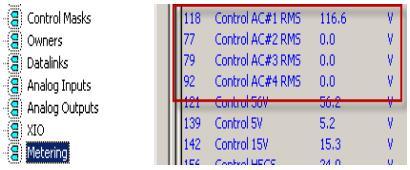
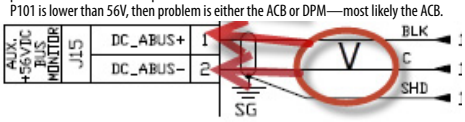
Appendix A Spare Parts

Item	Description	Part Number
SCR Matched set of two		
350A	Matched set of two 350A SCR	81001-335-72-R
800A	Matched set of two 800A SCR	81003-437-52-R
SCR Matched set of three		
350A	Matched set of three 350A SCR	81001-335-73-R
800A	Matched set of three 800A SCR	81003-437-53-R
Power Supplies		
AC/DC	Single phase input, 56V DC output, AC/DC 1000W	80026-529-01-R
AC/DC	Single phase input, 56V DC output, AC/DC 1500W	80026-524-01-R
AC/DC	Single phase input, 56V DC output, AC/DC 300W	80026-088-01-R
DC/DC	56V DC input, Absopulse	80026-518-01-R
IGDPS	56V DC / 20V DC	80026-044-06-R

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Fault Messages

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						AC/DC#1 AC Fail	58	There can be up to 4 AC/DC power supplies in a drive, designated 1, 2, 3 and 4. Each power supply will have its input control voltage measured and monitored for reliable drive operation. An AC Fail is detected when the input to any of the AC/DC power supplies goes below 85Vrms. 120Vac is measured directly on the ACB at terminals J1 14-15. The drive displays the measured value in the Metering group parameters 118, 77, 79, and 92 for power supplies 1 to 4 respectively.	• Verify the input AC voltage to the power supply, typically 110Vac or 120Vac. • Be sure that the AC/DC power supply monitor signal is connected to the ACB. • Check the Metering group in the drive variables to view the control power value the drive is measuring. • The example below shows that the drive is detecting a single AC/DC power supply whose input voltage is 116.6V. 
X						AC/DC#2 AC Fail	59		
X						AC/DC#3 AC Fail	60		
X						AC/DC#4 AC Fail	61		
X						AC/DC#1 DC Fail	48	There can be up to 4 AC/DC power supplies in a drive, designated 1, 2, 3 and 4. Each power supply has its own sensing circuit and will monitor its DC output voltage. The AC/DC power supply triggers a DC Fail signal when an output drops below 49Vdc. The drive monitors the DC Fail signals from the inputs connected to terminals J18, J19, J20 and J21. The drive monitors the 56VDC supply via connection J15 1-2 on the ACB.	• Verify that the power supply is energized and is using the appropriate input control power. • Measure the output voltage and confirm whether the output level is below the trip level. • Verify that the fault detection wiring is per the drawings, and measure the voltage on the trip signals. For example, Terminal J18 2-3 is 5Vdc when healthy, and 0V in a faulted state. • Verify that the power supply internal cooling fan is operational, cycle control power if needed. • If the cooling fan is not operational, replace the power supply. • Check parameter 121 in the Metering group of the drive variables to view the measured DC voltage.
X						AC/DC#2 DC Fail	49		
X						AC/DC#3 DC Fail	50		
X						AC/DC#4 DC Fail	51		
X						Adapter 1 Loss	17	There has been a loss of communication between the Drive Processor Module (DPM) and the DPI adapter 1-6.	• Cycle control power to the drive. • Change the adapter and/or DPM if all attempts to restore communication fail. • Ensure that the adapter is plugged into the ACB, powered, and working properly.
X						Adapter 2 Loss	18		
X						Adapter 3 Loss	19		
X						Adapter 4 Loss	20		
X						Adapter 5 Loss	21		
X						Adapter 6 Loss	22		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						IGDPS 56V Loss	53	The drive has detected a loss of the 56V dc voltage feeding the IGDPS.	• Check connections, the DC output of the AC/DC converter and the input voltage to the IGDPS. • Replace the power supply if required. • Measure the voltage at the ACB connector J15 and compare it to parameter P101. P101 provides the value the drive processor board measures. If the actual value at J15 is 56V and P101 is lower than 56V, then problem is either the ACB or DPM—most likely the ACB. 
		X	X			InputLockOut 5Min	462	This fault is valid for 18-pulse drives and prevents damage to the isolation transformer. The input contactor has been locked out for 5 minutes due to a Line OverCurrent condition.	• Investigate the cause of the over-current condition. Fault can only be reset after 5 minutes. • Check the rectifier SCRs for short across anode to cathode
		X	X			InputLockOut Indef	463	This fault is valid for 18-pulse drives and prevents damage to the isolation transformer. The input contactor has been locked indefinitely due to a Line OverCurrent condition.	• It is likely that there is line to line short condition due to shorted SCR devices. • Investigate the cause of the over-current condition. • If nothing found short, cycle control power to reset the fault.
					X	Inv Airflow Loss	495	The cooling airflow velocity on the specified power stack is below the trip/warn level. This fault is not active starting in Firmware 11.001.	• Ensure that there are no obstructions to the path of the incoming/outgoing air flow. • Check for cooling fan deterioration. • Verify if the trip (P840) and warn setting (P841) matched factory recommended values.
X						InvA2D Seq Error	188	An error has been detected in A2D conversion.	• Cycle control power. • If the fault does not clear after cycling the control power, then replace ACB Board. If this does not resolve the issue, then replace DPM board.
X						InvFbrOpt Config	187	The drive has detected that the number of fiber-optic boards does not match the number of devices in the inverter section.	• Verify the parameter settings and check that the board in plugged properly on the OIBB.
	X	X			X	Inv Hs Over Temp	491	The drive detected high heatsink temperature at the specified location.	• Verify if the warn (rectifier P112, inverter P316) and trip settings (rectifier P111, inverter P315) match factory recommended values.
	X	X			X	InvHSnk FbrOptic	180	While Not Running, the fiber-optic signal from the TFB on the inverter heatsink, connected to Channel A fiber-optic receiver RX7 on FOI-M-A is not present. This is only a fault while not running. If this occurs while running it will appear as a warning.	• Check TFB and FOI board for power. • Check the fiber-optic cables are properly seated in the transmitters and receivers. • Check the fiber-optic cable for kinks, bends, breaks that could be blocking the signal. • This can occur if the sensor is not connected to the TFB.
	X	X			X	InvHSnk LowTemp	179	If the measured temperature IHeatsink Temp C (P252) is less than 2 °C, and the drive is not running, the drive will display this fault.	• Verify that the ambient in the control room is not below 2 °C (35.6 °F). • Verify power to the TFB. • There could be a mechanical problem with the temperature sensor or with the cable feeding the signal back to the TFB. • Swap with the rectifier hardware to identify the bad component.

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Warning Messages

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X						AC/DC#1 AC Fail	108	There has been a loss or dip in the control power feeding the drive. Be sure that the power source is active and investigate the reliability of the source.	• Investigate the possibility of a loss of input voltage to the AC/DC power supply. • Verify the output voltage. • Check the alarm signal connections. • Replace the power supply if necessary.
X						AC/DC#2 AC Fail	109		
X						AC/DC#3 AC Fail	110		
X						AC/DC#4 AC Fail	111		
X						AC/DC#1Redundant	104	The redundant AC/DC power supply #1…4 has failed.	• Verify the electrical connections. • Replace the power supply if necessary.
X						AC/DC#2Redundant	105		
X						AC/DC#3Redundant	106		
X						AC/DC#4Redundant	107		
X						Adapter 1 Loss	49	There has been a loss of communication between the drive processor module (DPM) and the adapter 1…6.	• Be sure that the adapter is plugged in the analog control board (ACB). • Be sure that the remote communication device is powered. • Verify the light status and ensure the communication device is operating properly. • Verify the customer network is properly communicated with the device. • Check the LED status. • Cycle control power to the drive. • Change the adapter if all attempts to restore communication fail.
X						Adapter 2 Loss	50		
X						Adapter 3 Loss	51		
X						Adapter 4 Loss	52		
X						Adapter 5 Loss	53		
X						Adapter 6 Loss	54		
	X	X				Air HighPressure	199	High air pressure reading coming back from analog air pressure transducer located between the converter sections.	• Be sure pressure sensor is working, that there are no obstructions to the path of the exhaust airway or through the heatsinks. • Check for cooling fan abnormal operation. • Verify if the trip setting (P926) matched factory recommended value.
X						AIn1 Calib Error	224	The analog input supplied was outside of the allowable range of 4…20 mA during calibration. Recalibrate with the proper range.	• Verify the calibration of analog inputs.
X						AIn2 Calib Error	225		
X						AIn3 Calib Error	226		
					X	Ambient FbrOptic	221	The drive has detected a missing temperature sensor to the temperature feedback board (TFB). Be sure that the sensor in plugged in	Not Used
					X	Ambient OvrTemp	217	Drive detected high ambient temperature.	Not Used
					X	Ambient Sensor	219	The drive has detected a missing temperature sensor to the TFB. Be sure that the sensor in plugged in.	Not Used

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