High Pressure Systems Division

Technical Service Bulletin

TITLE: Trifecta XPRO Crouzet EM4 PLC Retrofit Kit Installation
Date: 10/26/2026 ***TSB-HPS-1045***

Issue: The existing Mitsubishi AL2 PLC and related control-panel components require replacement with the Crouzet EM4 PLC retrofit kit on the Trifecta systems identified above. The retrofit changes the panel layout and wiring as shown on Chart drawing B-22839657, Revision A.

Solution: Install the supplied Crouzet EM4 PLC retrofit kit in accordance with this bulletin and Chart drawing B-22839657, Revision A. The engineering drawing remains the controlling reference for component locations and wire terminations. Chart drawing B-22839658 Revision A is the final panel drawing after the retrofit has been completed.

Description: This bulletin provides a field-friendly sequence for removing the existing PLC and related components, installing the new components, reconnecting wiring, and documenting final verification. This bulletin does not replace site safety procedures or the approved electrical drawing.

WARNING: *Installation must be performed by qualified personnel. De-energize the equipment and follow all applicable lockout/tagout and site safety requirements before opening or modifying the control panel.*

Reference	Revision	Use
Chart drawing B-22839657	A	Panel layout, removal, installation, and wiring
Trifecta XPro Series Product Manual PN 21243803	C	System operation and service information
TRIFECTA_XPRO_EM4_*** _***_REV*.*	1.4	EM4 program verification

Verify the shipped kit against the approved bill of material before starting. The drawing identifies the following installed items; confirm quantities and part numbers before release:

Component	Quantity	Part number
Crouzet EM4 PLC	1	Programmed based on Liquid Service and MAWP
Control relays CR214, CR216, CR218, CR220, CR222	5	Included in Kit 22802573
Fuse holders FU301, FU305, FU309	3	Included in Kit 22802573
Additional terminals and hardware	-	Included in Kit 22802573
Provided wire 202	1	Included in Kit 22802573
Provided wire 203	1	Included in Kit 22802573



- Record the Trifecta model and serial number.
- Photograph the complete control panel before disconnecting wiring.

DRAWING CONTROL: If a wire label, terminal designation, or field condition differs from drawing B-22839657, stop and contact Chart Technical Support before energizing the panel.

NOTE: *Sheets from drawing B-22839657 will be referenced in the following instructions.*

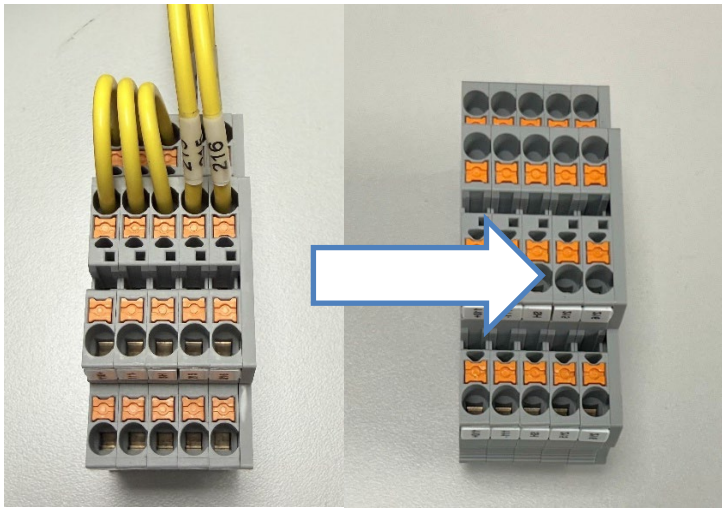
1 Removing components

1.1 Disconnect all wires from the cycle counter, then remove the cycle counter from the panel.

1.2 Disconnect all wires from the Mitsubishi AL2 PLC, then remove the AL2 PLC from the panel.



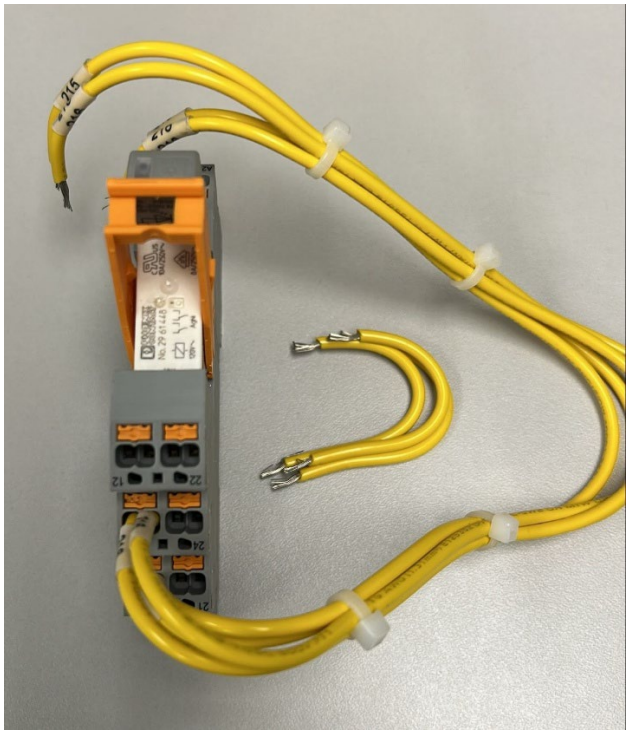
1.3 Disconnect all wires from the signal-wiring terminal block, then remove the terminal block and all yellow wires from the panel. Retain this terminal block for **reinstallation** in **Section 3**.



CAUTION: *Do not discard the removed signal-wiring terminal block or the retained neutral wire. Both are reused during the retrofit.*

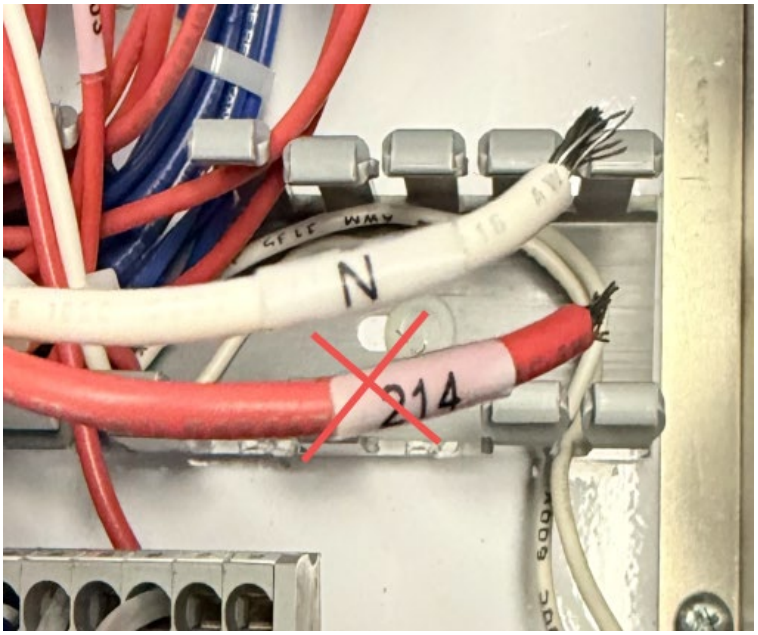
1.4 Disconnect all wires from relay CR221, then remove CR221 from the panel.

1.5 Discard the removed relay module and yellow wires, these are no longer required.



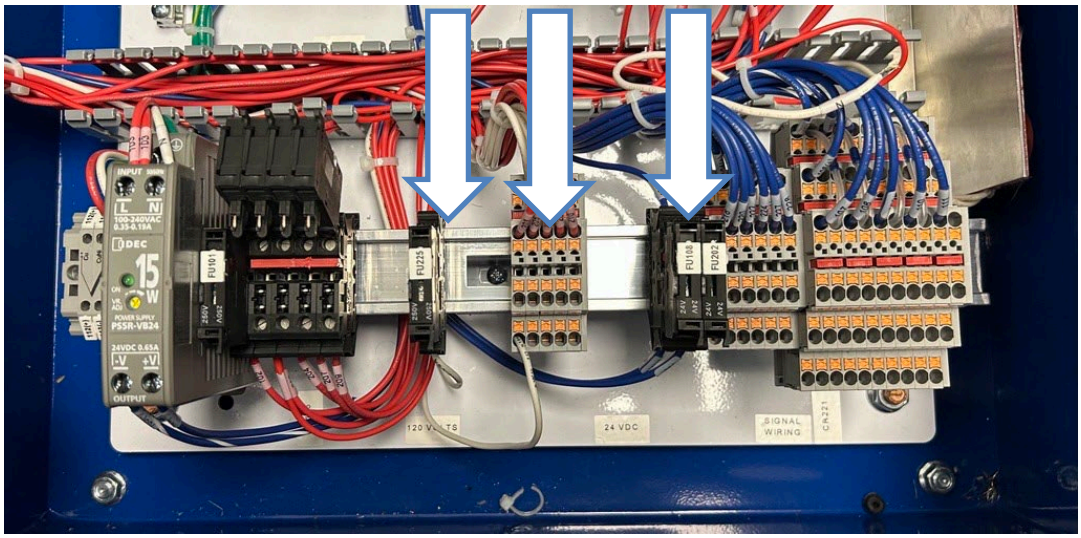
1.6 Remove wire 214 from the panel and discard, this is no longer required.

1.7 Retain the neutral wire identified on Sheet 2 for the connection described on Section/Step 5.2.

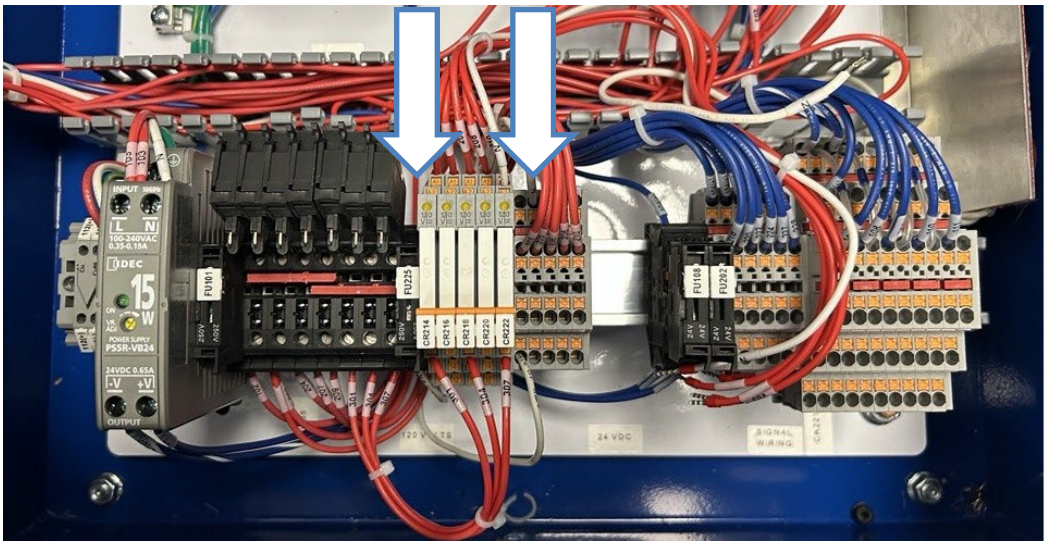


2 Preparing and Installing the Relay and Fuse Module

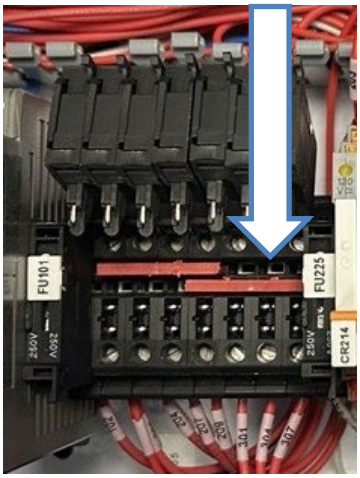
2.1 Shift the existing components to create the three openings shown on Sheet 3 for the additional fuse holders, relays, and terminals.



2.2 Mount the prewired relay block and fuse holder block in the locations shown on Sheet 4.

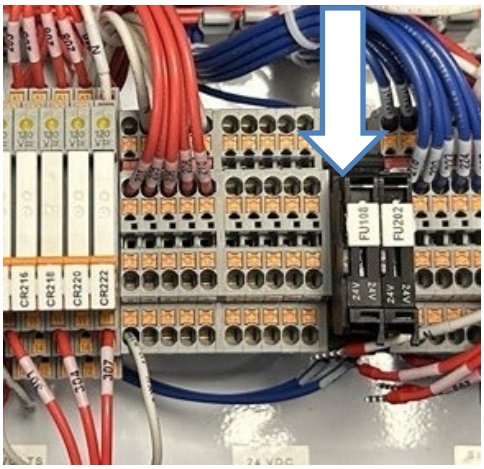


2.3 The red jumper should **overlap** at FU212 as shown below:



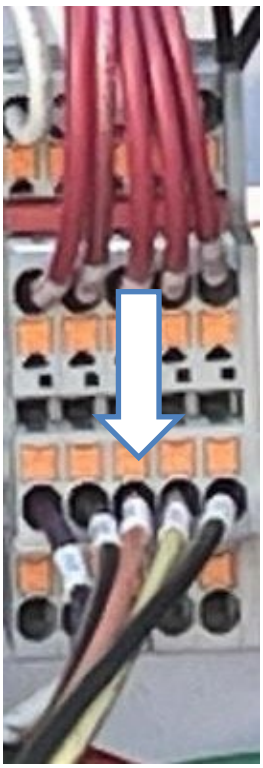
3 Mount Terminal Block From Section 1.3

3.1 **Reinstall** the signal-wiring terminal block **(previously removed)** in the location shown on Sheet 4.

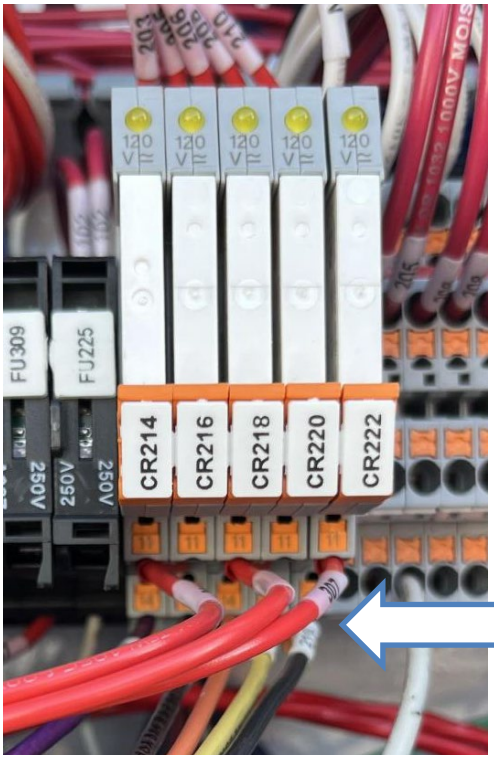


4 Relocating the valve wires

4.1 **Disconnect** the valve wires from the existing terminal block as shown on Sheet 5.



4.2 **Reconnect** the valve wires to the relay outputs shown on Sheet 5.

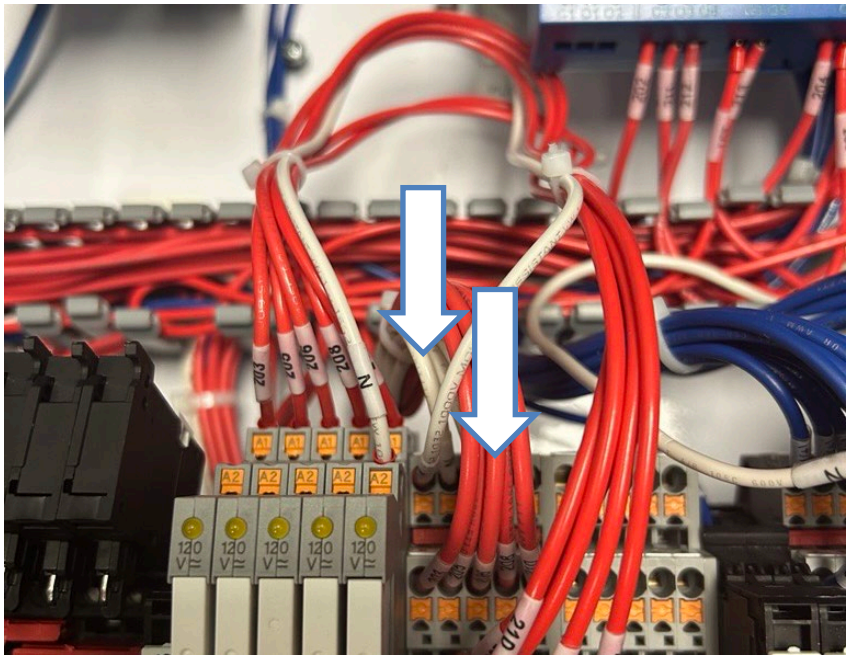


From Left to Right:

1. CR214 = Purple
2. CR216 = Brown
3. CR218 = Orange
4. CR220 = Yellow
5. CR222 = Black

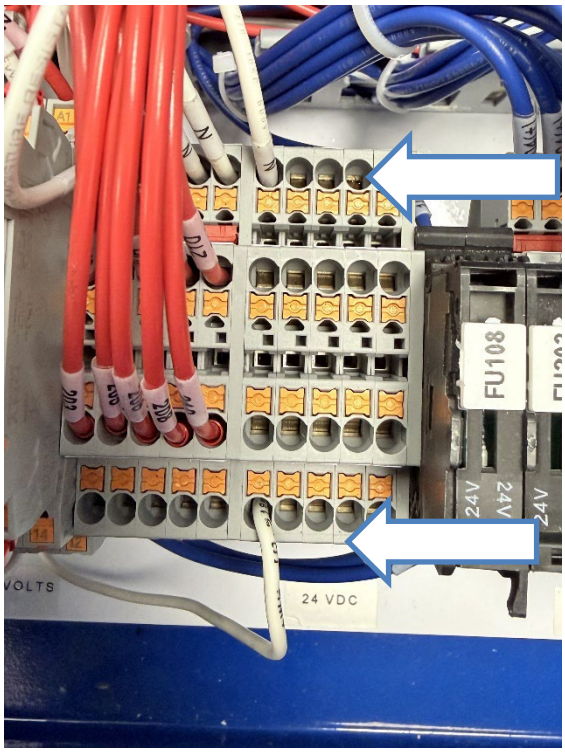
5 Wiring the Neutrals

5.1 Connect the **neutral** from the **relay block** to the **neutral terminal block** as shown on Sheet 6.



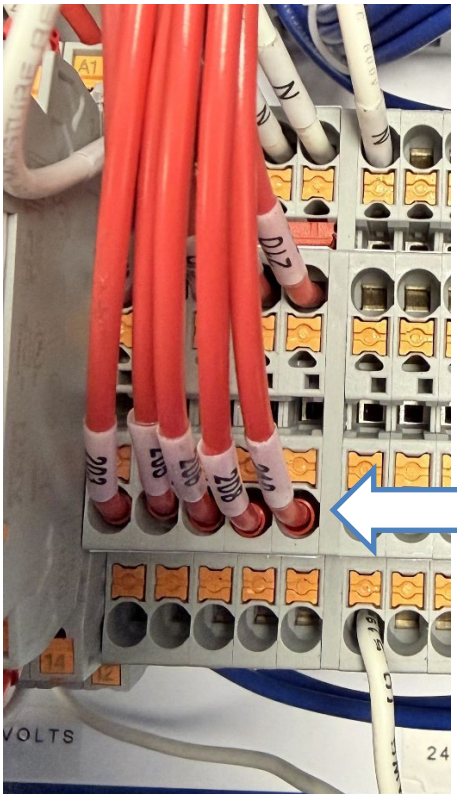
5.2 Connect the neutral wire retained from Section/Step 1.7 to the terminal block shown on Sheet 6.

Connect the heater neutral to the terminal block location shown on Sheet 6.



6 Wiring the Relay Block

6.1 Connect the relay-block wires to the terminal block exactly as shown on Sheet 7.

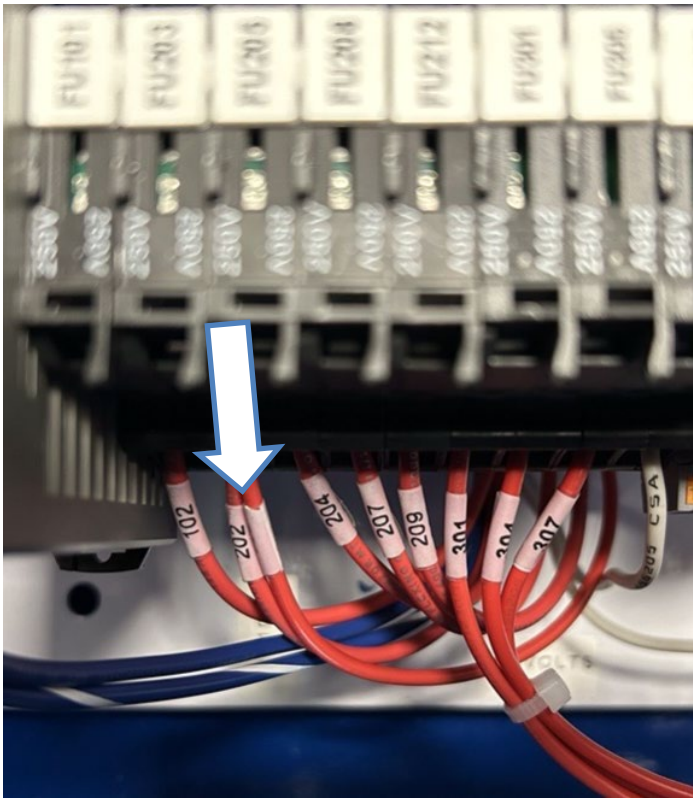


From Left to Right:

1. 203
2. 205
3. 206
4. 208
5. 210

7 Connecting Provided wire 202

7.1 Use provided wire 202 to connect FU203 to terminal C3 on the PLC according to Sheet 8.

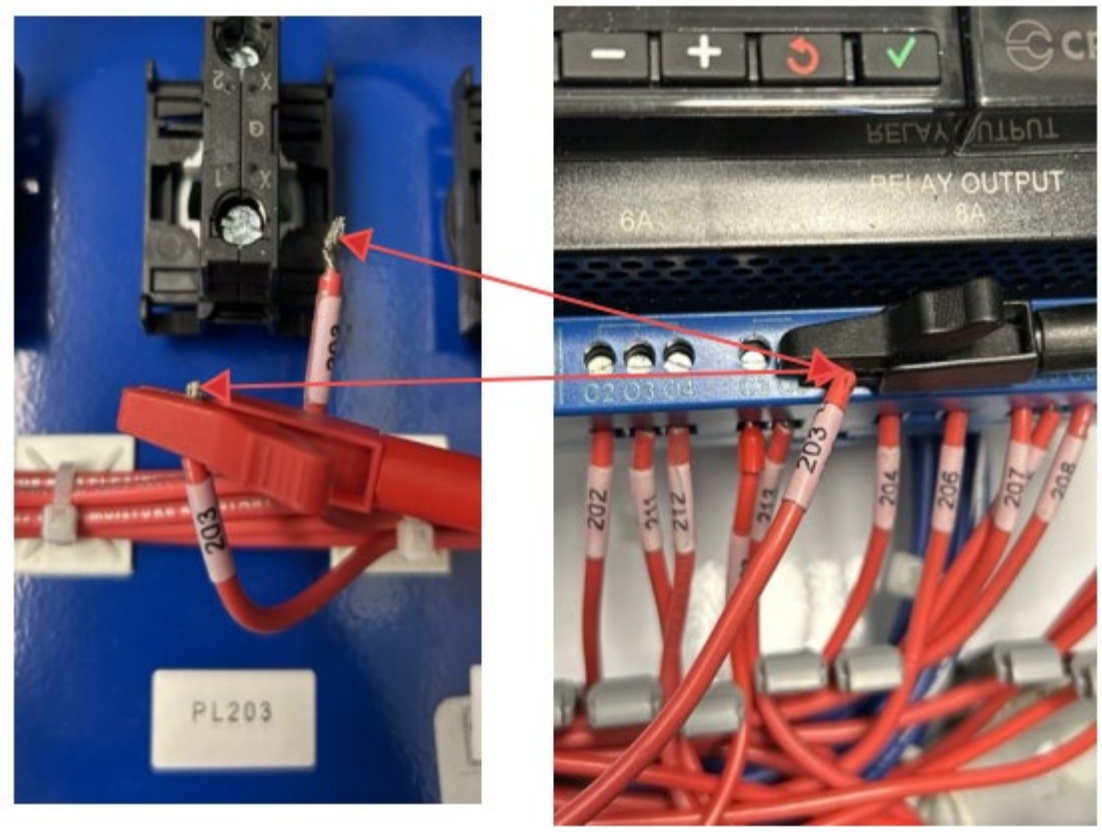


8 Removing and Replacing Short wire 203

8.1 Disconnect both wires labeled 203 from pilot light PL203.



8.2 Check continuity between wire 203 on the PLC side and each of the two wires removed from PL203.



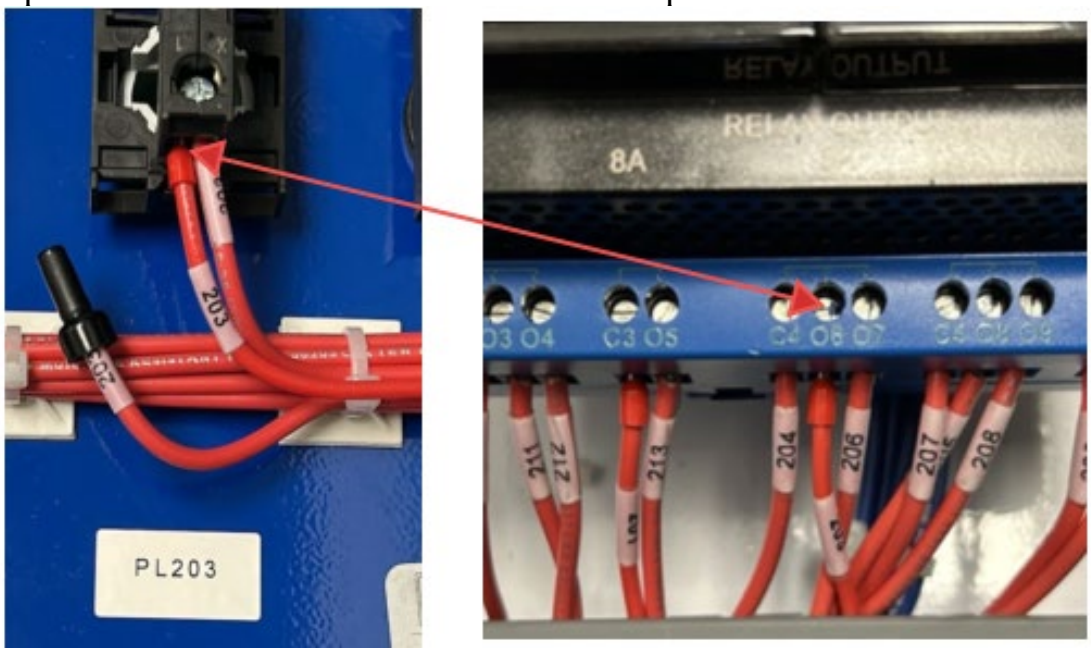
8.3 Identify the short wire 203 that has continuity to the PLC-side conductor.

8.4 Use the supplied wire crimp nut to cap both ends of the identified short wire 203. Tuck the capped wire away or completely remove the short wire 203 from the panel.

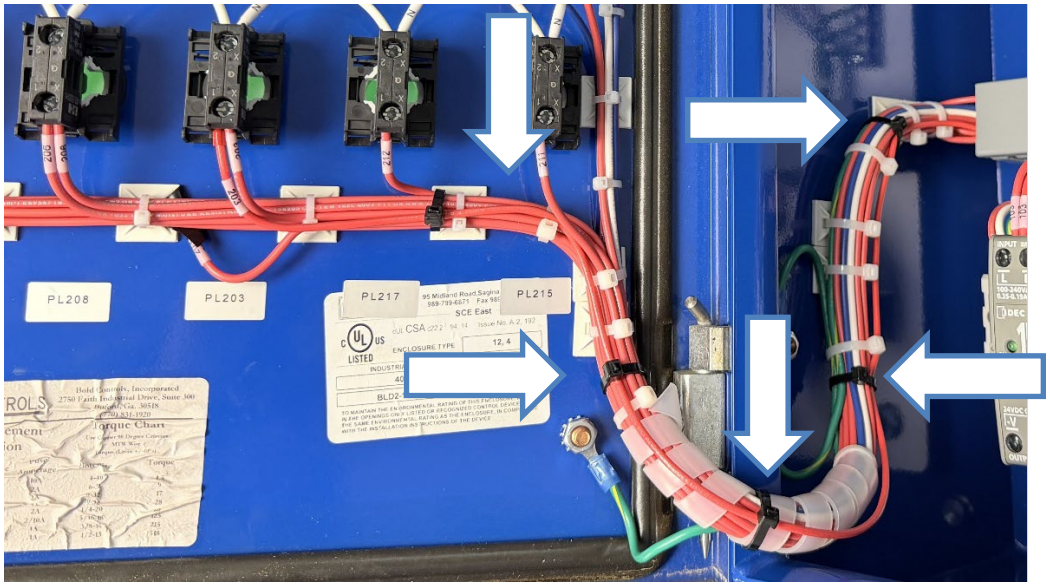




8.5 Use provided wire 203 to connect PL203 to output O6 on the EM4 PLC.

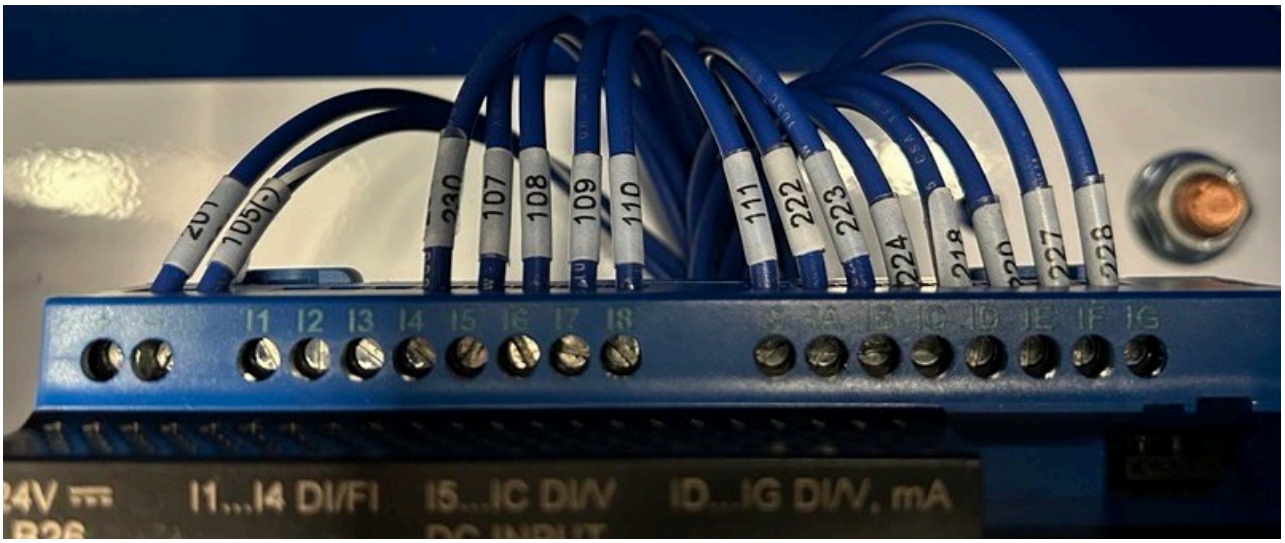


8.6 Use the provided zip ties to bundle the newly added 203 wire.

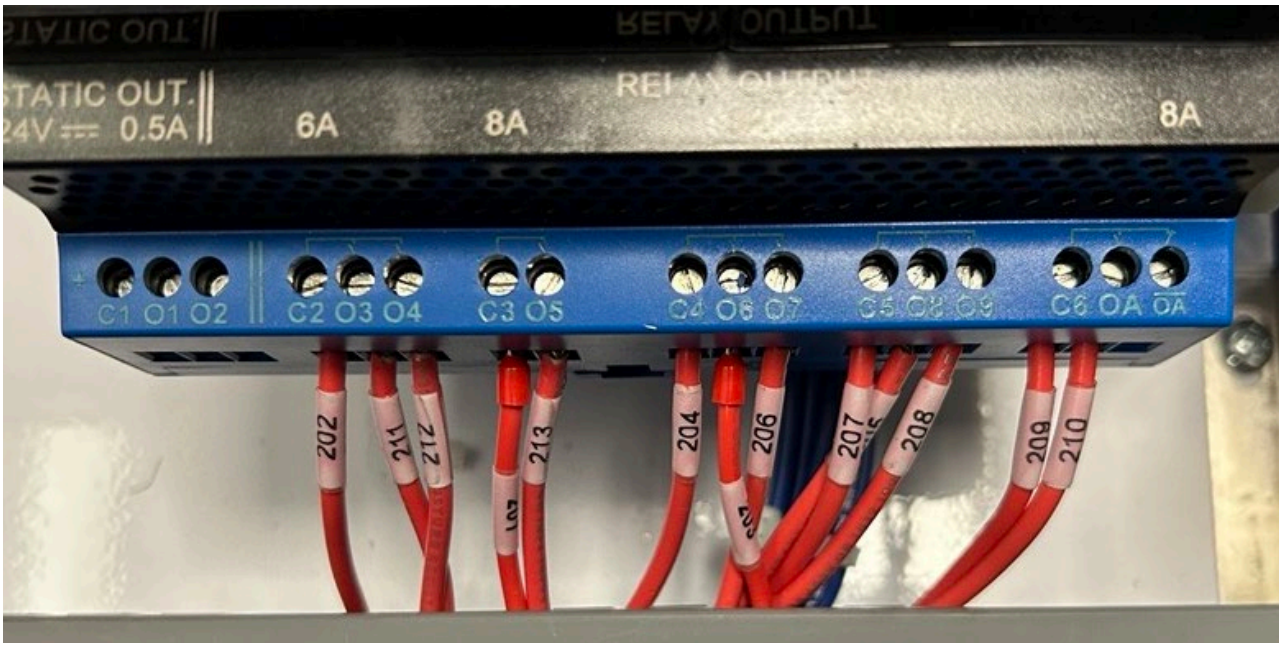


9 Wiring the PLC

9.1 Terminate the conductors at the Crouzet EM4 PLC in accordance with the red-highlighted connections on Sheet 10 of drawing B-22839657. Confirm each wire number and PLC terminal designation before tightening the connection.



PLC Terminal	*Wire No.*	*Type*	*Signal / Function*
+	**201**	Power	
-	**105(-)**	Power	
I1	-	Input	Not Connected
I2	-	Input	Not Connected
I3	-	Input	Not Connected
I4	**230**	Input	Spare
I5	**107**	Input	Tank #1 Pressure
I6	**108**	Input	Tank #1 Level
I7	**109**	Input	Tank #2 Pressure
I8	**110**	Input	Tank #2 Level
I9	**111**	Input	Bulk Tank Pressure
IA	**223/133**	Input	Vent Temperature
IB	**230/205**	Input	Run Mode
IC	***224***	Input	Spare
ID	***218***	Input	Spare
IE	***220***	Input	Spare
IF	***227***	Input	Spare
IG	***228***	Input	Spare



PLC Terminal	*Wire No.*	*Type*	*Signal / Function*
C1	-	Power	Not Connected
O1	-	Output	Not Connected
O2	-	Output	Not Connected
C2	**202**	Power	120VAC
O3	**211**	Output	Tank #1 Primary Light
O4	**212**	Output	Tank #2 Primary Light
C3	**202**	Power	120VAC
O5	**213**	Output	Alert Light
C4	**204**	Power	120VAC
O6	**203**	Output	Tank #1 Pressure Build Valve
O7	**206**	Output	Tank #1 Vent Valve
C5	**207**	Power	120VAC
O8	**205**	Output	Tank #2 Pressure Build Valve
O9	**208**	Output	Tank #2 Vent Valve
C6	**209**	Power	120VAC
OA	**210**	Output	Vent-to-Atmosphere Valve
OA/	-	Output	Not Connected

10 Verify Retrofit

10.1 Perform a point-to-point inspection against Sheet 10 **before applying power**.

Item	Verification	Pass
1	All removed components identified in Section 1 have been removed.	☐
2	The discarded relay module and wire 214 are not connected in the panel.	☐
3	The EM4 PLC, five relays, three added fuse holders, terminals, and retained terminal block are secure.	☐
4	Wire 202 is connected from FU203 to PLC terminal C3.	☐
5	The identified short wire 203 is capped at both ends or removed, and provided wire 203 connects PL203 to PLC output O6.	☐
6	Valve output wiring matches Sheet 5 and the schematic on Sheet 10.	☐
7	All neutral connections match Sheet 6, and relay-block wires match Sheet 7.	☐
8	No loose conductors, exposed strands, or unused energized wires are present.	☐

PROGRAM VERIFICATION REQUIRED:
Confirm the PLC program information below matches the approved program for the affected Trifecta model before energizing the system.

Program name	
Program revision/version	
PLC supplied preprogrammed?	[YES / NO]
Verification method	

11 Test Retrofit

11.1 Complete the approved Trifecta startup procedure and record the results below. Exact operating setpoints and test methods must be taken from the applicable Trifecta service manual and approved control sequence.

Item	Verification	Pass
1	Control power was restored with no unexpected condition.	☐
2	Crouzet EM4 PLC powers up normally.	☐
3	PLC display and program information match the approved configuration.	☐
4	Tank #1 pressure input is displayed/recognized correctly.	☐
5	Tank #1 level input is displayed/recognized correctly.	☐
6	Tank #2 pressure input is displayed/recognized correctly.	☐
7	Tank #2 level input is displayed/recognized correctly.	☐
8	Bulk tank pressure input is displayed/recognized correctly.	☐
9	Vent temperature input is displayed/recognized correctly.	☐
10	Run Mode output operates correctly.	☐
11	Tank #1 pressure-build output operates correctly.	☐
12	Tank #1 vent output operates correctly.	☐
13	Tank #2 pressure-build output operates correctly.	☐
14	Tank #2 vent output operates correctly.	☐
15	Vent-to-atmosphere output operates correctly.	☐
16	Alarm/alert operation has been verified using the approved test method.	☐
17	Panel wiring and covers have been restored, B-22839658 Sheets 1 and 2 have been placed with the panel, the old drawing has been discarded.	☐

Trifecta model		**Serial number**	
Technician		**Date**	
PLC program		**Program revision**	
Drawing used	B-22839657 Rev. A	**Final result**	☐ Pass ☐ Follow-up required

12 Replace the Panel Drawing

After the retrofit has passed final inspection and functional testing:

12.1 Remove the old Trifecta X-series control-panel drawing from the panel.

12.2 Discard the old drawing so it cannot be mistaken for the current panel configuration.

12.3 Place the new Trifecta XPro control-panel drawing B-22839658, Sheets 1 and 2, with the panel.

12.4 Verify both sheets are complete, legible, and match the released revision before closing the panel.

Chart's continuous attention to product improvement and customer satisfaction has resulted in this design modification. If you have concerns or questions relative to this action, contact your Chart Customer Service Representative at (800) 400-4683.