Rockwell 755 Standard Tier

VFD Training for Carrier Commercial Service

ROCKWELL PF755

Overview

- Literature
- Drive identification
- Component familiarization
- Wiring Diagrams
- Check field wiring and enter the control parameter before start up
- Basic troubleshooting
- Registering the new drive in the Rockwell Warp System

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Identification No. String Code

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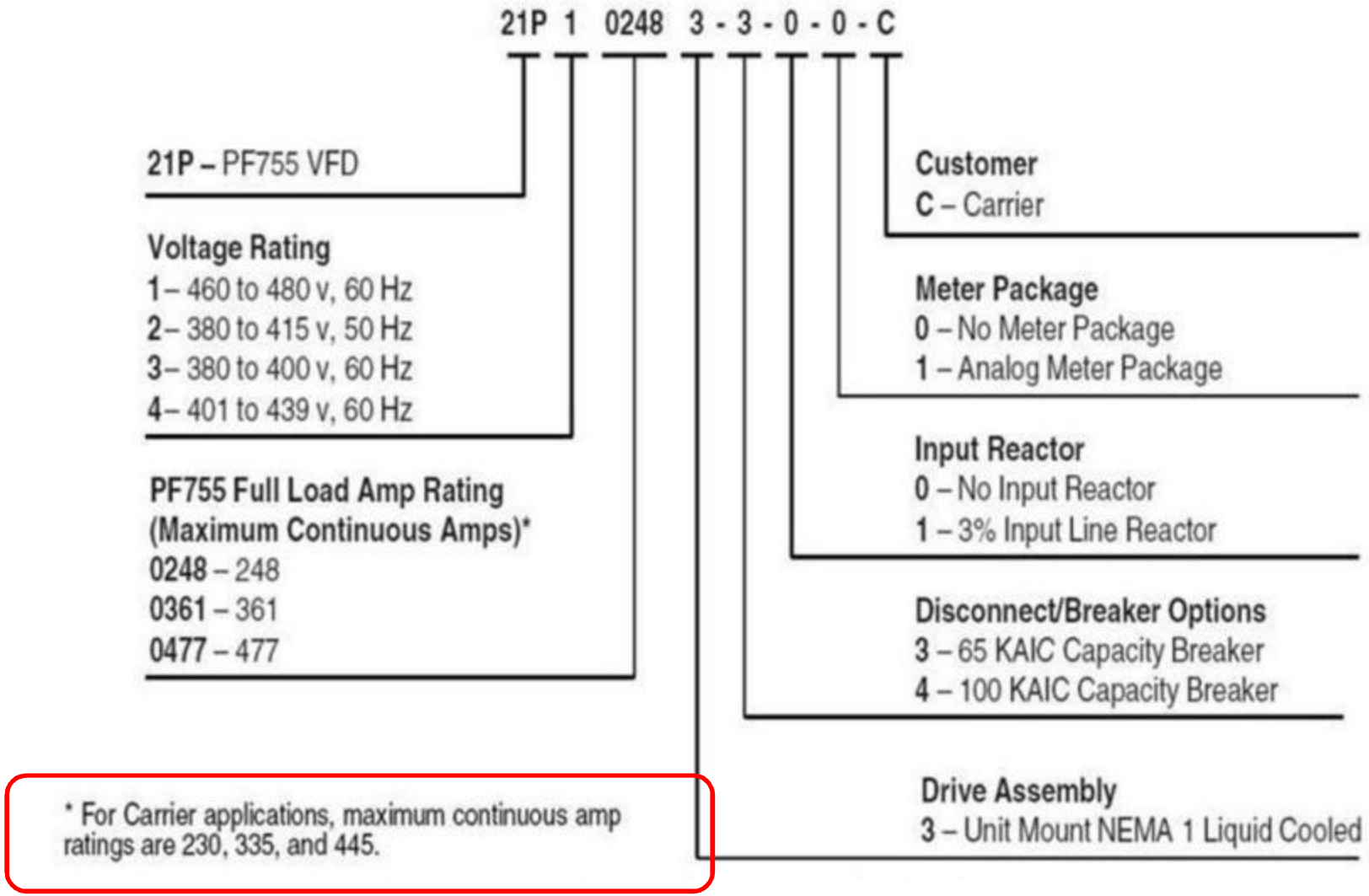

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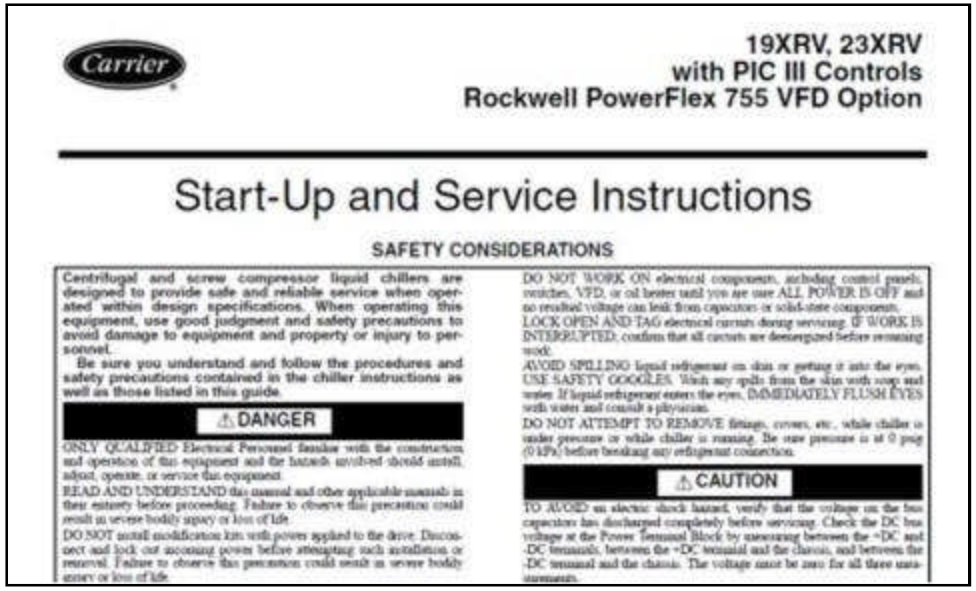
Literature

19/23-2SS Start Up and Operations Manual

19/23-2SI Installation Manual

Allen Bradley Power-Flex 750 series AC Drive form# 750-UM001C-EN-P



Carrier

19XRV, 23XRV
with PIC III Controls
Rockwell PowerFlex 755 VFD Option

Start-Up and Service Instructions

SAFETY CONSIDERATIONS

Centrifugal and screw compressor liquid chillers are designed to provide safe and reliable service when operated within design specifications. When operating this equipment, use good judgment and safety precautions to avoid damage to equipment and property or injury to personnel.

Be sure you understand and follow the procedures and safety precautions contained in the chiller instructions as well as those listed in this guide.

⚠ DANGER

ONLY QUALIFIED Electrical Personnel familiar with the construction and operation of this equipment and the hazards involved should install, adjust, operate, or service this equipment.

READ AND UNDERSTAND this manual and other applicable manuals in their entirety before proceeding. Failure to observe this precaution could result in severe bodily injury or loss of life.

DO NOT install modification kits with power applied to the drive. Disconnect and lock out incoming power before attempting such installation or removal. Failure to observe this precaution could result in severe bodily injury or loss of life.

DO NOT WORK ON electrical components, including control panels, switches, VFD, or oil heater until you are sure ALL POWER IS OFF and no residual voltage can leak from capacitors or solid-state components.

LOCK OPEN AND TAG electrical circuits during servicing. IF WORK IS INTERRUPTED, confirm that all circuits are deenergized before resuming work.

AVOID SPILLING liquid refrigerant on skin or getting it into the eyes. USE SAFETY GOGGLES. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, IMMEDIATELY FLUSH EYES with water and consult a physician.

DO NOT ATTEMPT TO REMOVE fittings, covers, etc., while chiller is under pressure or while chiller is running. Be sure pressure is at 0 psig (0 kPa) before breaking any refrigerant connection.

⚠ CAUTION

TO AVOID an electric shock hazard, verify that the voltage on the bus capacitors has discharged completely before servicing. Check the DC bus voltage at the Power Terminal Block by measuring between the +DC and -DC terminals, between the +DC terminal and the chassis, and between the -DC terminal and the chassis. The voltage must be zero for all three measurements.

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Product Identification

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Record this information:

1. ID# of the starter
2. Drive Current Rating
3. (248/361/477amp)
4. Carrier VFD Part# (Power module can be found in EPIC with this number)
5. VFD Serial#

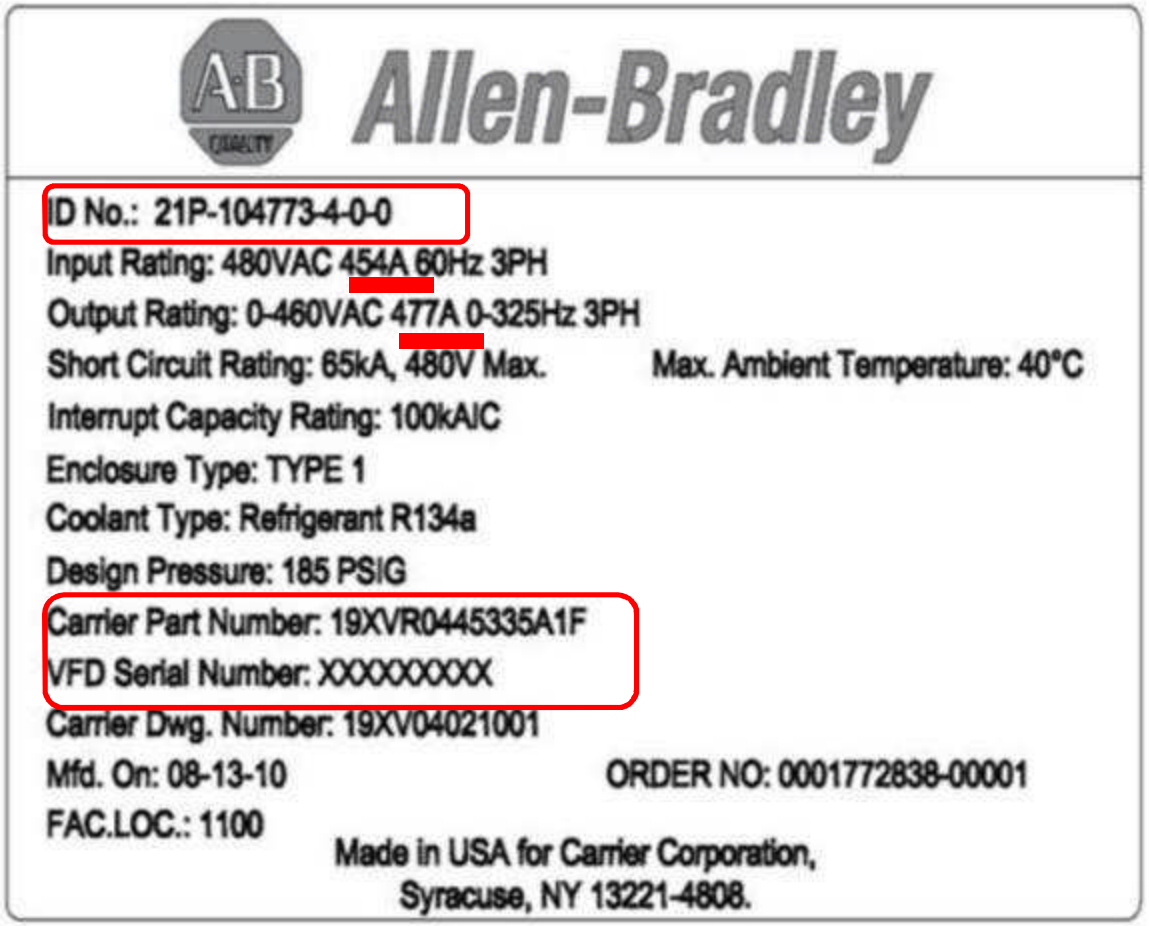

Fig. 1 — Allen Bradley Data Nameplate

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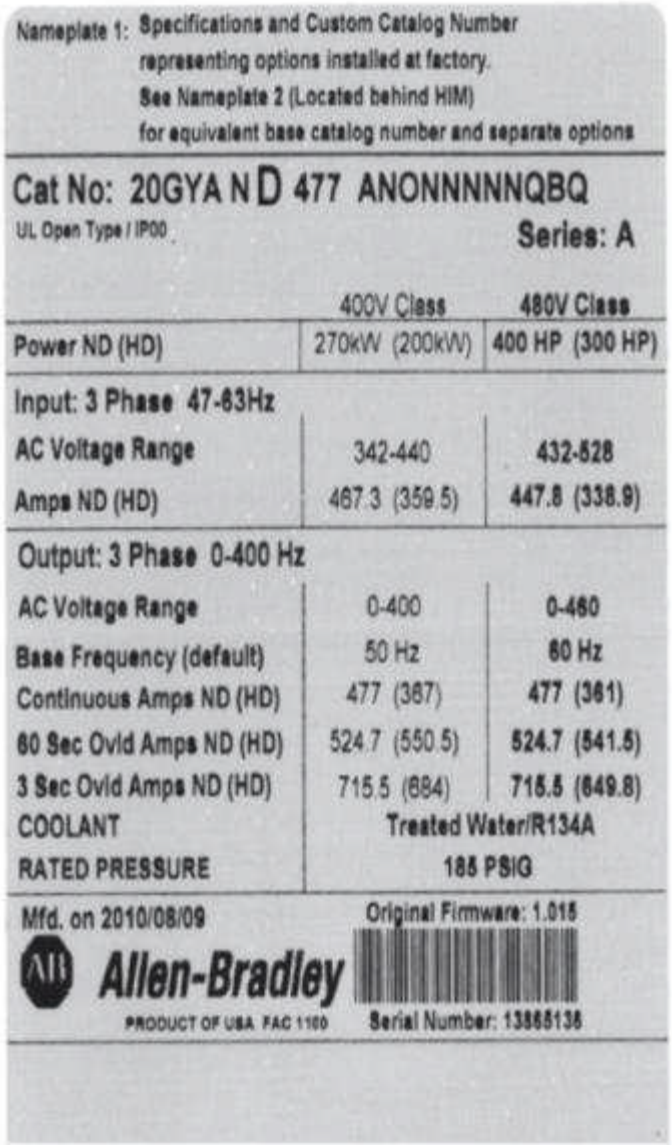
Label on drive



Nameplate 1: Specifications and Custom Catalog Number representing options installed at factory.
See Nameplate 2 (Located behind HIM) for equivalent base catalog number and separate options

Cat No: 20GYA N D 477 ANONNNNNQBQ

UL Open Type / IP00

Series: A

	400V Class	480V Class
Power ND (HD)	270kW (200kW)	400 HP (300 HP)
Input: 3 Phase 47-63Hz		
AC Voltage Range	342-440	432-528
Amps ND (HD)	467.3 (359.5)	447.8 (338.9)
Output: 3 Phase 0-400 Hz		
AC Voltage Range	0-400	0-460
Base Frequency (default)	50 Hz	60 Hz
Continuous Amps ND (HD)	477 (387)	477 (361)
60 Sec Ovld Amps ND (HD)	524.7 (550.5)	524.7 (541.5)
3 Sec Ovld Amps ND (HD)	715.5 (684)	715.5 (649.8)
COOLANT	Treated Water/R134A	
RATED PRESSURE	185 PSIG	

Mfd. on 2010/08/09

Original Firmware: 1.015

Allen-Bradley

PRODUCT OF USA FAC 1100

Serial Number: 13565136

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PF755 vs. LF1

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Specification (Similar Amp Rating)	LiquiFlo 1 Frame B	PowerFlex 755 Frame 7
2-Dimensional Area	589.1 in^2	587.5 in^2
Weight	275 lbs	240 lbs
Conformal Coating	No	Yes
Front-End / Converter	Passive Rectifier	Passive Rectifier
Real-Time Clock	No	Yes
Displacement Pwr Factor	96%	98%
Efficiency	97%	97.5%
Overload Capability	1 Min:110%, 3Sec:150%	1 Min:110%, 3Sec:150%
Predictive Diagnostics	No	Yes
Embedded Network	Serial	Ethernet/IP

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Frequency

MACHINE ELECTRICAL DATA	
MOTOR NAMEPLATE VOLTAGE	
COMPRESSOR 100% SPEED	50 or 60HZ
RATED LINE VOLTAGE	
RATED LINE AMPS	
RATED LINE KILOWATTS	
MOTOR RATED LOAD KW	
MOTOR RATED LOAD AMPS	
MOTOR NAMEPLATE AMPS	
MOTOR NAMEPLATE RPM	
MOTOR NAMEPLATE KW	
INTERTER PWM FREQUENCY	

This setting should be at the rated frequency of the unit

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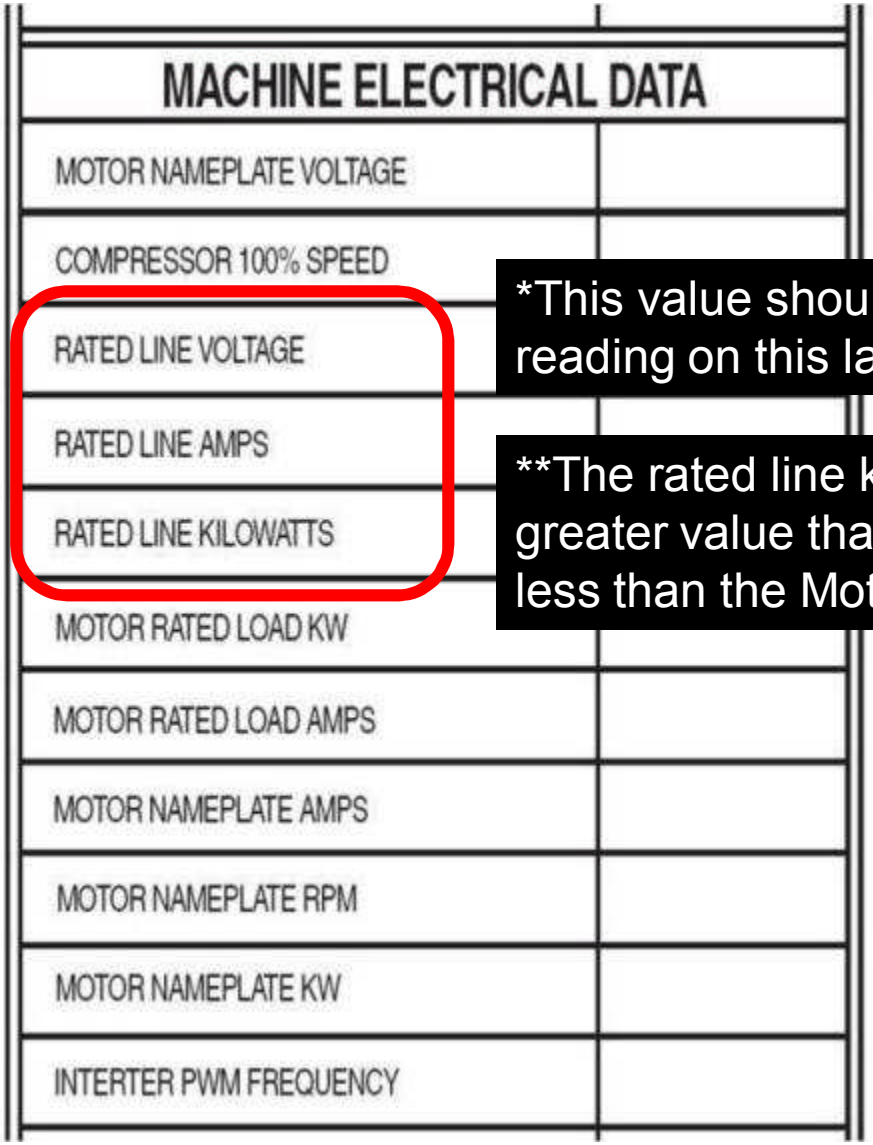
Machine data



MACHINE ELECTRICAL DATA	
MOTOR NAMEPLATE VOLTAGE	
COMPRESSOR 100% SPEED	
RATED LINE VOLTAGE	
RATED LINE AMPS	
RATED LINE KILOWATTS	
MOTOR RATED LOAD KW	
MOTOR RATED LOAD AMPS	
MOTOR NAMEPLATE AMPS	
MOTOR NAMEPLATE RPM	
MOTOR NAMEPLATE KW	
INTERTER PWM FREQUENCY	

*This value should be the lowest current reading on this label

**The rated line kilowatts should be slightly greater value than the motor rated KW, but less than the Motor Nameplate KW.

This is the current and voltage as measured on the line or incoming side of the VFD at 100% of capacity

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Machine data

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MACHINE ELECTRICAL DATA	
MOTOR NAMEPLATE VOLTAGE	
COMPRESSOR 100% SPEED	
RATED LINE VOLTAGE	
RATED LINE AMPS	
RATED LINE KILOWATTS	
MOTOR RATED LOAD KW	
MOTOR RATED LOAD AMPS	
MOTOR NAMEPLATE AMPS	
MOTOR NAMEPLATE RPM	
MOTOR NAMEPLATE KW	
INTERTER PWM FREQUENCY	

This is the voltage and current as measured on the output of the VFD or at the motor at 100% of rated capacity

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Machine data

MACHINE ELECTRICAL DATA	
MOTOR NAMEPLATE VOLTAGE	
COMPRESSOR 100% SPEED	
RATED LINE VOLTAGE	
RATED LINE AMPS	
RATED LINE KILOWATTS	
MOTOR RATED LOAD KW	
MOTOR RATED LOAD AMPS	
MOTOR NAMEPLATE AMPS	
MOTOR NAMEPLATE RPM	
MOTOR NAMEPLATE KW	
INTERTER PWM FREQUENCY	

This is the nameplate information from the motor at 100% of design rating

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Machine data

MACHINE ELECTRICAL DATA	
MOTOR NAMEPLATE VOLTAGE	
COMPRESSOR 100% SPEED	
RATED LINE VOLTAGE	
RATED LINE AMPS	
RATED LINE KILOWATTS	
MOTOR RATED LOAD KW	
MOTOR RATED LOAD AMPS	
MOTOR NAMEPLATE AMPS	
MOTOR NAMEPLATE RPM	
MOTOR NAMEPLATE KW	
INTERTER PWM FREQUENCY	1=2KHZ

This value must be set at 1 or 2KHZ regardless of what this label has on it

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Components Familiarization

NEMA 1 enclosure

Designed for indoor or dry installation

The power module is refrigerant cooled, but it also requires air movement for additional cooling

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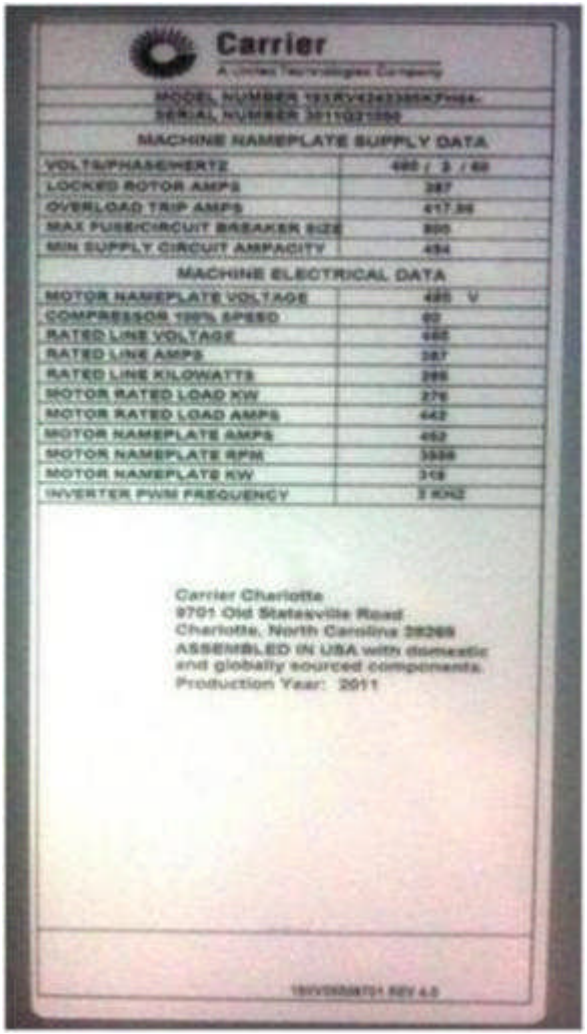
VFD Configuration Information



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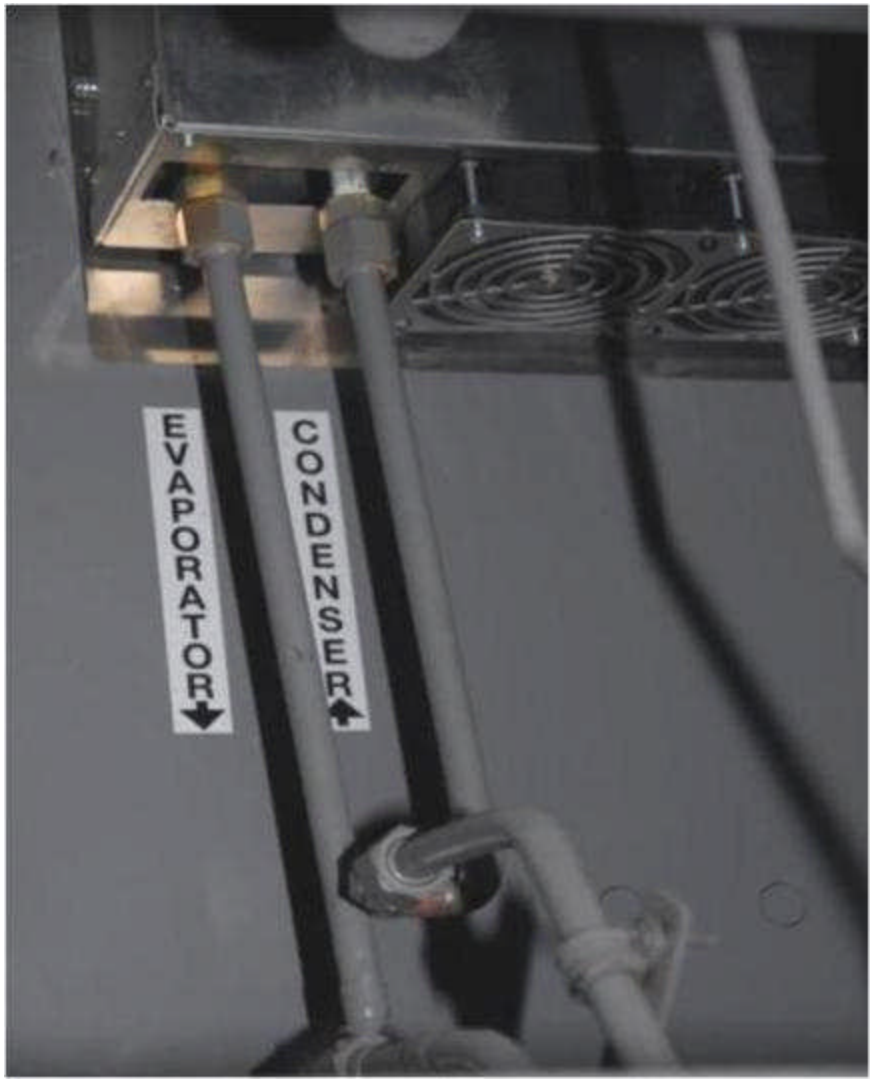
Refrigerant Cooling Line



Refrigerant cooling line inlet and outlet at the rear of the unit.

Two rear cooling fans located at the rear and bottom of starter

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Front View

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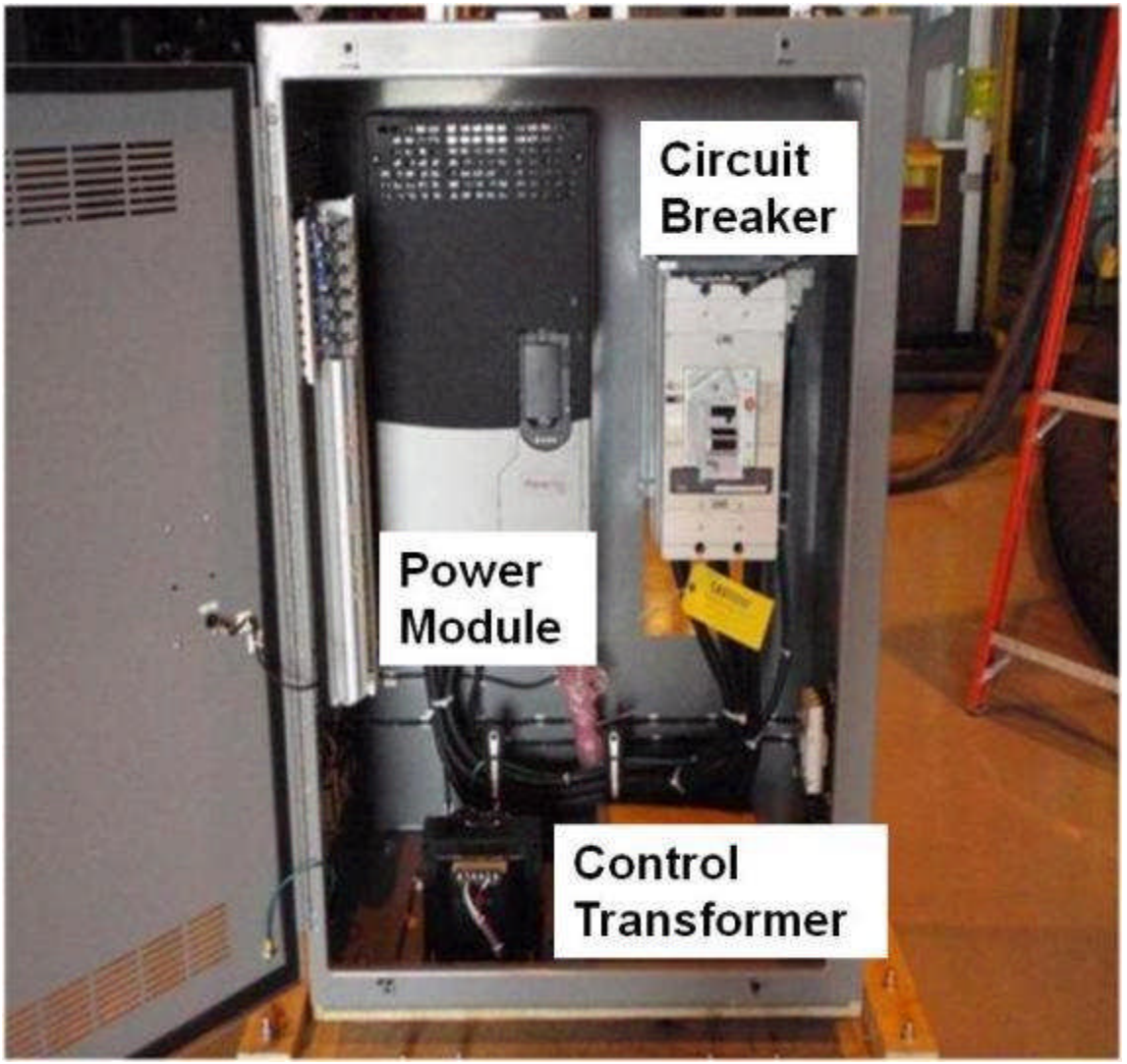

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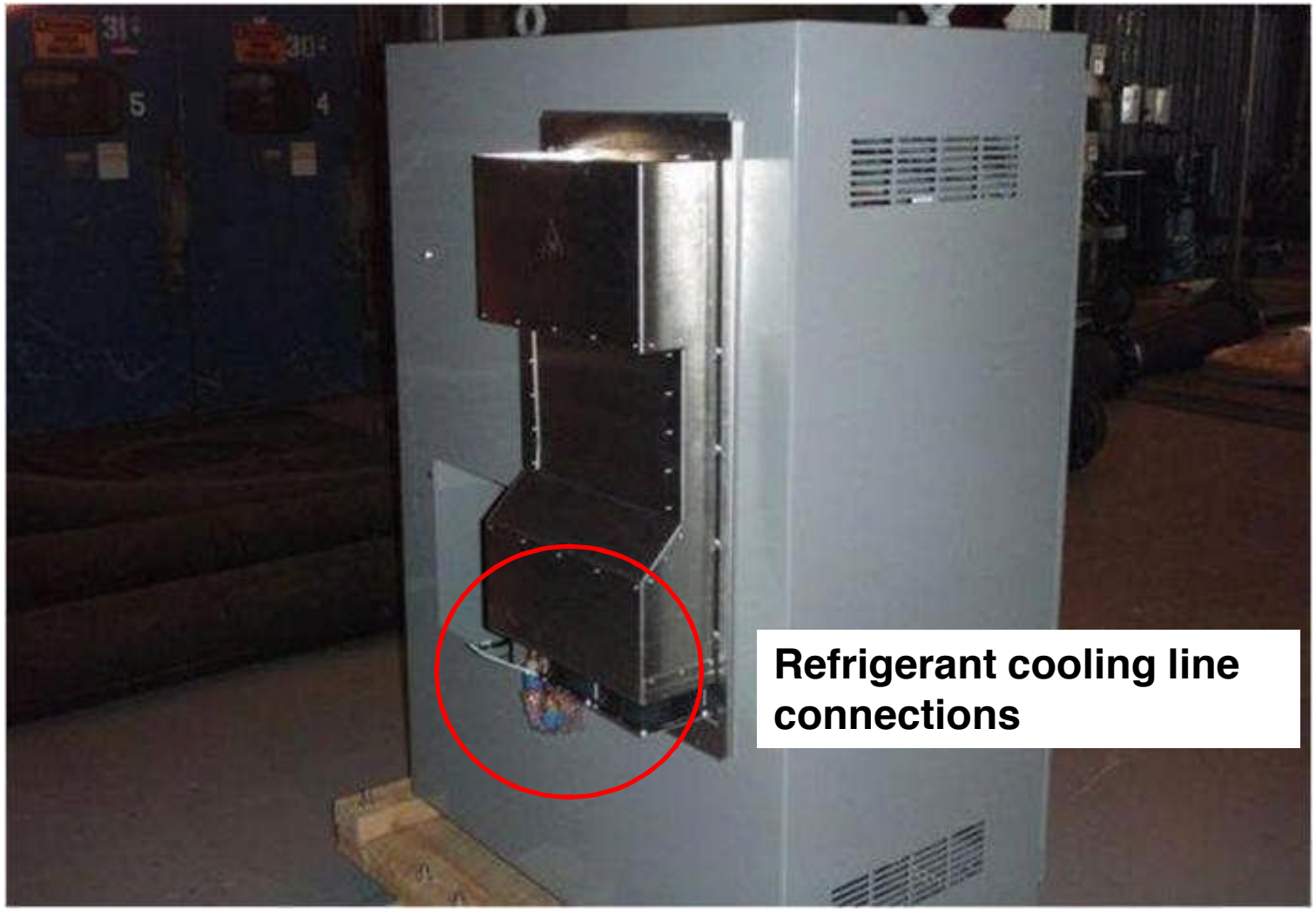
Rear View



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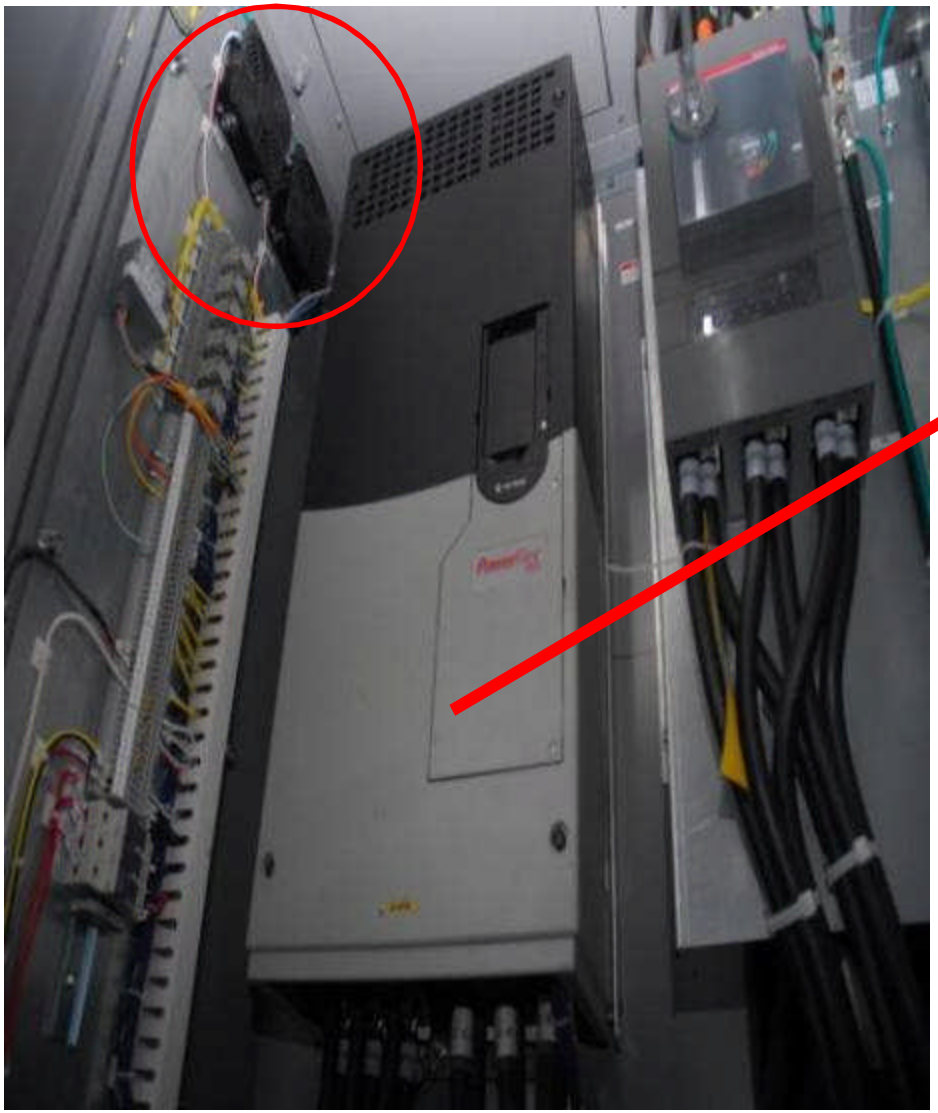
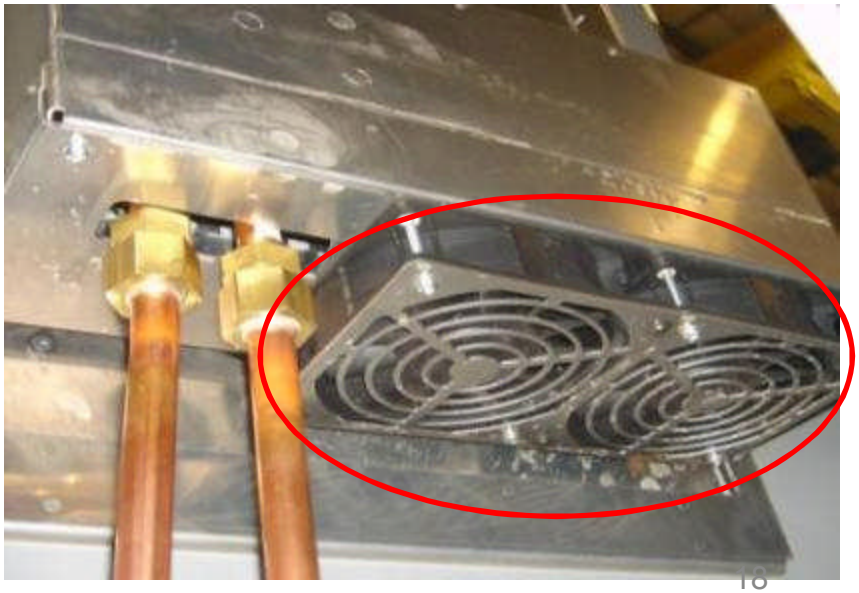
Cooling Fans





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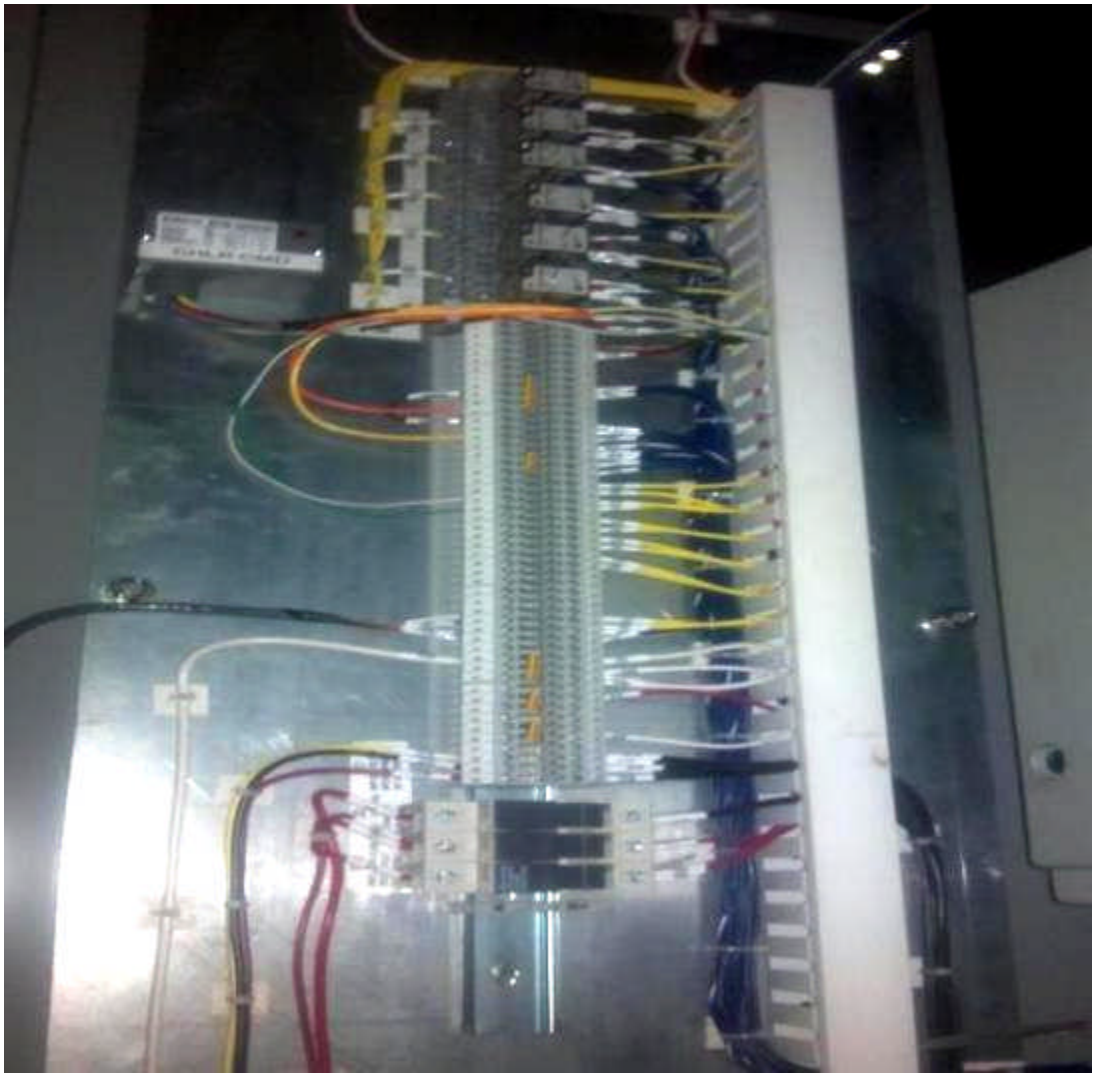
Terminal strip for field wiring



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Refrigerant Cooling with Orifice

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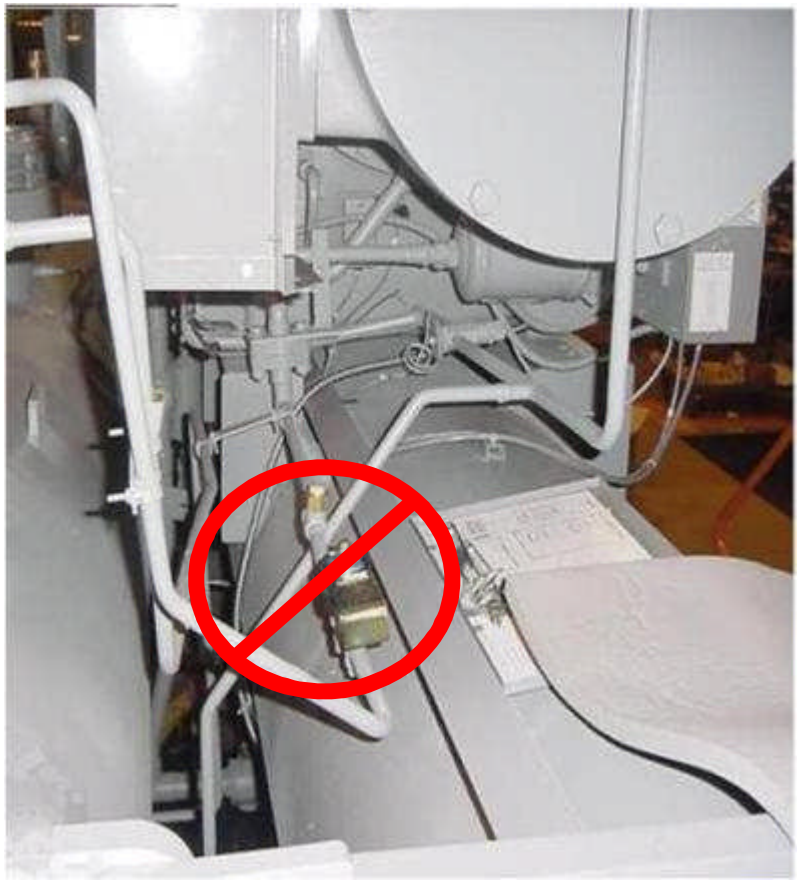
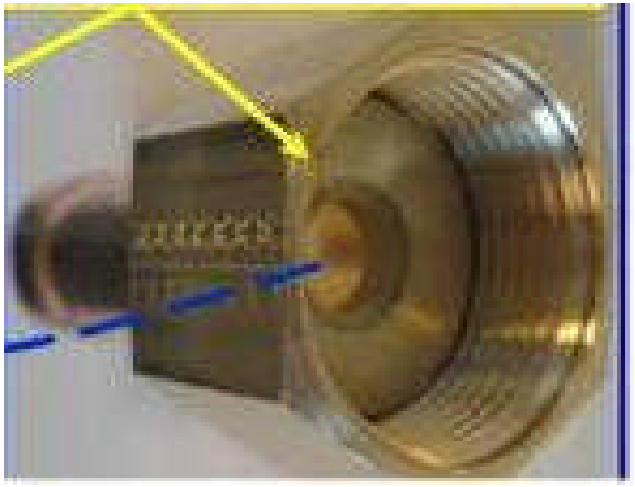


No solenoid valve, it has been replaced with a fixed orifice



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Relative humidity sensor

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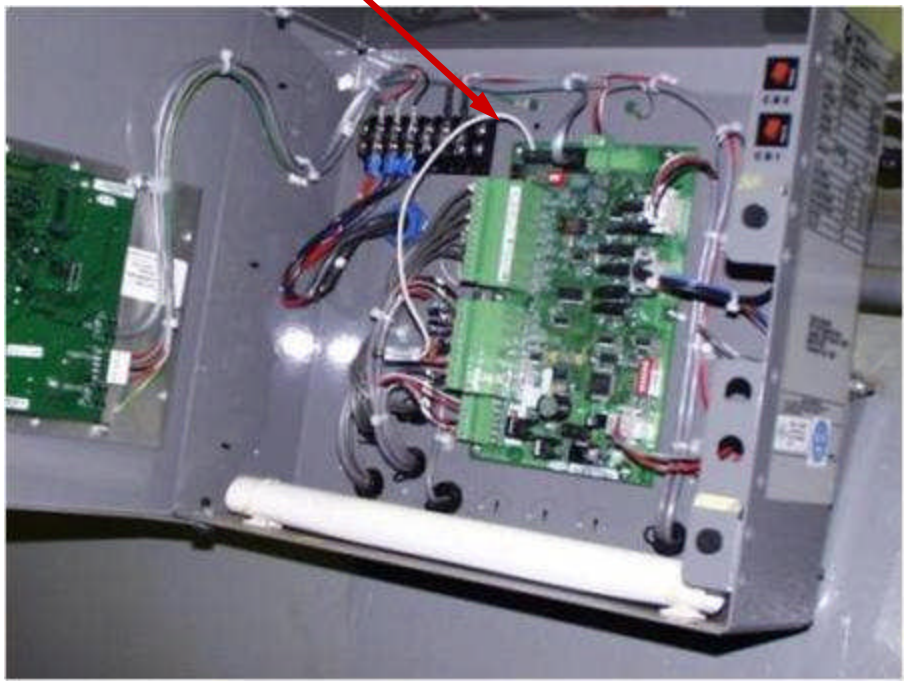
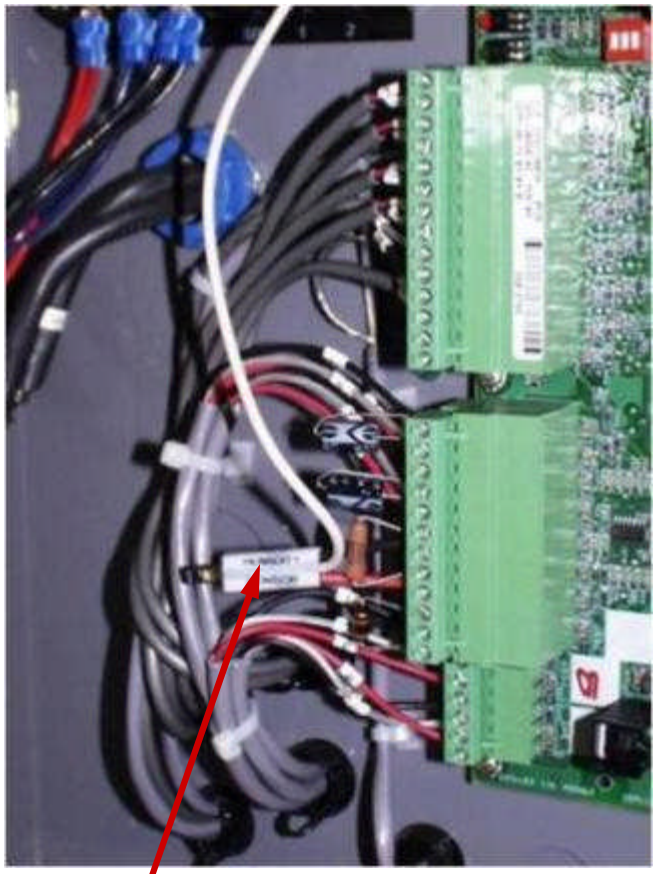
0-5 V Humidity Sensor Output
Wired to Terminals J5-6





Terminals J3-7 and J3-9 Provide 5V
Power Supply to Humidity Sensor

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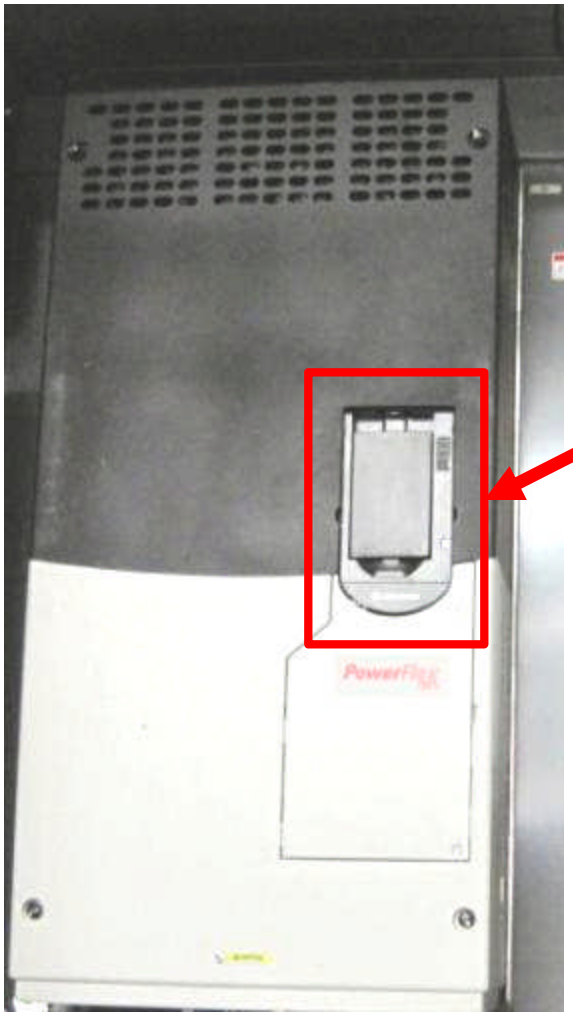
Access



Optional Keypad – not included in standard Carrier Chillers

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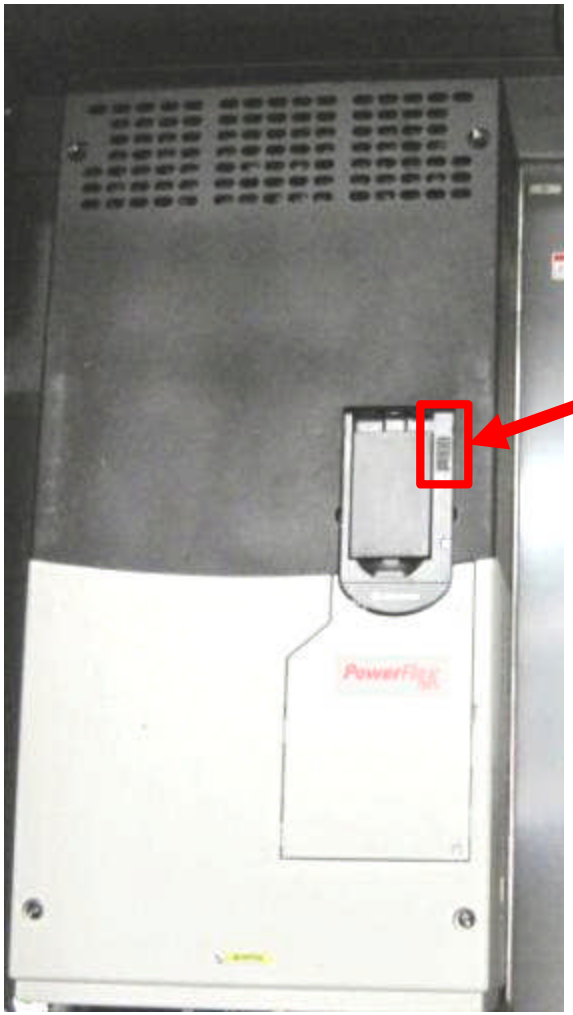
Status Indicator



STS – Status (Drive Status)

ENET (Adapter/network)

LINK (Adapter/Network)

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Status Indicator – Page 9 19/23-2SS manual

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Refer to manual for status

Table 3 — Drive Status Indicator Descriptions

NAME	COLOR	STATE	DESCRIPTION
STS (Status)	Green	Flashing	Drive ready but not running, and no faults are present.
		Steady	Drive running, no faults are present.
	Yellow	Flashing	Drive is not running. A type 2 (non-configurable) alarm condition exists and the drive cannot be started.
		Steady	Drive is not running, a type 1 alarm condition exists. The drive can be started.
	Red	Flashing	A major fault has occurred. Drive cannot be started until fault condition is cleared.
		Steady	A non-resettable fault has occurred.
	Red/Yellow	Flashing Alternately	A minor fault has occurred. When running, the drive continues to run. System is brought to a stop under system control. Fault must be cleared to continue. Use parameter 950 [Minor Flt Config] to enable. If not enabled, acts like a major fault.
	Green/Red	Flashing Alternately	Drive is flash updating.
ENET	None (Unlit)	Off	Adapter and/or network is not powered, adapter is not properly connected to the network, or adapter needs an IP address.
	Red	Flashing	An EtherNet/IP connection has timed out.
		Steady	Adapter failed the duplicate IP address detection test.
	Red/Green	Flashing Alternately	Adapter is performing a self-test.
	Green	Flashing	Adapter is properly connected but is not communicating with any devices on the network.
		Steady	Adapter is properly connected and communicating on the network.
LINK	None (Unlit)	Off	Adapter is not powered or is not transmitting on the network.
	Green	Flashing	Adapter is properly connected and transmitting data packets on the network.
		Steady	Adapter is properly connected but is not transmitting on the network.

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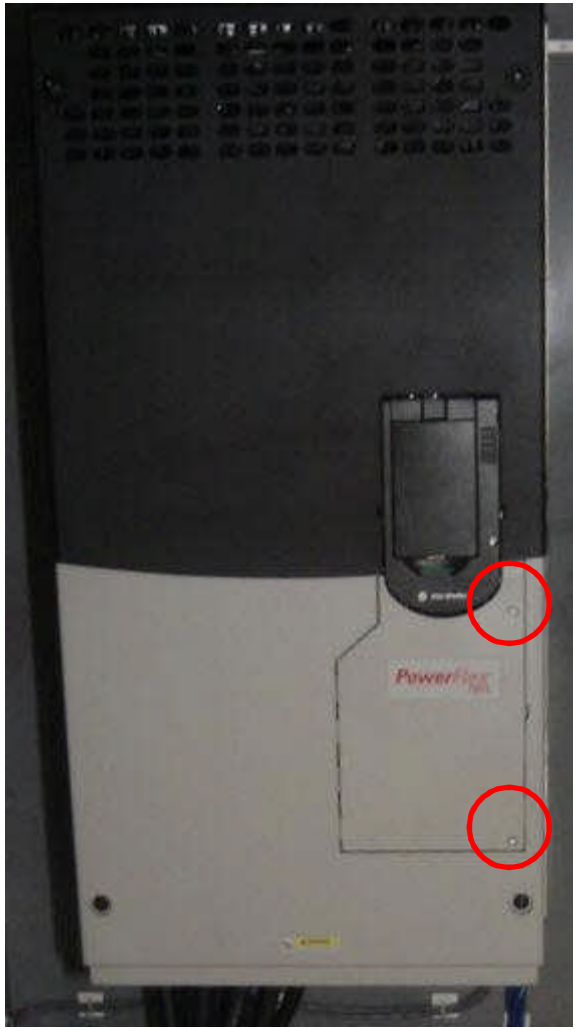
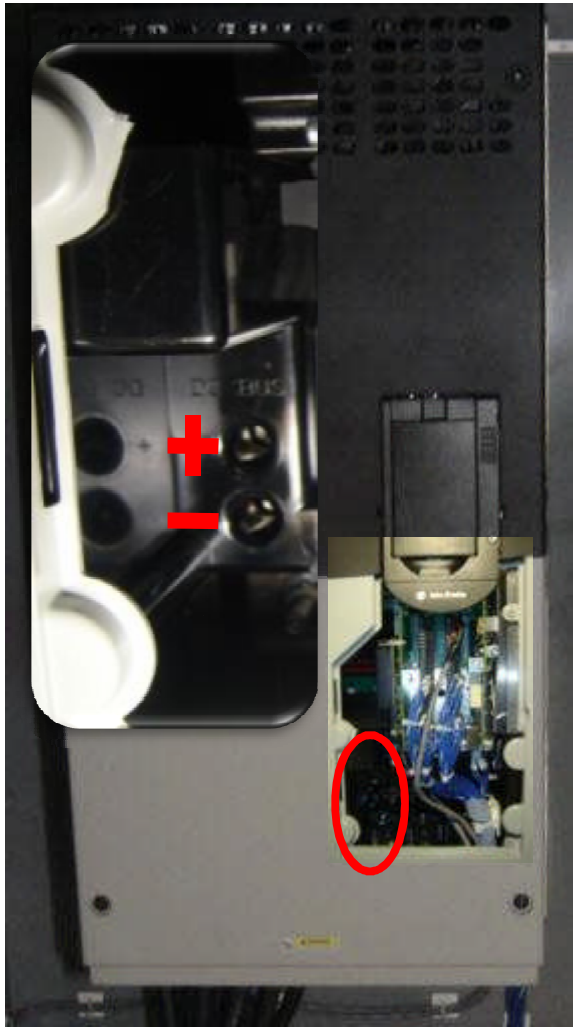
Access





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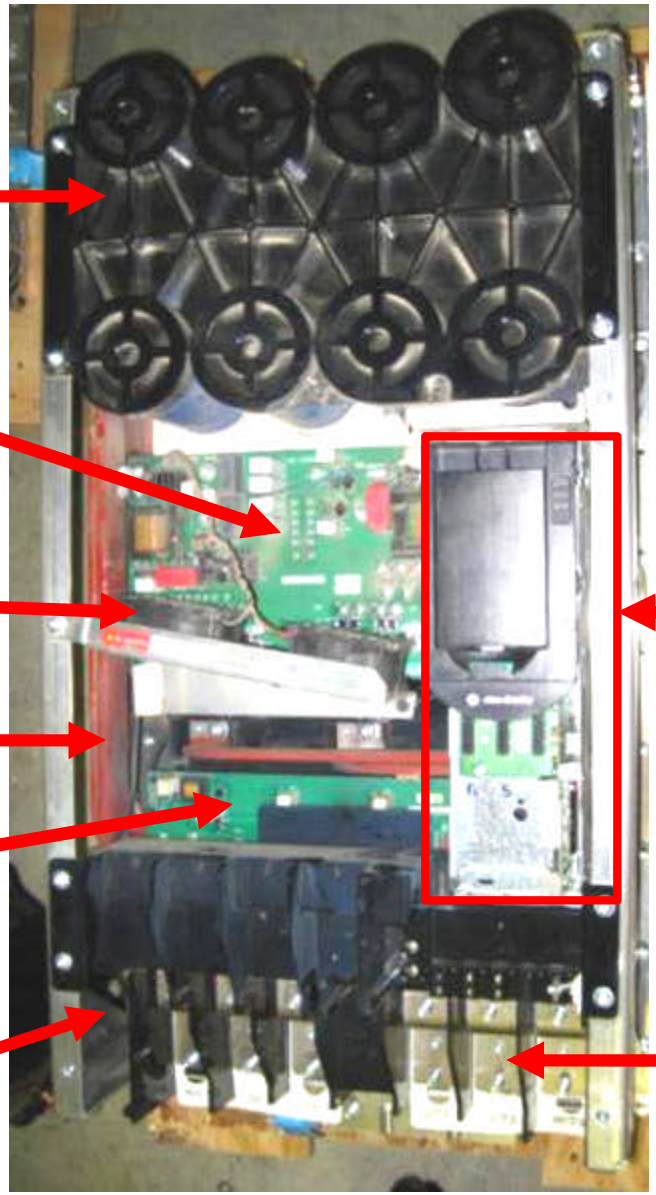
Power Module



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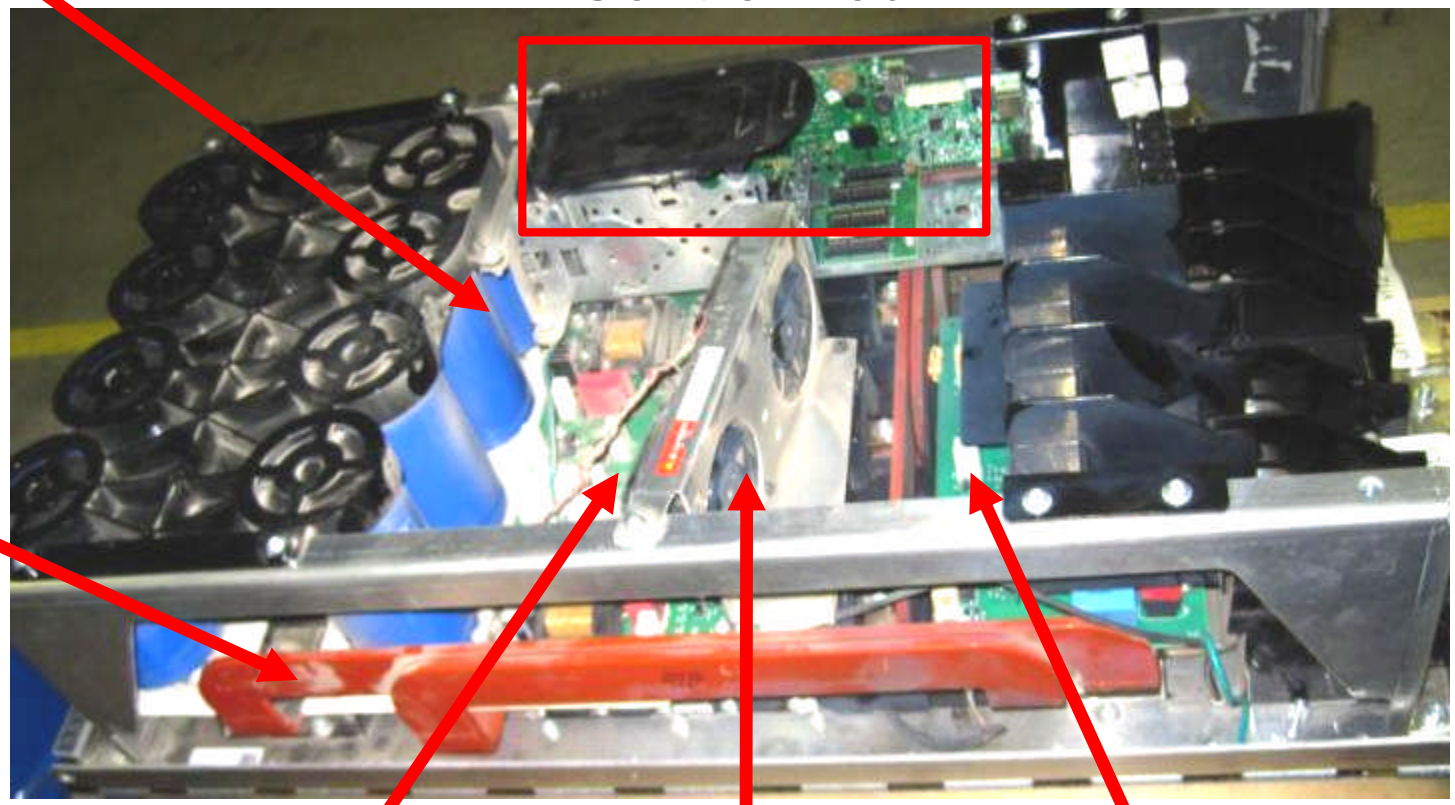
Power Module



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Power Interface Board

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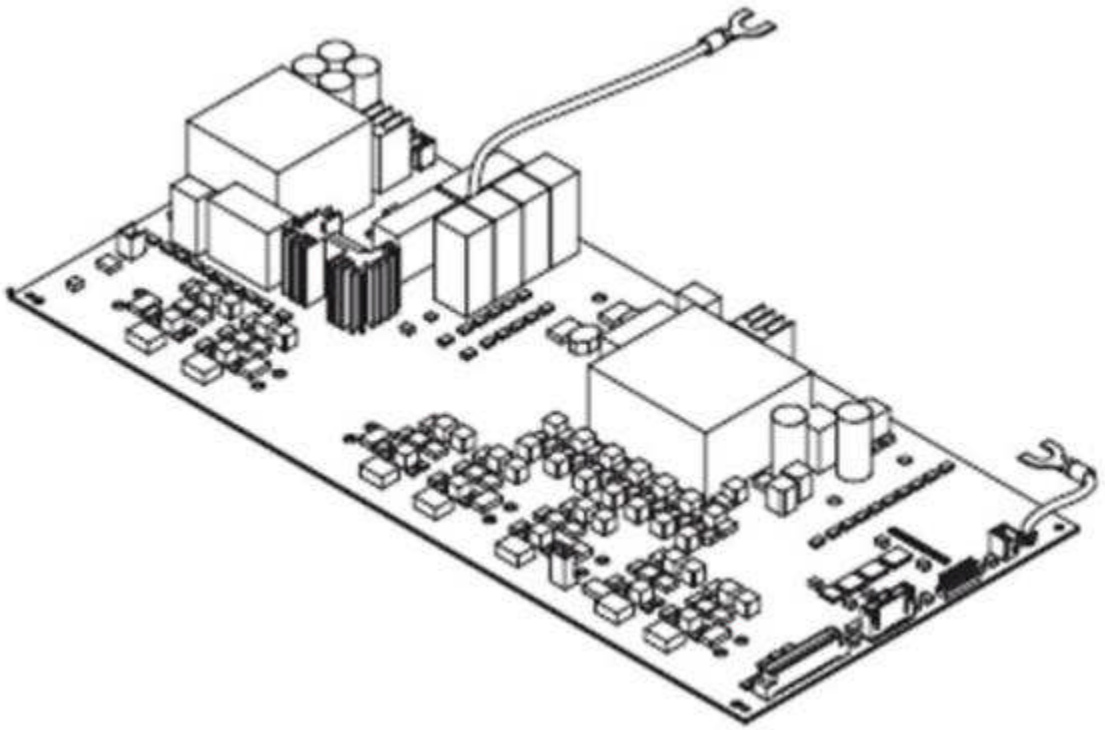

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Pre-charge Board

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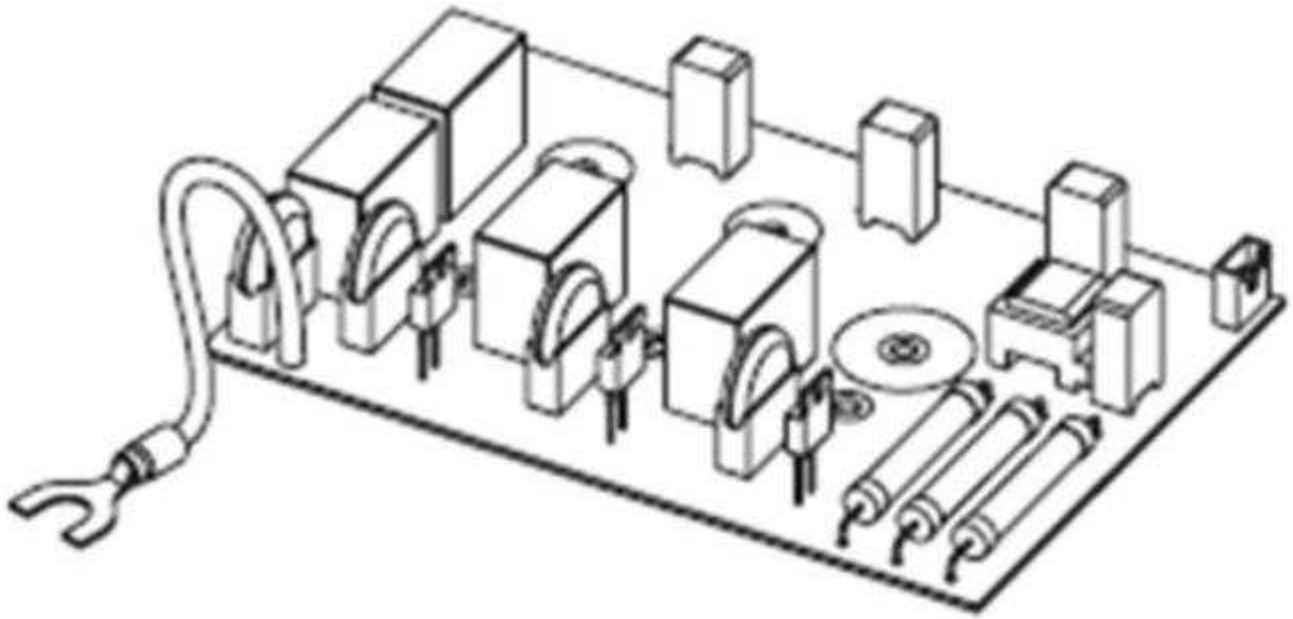

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Conformal Coating

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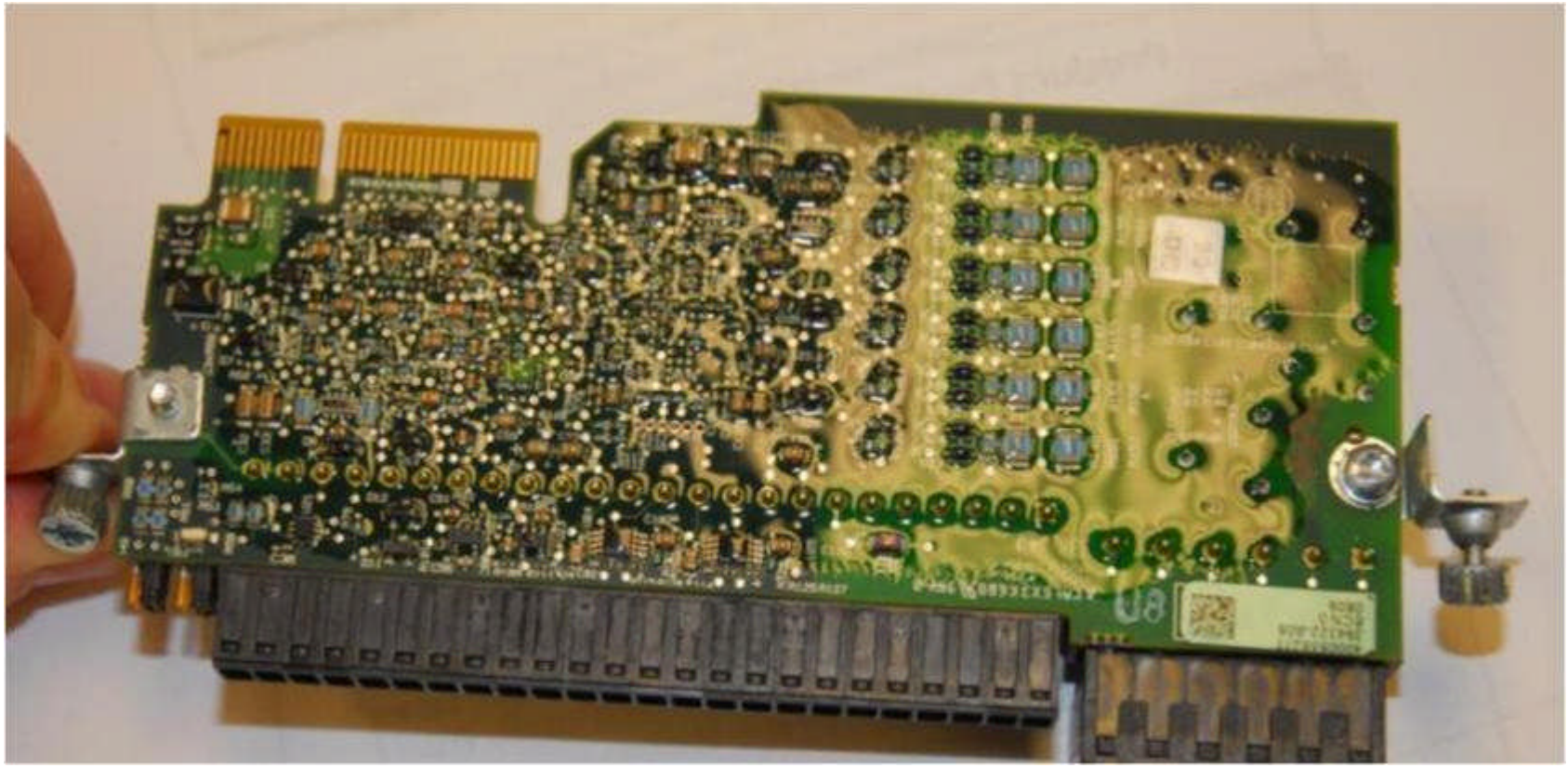

All circuit boards has conformal coating for moisture, dust, chemical, extreme temperature protection

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Control POD

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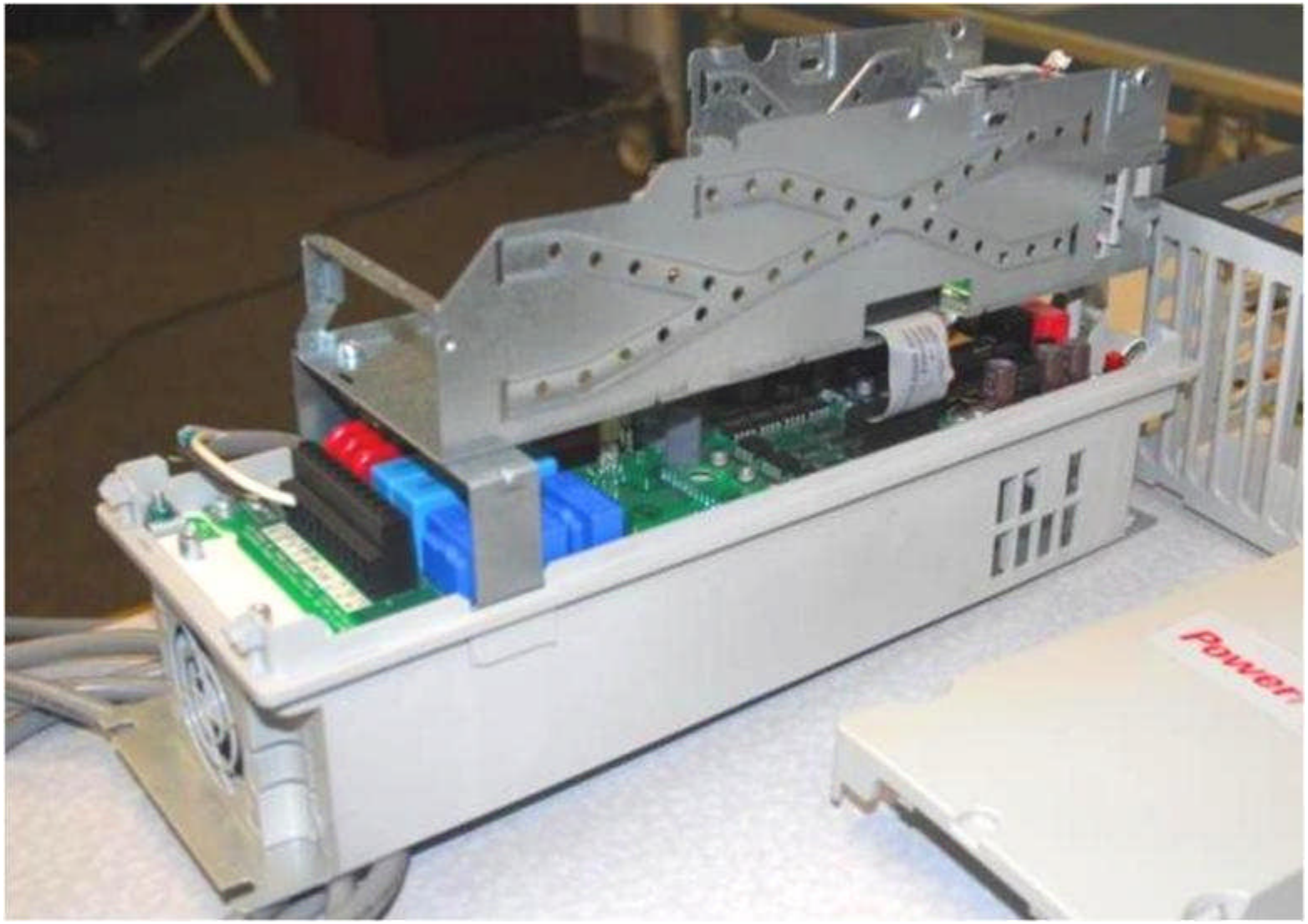

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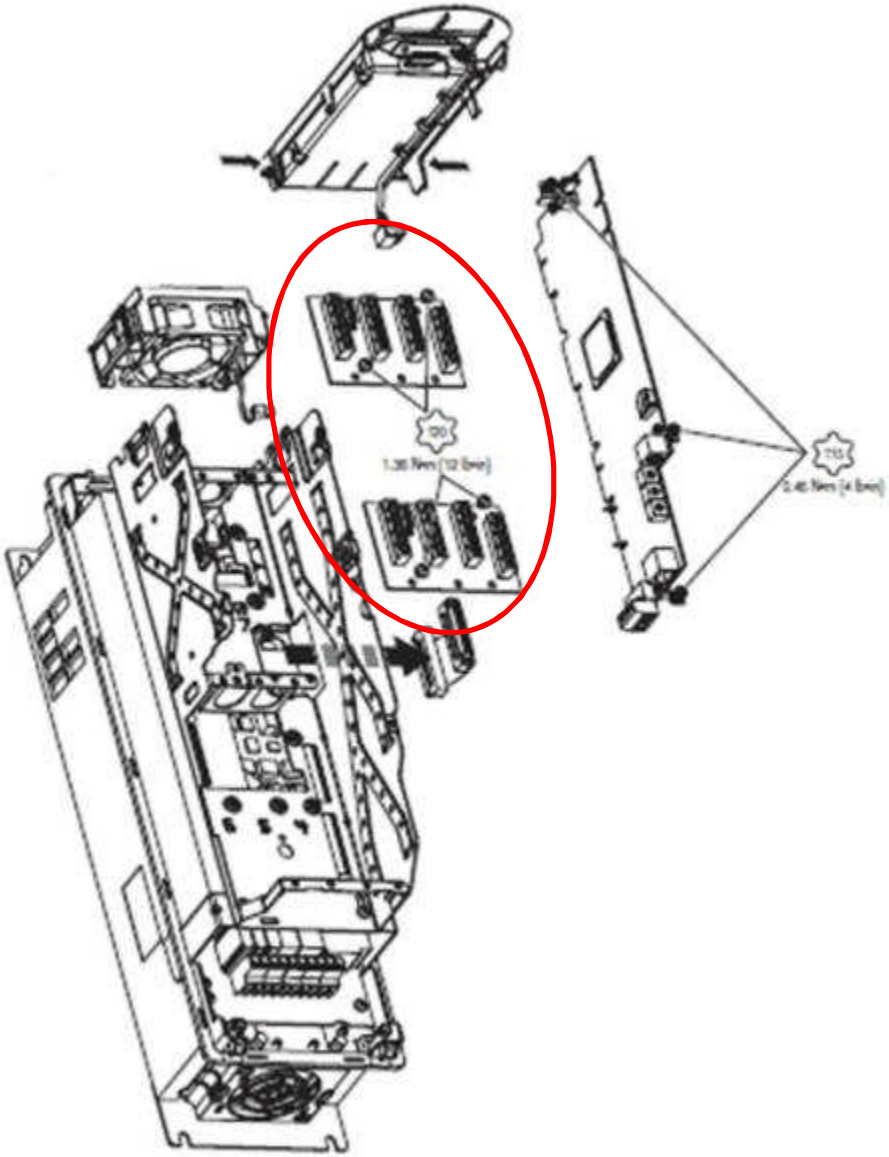
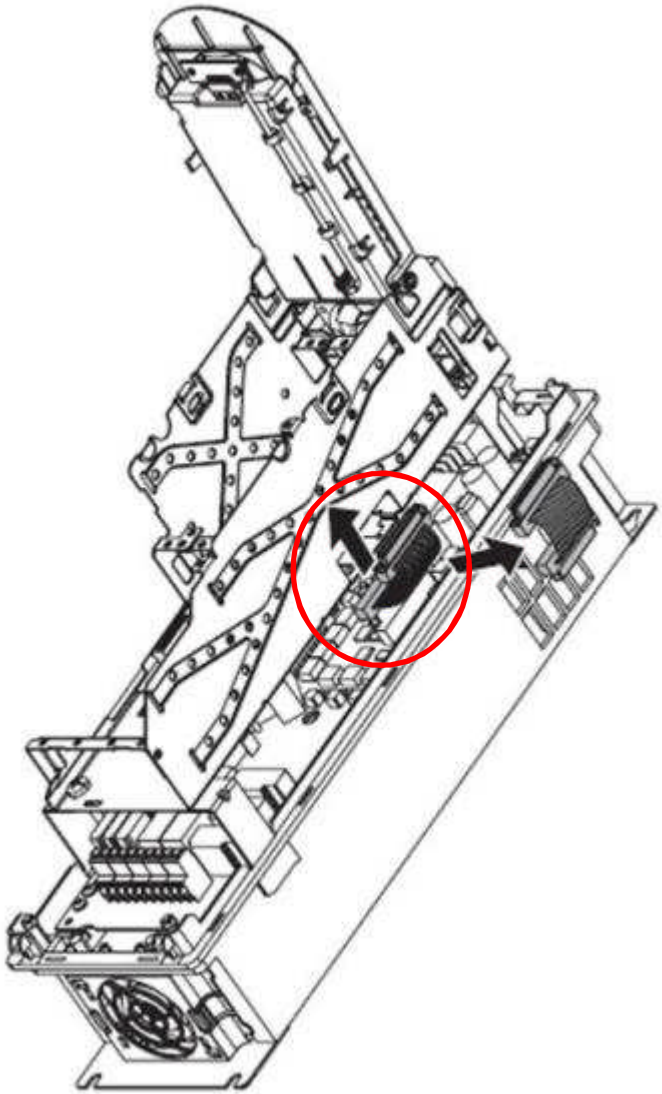
Control POD





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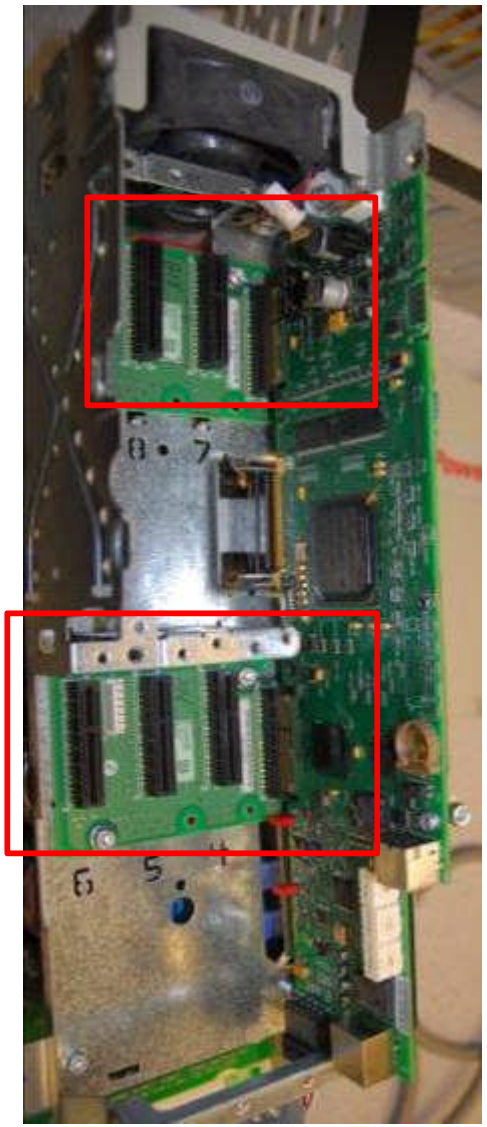
Option Card Slots



There are five (5) available slots for option cards within the control pod.

Carrier is only using the three (3) on the bottom.

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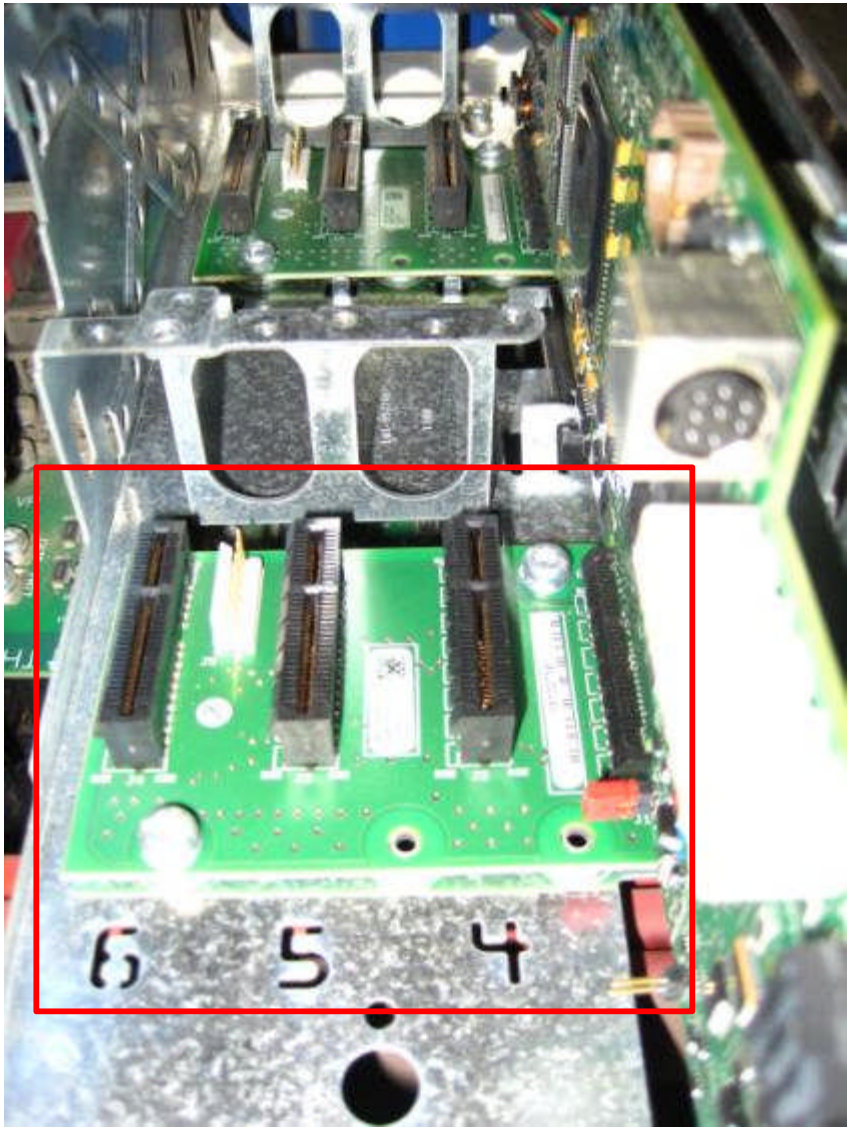
Control POD

Carrier is only using the three (3) on the bottom

These slots are numbered as 4,5,6



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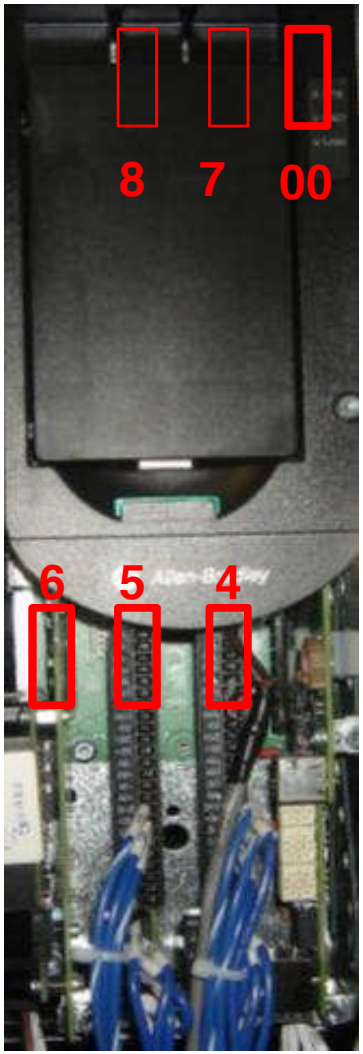
Option Card Slots

Turn to the Experts

The slots correspond to the DPI port number that the card will be assigned

- Slot 00 (DPI Port 00) is a double-height slot reserved for the MCB
- Slot 04 (DPI Port 04) is an I/O card
- Slot 05 (DPI Port 05) is an I/O card
- Slot 06 (DPI Port 06) is the Gateway card
- Slots 07 and 08 are not used
- (Behind the HIM cradle that pivots up.)



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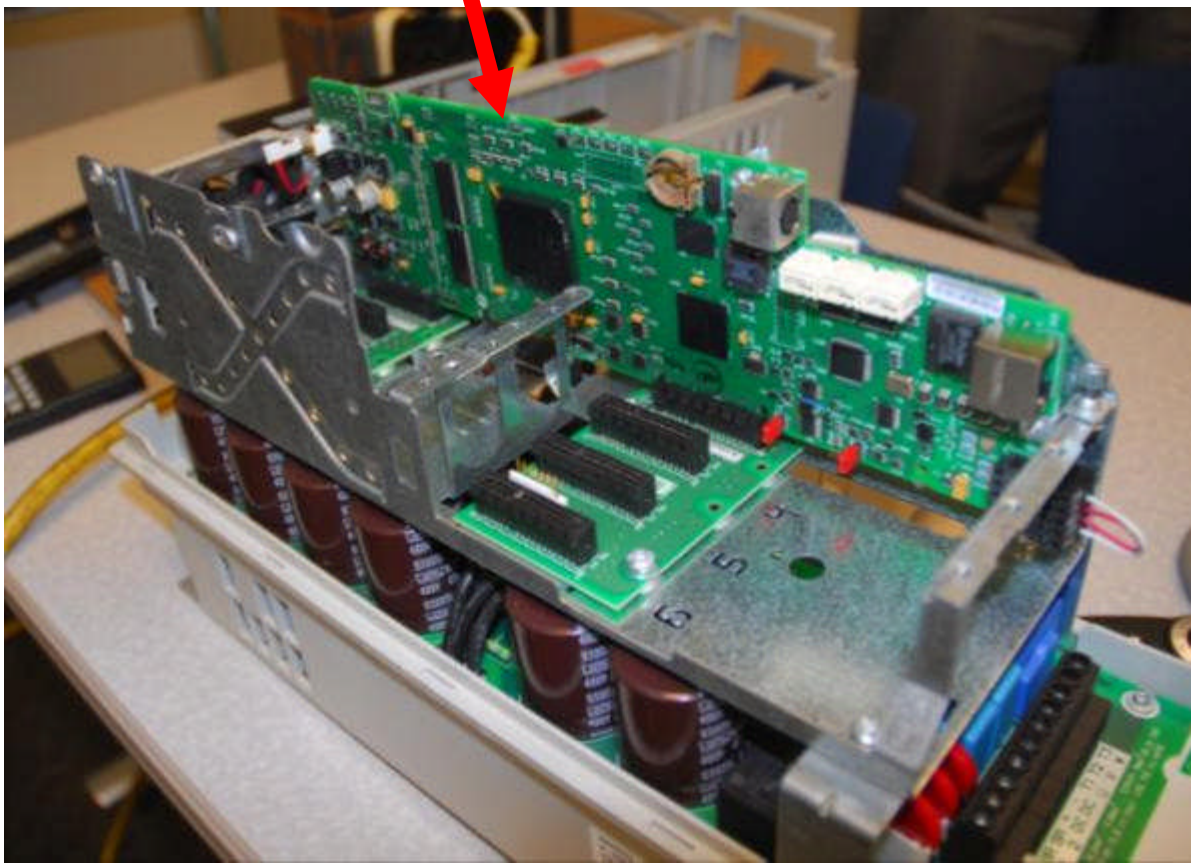
Option Card Slots -- MCB

Slot 00 (DPI Port 00) is a double-height slot reserved for the MCB



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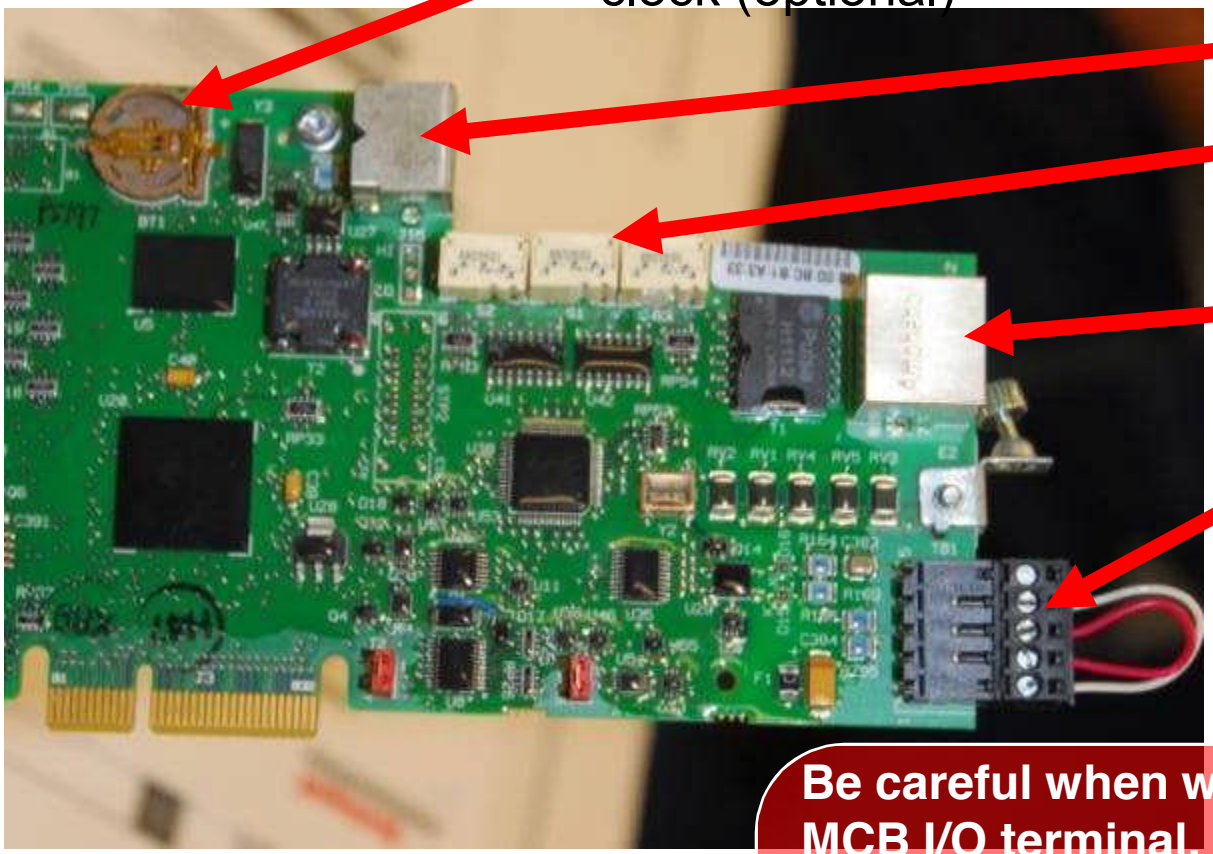
Option Card Slots -- MCB



Slot 00 – Main control board

Wired to – High pressure switch

Be careful when working around the MCB I/O terminal. Pulling on the connected input wires could pull out the terminal and cause a High Pressure Fault.

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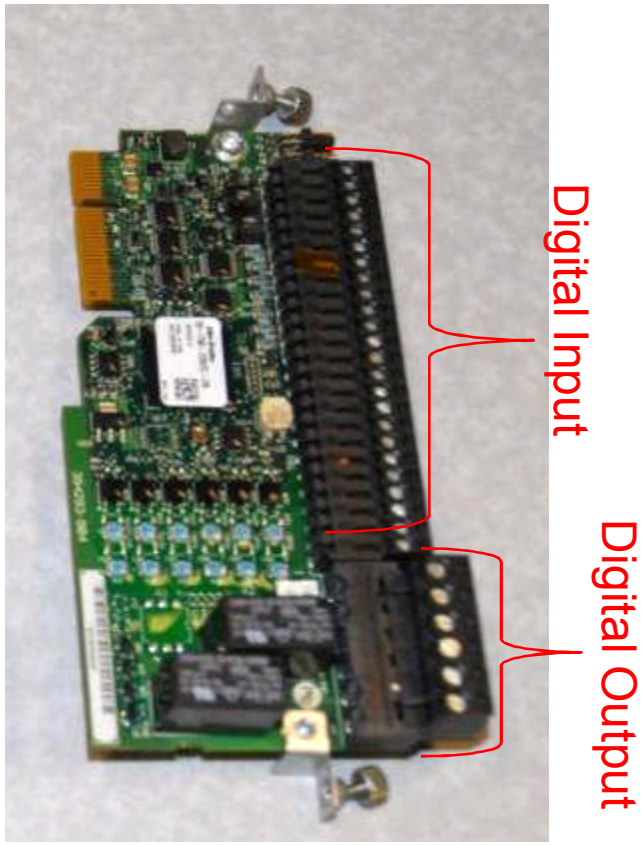
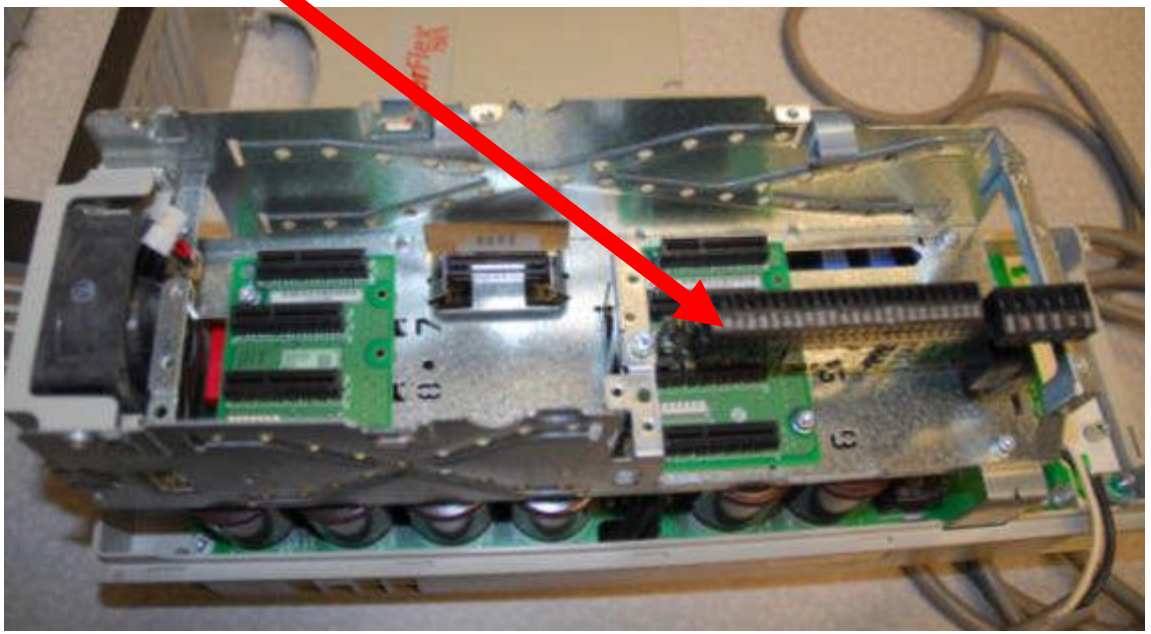
Option Card Slots – I/O Card

Slot 04 (DPI Port 04) is an I/O card
Slot 05 (DPI Port 05) is an I/O card





Slot 4 – I/O board
Wired to -- Spare Safety, ice build, remote, oil interlock, evaporator pump, trip alarm, 4-20ma reference
Slot 5 – I/O board
Wired to -- Condenser pump, Tower fan hi/low

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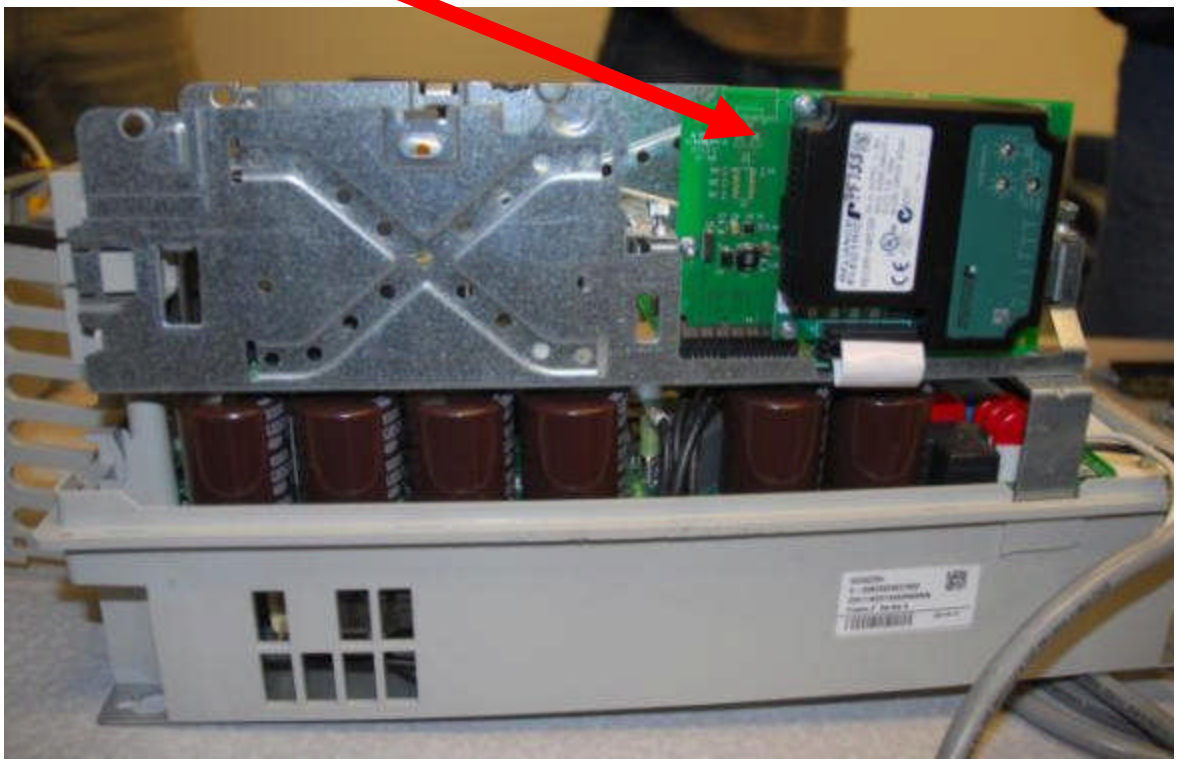
Option Card Slots – Gateway Comm Card

Slot 06 (DPI Port 06) is the Gateway card



Carrier Communication Adapter -- enables communication between ICVC and drive

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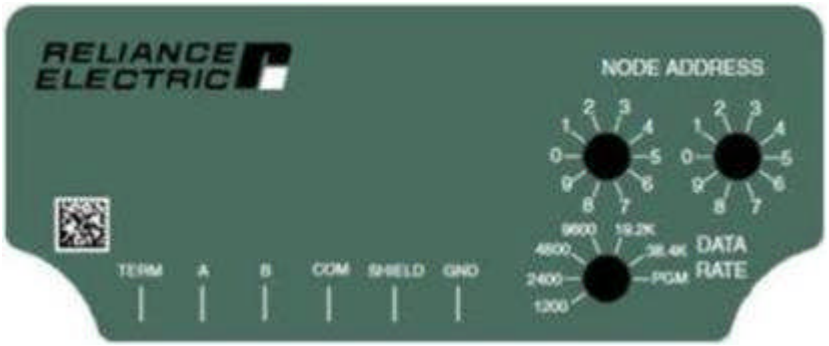
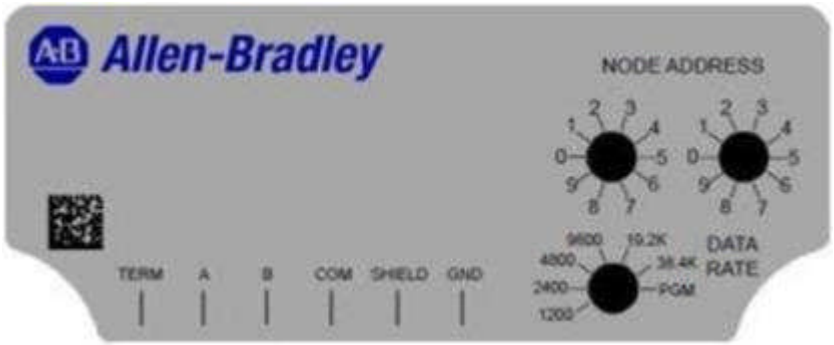
Gateway

- Although the Gateway card for the PowerFlex 755 will look very similar to the Gateway card for the LiquiFlo 2 they are not the same.
- The two different Gateway cards have their own firmware and can not be interchanged.
  - RECOMM-CARRIER: LiquiFlo 2 Gateway
  - 20-750-CARRIER: PowerFlex 755 Gateway





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Input/Output Power

Input Power Supply	Output Power Supply

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DC link Choke

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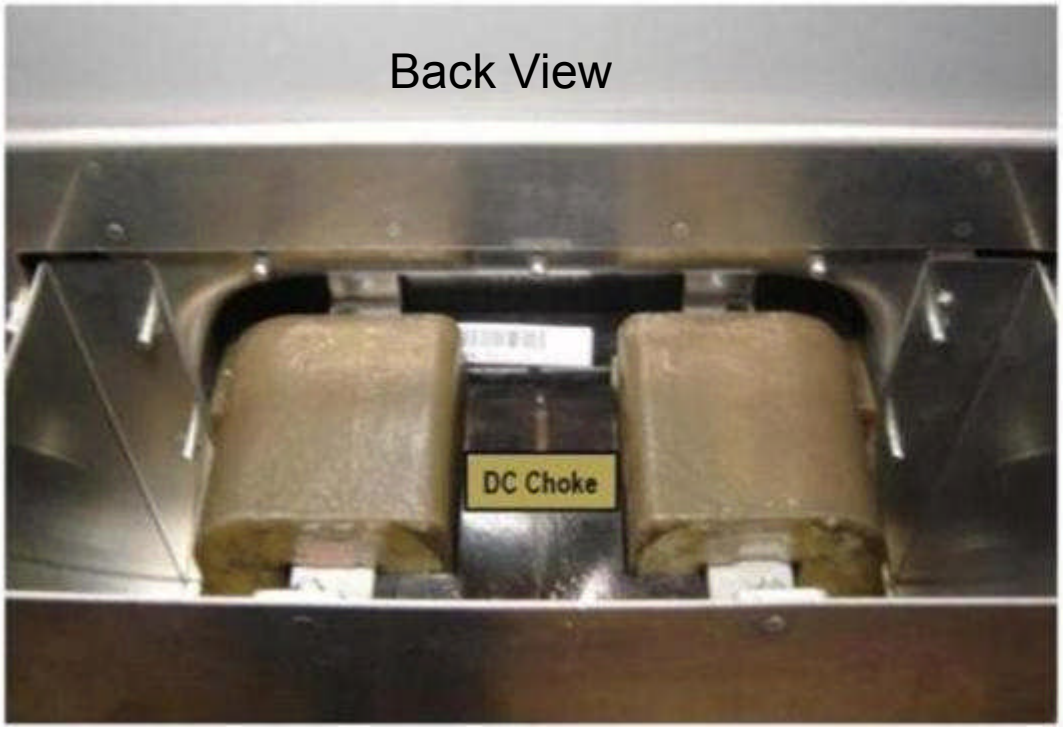
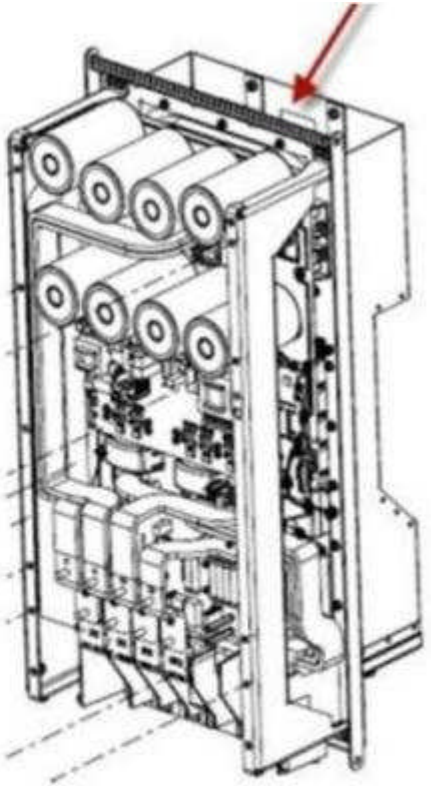
- DC Link Choke (DC bus inductor)





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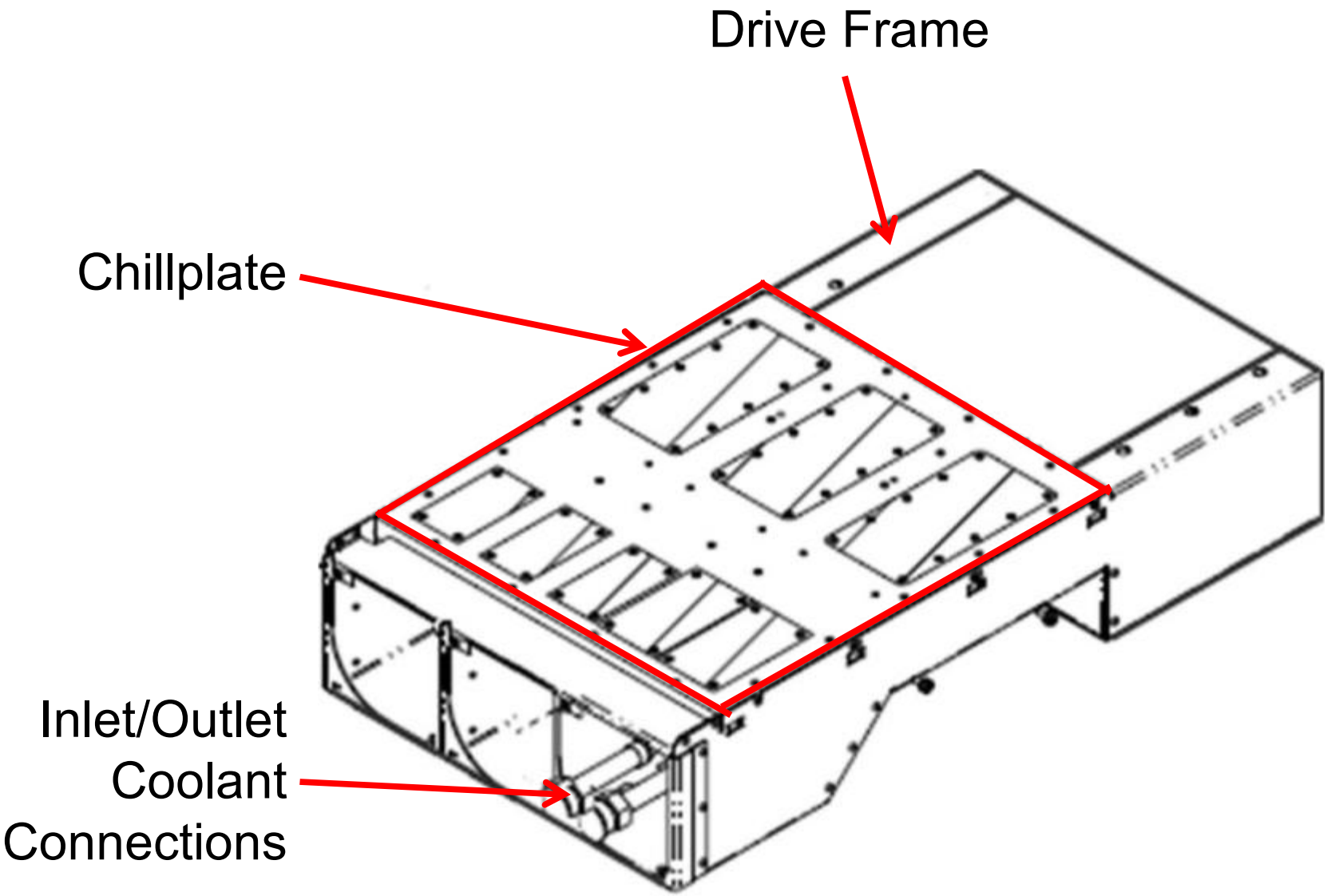

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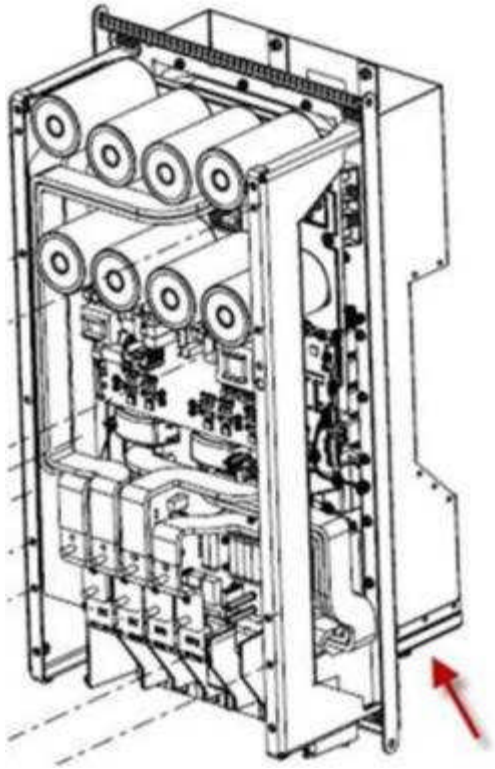
Cooling lines

View from the back of the enclosure:

External Cooling Fans

Coolant Connections (Liquid-Cooled Drive)

Back View



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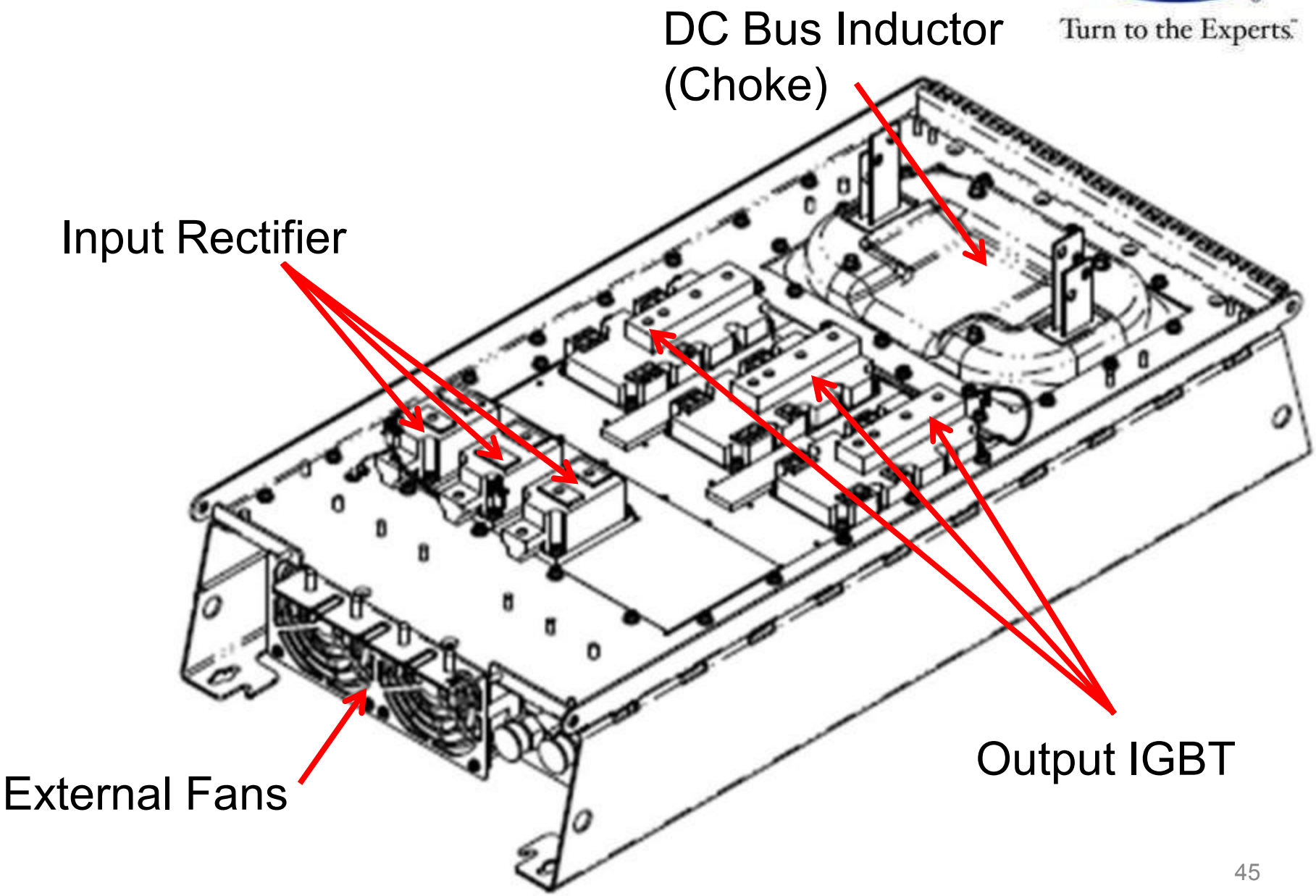

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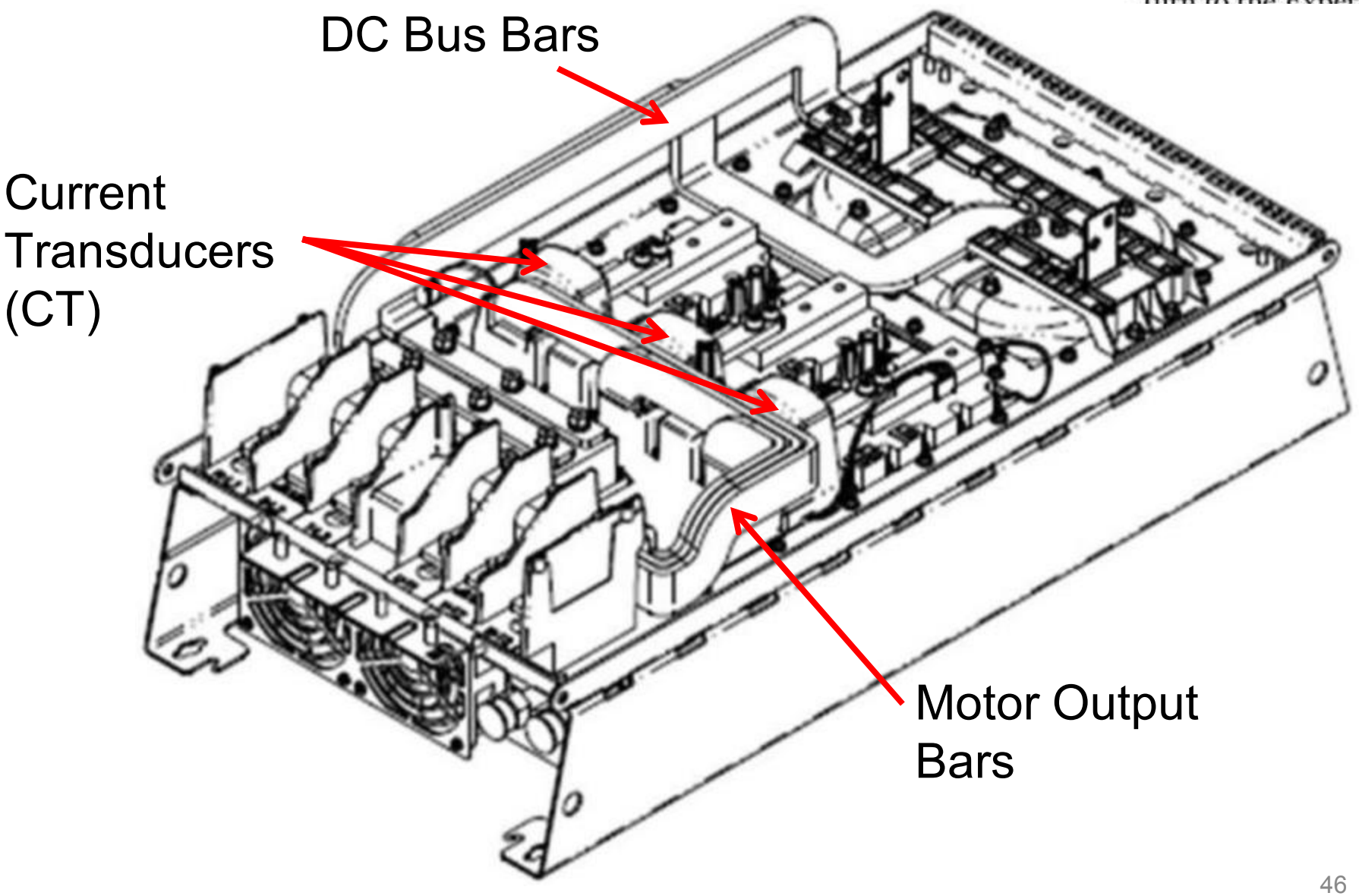

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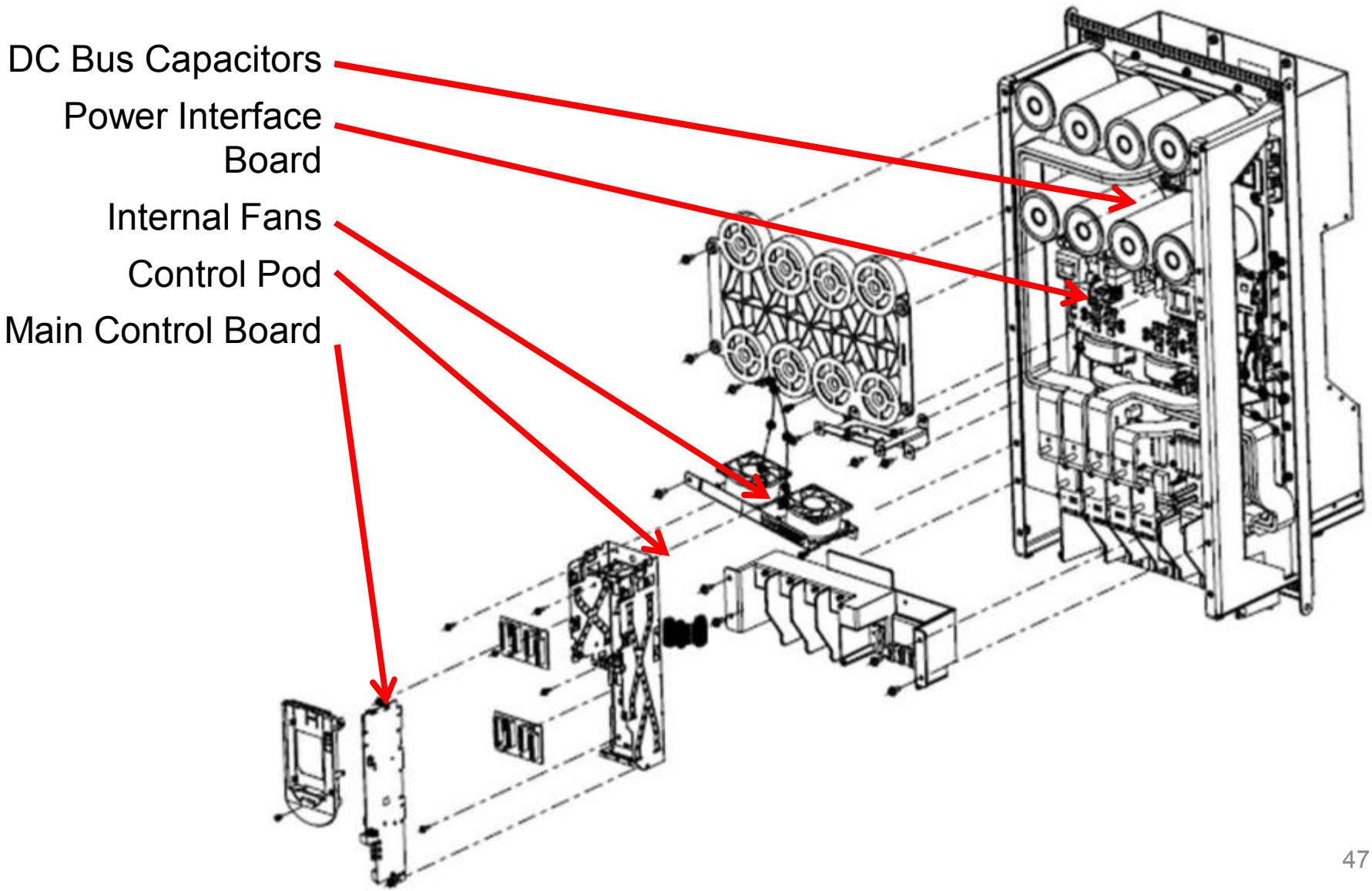

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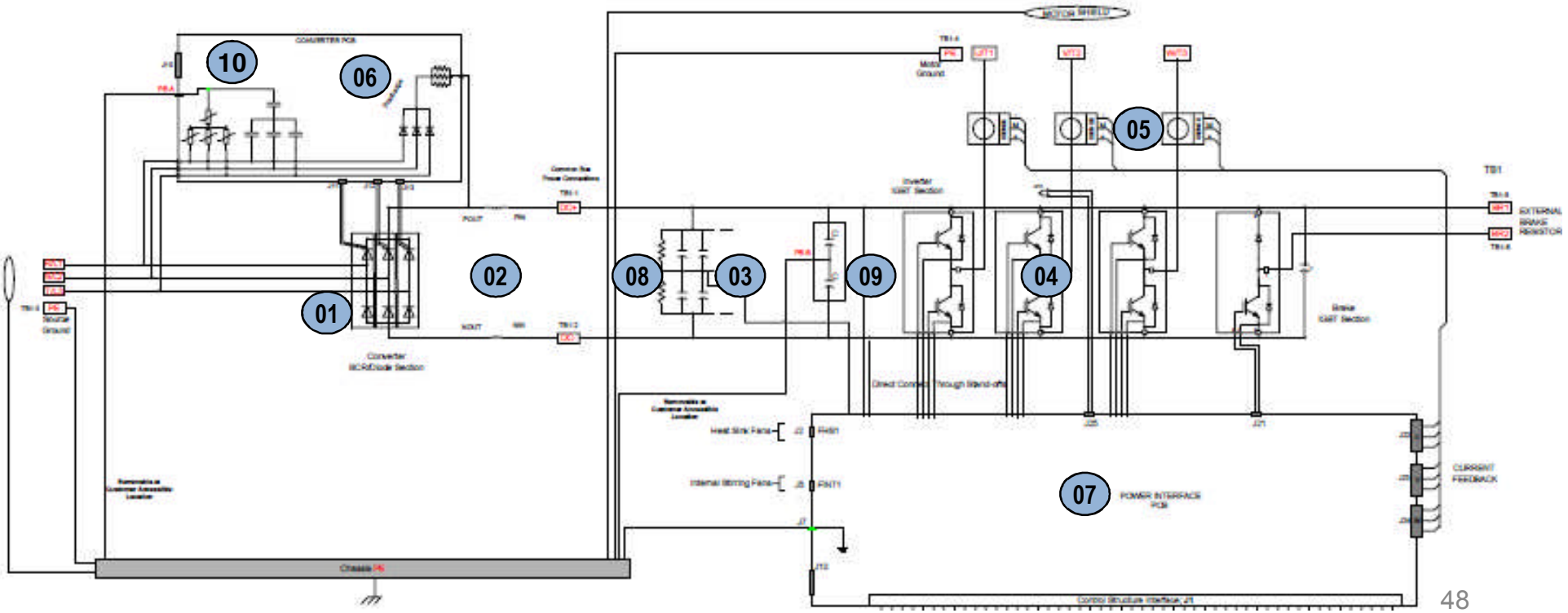
Turn to the Experts

Wiring

1. Converter/Rectifier Section (Diodes/SCR's)
2. DC Choke (Inductor)
3. Bus Capacitors
4. Inverter Section (IGBT's)
5. Current Transducer (CT's)
6. Precharge Board
7. Power Interface Board
8. Balancing Resistors
9. Common Mode Caps
10. MOV's (Metal Oxide Resistors) & EMI Caps



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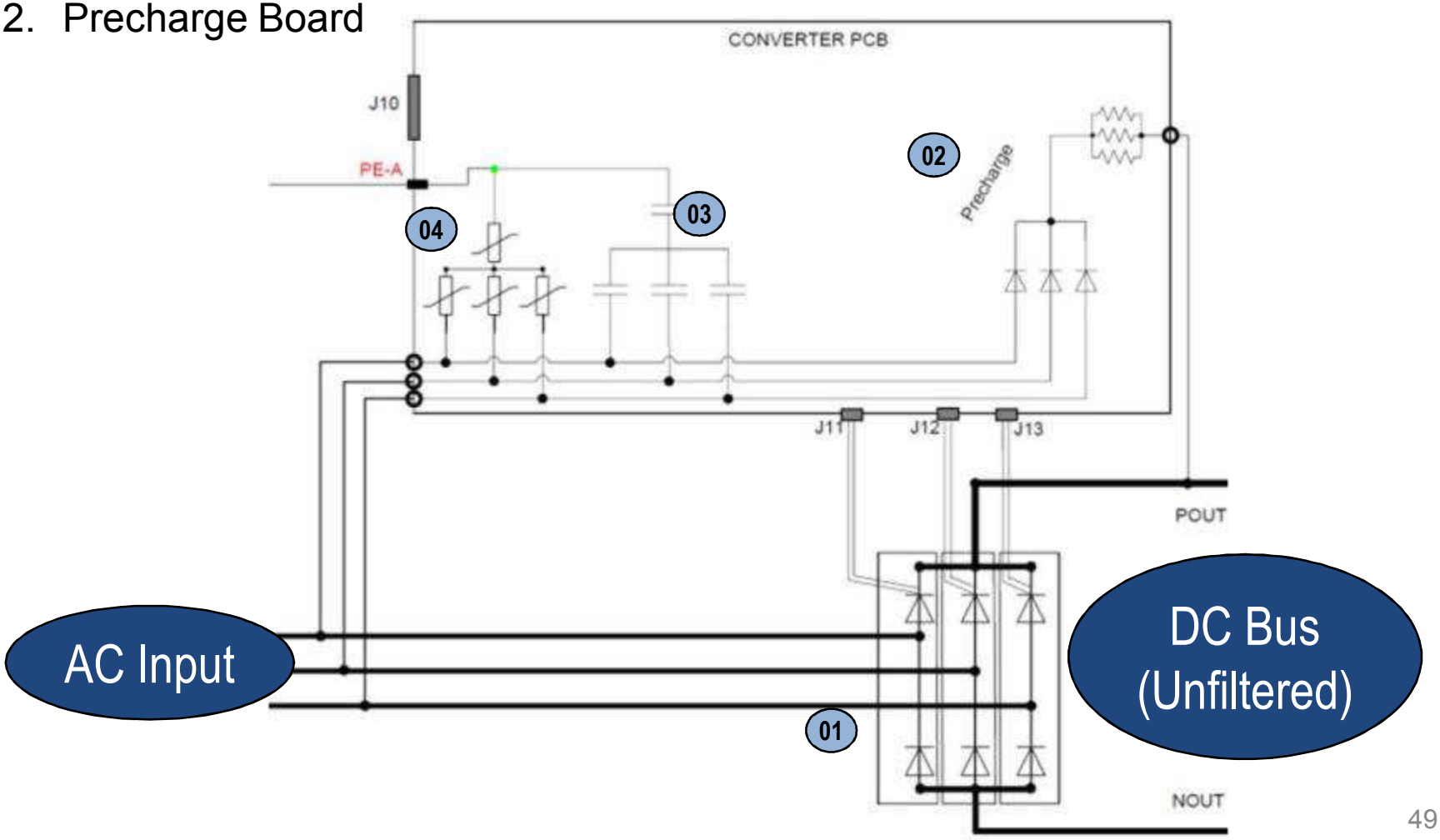
Pre-charge Board

1. Converter/Rectifier Section (Diodes/SCR's)
2. Precharge Board
3. AC EMI Capacitors
4. MOV's (Metal Oxide Resistors)



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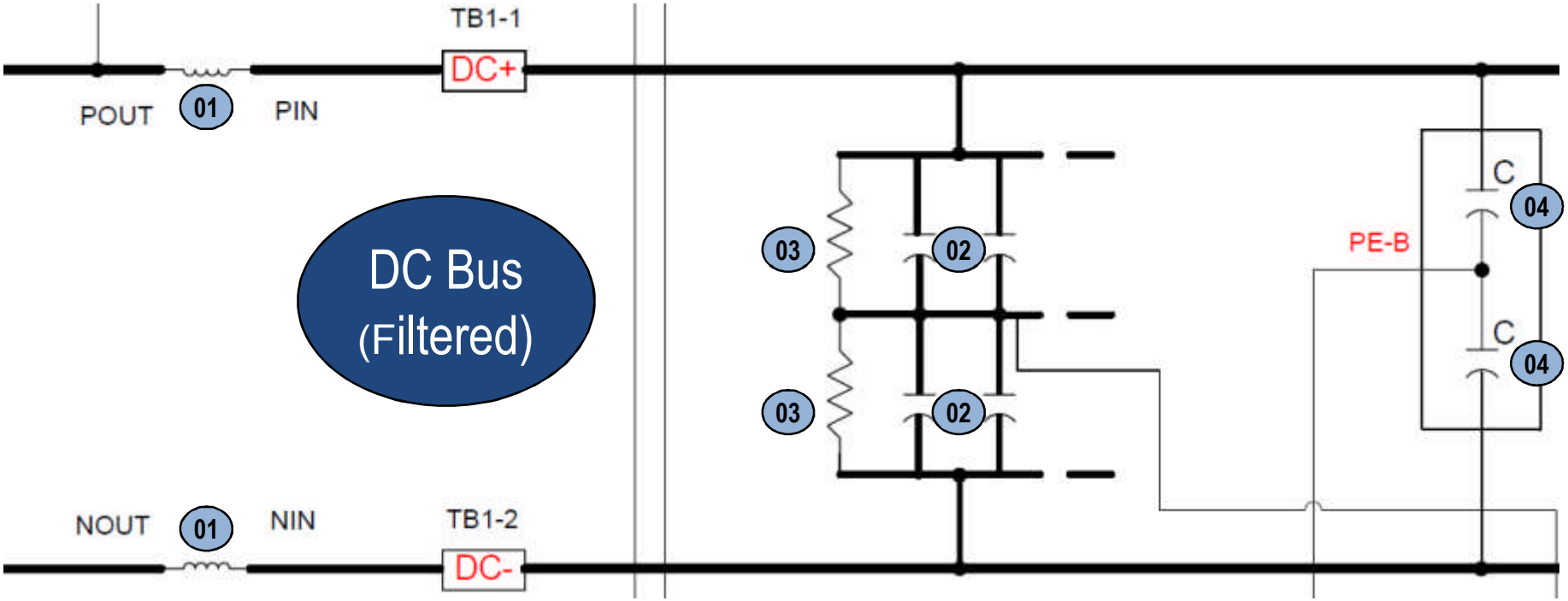
DC Bus

1. DC Choke (Inductors)
2. Bus Capacitors
3. Balancing Resistors
4. Common Mode Caps



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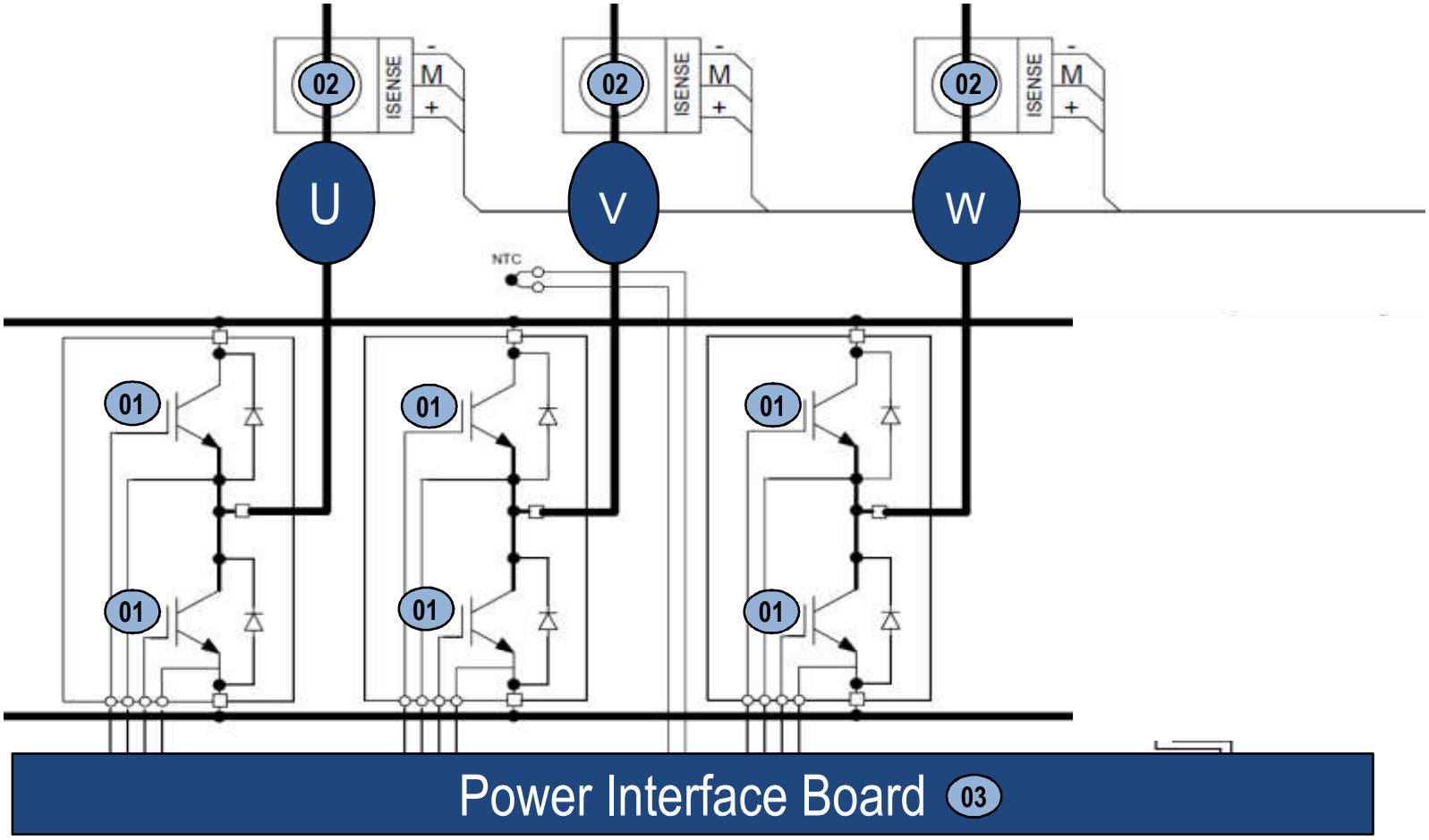
IGBT

1. Inverter Section (IGBT's)
2. Current Transducer (CT's)
3. Power Interface Board



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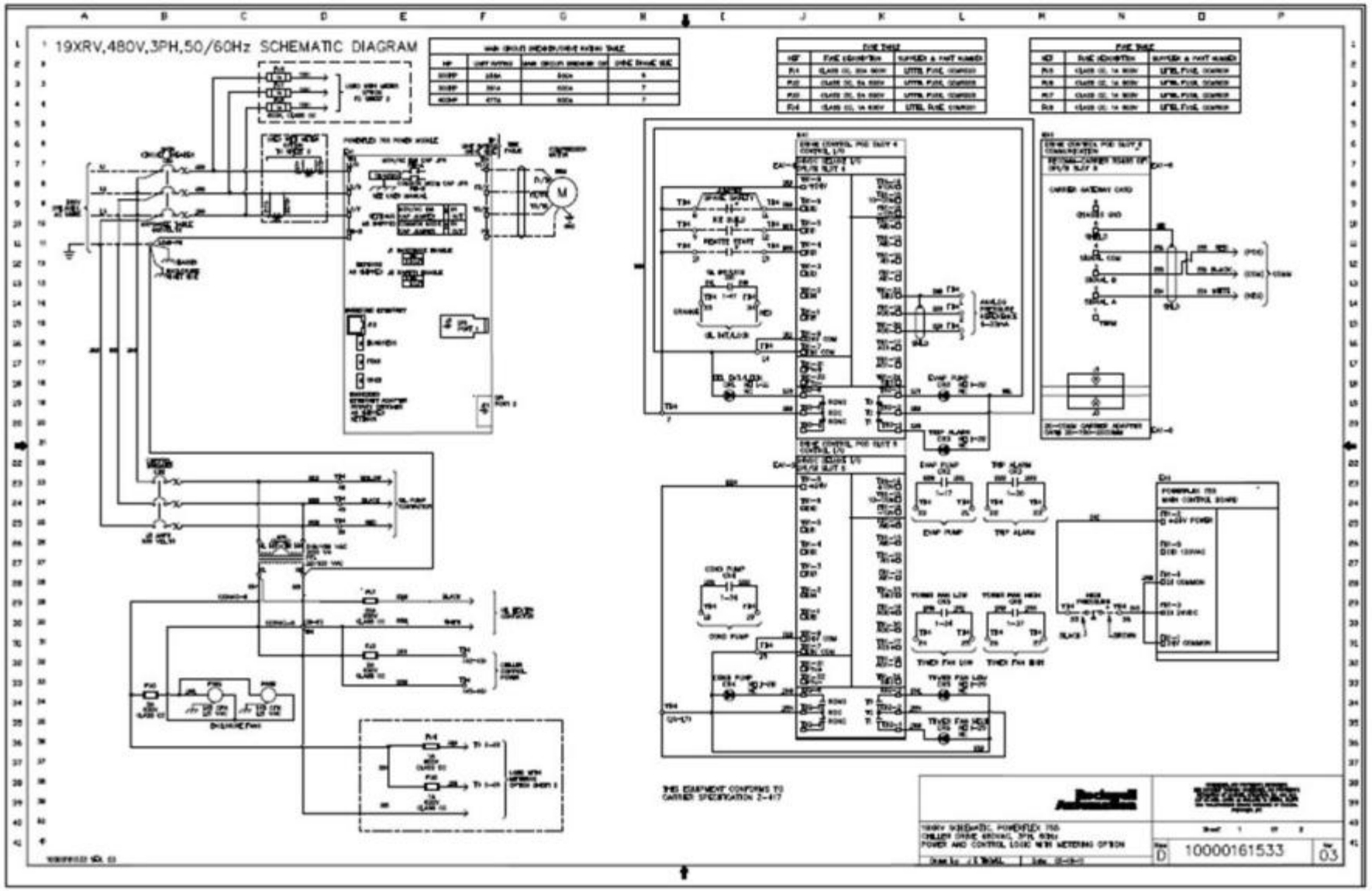
19XRV Drive control wiring diagram -- #10000161533



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Spare Safety

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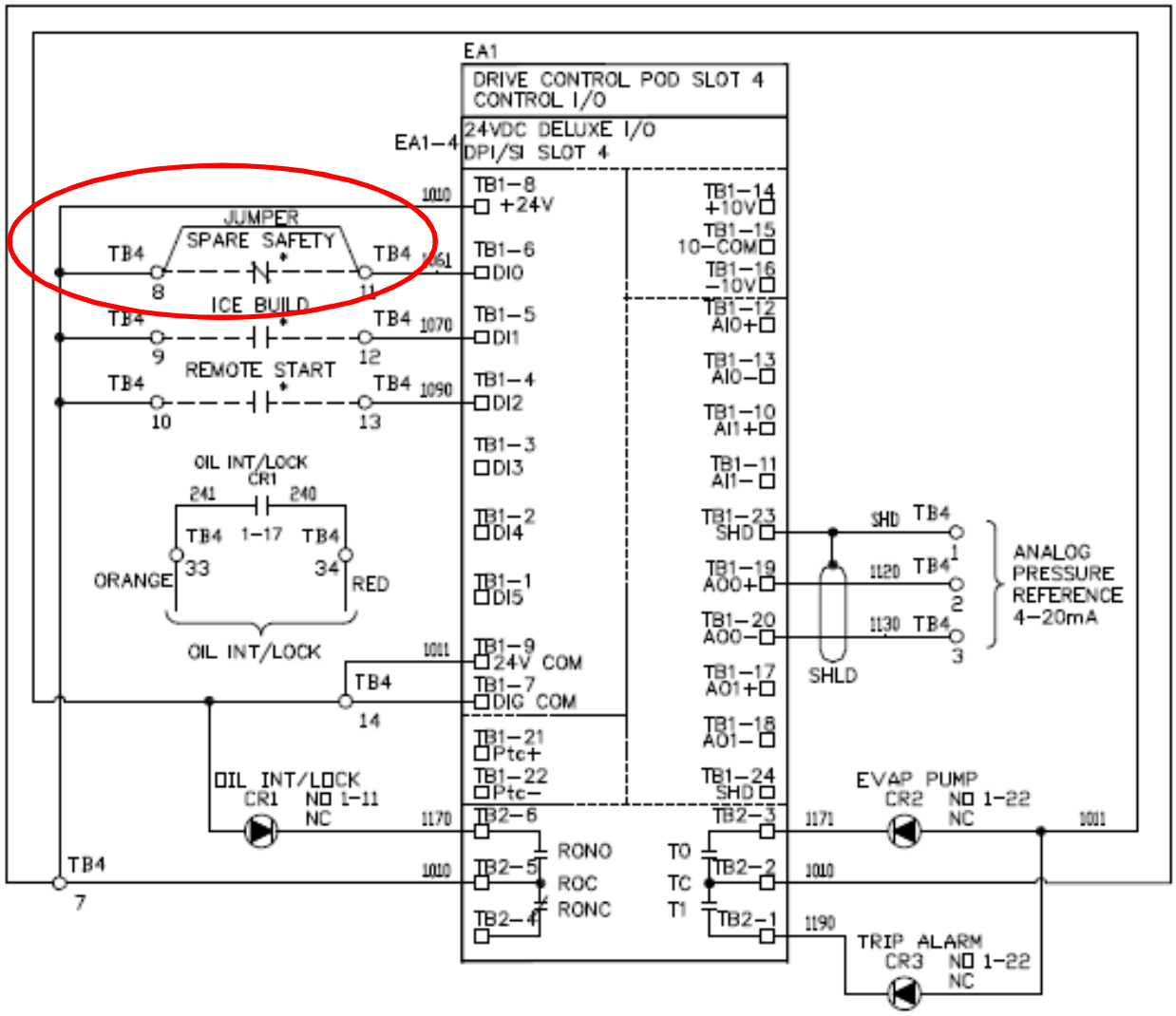

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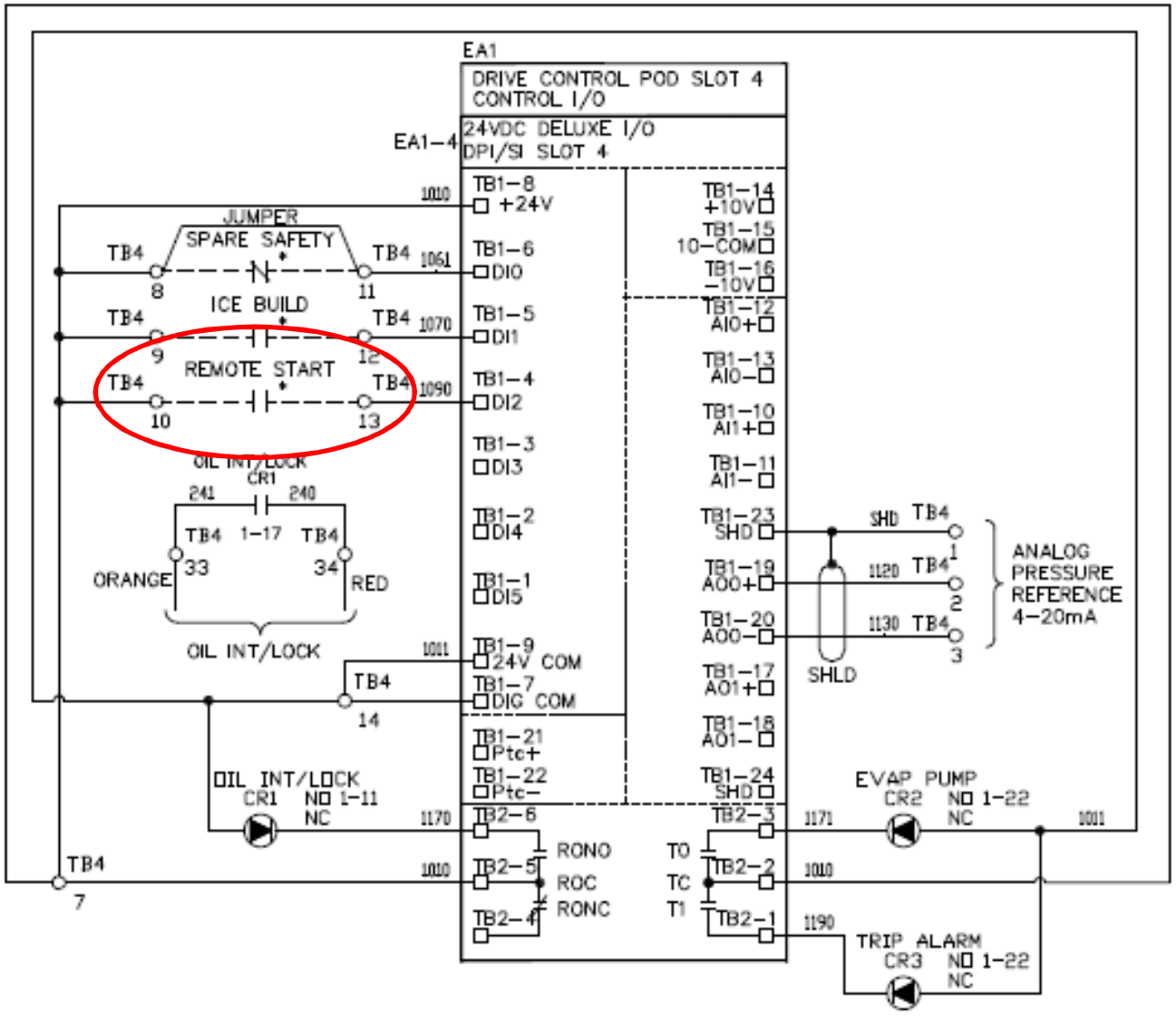
Remote Start/Stop



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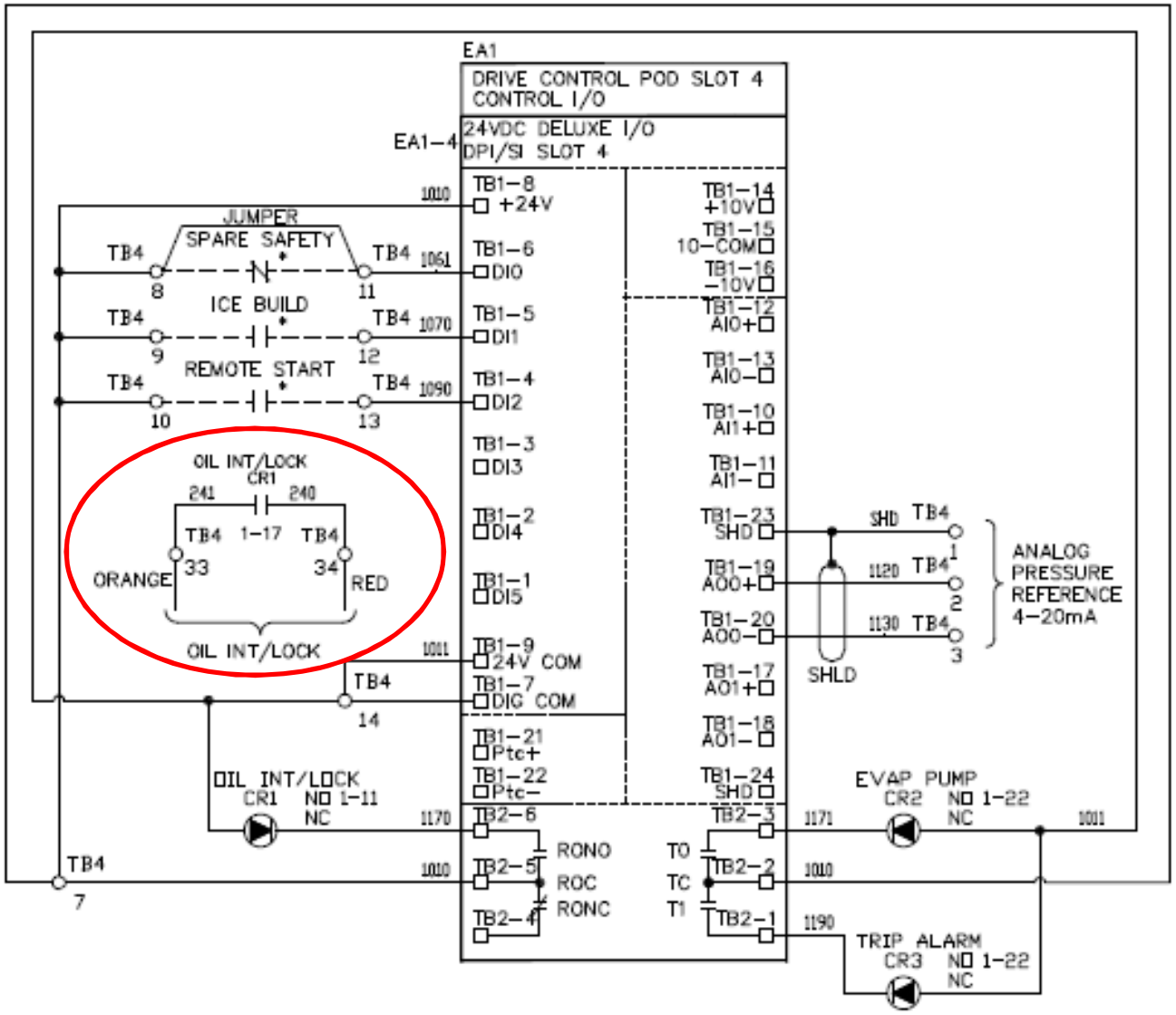
Oil Pump Interlock



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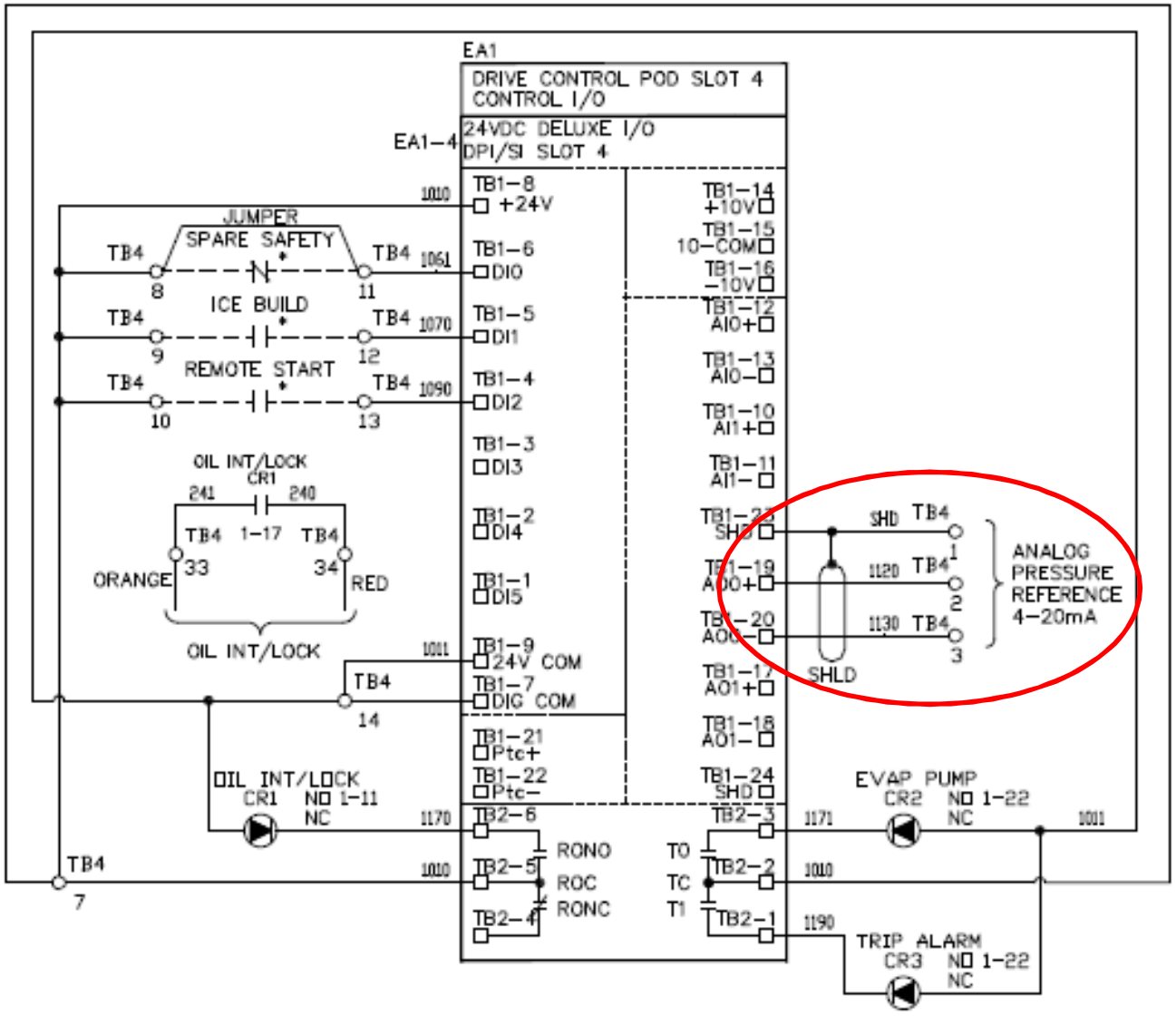
Head Pressure Reference



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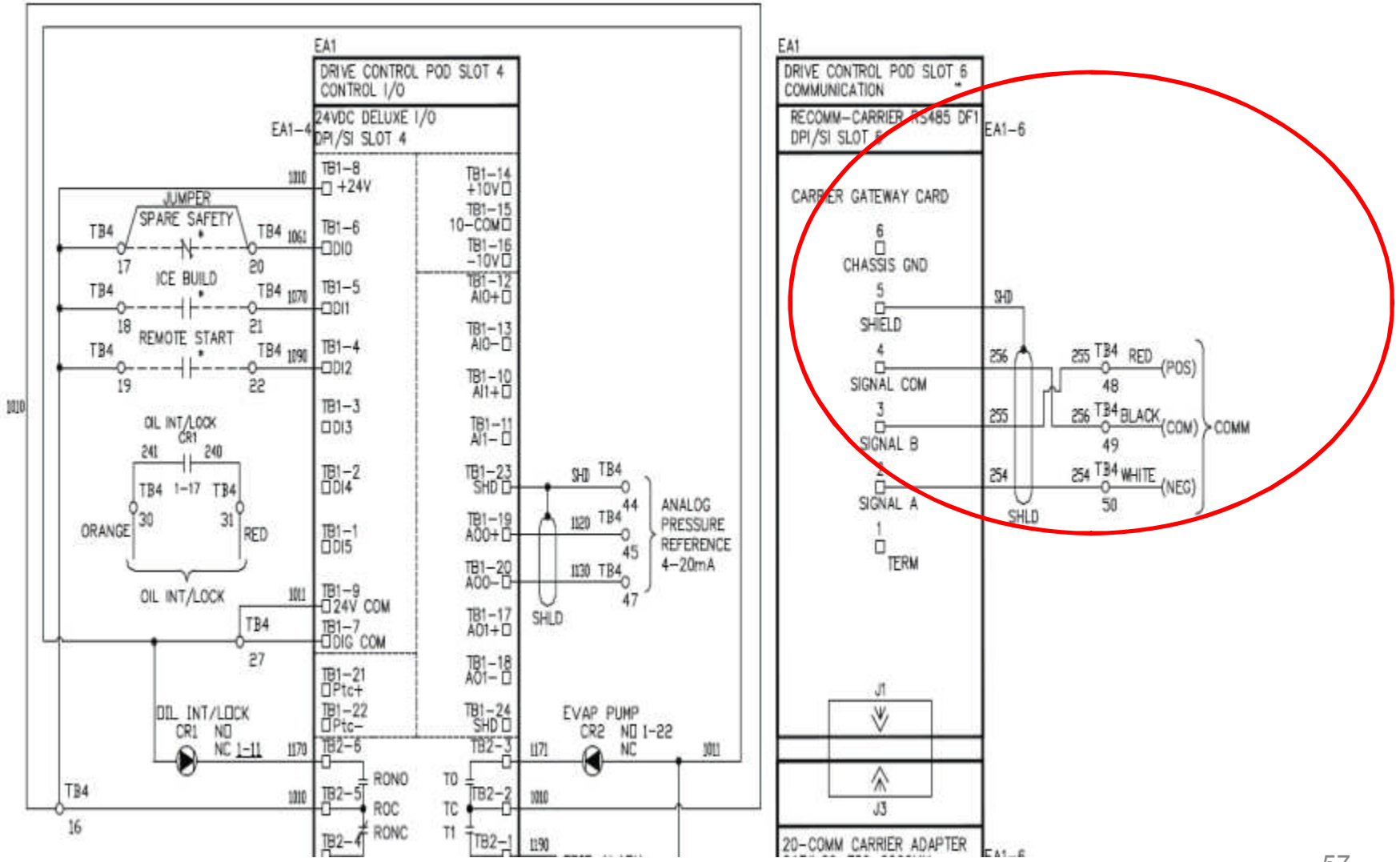
SIO bus from power panel to gateway



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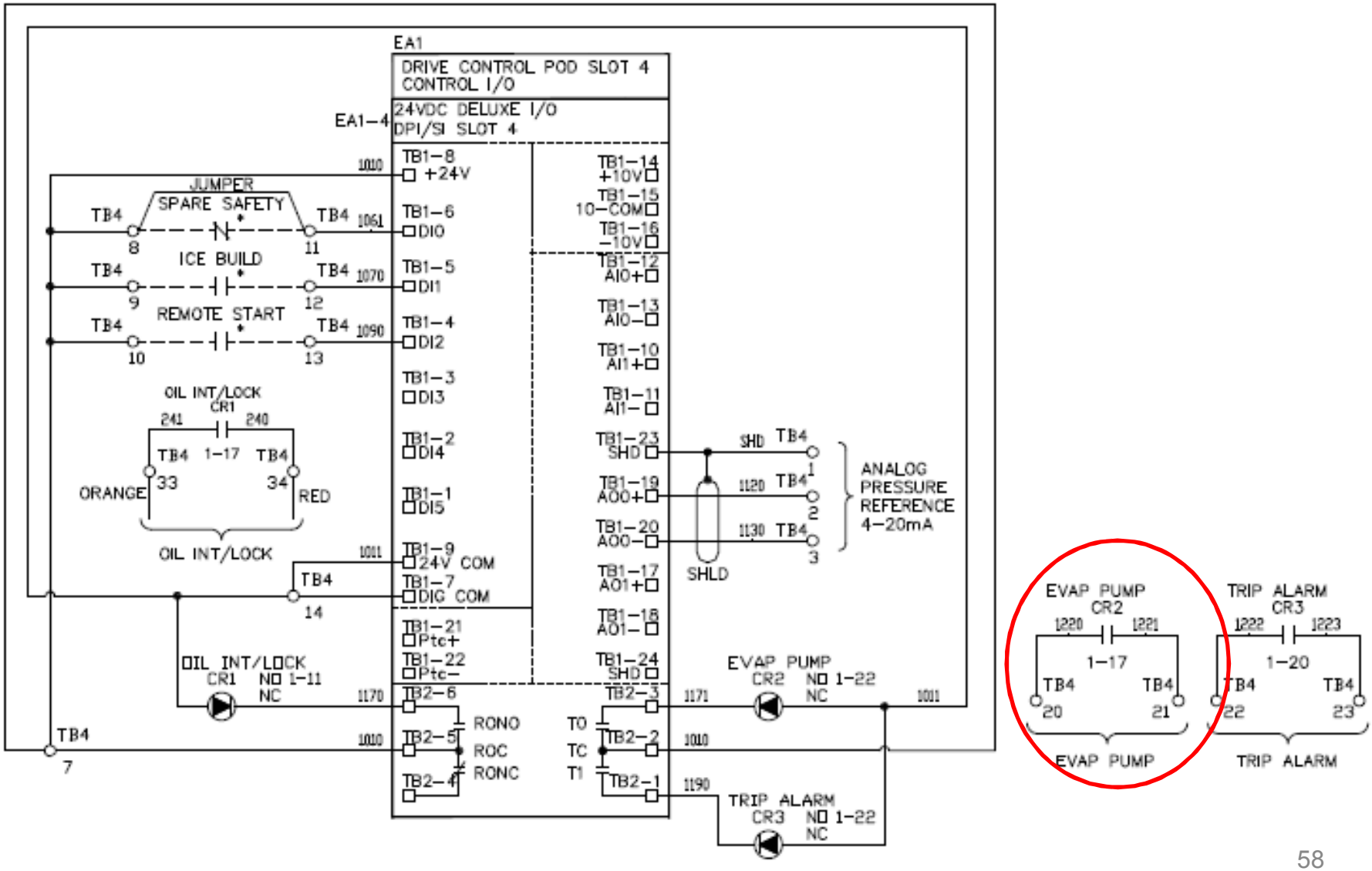
Evap Pump contacts



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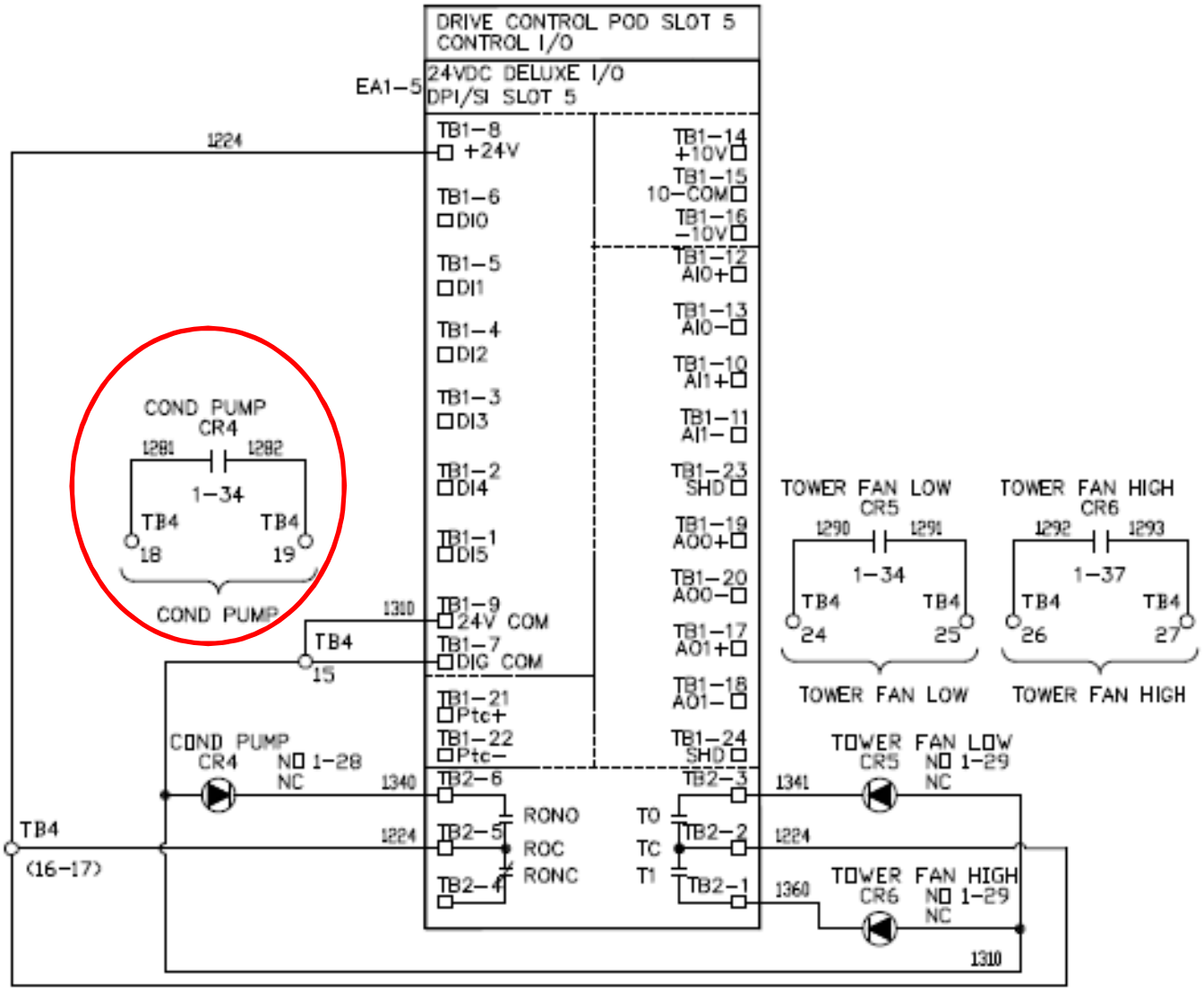
Condenser Pump Contacts



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Tower Fan Contacts

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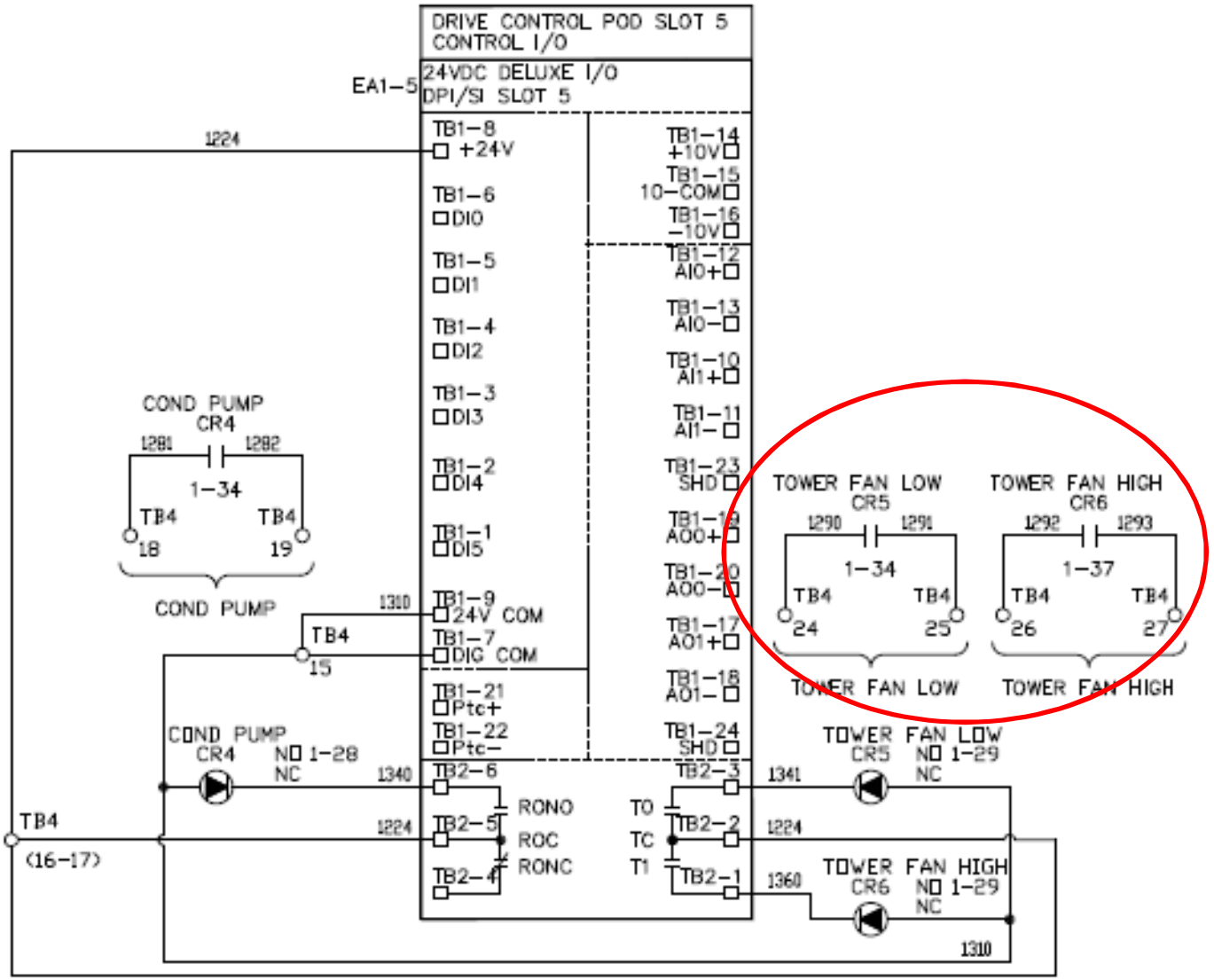

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Alarm Contacts

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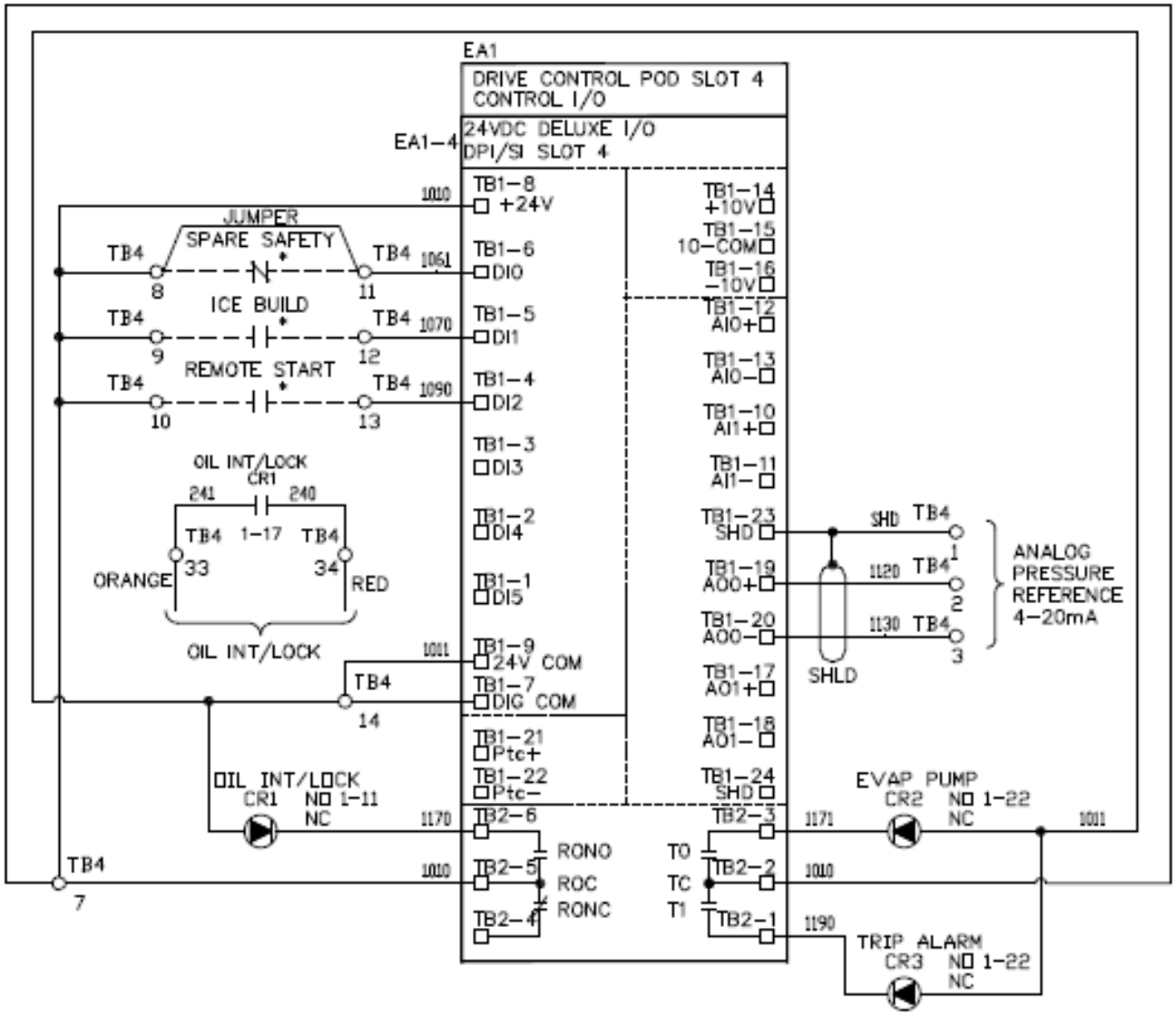

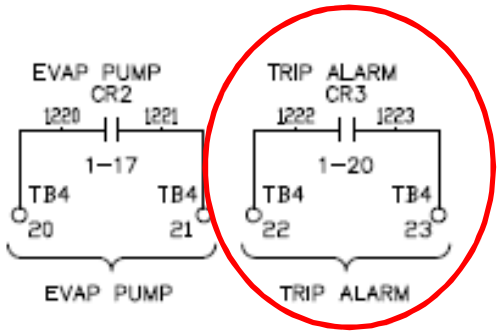

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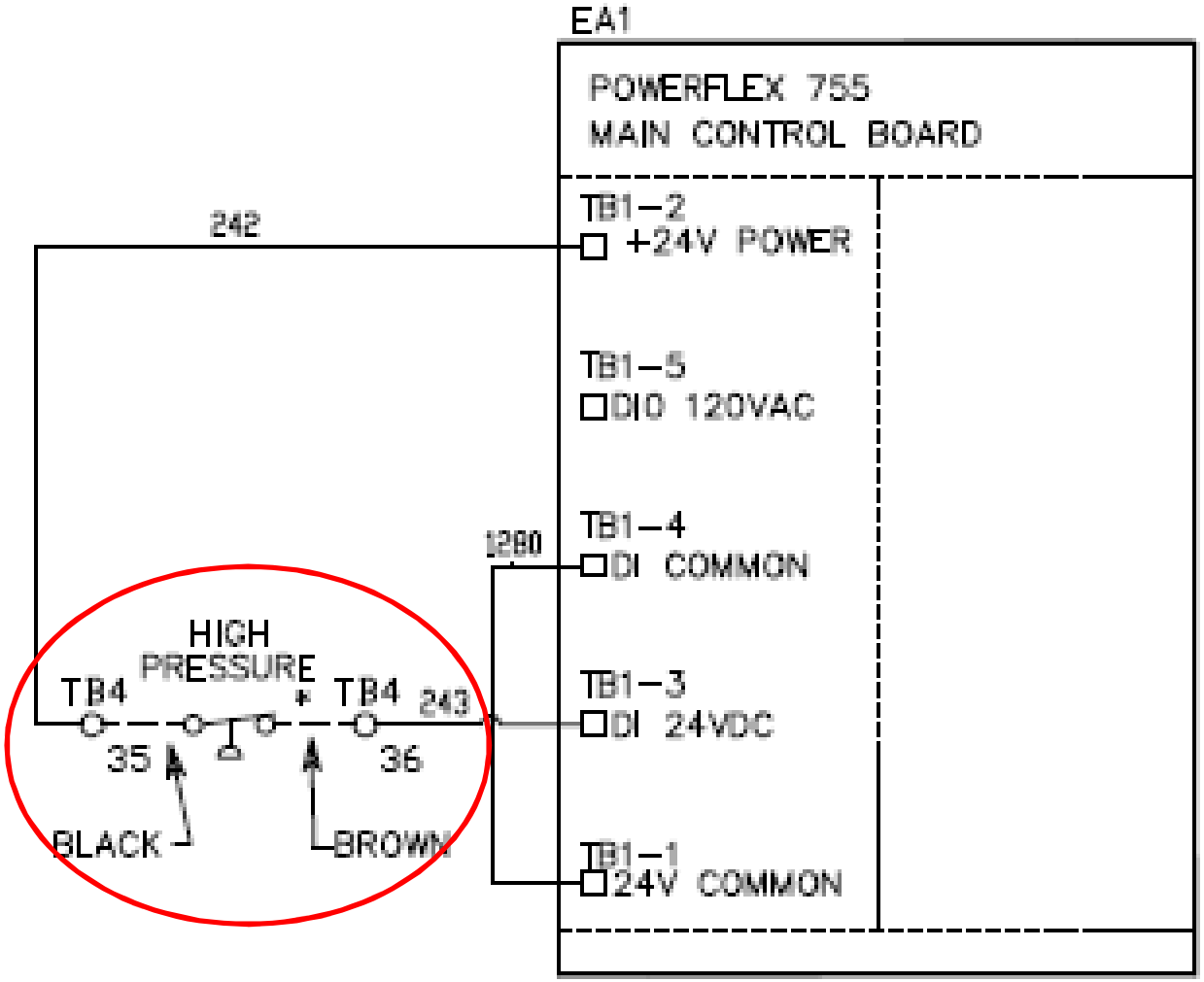
High pressure switch



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Control Power Transformer & Fuses

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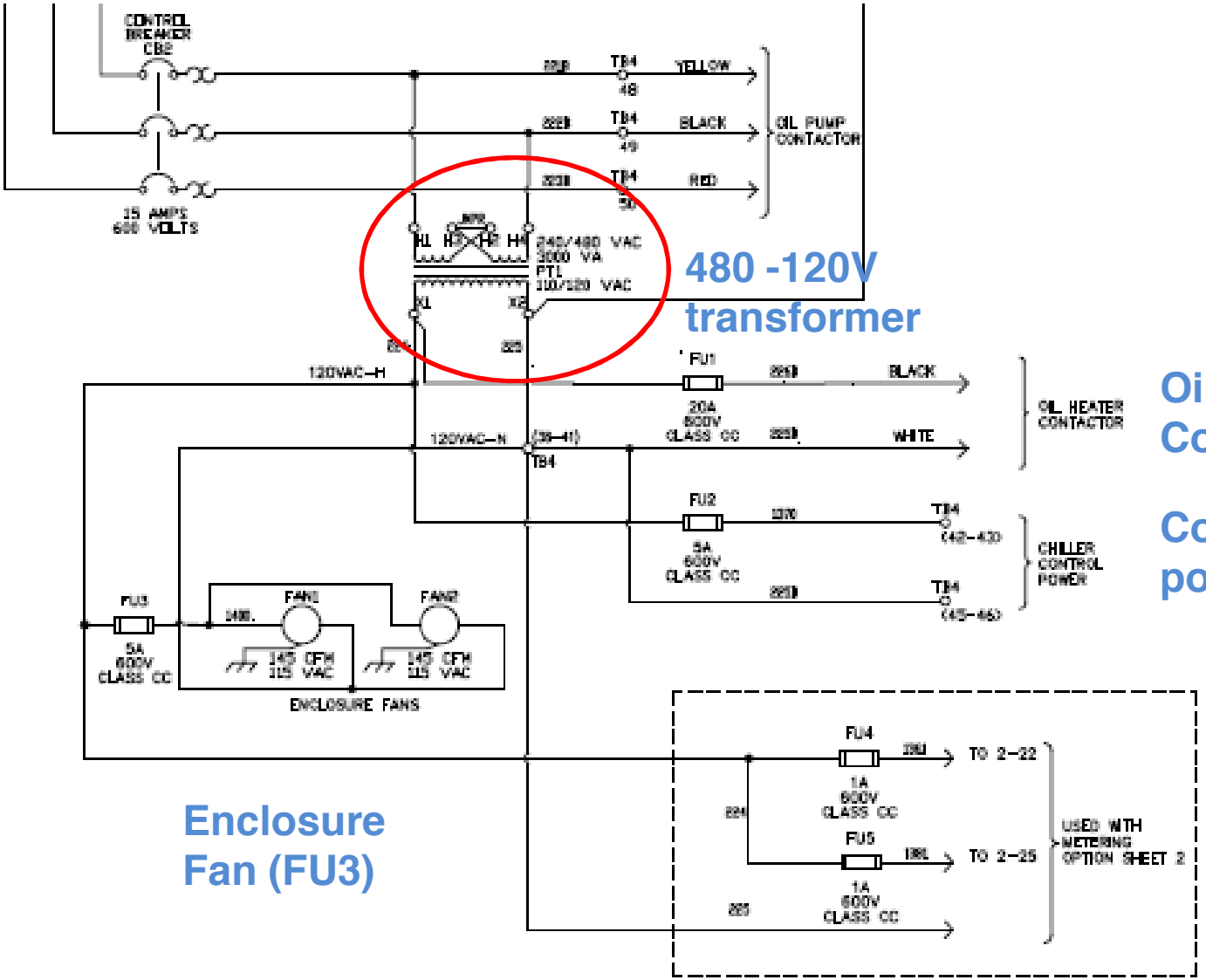

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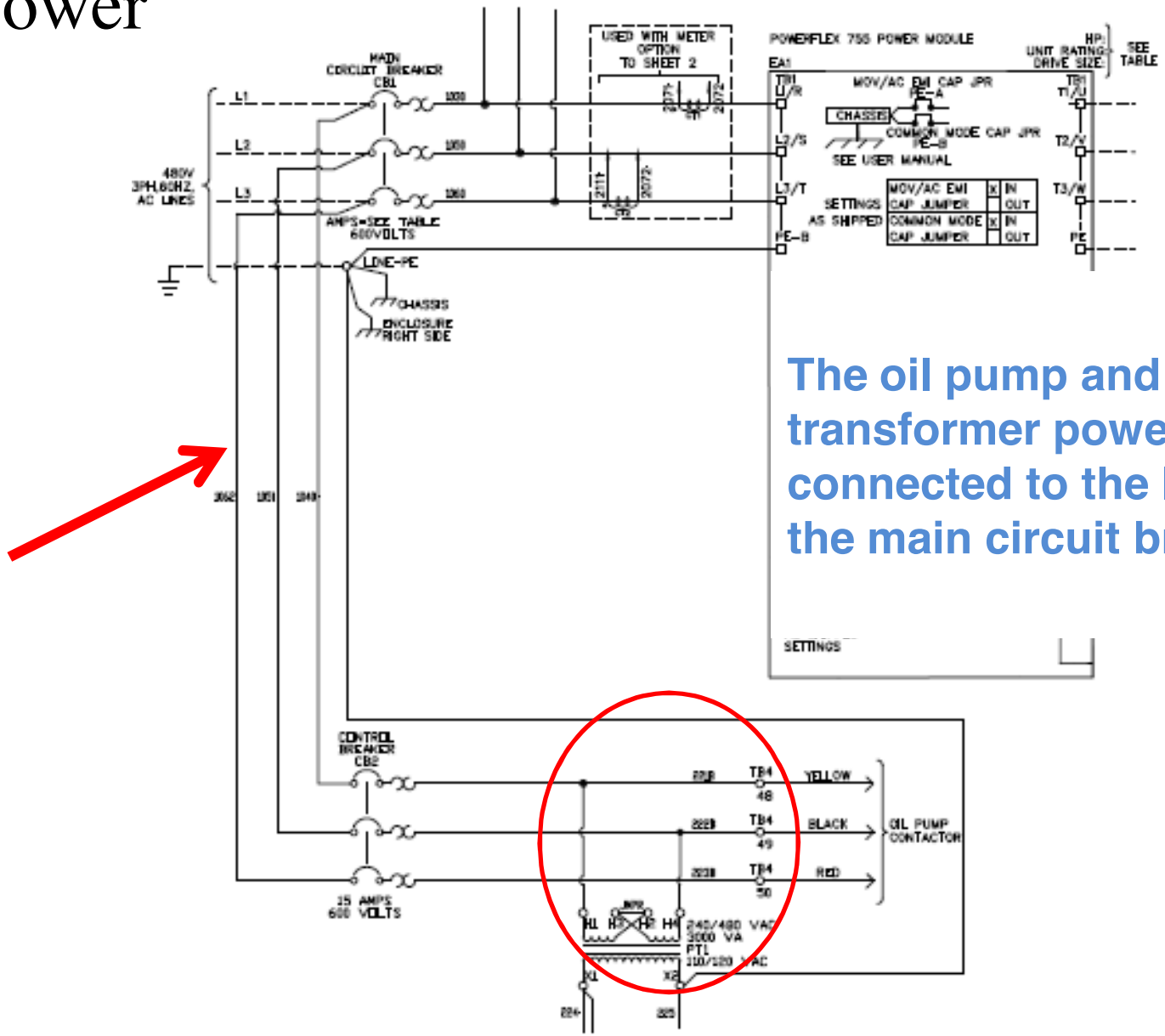
Power



The oil pump and control transformer power supply is connected to the line side of the main circuit breaker

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Line Voltage/Current

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Dummy Signals

- Ground Fault Current
- Line Fault Imbalance
- Line Voltage Imbalance
- DC Bus Voltage Reference
- Line Frequency
- Line Power Factor
- Rectifier Overload
- Inverter Overload
- Rectifier Temperature

Approximation

- Line Voltage Phase 1, 2, 3
- Line Current Phase 1, 2, 3

There are no current transformers or line voltage measurements taken on the incoming power supply. These values are calculated from the DC Bus Voltage and current, so the values you measure with a meter will most likely be different from what is displayed on the Carrier Controls.

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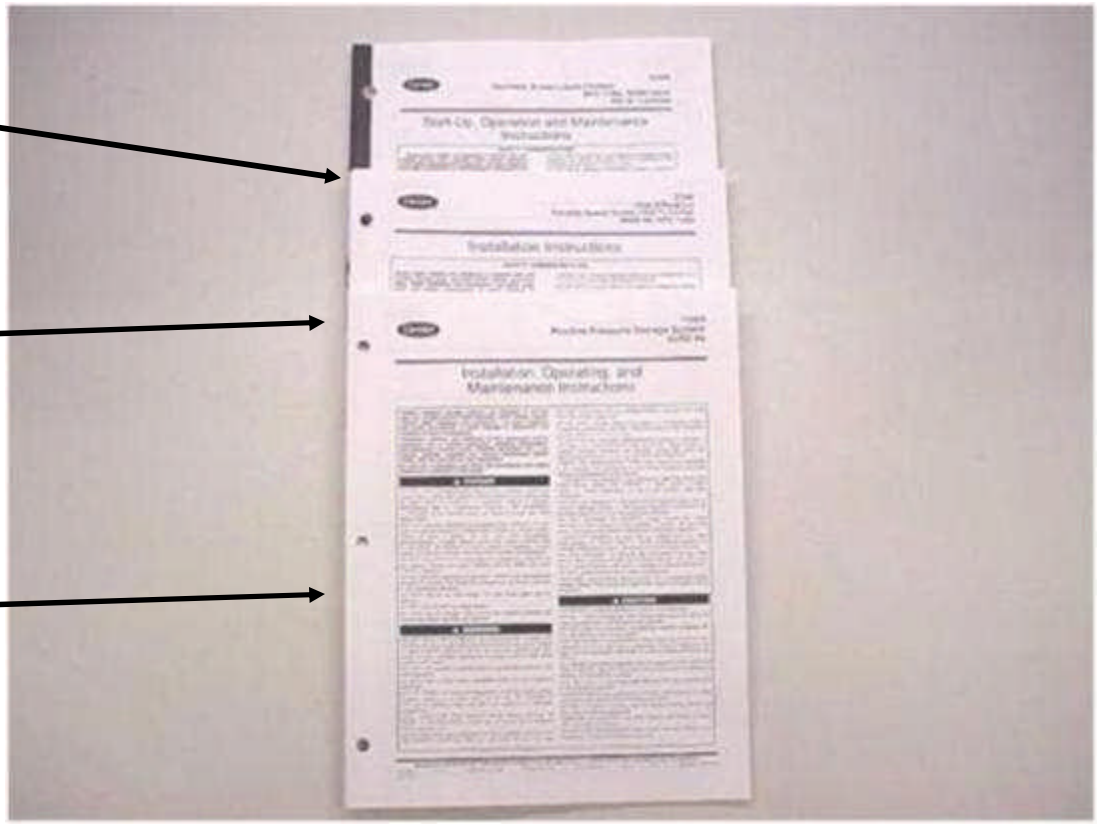
Startup Info

19XRV-2SS Operation & Maintenance Manual

119/23-2SS Operation & Maintenance Manual for Standard Tier Drive

19XRV-1SI Installation Manual

19/23-2SI Installation Manual



Reports Output of the design data sheet

(Minimum of 2 pages)

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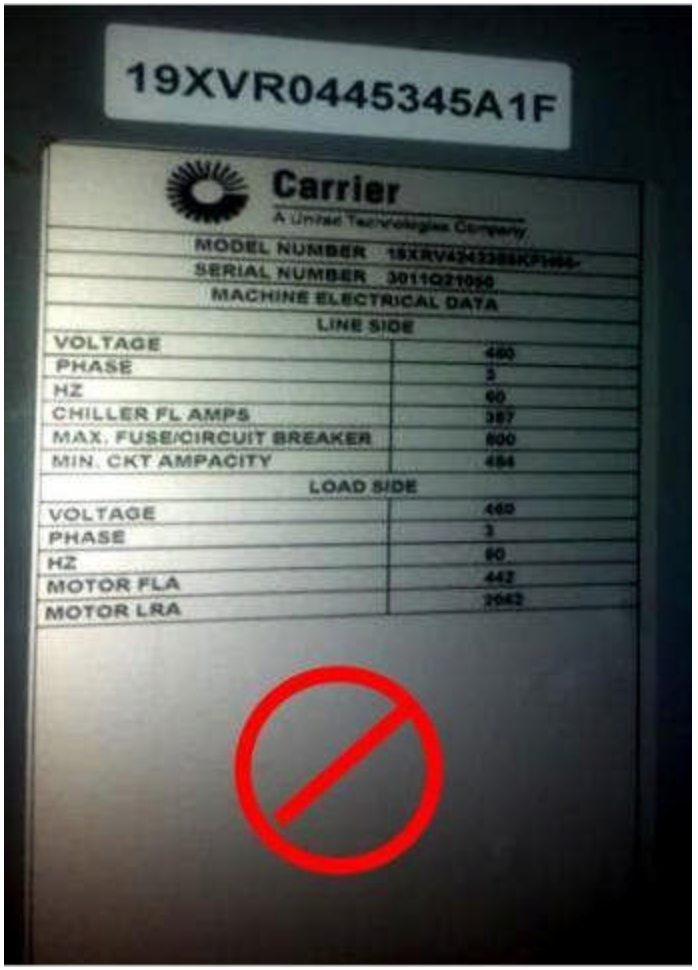
Wrong label

This information is useless and does nothing but confuse people. It is a carryover from the Rockwell LF1 Drive or Toshiba drive using a PIC 2 Control Platform. It serves no purpose on a unit using a PIC 3 control platform.



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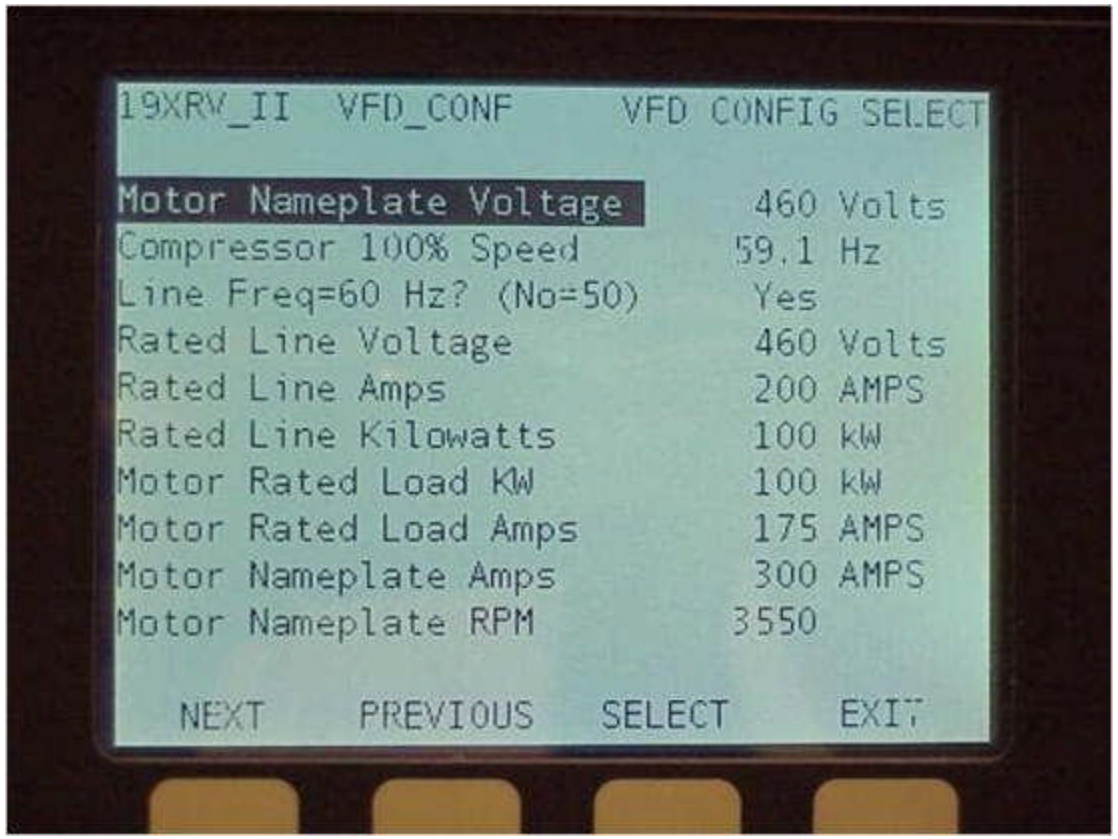
Check VFD Config Parameters



Label located on inside of VFD enclosure door

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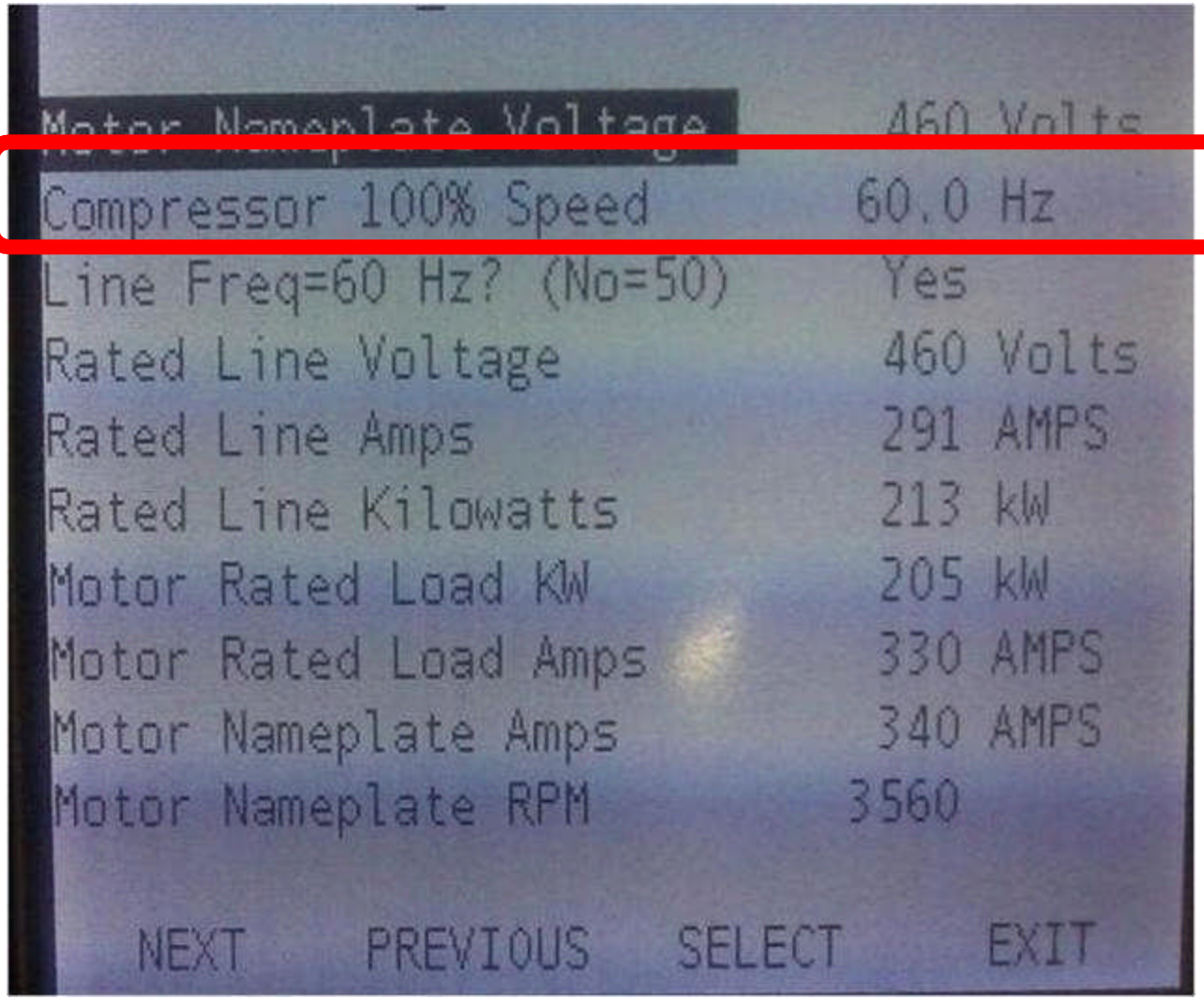
VFD Config



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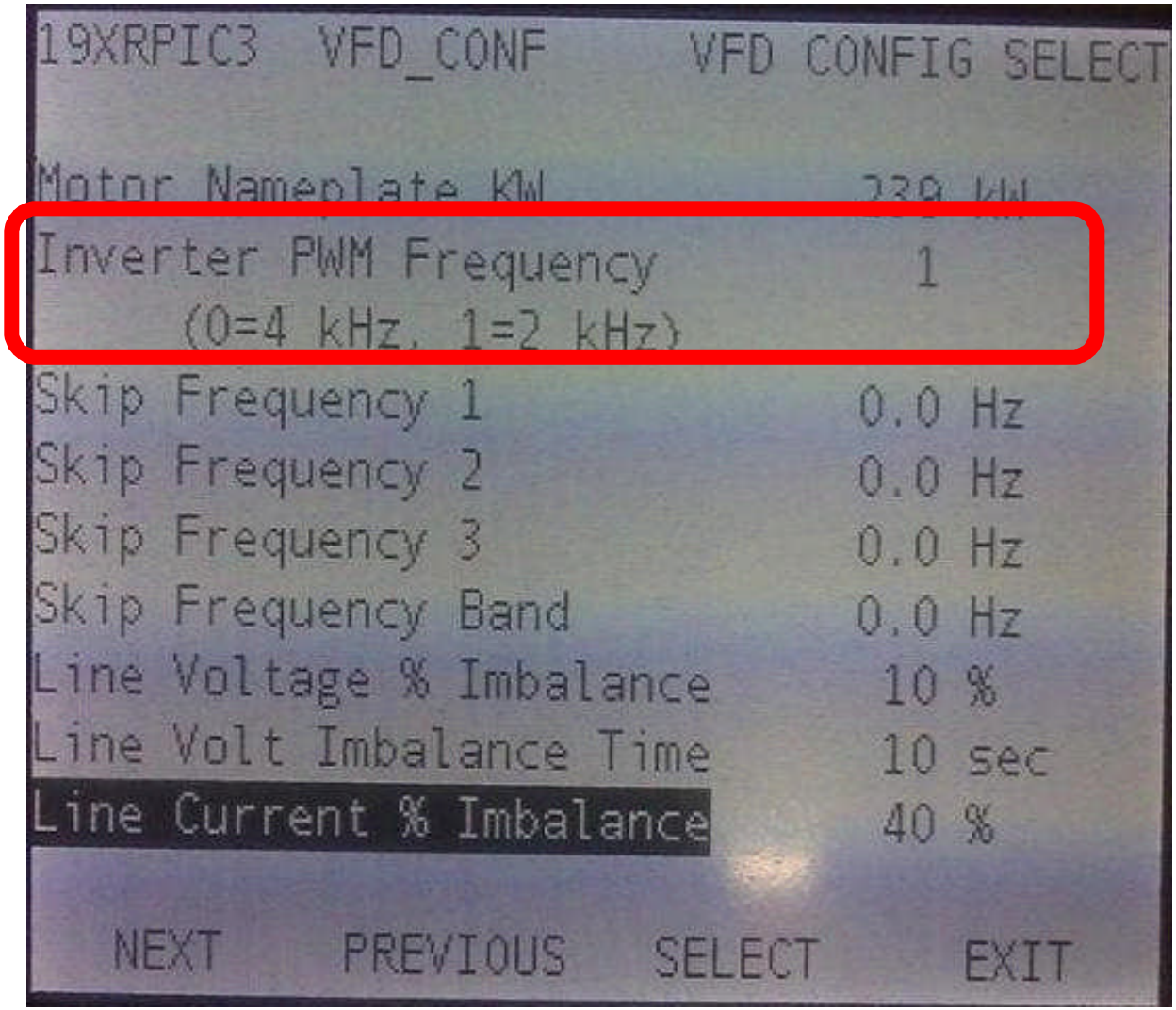
VFD Config



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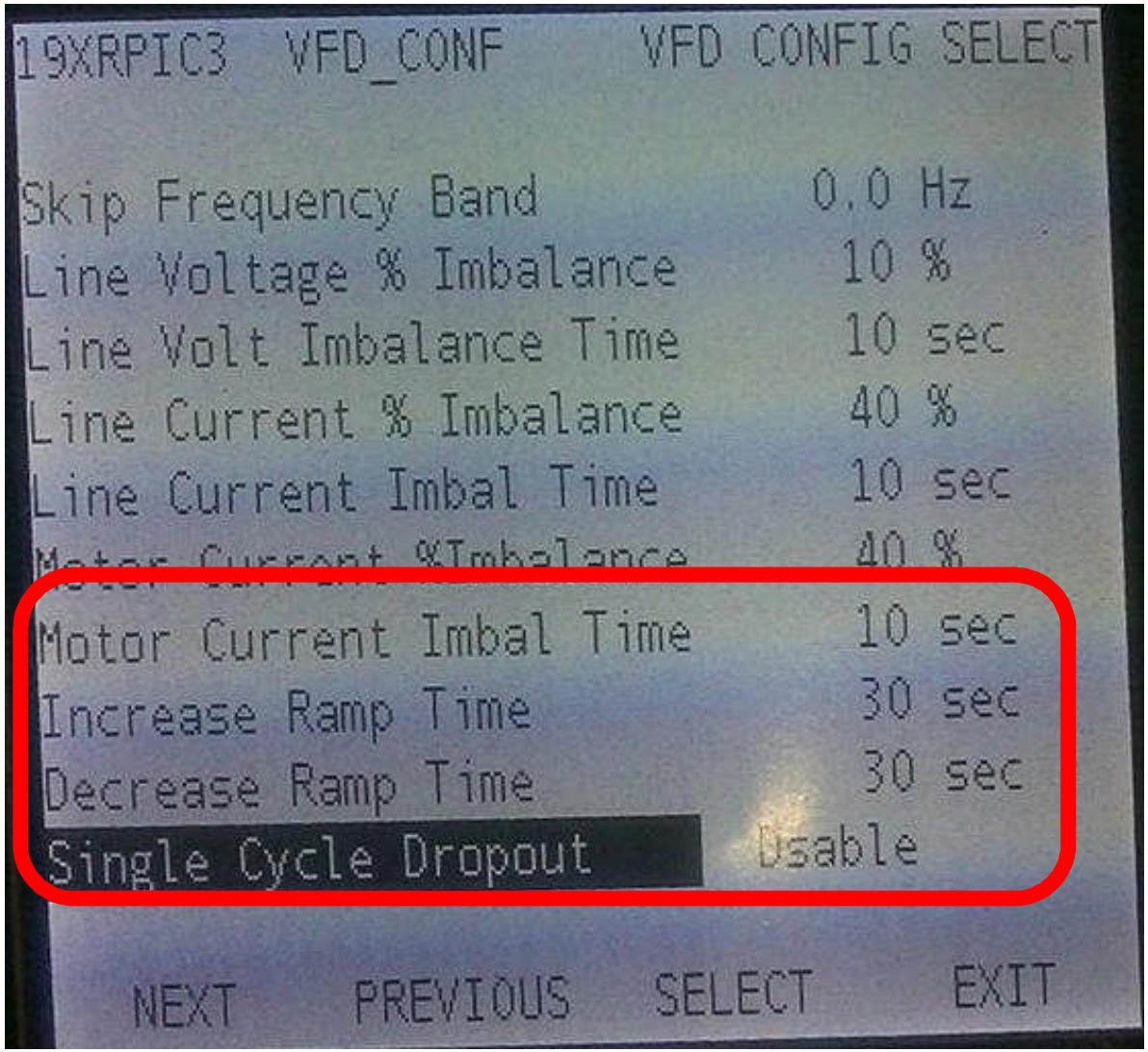
VFD Config



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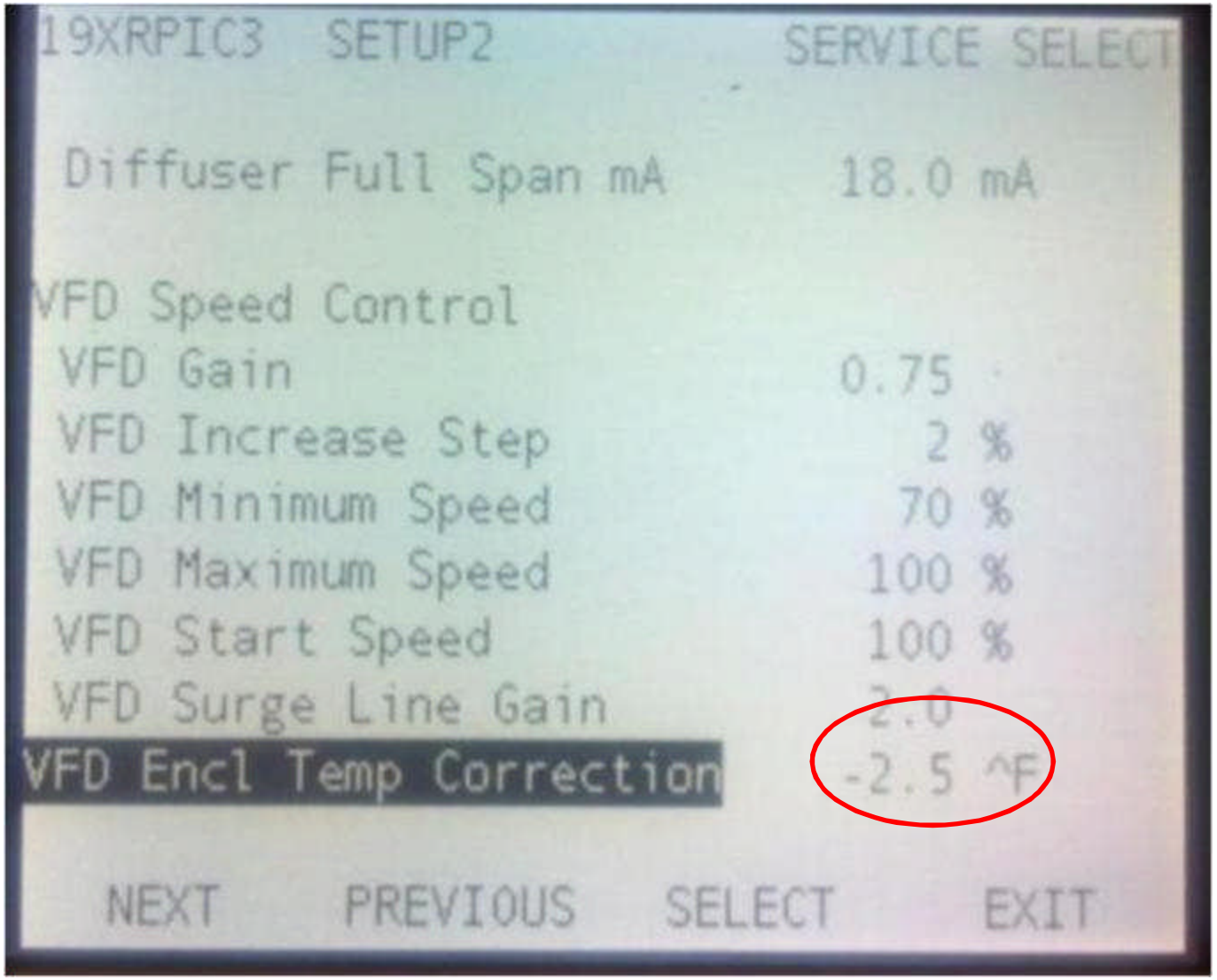
VFD Encl Temp Correction



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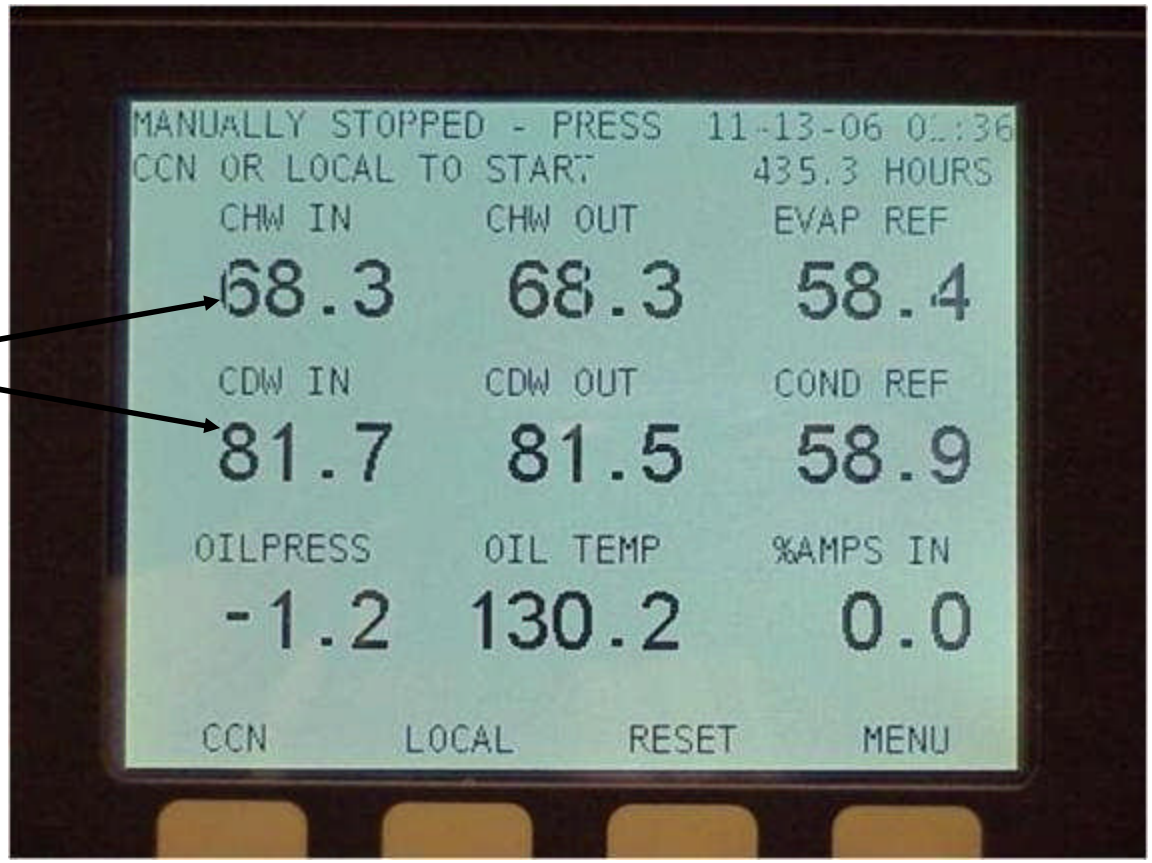
Consistent Liquid Temperatures

Entering and Leaving Liquid Temperatures should be close when the water pumps are on but the compressor is not running



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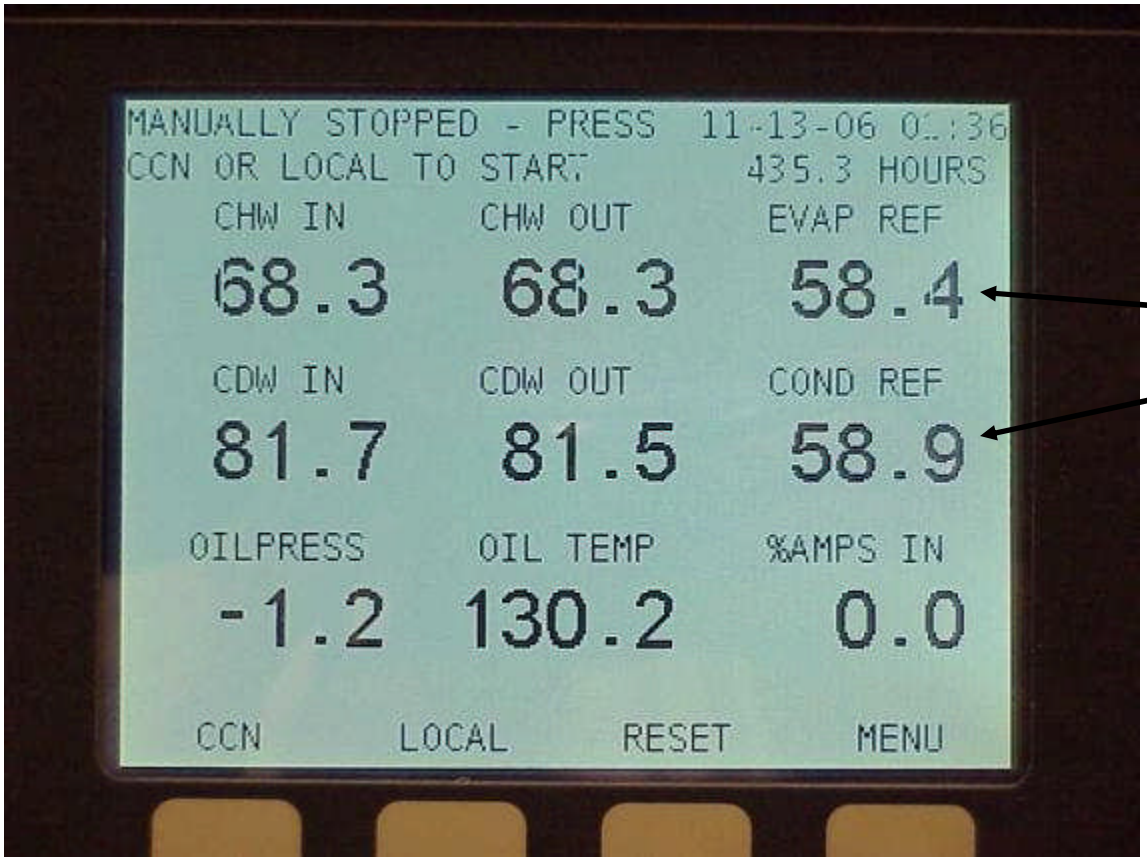
Consistent Refrigerant Temperature



Refrigerant Temperatures should be close when the Isolation Valves are open, the Water Temperatures are stable, and the Chiller is not running

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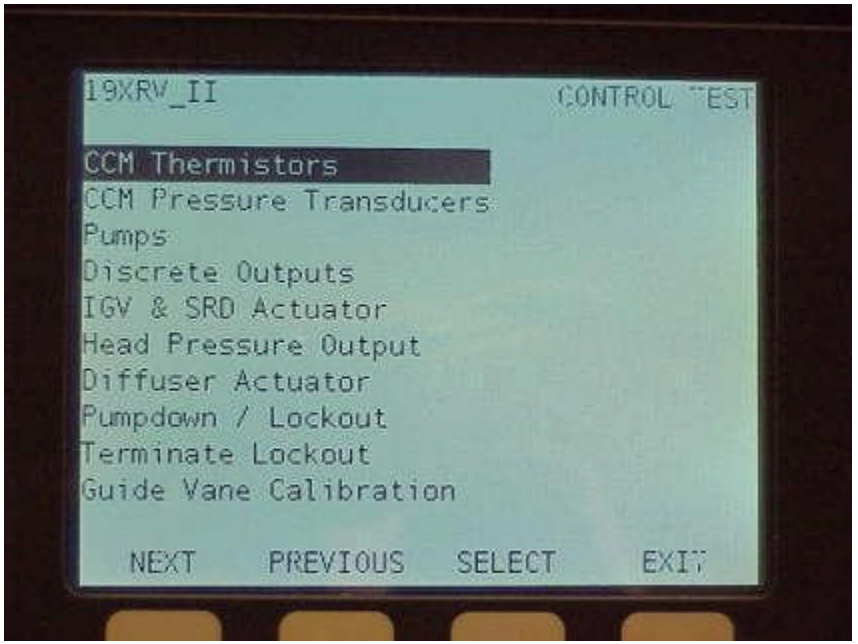
Perform Control Test

Pumps: Carrier Controls must be able to independently energize the Cooler and Condenser Liquid Pumps for Freeze Protection

Discrete Outputs: Cycles Oil Heater Relay, HGBP, Alarm Relay, VFD Cooling Solenoid, and Shunt Trip

Head Pressure Output: 4-20 mA



Perform Guide Vane Calibration

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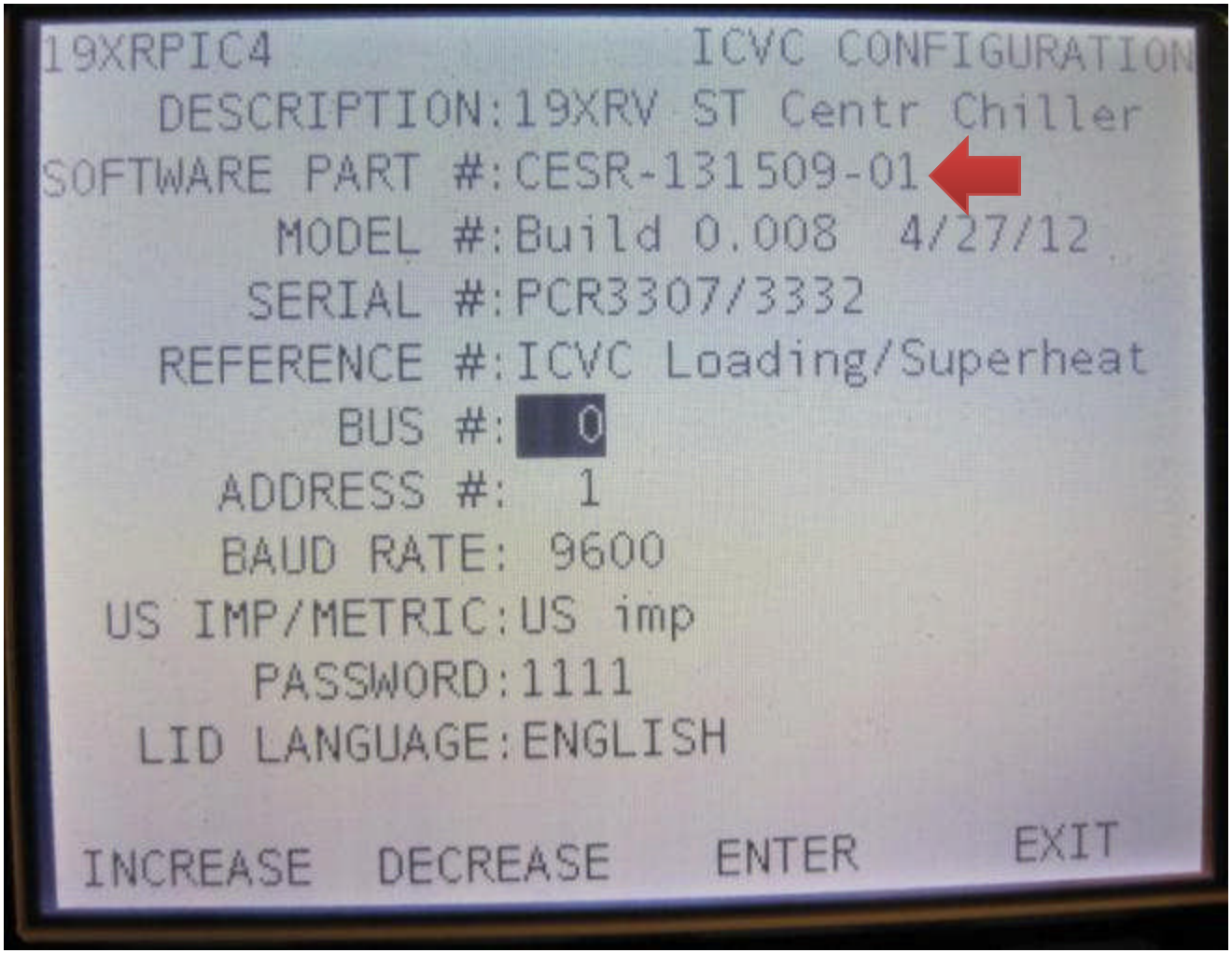
Check ICVC Software versions



ICVC Software Version in ICVC Configuration Screen

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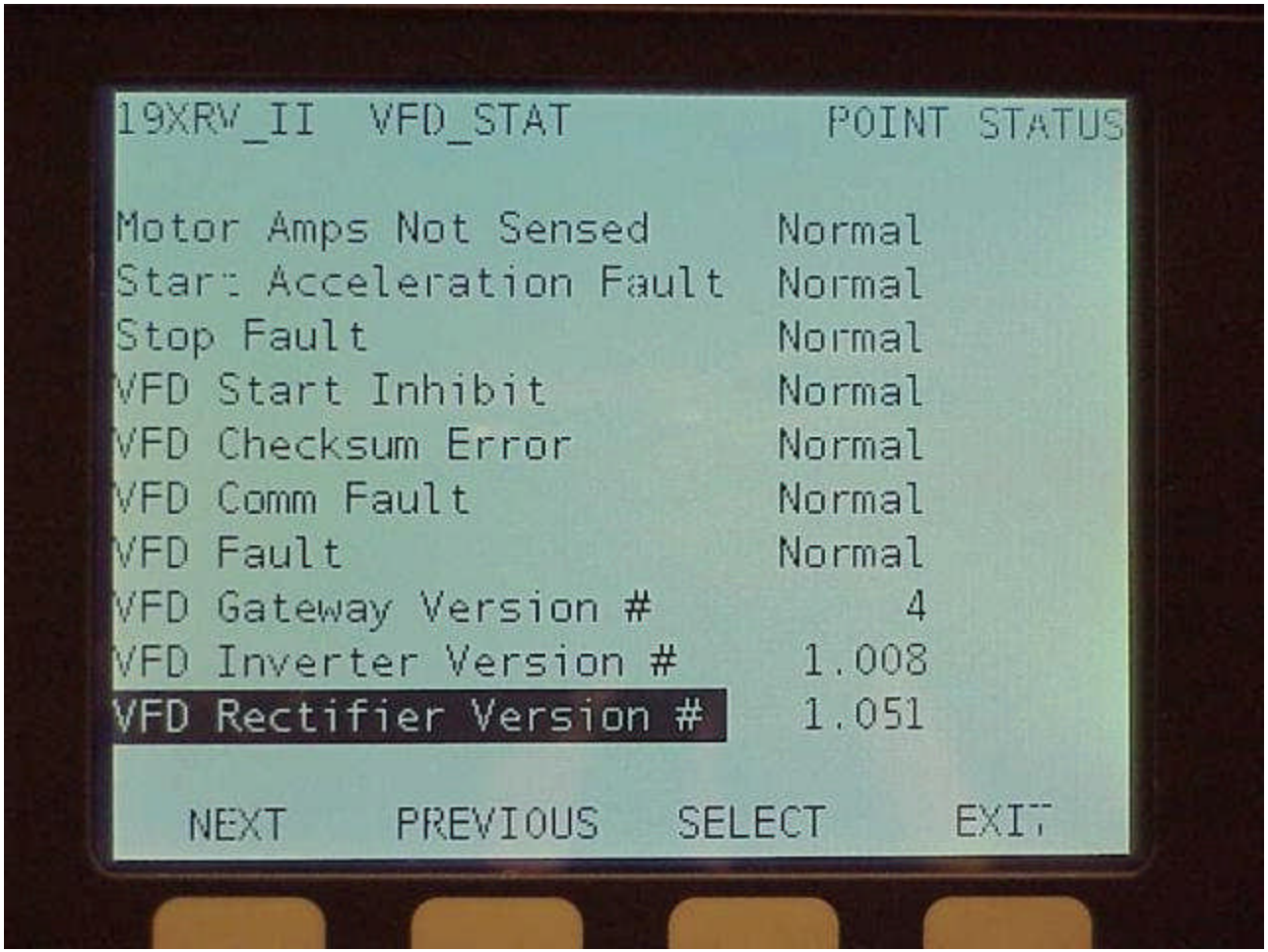
Firmware for VFD Hardware



Gateway and Inverter VFD Software Versions in VFD_STAT Screen

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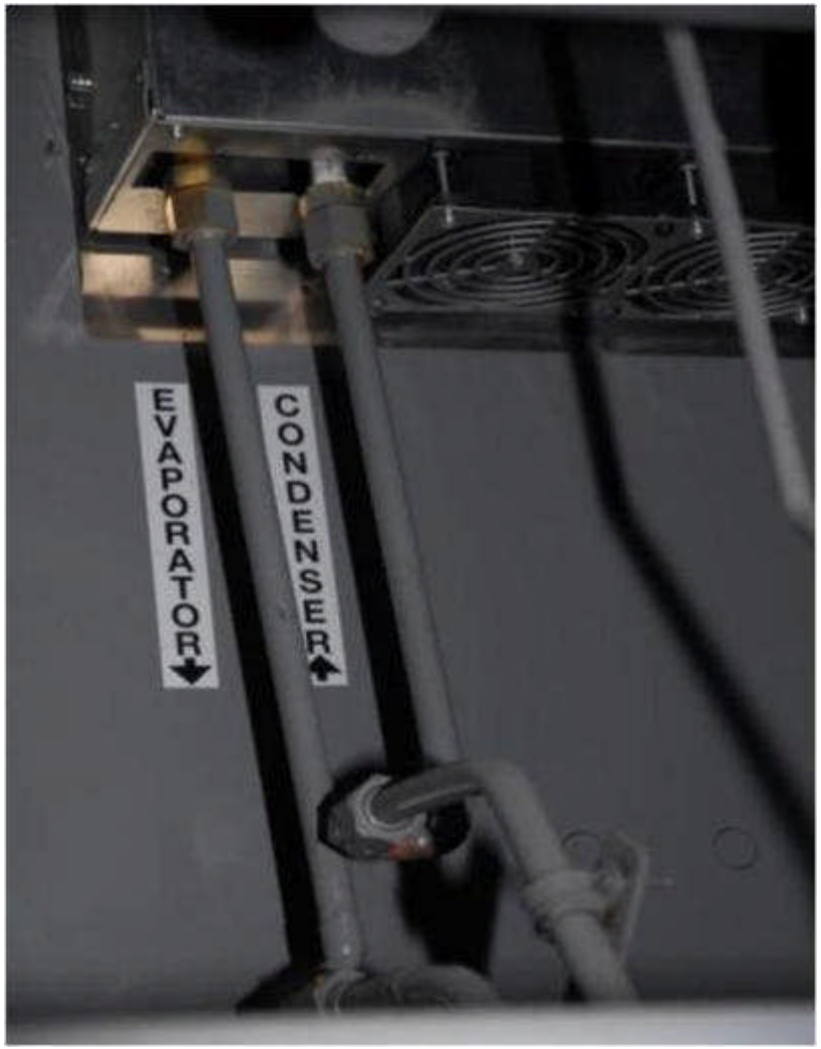
Check Condensation



If the refrigerant line leaving the power module has condensation on it, it will require adjustment from full open towards closed to establish a refrigerant temperature of 80-90 deg f (leaving temp) under full load conditions

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Additional Startup Check list

- ❑Zero Transducers
- ❑Calibrate Guide Vane
- ❑Check ICVC configuration for
  - ❑VFD Config
  - ❑Surge/HGBP settings (Equipment service → Options)
  - ❑Thrust bearing reset factory is set to 1.2~1.4 (Equipment service → Setup1)
  - ❑VFD control setup (Equipment service → setup 2)
  - ❑VFD Encl temp correction is set to -2.5 (Equipment service → Setup2)
- ❑ VFD Cooling lines to ensure that refrigerant temperature is not too cold

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Basic Troubleshooting

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Troubleshooting the Drive — The drive can display two kinds of error codes on the ICVC called the Alert and Alarm codes. These codes signal a problem detected during self tuning or drive operation. Alert and Alarm codes are located in the 19XRV Start-Up, Operation and Maintenance Instructions.

Note the following differences between Carrier and Allen-Bradley terminology:

- A warning message on the ICVC is an ALERT
- The same warning viewed with Rockwell Drive Explorer is a VFD ALARM
- A failure resulting in a shutdown is seen as an ALARM on the ICVC and as a VFD FAULT when viewed with Drive Explorer

CONDITION CODES
ICVC ALERT = VFD ALARM
ICVC ALARM = VFD FAULT

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Basic Troubleshooting

In order to verify power is off before removing the drive cover you should do two things:

1. Check the STS (Status) indicator and verify that it is off. If the drive was on, this LED would be on or flashing (red, amber, or green)
2. Secondly, you can remove the access door to reveal the DC bus test points so you can verify the DC bus is discharged
3. Loosen the screws
4. Remove the door

Which will reveal the “Control Pod” that holds the main control board (MCB) and I/O cards.

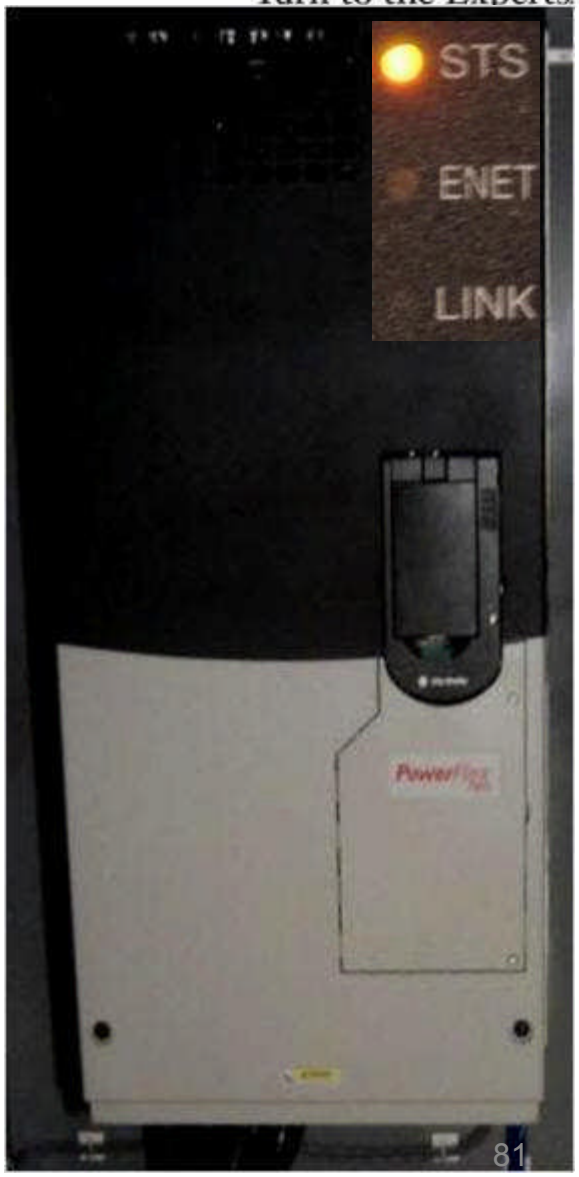

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Table 3 — Drive Status Indicator Descriptions

NAME	COLOR	STATE	DESCRIPTION
STS (Status)	Green	Flashing	Drive ready but not running, and no faults are present.
		Steady	Drive running, no faults are present.
	Yellow	Flashing	Drive is not running. A type 2 (non-configurable) alarm condition exists and the drive cannot be started.
		Steady	Drive is not running, a type 1 alarm condition exists. The drive can be started.
	Red	Flashing	A major fault has occurred. Drive cannot be started until fault condition is cleared.
		Steady	A non-resettable fault has occurred.
	Red/Yellow	Flashing Alternately	A minor fault has occurred. When running, the drive continues to run. System is brought to a stop under system control. Fault must be cleared to continue. Use parameter 950 [Minor Flt Config] to enable. If not enabled, acts like a major fault.
	Green/Red	Flashing Alternately	Drive is flash updating.
ENET	None (Unlit)	Off	Adapter and/or network is not powered, adapter is not properly connected to the network, or adapter needs an IP address.
	Red	Flashing	An EtherNet/IP connection has timed out.
		Steady	Adapter failed the duplicate IP address detection test.
	Red/Green	Flashing Alternately	Adapter is performing a self-test.
	Green	Flashing	Adapter is properly connected but is not communicating with any devices on the network.
		Steady	Adapter is properly connected and communicating on the network.
LINK	None (Unlit)	Off	Adapter is not powered or is not transmitting on the network.
	Green	Flashing	Adapter is properly connected and transmitting data packets on the network.
		Steady	Adapter is properly connected but is not transmitting on the network.

NOTES:
1. A Type 1 alarm indicates that a condition exists. Type 1 alarms are user configurable.
2. A Type 2 alarm indicates that a configuration error exists and the drive cannot be started. Type 2 alarms are not configurable.

ROCKWELL PF755

Test DC Bus Voltage

Turn to the Experts

Opening the VFD Access Door

⚠WARNING

Before removing the drive enclosure, open access door and verify that the DC bus voltage has dropped to zero by checking the terminals behind the access door. Failure to observe this precaution could result in severe bodily injury or loss of life.

1. Using recommended screwdriver = 6.4 mm (0.25 in.) flat or T20 star, open access door. See Fig. 2.
2. Check to be sure that the voltage between DC+ and DC- and from each DC terminal to the chassis is zero before proceeding. See Fig. 3.

Drive Assembly Catalog Number — See Fig. 4 for an example Catalog Number.

Components and Physical Data — The Allen-Bradley PF755 Frame 6 drive is used for the 230-amp rated application (carrier Part No. 19XRV0230...). See Fig. 5.

The Allen-Bradley PF755 Frame 7 drive is used for the 335-amp and 445-amp rated application (Carrier Part No. 19XVR0335... and 19XVR0445... respectively). See Fig. 6.

See Fig. 7 for the dimensions of Frames 6 and 7.

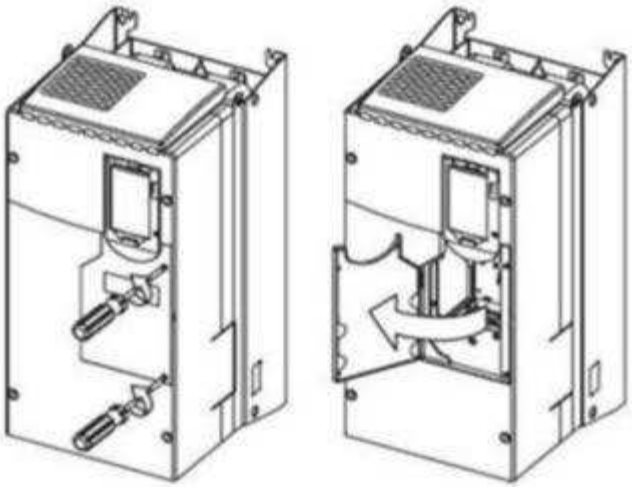


Fig. 2 — Opening Access Door

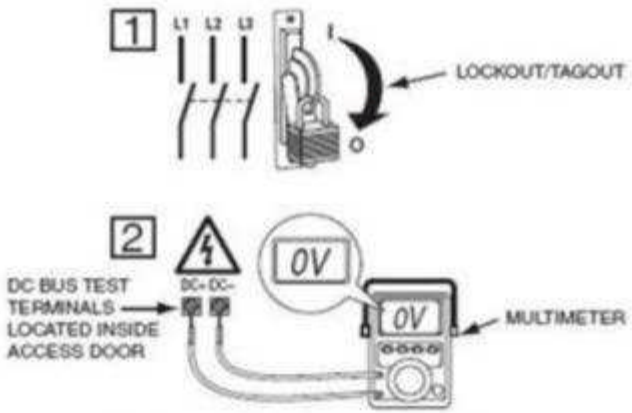


Fig. 3 — Check DC Bus Terminals

ROCKWELL PF755

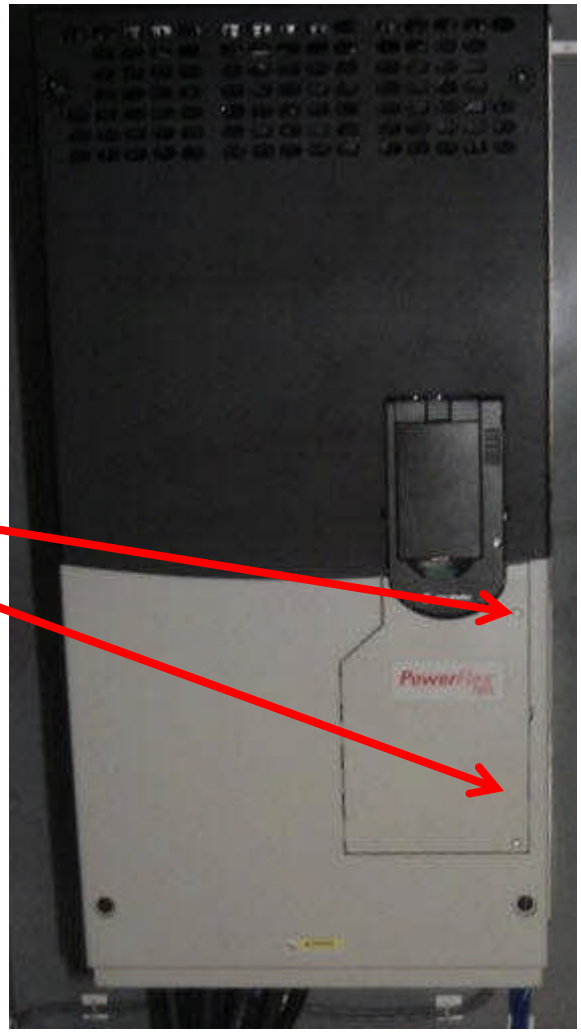
Test DC Bus Voltage

Carrier
Turn to the Experts

In order to verify power is off before removing the drive cover you should do two things:

1. Check the STS (Status) indicator and verify that it is off. If the drive was on, this LED would be on or flashing (red, amber, or green)
2. Secondly, you can remove the access door to reveal the DC bus test points so you can verify the DC bus is discharged
3. Loosen the screws
4. Remove the door

Which will reveal the “Control Pod” that holds the main control board (MCB) and I/O cards.



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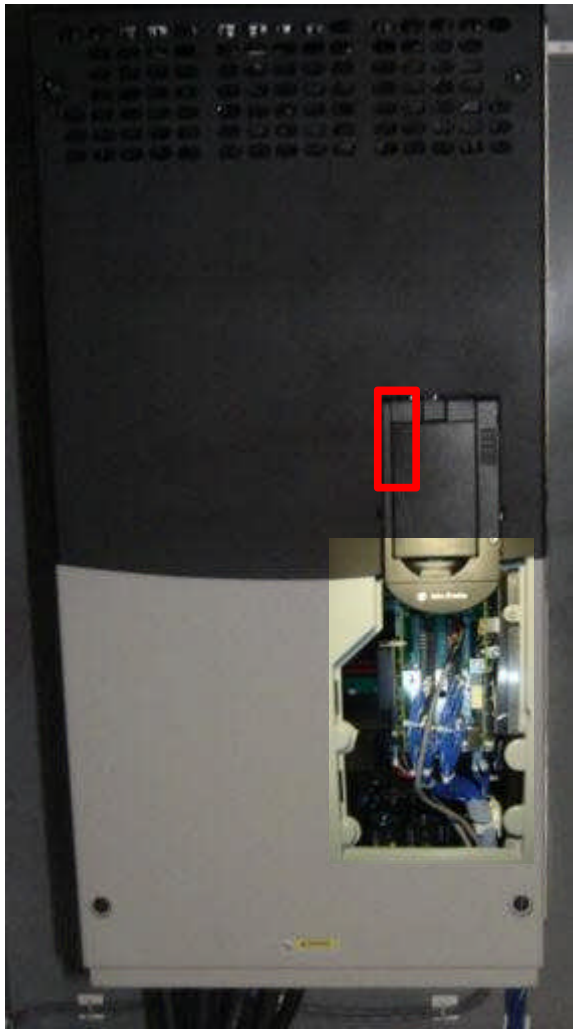

ROCKWELL PF755

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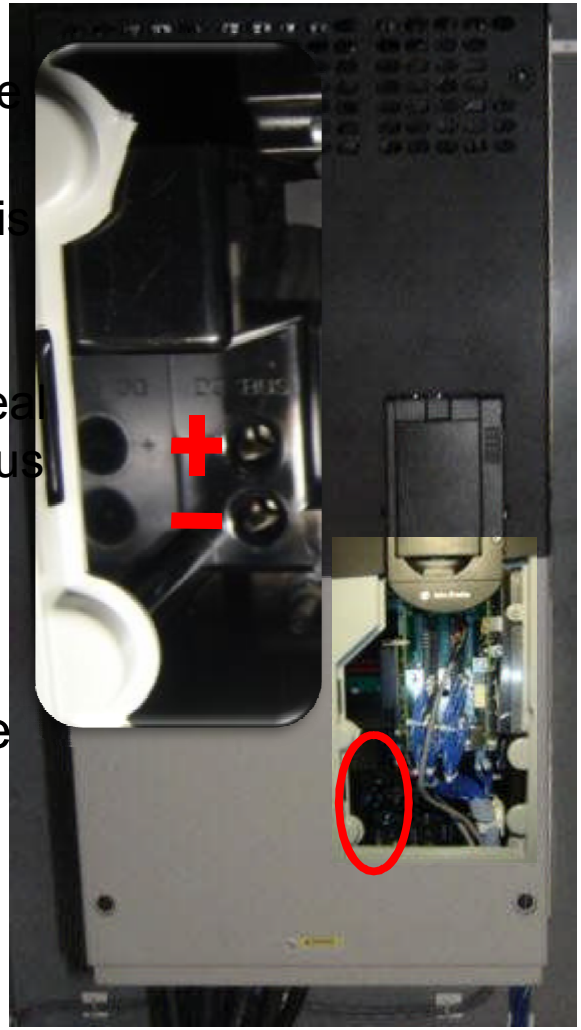
5. Check DC Bus Voltage



ROCKWELL PF755

Accessing Internal parts

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Servicing the Drive

⚠WARNING

To guard against possible personal injury and/or equipment damage:

1. Inspect all lifting hardware for proper attachment before lifting drive.
2. Do not allow any part of the drive or lifting mechanism to make contact with electrically charged conductors or components.
3. Do not subject the drive to high rates of acceleration or deceleration while transporting to the mounting location or when lifting.

Do not allow personnel or their limbs directly underneath the drive when it is being lifted and mounted.

⚠WARNING

DC bus capacitors retain hazardous voltages after input power has been disconnected. After disconnecting input power, wait five (5) minutes for the DC bus capacitors to discharge and then check the voltage with a voltmeter to ensure the DC bus capacitors are discharged before touching any internal components. Failure to observe this precaution could result in severe bodily injury or loss of life.

1. Using recommended screwdriver = 6.4 mm (0.25 in.) flat or T20 star, open access door. See Fig. 16.
2. Check to be sure that the voltage between DC+ and DC- and from each DC terminal to the chassis is zero before proceeding. See Fig. 17.
3. Remove the enclosure. See Fig. 18.

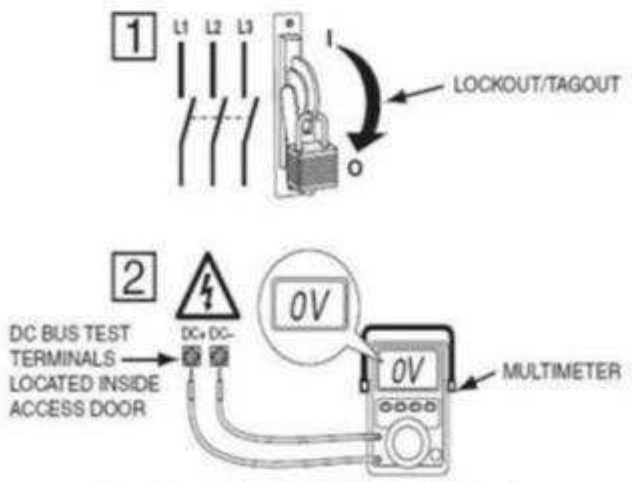

Fig. 17 — Check DC Bus Terminals

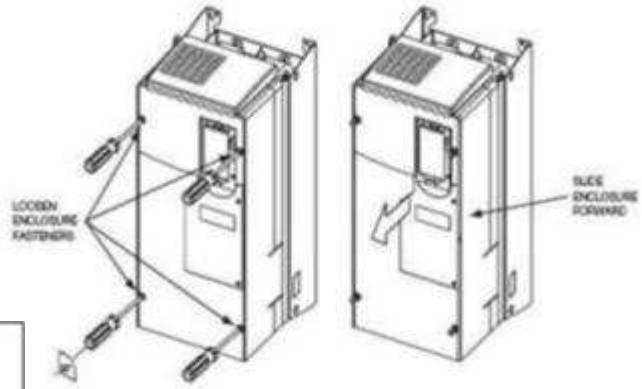

Fig. 18 — Removing Enclosure

When replacing the drive, reverse the procedures and tight-

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Accessing Internal parts

To remove the drive cover there are four (4) captive screws to loosen.

They should unthread but not fall out.

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Performing Static Resistance checks of the IGBT and SCR/Diodes

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NOTE: Digital meters require a special diode check function because the current sourced by the meter during a normal resistance (Ohms) test is too low to accurately test a diode. Make sure the meter is set to the diode test function. Voltage readings may not be exact as shown in above tables, but look for consistency during each of the 4 tests. When performing a test that should return infinity (OL) as shown in above tables, you may see a value slowly climbing toward infinity. This is a result of the meter charging a capacitor and is normal.

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Diode Checks

Turn to the Experts

Checking Power Modules and Motor Input with Input Power Off — Use the following procedure to check the drive's power module circuitry with power off:

1. Turn off and lock out input power. Wait five minutes.
2. Verify there is no voltage at the drive's input power terminals.
3. Using a voltmeter, check the DC bus potential as described above to ensure the DC bus capacitors are discharged.
4. Disconnect the motor from the drive.
5. Check all AC line and DC bus fuses.
6. Use a multimeter to check the input diodes and output IGBTs if a fuse is open.
7. Check motor impedance.
8. Reconnect the motor to the drive.
9. Reapply input power. See Tables 7 and 8.

⚠ WARNING

Confirm that the DC bus has discharged before performing diode checks.

Table 7 — Diode Checks

METER LEAD		METER READING
(+)	(-)	
R	DC+	0.5 V
S	DC+	0.5 V
T	DC+	0.5 V
R	DC-	infinite (OL)
S	DC-	Infinite (OL)
T	DC-	Infinite (OL)
U	DC+	0.5 V
V	DC+	0.5 V
W	DC+	0.5 V
U	DC-	infinite (OL)
V	DC-	Infinite (OL)
W	DC-	Infinite (OL)
DC+	R	Infinite (OL)
DC+	S	Infinite (OL)
DC+	T	Infinite (OL)
DC-	R	0.5 V
DC-	S	0.5 V
DC-	T	0.5 V
DC+	U	Infinite (OL)
DC+	V	Infinite (OL)
DC+	W	Infinite (OL)
DC-	U	0.5 V
DC-	V	0.5 V
DC-	W	0.5 V

NOTE: Digital meters require a special diode check function

ROCKWELL PF755

Drive Explorer

Turn to the Experts

VFD FAULT CODE ON VFD HIST SCREEN	ICVC FAULT STATE	FAULT TYPE	DESCRIPTION	CORRECTIVE ACTION
NONE	206		Processor memory fault	Consult VFD manual to resolve generic fault.
0		No Entry		
2	207	Auxiliary Input	Input is open.	Check Compressor Discharge High Pressure switch wiring and accuracy. Check for high condenser water temperatures, low water flow, fouled tubes. Check for division plate/gasket bypass. Check for noncondensables in refrigerant.
3	210	Power Loss	Line voltage dropout	Temporary loss of voltage. Disable Single Cycle Dropout in VFD_CONF sceen.
4	215	Undervoltage	Low DC bus voltage	Verify phase-to-phase and phase-to-ground line voltage. VFD Circuit Board malfunction. Contact Carrier Service.
5	166	Overvoltage	High DC bus voltage	Verify phase to phase and phase to ground line voltage. Monitor AC line for high transient voltage conditions.
7	217	Motor Overload	An internal electronic overload trip has occurred.	Any phase current > 106% RLA. Can result from significant load side current imbalance when running at full load. Check entering condenser water temperature and water flow rate. Check Motor Rated Load Amps in VFD_CONF screen.

VFD Fault code is list in VFD History screen on ICVC, separate from ICVC Alarms

ROCKWELL PF755

Drive Explorer

Member of the “Computer-To-Drive” communication adapter family

Some of the 1203-USB’s other family members are:

- 1203-SSS: Serial to DPI adapter (AB)
- RECOMM-232: Serial to DPI adapter (Reliance)

Provides connectivity for computers that do not have a serial port

Used to connect to a drive and go online via a drive software package such as Drive Explorer

ROCKWELL PF755

LCD Operator Interface Module (OIM)

Turn to the Experts

Using the OIM Operator Interface Module

Refer to D2-3488-1for more details

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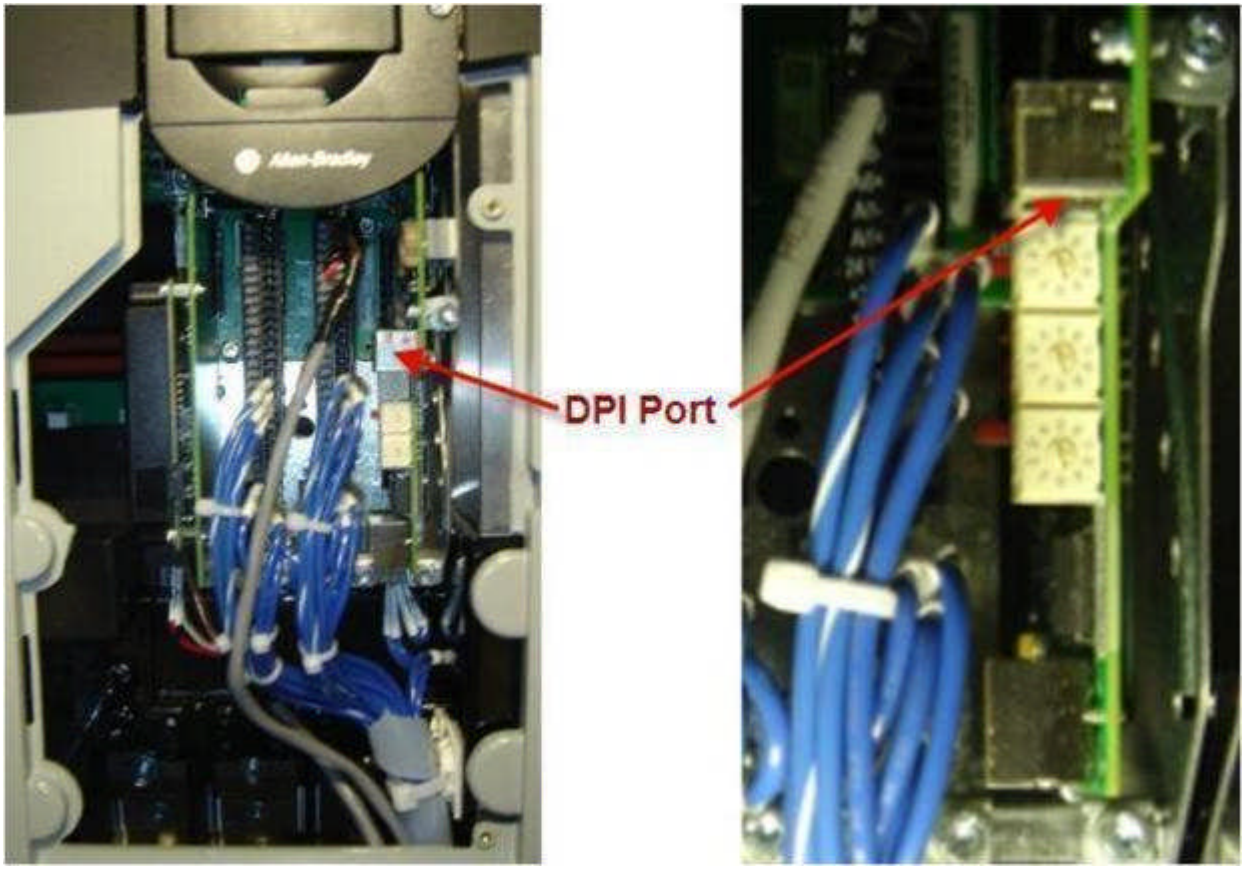
Connecting to Drive

Next, locate the DPI port on the Main Control Board (MCB).



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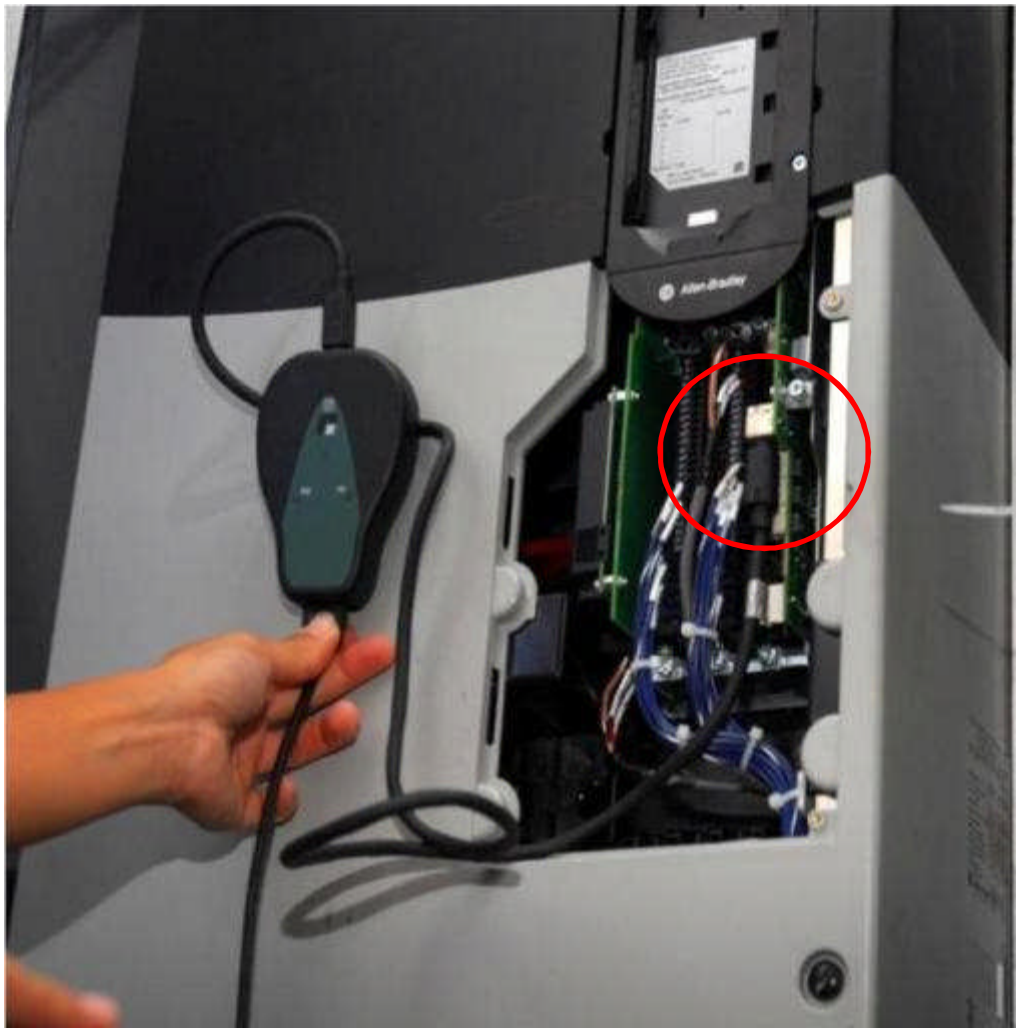
Connecting to Drive via Anacada



Additional training is required to use the Drive Explorer Software and it will not covered in this training

ROCKWELL PF755

SWI

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Go to Service tab → Post sale support → SWI

How to setup "CUSTOM VIEW" in VS Utilities **CCS-SOP-7-SWI00353**