



Maintenance Bulletin (MB-0040)

F1 to F3 VARISPEED Inverter Change out

Version 2, Sept 2016

Purpose:

This document provides instructions for converting the inverter on a VARISPEED compressor from a F1 model to an F3 model.

Sections:

1. Required tools
2. Required hardware
3. Removing the F1 compressor
4. Installing the F3 compressor
5. Wiring diagram

Warning:

Prior to any work being done, insure power has been disconnected from the compressor and the inverter.

All work on the compressors and refrigeration systems should only be performed by properly trained/certified refrigeration personnel.

1. Required Tools:

- Phillips head screwdriver
- Flathead screwdriver
- 8mm deep socket
- Ratchet or driver
- Rubber mallet
- 3/16" Allen wrench (5mm)
- 1/4" Allen wrench (6mm)
- Channel lock pliers
- Adjustable wrench
- Dielectric grease (i.e. Dow Corning 4 Electrical Insulating Compound)
- T20 Star wrench (optional)
- T25 Star wrench (optional)

2. Required hardware:

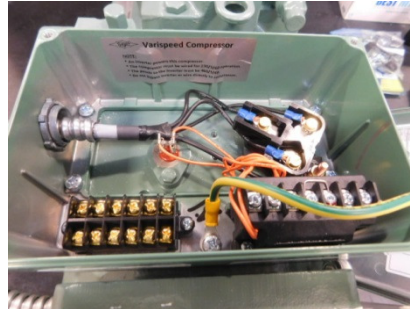
Part number 999-0015-01 includes the following hardware **in addition to the F3 inverter.**

Note: The operating parameters for the F3 inverter on a 4 cylinder compressor are different than those of a 2 cylinder compressor.

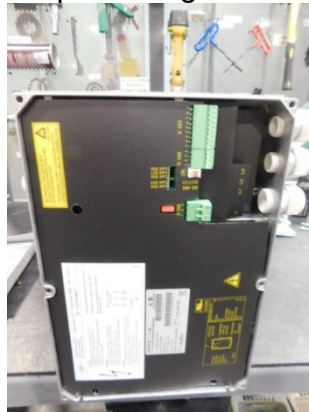
Item	Picture	Part Number / Description	Quantity
A		344110-02 Jumper wire	1
B		939002-01 Heat transfer paste	10
C		380387-02 F3 Inverter bolt	4
D		901-0015-01 Washer	4
E		381920-01 Conduit nut	2
F		365730-03 Adaptor	2
G		345312-03 Hose w/elbows (Disassemble the elbows from the hose)	1
H		832-1000-01 Ring terminal	3
I		378006-69 Electrical Sticker	1

3. Removing the F1 Inverter:

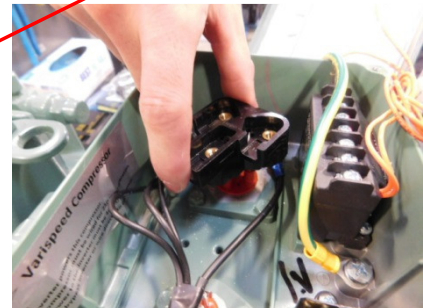
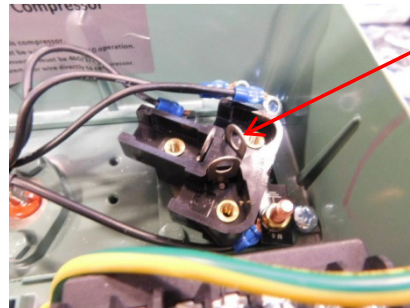
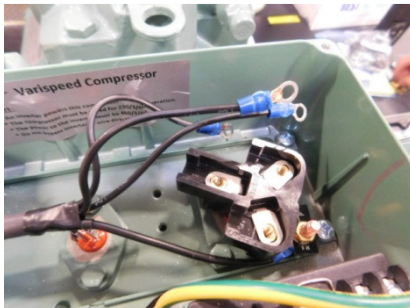
1. Make notes and label wiring from the X101 and X102 terminal strips on F1 inverter. See Section 5 - Wiring Diagram.
2. Remove the terminal box cover with the Phillips head screwdriver and the inverter cover with the flathead screwdriver (or T20 Star wrench).



3. Remove the black cover protecting the circuit board with the flathead screwdriver.



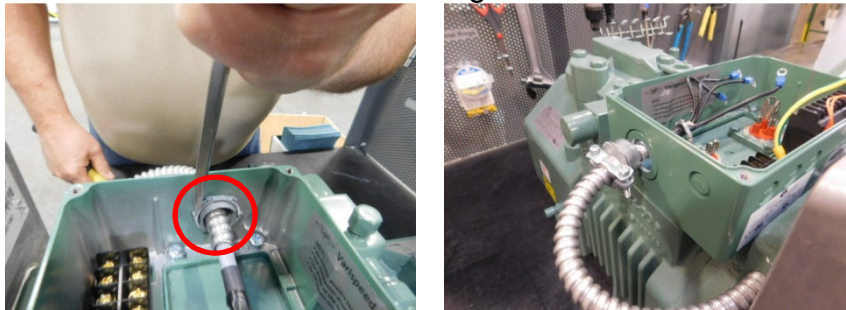
4. Disconnect the power wires from the terminal plate, gently lift the (3) terminal tabs and remove the terminal block.



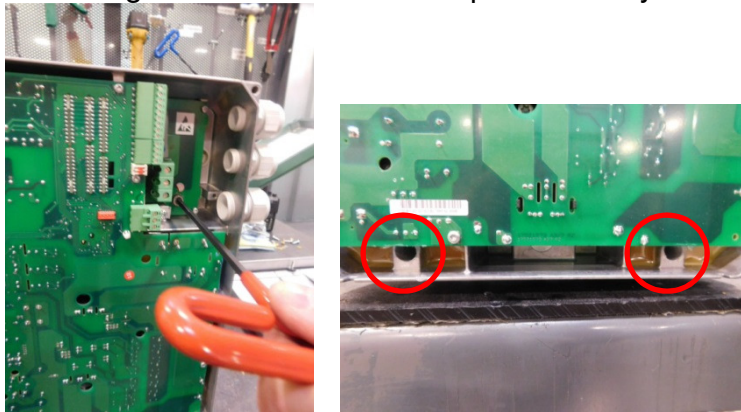
5. Disconnect the ground wire from the grounding post (8mm socket).



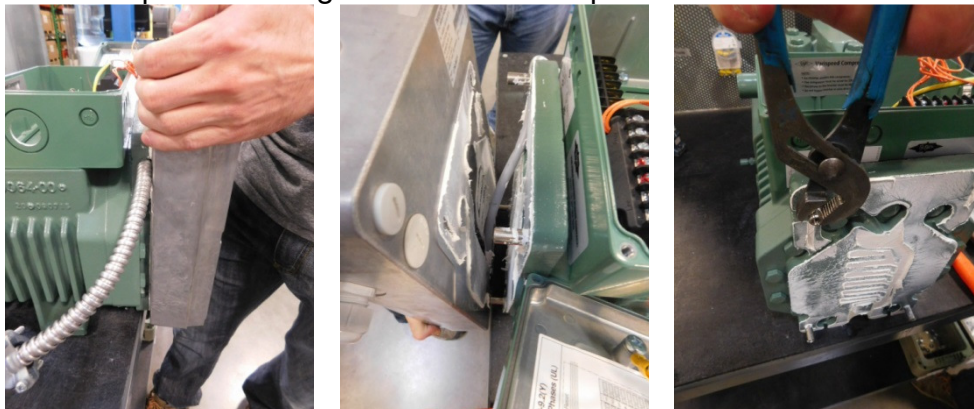
6. Remove the conduit from the terminal box using the flathead screwdriver and mallet.



7. Remove the 4 bolts holding the inverter to the compressor body with the 5mm Allen wrench.



8. Pull the inverter off the compressor body (use the rubber mallet if necessary) and remove the studs from the compressor using the Channel lock pliers.



4. Installing the F3 inverter:

1. Before installing the F3 inverter, ensure that the jumper wire (A) is connected between SDI1 to SDI2.



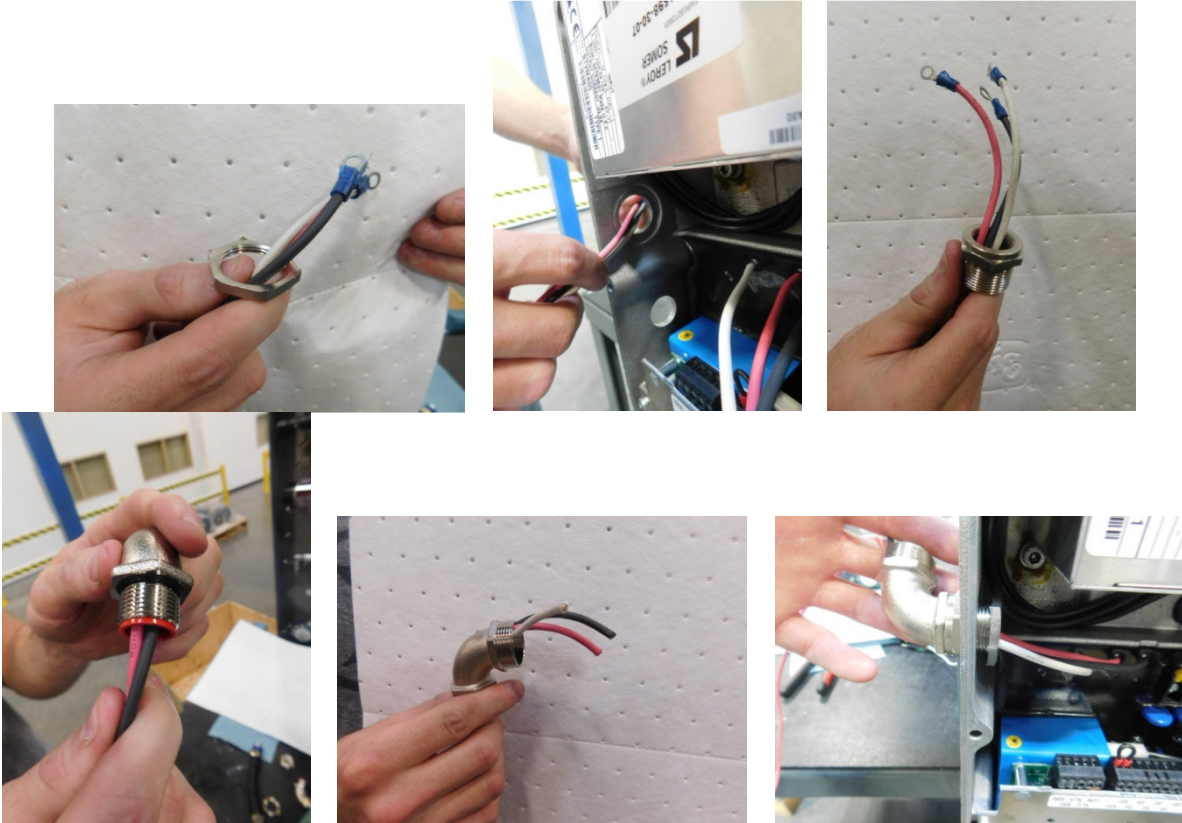
2. Apply heat transfer paste (B) to the back of the inverter and to the compressor surface.
3. Install the F3 inverter using the 4 inverter bolts (C) and washers (D) provided. Insure that the rubber sides of the washers face the inverter. Align all the inverter bolts to the bolt holes on the compressor before tightening.



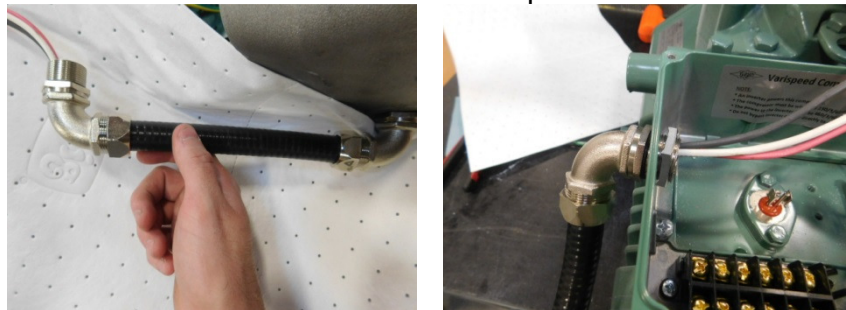
4. Apply dielectric grease (not included) onto the 4 bolts.



- Run the wires from the inverter through the conduit nut (E), insuring that the pointed side of the nut will be against the inside wall of the inverter. Next, run the wires through the electrical connecting hole (on the left), adapter (F), and elbow (G) and fasten the elbow to the inverter.



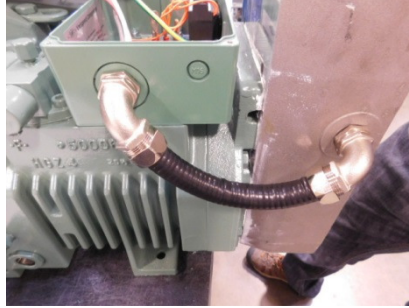
- Run the wire through the hose (G) and again through the second elbow (G), adapter (F) and nut (E) combination. Secure the conduit to the compressor terminal box.



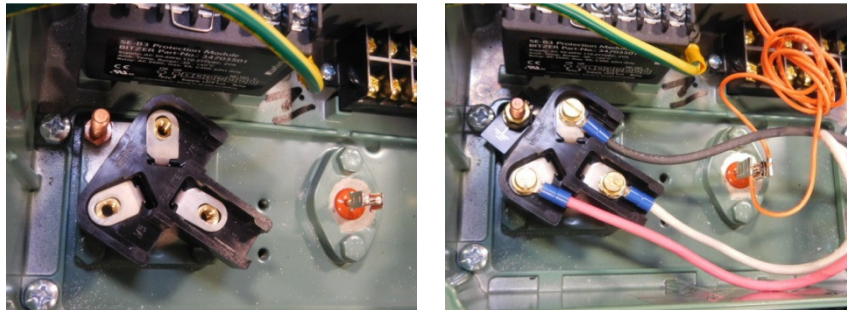
- Tighten the hose/elbow connection with the adjustable wrench until the blue nylon ring is visible.



8. The final assembly should look like the picture below.



9. Crimp the ring terminals (H) onto the inverter wires, reassemble the terminal block in the terminal box and connect all the wires.



10. Reconnect the wires to the F3 inverter on terminal strips X101a, X101b and X102. See Section 5 - Wiring Diagram.

11. Place the electrical sticker (J) on the inside of the inverter cover and install the covers on the inverter and terminal box.



12. Seal all inverter conduit penetrations per TB-0055.

4. Wiring Diagram:

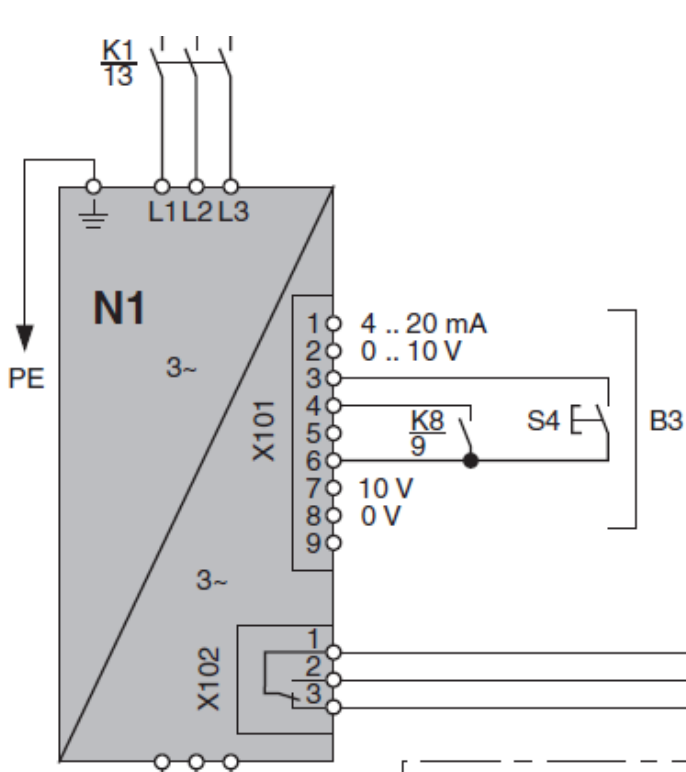


Figure 1: F1 Inverter

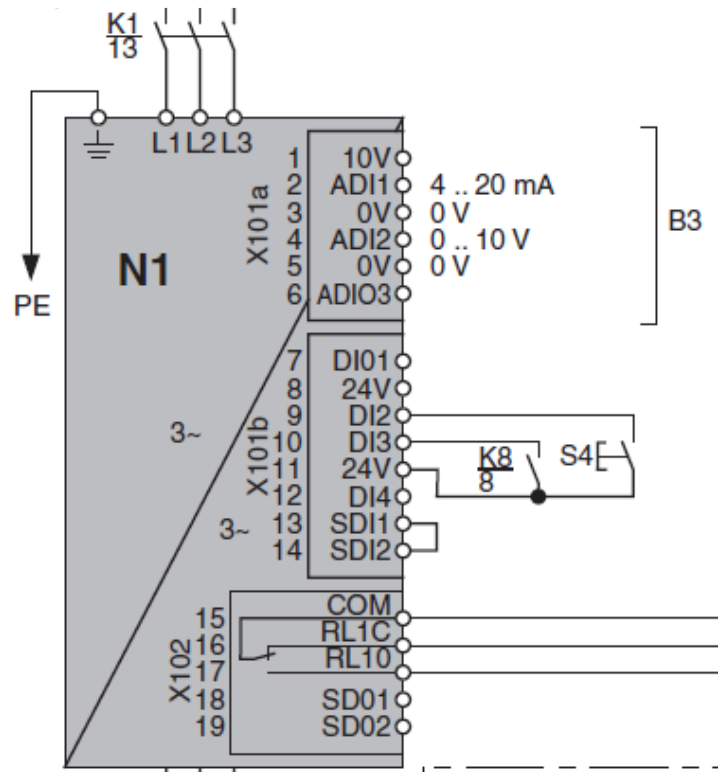


Figure 2: F3 Inverter

F1 INVERTER TERMINAL			F3 INVERTER TERMINAL	
	#			#
X101	1	→	X101A	3
	2	→		5
	3	→	X101B	9 (DI2)
	4	→		10 (DI3)
X102	6	→	X102	11 (24V)
	1	→		15 (COM)
	2	→		17 (RL10)
	3	→		16 (RL1C)

Table 1

Use the BEST tool to verify that the minimum speed for the 2 cylinder compressor is set for 30 Hz.

NOTE: In order to connect to the inverter with the BEST tool, a compressor model with an F3 inverter must be selected.