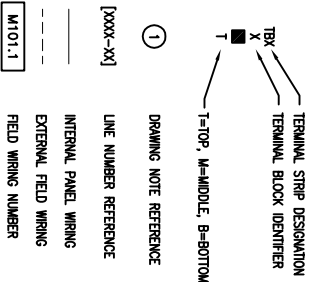


- ### GENERAL NOTES
- REFER TO SHEET 101 FOR ASSOCIATED PROJECT NOTES AND SYMBOLS.
  - REFER TO SHEET 601 FOR GENERAL PANEL INSTALLATION NOTES.

### DRAWING NOTES

①

### CONVENTIONS



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				BY:	DRAWN	05-05-20	BMS	
				BY:	CHECK	05-05-20	FUNCTIONAL FOODS	
				APPV	05-05-20	CAL	WINNIEG, MB	
B WIRING				BY:	BMS	05-14-20	MAIN CONTROL PANEL SCHEMATICS PAGE 2 OF 2	
A CONSTRUCTION				BY:	BMS	05-11-20		
 www.caloris.com (510) 872-8000				DWG #				
				E877-603				
				REV	B			



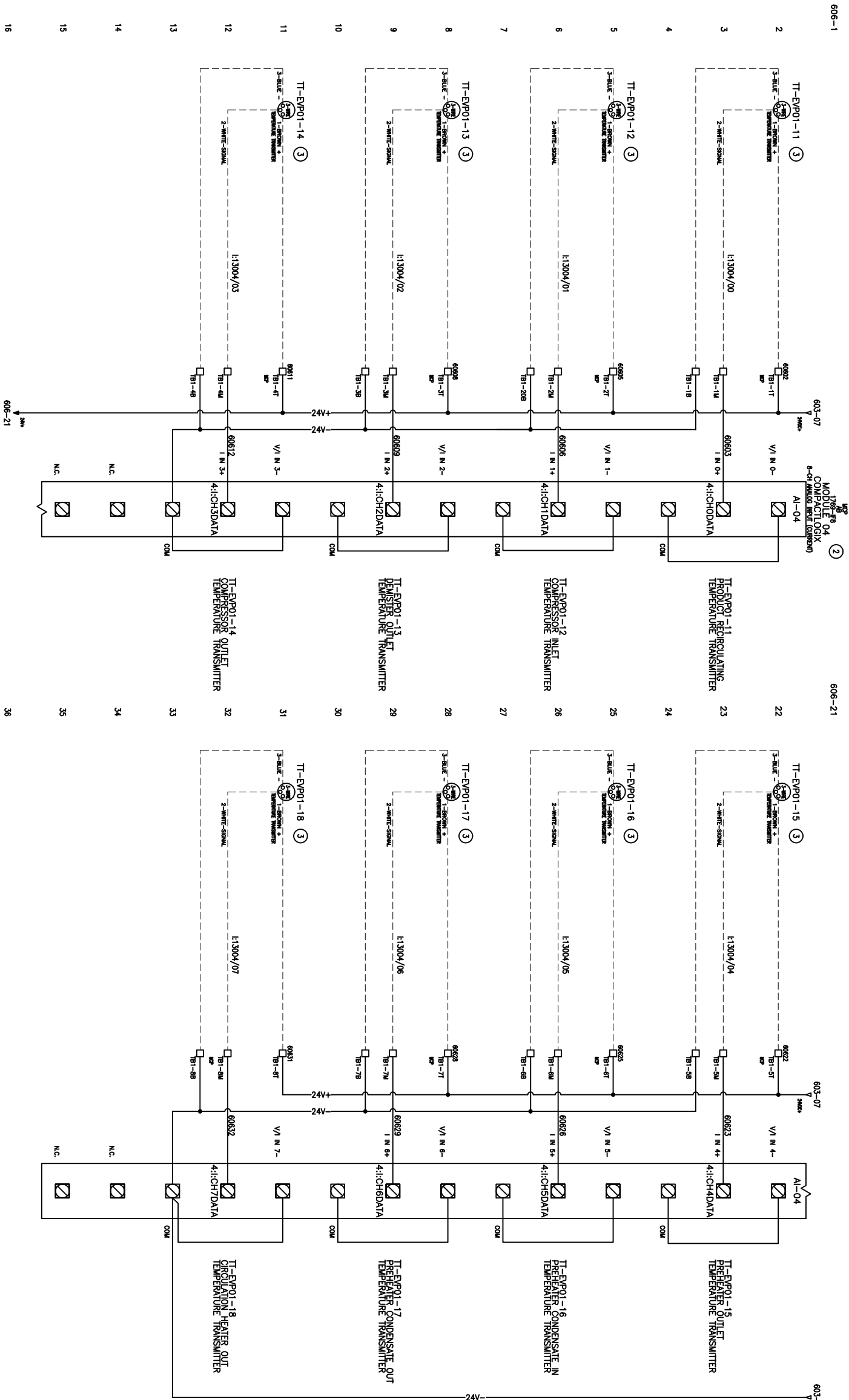
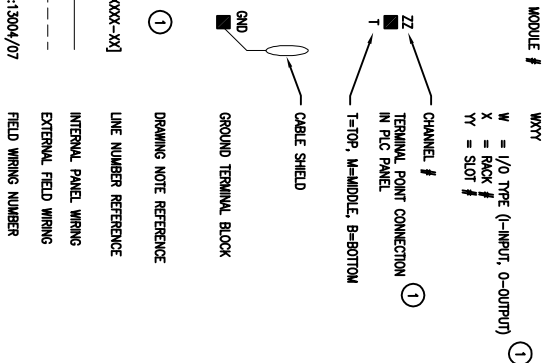
GENERAL NOTES

- REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
- REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL INSULATION DETAILS.

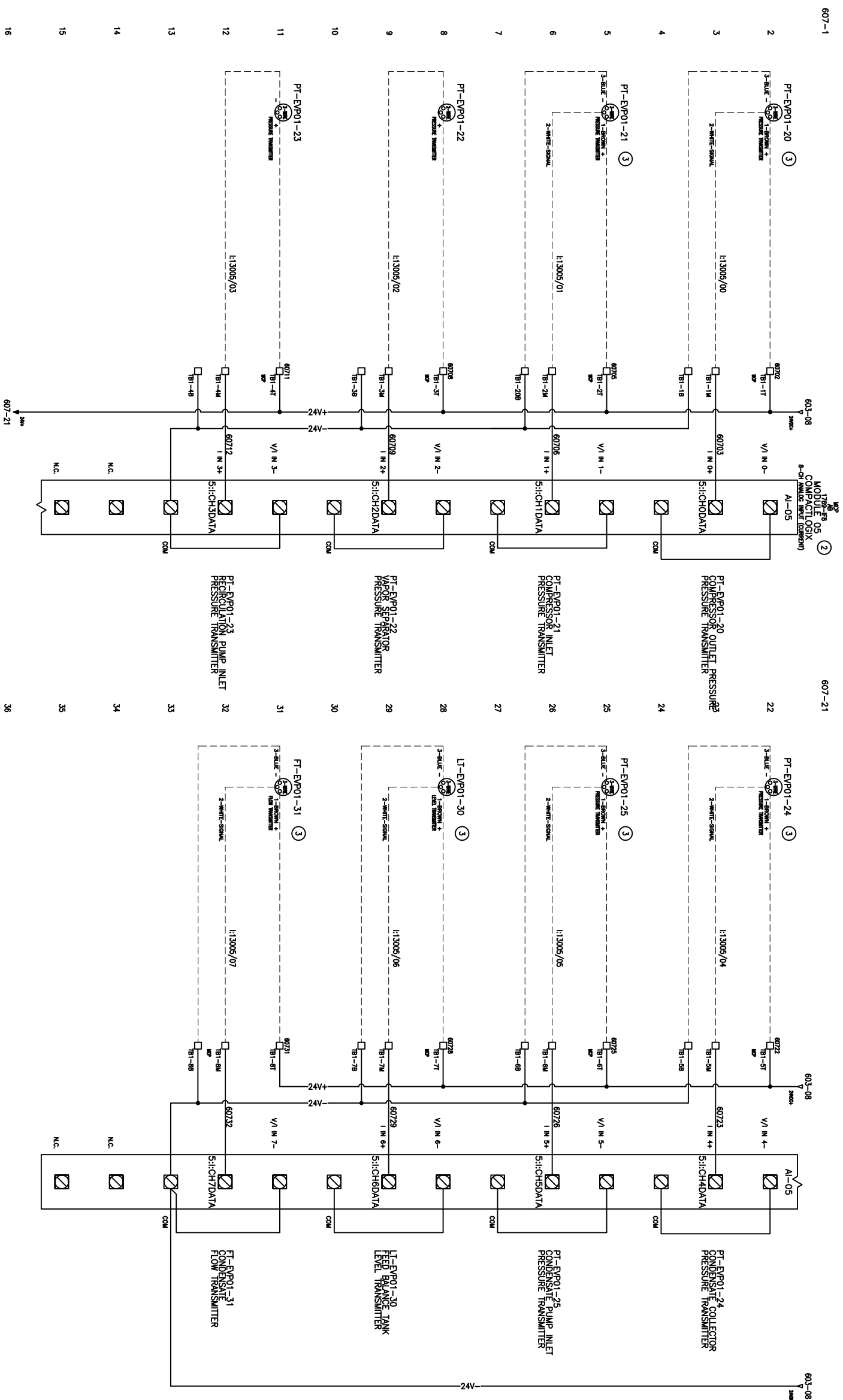
DRAWING NOTES

- ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER. ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.
- MODULE CONFIGURED FOR SINGLE ENDED CURRENT WIRING.
- ALL FIELD WIRING SHOWN ON DRAWING BETWEEN ANALOG I/O MODULE AND FIELD MOUNTED COMPONENTS SHALL BE V4 FOUR WIRE M12 CABLES EXCEPT WHERE NOTED.

CONVENTIONS



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				BY:	DRAWN	05-06-20	BMS
				BY:	CHECK	05-06-20	WINNIEG,MB
				BY:	APPV	05-06-20	WINNIEG,MB
B WIRING				BY:	BMS	05-14-20	
A CONSTRUCTION				BY:	BMS	05-11-20	
				CALORIS			
				Therm 8 Process 1 60770-002			
				www.caloris.com (c) 2022 600			
				DWG # E877-606			
				REV B			



## **GENERAL NOTES**

1. REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
2. REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL INSTALLATION DETAILS.

## DRAWING NOTES

- ① ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER.
  - ② ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.
  - ③ MODULE CONFIGURED FOR SINGLE ENDED CURRENT WIRING.
- ALL FIELD WIRING SHOWN ON DRAWING BETWEEN ANALOG I/O MODULE AND FIELD MOUNTED COMPONENTS SHALL BE VIA FOUR WIRE M12 CABLES EXCEPT WHERE NOTED.

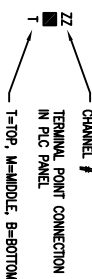
## CONVENTIONS

## MODULE 4

WXTN

**W = I/O TYPE (I-INPUT, O-OUTPUT)**

$$\gamma = \text{MAC}$$

$$\gamma = \text{SLOT}$$
$$\gamma = \text{SLOT} \#$$
$$\gamma = \text{SLOT} \#$$


CABLE SHIELD

 GROUND TERMINAL BLOCK

① DRAWING NOTE REFERENCE

LINE NUMBER REFERENCE

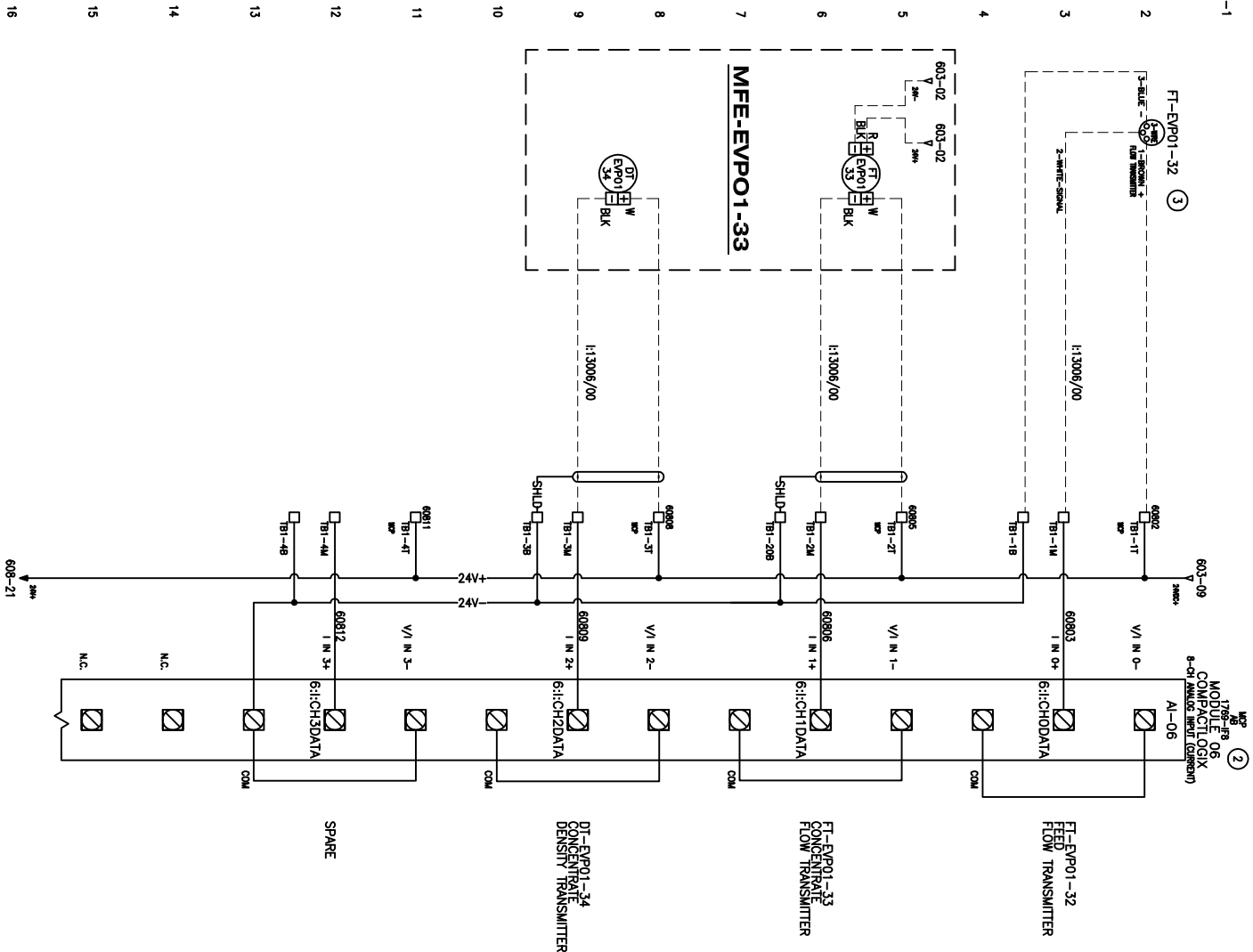
## INTERNAL PANEL WIRING

3005/07 FIELD WIRING NUMBER

3005/05

[illegible]

608-1 608-21



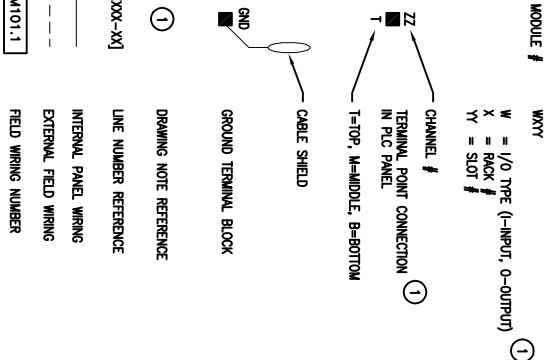
## GENERAL NOTES

- REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
- REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL.

## DRAWING NOTES

- ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER. ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.
- MODULE CONFIGURED FOR SINGLE ENDED CURRENT WIRING.
- ALL FIELD WIRING SHOWN ON DRAWING BETWEEN ANALOG I/O MODULE AND FIELD MOUNTED COMPONENTS SHALL BE VIA FOUR WIRE M12 CABLES EXCEPT WHERE NOTED.

## CONVENTIONS



20 40

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				BY:	DRAWN	05-05-20	BUS
				BY:	CHECK	05-05-20	FUNCTIONAL FOODS
				BY:	APPR	05-05-20	WINNIEG.MB
B WIRING				05-1-4-20			
A CONSTRUCTION				05-11-20			
BY: BMS				05-11-20			
BY: BMS				05-11-20			
Caloris Engineering, LLC				www.caloris.com (410) 872-8000			
Therm 8 Process 1 60710-002				DWG #			
E877-608				REV			
B				B			

MAIN CONTROL PANEL  
ANALOG INPUTS  
PAGE 3 OF 3





GENERAL NOTES

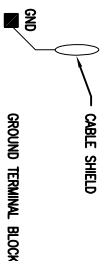
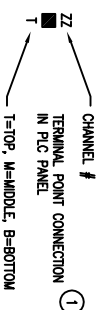
- 1. REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
- 2. REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL INSTALLATION DETAILS.

DRAWING NOTES

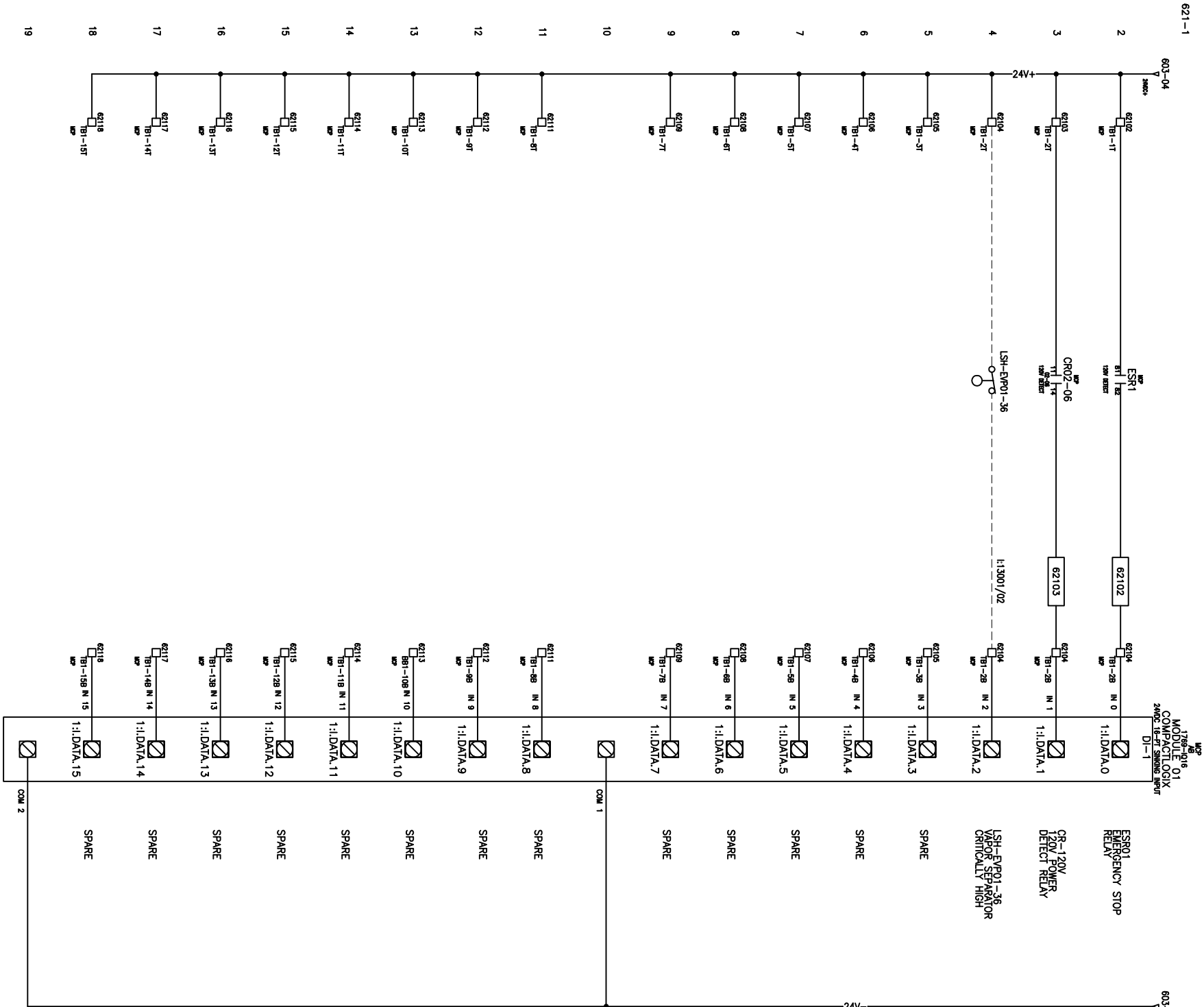
- ① ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER. ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.
- ② MODULE CONFIGURED FOR 24VDC SNK WIRING.

CONVENTIONS

MODULE #      WXYZ  
W = I/O TYPE (I=INPUT, O=OUTPUT)  
X = RACK #  
YY = SLOT #



- ① DRAWING NOTE REFERENCE
- [XXXX-XX] LINE NUMBER REFERENCE
- INTERNAL PANEL WIRING
- EXTERNAL FIELD WIRING
- I:13001/02 FIELD WIRING NUMBER



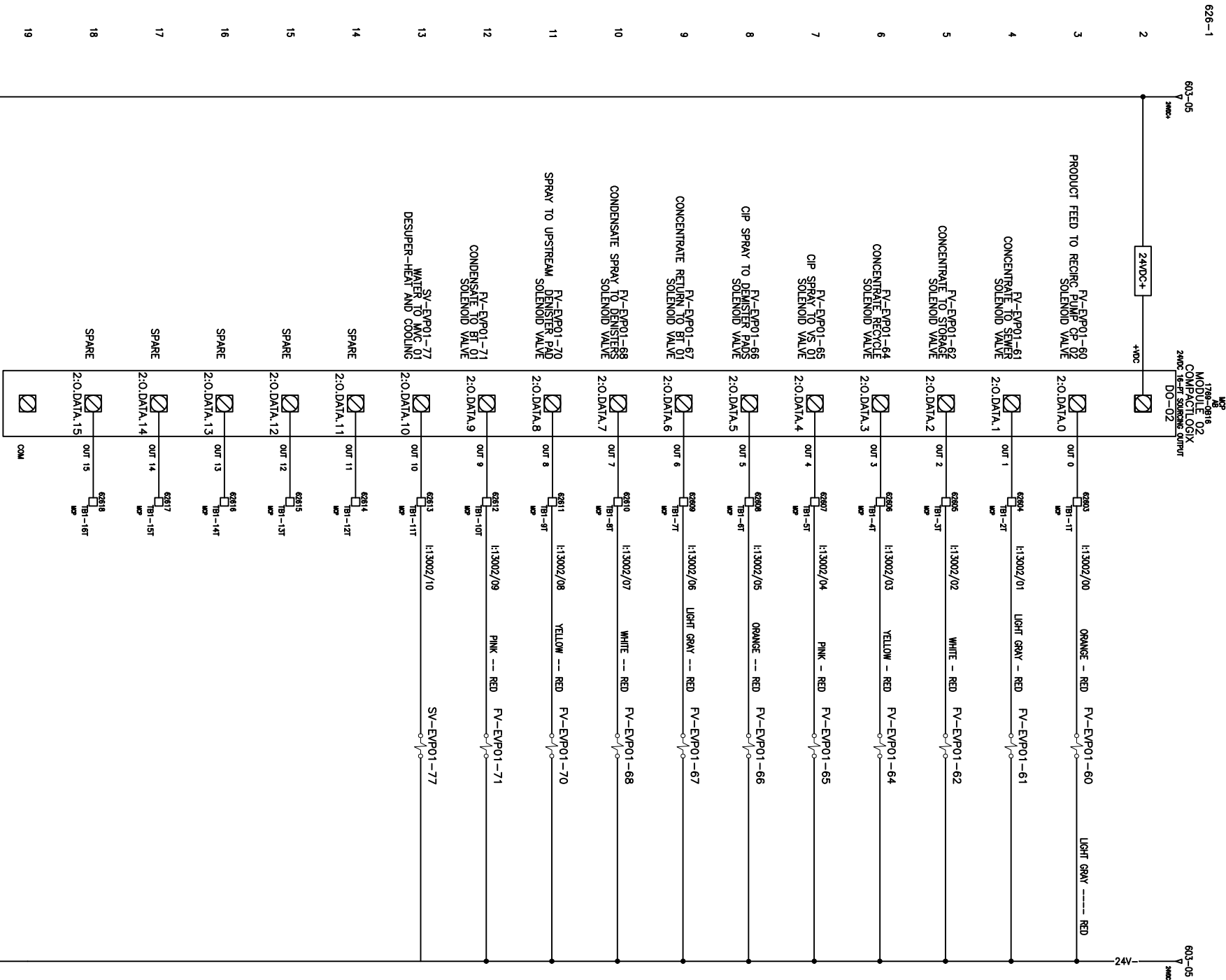
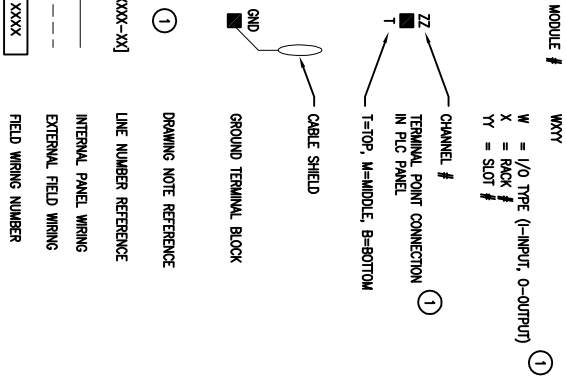
GENERAL NOTES

- 1. REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
- 2. REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL INSULATION DETAILS.

DRAWING NOTES

- ① ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER.
- ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.

CONVENTIONS



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B	RELEASED FOR	WIRING	BY: BMS	05-14-20	CAL	CAL	WINNIEG, MB
MAIN CONTROL PANEL				DIGITAL OUTPUTS			
PAGE 1 OF 2				E877-626			
REV				B			

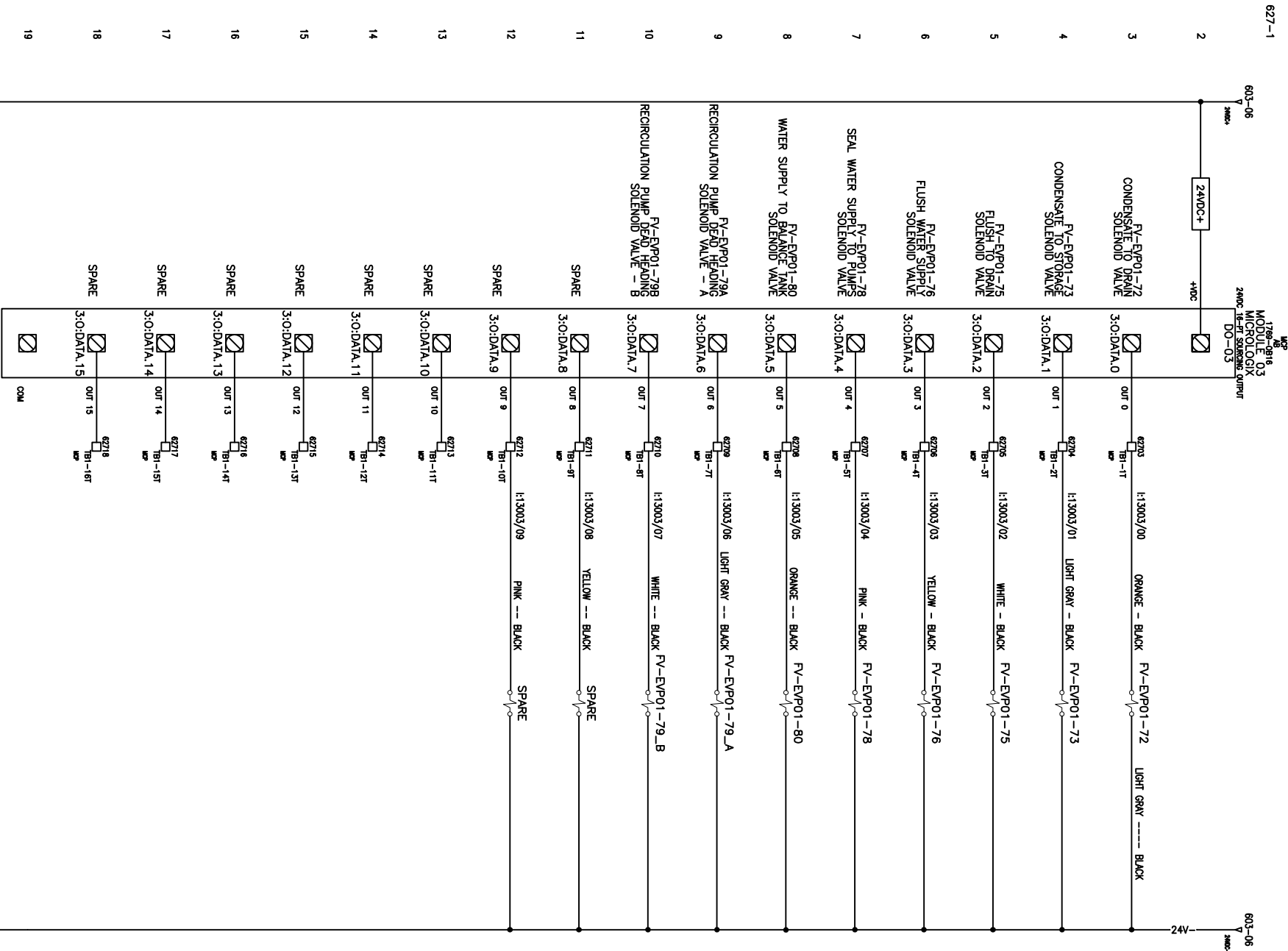
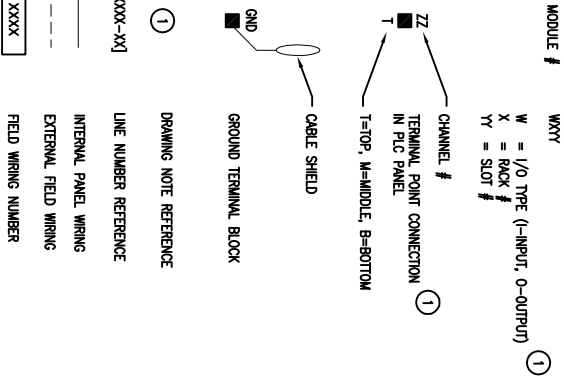
GENERAL NOTES

- REFER TO SHEET 101 FOR ASSOCIATED PROJECT AND GENERAL NOTES.
- REFER TO PANEL GENERAL ARRANGEMENT FOR GENERAL DRAWING PANEL INSULATION DETAILS.

DRAWING NOTES

- ① ALL TERMINAL STRIPS TO BE LABELED WITH ASSOCIATED MODULE NUMBER.  
ALL TERMINAL BLOCKS SHALL BE LABELED WITH ASSOCIATED CHANNEL NUMBER.

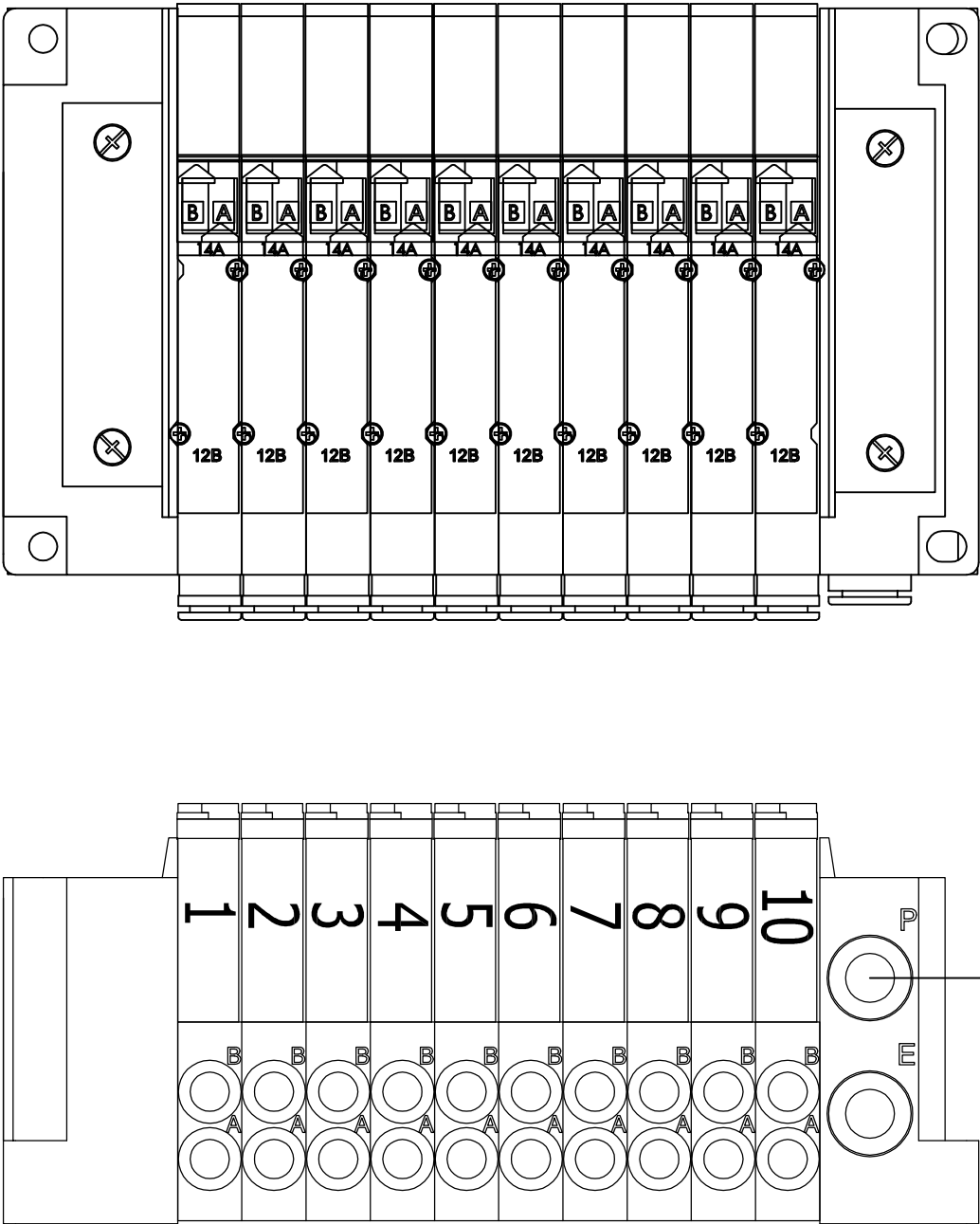
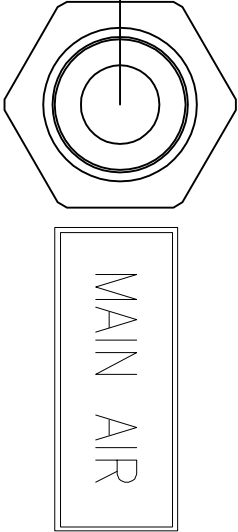
CONVENTIONS



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		BY: _____	DRAWN 05-05-20 BMS
		CHECK _____	APPD 05-05-20 CAL
	RELEASED FOR	BY: BMS	FOR MERT FUNCTIONAL FOODS WINNIPEG, MB
	RELEASED FOR	BY: BMS	
	CONSTRUCTION	BY: BMS	MAIN CONTROL PANEL DIGITAL OUTPUTS PAGE 2 OF 2
		05-11-20	
Caloris Thermal Process Technology www.caloris.com (438) 823-6600			DWG # E877-627
			REV B

GENERAL NOTES

1. REFER TO SHEET 101 FOR GENERAL NOTES AND LEGENDS.



1A	FV-EVP01-60	1B	FV-EVP01-72
2A	FV-EVP01-61	2B	FV-EVP01-73
3A	FV-EVP01-62	3B	FV-EVP01-75
4A	FV-EVP01-64	4B	FV-EVP01-76
5A	FV-EVP01-65	5B	FV-EVP01-78
6A	FV-EVP01-66	6B	FV-EVP01-80
7A	FV-EVP01-67	7B	FV-EVP01-79A
8A	FV-EVP01-68	8B	FV-EVP01-79B
9A	FV-EVP01-70	9B	SPARE
10A	FV-EVP01-71	10B	SPARE

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		BY:	SCALE	NTS			
		BY:	DRAWN	05-05-20	BMS		
		CHECK	APPD	05-05-20	CAL		
		BY:					
		RELEASED FOR					
		CONSTRUCTION					
		BY: BMS					
		05-11-20					
CALORIS Thermal Process Technology www.caloris.com (416) 822-6900				MAIN CONTROL PANEL PNEUMATICS DETAIL			
				DWG # E877-631			
				REV A			

GENERAL NOTES

1. REFER TO SHEET 101 FOR ASSOCIATED PROJECT NOTES AND SYMBOLS.

DRAWING NOTES

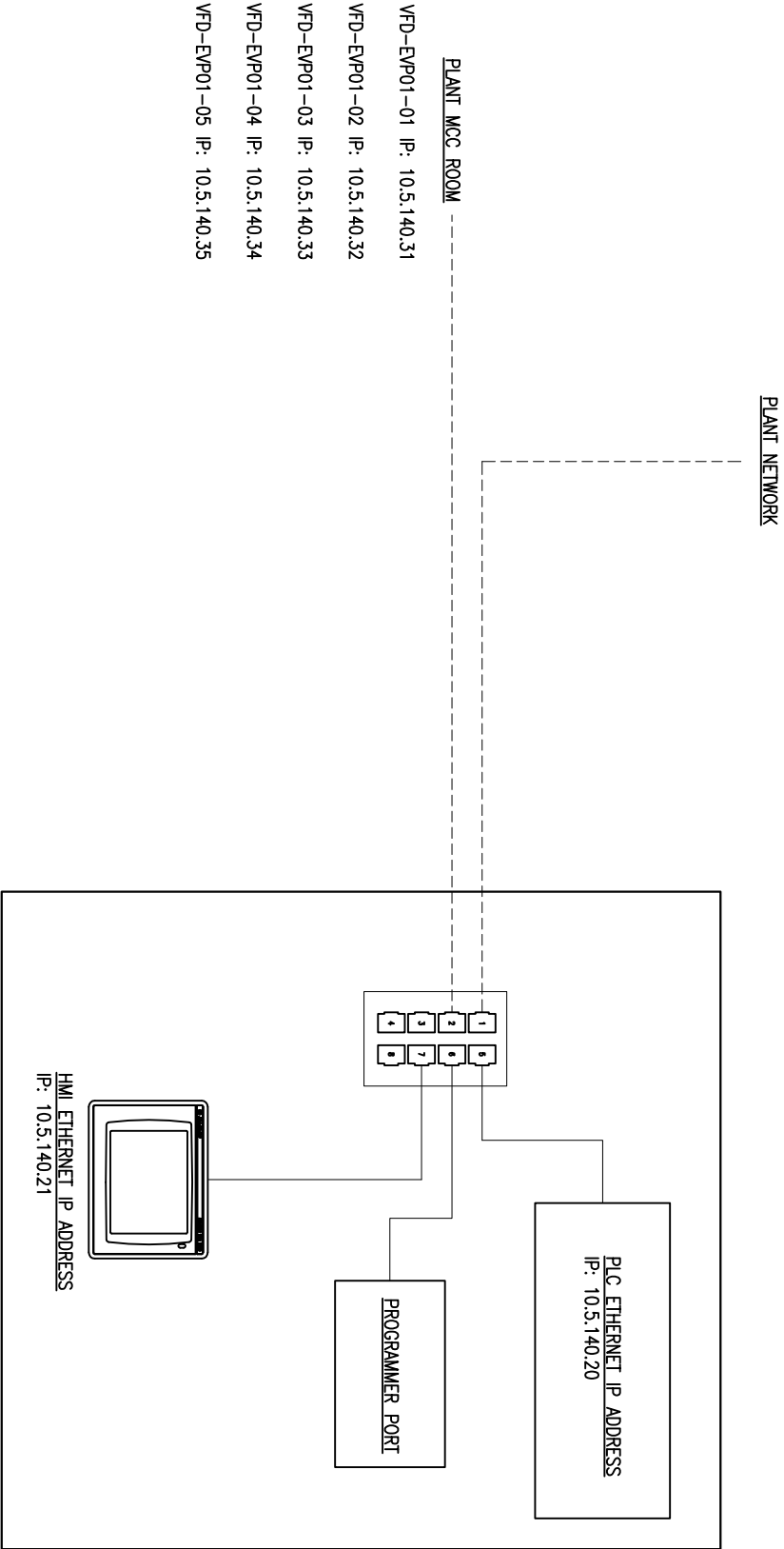
CONVENTIONS

- ①

DRAWING NOTE REFERENCE
- [xxxx-xx]

LINE NUMBER REFERENCE
- INTERNAL PANEL WIRING
- EXTERNAL FIELD WIRING
- M101.1

FIELD WIRING NUMBER



ETHERNET NETWORK DIAGRAM

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			BY: _____	DRAWN	05-06-20	MERT	
			BY: _____	CHECK		FUNCTIONAL FOODS	
			BY: _____	APP'D	05-06-20	WINNIEG, MB	
	RELEASED FOR		BY: BMS				DWG #
	CONSTRUCTION		05-11-20				E877-801
							REV
							A



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186770-002  
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