AN EXCHANGE OF TECHNICAL INFORMATION

Number: **TL003 - 2022**
Subject: **ML5 PrimeLINE Controller Bypass** **Released: March 09, 2022**

The following emergency bypass procedure was written for PrimeLINE model number units 69NT40-571 with ML5 controllers. This procedure is only to be performed if an ML5 controller failure has occurred and a replacement controller is not immediately available.

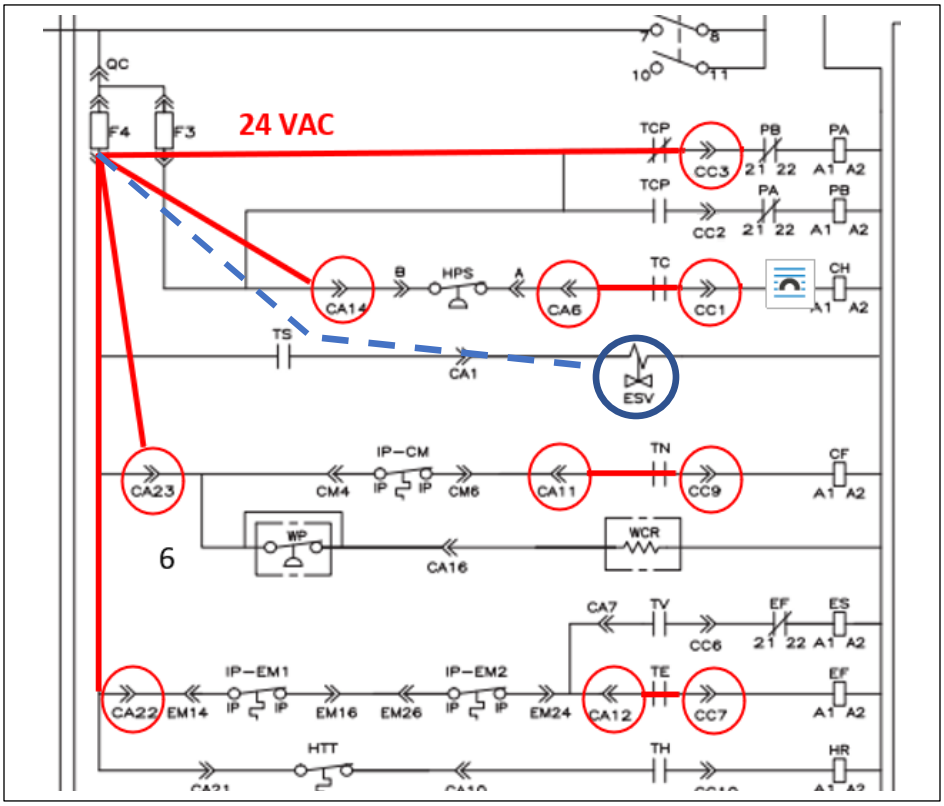
Warning:
Remove all power from the unit including removing the power plug from the socket prior to starting. Follow your company's standard Lockout/Tagout procedure for working with electrical components. Once these instructions have been carried out, the container unit will operate in cooling mode with limited temperature control. The unit must be checked each time a different source of power is provided to ensure that the compressor and evaporator motors are running in the correct direction.

Set Up:

Refer to the schematic found in the control box (or in the T-372 manual) for connection detail.

1. Remove the ML5 controller.
2. Remove fuse F3 or F4 from the controller. Check to make sure the fuse is not blown.
3. Connect QC to one leg of the fuse.
4. Using a spade connector, create a single wire connection with a 6 inch (15 cm) length of minimum 18 AWG wire (24 VAC power source).
5. Connect the spade of the 24 VAC power source to the other leg of the fuse. Heat shrink the fuse assembly.
6. Cut the CA14, CA23, and CA22 wires each 4 inches (10 cm) back from the CA connector plug.
7. Cut the CC3 wire 4 inches (10 cm) back from the CC connector plug.
8. Splice CA14, CA23, CA22, and CC3 and the 24 VAC power source wires and cover with heat shrink.
9. Cut the CA6 wire 4 inches (10 cm) back from the CA connector plug.
10. Cut the CC1 wire 4 inches (10 cm) back from the CC connector plug.
11. Splice the CA6 and CC1 wires and cover with heat shrink.
12. Cut the CA11 wire 4 inches (10 cm) back from the CA connector plug
13. Cut the CC9 wire 4 inches (10 cm) back from the CA connector plug.

14. Splice the CA11 and CC9 and cover with heat shrink.
15. Cut the CA12 wire 4 inches (10 cm) back from the CA connector plug.
16. Cut the CC7 wire 4 inches (10 cm) back from the CC connector plug.
17. Splice the CA12 and CC7 wires and cover with heat shrink.
18. Connect refrigerant pressure gauges to the suction and discharge service valves.
19. Start the unit and observe the gauges. The discharge pressure should immediately start to increase while the suction pressure should immediately decrease. If not, stop the unit immediately as the compressor is running backwards. Complete the following sub-steps to correct the compressor rotation:
    a. Cut the splice completed in step 6 and remove the CC3 wire from the bundle.
    b. Cut the CC2 wire 4 inches (10 cm) back from the CC connector plug.
    c. Splice CC3 together with CA14, CA23, CA22 and the 24 VAC power source wire and cover with heat shrink.
    d. Reconnect CC3 to the CC connector plug.
    e. Restart the unit and verify that the compressor discharge pressure increases, and the suction pressure decreases.



Checking Temperature:

- In order to monitor temperature, perform resistance reading checks on the STS (Supply Temperature Sensor) or RTS (Return Temperature Sensor). See Schematic for wire location.
- Compare measured resistance readings to specified readings in table below.

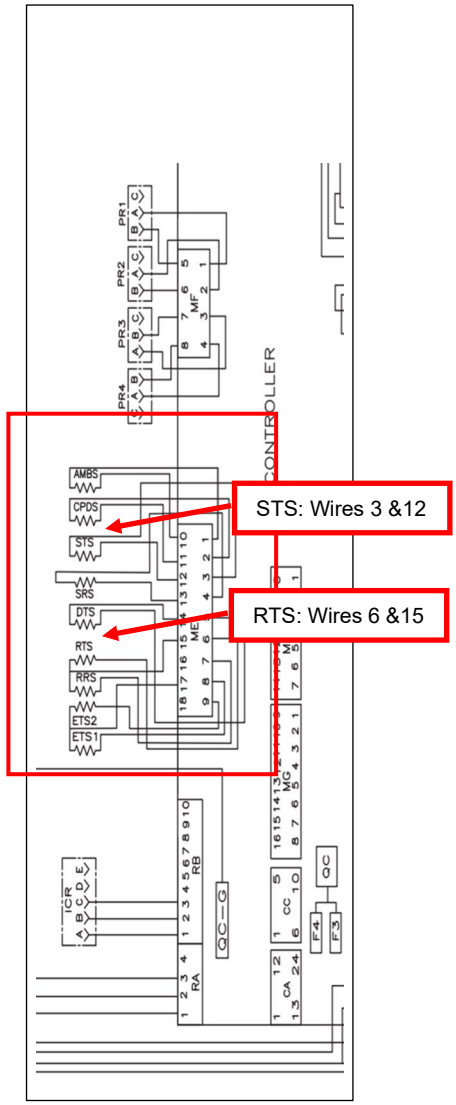


Table 7–2 Sensor Resistance - AMBS, DTS, ETS, RRS, RTS, SRS, STS

°C	°F	OHMS	°C	°F	OHMS
-40	-40	336,500	6	42.8	24,173
-39	-38.2	314,773	7	44.6	23,017
-38	-36.4	294,600	8	46.4	21,922
-37	-34.6	275,836	9	48.2	20,886
-36	-32.8	258,336	10	50	19,900
-35	-31	242,850	11	51.8	18,975
-34	-29.2	228,382	12	53.6	18,093
-33	-27.4	214,164	13	55.4	17,258
-32	-25.6	200,909	14	57.2	16,466
-31	-23.8	188,545	15	59	15,715
-30	-22.0	177,000	16	60.8	15,002
-29	-20.2	166,360	17	62.6	14,325
-28	-18.4	156,426	18	64.4	13,683
-27	-16.6	147,148	19	66.2	13,073
-26	-14.8	138,478	20	68	12,494
-25	-13	130,374	21	69.8	11,944
-24	-11.2	122,794	22	71.6	11,420
-23	-9.4	115,702	23	73.4	10,923
-22	-7.6	109,063	24	75.2	10,450
-21	-5.8	102,846	**25**	**77**	**10,000**
-20	-4	97,022	26	78.8	9,572
-19	-2.2	91,563	27	80.6	9,164
-18	-0.4	86,445	28	82.4	8,777
-17	1.4	81,644	29	84.2	8,407
-16	3.2	77,139	30	86	8,055
-15	5	72,910	31	87.8	7,720
-14	6.8	68,938	32	89.6	7,401
-13	8.6	65,206	33	91.4	7,096
-12	10.4	61,699	34	93.2	6,806
-11	12.2	58,401	35	95	6,529
-10	14	55,330	36	96.8	6,265
-9	15.8	52,381	37	98.6	6,013
-8	17.6	49,634	38	100.4	5,772
-7	19.4	47,047	39	102.2	5,543
-6	21.2	44,610	40	104.0	5,323
-5	23	42,314	41	105.8	5,114
-4	24.8	40,149	42	107.6	4,914
-3	26.6	38,108	43	109.4	4,723
-2	28.4	36,182	44	111.2	4,540
-1	30.2	34,365	45	113	4,365
0	**32**	**32,650**	46	114.8	4,198
1	33.8	31,030	47	116.6	4,038
2	35.6	29,500	48	118.4	3,885
3	37.4	28,054	49	120.2	3,739
4	39.2	26,688	50	122	3,599
5	41	25,396			

Once these instructions have been carried out, the container unit will operate in cooling mode with limited temperature control. Adjustments to the cooling capacity can be completed as follows:

Frozen Mode:

1. If the temperature does not pull down, it will be necessary to increase the capacity of the unit by opening the Economizer Solenoid Valve (ESV) as follows. Refer to the blue dotted line in the schematic provided in step 19 of the Set Up section of this article.
   a. Cut open the 24VAC power source splice completed in step 8.
   b. Cut the CA1 wire 4 inches back from the CA connector plug.
   c. Add the CA1 to the 24VAC power source and cover with heat shrink.

2. If the cargo temperature continues to rise or the container unit goes into vacuum, manually open the Electronic Expansion Valve (EEV) using a magnet as detailed below in the Opening / Closing of the EEV section.

Perishable Mode:

1. If the cargo temperature rises, manually open the Electronic Expansion Valve (EEV) as detailed below in the Opening / Closing of the EEV section.
2. If the cargo temperature falls, slowly close the Suction Service Valve to reduce the flow of refrigerant and the capacity of the container unit. This may provide very limited temperature control.

Opening / Closing the Electronic Expansion Valve (EEV):

- It is recommended that the EEV be set at the highest ambient temperature during the day.
- The container unit should be continuously monitored, and the Suction Service Valve should be adjusted accordingly to maintain temperature control.
- The Suction Service Valve should not be fully closed, as the compressor will run in deep vacuum potentially damaging the compressor for adjustment of the EEV by using a magnet.

Procedure:

1. Ensure that power is OFF to the container unit. Follow your company's standard Lock out / Tag out procedure for working with electrical components.
2. Connect manifold gauges to monitor pressure.
3. Disconnect the EEV coil and remove the cap and coil (See Figure 1).

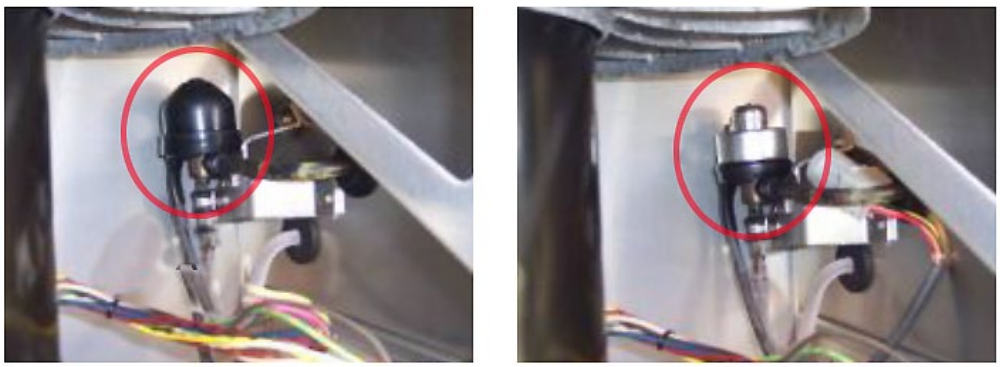


Figure 1

4. Place a magnet (p/n 44-00417-00) next to the coil stem (See Figure 2) and rotate it around the stem to open or close the valve (one turn [360°] approximately 0.5 bars (7 psig)).

Figure 2

5. Power the container unit ON and monitor the cooling requirement.
6. If additional adjustment is required, repeat steps 1 through 5.