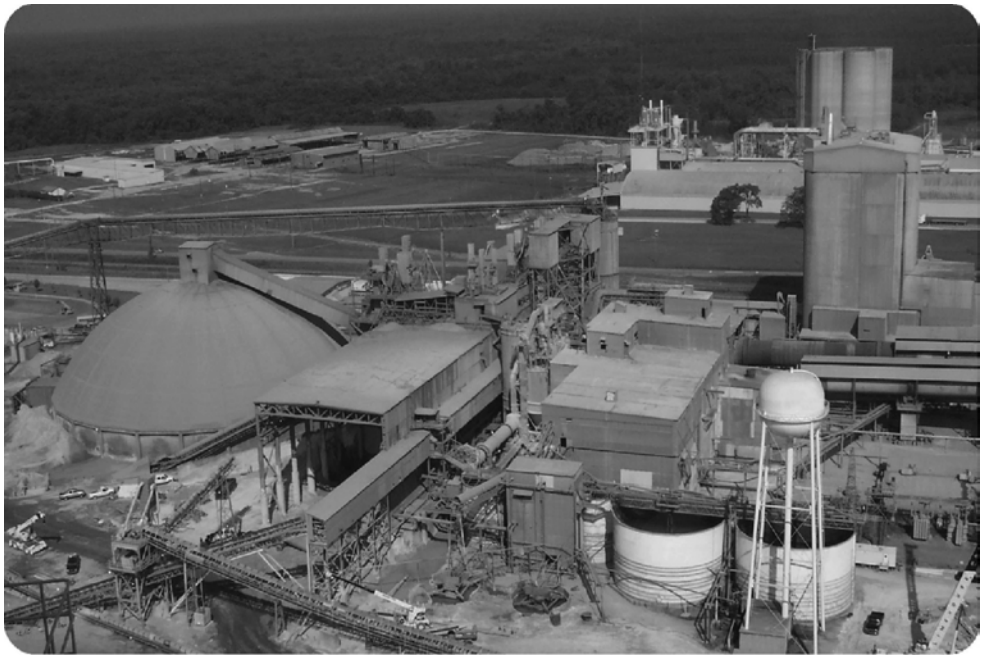
Troubleshooting Guide

Allen-Bradley

PowerFlex 7000 Medium Voltage AC Drives

Publication 7000-TG002J-EN-P



Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.

	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.
	**ARC FLASH HAZARD:** Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

This manual contains new and updated information.

New and Updated Information

This table contains the changes made to this revision.

Topic	Page
Added Fault 159	21
Updated STO Gating Flt description	40

Notes:

Notes:

About this Publication

This manual contains troubleshooting information for medium voltage PowerFlex® 7000 drives only.

Who Should Use This Manual

This manual is intended for qualified service personnel responsible for troubleshooting and repairing medium voltage PowerFlex 7000 drives. You should have previous experience with, and basic understanding of, electrical terminology, procedures, required troubleshooting equipment, equipment protection procedures and methods, and safety precautions.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
Publication 7000-IN006	PowerFlex 7000 Medium Voltage AC Drive (B Frame) Commissioning - ForGe Control
Publication 7000-IN007	PowerFlex 7000 Medium Voltage AC Drive (B Frame) Installation - ForGe Control
Publication 7000-IN008	PowerFlex 7000 Medium Voltage AC Drive (B Frame) Trans. & Handling - ForGe Control
Publication 7000-IN010	Handling, Inspection, and Storage of Medium Voltage Line Filter Capacitors
Publication 7000-PP002	PowerFlex 7000 Air-Cooled Drives
Publication 7000-QS002	HMI Interface Board Software Updater and Firmware Download Procedure
Publication 7000-TD001	PowerFlex 7000 Medium Voltage AC Drive (Firmware Version 6.xxx) - Classic Control
Publication 7000-TD002	PowerFlex 7000 Medium Voltage AC Drive (Firmware Version 9.xxx) - ForGe Control
Publication 7000-UM150	PowerFlex 7000 Medium Voltage AC Drive (B Frame) - Classic Control
Publication 7000-UM151	PowerFlex 7000 Medium Voltage AC Drive (B Frame) - ForGe Control (Using PanelView 500)
Publication 7000-UM201	PowerFlex 7000 HMI Offering with Enhanced Functionality
Publication 7000-UM202	PowerFlex 7000 Medium Voltage AC Drive (B Frame) - ForGe Control
Publication 7000-UM203	PowerFlex 7000 Series Safe Torque Off
Publication 7000A-UM150	PowerFlex 7000 Medium Voltage AC Drive (A Frame) - Classic Control
Publication 7000A-UM151	PowerFlex 7000 Medium Voltage AC Drive (A Frame) - ForGe Control (Using PanelView 550)
Publication 7000L-UM301	PowerFlex 7000 Medium Voltage AC Drive (C Frame) - ForGe Control
Publication 7000L-UM302	PowerFlex 7000 Medium Voltage AC Drive (C Frame) - ForGe Control (Marine)

You can view or download publications at http:/www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Acronyms and Abbreviations

Acronym/ Abbreviation	Description
A/D	Analog/Digital
A2D	Analog to Digital
AC	Alternating Current
ACB	Analog Control Board
Accel	Acceleration
ADC	Analog to Digital Converter
Anlg	Analog
BW	Bandwidth
Cap	Capacitor
Ch	Channel
Chn	Channel
CIB	Customer Interface Board
CMC	Common Mode Choke
Cmd	Command
Conv	Converter
CT	Current Transformer
Ctctr	Contactor
Cur	Current
DAC	Digital to Analog Converter
DB	Dynamic Braking
DC	Direct Current
DCB	Drive Control Board
DCSL	Drive Control and Synchronization Link
DD	Dimensional Drawings
Decel	Deceleration
DIM	Drive Identity Module
Dly	Delay
DO	Drive Output
DPI	Drive Peripheral Interface
DPM	Drive Processor Module
DrvIn	Drive Input
ED	Electrical Drawings
ESP	Electric Submersible Pump
Fbk	Feedback
Flt	Fault
Fltr	Filter
FO	Fiber-Optic
FOB	Fiber-Optic Interface Board
FOI	Fiber-Optic Interface
FPGA	Field-Programmable Gate Array

Acronym/ Abbreviation	Description
Freq	Frequency
GND	Ground
Gnrl	General
HECS	Hall Effect Current Sensor
Hi	High
HP	Horse Power
HW	Hardware
I	Current
IGDPS	Isolated Gate Driver Power Supply
Init	Initialize
Inv	Inverter
IO	Input/Output
Isoltn Sw	Isolation Switch
L	Inductance
L	Line
LED	Light-emitting diode
Liq	Liquid
Lo	Low
LR	Line Reactor
LV	Low Voltage
M	Machine
Magntz	Magnetizing
Max	Maximum
Min	Minimum
Mstr	Master
MTR	Motor
NVRAM	Non-Volatile Random Access Memory
OC	Overcurrent
OL	Overload
OP	Output
OT	Overtemperature
OV	Overvoltage
PD	Parallel Drive
PF	Power Factor
PFC	Power Factor Correction
PID	Proportional, Integral, Derivative (process control)
PLC	Programmable Logic Control
PSD	Power Structure Diagnostic
PWM	Pulse-Width Modulation
Rect	Rectifier

Acronym/ Abbreviation	Description
Rot'n	Rotation
SCB	Signal Conditioning Board
SCR	Silicon-Controlled Rectifier
SGCT	Symmetrical-Gate Commutated Thyristor
Slv	Slave
Spd	Speed
SPGD	Self-Powered Gate Driver
STO	Safe Torque Off
SW	Software
Sync	Synchronous
Tach	Tachometer
TFB	Temperature Feedback Board
TFB3	Temperature Feedback Board, 3rd generation
Trp	Trip
Trq	Torque
TSN	Transient Suppression Network
UB	Unbalance
UPS	Uninterrupted Power Supply
USART	Universal Synchronous/Asynchronous Transmitter/Receiver
V	Volt
VSB	Volt Sensing Board
Wrn	Warning
Xfer	Transfer
XIO	External Input/Output

Fault Messages

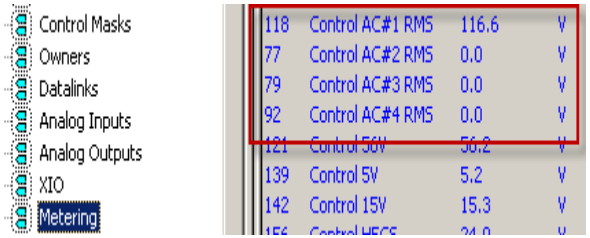
Overview

All faults, warnings, or messages displayed on the operator interface should be thoroughly documented by the user prior to resetting those messages. This will assist maintenance personnel in correcting problems and ensuring they do not recur.

ATTENTION: Investigate all faults before resetting the drive.

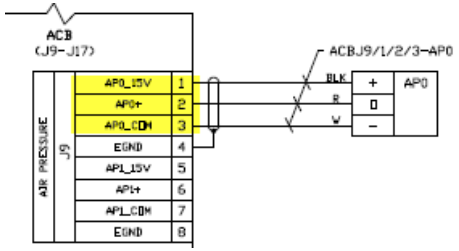
Resetting the drive into a fault condition that has been unresolved can propagate the faults and cause an increased level of damage to the equipment.

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						Adaptr1 ForceFlt	26	There has been a loss of communication between the identified DPI adapter and the customer's communication network. The communication between the drive and the DPI adapter may still be active. This is a requirement for DPI communications. If the loss of communication from the network to the adapter is required to be a warning, this must be set in the adapter itself, not within the drive.	• Verify the customer network is properly communicating with the device. • Check DPM status LEDs and compare to the information in the User Manual. • Change the adapter if all attempts to restore communication fail. • Cycle control power.
X						Adaptr2 ForceFlt	27		
X						Adaptr3 ForceFlt	28		
X						Adaptr4 ForceFlt	29		
X						Adaptr5 ForceFlt	30		
X						Adaptr6 ForceFlt	31		
						Ambient OvrTemp	182	NOT ACTIVE	
						Ambient LowTemp	183	NOT ACTIVE	
						Ambient FbrOptic	184	NOT ACTIVE	
						Ambient Sensor	185	NOT ACTIVE	
X						Arbitration Loss	602	The number of Arbitration Loss faults has exceeded the maximum allowable level.	• Check the DCSL communication wiring and shielding.
X						Auxiliary Prot'n	37	Standard External Fault/Warning Input included to allow the end user to install a protective relay/system status contact that can activate a drive fault or warning, depending on configuration of Aux Prot Class (P445). The message means that the drive has detected a fault triggered by the input wired in the auxiliary input of the XIO card.	• Check the device responsible for the auxiliary contact to this input, and investigate the cause of the open contact status. • Check the 120V signal through the external device. • Check the XIO board inputs and parameter status bits. • Check the 120V wiring and the XIO card.
X						Bypass CtctrOpen	168	The bypass contactor was opened without a command from the drive. Verify the contactor feedback and the 120V wiring to the ACB.	• Because the drive system needs to have complete control over all contactors, investigation of the specific contactor fault is required. • Verify contactor feedback. • Verify the control power circuit for the contactor. • Check permissive string to the contactor control relay (refer to drawing). • Check contactor/breaker for physical malfunction (auxiliaries). • Check ACB inputs and outputs at J1.
X						Bypass IsoSwClsd	175	The bypass isolation switch is closed when it was expected to be open. Verify the isolation switch mechanical set up and the 120V wiring to the ACB. Depending on the operating mode of the drive, ensure that the switch is in the proper position.	• Depending on the mode of operation (Normal, System Test, Open-Circuit Test, DC Current Test, or Open-Loop), there are specific states for all the possible system isolation switches (Refer to the description of parameter 141 Hardware Options1. Be sure the isolation switches are in the proper position. • Verify wiring feedback. • Verify isolation switch mechanical auxiliary setup. • READ ASSOCIATED DESCRIPTION.
X						Bypass IsoSwOpen	172	The bypass isolation switch is open when it was expected to be closed. Verify the isolation switch mechanical set up and the 120V wiring to the ACB. Depending on the operating mode of the drive, ensure that the switch is in the proper position.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
			X	X		CabinetTemp High (C-Frame Only)	70	The drive has a temperature switch in several cabinets, and all the N/C switches are connected in series and fed back to the XIO input. The levels are set differently for different cabinets.	• Identify which switch has opened, and focus on that cabinet. • Check for proper air flow within the identified section. • Verify that the stirring fans are operating correctly. • Verify that the ambient temperature is within tolerances.
X						Capability Limit	465	The motor current exceeded maximum allowable level for the variable torque drive. Drive was limiting the motor current to the safe level for drive thermal protection, but new speed operating point cannot be achieved higher than 6 Hz.	• Ensure that the drive is not used for constant torque load condition.
					X	CMC Blcked Exhst	477	There is possibly blockage to the CMC exhaust/inlet airflow. **Note:** This fault word is used exclusively on Heatpipe drives.	• Ensure that there are no obstructions to the path of the outgoing/incoming air flow. • Check for cooling fan deterioration. • Verify if the trip setting (P813/P814) matched factory recommended value.
					X	CMC Blcked Inlet	480	There is possibly blockage to the CMC exhaust/inlet airflow. Note: This fault word is used exclusively on Heatpipe drives.	• Ensure that there are no obstructions to the path of the outgoing/incoming air flow. • Check for cooling fan deterioration. • Verify if the trip setting (P813/P814) matched factory recommended value.
					X	CMC Double Fans	474	The drive has just lost two or more of the cooling fans.	• Verify the fan contactors, fan overload and the 120V wiring to the XIO card.
					X	Cnv Airflow Loss	505	The cooling airflow velocity on the specified power stack is below the trip/warn level.	• Ensure that there are no obstructions to the path of the outgoing/incoming air flow. • Check for cooling fan deterioration. Verify if the trip (P840) and warn setting (P841) matched factory recommended values.
					X	Cnv Double Fans	473	The drive has just lost two or more of the cooling fans.	• Verify the fan contactors, fan overload and the 120V wiring to the XIO card.
					X	CMC Fan9 Ctctr	487	Loss of the cooling fan.	• Verify the fan contactor, fan overload and the 120V wiring to the XIO card.
					X	Cnv Fan3 Ctctr	482		
					X	Cnv Fan4 Ctctr	483		
					X	Cnv Fan5 Ctctr	484		
					X	Cnv Fan6 Ctctr	485		
					X	Cnv Fan7 Ctctr	486		
X						Control Pwr Loss	57	There has been a loss or dip in the control power feeding the drive for more than 5 cycles.	• Ensure that the power source is active and investigate the reliability of the source. • Check control power input to ACB.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
	X	X			X	Convrtr Air Flow	176	The air pressure drop at the input to the converter section sensed by the pressure transducer (as a voltage) has dropped below the value set in AirLoPresure Trp (P319). This is dependent on the operation of the main cooling fan. Components to check are cooling fan, air pressure transducer, analog control board, blocked air filters, correct parameter settings. 	• Verify fan rotation, necessary air pressure is developed only with the correct direction of fan rotation. • Check for blocked airflow in the filters/heatsinks/ducting (if installed). Clean as necessary. • Improper Trip settings – Verify pressure value voltage level when running with clear air flow, and compare to expected values for that specific drive type. • Verify the alarm and trip set-up procedure was completed adequately during commissioning and adjust as necessary; applicable parameters are: – Air Pressure Nom (P317) – AirLoPresure Wrn (320) – AirLoPresure Trp (319) • Check that the pressure sensor is working and is connected to the ACB at J9. Control Voltage for the pressure transducer is +15V on J9 terminals 1 to 3 • Confirm output of the transducer is stable, J9 terminal 2 to 3 • Verify for drives with external ducting that there is sufficient air to the drive input. • Applicable Tech Notes: – PowerFlex 7000-Gen-11 PowerFlex 7000 Air Pressure Sensor Setup – PowerFlex 7000_4Gen_Gen-16 How to Configure Differential Pressure Transducer – PowerFlex 7000-4Gen_Gen-23 High Air Pressure Fault When Upgrading Firmware to Rev 8 or Higher
			X	X		ConductivityHigh (C-Frame Only) OIBBS	68	The measured coolant conductivity is greater than 2 µS/cm^3.	• Verify that no foreign debris has entered the system (iron piping, non-deionized water, etc.). • Wash the mesh filters. • Change the de-ionizing cartridge and run the system, verifying that the conductivity is decreasing. • If the cooling pumps have not been running for a period of time, the conductivity level will increase. Anticipate this and run the cooling pumps to reduce the conductivity level before starting
X						Config Fault Inv	629	Inverter configuration fault: A functional safety hardware / configuration mismatch was detected. There is a hardware configuration fault on the inverter side.	• If the drive uses the STO feature, ensure no SPS jumper is installed on the inverter OIBBS. • Verify the drive settings. If the drive uses the STO feature, enable STO. • Verify the inverter OIBBS (for STO drive) or OIBB (for non-STO drive). In case of incorrect part(s), contact the manufacturer for replacement spare parts.
X						Config Fault Rec	625	Rectifier configuration fault: A functional safety hardware / configuration mismatch was detected. There is a hardware configuration fault on the rectifier side.	• If the drive uses STO feature, the SPS jumper on the rectifier OIBBS must be set correctly. See parameter 274. • Verify the drive settings. If the drive uses the STO feature, enable STO. • Verify the rectifier OIBBS (for STO drive) or OIBB (for non-STO drive). In case of incorrect part(s), contact the manufacturer for replacement spare parts.
X						Config Fault1	616	Configuration Fault 1: This bit indicates that a configuration conflict has been detected. The Safe Torque Off function is incompatible with the following features: N+1, Parallel Drives, 18-Pulse rectifiers.	• See parameters P141 for redundant devices, P153 for rectifier type, and P717 and P745 for parallel drives. • Verify the drive settings and disable the un-supported features. • Cycle the control power.
X						Config Fault2	617	Configuration Fault 2: This bit indicates that a configuration conflict has been detected. The Safe Torque Off function is incompatible with drives utilizing a bypass contactor including synchronous transfer.	• See parameters P99 for sync transfer enabled and P141 for bypass contactor configuration. • Verify the drive settings and disable the un-supported features. • Cycle the control power.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Control 5V Loss	54	There is a single DC/DC power in each drive. It receives 56VDC input and produces various levels of DC voltages on the output. One of these output voltage level is 5Vdc. It is a critical voltage level for the drive processors. This fault message indicates the 5Vdc produced by the DC/DC power supply has failed. The drive monitors the 5Vdc by measuring this voltage.The 5Vdc is connected to the ACB terminal JX 1-2.	• Check connections, test the rail voltage level and test for shorts. • Replace the DC/DC converter if this problem remains.
X						Control 15V Loss	55	There has been a loss of the 15 volt DC rail from the DC/DC converter.	• Check connections, test the rail voltage level and test for shorts. • Replace the DC/DC converter if this problem remains.
X						Control 56V Loss	52	The drive has detected a loss of the 56V dc voltage feeding the DC/DC converter.	• Check the connections, feedback wiring on J14 of the ACB, the DC output of the AC/DC converter and the input voltage to the DC/DC converter. • Replace the power supply if required.
			X	X		CoolantLevel Low (C-Frame Only)	69	The measured coolant level within the reservoir has dropped below the second (lowest) level sensor and the drive has faulted. This sensor is set for the minimum level required to ensure there will be no air drawn into the system through the reservoir.	• Verify that the drive cooling system does not have any coolant leaks – repair if found. • Add the proper amount of de-ionized water to get the level above the warning sensor (de-ionized water will evaporate, not the glycol).
			X	X		CoolantTemp High (C-Frame Only)	67	The measured coolant temperature has exceeded 54 °C (129 °F). The drive detected that the coolant temperature has exceeded the trip setting in P483. Ensure that the heat exchanger fans are working properly and the room ambient is adequate for the drive operation.	• Verify the heat exchanger fans are operating. • Verify that the thermostatic valve is fully opened. • Check that all valves are in the normal operating position. • Verify that the drive is operating within specified load and ambient conditions.
			X	X		CoolantTemp Low (C-Frame Only)	66	The measured coolant temperature has dropped below 4 °C (40 °F). It will not clear until the coolant temperature reaches 10 °C (50 °F). This fault will only occur if the drive is not running, to stop you from starting with a low coolant temperature. If you are already running when the coolant level drops, you will only get a warning.	• Verify that the thermostatic bypass valve (V10) was not left open. • Verify that the ambient temperature within the drive control room is not below specification. • Warm up the control room ambient to get the drive to an operational level.
X						CRC Fault	601	The number of Cyclic Redundancy Check (CRC) faults has exceeded the maximum allowable level.	• Check the DCSL communication wiring and shielding.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Current Sensor	155	This fault is detected in either DC test mode or open loop test mode or during auto tune. This indicates that there is a problem with the current feedback in the drive. There are three different current sensors: Line side CT, DC Link HECS and Motor HECS. To ascertain the cause of the fault check Cur Sens FltCode (P764) under Diagnostic group. Corresponding bit and its troubleshooting guide should be followed.	• If you have the ***Line HECS/CT*** code, the line current measurement is not what is expected at this level of dc current. Either of the CT DC HECS and there burden resistors may be damaged or programmed incorrectly. For example, the DC HECS may actually be 2500:1, the drawings and parameters indicate 4000:1. Another cause would be an unplugged DC HECS. • If you have the ***CT Phs Seqn*** code, the CTs are likely swapped. For example, the CT/wiring for 2U has been switched with 2W. • If you have the ***CT Phs/Alpha*** code, the rectifier is firing with the wrong firing angle relative to the angle measured from the line current. This can occur when the CTs on an 18-pulse rectifier are switched between master and slaves. • If you have the ***Cap/CT Error*** code, this only occurs for PWM rectifiers when energized and not running. The line current measured by the CTs does not match the expected line current based on the capacitor parameters and measured voltage. Possible causes are incorrect capacitor, CT or burden resistor parameters, and in some cases, blown TSN fuses. • If you have the ***Motor HECS*** code, this only occurs when running on the motor in open loop mode. The drive compares the motor current to the dc current, and flags this fault if there is a significant difference. If there were no *Line HECS/CT* codes, then the likely cause of this fault in an incorrectly programmed motor HECS value or burden resistor. Other causes could be a defective or unplugged motor HECS. • Make sure hardware parameters are correct and do not exceed the range.
X						DAN Comm Loss	456	**This is applicable to parallel drive systems.** Drive Area Network (DAN) communication fault. The communication between drives used in a parallel drive system communicates over the DAN link. This fault indicates a loss of the DAN link for a drive acting as a Slave. This would result in the slave drive stopping.	• Check RS485/RS232 converter. Red LED should be steady, and green and yellow transmit and receive LEDs should be flashing. • Check RS485 cable between drives. • Check RS232 cable between ACB board and serial converter. • Previous issue required the replacement of the RS232 to RS485 converter (MOXA)

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
				X		DBSE1DiagFbkLoss	520	This is an offline Symmetrical Gate Commutated Thyristors (SGCT) fault on the DB side and indicates that the drive did not sense the proper diagnostic feedback before and after the diagnostic gating. It is likely that the feedback fiber-optic cable is not plugged in or has been damaged.	• Check that the fiber-optic cables are seated properly in the optical interface board and the SGCT firing card. • Check that the fiber-optic cable is not pinched or damaged. • Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range – Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly.
				X		DBSE2DiagFbkLoss	521		
				X		DBSE3DiagFbkLoss	522		
				X		DBSE4DiagFbkLoss	523		
				X		DBSH1DiagFbkLoss	524		
				X		DBSH2DiagFbkLoss	525		
				X		DBSH3DiagFbkLoss	526		
				X		DBSH4DiagFbkLoss	527		
				X		DBSE1GatingLoss	528		
				X		DBSE2GatingLoss	529		
				X		DBSE3GatingLoss	530		
				X		DBSE4GatingLoss	531		
				X		DBSH1GatingLoss	532		
				X		DBSH2GatingLoss	533		
				X		DBSH3GatingLoss	534		
				X		DBSH4GatingLoss	535		
				X		DBSE1Offline	536	This SGCT device on the DB side was detected to be faulted after the input contactor was closed or following a start command or following a drive reset. After isolating the drive from MV, ensure that the device, IGDPS power supply and the fiber-optic signals are not damaged.	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range – Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly.
				X		DBSE2Offline	537		
				X		DBSE3Offline	538		
				X		DBSE4Offline	539		
				X		DBSH1Offline	540		
				X		DBSH2Offline	541		
				X		DBSH3Offline	542		
				X		DBSH4Offline	543		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
				X		DBSE1Online	544	The drive detected that the diagnostic feedback from this SGCT device on the DB side did not match the gating pattern. After isolating the drive from MV, ensure that the device, IGDPS power supply and the fiber-optic signals are not damaged.	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range – Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. • For nuisance faults, contact the factory about extending the Diagnostic Delay.
				X		DBSE2Online	545		
				X		DBSE3Online	546		
				X		DBSE4Online	547		
				X		DBSH1Online	548		
				X		DBSH2Online	549		
				X		DBSH3Online	550		
				X		DBSH4Online	551		
				X		DB Airflow Fault	570	The drive has detected that either the DB exhaust temperature or the DB ambient temperature has exceeded the corresponding trip level. For the DB Airflow Fault the drive has detected that the airflow in the DB cabinet is below the trip level.	• Verify the trip and warning settings match the factory recommended values. • Check TFB, temperature sensors and airflow sensor in DB cabinet. • Verify that feedback values are consistent with actual conditions. • Ensure that ambient conditions do not exceed specifications.
				X		DB Amient OvrTemp	569		
				X		DB Resis OvrTemp	568		
				X		DB Airflow Sensor	573	DB airflow sensor not functioning. A warning is issued if this happens while running and a fault is issued when the drive is stopped.	• Check TFB and airflow sensor in the DB cabinet. • Verify that feedback value is consistent with actual conditions.
				X		DB AmbientSensor	572	DB temperature sensor not functioning. For DB Resis Sensor, a warning is issued if this happens while running and a fault is issued when the drive is stopped.	• Check TFB (onboard ambient sensor) and DB exhaust temperature sensor in the DB cabinet. • Verify that feedback values are consistent with actual conditions.
				X		DB Resis Sensor	571		
				X		DB fiber-optic	574	DB TFB is not functioning.	• Check TFB in the DB cabinet. • Verify that feedback values are consistent with actual conditions.
				X		DBR Overload	575	Braking energy dissipated in DB Resistor exceeded the fault threshold (i.e. 150% of DBR rated energy). This is a calculated measurement and does not reflect any physical feedback.	• Verify DBR parameter settings are correct. • Verify DC Current feedback measurement is correct.
			X			DC Link Flow Low (C-Frame Only)	72	The flow switch in the DC Link coolant path has detected the flow is less than optimal, indicating a problem with the flow path. This is not designed to specifically measure flow. This is a switch that differentiates between flow and no flow.	• Verify pressure values in the cooling system are nominal. • Verify the cooling path is not restricted because of tube crimping. • Check flow switch for proper operation. • It may be required to disconnect cooling path and complete a check on the DC Link for blockages.

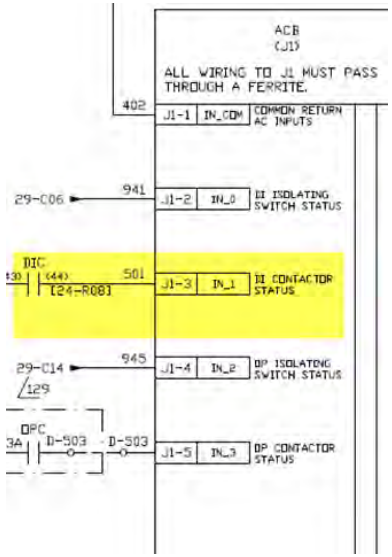
All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						DCInk OvrCurrent	113	The DC Link current given by Idc Feedback (P322) has exceeded the DC Link current trip settings (P169). Verify the parameter settings of the drive. Check the HECS and burden resistor. Confirm stable operation of the drive and any sudden load transients.	• Verify that the parameters for drive and device ratings, and installed current sensing components are set accordingly. • Verify that the DC Link HECS is wired properly and properly powered. • Verify the burden resistor value. • Complete a DC Current Test to verify the feedback corresponds to the IDC command. • Setup trending to capture DC Link current feedback and other related read-only parameters (Contact factory if you require assistance). • Check Alpha Line, and verify that the value is not too low (15°) and the current regulator is not in limit; Decrease Flux Command Base Speed or increase incoming Line Voltage. • Restart the drive to allow the start up diagnostics to detect any shorted thyristors, but **only attempt this once if shorted SCRs are detected**.
X						DCLnk OvrTemp	34	The thermal switch in the DC Link inductor has detected an over temperature condition and opened the AC input to the standard XIO. Ensure that the converter cooling fan is working and that the air flow is not obstructed. Also check the 120V wiring and the XIO card. There is a thermal switch in each DC Link winding, and they are connected in series.	• Verify operating conditions (ambient/ altitude/ load levels/ ventilation and fans) and verify that the DC Link Reactor is within ratings. • Check the 120V signal through the thermal switch. • Verify the drive cooling circuit is operating correctly. • Check the XIO board inputs and parameter status bits. • Determine through elimination whether there is a faulty switch and replace if necessary.
X						DC Neutral VSB	461	This fault indicates that the voltage sensing board associated with the dc and neutral voltages is not plugged in.	• Check connector J25. • Verify connection from VSB to ACB.
				X	X	DriveApplication	583	This fault indicates that either the drive application (P751) has been changed or that one or more of the application-specific functions are incorrectly set (for example, for Marine Application 1, P751 Drv Application must be set to 'Marine 1', Speed Ref Select (P7) must be set to 'App Specific', TorqueRef Select (P401) must be set to 'App Specific' and Trq Control Mode (P90) must be set to 'App Control').	• Ensure that all application-specific parameters are correctly set. • Cycle control power.
X						Drive OvrLoad	144	Drv OvrLoad Trp (P163) as the absolute trip level, Drv OvrLoad Dly (P164) as the base trip delay, and Drv OvrLoad Min (P269) as initial detection level. The drive has detected an overload condition in the dc link indicated by Drv Overload (P551).	• Transient Loading – Check torque limit and overload settings and compare loading to torque settings and trip settings. • Open Burden Resistor – Check Current feedback and check the burden resistors. • Verify the drive sizing and that the overload parameters to meet the load requirements.
						DvcAnodCath/Snub	154	Device Anode-Cathode or Snubber fault	NOT USED
						Drv Output Open	161	NOT USED	NOT USED
X						Duplct Node Flt	603	The drive has detected nodes that have the same Node ID.	• Change the affected drive(s) node ID using parameter DCSL Node ID (935).
X						Encoder Loss	163		• Be sure that the encoder is powered and connected properly. • Be sure that all channels are connected properly and not swapped at motor and drive end. For example, swapping A+ and A- will give this fault • Z+ and Z- are not to be used in PF7000 Forge drives, remove any wires, jumpers on the Z+ Z- terminals • Tech notes related to Encoders are PF7000 4th Gen_FMW-11, PF7000 Firmware 9.001 and 9.002 with Encoder Release Notes

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						External 1…16	1…16	These are the optional additional external faults available when there is an additional XIO board installed. This is configured with XIO Ext Faults (P593), and this message will appear if the specific input (1-16) is configured in Fault Config as a Class 1 or Class 2 fault.	• Review XIO board drawing: • Identify source of input from the external fault XIO board print and investigate the cause of the fault. • Verify voltage signals from external sources.
			X			Ext Cooling Loss (C-Frame only)	65	The drive has detected the loss of the ability to provide cooling for the drive. This is detected through feedback from the heat exchanger cooling fans contactors and overloads.	• Review the inputs to the drive liquid cooling XIO and determine the source of the missing signals. • Investigate the heat exchanger fans and control for a cause. • Check the liquid cool XIO card.
X						Fault Code 159	159	Line voltage and/or line frequency loss at the drive input. This fault is active when the drive operates in HPTC mode. This fault is valid for firmware 10.002 and later revisions. Bit 15 of Par#281 ('Drive Fault3') will be set for the fault.	• Investigate power disturbances at the drive input. • Investigate if the fault is caused by starting or stopping the across the line starter or soft starter. • Verify voltage sensing board VSB1 is free of visible damage. Use a multimeter to check resistances against nameplate ratings. • Verify the parameter setting for line loss: Par #698 ('Line Loss Trip') is more or less than the default value • Upload black box data from the drive and contact MV Tech Support
X						Fault Code 648	648	Rectifier A3 Fault: A3 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement
X						Fault Code 649	649	Rectifier A4 Fault: A4 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement
X						Fault Code 650	650	Rectifier A5 Fault: A5 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement
X						Fault Code 680	680	Inverter A3 Fault: A3 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement
X						Fault Code 681	681	Inverter A4 Fault: A4 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement
X						Fault Code 682	682	Inverter A5 Fault: A5 diagnostic test failure on the OIBBS	• Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						GatePwrSup V Low	130	This alarm is for SGCT based drives and indicates a problem with the gate power supply, which is being monitored using the temperature feedback board (TFB). There are two types of TFBs used in the PowerFlex 7000. The original TFB only provides temperature feedback. The 3rd generation temperature feedback board (TFB3) provides temperature feedback and SGCT gate power supply level in real time. See parameters 796, 805 and 807 in the Thermal Protection group to see the real time power supply level. See Appendix A for part numbers of the TFB.	• Removing and inserting the fiber-optic cable into the TFB may cause the drive to fault on Gate Power Supply V Low. Cycle power to reset this event. • Check the 20Vdc input to the gate driver board. Replace IGDPS if the voltage output on any channel is outside 20V+/-2% range.
X						Gnd OvrCurrent	114	The ground current (P367) measured on the ground fault CT has exceeded the value in Gnd OvrCur Trp (P171) for the duration set in Gnd OvrCur Dly (P172). The GFCT (zero-sequence CT) is not installed in all drives.	• Verify the burden resistor has not opened. On the ACB measure J7 pin 3-5, expect 500 ohm. • Verify that parametersP171 and P172 are set properly. • Check for any imbalance in line currents. • Electrically isolate the drive from the motor and place drive in IDC Test mode. If P367 is zero amps, then ground fault most likely located in motor cables or motor. If P367 is a non-zero value, examine drive for potential source of ground fault. • Megger the drive and motor and input transformer/AC line reactor to search for a ground fault in the system. • Check CMC and neutral resistor. See Technical Note PF7000_GEN-65, “Testing of Common Mode Chokes”.
X						HECS Power Loss	56	The power supplied to the motor Hall-Effect current sensors (±24VDC) is monitored on the control board and will fault the drive if the voltage is out of tolerance.	• Verify the DC voltage on the DC/DC supply, at the ACB board, and at the Current Sensors [HECS]. • Check the current sensor wiring and ensure all connections are per the electrical drawing.
	X	X			X	High AirPressure	467	High air pressure reading coming back from analog air pressure transducer located between the converter sections. The pressure sensor detects blockage of air flow through the heatsinks of the power cage.	• Ensure that the pressure sensor is working, and 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 (P925) matched factory recommended value. P925 is set to 1.0V above nominal value displayed in P447. Tech note PowerFlex 7000_4Gen_Gen23 describes actions to take for 2400V applications when upgrading drive software from 7.00x to 8.00x or higher.
					X	HP XIO NotAssgnd	553	A required XIO card has not been assigned based on the selection of drive model.	• This fault is related to Heatpipe drive. Verify that the parameter P781 is set correctly (proper XIO card is assigned to the parameter).
X						IdcHECSConnector	191	The drive has detected that the Idc HECS connector (J7) is not connected properly.	• Turn off the control power and verify that connector and the interlock are in place.

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.	• 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.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
	X	X			X	InvHSnk OvrTemp	178	The temperature detection on the inverter heatsink, connected to Channel A fiber-optic receiver RX7 on FOI-M-A, has exceeded InvHSink TempTrp (P315).	• Confirm actual temperature in parameters is not higher than the trip value – If so, investigate the conditions of the drive (ambient/ loading/ elevation / ventilation/ filter status /heatsink clogging). • Check the sensor and temperature offline (ambient) for accuracy. • Check for any harmonic and capture DC current waveforms on ACB board. • Ensure that the fan is working properly and that the air flow is sufficient in this cabinet.
	X	X			X	InvHSnk Sensor	181	While Not Running, The drive has detected a missing temperature sensor connected to the TFB on the inverter heatsink. A missing sensor can result in either a Fiber Optic Loss fault or a Sensor fault because a missing sensor can be interpreted as either 0 °C or over 100 °C, and both are unrealistic values.	• Verify sensor is completely seated properly on TFB. • Measure sensor resistance. • Replace if necessary.
X						Inv OIBB Com Flt	628	Inverter OIBBS communication fault: Communication failed to the OIBBS. Communication from the inverter OIBBS is lost.	• Verify the drive settings. If the drive does not use the STO feature, disable STO and verify that the correct OIBB type is installed. • Verify the inverter Optical Interface Base Board Safety (OIBBS) connections to the DPM. • Check and cycle the control power to the safety system (OIBBS). • If the same fault trips the drive again, contact the manufacturer for the OIBBS spare part for replacement.
X						InvOvrVoltage SW	468	The drive has detected an over-voltage at the inverter output terminals in software for long cable applications. A fault is issued if the drive is gating else a warning is issued.	• Verify that the Motor Over Voltage Trip (P181) is set correctly. • Verify that the motor cables are not disconnected. • Contact MV Tech Support for assistance.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Input CtctrOpen	166	The input contactor has opened without a command from the drive.Verify the contactor feedback and the 120V wiring to the ACB.	• The drive system needs to have complete control over all contactors, so investigation of the specific contactor fault is required. • Verify contactor feedback. • Verify the control power circuit for the contactor. • Check permissive string to the contactor control relay (refer to drawing) - Check contactor/ breaker for physical malfunction (auxiliaries). • Check ACB board inputs and outputs. • Check ACB connector for loose connections or damaged connector J1 
X						Input IsoSwClsd	173	The input contactor isolation switch is closed when it was expected to be open. Verify the isolation switch mechanical set up and the 120V wiring to the ACB. Depending on the Operating Mode of the drive, ensure that the switch is in the proper position.	• Depending on the mode of operation (Normal, System Test, Open-Circuit Test, DC Current Test, or Open-Loop), there are specific states for all the possible system isolation switches (Refer to the description of HardwareOptions1, P141). Be sure the isolation switches are in the proper position. • Verify wiring feedback. • Verify isolation switch mechanical auxiliary setup. • READ ASSOCIATED DESCRIPTION.
X						Input IsoSwOpen	170	The input isolation switch is open when it was expected to be closed. Verify the isolation switch mechanical set up and the 120V wiring to the ACB. Depending on the Operating Mode of the drive, ensure that the switch is in the proper position.	• Depending on the mode of operation (Normal, System Test, Open-Circuit Test, DC Current Test, or Open-Loop), there are specific states for all the possible system isolation switches (Refer to the description of HardwareOptions1, P141). Be sure the isolation switches are in the proper position. • Verify wiring feedback. • Verify isolation switch mechanical auxiliary setup. • READ ASSOCIATED DESCRIPTION.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Input Prot'n #1	32	Standard external fault/warning input included allowing the end-user to install a protective relay (for example, input feed protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of InputProt1 Class (P440).	• Check device responsible for the auxiliary contact to this input and investigate the fault indicated by the device's fault message. • Investigate internal and external causes for this fault code. • Check the 120V signal through the external device. • Check the XIO board inputs and parameter status bits.
X						InputProt'n #2	36	Standard external fault/warning input included allowing the end-user to install a protective relay (for example, input feed protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of InputProt2 Class (P444).	• Check device responsible for the auxiliary contact to this input and investigate the fault indicated by the device's fault message. • Investigate internal and external causes for this fault code. • Check the 120V signal through the external device. • Check the XIO board inputs and parameter status bits. • **REVISION 9003 and higher,** this input is dedicated to line filter capacitor protection. An open circuit on this input will trigger the line filter capacitor protection. For additional information see fault code 135
X						Inv A1 Fault	677	Inverter A1 fault: The inverter OIBBS diagnostic subsystem has detected a fault.	• Ensure the OIB2s are installed in the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Inv A1 PwrSupply	678	Inverter A1 power supply out of range: The inverter OIBBS diagnostic subsystem has detected a fault. A1 boost converter output voltage is out of range.	• Ensure OIB2s are installed in the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						InvA2D Convrsion	189	This fault indicates that the analog to digital converters on the ACB were not able to completely transmit the data to the slave processor using the DMA within the sampling period.	• Cycle control power to see if the fault remains, and replace the ACB or DPM.
X						Inv A2GateBufFlt	679	Inverter A2 gate buffer fault: The inverter OIBBS diagnostic subsystem has detected a fault. A2, the gate buffer has detected a fault.	• Verify all the connection to the inverter OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						InvAnlg SelfTest	186	On power up the drive has detected that dc offset on some analog feedback channels is high. The offending channels are indicated by parameters InvAnlg SelfTst1 (P96) and InvAnlg SelfTst2 (P251) in the Diagnostic group.	• Cycle control power to see if the fault remains, and replace the ACB if necessary. • Using a multimeter, check the DC offset on the circuit when this fault is present. The feedbacks that cause this fault can be determined by looking at parameter (P96 and P251) in the Diagnostic group. • See Technical Note PF7000_GEN-12, **Line/Motor ADC/DAC Faults on Initial Power-Up** • See Technical Note PF7000-4th Gen_Gen 34 **Troubleshooting 'InvAnlg SelfTst2' Fault**
X						Inv Gate Act Flt	691	Inverter gate active fault: The safety control system has detected a failure in the non safety-related drive control system to perform an orderly shutdown in preparation for activation of the safety function. The safety function has been executed independent of the non-safety related control system.	• Check LV wiring/connectors to OIBBS and ACB. • Verify the drive settings. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for further actions.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Inv General Flt	671	Inverter general fault: The SGCTs have passed their operational lifetime and maintenance needs to be completed.	• Verify the LV connections and configuration of the input device feedback to the OIBBS. • Verify the drive configuration • Cycle the control power • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement.
X						Inv Heartbeat	132	The master processor has detected that the slave DSP software has either over-run or failed to initialize.	• Verify DC Control voltages on ACB. • Cycle power and replace DPM board if necessary.
	X	X			X	InvHS TempSensor	503	The specified temperature reading is out of normal range.	• Verify that bit-1 of parameter P274 is set correctly. • Ensure that the temperature sensor is correctly plugged in and is not damaged.
X						Inv InpCtctrClsd	689	Inverter input contactor closed: The safety control system has detected a fault in the drive input contactor control system. The input device indicates closed when it was commanded to open by the OIBBS.	• Verify the input contactor. In case the contactor has any problem(s), stop running the drive and contact the manufacturer. • Verify the low voltage wiring of the input contactor / circuit breaker control command. • Verify the low voltage wiring of input contactor feedback. • Cycle the control power.
X						Inv NSR PS Rng	668	Inverter non safety-related power supply out of range: The inverter OIBBS diagnostic subsystem has detected an out of range power supply voltage of the 24Vdc power supply.	• Verify the STO system power supply/connection to the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for spare parts of the power supply and/or OIBBS for replacement.
X						Inv OIB Detected	688	Inverter OIB detected: The safety control system has detected incompatible hardware. One or more OIBs have been detected.	• Verify the board mounted on the inverter OIBBS. It should be OIB2, not OIB. • In case OIB(s) is/are applied, contact the manufacturer for the OIB2 spare parts for replacement.
X						Inv OvrVoltage	160	The inverter output voltage given by Inv Output Volt (P761) has exceeded the trip settings. This is detected by the hardware circuit in the ACB.	• This is drive output Voltage [ESP Surface Volt (P760) terminology used in ESP application]. • The protection uses P193 setting but drive calculates the motor filter cap voltage. • In ESP application Inverter voltage may be different from motor voltage due to long cable drop. • Check the voltage sensing board for any resistor failure. • Check for any open circuit at the drive output. • Check the devices at the inverter.
X						Inv PS Out Rng	666	Inverter power supply out of range: The inverter OIBBS diagnostic subsystem has detected an out of range power supply voltage on the internally generated supplies.	• Verify the STO system power supply/connection to the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for spare parts for the power supply and/or OIBBS for replacement.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Inv PSD Fault	690	Inverter power structure diagnostic fault: The safety control system has detected a fault in one or more SGCTs. Incorrect SGCT unit feedback was detected.	• Resolve all other faults first • Ensure there are OIB2s are installed in the OIBBS, not the OIBs • Ensure proper configuration setting of the SPS with drive hardware • Check the LV wiring from the input device feedback • Check the LV wiring/connectors to the OIBBS and ACB. • Verify correct STO configuration settings • Turn off all the power supplies to the drive and replace the SGCTs according to the procedures in the User Manual. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part(s) for replacement.
X						Inv S1 Stuck	672	Inverter S1 stuck: The inverter OIBBS diagnostic subsystem has detected a fault.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Inv S2 Stuck	673	Inverter S2 stuck: The inverter OIBBS diagnostic subsystem has detected a fault.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Inv S3 Timeout	676	Inverter S3 timeout: The inverter OIBBS diagnostic subsystem has detected a fault. A problem of timing function on the OIBBS has been detected.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Inv STOInp Invld	675	Inverter safety input invalid: The inverter OIBBS diagnostic subsystem has detected an invalid control input state.	• Verify the wiring of the inverter OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Inv Temp Out Rng	667	Inverter temperature out of range: The inverter OIBBS diagnostic subsystem has detected an out of range temperature.	• Verify the airflow in the low voltage control compartment. • Shut off the control power to let the temperature in the control compartment cool. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
	X	X			X	Inv TFBFbk Error	499	The drive has lost the fiber-optic signal from the specified temperature feedback board.	• Verify that bit-1 of parameter P274 is set correctly. • Check for damaged fiber-optic cable or loose connection.
X						Inv WtchDg T Out	665	Inverter watchdog timeout: A failure of the Inverter OIBBS diagnostic subsystem was detected.	• Verify all the connections for OIBBS, OIB2 on inverter side. • This fault will only reset upon cycling control power. • Cycle the control power, and if the same fault still trips the drive, contact the manufacturer for spare parts of the OIBBS, OIB2 and/or the connections for replacement.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
	X					IsoTx Air Flow (A-Frame Only)	177	The pressure sensed by the pressure transducer in the integral isolation transformer section (as a voltage) has dropped below the value set in IsoTxPressureTrp (P654).	• Verify fan rotation. • Check for blocked airflow in the filters/ducting (if installed) – clean as required. • Improper trip settings – verify the pressure value voltage level (P653) when running with clear air flow. • Check that the pressure sensor is working and is connected to the ACB. • Verify the alarm and trip set-up procedure was completed adequately and adjust as necessary, and compare with expected values for that specific drive type. • Verify for drives with external ducting that there is sufficient air to the drive input. • Verify supply voltage to pressure transducer, and confirm output is stable.
X						IsoTx/ReacOvrTmp	33	The thermal switch in the drive input isolation transformer or the line reactor has detected an over temperature condition and opened the AC input to the standard XIO.	• Verify operating conditions (ambient/ altitude/ current levels/ ventilation and fans/ cooling oil) and verify that the Rectifier Transformer/Reactor is within ratings. • Check the 120V signal through the thermal switch. • Verify that it is not a faulty switch. • Check the XIO board inputs and parameter status bits. • Determine through elimination whether there is a faulty switch and replace if necessary.
X						Isolator 24V Loss	63	The 24V isolator power supply has malfunctioned.	• Measure the voltage between pins 1 and 2 on connector P3 on the DC/DC power supply. • Ensure that the ribbon cable between P2 (at DC/DC PS) and J14 (at ACB) is securely fastened.
	X	X			X	Junction OvrTemp	504	The device junction temperature calculated is higher than the specified trip/warn level (trip P574, warn P577). High junction temperature could be a result of one or combination of the following: high ambient temperature, high Idc, low cooling airflow, incorrect setting of rectifier type or heatsink type, trip/warn level setting too low.	• Check the ambient temperature. • Check for dirty air filters. Clean or replace the filters. • Check for restriction in the airflow path. • Verify that the parameters P399 and P880 are set correctly.
			X			LC XIO NotAssgnd	552	A required XIO Card has not been assigned based on the selection of drive model.	• This fault is related to a liquid-cooled drive. Verify that parameter P64 is set correctly (proper XIO card is assigned to the parameter).

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Line Capacitor Failure	136	The drive has detected a possible line capacitor failure. This fault cannot be reset unless a specific code is entered. This is to ensure that before re-energizing the drive, all necessary checks and troubleshooting steps have been carried out as described in the user manual.	• Check the integrity of the line filter capacitors (applies to AFE drives only) by following the test procedure as described in the user manual. • For detailed instructions on capacitor testing and the procedure to reset the line capacitor fault: – Firmware 9.002 and higher – use link to access Knowledgebase ID 221486 (http://rockwellautomation.custhelp.com/app/answers/detail/a_id/221486) – Firmware 7.00x and 8.00x – use link to access Knowledgebase ID 66655 (http://rockwellautomation.custhelp.com/app/answers/detail/a_id/66655) • See Tech Note PF7000_Gen-99, **Resetting Line Filter Capacitor (LFC) Fault Throughout all Firmware Revisions**, which provides a summary of reset procedures for Classic and Forge, for all revision level of software. • For drives which are **RPTX**, upgrading to firmware 9.002 and higher may introduce this lockout fault. Line CT location should be examined. Review tech note Nuisance Line Filter Cap fault in PowerFlex 7000 Drives with Isolation Transformer—RPTX PF7000_4GEN_GEN-27 • Check the CT connections (J2) are not reversed and properly installed (no offset) • Check the CT open circuit resistance value. For a 1000:1 CT the open circuit resistance should be 3.9 Ω. The tolerance is 1%. If one CT or both CTs are below this value, replace the CTs to correct the unbalance. • After resetting the line capacitor lockout, the Fault Queue must be cleared, otherwise, the line capacitor lockout will be triggered every time the control power is cycled. • Line overcurrent will trigger this lockout protection; investigate possible causes of overcurrent such as a short circuit, multiple rectifier SGCTs failing. • **Firmware 9.003 and higher**. XIO Input #2 is dedicated to the LFC protection. If this input is at logic 0, then LFC Lockout will occur. Examine how this input is used in the drive application and modify as necessary. In firmware 9.003 and higher this input is dedicated to line filter capacitor protection and must be logic 1 to inhibit the fault from occurring. • **Firmware 9.004 and higher.** Check line current against line to neutral trip current, which is estimated using the filter cut-off frequency (P192) and line cap pu (P133) values. If the drive trips on a nuisance Line Capacitor Failure from high line to neutral current during energization, then the unbalance ratio (P951) can be increased to 2 in order to increase the delay time of the logic.
X						Line Harmonic OV	119	The drive has detected a steady-state resonance-induced overvoltage on the line (P683). This is defined at the level set in Harmonic VoltTrp (P675) for the delay Harmonic VoltDly (P676) (on top of normal line voltage) for 1 second. The drive only detects the 5^{th} harmonic to eliminate nuisance faults from capacitor charging events.	• Verify waveforms show excessive harmonics using oscilloscope on ACB unfiltered voltage testpoints. • Investigate sources for excessive harmonics on customer power system. • P675 Harmonic VoltTrp has a default of 15% for the trip setting, it can be increased to 30% in multi drive applications • Contact factory for possible re-tuning of input filter.
X						LineNeut OvrVolt	118	The line side neutral voltage (calculated from line to ground voltages for SCR rectifiers and measured from the capacitor neutral point for PWM rectifiers) displayed in LineNeutral Volt (P589) has exceeded the trip settings. Verify parameter settings. Check the system grounding and megger the input cables to ground.	• Insulation Failure – Megger the motor insulation/motor cables/drive insulation to ground. • If the grounding network is NOT connected to the line cap neutral then the trip level can be increased from default 0.4 pu to a higher value. • **NOTE: In DTD drive the default trip setting MUST not be increased without consulting with MV Tech Support.** • Verify the integrity of the input grounding network if applicable. • Megger the input isolation transformer secondary/input cables to ground. • Verify Parameter settings are appropriate for AC line reactor or isolation transformer drives. See tech note PF7000_Gen-04, Neutral Overvoltage Setup for 6P/PWM Drives

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Line OvrCurrent	112	The measured line current (P122) has exceeded line overcurrent trip value (P161) for the duration set in the line overcurrent delay parameter (P162).	• CHECK FOR SHORTED SCRs – DO NOT ATTEMPT TO RESET THIS FAULT UNTIL YOU HAVE VERIFIED THE SCRS ARE NOT SHORTED. • Investigate possible damage to the input isolation transformer if there have been several aborted starts with line overcurrent faults. • Verify that the drive sizing is not too small for the rated motor current. • Verify that the parameters are set properly. • Verify the burden resistors are not opened and there are no loose grounds.
X						Line OvrVoltage	116	The calculated Line Voltage has exceeded Line Overvoltage Trip value (P165) for the duration set in Line Overvoltage Delay parameter (P166). This is calculated by looking at the compensated individual bridge voltages Master, Slave1 and Slave2 line volt (P136-138), and comparing them to 1/3 of the line overvoltage trip value.	• Verify the parameters are set properly. • Verify VSB connections and tap settings, resistor values, and grounds. • Verify that the parameter Input Impedance (P140) was tuned properly. • If voltage is too high, change tap settings on the input source to lower voltage to an acceptable level. • Verify if drive is being fed from generators. Review the reactive power capability of the generators. Contact the factory for details.
X						Login Declined	604	The Master drive has refused the Follower drive's attempt to login (connect) to the DCSL network.	• Confirm that the firmware major revision level on the Master drive and Follower drive are the same. • Confirm that the Number of Nodes (P936) and load factor parameters of the Follower drive match the Master drive settings.
X						Low Capacity Flt	605	The number of drives in the DCSL Master-Follower drive system has dropped below the specified minimum capacity the system can run.	• Check the minimum capacity set for Number of Nodes (P936) and DCSL Config (P955), bits 3 (Ld Factor 0) and 4 (Ld Factor 1). The minimum number of drives required = Number of Nodes - Maximum reduced margin.
X						LR Double Fans	472	The drive has just lost two or more of the cooling fans.	• Verify the fan contactors, fan overload and the 120V wiring to the XIO card.
X						LR Fan1 Ctctr	481	A cooling fan loss has been detected.	• Verify the fan contactor, fan overload and the 120V wiring to the XIO card.
X						Main VSB	459	This fault indicates that the voltage sensing board associated with the motor and line voltages is not plugged in	• Check connector J27 at ACB. • Verify connection from VSB to ACB.
X						Master Comm Flt	600	Follower drive has detected the loss of communications with the Master drive.	• Check the communication wiring and shielding.
X						Master CurUnbal	123	The measured and calculated phase currents in the master bridge have exceeded the value set in Line CurUnbalTrp (P108) for the duration set in Line CurUnbalDly (P109). The unbalance value can be seen in parameter 613.	• Verify that all current transformer connections are connected properly and that no wires are reversed – ring-out wires to verify connections. • Check grounding on CTs. • Ensure that all plugs are firmly connected in the ACB. • Check that all input voltages are balanced. • Verify parameter settings. • Check the burden resistors. • Verify the input capacitor values if installed. • Verity that there are no open sharing resistors. • Verify all line thyristors are firing in Gating Test mode. • Check the input filter capacitor (for PWM rectifier drives).

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Master VoltUnbal	120	The measured phase voltages (610) in the master bridge have exceeded the value set in LineVoltUnbalTrp (P271) for the duration set in LineVoltUnbalDly (P272).	• 1. CHECK TSN FUSING. • 2. CHECK TSN FUSING. • 3. CHECK TSN FUSING. • Verify the VSB connections and tap settings, and check resistance of VSB board – Megger board to confirm integrity. • Check actual voltage values on the operator interface terminal for each bridge and the total line voltage. • Check for possible source voltage supply problems. • Use multimeter and oscilloscope to check voltages on the drive voltage test points.
X						Motor Current UB	100	The measured current unbalance on the drive output has exceeded Mtr CurUnbal Trp (P208) for the duration set in Mtr CurUnbal Dly (P214).	• Verify the current sensor wiring and burden resistors from the motor current sensors. • Verify the HECS power. • Check the output filter capacitors for balanced loading on all 3 phases. • Investigate the possibility of motor winding or cabling problems.
X						Motor Flux UB	99	The measured motor flux has exceeded the value in Mtr FluxUnbalTrp (P585) for the duration set in Mtr FluxUnbalDly (P586).	• Verify the VSB resistors are not open and that they are balanced. • Check for shorted motor output filter capacitors. • Check for a grounded phase on the drive system using a megger test. • Verify the low voltage groundings in the low voltage control cabinet. • Verify if the drive has an output transformer and is tuned for speed and flux regulators with the transformer. • Verify the ribbons cables between the voltage feedback and SCBL/SCBM boards.
X						Motor Load Loss	104	The drive has detected a loss of load condition. This is activated as a fault using the parameter Load Loss Detect (P199), and the necessary setpoints are Mtr LoadLoss Lvl (P246), Mtr LoadLoss Dly (P231), and Mtr LoadLoss Spd (P259).	• Verify the parameter settings. • Ensure that the load should not normally be in an unloaded condition. • This is designed for applications likely to lose the load (downhole pump – hollow-shaft motor) and we do not want to run with the loss of load.
X						MotorNeut OvrVolt	98	The measured motor neutral to ground voltage in Mtr Neutral Volt (P347) has exceeded the Mtr NeutVolt Trp (P189) setting. This fault message indicates a ground fault in the drive system, such as cable insulation failure or motor winding insulation failure, DC link reactor, common mode choke (CMC), Motor Filter Capacitors. The investigation of this fault is to locate the component(s) which may have an insulation failure.	• **NOTE: In DTD drive the default trip setting MUST not be increased without consulting with MV Tech Support.** • Remove motor cables from drive, then megger motor cables and motor. • Verify Parameter settings are appropriate for AC line reactor or isolation transformer drives, may not be set correctly during commissioning. See tech note PF7000_Gen-04, Neutral Overvoltage Setup for 6P/PWM Drives • Verify the integrity of the output filter capacitors, looking for shorts or signs of physical damage. • If this application is recently installed, parameter settings should be verified. • Check each motor filter capacitor; capacitance should be equal to nameplate value. • With motor cables disconnected, run IDC Test and see if drive still trips on same fault, this indicates if fault stays with the drive or is at the motor cables or motor. • It may be necessary to check the CMC and neutral resistor. If the neutral resistor is hot while running IDC Test, then examine the CMC using tech note PowerFlex 7000_Gen-65 **Testing Common Mode Choke** • Megger the input isolation transformer secondaries/input cables to ground. • If drive is a RPTX, the Isolation Transformer neutral should not be grounded. Check electrical drawings to see grounding requirements of the system.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Motor OvrCurrent	96	The measured motor current Stator Current (P340) has exceeded the Mtr OvrCur Trip (P177) setting.	Possible causes include: • Real OC/transients. • Bad burden resistor/current sensor circuit failure – check components. • Parameter settings too low compared to torque limit. Verify the parameter settings. • Current regulator in limit (check line voltage and alpha line while running).
X						Motor OvrLoad	101	A motor overload condition has been detected, where the overload condition is calculated using I Stator (P340) and an algorithm based on the value of Mtr OvrLoad Trp (P179) as the absolute trip level, Mtr OvrLoad Dly (P180) as the base trip delay, and Mtr OvrLoad Wrn (P351) as the point where the overload calculation begins.	• Transient loading - check torque limit motoring, torque limit overload and motor overload settings and compare loading to torque settings and trip settings. • Burden resistor – Check HECS feedback and check the burden resistors.
X						Motor Ovrspeed	102	The speed of the motor has exceeded the Mtr OvrSpeed Trp (P185). Verify that parameter meets the load requirements. Check for load transients	• Check for unbalance on the motor and line feedback voltages. • Improper Settings – check parameter settings for reference command maximum and be sure it is not too close to overspeed trip increase. • Adjust the speed regulator bandwidth to control overshoot, and ensure acceleration rate near maximum speed is not too great. • Check for load transients. • For tachometers - be sure the PPR is set properly and the feedback is valid. • Check tachometer pulse train with an oscilloscope.
X						Motor OvrVoltage	97	The measured motor voltage Stator Voltage (P344) has exceeded the Mtr OvrVolt Trip (P181) setting.	• Parameter setting incorrect (flux command/trip values). • VSB damage – check VSB resistors, grounds, and verify tap settings are correct. • Self-Excitation – check for flying start/induced motor rotation. • Make sure motor is not started in open circuit. • Make sure drive is not started in open circuit. Verify that the motor is connected.
X						Motor Protection	35	Standard external fault/warning input included allowing the end-user to install a protective relay (for example, Bulletin 825 motor protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of Motor Prot Class (P443).	• Check device responsible for the auxiliary contact to this input and investigate the fault indicated by the device's fault message. • Investigate internal and external causes for this fault code. • Check the 120V signal through the external device. Check the XIO board inputs and parameter status bits.
X						Motor Slip Range	106	Incorrect motor RPM has been entered for an induction motor. Check the name plate data. Motor RPM cannot be the synchronous RPM. Enter the correct data and cycle control power.	• This fault cannot be reset until correct slip is programmed. • If the motor nameplate shows synchronous RPM, then verify what the rated slip RPM is, subtract the slip RPM from synchronous RPM. • See tech note, PF7000_Gen-102, **Determining Rated Motor RPM for Induction Motors**, for information on how to calculate rated motor RPM.

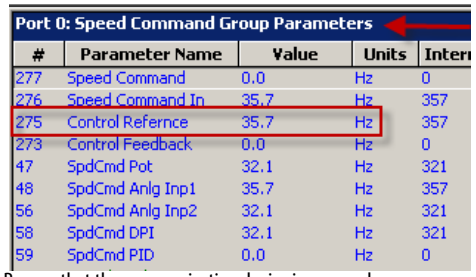
All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Motor Stall	103	The drive has detected a motor stall condition, with a delay set in Mtr Stall Dly (P191). The different methods of motor stall detection depend on whether a tachometer/encoder is installed or not. Sensorless faults involve the motor not building up enough flux feedback to be detected by the drive, while tachometer feedback methods look at the difference between the tachometer/encoder feedback and the speed command.	Possible Causes: • Insufficient torque on starting– increase torque command 0 and 1 to avoid motor stalls when starting if Speed Feedback mode is Sensorless. • Insufficient torque – Increase torque limit motoring to avoid motor stalls while running. • Reverse load rotation – Be sure the load is not rotating in the opposite direction. • Capture the value of parameter FlxFbk VoltModel (P342). • Be sure that tachometer feedback is functional where applicable. • Be sure the motor is not spinning forward at a speed greater than reference command. • While running – make sure there is no sudden increase of the load. • A short circuit on drive output may get interpreted as motor stall. Check motor filter capacitors or other apparatus that may be creating a short circuit phase to phase on the drive output.
		X	X	X	X	Mstr Transfr Err	457	Master Transfer Error - This is applicable to parallel drives only.	• The master drive cannot find a slave drive able to take over as master. • Possible causes are: slave drive not ready, or slave drive masked off.
X						MV in Gate Test	165	The drive has medium voltage applied and the user attempted to program the drive in Gate test. Isolate medium voltage from the drive and then proceed with the test.	• Check input contactor control and status. • Be sure that the isolation switch is in the open position and locked out – confirm with hot-stick and status parameters.
X						MV in System Test	164	The drive has medium voltage applied and the user attempted to program the drive in System test. Isolate medium voltage from the drive and then proceed with the test.	• Check input contactor control and status. • Be sure that the isolation switch is in the open position and locked out – confirm with hot-stick and status parameters.
X						No Output Ctctr	169	This fault is specifically used for Open Circuit test mode, which demands that an output contactor be specified in Output Ctctr Cfg (P5). If the contactor is not specified, you will get this fault in Open Circuit test mode. This is to help avoid inexperienced people putting the drive in open circuit test mode without actually open circuiting the output with either a contactor or by disconnecting the motor cables.	• If there truly is no output contactor in the system, then you can mask the fault. Then there will be a No DO/OP Ctctr warning, and you can continue with the open circuit test after disconnecting the motor cables.
X						Op Mode Conflict	609	Operating mode of the Follower drive and of the Master drive do not match.	• Change the operating mode.
X						OVH Overspeed	471	The motor speed feedback exceeds 80 Hz and the drive is experiencing an overhauling load without an output contactor.	• Verify that parameter Overhauling Load (P1160) and bit 8 (Output Ctctr) of parameter HardwareOptions1 (P141) are properly set. • Check recommendations for Fault Code 102, Motor Ovrspeed.
		X	X	X	X	PD Capcity Low	458	This fault is for parallel drives only and indicates that the available drive capacity is less than 50% of the motor rated current. The drive cannot run.	• The available drive capacity is less than 50% of the motor rated current. The drive cannot run.
X						Process Var Loss	464	Feedback from the process is not valid.	• Check the process sensor, 4…20 mA or 0...10V input to the drive at IFM board. • Check the wiring at IFM board and connection between IFM and ACB.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
			X	X		Pressure Loss (C-Frame Only)	64	The measured system pressure has dropped below a preset trip level. The standard operating pressure is around 50 psi. The pressure switch is not designed to be an accurate measure of pressure, but is designed as a Pressure/No Pressure indication. Typically anything less than 20 psi will activate this switch.	• Check that the pumps are operating. • Verify that there are no leaks in the system. • Verify that there is no blockage in the system.
			X	X		Pump/Fan Pwr Off (C-Frame Only)	71	The control power to the pumping system and the heat exchanger fans is not present. The drive detected that the Pump/Fan power is off.	• Verify the disconnect switch is closed and that there are no blown fuses. • Measure the voltage at the pump and fan inputs to ensure voltage is present. • Trace the feedback to the drive from the circuit, looking for loose wiring or incorrect auxiliaries.
X						RecAnlg SelfTest	128	On power up the drive has detected that dc offset on some analog feedback channels is high. The offending channels are indicated by parameters RecAnlg SelfTst1 (473), RecAnlg SelfTst2 (474) and RecAnlg SelfTst3 (494) in the Diagnostics group.	• Using a multimeter, check the DC offset on the circuit when this fault is present. The feedbacks that cause this fault can be determined by looking at parameter (P473, P474 and P494) under Diagnostics group. • Cycle control power, to see if the Fault condition remains and replace ACB if necessary.
X						RecA2D Convrsion	131	This fault indicates that the analog to digital converters on the ACB were not able to completely transmit the data to the master processor using the DMA within the sampling period.	• Cycle power to the drive. • If the problem persists replace DPM or ACB.
X						RecA2D SeqError	133	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						RecChB FbrOptic	152	Not normally used. While Not Running, the fiber-optic signal from the optional TFB connected to channel B fiber-optic receiver RX7 on FOI-L-B 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.
X						RecHSnk FbrOptic	148	While Not Running, the fiber-optic signal from the TFB on the rectifier heatsink, connected to channel A fiber-optic receiver RX7 on FOI-L-A is not present. This is only a fault while not running. If this occurs while running it will appear as a warning.	
X						RecHSnk LowTemp	147	The drive detected that the rectifier heat sink temperature is less than 2 °C (35.6 °F). Ensure the room ambient is higher than 0 °C (32 °F) before starting the drive.	• 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 inverter hardware to identify the bad component.
						RecChB LowTemp	151	This is not enabled on most drives and the parameter is a high-level parameter. The drive has detected that the temperature feedback from the optional temperature board is less than 2 °C (35.6 °F).	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						RecHSnk OvrTemp	146	The drive detected that the rectifier heat sink temperature has reached the trip setting. Be sure that the fan is working properly and that the air flow is sufficient in this cabinet.	Confirm actual temperature in parameters is not higher than the trip value. If so, investigate the conditions of the drive (ambient/ loading/ elevation / ventilation/ filter status /heatsink clogging). Check TFB and FOI board for power and fiber-optic integrity. Check the sensor and temperature offline (ambient) for accuracy.
X						RecChB OvrTemp	150	Not normally used. The drive has detected that the temperature feedback from the optional temperature board has reached the trip setting.	
X						RecHSnk Sensor	149	The drive has detected while not running a missing temperature sensor connected to the TFB on the rectifier heatsink. A missing sensor can result in either a Fiber Optic Loss fault or a Sensor fault because a missing sensor can be interpreted as either 0 °C or over 100 °C, and both are unrealistic values.	• Verify sensor is completely seated properly on TFB. • Measure sensor resistance. • Replace if necessary.
X						RecChB Sensor	153	Not normally used. The drive while not running has detected a missing temperature sensor connected to the optional temperature feedback channel. Be sure that the sensor in plugged in.	
X						RecFbrOpt Config	129	The drive has detected that the number of fiber-optic boards does not match the number of devices.	• Verify the parameter settings. • Check that the boards are plugged properly on the OIBB.
X						Rec A1 Fault	645	Rectifier A1 fault: The rectifier OIBBS diagnostic subsystem has detected a fault.	• Ensure the OIB2s are installed in the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec A1 PwrSupply	646	Rectifier A1 power supply out of range: The rectifier OIBBS diagnostic subsystem has detected a fault. A1 Boost converter output voltage is out of range.	• Ensure OIB2s are installed in the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec A2GateBufFlt	647	Rectifier A2 gate buffer fault: The rectifier OIBBS diagnostic subsystem has detected a fault. A2, the gate buffer has detected a fault.	• Verify all connections to the rectifier OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec Gate Act Flt	659	Rectifier gate active fault: The safety control system has detected a failure in the non safety-related drive control system to perform an orderly shutdown in preparation for activation of the safety function. The safety function has been executed independent of the non safety-related control system.	• Check LV wiring and connectors to OIBBS and the ACB. • Verify the drive settings. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for further actions.
X						Rec General Flt	639	Rectifier general fault: This fault indicates a diagnostic of the PSD test failed, a diagnostic of the power supply monitoring failed, the input contactor power on timer has failed, or the input contactor does not indicate closed when the drive is running.	• Verify the LV connections and configuration of the input device feedback to the OIBBS. • Verify the drive configuration. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part replacement.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Rec Heartbeat	190	The slave processor drive has detected that the master DSP software has either over-run or failed to initialize.	• Verify DC Control voltages to both ACB/DPM. • Possible failed ACB board. • Cycle power and replace DPM board if necessary.
X						Rec InpCtctrClsd	657	Rectifier input contactor closed: The safety control system has detected a fault in the drive input contactor control system. The input device indicates closed when it was commanded to open by the OIBBS.	• Verify the input contactor. In case the contactor has any problem(s), Stop running the drive and contact the manufacturer. • Verify the low voltage wiring of the input contactor / circuit breaker control command. • Verify the low voltage wiring of the input contactor feedback. • Cycle the control power.
X						Rec NSR PS Rng	636	Rectifier non safety-related power supply out of range: The rectifier OIBBS diagnostic subsystem has detected an out of range power supply voltage on the 24Vdc power supply.	• Verify the STO system power supply/connection to the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for spare parts of the power supply and/or OIBBS for replacement.
X						Rec OIB Detected	656	Rectifier OIB detected: The safety control system has detected incompatible hardware. One or more optical interface board(s) have been detected.	• Verify the board mounted on the rectifier OIBBS. It should be OIB2, not OIB. • In case OIB(s) is/are applied, contact the manufacturer for the OIB2 spare parts for replacement.
X						Rec OIBB Com Flt	624	Rectifier OIBBS communication fault: Communication failed to the rectifier OIBBS. The communication from rectifier OIBBS is lost.	• Verify the drive settings. If the drive is not using the STO function, disable STO and verify that the correct OIBB type is installed. • Verify the connection between the rectifier OIBBS and the DPM. • Check and cycle the control power to the safety system (OIBBS). • If the same fault trips the drive again, contact the manufacturer for the OIBB spare part for replacement.
X						RecOvrTimeOut	135	The rectifier input voltage given by Rec Input Volt (P696) has exceeded Rec OvrVolt Trp (P173). A warning is logged first and if the over-voltage occurs repeatedly with at least four warnings in one second interval then the drive will fault.	• Verify the parameters and inspect the ACB, VSB for possible damage. • Investigate occurrences of bus transients. • If the drive trips on this fault repeatedly, system harmonics need to be investigated. Setup a trend to capture the harmonic voltage, rectifier input voltage, and line voltage to trigger at this fault. Contact the factory for details.
X						Rec OvrVoltage	117	The rectifier input voltage given by Rec Input Volt (P696) has exceeded the trip settings (P#173). This is detected by the hardware circuit in the ACB.	• Verify the parameters are set properly. • Verify VSB connections and tap settings, resistor values, and grounds. • This is less likely to be caused by a true line overvoltage and more likely to be due to the effects of capacitive leading VARs on a high-impedance system. • Tap down the input if possible. • Investigate occurrences of bus transients. • Check for loose connections on ACB J27 • Investigate system grounding. Power cable shields grounded only at one end, the source end. • Verify if drive is being fed from generators. Review the reactive power capability of the generators. Contact the factory for details. • See tech note PowerFlex 7000_4Gen_Gen19
X						RecOvrVolt SW	134	The rectifier input voltage Rec Input Volt (P696) detected by the software has exceeded Rec OvrVolt Trp (P173) for the delay specified in Rec OvrVolt Dly (P174).	• Verify the parameters and inspect the VSB for possible damage. Investigate occurrences of bus transients. • Check for loose connections on ACB J27 • See tech note PowerFlex 7000_4Gen_Gen19

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Rec PS Out Rng	634	Rectifier power supply out of range: The rectifier OIBBS diagnostic subsystem has detected an out of range power supply voltage on the internally generated supplies.	• Verify the STO system power supply/connection to the OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for spare parts of the power supply and/or OIBBS for replacement.
X						Rec PSD Fault	658	Rectifier power structure diagnostic fault: The safety control system has detected a fault in one or more SGCTs. Incorrect SGCT unit feedback was detected.	• Resolve all other faults first • Ensure there are OIB2s are installed in the OIBBS, not the OIBs • Ensure proper configuration setting of the SPS with drive hardware • Check the LV wiring from the input device feedback • Check the LV wiring/connectors to the OIBBS and ACB. • Verify correct STO configuration settings • Shut off all the power to the drive. Test the SGCTs according to the procedures in the User Manual. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare part(s) for replacement.
X						Rec S1 Stuck	640	Rectifier S1 stuck: The rectifier OIBBS diagnostic subsystem has detected a fault.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec S2 Stuck	641	Rectifier S2 stuck: The rectifier OIBBS diagnostic subsystem has detected a fault.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec S3 Timeout	644	Rectifier S3 timeout: The rectifier OIBBS diagnostic subsystem has detected a fault. A problem of timing function on the OIBBS has been detected.	• Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						RecSTOInp Invld	643	Rectifier safety input invalid: The rectifier OIBBS diagnostic subsystem has detected an invalid control input state.	• Verify the wiring of the rectifier OIBBS. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec Temp Out Rng	635	Rectifier temperature out of range: The rectifier OIBBS diagnostic subsystem has detected an out of range temperature.	• Verify the airflow in the low voltage control compartment. • Shut off the control power to let temperature drop off. • Cycle the control power. • If the same fault still trips the drive, contact the manufacturer for the OIBBS spare parts for replacement.
X						Rec WtchDg T Out	633	Rectifier watchdog timeout: A failure of the rectifier OIBBS diagnostic subsystem was detected.	• Verify all the connections for OIBBS, OIB2 on rectifier side. • This fault will only reset upon cycling control power. • Cycle the control power, and if the same fault still trips the drive, contact the manufacturer for spare parts of the OIBBS, OIB2 and/or the connections for replacement.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						Refrnce Cmd Loss	23	The drive has lost communication with the device responsible for providing the speed command to the drive. This has been set to annunciate as a fault. The drive will configure the Speed Command Loss as a fault when the associated bit in DPI Loss Mask (P175) is set to a 1. Setting the bit to 0 will cause the drive to indicate a warning and run at the last commanded speed. The fault could be the DPI adapter or the 4…20mA signal wired to the analog input (IFM board). Be sure that all connections are secure, device is powered and operating correctly.	• Check P275 in the Speed Command group to see if is responding to the external speed command, if not responding, then check for loose or open wire connected to the drive ACB or replace the ACB  **Port 0: Speed Command Group Parameters** | # | Parameter Name | Value | Units | Inter | | 277 | Speed Command | 0.0 | Hz | 0 | | 276 | Speed Command In | 35.7 | Hz | 357 | | 275 | Control Refernce | 35.7 | Hz | 357 | | 273 | Control Feedback | 0.0 | Hz | 0 | | 47 | SpdCmd Pot | 32.1 | Hz | 321 | | 48 | SpdCmd Anlg Inp1 | 35.7 | Hz | 357 | | 56 | SpdCmd Anlg Inp2 | 32.1 | Hz | 321 | | 58 | SpdCmd DPI | 32.1 | Hz | 321 | | 59 | SpdCmd PID | 0.0 | Hz | 0 | • Be sure that the communication device is powered. • Check P275 in the Speed Command group to see if is responding to the external speed command, if not responding, then check for loose or open wire connected to the drive ACB or replace the ACB. • Verify the light status and ensure the communicating device is operating properly. • Verify the customer network is properly communicated with the device. • Check ACB LED status. • Cycle control power to the drive. • Change the Adapter and/or ACB if all attempts to restore communication fail. • Ensure that all connections at IFM are secure, and device is powered and operating correctly.
X						RNeut OvrCurrent	115	This fault is valid only for common mode choke drives (D2D) and indicates that the current through the neutral resistor has exceeded the trip settings. The current is displayed by ComMode Current (P697).	• Check the neutral R for open. • Check devices on rectifier and inverter for shorts. • Check the line and motor filter cap for short between Phase to Neutral or Phase to Phase. • Check the line and motor neutral voltage • Verify the neutral R parameters, for non-DTD drives, set this parameter to zero ohms. • Investigate the cause of neutral shift between the input and output filter capacitors which could be due to severe line transients or insulation failure. • Megger the drive if necessary.
X						RNeutral OvrLoad	145	The neutral resistor required for Direct-to-Drive (DTD) technology has reached an overload condition. This is determined from parameters Neutral Resistor (P680), RNeut Pwr Rating (P681). The current through the neutral resistor is calculated by measuring the voltage across the resistor and knowing the resistance. ComMode Current (P697) displays that current, and R Neutral OL (P682) shows the overload accumulator. The resistor is allowed 500% for 10 seconds every 5 minutes, and P682 is normalized to fault whenever the value reaches 1.00.	• Verify the resistor ratings. • Verify that the drive voltage feedback splitter board is operating properly. • Investigate the possibility of voltage unbalances on the input or output of the drive that would create a voltage differential across the resistor. • Contact the factory for further instructions. • Verify the resistor parameters, for non-DTD drives, set this parameter to zero ohms. • Investigate the cause of neutral shift between the input and output filter capacitors which could be due to severe line transients or insulation failure. • Megger the drive if necessary.
X						RPM Exceed HiLmt	607	The Follower drive motor RPM is higher than the Master drive and the deviation exceeded the acceptable range specified by parameter Spd Window High (938).	• Check the mechanical coupling and encoder. Check Gear Ratio (P934) and Spd Window High (P938) for the correct settings. Check parameter Master RPM Ref (P932) for the correct reading.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						RPM Exceed LoLmt	608	The Follower drive motor RPM is lower than the Master drive and the deviation exceeded the acceptable range specified by parameter Spd Window Low (1090).	• Check the mechanical coupling and encoder. Check Gear Ratio (P934) and Spd Window Low (P1090) for the correct settings. Check Master RPM Ref (P932) for the correct reading.
			X	X	X	SA XIO NotAssgnd	554	A required XIO card has not been assigned based on the selection of drive model.	• This fault is related to special application drives. Verify that the parameter P833 is set correctly (proper XIO card is assigned to the parameter).
X						Self Test Flt	606	The DCSL link controller failed the power-on internal loopback self-test.	• Cycle drive control power. If this error persists, contact the factory.
X						Short STO Req	619	Short STO request fault: The demand for the Safe Torque Off (STO) function was not consistent across all channels. One or more of the STO request signals to the OIBBS are de-asserted within 1 second after being asserted.	• Verify the STO wiring and relevant components. • Cycle the control power before attempting to reactivate the STO feature. • If the same fault trips the drive again, contact the manufacturer for further actions.
	X	X	X	X		Slave1 CurUnbal	124	The level of unbalance in the input current of the Slave1 bridge displayed in Slave1 Cur Unbal (P614) has exceeded the value of the trip settings (P108). Verify the CTs, burden resistors and connections on the ACB. Investigate the incoming source voltage for unbalance.	• Verify that all CT connections are connected properly and that no wires are reversed – Ring-out wires to verify connections. • Check grounding on CTs. • Ensure that all plugs are firmly connected in the ACB. • Check that all input voltages are balanced. • Verify Parameter settings. • Check the burden resistors. • Verify the Input capacitor values if installed. • Verify that there are no open sharing resistors. • Verify all line thyristors are firing in Gating test mode.
	X	X	X	X		Slave2 CurUnbal	125	The level of unbalance in the input voltage of the Slave 2 Bridge displayed in Slave2 Cur Unbal (P615) has exceeded the value of the trip settings (P108). Verify the CTs, burden resistors and connections on the ACB. Investigate the incoming source voltage for unbalance.	
	X	X	X	X		Slave1 Phasing	126	The drive has detected that the phasing in the Slave1 bridge is incorrect. Verify the cables are terminated correctly.	• Verify that cables are terminated correctly. • Verify that the feedback wires from the terminals to the VSB are terminated correctly. • The faults can be masked, and then the voltages and phasing can be checked using the test points on the ACB, being aware that there will be phase differences between the master and secondary bridges depending on the drive configuration. Refer to Commissioning chapter of the User Manual.
	X	X	X	X		Slave2 Phasing	127	The drive has detected that the phasing in the Slave2 bridge is incorrect. Verify the cables are terminated correctly.	
	X	X	X	X		Slave1 VoltUnbal	121	The level of unbalance in the input voltage of the Slave 1 bridge displayed in Slave1 VoltUnbal (P611) has exceeded the value of the trip settings in (P271). This fault is valid only for 18-pulse rectifier.	• Check TSN fusing. • Verify the VSB connections and tap settings, and check resistance of VSB board – Megger board to confirm integrity. • Check actual voltage values on the operator interface terminal for each bridge and the total line voltage. • Check for possible source voltage supply problems. • Use a multimeter and oscilloscope to check voltages on the drive voltage test points.
	X	X	X	X		Slave2 VoltUnbal	122	The level of unbalance in the input voltage of the Slave 2 Bridge displayed in Slave2 VoltUnbal (P610) has exceeded the value of the trip settings in (P271). This fault is valid only for 18-pulse rectifier.	
			X	X	X	Sp App Card Loss	466	The drive failed to read the data from the special application XIO card.	• Check the healthy status of the card. Also verify the status of input 15.
X						STO Gating Flt	620	STO Gating Fault: The drive was unable to perform a controlled shutdown in the allotted time after an STO request, or there is a hardware compatibility problem with the STO hardware and the drive parameter settings.	• Verify the drive settings. • Cycle the control power before attempting to reactivate the STO feature. • If the same fault trips the drive again, contact the manufacturer for further actions.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						STO Req Fault	618	STO Request Fault: The demand for the Safe Torque Off (STO) function was not consistent across all channels. There is a mismatch among four channels.	• Verify the STO wiring and relevant components. • Cycle the control power before attempting to reactivate the STO feature. • If the same fault trips the drive again, contact the manufacturer for further actions.
X						Sync Field Loss		Synchronous motor application. The drive has commanded full field current 1.0 pu for 30 seconds. This is not a typical operating point for the drive.	• The drive has detected the motor field current has been interrupted. • For 3 phase AC brushless motors, confirm the phasing to the exciter card is correct. Exciters require ABC rotation to their electronic circuit boards. • Exciter circuits typically have an Enable permissive. Locate this input on the exciter control board and confirm it is enabled. • Exciter circuits have built in temperature switches to protect the SCRs, confirm this switch is not in the tripped position.
X						Sync VSB	460	This fault indicates that the voltage sensing board associated with the synchronous transfer voltages is not plugged in.	• Check connector J25 at ACB. • Verify the ribbon cable connection from Sync VSB to ACB board.
X						Sync Xfer Failure	162	A synchronous transfer was not completed in the time specified in Sync Xfer Time (P230) and the drive has faulted. This fault will only occur if the parameter Drive Fault4 (P370), bit 2, SyncXferFail is enabled (=1). If bit 2, SyncXferFail is not set (=0), the drive will go back to last speed command and issue a warning.	• Instability at synchronous speed. Check for stability of the synchronous transfer process/ speed regulator. • Motor cannot reach synchronous speed due to heavy load. • Check load conditions for torque limit or low alpha line (low hline voltage). • Consult factory for review of synchronous transfer parameters. • This fault indicates that the drive failed to synchronize the motor to the bypass within the specified time. Adjust the Sync Reg Gain (P225), Sync Error Max (P228), Spd Reg Bandwidth (P81) for a smooth transfer.
X			X	X		TempFeedback Loss (C-Frame only)	73	This fault occurs only if the drive is not running. The drive has detected missing temperature feedback from the cooling system. A missing sensor can be interpreted as either 0 °C (32 °F) or over 100 °C (212 °F), and both are unrealistic values, so it is considered a feedback loss.	• Verify sensor is completely seated properly on TFB. • Measure sensor resistance. • Verify fiber-optic cables are properly seated on TFB. • Verify the TFB has power. • Replace if necessary.
X						fiber-optic	506	The drive has lost the fiber-optic signal from the specified temperature feedback board.	• Check for damaged fiber-optic cable or loose connection.
X						TFB 2U Fbk Error	496	The drive has lost the fiber-optic signal from the specified temperature feedback board.	• Check for damaged fiber-optic cable or loose connection.
X						TFB 2V Fbk Error	497		
X						TFB 2W Fbk Error	498		
X						UPS Fault	62	The drive has detected that either the UPS is running on low battery or there is an internal problem with the UPS and the dc output voltage of the DC/DC converter fed by the UPS has dropped below 52V.	• Check the UPS and the AC/DC power supply. • Investigate what is causing PS dip. Replace UPS or PS if the problem still persists.
X						UV Blcked Exhst	478	High air pressure reading coming back from analog air pressure transducer located between the converter sections.	• Ensure pressure sensor is working, there are no obstructions to the path of the exhaust airway or through the heatsinks. • Check the cooling fans for abnormal operation. • Verify if the trip setting (P925) matched factory recommended value.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						UV Blcked Inlet	475	Low air pressure reading coming back from analog air pressure transducer located between the converter sections. **Note**: This fault word is used exclusively on Heatpipe drives.	• Ensure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check the cooling fan for abnormal operation. • Verify if the trip setting (P319) matched factory recommended value.
X						VW Blcked Exhst	479	High air pressure reading coming back from analog air pressure transducer located between the converter sections.	• Ensure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check the cooling fan for abnormal operation. • Verify if the trip setting (P319) matched factory recommended value.
X						VW Blcked Inlet	476	Low air pressure reading coming back from analog air pressure transducer located between the converter sections. **Note**: This fault word is used exclusively on Heatpipe drives.	• Ensure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check the cooling fan for abnormal operation. • Verify if the trip setting (P319) matched factory recommended value.
X						U1A Offline	246	INVERTER SGCT FAULT This fault will only occur during the initial contactor closure and the diagnostic sequence after a start command. The inverter monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. The SGCT has smart diagnostics, so the feedback may indicate short before firing, and if the pulse is received and the device is really shorted, the diagnostic will toggle the feedback to let you know the problem is with the device, or the power supply for that device. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action.	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active, range 19.6…20.4V • Verify all the power connections to the SGCT firing card are seated properly.
X						U1B Offline	252		
X						U1C Offline	258		
X						U4A Offline	249		
X						U4B Offline	255		
X						U4C Offline	261		
X						V3A Offline	248		
X						V3B Offline	254		
X						V3C Offline	260		
X						V6A Offline	251		
X						V6B Offline	257		
X						V6C Offline	263		
X						W2A Offline	247		
X						W2B Offline	253		
X						W2C Offline	259		
X						W5A Offline	250		
X						W5B Offline	256		
X						W5C Offline	262		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						U1A DiagFbkLoss	210	**INVERTER SGCT FAULT** (Feedback Fiber-Optic Loss) This fault will only occur during the initial contactor closure and the diagnostic sequence after a start command. The inverter monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. This fault occurs when the feedback was low from the device before gating, and is still low from the device after gating. The drive then assumes the feedback must be the problem. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action	• Check that the fiber-optic cables are seated properly in the optical interface board and the SGCT firing card. • Check that the fiber-optic cable is not pinched or damaged. • Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly.
X						U1B DiagFbkLoss	216		
X						U1C DiagFbkLoss	222		
X						U4A DiagFbkLoss	213		
X						U4B DiagFbkLoss	219		
X						U4C DiagFbkLoss	225		
X						V3A DiagFbkLoss	212		
X						V3B DiagFbkLoss	218		
X						V3C DiagFbkLoss	224		
X						V6A DiagFbkLoss	215		
X						V6B DiagFbkLoss	221		
X						V6C DiagFbkLoss	227		
X						W2A DiagFbkLoss	211		
X						W2B DiagFbkLoss	217		
X						W2C DiagFbkLoss	223		
X						W5A DiagFbkLoss	214		
X						W5B DiagFbkLoss	220		
X						W5C DiagFbkLoss	226		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						U1A Gating Loss	228	**INVERTER SGCT FAULT** (Gating Fiber-Optic Loss) This fault will only occur during the initial contactor closure and the diagnostic sequence after a start command. The inverter monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. This fault occurs when the feedback was high from the device before gating, and is still high from the device after gating. The drive then assumes the gating pulse must not have reached the device. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action	• Check that the fiber-optic cables are seated properly in the optical interface board and the SGCT firing card. • Check that the fiber-optic cable is not pinched or damaged. • Verify that the connection between the DPM and OIB is correctly installed. • Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly.
X						U1B Gating Loss	234		
X						U1C Gating Loss	240		
X						U4A Gating Loss	231		
X						U4B Gating Loss	237		
X						U4C Gating Loss	243		
X						V3A Gating Loss	230		
X						V3B Gating Loss	236		
X						V3C Gating Loss	242		
X						V6A Gating Loss	233		
X						V6B Gating Loss	239		
X						V6C Gating Loss	245		
X						W2A Gating Loss	229		
X						W2B Gating Loss	235		
X						W2C Gating Loss	241		
X						W5A Gating Loss	232		
X						W5B Gating Loss	238		
X						W5C Gating Loss	244		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						U1A Online	192	**INVERTER SGCT FAULT** This fault will occur during running operation of the drive. The drive detects the feedback from the device was not correct, and does not wait to determine the exact problem. The drive polls the entire bridge three times before and three times after each gating command. All six of the readings for each device must be consistent for the fault to occur. Parameter Inv Dvc Diag Dly] (P268) lets you to change the number of consecutive firings to eliminate nuisance faults. It will still poll three times before and after each firing, but will now require the condition to exist for the number of consecutive firings set in the diagnostic delay parameter for a fault to occur. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action. The drive detected that the diagnostic feedback from this device did not match the gating pattern.	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. • For nuisance faults, contact the factory about extending the diagnostic delay.
X						U1B Online	198		
X						U1C Online	204		
X						U4A Online	195		
X						U4B Online	201		
X						U4C Online	207		
X						V3A Online	194		
X						V3B Online	200		
X						V3C Online	206		
X						V6A Online	197		
X						V6B Online	203		
X						V6C Online	209		
X						W2A Online	193		
X						W2B Online	199		
X						W2C Online	205		
X						W5A Online	196		
X						W5B Online	202		
X						W5C Online	208		
	X	X				2U Airflow Loss	492	The cooling airflow velocity on the specified power stack is below the trip/warn level.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan deterioration. • Verify if the trip (P840) and warn setting (P841) matched factory recommended values.
	X	X				2V Airflow Loss	493		
	X	X				2W Airflow Loss	494		
	X	X				2U Over Temp	488	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				2V Over Temp	489		
	X	X				2W Over Temp	490		
					X	2U Temp Sensor	500	The specified temperature reading is out of normal range.	• Ensure that the temperature sensor is correctly plugged in and is not damaged.
					X	2V Temp Sensor	501		
					X	2W Temp Sensor	502		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A Offline	318	**PWM RECTIFIER SGCT FAULT** This fault will occur during the initial contactor closure, the diagnostic sequence after a start command, or the diagnostic sequence after a stop command. The rectifier monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. The SGCT has smart diagnostics, so the feedback may indicate short before firing, and if the pulse is received and the device is really shorted, the diagnostic will toggle the feedback to let you know the problem is with the device, or the power supply for that device. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action. The main example of this is closing the input contactor on a shorted bridge.	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly.
X						2U1B Offline	324		
X						2U1C Offline	330		
X						2U4A Offline	321		
X						2U4B Offline	327		
X						2U4C Offline	333		
X						2V3A Offline	320		
X						2V3B Offline	326		
X						2V3C Offline	332		
X						2V6A Offline	323		
X						2V6B Offline	329		
X						2V6C Offline	335		
X						2W2A Offline	319		
X						2W2B Offline	325		
X						2W2C Offline	331		
X						2W5A Offline	322		
X						2W5B Offline	328		
X						2W5C Offline	334		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A DiagFbkLoss	282	**PWM RECTIFIER SGCT FAULT** (Feedback Fiber-Optic Loss) This fault will occur during the initial contactor closure, the diagnostic sequence after a start command, or the diagnostic sequence after a stop command. The rectifier monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. This fault occurs when the feedback was low from the device before gating, and is still low from the device after gating. The drive then assumes the feedback must be the problem. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action	• Verify that the feedback fiber-optic cable from the SGCT to the FOI board is not damaged or disconnected. • Verify that the gate pulse has been received by the SGCT board using Gating test mode. • Complete a resistance check described in Chapter 4, checking the devices, sharing resistors, and snubber circuitry. • Replace all faulty components. • It is likely that the feedback fiber-optic cable is not plugged in or has been damaged.
X						2U1B DiagFbkLoss	288		
X						2U1C DiagFbkLoss	294		
X						2U4A DiagFbkLoss	285		
X						2U4B DiagFbkLoss	291		
X						2U4C DiagFbkLoss	297		
X						2V3A DiagFbkLoss	284		
X						2V3B DiagFbkLoss	290		
X						2V3C DiagFbkLoss	296		
X						2V6A DiagFbkLoss	287		
X						2V6B DiagFbkLoss	293		
X						2V6C DiagFbkLoss	299		
X						2W2A DiagFbkLoss	283		
X						2W2B DiagFbkLoss	289		
X						2W2C DiagFbkLoss	295		
X						2W5A DiagFbkLoss	286		
X						2W5B DiagFbkLoss	292		
X						2W5C DiagFbkLoss	298		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A Gating Loss	300	**PWM RECTIFIER SGCT FAULT** (Gating Fiber-Optic Loss) This fault will occur during the initial contactor closure, the diagnostic sequence after a start command, or the diagnostic sequence after a stop command. The rectifier monitors the state of the feedback before a gate pulse is given, and monitors the feedback after a gate pulse has been sent. This fault occurs when the feedback was high from the device before gating, and is still high from the device after gating. The drive then assumes the gating pulse must not have reached the device. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action	• Check that the fiber-optic cables are seated properly in the optical interface board and the SGCT firing card. • Check that the fiber-optic cable is not pinched or damaged. • Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating test mode check on the devices. • Verify all the power connections to the SGCT firing card are seated properly.
X						2U1B Gating Loss	306		
X						2U1C Gating Loss	312		
X						2U4A Gating Loss	303		
X						2U4B Gating Loss	309		
X						2U4C Gating Loss	315		
X						2V3A Gating Loss	302		
X						2V3B Gating Loss	308		
X						2V3C Gating Loss	314		
X						2V6A Gating Loss	305		
X						2V6B Gating Loss	311		
X						2V6C Gating Loss	317		
X						2W2A Gating Loss	301		
X						2W2B Gating Loss	307		
X						2W2C Gating Loss	313		
X						2W5A Gating Loss	304		
X						2W5B Gating Loss	310		
X						2W5C Gating Loss	316		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A Online	264	**PWM RECTIFIER SGCT FAULT** This fault will occur during operation of the drive. The drive has detected that the feedback from the device was not correct, and does not wait to determine the exact problem. The drive polls the entire bridge three times before and three times after each gating command. All six of these readings for each device must be consistent for the fault to occur. Parameter Rec Dvc Diag Dly (P266) lets you change the number of consecutive firings to eliminate nuisance faults. It will still poll three times before and after each firing, but will now require the condition to exist for the number of consecutive firings set in the diagnostic delay parameter for a fault to occur. The firmware now completes a diagnostics sequence immediately after any drive reset, with the goal of detecting faults before any destructive action is taken from the next action	• Complete a resistance check per the instructions in the manual. • NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. • Reset the drive and let the offline diagnostics further define the problem. • For nuisance faults, contact the factory about extending the diagnostic delay.
X						2U1B Online	270		
X						2U1C Online	276		
X						2U4A Online	267		
X						2U4B Online	273		
X						2U4C Online	279		
X						2V3A Online	266		
X						2V3B Online	272		
X						2V3C Online	278		
X						2V6A Online	269		
X						2V6B Online	275		
X						2V6C Online	281		
X						2W2A Online	265		
X						2W2B Online	271		
X						2W2C Online	277		
X						2W5A Online	268		
X						2W5B Online	274		
X						2W5C Online	280		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A OfflineOpen	372	6P or 18P SCR RECTIFIER FAULT (Offline Open-Circuit) For SCR rectifiers, this fault will occur after the initial contact closure, or during the diagnostic sequence after a start command. After the short-circuit test described below, the drive fires each device, and verifies that the feedback from that device went low. If the feedback does not go low, the drive assumes the SCR must be open-circuited.	Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. Complete a firing check on the rectifier. Verify the snubber circuitry, and the sharing resistors. Verify fiber-optic cable integrity from FOI board transmitter to SCRGD board receiver. Replace all faulty components.
X						2U1B OfflineOpen	378		
X						2U1C OfflineOpen	384		
X						2U4A OfflineOpen	375		
X						2U4B OfflineOpen	381		
X						2U4C OfflineOpen	387		
X						2V3A OfflineOpen	374		
X						2V3B OfflineOpen	380		
X						2V3C OfflineOpen	386		
X						2V6A OfflineOpen	377		
X						2V6B OfflineOpen	383		
X						2V6C OfflineOpen	389		
X						2W2A OfflineOpen	373		
X						2W2B OfflineOpen	379		
X						2W2C OfflineOpen	385		
X						2W5A OfflineOpen	376		
X						2W5B OfflineOpen	282		
X						2W5C OfflineOpen	388		
	X	X	X	X		3U1B OfflineOpen	432		
	X	X	X	X		3U4B OfflineOpen	435		
	X	X	X	X		3V3B OfflineOpen	434		
	X	X	X	X		3V6B OfflineOpen	437		
	X	X	X	X		3W2B OfflineOpen	433		
	X	X	X	X		3W5B OfflineOpen	436		
	X	X	X	X		4U1C OfflineOpen	438		
	X	X	X	X		4U4C OfflineOpen	441		
	X	X	X	X		4V3C OfflineOpen	440		
	X	X	X	X		4V6C OfflineOpen	443		
	X	X	X	X		4W2C OfflineOpen	439		
	X	X	X	X		4W5C OfflineOpen	442		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A OfflineShrt	390	6P or 18P SCR RECTIFIER FAULT (Offline Short-Circuit) For SCR rectifiers, this fault will occur after the initial contact closure or during the diagnostic sequence after a start command. This is the first test on the rectifier. When all devices blocking, the feedback from the devices should toggle from open to short to open every time the line voltage sine wave passes through zero. If this is consistently showing short (no feedback), then the drive assumes that the device is short-circuited.	Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. Complete a firing check on the rectifier. Verify the snubber circuitry, and the sharing resistors. Verify fiber-optic cable integrity from SCRGD board transmitter to FOI board receiver. Replace all faulty components.
X						2U1B OfflineShrt	396		
X						2U1C OfflineShrt	402		
X						2U4A OfflineShrt	393		
X						2U4B OfflineShrt	399		
X						2U4C OfflineShrt	405		
X						2V3A OfflineShrt	392		
X						2V3B OfflineShrt	398		
X						2V3C OfflineShrt	404		
X						2V6A OfflineShrt	395		
X						2V6B OfflineShrt	401		
X						2V6C OfflineShrt	407		
X						2W2A OfflineShrt	391		
X						2W2B OfflineShrt	397		
X						2W2C OfflineShrt	403		
X						2W5A OfflineShrt	394		
X						2W5B OfflineShrt	400		
X						2W5C OfflineShrt	406		
	X	X	X	X		3U1B OfflineShrt	444		
	X	X	X	X		3U4B OfflineShrt	447		
	X	X	X	X		3V3B OfflineShrt	446		
	X	X	X	X		3V6B OfflineShrt	449		
	X	X	X	X		3W2B OfflineShrt	445		
	X	X	X	X		3W5B OfflineShrt	448		
	X	X	X	X		4U1C OfflineShrt	450		
	X	X	X	X		4U4C OfflineShrt	463		
	X	X	X	X		4V3C OfflineShrt	452		
	X	X	X	X		4V6C OfflineShrt	455		
	X	X	X	X		4W2C OfflineShrt	451		
	X	X	X	X		4W5C OfflineShrt	454		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A OnlineOpen	336	6P or 18P SCR RECTIFIER FAULT (Online Open-Circuit) For SCR rectifiers, this fault will occur during operation. After a firing signal is sent to a device, the drive monitors the feedback status to ensure the voltage drops to zero across that device, indicating it has been turned on. If the feedback does not drop to zero before approximately 30…50 µsec, the drive will assume the device is open and a fault will occur. There is a six cycle fixed delay, which means that this has to occur for sex consecutive firings before the fault is instigated.	Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. Complete a firing check on the rectifier. Verify the snubber circuitry, and the sharing resistors. Verify fiber-optic cable integrity from FOI board transmitter to SCRGD board receiver. Replace all faulty components.
X						2U1B OnlineOpen	342		
X						2U1C OnlineOpen	348		
X						2U4A OnlineOpen	339		
X						2U4B OnlineOpen	345		
X						2U4C OnlineOpen	351		
X						2V3A OnlineOpen	338		
X						2V3B OnlineOpen	344		
X						2V3C OnlineOpen	350		
X						2V6A OnlineOpen	341		
X						2V6B OnlineOpen	347		
X						2V6C OnlineOpen	353		
X						2W2A OnlineOpen	337		
X						2W2B OnlineOpen	343		
X						2W2C OnlineOpen	349		
X						2W5A OnlineOpen	340		
X						2W5B OnlineOpen	346		
X						2W5C OnlineOpen	352		
	X	X	X	X		3U1B OnlineOpen	408		
	X	X	X	X		3U4B OnlineOpen	411		
	X	X	X	X		3V3B OnlineOpen	410		
	X	X	X	X		3V6B OnlineOpen	413		
	X	X	X	X		3W2B OnlineOpen	409		
	X	X	X	X		3W5B OnlineOpen	412		
	X	X	X	X		4U1C OnlineOpen	414		
	X	X	X	X		4U4C OnlineOpen	417		
	X	X	X	X		4V3C OnlineOpen	416		
	X	X	X	X		4V6C OnlineOpen	419		
	X	X	X	X		4W2C OnlineOpen	415		
	X	X	X	X		4W5C OnlineOpen	418		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Fault Message	Fault Code	Description	Recommended Action(s)
X						2U1A OnlineShrt	354	6P or 18P SCR RECTIFIER FAULT (Online Short-Circuit) For SCR rectifiers, this fault will occur during operation. Before an individual leg is fired, the drive takes five samples of the voltage across that device. This is because the notching on the line could cause individual readings to be low. If they are all low, the device is assumed to be short-circuited and a fault occurs. Parameter Rec Dvc Diag Dly (P266) lets you change the number of consecutive firings to eliminate nuisance faults. It will still check five times before each firing, but will now require the condition to exist for the number of consecutive firings set in the diagnostic delay parameter for a fault to occur.	For multiple device faults, the risk of a line to line short exists, so tests with MV isolated should be attempted. Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. Complete a firing check on the rectifier. Verify the snubber circuitry, and the sharing resistors. Verify fiber-optic cable integrity from SCRGD board transmitter to FOI board receiver. Replace all faulty components. For nuisance faults, contact the factory about extending the diagnostic delay.
X						2U1B OnlineShrt	360		
X						2U1C OnlineShrt	366		
X						2U4A OnlineShrt	357		
X						2U4B OnlineShrt	363		
X						2U4C OnlineShrt	369		
X						2V3A OnlineShrt	356		
X						2V3B OnlineShrt	362		
X						2V3C OnlineShrt	368		
X						2V6A OnlineShrt	359		
X						2V6B OnlineShrt	365		
X						2V6C OnlineShrt	371		
X						2W2A OnlineShrt	355		
X						2W2B OnlineShrt	361		
X						2W2C OnlineShrt	367		
X						2W5A OnlineShrt	358		
X						2W5B OnlineShrt	364		
X						2W5C OnlineShrt	370		
	X	X	X	X		3U1B OnlineShrt	420		
	X	X	X	X		3U4B OnlineShrt	423		
	X	X	X	X		3V3B OnlineShrt	422		
	X	X	X	X		3V6B OnlineShrt	425		
	X	X	X	X		3W2B OnlineShrt	421		
	X	X	X	X		3W5B OnlineShrt	424		
	X	X	X	X		4U1C OnlineShrt	426		
	X	X	X	X		4U4C OnlineShrt	429		
	X	X	X	X		4V3C OnlineShrt	428		
	X	X	X	X		4V6C OnlineShrt	431		
	X	X	X	X		4W2C OnlineShrt	427		
	X	X	X	X		4W5C OnlineShrt	430		

Notes:

Warning Messages

Overview

All faults, warnings, or messages displayed on the Operator Interface should be thoroughly documented by the user prior to resetting those messages. This will assist maintenance personnel in correcting problems and ensuring they do not recur.

ATTENTION: Investigate all faults before resetting the drive.

Resetting the drive into a fault condition that has been unresolved can propagate the faults and cause an increased level of damage to the equipment.

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

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X						AnIg PwrLmt Loss	198	The drive has lost analog power limit signal.	• Check the 4. . .20 mA input to the drive.
X						Arbitration Warn	502	The number of Arbitration Loss faults has exceeded or is equal to the maximum allowable arbitration warnings level.	• Check the DCSL communication wiring and shielding.
X						Autotune TimeLmt	62	Autotune test failed to complete in two minutes. Perform the test manually.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drive User Manual for autotune procedures, results and actions.
X						Auxiliary Prot'n	79	Standard external fault/warning Input included to allow the end-user to install a protective relay/system status contact that can activate a drive fault or warning, depending on configuration of Aux Prot Class (P445)	• See associated fault description. • The drive has detected an alarm triggered by the input wired in the auxiliary input of the XIO card. The alarm is user configurable by parameters in the Alarm Config group. Investigate the cause of the alarm. Check the 120V wiring and the XIO card.
X						BlkBox NVRAM Clr	176	Black box NVRAM has been cleared.	Not Used
X						Bus Transient	164	This warning indicates a line side switching transient has occurred. The drive puts both bridges in freewheel mode till the event is cleared and resumes normal operation. Check system for capacitative switching events.	• Check system for capacitive switching events. • Check the drive if it is unstable. • Check the Alpha Line for instability. • Contact factory for detailed actions.
X						Bypass CtctrOpen	188	The bypass contactor is open even though it has been commanded to close. Verify the contactor feedback and the 120V wiring to the ACB.	• Be sure the associated starter unit is set to Normal mode. • Verify the feedback from the contactor status (normally control relay auxiliary and contactor mechanical auxiliary) is wired properly and powered. • Verify that there is control power to the contactor. • Verify the associated ACB I/O. • Verify that the holding coil or closing coil is not shorted. • Verify the contactor control wiring. • These warnings may also occur during the auto-restart feature, as the loss of power may also result in the inability to hold in the contactor during the outage.
X						Bypass CtctrClsd	189	The bypass contactor is closed even though it has been commanded to open. Verify normal mode of starter the contactor feedback and the 120V wiring to the ACB.	
X						Bypass IsoSwOpen	192	The bypass contactor is open even though it has been commanded to close, which is in Normal mode, DC Current test mode, and Open Loop test mode. Verify the contactor feedback and the 120V wiring to the ACB.	• In DC Current test mode, the isolation switches are expected to be closed for the test; even though only the input contactor is required, the test will run with warnings if the switches are open. • Be sure the isolation switches are in the proper position for the specific operating mode (Refer to the description for parameter 141 – **Hardware Option1** in the parameters manual). • Verify the wiring feedback. • Verify the isolation switch mechanical auxiliary setup.
X						Bypass IsoSwClsd	195	The bypass isolation switch is closed when it is expected to be open. The switch should be open in all operating modes of the drive except Normal. Be sure proper positioning, wiring feedback to ACB, mechanical auxiliary setup.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X						Bypass OvrVolt	141	The measured line voltage pu, displayed in Bypass Voltage (P117), has exceeded the Line OvrVolt Trip (P165) setting. Synchronous transfer has been disabled.	• Verify the parameters are set properly. • Check for possible line voltage transients. • Verify voltage sensing board (VSB) connections and tap settings, resistor values, and grounds. • If voltage is too high, change tap settings on the input source to lower voltage to an acceptable level.
X						Bypass Phase Seq	144	The bypass phase sequence does not match the phase sequence of the input to the drive. Synchronous transfer has been disabled.	• The drive will not allow a synchronous transfer unless the phasing is the same. • Confirm the phase sequences and swap cables if necessary.
X						Bypass UnderVolt	142	The measured line voltage pu, displayed in Bypass Voltage (P117), is less than the Line UndVolt Lvl (P167) setting. Synchronous transfer has been disabled.	• Verify the VSB connections and tap settings, and check resistance of VSB board. Megger board to confirm integrity. • Check for possible source voltage supply problems. • Use a multimeter and oscilloscope to check voltages on the drive test points.
X						Bypass VoltUnbal	143	The measured unbalance in parameter Bypass Voltage (P117) has exceeded the trip setting in parameter LineVoltUnbalTrp (P271). Synchronous transfer has been disabled.	• Verify the VSB connections and tap settings, and check resistance of VSB board. Megger board to confirm integrity. • Check for possible source voltage supply problems. • Use a multimeter and oscilloscope to check voltages on the drive voltage test points.
	X	X	X		X	Cable Resistance	215	This warning indicates that the programmed value of cable resistance ESP Cable Resis (P750) does not match the stator resistance value determined through auto tune.	• Verify the length of the cable and cable resistance per unit length or autotune the drive again.
					X	CMC Blcked Exhst	481	Low air pressure reading coming back from analog air pressure transducer located the Common Mode Choke (CMC) section.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan deterioration. • Verify if the warning setting in parameter CMC AirExhst Wrn (P811) matches the factory recommended value.
					X	CMC Blcked Inlet	480	High air pressure reading coming back from analog air pressure transducer located in the CMC section.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan abnormal operation. • Verify if the warning setting in parameter CMC AirInlet Wrn (P812) matches the factory recommended value.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
					X	CNV Fan3 Ctctr	342	Loss of the cooling fan.	• Verify the fan contactor, fan overload and the 120V wiring to the XIO card.
					X	CNV Fan4 Ctctr	343		
					X	CNV Fan5 Ctctr	344		
					X	CNV Fan6 Ctctr	345		
					X	CNV Fan7 Ctctr	346		
					X	CNV Fan8 Ctctr	347		
					X	CMC Fan9 Ctctr	348		
					X	CMC Fan10 Ctctr	349		
					X	CMC Fan9 Aux	476	The specified fan was not commanded to run but its interposing relay status indicated that the fan was turned on. Note: This warning is used exclusively on Heatpipe drives.	• Check fan feedback wiring and confirm with the electrical drawings. Verify that XIO is functional.
					X	CMC Fan10 Aux	477		
					X	Cnv Fan3 Aux	470		
					X	Cnv Fan4 Aux	471		
					X	Cnv Fan5 Aux	472		
					X	Cnv Fan6 Aux	473		
					X	Cnv Fan7 Aux	474		
					X	Cnv Fan8 Aux	475		
			X	X		ConductivityHigh (C-FRAME ONLY)	37	This warning is for liquid cool drives. The drive indicates that the measured coolant conductivity is greater than 1 $\mu S/cm^3$. Verify that there is no debris in the coolant, and replace the de-ionizing cartridge if necessary.	• Verify that no foreign debris has entered the system (iron piping, non-deionized water, etc.). • There is no immediate need for action, but be prepared to change the de-ionizing cartridge and run the system, verifying that the conductivity is decreasing.
X						Control Pwr Loss	112	This is used in the auto-restart feature algorithm as an indicator to tell the drive to stop gating and wait for control power to return. This alarm is for drives engineered with a UPS option. There has been a loss or dip in the control power feeding the drive for more than five cycles.	• Investigate reliability of the control power. • Be sure the drive operates as expected when there is a control power outage (UPS must be installed). • Be sure that the power source is active and investigate the reliability of the source.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
	X	X				Convrtr AirFlow	204	The pressure drop at the input to the converter section sensed by the pressure transducer (as a voltage) has dropped below the value set in AirLoPresure Wrn (P320). This is dependent on the operation of the main cooling fan.	• Verify fan rotation. • Check for blocked airflow in the filters/ heatsinks/ ducting (if installed) and clean as required. • Improper alarm settings. Verify the pressure value voltage level when running with clear air flow, and compare to expected values for that specific drive type. • Verify that the alarm and trip set-up procedure was completed adequately and adjust as necessary. • For drives with external ducting, verify that there is sufficient air to the drive input. • Verify supply voltage to differential pressure transducer at ACB and confirm output is stable.
	X	X				Convrtr FansOn	206	The drive control has detected that the converter fan contactors are closed even though it has not been commanded to run.	• Check the fan feedback wiring and confirm with the electrical drawings. • Verify that XIO is functional.
	X	X				Convrtr Fan1Loss	208	Drives with a redundant fan (specified in Redn ConvFan HardwareOptions1 [141]) will give this warning if fan 1 is running, there were no problems with fan 2, and fan 1 is lost. Fan 2 will start and the drive will continue running.	• Investigate the cause of the fan 1 loss (OL/damaged relay). • Verify that fan 2 is operating with the proper current levels. • At the next possible shutdown, reset the warnings and fan 1 can be run again.
	X	X				Convrtr Fan2Loss	209	Drives with a redundant fan (specified in Redn ConvFan HardwareOptions1 [141]) will give this warning if fan 2 is running, there were no problems with fan 1, and fan 2 is lost. Fan 1 will start and the drive will continue running.	• Investigate the cause of the fan 2 loss (OL/damaged relay). • Verify that fan 1 is operating with the proper current levels. • At the next possible shutdown, reset the warnings and fan 2 can be run again.
	X	X				Conv Fan1 Ctctr	200	This warning indicates that while the drive was running it detected the loss of the main converter cooling fan. When the drive is running, the feedback from the fan 1 contactor auxiliary and isolation switch is lost, but the drive will not trip and wait for power supply faults or converter air flow faults to fault the drive.	• If the drive faults, investigate problems with the fan contactors or the fan overloads. • Verify the fan contactor, fan overload and the 120V wiring to the standard XIO card. • If the drive is still running with this warning, there is a problem with the fan isolation switch auxiliary.
	X	X				Conv Fan2 Ctctr	201	This warning indicates that while the drive was running it detected the loss of the redundant converter cooling fan. When the drive is running, the feedback from the fan 2 contactor auxiliary and isolation switch is lost, but the drive will not trip and wait for power supply faults or air pressure faults to fault the drive.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
			X	X		CoolantLevel Low (C-FRAME ONLY)	38	This warning is for liquid cool drives. The measured coolant level in the reservoir is low.	• Check the coolant level and inspect for any leaks. If there are no visible leaks, add an approved coolant to the maximum level. • You will lose coolant over time through evaporation, but you should still verify that there are no slow leaks in the system. • Add de-ionized water to the system since this is what normally evaporates, and check the coolant mixture with a glycol tester. • If the coolant level is OK but the warning is still there, then check the low level switch's function.
			X	X		Coolant Temp Low (C-FRAME ONLY)	35	This warning is for liquid cool drives. The measured coolant temperature is below 10 °C (50 °F). The warning will not clear until the temperature rises above 15°C (58°F).	• Verify that the thermostatic bypass valve (V10) was not left open. • Warm up the control room ambient to get the drive to an operational level. • If the warning persists, check the function of the thermoswitch.
			X	X		CoolantTempHigh (C-FRAME ONLY)	36	The measured coolant temperature has exceeded the 48°C (120°F) trip setting (P478). The warning cannot be cleared until the temperature has dropped below 44°C (110°F).	• Verify the heat exchanger fans are operating. • Verify that the thermostatic valve is fully opened. • Check that all valves are in the normal operating position. • Verify room ambient temperature is adequate for the drive operation.
X						CRC Warning	501	The number of cyclic redundancy check (CRC) faults has exceeded or is equal to the maximum allowable CRC warning level.	• Check DCSL the communication wiring and shielding.
X						Ctrl5V Redundant	118	5V redundant output of the DC/DC converter has failed.	• Verify the output from the alarm signal is wired correctly. • Check the 5V rail connections. • Replace the power supply when possible.
X						DataRecorder Clr	176	Black box NVRAM has been cleared.	• Check if DPM battery is depleted. If DPM battery level is good, check that the battery is properly seated (connection is good). • If this fault recurs, replace the DPM.
				X		DB AirflowSensor	363	Dynamic brake (DB) airflow sensor not functioning. A warning is issued if this happens while running and a fault is issued when the drive is stopped.	• Check DPM and airflow sensor in the DB cabinet.
				X		DB Ambient Loss	361	DB temperature sensor not functioning. A warning is issued if this happens while running and a fault is issued when the drive is stopped.	• Check the temperature feedback board (TFB) and DB exhaust temperature sensor in the DB cabinet.
				X		DB Disabled	360	DB unit is disabled. SpecialFeatures3 (P920), bit 0 is used to enable / disable the DB function. If the DB resistance value is set to 0, the DB function will automatically be disabled.	• If the DB cabinet is present, verify DB resistance parameter settings. • If the DB function required, ensure that it is enabled.
				X		DB Fan Ctctr	357	DB fan contactor is engaged but not commanded from drive.	• Check the DB fan input status and its control circuit.
				X		DB Fan ON	358	DB fan contactor is not engaged (to run the fan) although commanded from drive.	• Check the DP fan control circuit and contactor.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
				X		DB GatePwrSupply	177	This warning is for the power supply to the SGCT devices in the DB cabinet which is being monitored using the TFB and indicates a problem with the gate power supply associated with a particular device.	• The device feedback was not correct due to power loss to the gate driver board. This warning can also appear as a result of another device fault in the DB cabinet. • Check the 20V input to the gate driver board. Replace the IGDPS if necessary.
				X		DB High Amb Temp	359	Either the DB cabinet ambient temperature exceeds the warning level or the DB Air flow is less than the specified warning level.	• Verify the trip and warning settings match the factory recommended values. • Check the DB fan, air flow, TFB and DB exhaust temperature sensor in the DB cabinet.
				X		DB Low Airflow	362		
				X		DB Temp Sensor	365	The DB temperature sensor is not functioning. A warning is issued if this happens while running and a fault is issued when the drive is stopped.	• Check TFB and resistor exhaust temperature sensor in the DB cabinet.
				X		DB TFB DataError	366	The DB TFB is not functioning.	• Check the TFB in the DB cabinet.
				X		DBOvrTemperature	364	The DB exhaust temperature has exceeded the DB over temperature warning level.	• Check the DB fan, air flow, TFB and DB resistor exhaust temperature sensor in the DB cabinet. • Verify that the trip and warning settings match the factory recommended values.
				X		DBR Overload	367	Braking energy dissipated in the DB resistor exceeded the fault threshold (in other words, 150% of DB resistor rated energy). This is a calculated measurement and does not reflect any physical feedback.	• Verify that the DB resistor parameter settings are correct. • Verify that the DC current feedback measurement is correct.
				X		DBSE1Online	420	The drive detected that the diagnostic feedback from this SGCT device on the DB side did not match the gating pattern.	• After isolating the drive from medium voltage, be sure that the device, IGDPS power supply and the fiber-optic signals are not damaged. • Perform gating test and verify that the gating pattern is correct and that the drive is receiving proper gating feedback.
				X		DBSE2Online	421		
				X		DBSE3Online	422		
				X		DBSE4Online	423		
				X		DBSH1Online	424		
				X		DBSH2Online	425		
				X		DBSH3Online	426		
				X		DBSH4Online	427		
X						DC Link Range	167	The calculated pu value (P27) of the DC link inductance is less than the minimum recommended. For 6-pulse SCR the value is less than 0.8 pu, for 18-pulse SCR the value is less than 0.42 pu and for PWM rectifier drives the value is less than 0.55 pu.	• Review the DC link nameplate data. • Review the motor and drive nameplate data and verify that all parameters were entered properly. • Contact factory if the above seems OK.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X						DCLnk OvrTemp	76	There is a thermal switch in each DC link winding, and they are connected in series. The thermal switch in the DC link inductor has detected an over temperature condition and opened the AC input to the standard XIO. The alarm is user configurable by parameters in he Alarm Config group.	• Be sure that the converter cooling fan is working and that the air flow is not obstructed. • Check the 120V wiring and the XIO card. • Make sure there are no distorted waveforms to the DC link. Check if there are harmonics on line voltages/current.
X						DCLnk OvrCurrent	156	The DC link current in Idc Feedback (P322) has exceeded the DC link current trip settings. A warning is logged first and if the over-current persists for the time delay a fault is logged.	• See associated fault description. • Verify the parameter settings of the drive. • Check the HECS and burden resistor. • Confirm stable operation of the drive and any sudden load transients.
X						DCSL Conflict	507	Synchronous transfer or parallel follower drives features cannot be enabled if DCSL feature is already enabled.	• Check DCSL Config (P955), bit 0, Enable.
X						DCSL Not Enabled	506	DCSL feature is not enabled. This feature is mutually exclusive with either synchronous transfer or parallel drives.	• Check Special Features (P99), bit 5, SyncXfr Enab, and Powerup Config (P717).
		X	X	X	X	DecLined Master	122	This warning is for parallel drives only and indicates that the slave drive was requested to be the Master, but it was unable to comply.	• Slave has lost communication with hub PLC, or slave is masked off in parameter *Master Mask*.
X						Desync Delay	146	A transfer from the line back to drive (desync) has been commanded, but it has been less than 1 minute since the transfer from drive to line (sync) was completed. As a result, the output motor filter capacitors have not had time to adequately discharge.	• Wait for 1 minute and attempt the desync transfer again. • Insufficient time gap between drive sync and attempted desync. Wait till the motor filter capacitor has discharged and the drive is in READY mode.
X						Drive OvrLoad	152	The drive has detected an overload condition in the drive indicated by Drive Overload (P551). A Drive Overload warning has been detected, where the overload condition is calculated using DC Current Feedback (P322) and Drive Overload Warning (P270) as the point where the overload warning occurs. (P270) is programmed as a percentage of the difference between Line Overload Minimum (P269) and Line Overload Trip (P163).	• Transient loading – Check the torque limit and overload settings and compare loading to torque settings and trip settings. • Verify the drive sizing and that the overload parameters to meet the load requirements. Verify HECS feedback and burden resistors.
X						Drv Maintenance	212	Drive maintenance is due. Contact the factory.	Not Used
X						Drv in Test Mode	59	The drive operating mode (P4) is programmed in test mode (Gate, System, DC Current, Open Circuit or Open Loop) when initiated for autotune test. Place drive back in Normal mode before autotune.	• Place drive back in Normal mode before attempting autotune.
X						DuplctMaster Wrn	500	A Master drive detected another Master on DCSL and has reverted to the role of Follower.	• Check DCSL Config (P955), bit 1, Master.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X						Duplicate Master	121	This warning is for parallel drives only with DCSL enabled and indicates that this drive was configured to be the Master, but already another Master drive exists in the link.	• The Powerup Config parameter is set to Master in more than one drive. The first drive to power up will become the master.
X						EncoderDirection	148	The drive cannot determine the direction of rotation from the tachometer feedback. It is likely that one of the quadrature pulses is not being sensed.	• Check all signal connections on the tachometer feedback board. Replace the board if necessary.
X						Encoder Loss	147	The error between tachometer feedback and estimated speed from motor flux is more than the Tach Lost Trip (P235) for the duration set in the Tach Loss Delay (P236). The drive will continue to run in sensorless mode.	• Verify the tachometer feedback, wiring and +15Vdc supply. Also ensure the stability of the drive.
X						Encoder PhA Loss	149	The drive has detected a loss of a phase from the encoder. The drive will continue to run on the encoder provided pulses from the other phase are valid. This warning is valid only if HPTC mode is enabled.	• Verify the tachometer, tachometer wiring, power supply and the board. • Be sure that all channels are connected properly and not swapped at motor and drive end. For example, swapping A+ and A- will cause this fault. • Z+ and Z- are not to be used in PowerFlex 7000 Forge drives. Remove any wires and/or jumpers on the Z+, Z- terminals. • Tech notes related to encoders are: PF7000 4th Gen_FMW-11, PF7000 Firmware 9.001 and 9.002 with Encoder Release Notes
X						Encoder PhB Loss	151		
						Ext Flt Config	19	XIO card assigned to external fault is unusable for this purpose. Select the proper slot compatible for usage.	• Select the proper slot containing the XIO card which is compatible for external faults usage.
						Ext Flt Conflict	20	External fault XIO card has been re-assigned for another purpose. Check configuration of all cards and reassign if necessary.	• Check the configuration of all XIO slots and reassign if necessary.
						External 1…External 16	1…16	These are the optional additional external faults available when there is an additional XIO board installed. This is configured with XIO Ext Faults (P593), and this message will appear if the specific input (1…16) is configured in Fault Config as a warning.	• See the associated fault description. • Check the input circuit for that warning. • Refer the optional XIO board wiring circuit on electrical drawing.
						FlexIO Config	29	The XIO card which is being assigned is not a card which can be used for this purpose.	• Select the proper slot containing a compatible XIO card.
						FlexIO Conflict	30	The XIO card previously used has been reassigned to another function.	• Check the configuration of all XIO slots.
						GatePwrSup V Low	160	This alarm is for SGCT based drives and indicates a problem with the gate power supply, which is being monitored using the temperature feedback board.	• Check the 20V input to the gate driver board. Replace the IGDPS if necessary.
			X			HeatExchnger Fan (C-FRAME ONLY)	34	This warning is for liquid cool drives. The drive has detected a problem in the liquid to air heat exchanger fans.	• Verify the fan Overload settings and conditions. • Verify the fan control relay status and auxiliary contact signals.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						High AmbientTemp	406	The drive detected high ambient temperature at the specified location.	• Verify if the warning setting (P571) matches factory recommended value.
						HPipeIO Config	25	The XIO card which is being assigned is not a card which can be used for this purpose.	• Select the proper slot containing a compatible XIO card.
						HPipeIO Conflict	26	The XIO card previously used has been reassigned to another function.	• Check the configuration of all XIO slots.
X						HPTC Config Err	516	High performance torque control (HPTC) mode is not compatible with the current drive configuration.	• Check HPTC WrnCode (P1144), to identify the exact reason.
X						HPTC Conflict	517	The feature you are attempting to enable is in conflict with the enabled HPTC feature.	• Disable the HPTC feature and try enabling the feature again.
						Hub Comm Loss	120	This warning is for parallel drives only and indicates that the drive has lost communication with the PLC.	• Verify that the ControlNet adapter/cable and PLC are working properly.
						Inertia High	63	The drive estimated the total inertia is greater than 20secs. Check the Autotune Trq Stp (P215) value and repeat. If the warning persists, determine the inertia from system data and if different from autotune value, manually set total inertia.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives User Manual for autotune procedures, results and actions.
						Inertia Low	374	The drive estimated the total inertia is less than 0.1secs.	• Check the Autotune Trq Stp (P215) value and repeat. If the warning persists, determine the inertia from system data and if different from autotune value, manually set total inertia.
X						InpFilter Tuning	183	The input filter cut-off frequency is less than 3.65 pu or between 4.95 pu and 1.05 pu.	• Verify the design of the LC input filter.
						InputCloseDelay	197	For PWM drives, this warning indicates that a start command has been given, but the drive is still waiting for the DC voltage to discharge from the line filter capacitors. This can be observed by the status 'Discharging', on the main screen.	• Wait for the drive Ready status to appear, allowing you to start the drive.
						Input CtctrOpen	184	The input contactor is open even though it has been commanded to close. Verify the contactor feedback and the 120V wiring to the ACB. Drive may be in auto-restart mode following loss of medium voltage.	• verify that the associated starter unit is set to Normal mode. • Verify the feedback from the contactor status (normally control relay auxiliary and contactor mechanical auxiliary) is wired properly and powered. • Verify that there is control power to the contactor. • Verify the associated ACB I/O. • Verify that the Holding Coil or Closing Coil is not shorted. • Review Contactor control wiring. • These warnings may also occur during the auto restart feature, as the loss of power may also result in the inability to hold in the contactor during the outage.
						Input CtctrClsd	185	The input contactor is closed even though it has been commanded to open. Verify normal mode of starter the contactor feedback and the 120V wiring to the ACB.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Input IsoSwOpen	190	The input isolation switch is open when it is expected to be closed. The switch should be closed in all operating modes of the drive except System and Gate test. Be sure proper positioning, wiring feedback to ACB, mechanical auxiliary setup.	• In DC Current test modes, the isolation switches are expected to be closed for DC Current test; although only the input contactor is required the test will run with warnings if the switches are open. • Be sure the isolation switches are in the proper position for the specific operating mode (Refer to the description of the P141, **Hardware Option1** in the parameters manual). • Verify wiring feedback. • Verify isolation switch mechanical auxiliary setup.
						Input IsoSwClsd	193	The input isolation switch is closed when it is expected to be open. The switch should be open in System and Gate Test. Ensure proper positioning, wiring feedback to ACB, mechanical auxiliary setup.	
						Input Prot'n #1	74	Standard external fault/warning input included allowing the end-user to install a protective relay (for example, input feed protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of InputProt1 Class (P440).	• See the associated fault description. • Also check the 120V wiring and the XIO card.
						Input Prot'n #2	78	Standard external fault/warning input included allowing the end-user to install a second protective relay (for example, input feed protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of InputProt2 Class (P444).	• See the associated fault description. • Also check the 120V wiring and the XIO card.
						InvHSnk Sensor	218	While Running, the drive has detected a missing temperature sensor connected to the TFB on the inverter heatsink. A missing sensor can result in either a Fiber Optic Loss fault or a Sensor fault because a missing sensor can be interpreted as either 0° C (32 °F) or over 100° C (212 °F), and both are unrealistic values.	• Verify sensor is completely seated properly on TFB. • Measure sensor resistance. • Replace if necessary. • Ensure that the sensor in plugged in. • NOTE: This is a warning because the drive should not fault on the loss of the signal while running. There is no imminent danger to the drive, but the user needs to be aware that there is a temperature feedback signal missing.
						Inv Gate PwrSup	213	This warning is for SGCT based drives and indicates a problem with the gate power supply associated with a particular device which is also likely in the warning queue.	• The device feedback was not correct due to power loss to the gate driver board. • This can be from the 20V DC output of the IGDPS or on the gate driver board itself. • This warning can also appear as a result of another device fault such as an Online fault. • This warning can also appear if the device has failed.
						Invalid AlarmBit	98	DEVELOPMENT ERROR - An unused bit in the first 16 bits in either a fault or warning word has been set and detected by the alarm queue server. Either a used bit has been overlooked in the faults/warnings database, or the control is incorrectly setting an alarm word. Unused bit is being set in the fault or warning word by the control software.	• Contact the factory.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Invalid DIM	99	The drive tried to access the DIM, but either encountered a problem with the checksum on the DIM, or the DIM was not installed.	• This fault may occur on drives upgrading major revisions of firmware with the older DIM installed, or if the DIM has a failure. • Remove the DIM.
						Invalid Mstr Req	124	Invalid Master request-slave only This warning is for parallel drives only and indicates that the slave drive refused to the request to be the Master because it detected that another Master is active on the link.	• Drive tried to become master when another master was already active.
						InvOvrVoltage SW	368	The drive has detected an over-voltage at the inverter output terminals in software for long cable applications. A fault is issued if the drive is gating else a warning is issued.	• Verify that the Motor Overvoltage Trip (P181) is set correctly. • Verify that the motor cables are not disconnected. • Verify that the load is not overhauling the motor (this warning is generated while the drive is not gating). • Contact Medium Voltage Tech Support for assistance.
						IsoTx Fan1 Ctctr	202	Isolation transformer fan 1 contactor This warning indicates that while the drive was running it detected the loss of the main cooling fan in the isolation transformer cabinet.	• Isolation transformer fan status is not high while the drive asked the contactor to be closed. • This warning occurs when the drive commands the isolation transformer fan contactor to close, and does not detect the status feedback from the contactor. • Verify the fan contactor, fan overload and the 120V wiring to the standard XIO card.
						IsoTx Fan2 Ctctr	203	Isolation transformer fan 2 contactor This warning indicates that while the drive was running it detected the loss of the redundant cooling fan in the isolation transformer cabinet.	
						IsoTx Fan1 Loss	210	Isolation transformer fan 1 loss This warning is for drives with redundant isolation transformer fan option. The drive detected the loss of fan 1 and starts fan 2. Investigate the fan 1 loss and verify fan 2 operation.	• This warning occurs when the drive detects a loss of pressure or a loss of Fan contactor feedback when running. • This warning occurs when the drive detects a loss of pressure or a loss of fan 2 contactor feedback when running. • Reset warning at next shutdown and fan 1 will start running.
						IsoTx Fan2 Loss	211	Isolation transformer fan 2 Loss This warning is for drives with redundant isolation transformer fan option. The drive detected the loss of fan 2 and starts fan 1. Investigate the fan 2 loss and verify fan 1 operation.	
	X					IsoTx AirFlow (A-Frame Only)	205	The pressure sensed by the pressure transducer in the integral isolation transformer section (as a voltage) has dropped below the value set in pressure value transformer warning (P653).	• Verify fan rotation. • Check for blockage in the filters / ducting (if installed) and clean as required. • Check for improper warning settings. Verify the pressure value voltage level when running with clear air flow. • Verify the alarm and trip set-up procedure was completed adequately and adjust as necessary. • For drives with external ducting, verify that there is sufficient air to the drive input. • Verify the supply voltage to the pressure transducer and confirm that the output is stable. • Be sure that the pressure sensor is working and is connected to the ACB.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						IxoTx Fans On	207	Isolation transformer fan ON warning This warning is for drives with redundant isolation transformer fan option. The drive detected the loss of fan 2 and starts fan 1. Investigate the fan 2 loss and verify fan 1 operation. Reset warning at next shutdown and fan 2 will start running	• Isolation transformer fan status is high while it should be low. • Investigate the control circuit for isolation transformer fan. • Check the wiring at XIO for fan status.
						InpCtctrFeedback	159	The drive has detected the presence of medium voltage but is not sensing the input contactor status.	• Verify that the contactor is closed. • Confirm the feedback path from the contactor auxiliary contact to the contactor status input string on the ACB. • Verify the contactor status string (MSR contact, DIC contact, DI aux contact, etc.). • Confirm that the drive is commanding the contactor to close (DIC relay). If not, determine why the contactor was commanded to close. If DIC relay is not energized, the contactor should not be allowed to close.
						InvHSnk FbrOptic	220	While 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 the TFB and FOI board for power. • Check that the fiber-optic cables are properly seated in the transmitters and receivers. • Check the fiber-optic cables for kinks, bends, breaks that could be blocking the signal. • This can occur if the sensor is not connected to the TFB. • NOTE: This is a warning because the drive should not fault on the loss of the signal while running. There is no imminent danger to the drive, but the user needs to be aware that there is a temperature feedback signal missing.
						InvHSnk OvrTemp	216	The temperature detection on the inverter heatsink, connected to channel A fiber-optic receiver RX7 on FOI-M-A, has exceeded inverter heatsink temperature warning (P316).	• Confirm that the actual temperature in parameters is not higher than the warning value. If so, investigate the conditions of the drive (ambient / loading/ elevation / ventilation/ filter status / heatsink clogging). • Check the sensor and temperature offline (ambient) for accuracy. • Be sure that the fan is working properly and that the air flow is sufficient in this cabinet.
						Inv AC Cur Gain	223	The current gain calculated for motor current sensing is outside the limit of the expected range [2…5] pu.	• Verify that the HECS ratio and burden resistor match the drive/ motor ratings.
						Inv AirflwSensor	395	The specified airflow velocity reading is out of normal range.	• Ensure that the airflow sensor is correctly plugged in and is not damaged.
						Inv Ambient Loss	447	The specified ambient temperature reading is out of normal range.	• Ensure that the on-board temperature sensor is not damaged. If an external sensor is used, ensure that the sensor is correctly plugged in and is not damaged.
						Inv High Ambient	442	The drive detected high ambient temperature at the specified location.	• Verify if the warning setting (P571) matches factory recommended value.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Inv HS Over Temp	451	The drive detected high heatsink temperature at the specified location.	• Verify if the warning (rectifier P112, inverter P316) and trip settings (rectifier P111, inverter P315) match factory recommended values.
						Inv Low Ambient	443	The drive detected low ambient temperature at the specified location.	• Verify if the warning level setting matches factory recommendation.
						Inv Low Airflow	391	The cooling airflow velocity on the specified power stack is below the trip/warn level.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan deterioration. • Verify if the trip (P840) and warn setting (P841) matches factory recommended values.
						Inv OvrVoltage	222	Motor filter capacitor overvoltage. The inverter output voltage displayed in Inv Output Volt (P761) has exceeded the trip settings. This is detected by the hardware circuit in the ACB. A warning is logged first and if the overvoltage persists for the time delay a fault is logged Verify the parameters and ensure that the motor is connected to the drive either directly or through an output contactor. Inspect the VSB for possible damage.	• This warning occurs when drive is not gating. It may be when motor is coasting. • This is drive output V [surface voltage terminology used in ESP application]. • The protection uses P193 setting but drive calculates the motor filter cap voltage. • Make sure there is no open circuit at the drive output and motor is connected.
						Inv Temp Sensor	399	The specified temperature reading is out of normal range.	• Ensure that the temperature sensor is correctly plugged in and is not damaged.
						IsoTx/ReacOvrTmp	75	The temperature switch in the drive input isolation transformer or line reactor has detected an overtemperature and opened the AC input to the standard XIO opened. There is a thermal switch in each phase winding, and they are connected in series.	• See the associated fault description. • The alarm is user configurable by parameters in the Alarm Config group. Be sure that the cooling fan in the cabinet is working and that the air flow is not obstructed. • Also check the 120V wiring and the XIO card.
						Junction OvrTemp	404	The device junction temperature calculated is higher than the specified trip/warn level (trip P574, warn P577). High junction temperature could be a result of one or combination of the following: high ambient temperature, high Idc, low cooling airflow, incorrect setting of rectifier type or heatsink type, trip/warn level setting too low	• Check the ambient temperature. • Check for dirty air filters. Clean or replace the filters. • Check for restriction in the airflow path • Verify that the parameters P399 and P880 are set correctly.
						L Input Low	64	Indicates that the Autotune L Input (P217) measured was less than 0.02 pu and the Input Impedance (P140) will have to be tuned manually. For PWM rectifier drives, verify that the line reactor is properly installed.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives User Manual for autotune procedures, results and actions.
						L Input High	65	Indicates that the Autotune L Input (P217) measured was greater than 0.50 pu and the Input Impedance (P140) will have to be tuned manually. For PWM rectifier drives, verify that the size of line reactor is correct.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						L Leakage Low	68	Indicates that the Autotune L leakage (P220) measured was less than 0.10 pu. Verify the motor name plate data entered in the drive.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives User Manual for autotune procedures, results and actions.
						L Leakage High	69	Indicates that the Autotune L Leakage (P220) measured was greater than 0.35 pu. Verify the motor name plate data entered in the drive.	
						L Magnetize Low	70	Indicates that the Autotune L Magn (P221) measured was less than 1.00 pu, and Lm Rated (P131) will have to be tuned manually. Verify the motor name plate data entered in the drive.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives, User Manual for autotune procedures, results and actions.
						L Magnetize High	71	Indicates that the Autotune L Mag (P221) measured was greater than 10.00 pu, and Lm Rated (P131) will have to be tuned manually. Verify the motor name plate data entered in the drive. Manually tune flux regulator.	
						Line Cap Range	165	The calculated pu value of the line filter cap (P133) is either less than 0.35 pu or bigger than 0.55 pu. Verify capacitor nameplate data and compare with the drive and motor ratings.	• Verify the capacitor nameplate data and compare with information entered in the drive for the drive and motor ratings.
						Line Loss	161	The drive has detected a loss of input voltage from losing the frequency (PLL) lock on the input voltage. This is designed to be a faster method of detecting an undervoltage. The drive responds to this warning as it does to a Master UV warning.	• Verify the VSB connections and tap settings and the check resistance of VSB board. Megger the board to confirm the integrity. • Check the TSN fusing. • Check the actual voltage values on the terminal for each bridge and the total line voltage. • Check for possible source voltage supply problems. • Check the input contactor status or if it is open.
						Line Synch Loss	158	The drive has lost synchronization with the incoming line voltage and has announced a phase lock loop warning.	• Capture the voltage waveforms from the ACB test points and examine for inconsistency. • Verify the incoming voltage, input contactor status, VSB and TSN fuses. • Verify that the drive power system is properly grounded. • Check for noise on the control power in the drive. • Check the grounding for all signal and control wiring. • Verify the Input Impedance parameter is valid and retune if required.
						LiqCool Leakage	356	A converter, pump or DB coolant leak has been detected.	• Look through all of the cabinets for evidence of leaks. If a leak is found, identify source of leak and resolve the issue. • Verify that all leak detection sensors are operating correctly.
			X			Liqd IO Config (C-Frame Only)	21	The XIO card which was being assigned to the liquid cooling system faults input is not a card which can be used for this purpose.	• Select the proper slot containing the XIO card which is compatible for liquid cooling system faults usage.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
			X			Liqd IO Conflict (C-Frame Only)	22	The XIO card previously being used for liquid cooling system faults has been reassigned for another purpose.	• Check the configuration of all XIO slots and reassign if necessary.
						LogixIO Config	23	The XIO card assigned to Logix I/O is not usable for this purpose.	• Select the proper slot that is compatible for usage.
						LogixIO Conflict	24	Logix IO card has been re-assigned for another purpose.	• Check configuration of all cards and reassign if necessary.
						Low Cnv Airflow	405	The cooling airflow velocity on the specified power stack is below the trip/warn level.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan deterioration. • Verify that the trip (P840) and warn (P841) settings match the factory recommended values.
						LR Fan1 Aux	468	The specified fan was not commanded to run but its interposing relay status indicated that the fan was turned on. Note: This warning is used exclusively on Heatpipe drives.	• Check the fan feedback wiring and confirm with the electrical drawings. Verify that the XIO card is functional.
						LR Fan2 Aux	469		
						LR Fan1 Ctctr	340	Loss of the cooling fan.	• Verify the fan contactor, fan overload and the 120V wiring to the XIO card.
						LR Fan2 Ctctr	341		
X						Master Txfr Warn	503	A transfer of Master has failed and the old Master is still the active Master. Mastership transfer failed because of either, the requesting drive is not allowed to take Mastership, or an existing Follower refused to take on the role of Master.	• Check DCSL Config (P955) and Master Accept (P1045) to see if mastership transfer is enabled.
						Master UnderVolt	153	The measured line voltage (P135) or master line voltage (P136) is less than line undervoltage level (P167) with respect to 1/3 rated line voltage (P18) [for 18-pulse drives], and rated line voltage (P18) [for 6-pulse and PWM drives] for the period set by line undervoltage delay (P168).	• Verify the VSB connections and tap settings, and check resistance of VSB board. Megger the board to confirm integrity. • Check the TSN fusing. • Check the actual voltage values on the terminal for each bridge and the total line voltage. • Check for possible source voltage supply problems. • Use a multimeter and oscilloscope to check the voltages on the drive test points.
						MaxDrvCapability	231	The motor current exceeded maximum allowable level for the variable torque drive. The motor current is now limited to the safe level of drive thermal protection.	• Check the drive load condition. • The load exceeds the expected value at desired speed. Torque = k x speed^2, if speed is 50%, expected torque is 25%
X						M Cap Comp High	377	The calculated value of motor capacitor compensation is too large.	• Verify the motor capacitor nameplate data entered in the drive. • Tune the drive manually.
X						Minimum Capacity	505	The system has reached the minimum capacity the system can run.	• Check the minimum capacity setting (this is the minimum number of drives the system can run) specified in DCSL Config (P955), using bit 3 and bit 4, Ld Factor.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Motor Cap Range	137	The calculated per unit value of the motor filter capacitor (P128), based on the values entered for motor capacitor kVAR (P20), motor capacitor voltage (P21), and motor capacitor frequency (P28) is outside of the normal range of 0.26. . .0.55 pu.	• Verify the capacitor nameplate data and compare with the information entered in the drive for the drive rating and motor rating. • Contact the factory.
						Motor Load Loss	138	The drive has detected a loss of load condition. This is activated as a warning using the parameter Load Loss Detect (P199), and the necessary set points are Load Loss Level (P246), Load Loss Delay (P231), and Load Loss Speed (P259).	• Verify the parameter settings. • Be sure that the load should not normally be in an unloaded condition.
						Motor OvrLoad	136	A Motor Overload (P550) warning has been detected, where the overload condition is calculated using Stator Current (P340) and Motor Overload Warning (P351) as the point where the overload warning occurs. P351 is programmed as a percentage of the difference between Motor Overload Min (P350) and Motor Overload Trip (P179).	• Transient loading - Check the torque limit and overload settings and compare the loading to the torque and trip settings. • Verify the drive sizing and that the overload parameters meet the load requirements. • Verify HECS feedback and burden resistors.
						Motor OvrVoltage	139	The measured motor AC voltage or Stator Voltage (#P344) has exceeded Motor Overvoltage Trip (P181) for the duration set in Motor Overvoltage Delay (P182), but this has occurred with the drive NOT gating (as in a sync transfer event)	Possible Causes: • Be sure the motor is connected to the drive and there is no open circuit at the drive output when started in normal mode. • Self-excitation - Check for flying start/induced motor rotation. • Check for noise from contactor closure.
						Motor Protection	77	Standard external fault/warning input included allowing the end-user to install a protective relay (in other words, Bulletin 825 motor protection relay) auxiliary contact that can activate a drive fault or warning, depending on configuration of Motor Prot Class (P443).	• See the associated fault description. • Verify the alarm and be sure that there is no damage to the motor. • Also check the 120V wiring and the XIO card.
X						New Master	504	A new Master has been detected. The active Master Drive ID is displayed in DCSL Master ID (P937).	• This warning is to notify the user that a change of mastership event had just occurred. The active Master Drive ID is displayed in DCSL Master ID (P937).
						NoEncoderInstlld	150	There is no tach feedback either connected or programmed.	• Verify tach requirement for system and change the tach configuration parameter Tach Type (P233).
						No Output Ctctr	196	This warning will happen in Open Circuit test mode and indicates that there is no output contactor programmed in the drive. Verify the parameter settings and ensure that the output of the drive is truly open-circuited.	• If there truly is no output contactor in the system, then you can mask the fault. Then there will be a no OP Ctctr warning, and you can continue with the test. • Be sure that the output of the drive is truly open circuited. • If there is no output contactor then you MUST disconnect motor cables from the drive in case running Open Circuit test.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						No Tach InstalId	150	The drive has sensed that there is no tachometer/encoder connected, but the Speed Feedback Mode (P89) has been set to Pulse Tach. Verify tach requirement for system and change the tach configuration parameter Tach Type (P233).	• Verify whether there is a tachometer required for the system, and set the parameter Speed Feedback Mode accordingly. • Investigate the tachometer for damage. • Verify the wiring from the drive to the tachometer is per the electrical drawing. • Verify the +15VDC supplying the tachometer is not low/missing.
						NVRAM Cleared	96	The drive parameters are corrupt and have been initialized to default values. This happened either during a firmware upgrade or if the battery was low. Reload the parameters into the drive	• Reload the parameters from terminal memory, DriveTools, Flashcard, or from a hardcopy.
						Output CtctrOpen	186	The output contactor is open even though it has been commanded to close.	• Verify the contactor feedback and the 120V wiring to the ACB. • The drive may be in auto-restart mode following loss of medium voltage. • Be sure the associated starter unit is set to Normal mode. • Verify the feedback from the contactor status (normally control relay auxiliary and contactor mechanical auxiliary) is wired properly and powered. • Verify that there is control power to the contactor. • Verify the associated ACB I/O. • Verify that the holding coil or closing coil is not shorted. • Review the contactor control wiring. • These warnings may also occur during the auto restart feature, as the loss of power may also result in the inability to hold in the contactor during the outage.
						Output CtctrClsd	187	The output contactor is closed even though it has been commanded to open. Verify normal mode of starter the contactor feedback and the 120V wiring to the ACB.	
						Output IsoSwClsd	194	The input isolation switch is closed when it is expected to be open. The switch should be open in System, Gate and Open Circuit test.	• In DC Current test modes, the isolation switches are expected to be closed for DC Current test; although only the input contactor is required the test will run with warnings if the switches are open. • Be sure the isolation switches are in the proper position for the specific operating mode (Refer to the description of parameter 141 – **Hardware Option1** in the parameters manual). • Verify the feedback wiring. • Verify isolation switch mechanical auxiliary setup.
						Output IsoSwOpen	191	The output isolation switch is open when it is expected to be closed. The switch should be closed in Normal, DC Current test and Open Loop modes.	
						Parameter Range	97	The parameter value loaded from the NVRAM or the DIM is outside the valid range and has been set to default value. The offending parameter number has been stored in Parameter Error (P597). Enter the correct value.	• If this was a result of an INIT operation, contact the factory. • If this was a result of a LOAD operation, correct the parameter value and perform a SAVE operation. • Check the settings on the DIM to determine whether it is limiting the parameter's max or min values.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						PFC Disabled	214	The power factor compensation feature has been automatically disabled. This feature is disabled under the following conditions: • During dynamic braking • During over speed operating conditions • During sync/de-synch period • If line filter capacitor per unit is equal to or greater than 0.55 pu • When operating in an autotune function the feature (will not be used however will remain enabled) • When using the 'Standard' option and running up to 50% speed for 30 minutes • When using the 'Standard' option and commanding a speed greater than 50% where the drive is running in SVM for 5 minutes • When HPTC mode is enabled	• Read the description to understand why this feature could have been disabled. • Contact MV Product Support.
						PFC IdcLimit	227	Maximum DC current limit for power factor compensation has been reached.	• No further power factor correction is possible under these conditions. • Check the drive load, speed, line and motor voltage. • Contact the factory.
						PFC Flux Limit	228	Flux command has been limited to avoid high motor voltage or current.	• The power factor cannot be compensated further. • Check the drive load, speed, line and motor voltage. • Contact the factory.
						Phantom Alarm	102	Development error: An unused bit in fault/warning word has been detected. It is due to noise interference on the control boards. Contact the factory.	• Check for a noise/grounding issue. • Verify all board connections. • Contact the factory.
						Process Var Loss	229	Feedback from the process is not valid.	• Check the process sensor, 4…20 mA or 0…10V input to the drive. • Check the wiring at interface module (IFM).
			X			Pump Failure (C-FRAME ONLY)	33	This warning is for liquid cool drives. The drive has detected a pump failure in the cooling circuit.	• Verify the pump overload settings and conditions. • Verify the pump control relay status and auxiliary contact signals.
						Queues Cleared	100	The drive cleared the fault and warning queues due to a firmware upgrade.	• No action is required.
						R Stator High	61	Autotune R stator (P219) measured during the autotune test was higher than 0.50 pu, indicating the presence of extremely long motor leads.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives User Manual for autotune procedures, results and actions. • Be sure the motor windings are connected properly.
						RAM Battery Low	166	The battery power on the NVRAM is low.	• Save the parameters in the drive terminal and replace the battery.
						Rec AC Cur Gain	174	The current gain calculated for DC link current sensing is lower than expected.	• Verify that the HECS ratio and burden resistor match the drive/ motor ratings.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Rec DC Cur Gain	172	The current gain calculated for DC link current sensing is lower than expected.	• Verify that the HECS ratio and burden resistor match the drive/ motor ratings.
						Rec Gate Pwr Sup	173	Rectifier gate driver power supply warning. This warning is for SGCT based drives and indicates a problem with the gate power supply associated with a particular device which is also likely in the warning queue.	• The device feedback was not correct due to power loss to the gate driver board. • This can be from the 20V DC output of the IGDPS or on the gate driver board itself. • This warning can also appear as a result of another device fault such as an Online fault. • This warning can also come if the device has failed.
						RecHSnk FbrOptic	170	While Not Running, the fiber-optic signal from the TFB on the Rectifier Heatsink, connected to Channel A fiber-optic receiver RX7 on FOI-L-A is not present. This is only a fault while not running. If this occurs while running it will appear as a warning.	• Check the TFB and FOI boards for power. • Verify that the fiber-optic cables are properly seated in the transmitters and receivers. • Check the fiber-optic cables for kinks, bends and/or breaks that could be blocking the signal. • This can occur if the sensor is not connected to the TFB. **NOTE:** This is a warning because the drive should not fault on the loss of the signal while running. There is no imminent danger to the drive, but the user needs to be aware that there is a temperature feedback signal missing.
						RecChB FbrOptic	171	Not normally used: While Not Running, the fiber-optic signal from the optional TFB connected to channel B fiber-optic receiver RX7 on FOI-L-B is not present. This is only a fault while not running. If this occurs while running it will appear as a warning.	
						RecHSnk OvrTemp	162	The drive detected that the heat sink temperature has reached the alarm level.	• Confirm the actual temperature in parameters is not higher than the warning value. If the actual temperature is higher than the warning level value, investigate the conditions of the drive (ambient / loading / elevation / ventilation/ filter status / heatsink clogging). • Verify that the trip and warning settings match the factory recommended values. • Check the TFB and FOI boards for power and fiber-optic integrity. • Check the sensor and temperature offline (ambient) for accuracy. • Be sure that the fan is working properly and that the air flow is sufficient in this cabinet.
						RecChB OvrTemp	163	Not Normally Used – The temperature detection on a Rectifier Heatsink. The drive has detected that the temperature feedback from the optional temperature board has reached the warning level.	
						RecHSnk Sensor	168	While running, the drive has detected a missing temperature sensor connected to the TFB on the rectifier heatsink. A missing sensor can result in either a Fiber Optic Loss fault or a Sensor fault because a missing sensor can be interpreted as either 0°C (32 °F) or over 100°C (212 °F), and both are unrealistic values.	• Verify that the sensor is completely seated properly on the TFB. • Measure the sensor resistance. Replace if necessary. • NOTE: This is a warning because the drive should not fault on the loss of the signal while running. There is no imminent danger to the drive, but the user needs to be aware that there is a temperature feedback signal missing.
						RecChB Sensor	169	Not normally used: While running, the drive has detected a missing temperature sensor connected to the optional TFB connected to the fiber-optic receiver RX7 on FOI-L-B. A missing sensor can result in either a Fiber Optic Loss fault or a Sensor fault because a missing sensor can be interpreted as either 0°C (32 °F) or over 100°C (212 °F), and both are unrealistic values.	

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						Rec OvrVoltage	157	The rectifier input voltage given by Rec Input Volt (P696) has exceeded the trip settings. A warning is logged first and if the overvoltage persists for the specified time delay a fault is logged.	• This is detected by the hardware circuit in the ACB. • Verify the parameters and inspect the VSB for possible damage. • Investigate occurrences of bus transients.
						Rectifier 5Pulse	230	The motor current exceeded the maximum allowable level with seven pulse rectifier gating for the variable torque drive. Rectifier is operating now in five pulse pattern.	• Check the drive load conditions.
X	X	X	X	X	X	Refrnce Cmd Loss	55	The drive has lost communication with the device responsible for providing the speed command to the drive. This could either be a DPI adapter or the 4…20 mA signal or the remote 0…10V.	• Check the DPI adapter status and verify the connections. • Verify the communication to device providing speed reference. • Verify the signal wiring on the 4…20mA / 10VDC signal and that it is properly shielded. • Check the ACB and replace it if necessary.
X	X	X	X	X	X	RefSlct Conflict	452	An attempt was made to set the torque reference select and the speed reference select to the same source.	• Verify the wiring to the XIO card.
X	X	X	X	X	X	Regulator Limit	60	The regulators in the drive (Current, Flux and Speed) are running in the limit.	• The autotune results may not be accurate. Verify the input line voltage and the load conditions. • Raise the torque limits if necessary and repeat tuning.
X	X	X	X	X	X	Rs Tune Skipped	372	Rs tuning is skipped because the drive is declared of having an output isolation transformer (bit 3 of P141 is set).	• Check that the Motor Current HECS (U&W) polarity is correct.
X	X	X	X	X	X	Restart Xpired	369	This warning is issued when both of these conditions exist: 1. The drive is in auto-restart mode (drive is running and then a loss of medium voltage) 2. the auto-restart timer expired (the medium voltage outage is longer than specified auto-restart delay time)	• Review of the application to see if the auto restart timer can be increased. This is just a warning message to indicate the status of the drive; the auto-restart is no longer active.
X						Rotor Not Moved	376	The drive detected that the motor rotor was not moving during an encoder autotune.	• Check if the rotor is locked or if a heavy load exists.
X	X	X	X	X	X	RStator Low	373	Stator resistance measured during autotuning is negative.	
					X	SavedFanData Clr	350	The saved fan data, which is stored in NVRAM, was cleared. The saved fan data includes: active fan set and fan run times. Once the active fan set is cleared the default fan set will be selected for the next run. The retentive fan data is currently available only on Heatpipe drives.	
		X	X			Slave 0-7 Comm	128…135	Slave (0…7) DAN communication loss-Master only. This warning is for parallel drives only and indicates on the master drive that the Slave drive has stopped communication in the link.	• Slave is offline. • Check for communication between Master and Slave drives.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
		X	X			Slave RfsdMstr	123	Slave refused Master-master only. This warning is for parallel drives only and indicates that the Master requested the Slave to be the Master, but the Slave drive refused.	• The Slave drive has lost communication with hub PLC, or the Slave drive is masked off in parameter Master Mask (718).
		X	X			Slave1 UnderVolt	154	This warning is valid for 18-pulse drives only. The measured slave voltage Slave1 Line Volt (P137) is less than the Line UndVolt Lvl (P167) setting.	• Verify the VSB connections and tap settings, and check the resistance of the VSB board. Megger the board to confirm integrity. • Check the TSN fusing. • Check the actual voltage values on the terminal for each bridge and the total line voltage. • Check for possible source voltage supply problems. • Use a multimeter and oscilloscope to check the voltages on the drive test points. • Verify the parameter settings. • Verify the tap settings. Investigate occurrences of bus transients.
		X	X			Slave2 UnderVolt	155	This warning is valid for 18-pulse drives only. The measured slave voltage Slave2 Line Volt (#P138) is less than the Line UndVolt Lvl (P167) setting.	
X						Spd BW Reduced	518	Speed bandwidth has been reduced to 5 rad/sec as the signal from the encoder was lost or parallel drives have been selected.	• Be sure that the encoder is powered and functioning correctly and that parameter Powerup Config (P717) is not set for parallel drives.
			X	X	X	SpecApp Config	27	The XIO card which is being assigned is not a card which can be used for this purpose.	• Select the proper slot containing a compatible XIO card.
			X	X	X	SpecApp Conflict	28	The XIO card previously used has been reassigned to another function.	• Check the configuration of all XIO slots.
X	X	X	X	X	X	Speed Cmd Loss	55	The drive has lost communication with the device responsible for providing the speed command for the drive. The warning is configured by parameter Ref Command Loss (749). The warning could be due to the DPI adapter or the 4…20mA signal wired to the analog input.	• Verify the DPI adapter LED status and be sure the device is operating properly. • Verify that the customer network is properly communicating with the device. • Cycle control power to the drive. • Sometimes the adapter may not get power prior to the drive board, and the drive may detect speed command loss.
X	X	X	X	X	X	SpdProfile Limit	101	The sum of the individual ramp times has exceeded the maximum value for total acceleration time.	• Set the ramp correctly. • Contact the factory.
						Stack Depth	175	The stack size is now greater then the half allocated at initialization.	Not Used
X	X	X	X	X	X	Stnd IO Config	17	The XIO card assigned to XIO Standard Input/Output is unstable for this purpose.	• Select the proper slot compatible for usage.
X	X	X	X	X	X	Stnd IO conflict	18	An XIO Standard Input/Output XIO card has been re-assigned for another purpose.	• Check the configuration of all cards and reassign if necessary.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
	X	X	X			SyncXfer Failure	145	A synchronous transfer was not completed in the time specified in Synchronous Transfer Time (P230). This warning will occur if the sync transfer fault is masked, and the drive will continue to run at the last reference command before a synchronization command was initiated.	• There is instability at synchronous speed. Check for stability of the synchronous transfer process/speed regulator. • The motor cannot reach synchronous speed due to a heavy load. • Check the load conditions for torque limit or low alpha line (low line voltage). • Consult the factory for review of synchronous transfer parameters. • This fault indicates that the drive failed to synchronize the motor to the bypass within the specified time. Adjust the Sync Reg Gain (P225), Sync Error Max (P228), Spd Reg Bandwidth (P81) for a smooth transfer.
X	X	X	X	X	X	T DC Link High	67	Indicates that the Autotune T DCLnk (P218) measured was greater than 0.100 seconds, and the T DC Link (P115) will have to be tuned manually.	• Refer to the Commissioning chapter in the PowerFlex 7000 Medium Voltage AC Drives User Manual for autotune procedures, results and actions.
X	X	X	X	X	X	T DC Link Low	66	Indicates that the Autotune T DCLnk (P218) measured was less than 0.020 seconds, and the T DC Link (P115) will have to be tuned manually.	
X	X	X	X	X	X	T Rotor Low	72	Indicates that the Autotune T rotor (P222) measured was less than 0.2 seconds, and T rotor (P132) will have to be tuned manually.	
X	X	X	X	X	X	T Rotor High	73	Indicates that the Autotune T rotor (P222) measured was greater than 5.0 seconds, and T rotor (P132) will have to be tuned manually	
			X	X		TempFeedbackLoss (C-Frame Only)	42	While running, the drive has detected a missing temperature feedback. A missing sensor can be interpreted as either 0°C (32 °F) or over 100°C (212 °F) and both are unrealistic values.	• Verify that the sensor is completely seated properly on the TFB. • Measure the sensor resistance and replace if necessary. • NOTE: This is a warning because the drive should not fault on the loss of the signal while running. There is no imminent danger to the drive, but the user needs to be aware that there is a temperature feedback signal missing.
	X	X				TFB FbkData Err	407	The drive has lost the fiber-optic signal from the specified temperature feedback board.	• Check for a damaged fiber-optic cable or loose connection.
						Tuning Abort	58	Autotuning could not be completed in two minutes or had to be aborted due to drive stop/fault.	• Check the alarm queue and perform manual tuning if problem persists. • Investigate why the Autotune test aborted, and retry the Autotune test. • Verify that the autotune default parameters are sufficient to complete the test. • Make sure that the speed min/max and ramp time are set to the default values. • Also, refer to the tuning section in user manual. • Attempt to manually tune the drive.
						UPS Battery Low	115	Warning that the UPS battery is low.	• Replace the UPS battery.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						UPS Failed	116	The UPS has had an internal failure. This is a warning only. A signal/wiring error should not occur and fault the drive. Subsequent power supply faults are meant to protect the drive.	• Investigate the cause for the UPS failure. • Check the batteries. • Verify the input voltage/UPS wiring. • Refer to the UPS manual. • Replace the UPS if required.
						UPS on Battery	114	There has been a loss of control power feeding the UPS and it has switched to its internal battery pack.	• Check the control power to the UPS and rectify the situation before the battery power expires.
						UPS on Bypass	113	Warning that the UPS is now on bypass. This occurs when the drive has switched to UPS, but a UPS fault has forced the system to switch to bypass, if available.	• Investigate cause for initial transfer to UPS and correct the problem. • Investigate why the UPS failed and was forced to go to bypass.
						UV Blcked Exhst	482	A high air pressure reading was detected in the analog air pressure transducer located between the converter sections.	• Be sure that the pressure sensor is working and that there are no obstructions to the path of the exhaust airway or through the heatsinks. • Check the cooling fan for abnormal operation. • Verify that the trip setting (P926) matches factory recommended value.
						VW Blcked Exhst	483		
						UV Blcked Inlet	478	A low air pressure reading was detected in the analog air pressure transducer located between the converter sections.	• Be sure that the pressure sensor is working and that there are no obstructions to the path of the inlet airway. • Check the cooling fan for deterioration. • Verify that the trip setting (P319) matches factory recommended value.
						VW Blcked Inlet	479		
						Warning Code 371	371	The parameter Speed Cmd Max(P290) is clamped to 75 Hz due to the condition that the drive is set to speed mode and is having an overhauling load without an output contactor.	• Verify that parameter Overhauling Load (P1160) and bit 8 (Output Ctctr) of parameter HardwareOptions1 (P141) are properly set. • If the drive is truly having an overhauling load and the speed command needs to go higher than 75 Hz, please install an output contactor and set bit 8 (Output Ctctr) of parameter HardwareOptions1 (P141). • If the drive is truly having an overhauling load and there is no output contactor, the maximum speed command cannot go higher than 75 Hz in speed modes.
						Xfer Disabled	125	Transfer disabled-master only. This warning is for parallel drives only and indicates that the transfer of mastership has been disabled because they are performing certain functions, for example, synchronous transfer or stopping during a Class 2 fault.	• Transfer of master not allowed while drive is stopping.
						XIO Card #1-6 Loss	90-95	The XIO card has dropped off the communication link between other XIO cards and the ACB.	• Reset the board in an attempt to re-establish communications. • Check all connections between the customer interface board (CIB) and the jumpers between individual adapters. • Verify the status of all XIO adapters by comparing the LED status to the table in the manual.

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						XIO Power Loss	117	The 24V input to the XIO boards from the ACB has dropped below 22.8V.	• Verify the DC/DC power supply output. • Check the XIO LED status and compare them to values in the manual.
						U1A Offline	250	**INVERTER SGCT WARNING** This warning occurs if Redn Dvc Inv option is selected in HardwareOptions1 (P141). This SGCT device on the inverter side was detected to be faulted after the input contactor was closed or following a start command or following a drive reset.	• After isolating the drive from medium voltage, be sure that the device, IGDPS power supply and the fiber-optic signals are not damaged • Complete a resistance check per the instructions in the manual. NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be replaced in matched sets during the next outage. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. NOTE: For Redundant devices, there will be no change in the drive operation. For N-1 drives, the drive will attempt to run at a load/speed combination that does not exceed the voltage rating of the remaining devices.
						U1B Offline	256		
						U1C Offline	262		
						U4A Offline	253		
						U4B Offline	259		
						U4C Offline	265		
						V3A Offline	252		
						V3B Offline	258		
						V3C Offline	264		
						V6A Offline	255		
						V6B Offline	261		
X	X	X	X	X	X	V6C Offline	267		
X	X	X	X	X	X	W2A Offline	251		
X	X	X	X	X	X	W2B Offline	257		
X	X	X	X	X	X	W2C Offline	263		
X	X	X	X	X	X	W5A Offline	254		
X	X	X	X	X	X	W5B Offline	260		
X	X	X	X	X	X	W5C Offline	266		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X	X	X	X	X	X	U1A Online	232	**INVERTER SGCT WARNING** This warning occurs if Redn Dvc Inv option is selected in HardwareOptions1 (P141). SGCT device in the inverter section was detected to be faulted while the drive was running. The drive detected that the diagnostic feedback from this device did not match the gating pattern.	• After isolating the drive from medium voltage, be sure that the device, IGDPS power supply and the fiber-optic signals are not damaged. • Complete a resistance check per the instructions in the manual. NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. • For nuisance faults, contact the factory about extending the diagnostic delay. NOTE: For Redundant devices, there will be no change in the drive operation. For N-1 drives, the drive will attempt to run at a load/speed combination that does not exceed the voltage rating of the remaining devices.
X	X	X	X	X	X	U1B Online	238		
X	X	X	X	X	X	U1C Online	244		
X	X	X	X	X	X	U4A Online	235		
X	X	X	X	X	X	U4B Online	241		
X	X	X	X	X	X	U4C Online	247		
X	X	X	X	X	X	V3A Online	234		
X	X	X	X	X	X	V3B Online	240		
X	X	X	X	X	X	V3C Online	246		
X	X	X	X	X	X	V6A Online	237		
X	X	X	X	X	X	V6B Online	243		
X	X	X	X	X	X	V6C Online	249		
X	X	X	X	X	X	W2A Online	233		
X	X	X	X	X	X	W2B Online	239		
X	X	X	X	X	X	W2C Online	245		
X	X	X	X	X	X	W5A Online	236		
X	X	X	X	X	X	W5B Online	242		
X	X	X	X	X	X	W5C Online	248		
						2U AirflowSensor	392	The specified airflow velocity reading is out of normal range.	• Be sure that the airflow sensor is correctly plugged in and is not damaged.
						2V AirflowSensor	393		
						2W AirflowSensor	394		
						2U Ambient Loss	444	The specified ambient temperature reading is out of normal range.	• Be sure that the onboard temperature sensor is not damaged. If an external sensor is used, ensure that the sensor is correctly plugged in and is not damaged.
						2V Ambient Loss	445		
						2W Ambient Loss	446		
						2U High Amb Temp	436	The drive detected high ambient temperature at the specified location.	• Verify if the warn setting (P571) matches factory recommended value.
						2V High Amb Temp	438		
						2W High Amb Temp	440		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
						2U Low Amb Temp	437	The drive detected low ambient temperature at the specified location.	• Verify if the warn level setting matches factory recommendation.
						2V Low Amb Temp	439		
						2W Low Amb Temp	441		
						2U Low Airflow	388	The cooling airflow velocity on the specified power stack is below the trip/warn level.	• Be sure that there are no obstructions to the path of the incoming and/or outgoing air flow. • Check for cooling fan deterioration. • Verify if the trip (P840) and warn (P841) settings match the factory recommended values.
						2V Low Airflow	389		
						2W Low Airflow	390		
						2U Over Temp	448	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 the factory recommended values.
						2V Over Temp	449		
						2W Over Temp	450		
						2U Temp Sensor	396	The specified temperature reading is out of normal range.	• Be sure that the temperature sensor is correctly plugged in and is not damaged.
						2V Temp Sensor	397		
						2W Temp Sensor	398		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X	X	X	X	X	X	2U1A Offline	286	**PWM RECTIFIER SGCT WARNING** This warning occurs if Redn Dvc Rec option is selected in HardwareOptions1 (P141). This SGCT device on the rectifier side was detected to be faulted after the input contactor was closed or following a start command or following a drive reset.	• After isolating the drive from medium voltage, be sure that the device, IGDPS power supply and the fiber-optic signals are not damaged. • Complete a resistance check per the instructions in the manual. NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. NOTE: There is only the Redundant option available on the Rectifier, and only on 6P drives (SCR or PWM). You cannot have N-1 operation on the rectifier since we cannot control the line voltage.
X	X	X	X	X	X	2U1B Offline	292		
X	X	X	X	X	X	2U1C Offline	298		
X	X	X	X	X	X	2U4A Offline	289		
X	X	X	X	X	X	2U4B Offline	295		
X	X	X	X	X	X	2U4C Offline	301		
X	X	X	X	X	X	2V3A Offline	288		
X	X	X	X	X	X	2V3B Offline	294		
X	X	X	X	X	X	2V3C Offline	300		
X	X	X	X	X	X	2V6A Offline	291		
X	X	X	X	X	X	2V6B Offline	297		
X	X	X	X	X	X	2V6C Offline	303		
X	X	X	X	X	X	2W2A Offline	287		
X	X	X	X	X	X	2W2B Offline	293		
X	X	X	X	X	X	2W2C Offline	299		
X	X	X	X	X	X	2W5A Offline	290		
X	X	X	X	X	X	2W5B Offline	296		
X	X	X	X	X	X	2W5C Offline	302		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
X	X	X	X	X	X	2U1A Online	268	**PWM RECTIFIER SGCT WARNING** This warning occurs if Redn Dvc Rec option is selected in HardwareOptions1 (P141). This SGCT device in the rectifier section was detected to be faulted while the drive was running. The drive detected that the diagnostic feedback from this device did not match the gating pattern.	• After isolating the drive from medium voltage, be sure that the device, IGDPS power supply and the fiber-optic signals are not damaged. • Complete a resistance check per the instructions in the manual. NOTE: SGCTs may not have completely shorted, and still could read in the kΩ range. Any devices with low suspect readings should be changed. • Check the LED status of the SGCT gate driver card for abnormal readings. • Complete a Gating Test mode check on the devices. • Verify the associated 20V power supply is powered and active. • Verify all the power connections to the SGCT firing card are seated properly. • Reset the drive and let the offline diagnostics further define the problem. • For nuisance faults, contact the factory about extending the diagnostic delay. NOTE: There is only the redundant option available on the rectifier, and only on 6P drives (SCR or PWM). You cannot have N-1 operation on the rectifier since we cannot control the line voltage.
X	X	X	X	X	X	2U1B Online	274		
X	X	X	X	X	X	2U1C Online	280		
X	X	X	X	X	X	2U4A Online	271		
X	X	X	X	X	X	2U4B Online	277		
X	X	X	X	X	X	2U4C Online	283		
X	X	X	X	X	X	2V3A Online	270		
X	X	X	X	X	X	2V3B Online	276		
X	X	X	X	X	X	2V3C Online	282		
X	X	X	X	X	X	2V6A Online	273		
X	X	X	X	X	X	2V6B Online	279		
X	X	X	X	X	X	2V6C Online	285		
X	X	X	X	X	X	2W2A Online	269		
X	X	X	X	X	X	2W2B Online	275		
X	X	X	X	X	X	2W2C Online	281		
X	X	X	X	X	X	2W5A Online	272		
X	X	X	X	X	X	2W5B Online	278		
X	X	X	X	X	X	2W5C Online	284		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
	X	X				2U1A OfflineShrt	322	**6P SCR RECTIFIER WARNING** This warning occurs if Redn Dvc Rec option is selected in HardwareOptions1 (P141) and is valid only for 6P SCR drives. This SCR device was detected to be short circuited after the input contactor was closed or following a start command.	• After isolating the drive from medium voltage, be sure that the device, snubber circuit, sharing resistor and the fiber-optic signal are not damaged. • Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. • Complete a firing check on the rectifier. • Verify the snubber circuitry, and the sharing resistors. • Verify fiber-optic integrity from SCRGD board transmitter to FOI board receiver. • Replace all faulty components. NOTE: There is only the redundant option available on the rectifier, and only on 6P drives (SCR or PWM). You cannot have N-1 operation on the rectifier since we cannot control the line voltage.
	X	X				2U1B OfflineShrt	328		
	X	X				2U1C OfflineShrt	334		
	X	X				2U4A OfflineShrt	325		
	X	X				2U4B OfflineShrt	331		
	X	X				2U4C OfflineShrt	337		
	X	X				2V3A OfflineShrt	324		
	X	X				2V3B OfflineShrt	330		
	X	X				2V3C OfflineShrt	336		
	X	X				2V6A OfflineShrt	327		
	X	X				2V6B OfflineShrt	333		
	X	X				2V6C OfflineShrt	339		
	X	X				2W2A OfflineShrt	323		
	X	X				2W2B OfflineShrt	329		
	X	X				2W2C OfflineShrt	335		
	X	X				2W5A OfflineShrt	326		
	X	X				2W5B OfflineShrt	332		
	X	X				2W5C OfflineShrt	338		

All Drive Types	PF7000A	PF7000B	PF7000C	Marine Drive	Heat pipe Drive	Warning Message	Warning Code	Description	Recommended Action(s)
	X	X				2U1A OnlineShrt	304	**6P SCR RECTIFIER WARNING** This warning occurs if Redn Dvc Rec option is selected in HardwareOptions1 (P141) and is valid only for 6P SCR drives. This SCR device was detected to be short circuited while the drive was running.	• After isolating the drive from medium voltage, be sure that the device, snubber circuit, sharing resistor and the fiber-optic signal are not damaged. • For multiple device faults, the risk of a line to line short exists, so tests with medium voltage isolated should be attempted. • Complete a resistance check on the rectifier, including the gate-cathode resistance, the snubber and sharing resistors. • Complete a firing check on the rectifier. • Verify the snubber circuitry, and the sharing resistors. • Verify fiber-optic integrity from SCRGD board transmitter to FOI board receiver. • Replace all faulty components. • For nuisance faults, contact the factory about extending the diagnostic delay. NOTE: There is only the redundant option available on the Rectifier, and only on 6P drives (SCR or PWM). You cannot have N-1 operation on the rectifier since we cannot control the line voltage.
	X	X				2U1B OnlineShrt	310		
	X	X				2U1C OnlineShrt	316		
	X	X				2U4A OnlineShrt	307		
	X	X				2U4B OnlineShrt	313		
	X	X				2U4C OnlineShrt	319		
	X	X				2V3A OnlineShrt	306		
	X	X				2V3B OnlineShrt	312		
	X	X				2V3C OnlineShrt	318		
	X	X				2V6A OnlineShrt	309		
	X	X				2V6B OnlineShrt	315		
	X	X				2V6C OnlineShrt	321		
	X	X				2W2A OnlineShrt	305		
	X	X				2W2B OnlineShrt	311		
	X	X				2W2C OnlineShrt	317		
	X	X				2W5A OnlineShrt	308		
	X	X				2W5B OnlineShrt	314		
	X	X				2W5C OnlineShrt	320		

Spare Parts

Components and Related Part Numbers

	DESCRIPTION	PART NUMBER
Batteries	DPM Battery	346567-Q01
Control Boards		
ACB	Analog Control Board for 18 Pulse Drive	80190-560-01-R
ACB	Analog Control Board for NON 18 Pulse Drive	80190-560-02-R
DPM	Drive Processor Board	80190-580-01-R
XIO	External Input / Output board (120…240V AC)	80190-300-01-R
XIO	External Input / Output board (12…24V AC)	80190-300-02-R
Power Electronics		
SGCT single device		
400A	Single 400A SGCT	81004-286-51-R
800A	Single 800A SGCT	81001-450-51-R
1500A	Single 1500A SGCT	81001-451-61-R
1750A	Single 1750A SGCT	81001-451-71-R
SGCT Matched set of two		
400A	Matched set of two 400A SGCT	81004-286-52-R
800A	Matched set of two 800A SGCT	81001-450-52-R
1500A	Matched set of two 1500A SGCT	81001-451-62-R
1750A	Matched set of two 1750A SGCT	81001-451-72-R
SGCT Matched set of three		
400A	Matched set of three 400A SGCT	81004-286-53-R
800A	Matched set of three 800A SGCT	81001-450-53-R
1500A	Matched set of three 1500A SGCT	81001-451-63-R
1750A	Matched set of three 1750A SGCT	81001-451-73-R
SGCT Matched set of four		
1750A	Matched set of four 1750A SGCT, marine drive Dynamic Brake	81001-451-74-R
SCR single device		
350A	Single 350A SCR	81001-335-71-R
800A	Single 800A SCR	81003-437-51-R
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

Notes:

Fault Codes

Listed Numerically

7.xxx		8.xxx		9.xxx		10.xxx	
1	External 1	1	External 1	1	External 1	1	External 1
2	External 2	2	External 2	2	External 2	2	External 2
3	External 3	3	External 3	3	External 3	3	External 3
4	External 4	4	External 4	4	External 4	4	External 4
5	External 5	5	External 5	5	External 5	5	External 5
6	External 6	6	External 6	6	External 6	6	External 6
7	External 7	7	External 7	7	External 7	7	External 7
8	External 8	8	External 8	8	External 8	8	External 8
9	External 9	9	External 9	9	External 9	9	External 9
10	External 10	10	External 10	10	External 10	10	External 10
11	External 11	11	External 11	11	External 11	11	External 11
12	External 12	12	External 12	12	External 12	12	External 12
13	External 13	13	External 13	13	External 13	13	External 13
14	External 14	14	External 14	14	External 14	14	External 14
15	External 15	15	External 15	15	External 15	15	External 15
16	External 16	16	External 16	16	External 16	16	External 16
17	Adapter 1 Loss	17	Adapter 1 Loss	17	Adapter 1 Loss	17	Adapter 1 Loss
18	Adapter 2 Loss	18	Adapter 2 Loss	18	Adapter 2 Loss	18	Adapter 2 Loss
19	Adapter 3 Loss	19	Adapter 3 Loss	19	Adapter 3 Loss	19	Adapter 3 Loss
20	Adapter 4 Loss	20	Adapter 4 Loss	20	Adapter 4 Loss	20	Adapter 4 Loss
21	Adapter 5 Loss	21	Adapter 5 Loss	21	Adapter 5 Loss	21	Adapter 5 Loss
22	Adapter 6 Loss	22	Adapter 6 Loss	22	Adapter 6 Loss	22	Adapter 6 Loss
23	Speed Cmd Loss	23	Refrnce Cmd Loss	23	Refrnce Cmd Loss	23	Refrnce Cmd Loss
24	Fault Code 24	24	Fault Code 24	24	Fault Code 24	24	Fault Code 24
25	Fault Code 25	25	Fault Code 25	25	Fault Code 25	25	Fault Code 25
26	Adaptr1 ForceFlt	26	Adaptr1 ForceFlt	26	Adaptr1 ForceFlt	26	Adaptr1 ForceFlt
27	Adaptr2 ForceFlt	27	Adaptr2 ForceFlt	27	Adaptr2 ForceFlt	27	Adaptr2 ForceFlt
28	Adaptr3 ForceFlt	28	Adaptr3 ForceFlt	28	Adaptr3 ForceFlt	28	Adaptr3 ForceFlt
29	Adaptr4 ForceFlt	29	Adaptr4 ForceFlt	29	Adaptr4 ForceFlt	29	Adaptr4 ForceFlt
30	Adaptr5 ForceFlt	30	Adaptr5 ForceFlt	30	Adaptr5 ForceFlt	30	Adaptr5 ForceFlt
31	Adaptr6 ForceFlt	31	Adaptr6 ForceFlt	31	Adaptr6 ForceFlt	31	Adaptr6 ForceFlt

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
32	Input Prot'n #1	32	Input Prot'n #1	32	Input Prot'n #1	32	Input Prot'n #1
33	IsoTx/ReacOvrTmp	33	IsoTx/ReacOvrTmp	33	IsoTx/ReacOvrTmp	33	IsoTx/ReacOvrTmp
34	DCLnk OvrTemp	34	DCLnk OvrTemp	34	DCLnk OvrTemp	34	DCLnk OvrTemp
35	Motor Protection	35	Motor Protection	35	Motor Protection	35	Motor Protection
36	Input Prot'n #2	36	Input Prot'n #2	36	Input Prot'n #2	36	Input Prot'n #2
37	Auxillary Prot'n	37	Auxillary Prot'n	37	Auxillary Prot'n	37	Auxillary Prot'n
38	Fault Code 38	38	Fault Code 38	38	Fault Code 38	38	Fault Code 38
39	Fault Code 39	39	Fault Code 39	39	Fault Code 39	39	Fault Code 39
40	Fault Code 40	40	Fault Code 40	40	Fault Code 40	40	Fault Code 40
41	Fault Code 41	41	Fault Code 41	41	Fault Code 41	41	Fault Code 41
42	Fault Code 42	42	Fault Code 42	42	Fault Code 42	42	Fault Code 42
43	Fault Code 43	43	Fault Code 43	43	Fault Code 43	43	Fault Code 43
44	Fault Code 44	44	Fault Code 44	44	Fault Code 44	44	Fault Code 44
45	Fault Code 45	45	Fault Code 45	45	Fault Code 45	45	Fault Code 45
46	Fault Code 46	46	Fault Code 46	46	Fault Code 46	46	Fault Code 46
47	Fault Code 47	47	Fault Code 47	47	Fault Code 47	47	Fault Code 47
48	AC/DC#1 DC Fail	48	AC/DC#1 DC Fail	48	AC/DC#1 DC Fail	48	AC/DC#1 DC Fail
49	AC/DC#2 DC Fail	49	AC/DC#2 DC Fail	49	AC/DC#2 DC Fail	49	AC/DC#2 DC Fail
50	AC/DC#3 DC Fail	50	AC/DC#3 DC Fail	50	AC/DC#3 DC Fail	50	AC/DC#3 DC Fail
51	AC/DC#4 DC Fail	51	AC/DC#4 DC Fail	51	AC/DC#4 DC Fail	51	AC/DC#4 DC Fail
52	Control 56V Loss	52	Control 56V Loss	52	Control 56V Loss	52	Control 56V Loss
53	IGDPS 56V Loss	53	IGDPS 56V Loss	53	IGDPS 56V Loss	53	IGDPS 56V Loss
54	Control 5V Loss	54	Control 5V Loss	54	Control 5V Loss	54	Control 5V Loss
55	Control 15V Loss	55	Control 15V Loss	55	Control 15V Loss	55	Control 15V Loss
56	HECS Power Loss	56	HECS Power Loss	56	HECS Power Loss	56	HECS Power Loss
57	Control Pwr Loss	57	Control Pwr Loss	57	Control Pwr Loss	57	Control Pwr Loss
58	AC/DC#1 AC Fail	58	AC/DC#1 AC Fail	58	AC/DC#1 AC Fail	58	AC/DC#1 AC Fail
59	AC/DC#2 AC Fail	59	AC/DC#2 AC Fail	59	AC/DC#2 AC Fail	59	AC/DC#2 AC Fail
60	AC/DC#3 AC Fail	60	AC/DC#3 AC Fail	60	AC/DC#3 AC Fail	60	AC/DC#3 AC Fail
61	AC/DC#4 AC Fail	61	AC/DC#4 AC Fail	61	AC/DC#4 AC Fail	61	AC/DC#4 AC Fail
62	UPS Fault	62	UPS Fault	62	UPS Fault	62	UPS Fault
63	Isolator24V Loss	63	Isolator24V Loss	63	Isolator24V Loss	63	Isolator24V Loss
64	Pressure Loss	64	Pressure Loss	64	Pressure Loss	64	Pressure Loss
65	Ext Cooling Loss	65	Ext Cooling Loss	65	Ext Cooling Loss	65	Ext Cooling Loss
66	CoolantTemp Low	66	CoolantTemp Low	66	CoolantTemp Low	66	CoolantTemp Low
67	CoolantTemp High	67	CoolantTemp High	67	CoolantTemp High	67	CoolantTemp High
68	ConductivityHigh	68	ConductivityHigh	68	ConductivityHigh	68	ConductivityHigh
69	CoolantLevel Low	69	CoolantLevel Low	69	CoolantLevel Low	69	CoolantLevel Low

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
70	CabinetTemp High	70	CabinetTemp High	70	CabinetTemp High	70	CabinetTemp High
71	Pump/Fan Pwr Off	71	Pump/Fan Pwr Off	71	Pump/Fan Pwr Off	71	Pump/Fan Pwr Off
72	DC Link Flow Low	72	DC Link Flow Low	72	DC Link Flow Low	72	DC Link Flow Low
73	TempFeedbackLoss	73	TempFeedbackLoss	73	TempFeedbackLoss	73	TempFeedbackLoss
74	Fault Code 74	74	Fault Code 74	74	Fault Code 74	74	Fault Code 74
75	Fault Code 75	75	Fault Code 75	75	Fault Code 75	75	Fault Code 75
76	Fault Code 76	76	Fault Code 76	76	Fault Code 76	76	Fault Code 76
77	Fault Code 77	77	Fault Code 77	77	Fault Code 77	77	Fault Code 77
78	Fault Code 78	78	Fault Code 78	78	Fault Code 78	78	Fault Code 78
79	Fault Code 79	79	Fault Code 79	79	Fault Code 79	79	Fault Code 79
96	Motor OvrCurrent	96	Motor OvrCurrent	96	Motor OvrCurrent	96	Motor OvrCurrent
97	Motor OvrVoltage	97	Motor OvrVoltage	97	Motor OvrVoltage	97	Motor OvrVoltage
98	MtrNeut OvrVolt	98	MtrNeut OvrVolt	98	MtrNeut OvrVolt	98	MtrNeut OvrVolt
99	Motor Flux Unbal	99	Motor Flux Unbal	99	Motor Flux Unbal	99	Motor Flux Unbal
100	Motor CurUnbal	100	Motor CurUnbal	100	Motor CurUnbal	100	Motor CurUnbal
101	Motor OvrLoad	101	Motor OvrLoad	101	Motor OvrLoad	101	Motor OvrLoad
102	Motor OvrSpeed	102	Motor OvrSpeed	102	Motor OvrSpeed	102	Motor OvrSpeed
103	Motor Stall	103	Motor Stall	103	Motor Stall	103	Motor Stall
104	Motor Load Loss	104	Motor Load Loss	104	Motor Load Loss	104	Motor Load Loss
105	Synch Field Loss	105	Synch Field Loss	105	Synch Field Loss	105	Synch Field Loss
106	Motor Slip Range	106	Motor Slip Range	106	Motor Slip Range	106	Motor Slip Range
107	Fault Code 107	107	Fault Code 107	107	Fault Code 107	107	Fault Code 107
108	Fault Code 108	108	Fault Code 108	108	Fault Code 108	108	Fault Code 108
109	Fault Code 109	109	Fault Code 109	109	Fault Code 109	109	Fault Code 109
110	Fault Code 110	110	Fault Code 110	110	Fault Code 110	110	Fault Code 110
111	Fault Code 111	111	Fault Code 111	111	Fault Code 111	111	Fault Code 111
112	Line OvrCurrent	112	Line OvrCurrent	112	Line OvrCurrent	112	Line OvrCurrent
113	DCLnk OvrCurrent	113	DCLnk OvrCurrent	113	DCLnk OvrCurrent	113	DCLnk OvrCurrent
114	Gnd OvrCurrent	114	Gnd OvrCurrent	114	Gnd OvrCurrent	114	Gnd OvrCurrent
115	RNeut OvrCurrent	115	RNeut OvrCurrent	115	RNeut OvrCurrent	115	RNeut OvrCurrent
116	Line OvrVoltage	116	Line OvrVoltage	116	Line OvrVoltage	116	Line OvrVoltage
117	Rec OvrVoltage	117	RecOvrVolt HW	117	RecOvrVolt HW	117	RecOvrVolt HW
118	LineNeut OvrVolt	118	LineNeut OvrVolt	118	LineNeut OvrVolt	118	LineNeut OvrVolt
119	Line Harmonic	119	Line Harmonic	119	Line Harmonic	119	Line Harmonic
120	Master VoltUnbal	120	Master VoltUnbal	120	Master VoltUnbal	120	Master VoltUnbal
121	Slave1 VoltUnbal	121	Slave1 VoltUnbal	121	Slave1 VoltUnbal	121	Slave1 VoltUnbal
122	Slave2 VoltUnbal	122	Slave2 VoltUnbal	122	Slave2 VoltUnbal	122	Slave2 VoltUnbal
123	Master CurUnbal	123	Master CurUnbal	123	Master CurUnbal	123	Master CurUnbal
124	Slave1 CurUnbal	124	Slave1 CurUnbal	124	Slave1 CurUnbal	124	Slave1 CurUnbal

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
125	Slave2 CurUnbal	125	Slave2 CurUnbal	125	Slave2 CurUnbal	125	Slave2 CurUnbal
126	Slave1 Phasing	126	Slave1 Phasing	126	Slave1 Phasing	126	Slave1 Phasing
127	Slave2 Phasing	127	Slave2 Phasing	127	Slave2 Phasing	127	Slave2 Phasing
128	RecAnlg SelfTest	128	RecAnlg SelfTest	128	RecAnlg SelfTest	128	RecAnlg SelfTest
129	RecFbrOpt Config	129	RecFbrOpt Config	129	RecFbrOpt Config	129	RecFbrOpt Config
130	Fault Code 130	130	GatePwrSup V Low	130	2U GatePS V Low	130	2U GatePS V Low
131	RecA2D Convrsion	131	RecA2D Convrsion	131	RecA2D Convrsion	131	RecA2D Convrsion
132	Inv Heartbeat	132	Inv Heartbeat	132	Inv Heartbeat	132	Inv Heartbeat
133	Fault Code 133	133	RecA2D SeqError	133	RecA2D SeqError	133	RecA2D SeqError
134	Fault Code 134	134	RecOvrVolt SW	134	RecOvrVolt SW	134	RecOvrVolt SW
135	Fault Code 135	135	RecOvrTimeOut	135	RecOvrTimeOut	135	RecOvrTimeOut
136	Fault Code 136	136	Line Cap Failure	136	Line Cap Failure	136	Line Cap Failure
137	Fault Code 137	137	Fault Code 137	137	DriveInput Short	137	DriveInput Short
138	Fault Code 138	138	Fault Code 138	138	LineCap OvrVolt	138	LineCap OvrVolt
139	Fault Code 139	139	Fault Code 139	139	2V GatePS V Low	139	2V GatePS V Low
140	Fault Code 140	140	Fault Code 140	140	2W GatePS V Low	140	2W GatePS V Low
141	Fault Code 141	141	Fault Code 141	141	Inv GatePS V Low	141	Inv GatePS V Low
142	Fault Code 142	142	Fault Code 142	142	Fault Code 142	142	Fault Code 142
143	Fault Code 143	143	Fault Code 143	143	Fault Code 143	143	Fault Code 143
144	Drive OvrLoad	144	Drive OvrLoad	144	Drive OvrLoad	144	Drive OvrLoad
145	RNeutral OvrLoad	145	RNeutral OvrLoad	145	RNeutral OvrLoad	145	RNeutral OvrLoad
146	RecHSnk OvrTemp	146	RecHSnk OvrTemp	146	RecHSnk OvrTemp	146	RecHSnk OvrTemp
147	RecHSnk LowTemp	147	RecHSnk LowTemp	147	RecHSnk LowTemp	147	RecHSnk LowTemp
148	RecHSnk FbrOptic	148	RecHSnk FbrOptic	148	RecHSnk FbrOptic	148	RecHSnk FbrOptic
149	RecHSnk Sensor	149	RecHSnk Sensor	149	RecHSnk Sensor	149	RecHSnk Sensor
150	RecChB OvrTemp	150	RecChB OvrTemp	150	RecChB OvrTemp	150	RecChB OvrTemp
151	RecChB LowTemp	151	RecChB LowTemp	151	RecChB LowTemp	151	RecChB LowTemp
152	RecChB FbrOptic	152	RecChB FbrOptic	152	RecChB FbrOptic	152	RecChB FbrOptic
153	RecChB Sensor	153	RecChB Sensor	153	RecChB Sensor	153	RecChB Sensor
154	DvcAnodCath/Snub	154	DvcAnodCath/Snub	154	DvcAnodCath/Snub	154	DvcAnodCath/Snub
155	Current Sensor	155	Current Sensor	155	Current Sensor	155	Current Sensor
156	Fault Code 156	156	Fault Code 156	156	Fault Code 156	156	Fault Code 156
157	Fault Code 157	157	Fault Code 157	157	Fault Code 157	157	Fault Code 157
158	Fault Code 158	158	Fault Code 158	158	Fault Code 158	158	Fault Code 158
159	Fault Code 159	159	Fault Code 159	159	Fault Code 159	159	Fault Code 159
160	Inv OvrVoltage	160	Inv OvrVoltage	160	Inv OvrVoltage	160	Inv OvrVoltage
161	Drv Output Open	161	Drv Output Open	161	Drv Output Open	161	Drv Output Open
162	SyncXfer Failure	162	SyncXfer Failure	162	SyncXfer Failure	162	SyncXfer Failure

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
163	Tach Loss	163	Encoder Loss	163	Encoder Loss	–	–
164	MV in SystemTest	164	MV in SystemTest	164	MV in SystemTest	164	MV in SystemTest
165	MV in Gate Test	165	MV in Gate Test	165	MV in Gate Test	165	MV in Gate Test
166	Input CtctrOpen	166	Input CtctrOpen	166	Input CtctrOpen	166	Input CtctrOpen
167	Output CtctrOpen	167	Output CtctrOpen	167	Output CtctrOpen	167	Output CtctrOpen
168	Bypass CtctrOpen	168	Bypass CtctrOpen	168	Bypass CtctrOpen	168	Bypass CtctrOpen
169	No Output Ctctr	169	No Output Ctctr	169	No Output Ctctr	169	No Output Ctctr
170	Input IsoSwOpen	170	Input IsoSwOpen	170	Input IsoSwOpen	170	Input IsoSwOpen
171	Output IsoSwOpen	171	Output IsoSwOpen	171	Output IsoSwOpen	171	Output IsoSwOpen
172	Bypass IsoSwOpen	172	Bypass IsoSwOpen	172	Bypass IsoSwOpen	172	Bypass IsoSwOpen
173	Input IsoSwClsd	173	Input IsoSwClsd	173	Input IsoSwClsd	173	Input IsoSwClsd
174	Output IsoSwClsd	174	Output IsoSwClsd	174	Output IsoSwClsd	174	Output IsoSwClsd
175	Bypass IsoSwClsd	175	Bypass IsoSwClsd	175	Bypass IsoSwClsd	175	Bypass IsoSwClsd
176	Convrtr Air Flow	176	Convrtr Air Flow	176	Low AirPresure	176	Low AirPresure
177	IsoTx Air Flow	177	IsoTx Air Flow	177	IsoTx AirPresure	177	IsoTx AirPresure
178	InvHSnk OvrTemp	178	InvHSnk OvrTemp	178	InvHSnk OvrTemp	178	InvHSnk OvrTemp
179	InvHSnk LowTemp	179	InvHSnk LowTemp	179	InvHSnk LowTemp	179	InvHSnk LowTemp
180	InvHSnk FbrOptic	180	InvHSnk FbrOptic	180	InvHSnk FbrOptic	180	InvHSnk FbrOptic
181	InvHSnk Sensor	181	InvHSnk Sensor	181	InvHSnk Sensor	181	InvHSnk Sensor
182	Ambient OvrTemp	182	Ambient OvrTemp	182	Ambient OvrTemp	182	Ambient OvrTemp
183	Ambient LowTemp	183	Ambient LowTemp	183	Ambient LowTemp	183	Ambient LowTemp
184	Ambient FbrOptic	184	Ambient FbrOptic	184	Ambient FbrOptic	184	Ambient FbrOptic
185	Ambient Sensor	185	Ambient Sensor	185	Ambient Sensor	185	Ambient Sensor
186	InvAnlg SelfTest	186	InvAnlg SelfTest	186	InvAnlg SelfTest	186	InvAnlg SelfTest
187	InvFbrOpt Config	187	InvFbrOpt Config	187	InvFbrOpt Config	187	InvFbrOpt Config
188	Fault Code 188	188	InvA2D Seq Error	188	InvA2D Seq Error	188	InvA2D Seq Error
189	InvA2D Convrsion	189	InvA2D Convrsion	189	InvA2D Convrsion	189	InvA2D Convrsion
190	Rec Heartbeat	190	Rec Heartbeat	190	Rec Heartbeat	190	Rec Heartbeat
191	IdcHECSConnector	191	IdcHECSConnector	191	IdcHECSConnector	191	IdcHECSConnector
192	U1A Online	192	U1A Online	192	U1A Online	192	U1A Online
193	W2A Online	193	W2A Online	193	W2A Online	193	W2A Online
194	V3A Online	194	V3A Online	194	V3A Online	194	V3A Online
195	U4A Online	195	U4A Online	195	U4A Online	195	U4A Online
196	W5A Online	196	W5A Online	196	W5A Online	196	W5A Online
197	V6A Online	197	V6A Online	197	V6A Online	197	V6A Online
198	U1B Online	198	U1B Online	198	U1B Online	198	U1B Online
199	W2B Online	199	W2B Online	199	W2B Online	199	W2B Online
200	V3B Online	200	V3B Online	200	V3B Online	200	V3B Online
201	U4B Online	201	U4B Online	201	U4B Online	201	U4B Online

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
202	W5B Online	202	W5B Online	202	W5B Online	202	W5B Online
203	V6B Online	203	V6B Online	203	V6B Online	203	V6B Online
204	U1C Online	204	U1C Online	204	U1C Online	204	U1C Online
205	W2C Online	205	W2C Online	205	W2C Online	205	W2C Online
206	V3C Online	206	V3C Online	206	V3C Online	206	V3C Online
207	U4C Online	207	U4C Online	207	U4C Online	207	U4C Online
208	W5C Online	208	W5C Online	208	W5C Online	208	W5C Online
209	V6C Online	209	V6C Online	209	V6C Online	209	V6C Online
210	U1A DiagFbkLoss	210	U1A DiagFbkLoss	210	U1A DiagFbkLoss	210	U1A DiagFbkLoss
211	W2A DiagFbkLoss	211	W2A DiagFbkLoss	211	W2A DiagFbkLoss	211	W2A DiagFbkLoss
212	V3A DiagFbkLoss	212	V3A DiagFbkLoss	212	V3A DiagFbkLoss	212	V3A DiagFbkLoss
213	U4A DiagFbkLoss	213	U4A DiagFbkLoss	213	U4A DiagFbkLoss	213	U4A DiagFbkLoss
214	W5A DiagFbkLoss	214	W5A DiagFbkLoss	214	W5A DiagFbkLoss	214	W5A DiagFbkLoss
215	V6A DiagFbkLoss	215	V6A DiagFbkLoss	215	V6A DiagFbkLoss	215	V6A DiagFbkLoss
216	U1B DiagFbkLoss	216	U1B DiagFbkLoss	216	U1B DiagFbkLoss	216	U1B DiagFbkLoss
217	W2B DiagFbkLoss	217	W2B DiagFbkLoss	217	W2B DiagFbkLoss	217	W2B DiagFbkLoss
218	V3B DiagFbkLoss	218	V3B DiagFbkLoss	218	V3B DiagFbkLoss	218	V3B DiagFbkLoss
219	U4B DiagFbkLoss	219	U4B DiagFbkLoss	219	U4B DiagFbkLoss	219	U4B DiagFbkLoss
220	W5B DiagFbkLoss	220	W5B DiagFbkLoss	220	W5B DiagFbkLoss	220	W5B DiagFbkLoss
221	V6B DiagFbkLoss	221	V6B DiagFbkLoss	221	V6B DiagFbkLoss	221	V6B DiagFbkLoss
222	U1C DiagFbkLoss	222	U1C DiagFbkLoss	222	U1C DiagFbkLoss	222	U1C DiagFbkLoss
223	W2C DiagFbkLoss	223	W2C DiagFbkLoss	223	W2C DiagFbkLoss	223	W2C DiagFbkLoss
224	V3C DiagFbkLoss	224	V3C DiagFbkLoss	224	V3C DiagFbkLoss	224	V3C DiagFbkLoss
225	U4C DiagFbkLoss	225	U4C DiagFbkLoss	225	U4C DiagFbkLoss	225	U4C DiagFbkLoss
226	W5C DiagFbkLoss	226	W5C DiagFbkLoss	226	W5C DiagFbkLoss	226	W5C DiagFbkLoss
227	V6C DiagFbkLoss	227	V6C DiagFbkLoss	227	V6C DiagFbkLoss	227	V6C DiagFbkLoss
228	U1A Gating Loss	228	U1A Gating Loss	228	U1A Gating Loss	228	U1A Gating Loss
229	W2A Gating Loss	229	W2A Gating Loss	229	W2A Gating Loss	229	W2A Gating Loss
230	V3A Gating Loss	230	V3A Gating Loss	230	V3A Gating Loss	230	V3A Gating Loss
231	U4A Gating Loss	231	U4A Gating Loss	231	U4A Gating Loss	231	U4A Gating Loss
232	W5A Gating Loss	232	W5A Gating Loss	232	W5A Gating Loss	232	W5A Gating Loss
233	V6A Gating Loss	233	V6A Gating Loss	233	V6A Gating Loss	233	V6A Gating Loss
234	U1B Gating Loss	234	U1B Gating Loss	234	U1B Gating Loss	234	U1B Gating Loss
235	W2B Gating Loss	235	W2B Gating Loss	235	W2B Gating Loss	235	W2B Gating Loss
236	V3B Gating Loss	236	V3B Gating Loss	236	V3B Gating Loss	236	V3B Gating Loss
237	U4B Gating Loss	237	U4B Gating Loss	237	U4B Gating Loss	237	U4B Gating Loss
238	W5B Gating Loss	238	W5B Gating Loss	238	W5B Gating Loss	238	W5B Gating Loss
239	V6B Gating Loss	239	V6B Gating Loss	239	V6B Gating Loss	239	V6B Gating Loss
240	U1C Gating Loss	240	U1C Gating Loss	240	U1C Gating Loss	240	U1C Gating Loss

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
241	W2C Gating Loss	241	W2C Gating Loss	241	W2C Gating Loss	241	W2C Gating Loss
242	V3C Gating Loss	242	V3C Gating Loss	242	V3C Gating Loss	242	V3C Gating Loss
243	U4C Gating Loss	243	U4C Gating Loss	243	U4C Gating Loss	243	U4C Gating Loss
244	W5C Gating Loss	244	W5C Gating Loss	244	W5C Gating Loss	244	W5C Gating Loss
245	V6C Gating Loss	245	V6C Gating Loss	245	V6C Gating Loss	245	V6C Gating Loss
246	U1A Offline	246	U1A Offline	246	U1A Offline	246	U1A Offline
247	W2A Offline	247	W2A Offline	247	W2A Offline	247	W2A Offline
248	V3A Offline	248	V3A Offline	248	V3A Offline	248	V3A Offline
249	U4A Offline	249	U4A Offline	249	U4A Offline	249	U4A Offline
250	W5A Offline	250	W5A Offline	250	W5A Offline	250	W5A Offline
251	V6A Offline	251	V6A Offline	251	V6A Offline	251	V6A Offline
252	U1B Offline	252	U1B Offline	252	U1B Offline	252	U1B Offline
253	W2B Offline	253	W2B Offline	253	W2B Offline	253	W2B Offline
254	V3B Offline	254	V3B Offline	254	V3B Offline	254	V3B Offline
255	U4B Offline	255	U4B Offline	255	U4B Offline	255	U4B Offline
256	W5B Offline	256	W5B Offline	256	W5B Offline	256	W5B Offline
257	V6B Offline	257	V6B Offline	257	V6B Offline	257	V6B Offline
258	U1C Offline	258	U1C Offline	258	U1C Offline	258	U1C Offline
259	W2C Offline	259	W2C Offline	259	W2C Offline	259	W2C Offline
260	V3C Offline	260	V3C Offline	260	V3C Offline	260	V3C Offline
261	U4C Offline	261	U4C Offline	261	U4C Offline	261	U4C Offline
262	W5C Offline	262	W5C Offline	262	W5C Offline	262	W5C Offline
263	V6C Offline	263	V6C Offline	263	V6C Offline	263	V6C Offline
264	2U1A Online	264	2U1A Online	264	2U1A Online	264	2U1A Online
265	2W2A Online	265	2W2A Online	265	2W2A Online	265	2W2A Online
266	2V3A Online	266	2V3A Online	266	2V3A Online	266	2V3A Online
267	2U4A Online	267	2U4A Online	267	2U4A Online	267	2U4A Online
268	2W5A Online	268	2W5A Online	268	2W5A Online	268	2W5A Online
269	2V6A Online	269	2V6A Online	269	2V6A Online	269	2V6A Online
270	2U1B Online	270	2U1B Online	270	2U1B Online	270	2U1B Online
271	2W2B Online	271	2W2B Online	271	2W2B Online	271	2W2B Online
272	2V3B Online	272	2V3B Online	272	2V3B Online	272	2V3B Online
273	2U4B Online	273	2U4B Online	273	2U4B Online	273	2U4B Online
274	2W5B Online	274	2W5B Online	274	2W5B Online	274	2W5B Online
275	2V6B Online	275	2V6B Online	275	2V6B Online	275	2V6B Online
276	2U1C Online	276	2U1C Online	276	2U1C Online	276	2U1C Online
277	2W2C Online	277	2W2C Online	277	2W2C Online	277	2W2C Online
278	2V3C Online	278	2V3C Online	278	2V3C Online	278	2V3C Online
279	2U4C Online	279	2U4C Online	279	2U4C Online	279	2U4C Online

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
280	2W5C Online	280	2W5C Online	280	2W5C Online	280	2W5C Online
281	2V6C Online	281	2V6C Online	281	2V6C Online	281	2V6C Online
282	2U1A DiagFkbLoss	282	2U1A DiagFkbLoss	282	2U1A DiagFkbLoss	282	2U1A DiagFkbLoss
283	2W2A DiagFkbLoss	283	2W2A DiagFkbLoss	283	2W2A DiagFkbLoss	283	2W2A DiagFkbLoss
284	2V3A DiagFkbLoss	284	2V3A DiagFkbLoss	284	2V3A DiagFkbLoss	284	2V3A DiagFkbLoss
285	2U4A DiagFkbLoss	285	2U4A DiagFkbLoss	285	2U4A DiagFkbLoss	285	2U4A DiagFkbLoss
286	2W5A DiagFkbLoss	286	2W5A DiagFkbLoss	286	2W5A DiagFkbLoss	286	2W5A DiagFkbLoss
287	2V6A DiagFkbLoss	287	2V6A DiagFkbLoss	287	2V6A DiagFkbLoss	287	2V6A DiagFkbLoss
288	2U1B DiagFkbLoss	288	2U1B DiagFkbLoss	288	2U1B DiagFkbLoss	288	2U1B DiagFkbLoss
289	2W2B DiagFkbLoss	289	2W2B DiagFkbLoss	289	2W2B DiagFkbLoss	289	2W2B DiagFkbLoss
290	2V3B DiagFkbLoss	290	2V3B DiagFkbLoss	290	2V3B DiagFkbLoss	290	2V3B DiagFkbLoss
291	2U4B DiagFkbLoss	291	2U4B DiagFkbLoss	291	2U4B DiagFkbLoss	291	2U4B DiagFkbLoss
292	2W5B DiagFkbLoss	292	2W5B DiagFkbLoss	292	2W5B DiagFkbLoss	292	2W5B DiagFkbLoss
293	2V6B DiagFkbLoss	293	2V6B DiagFkbLoss	293	2V6B DiagFkbLoss	293	2V6B DiagFkbLoss
294	2U1C DiagFkbLoss	294	2U1C DiagFkbLoss	294	2U1C DiagFkbLoss	294	2U1C DiagFkbLoss
295	2W2C DiagFkbLoss	295	2W2C DiagFkbLoss	295	2W2C DiagFkbLoss	295	2W2C DiagFkbLoss
296	2V3C DiagFkbLoss	296	2V3C DiagFkbLoss	296	2V3C DiagFkbLoss	296	2V3C DiagFkbLoss
297	2U4C DiagFkbLoss	297	2U4C DiagFkbLoss	297	2U4C DiagFkbLoss	297	2U4C DiagFkbLoss
298	2W5C DiagFkbLoss	298	2W5C DiagFkbLoss	298	2W5C DiagFkbLoss	298	2W5C DiagFkbLoss
299	2V6C DiagFkbLoss	299	2V6C DiagFkbLoss	299	2V6C DiagFkbLoss	299	2V6C DiagFkbLoss
300	2U1A Gating Loss	300	2U1A Gating Loss	300	2U1A Gating Loss	300	2U1A Gating Loss
301	2W2A Gating Loss	301	2W2A Gating Loss	301	2W2A Gating Loss	301	2W2A Gating Loss
302	2V3A Gating Loss	302	2V3A Gating Loss	302	2V3A Gating Loss	302	2V3A Gating Loss
303	2U4A Gating Loss	303	2U4A Gating Loss	303	2U4A Gating Loss	303	2U4A Gating Loss
304	2W5A Gating Loss	304	2W5A Gating Loss	304	2W5A Gating Loss	304	2W5A Gating Loss
305	2V6A Gating Loss	305	2V6A Gating Loss	305	2V6A Gating Loss	305	2V6A Gating Loss
306	2U1B Gating Loss	306	2U1B Gating Loss	306	2U1B Gating Loss	306	2U1B Gating Loss
307	2W2B Gating Loss	307	2W2B Gating Loss	307	2W2B Gating Loss	307	2W2B Gating Loss
308	2V3B Gating Loss	308	2V3B Gating Loss	308	2V3B Gating Loss	308	2V3B Gating Loss
309	2U4B Gating Loss	309	2U4B Gating Loss	309	2U4B Gating Loss	309	2U4B Gating Loss
310	2W5B Gating Loss	310	2W5B Gating Loss	310	2W5B Gating Loss	310	2W5B Gating Loss
311	2V6B Gating Loss	311	2V6B Gating Loss	311	2V6B Gating Loss	311	2V6B Gating Loss
312	2U1C Gating Loss	312	2U1C Gating Loss	312	2U1C Gating Loss	312	2U1C Gating Loss
313	2W2C Gating Loss	313	2W2C Gating Loss	313	2W2C Gating Loss	313	2W2C Gating Loss
314	2V3C Gating Loss	314	2V3C Gating Loss	314	2V3C Gating Loss	314	2V3C Gating Loss
315	2U4C Gating Loss	315	2U4C Gating Loss	315	2U4C Gating Loss	315	2U4C Gating Loss
316	2W5C Gating Loss	316	2W5C Gating Loss	316	2W5C Gating Loss	316	2W5C Gating Loss
317	2V6C Gating Loss	317	2V6C Gating Loss	317	2V6C Gating Loss	317	2V6C Gating Loss

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
318	2U1A Offline	318	2U1A Offline	318	2U1A Offline	318	2U1A Offline
319	2W2A Offline	319	2W2A Offline	319	2W2A Offline	319	2W2A Offline
320	2V3A Offline	320	2V3A Offline	320	2V3A Offline	320	2V3A Offline
321	2U4A Offline	321	2U4A Offline	321	2U4A Offline	321	2U4A Offline
322	2W5A Offline	322	2W5A Offline	322	2W5A Offline	322	2W5A Offline
323	2V6A Offline	323	2V6A Offline	323	2V6A Offline	323	2V6A Offline
324	2U1B Offline	324	2U1B Offline	324	2U1B Offline	324	2U1B Offline
325	2W2B Offline	325	2W2B Offline	325	2W2B Offline	325	2W2B Offline
326	2V3B Offline	326	2V3B Offline	326	2V3B Offline	326	2V3B Offline
327	2U4B Offline	327	2U4B Offline	327	2U4B Offline	327	2U4B Offline
328	2W5B Offline	328	2W5B Offline	328	2W5B Offline	328	2W5B Offline
329	2V6B Offline	329	2V6B Offline	329	2V6B Offline	329	2V6B Offline
330	2U1C Offline	330	2U1C Offline	330	2U1C Offline	330	2U1C Offline
331	2W2C Offline	331	2W2C Offline	331	2W2C Offline	331	2W2C Offline
332	2V3C Offline	332	2V3C Offline	332	2V3C Offline	332	2V3C Offline
333	2U4C Offline	333	2U4C Offline	333	2U4C Offline	333	2U4C Offline
334	2W5C Offline	334	2W5C Offline	334	2W5C Offline	334	2W5C Offline
335	2V6C Offline	335	2V6C Offline	335	2V6C Offline	335	2V6C Offline
336	2U1A OnlineOpen	336	2U1A OnlineOpen	336	2U1A OnlineOpen	336	2U1A OnlineOpen
337	2W2A OnlineOpen	337	2W2A OnlineOpen	337	2W2A OnlineOpen	337	2W2A OnlineOpen
338	2V3A OnlineOpen	338	2V3A OnlineOpen	338	2V3A OnlineOpen	338	2V3A OnlineOpen
339	2U4A OnlineOpen	339	2U4A OnlineOpen	339	2U4A OnlineOpen	339	2U4A OnlineOpen
340	2W5A OnlineOpen	340	2W5A OnlineOpen	340	2W5A OnlineOpen	340	2W5A OnlineOpen
341	2V6A OnlineOpen	341	2V6A OnlineOpen	341	2V6A OnlineOpen	341	2V6A OnlineOpen
342	2U1B OnlineOpen	342	2U1B OnlineOpen	342	2U1B OnlineOpen	342	2U1B OnlineOpen
343	2W2B OnlineOpen	343	2W2B OnlineOpen	343	2W2B OnlineOpen	343	2W2B OnlineOpen
344	2V3B OnlineOpen	344	2V3B OnlineOpen	344	2V3B OnlineOpen	344	2V3B OnlineOpen
345	2U4B OnlineOpen	345	2U4B OnlineOpen	345	2U4B OnlineOpen	345	2U4B OnlineOpen
346	2W5B OnlineOpen	346	2W5B OnlineOpen	346	2W5B OnlineOpen	346	2W5B OnlineOpen
347	2V6B OnlineOpen	347	2V6B OnlineOpen	347	2V6B OnlineOpen	347	2V6B OnlineOpen
348	2U1C OnlineOpen	348	2U1C OnlineOpen	348	2U1C OnlineOpen	348	2U1C OnlineOpen
349	2W2C OnlineOpen	349	2W2C OnlineOpen	349	2W2C OnlineOpen	349	2W2C OnlineOpen
350	2V3C OnlineOpen	350	2V3C OnlineOpen	350	2V3C OnlineOpen	350	2V3C OnlineOpen
351	2U4C OnlineOpen	351	2U4C OnlineOpen	351	2U4C OnlineOpen	351	2U4C OnlineOpen
352	2W5C OnlineOpen	352	2W5C OnlineOpen	352	2W5C OnlineOpen	352	2W5C OnlineOpen
353	2V6C OnlineOpen	353	2V6C OnlineOpen	353	2V6C OnlineOpen	353	2V6C OnlineOpen
354	2U1A OnlineShrt	354	2U1A OnlineShrt	354	2U1A OnlineShrt	354	2U1A OnlineShrt
355	2W2A OnlineShrt	355	2W2A OnlineShrt	355	2W2A OnlineShrt	355	2W2A OnlineShrt
356	2V3A OnlineShrt	356	2V3A OnlineShrt	356	2V3A OnlineShrt	356	2V3A OnlineShrt

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
357	2U4A OnlineShrt	357	2U4A OnlineShrt	357	2U4A OnlineShrt	357	2U4A OnlineShrt
358	2W5A OnlineShrt	358	2W5A OnlineShrt	358	2W5A OnlineShrt	358	2W5A OnlineShrt
359	2V6A OnlineShrt	359	2V6A OnlineShrt	359	2V6A OnlineShrt	359	2V6A OnlineShrt
360	2U1B OnlineShrt	360	2U1B OnlineShrt	360	2U1B OnlineShrt	360	2U1B OnlineShrt
361	2W2B OnlineShrt	361	2W2B OnlineShrt	361	2W2B OnlineShrt	361	2W2B OnlineShrt
362	2V3B OnlineShrt	362	2V3B OnlineShrt	362	2V3B OnlineShrt	362	2V3B OnlineShrt
363	2U4B OnlineShrt	363	2U4B OnlineShrt	363	2U4B OnlineShrt	363	2U4B OnlineShrt
364	2W5B OnlineShrt	364	2W5B OnlineShrt	364	2W5B OnlineShrt	364	2W5B OnlineShrt
365	2V6B OnlineShrt	365	2V6B OnlineShrt	365	2V6B OnlineShrt	365	2V6B OnlineShrt
366	2U1C OnlineShrt	366	2U1C OnlineShrt	366	2U1C OnlineShrt	366	2U1C OnlineShrt
367	2W2C OnlineShrt	367	2W2C OnlineShrt	367	2W2C OnlineShrt	367	2W2C OnlineShrt
368	2V3C OnlineShrt	368	2V3C OnlineShrt	368	2V3C OnlineShrt	368	2V3C OnlineShrt
369	2U4C OnlineShrt	369	2U4C OnlineShrt	369	2U4C OnlineShrt	369	2U4C OnlineShrt
370	2W5C OnlineShrt	370	2W5C OnlineShrt	370	2W5C OnlineShrt	370	2W5C OnlineShrt
371	2V6C OnlineShrt	371	2V6C OnlineShrt	371	2V6C OnlineShrt	371	2V6C OnlineShrt
372	2U1A OfflineOpen	372	2U1A OfflineOpen	372	2U1A OfflineOpen	372	2U1A OfflineOpen
373	2W2A OfflineOpen	373	2W2A OfflineOpen	373	2W2A OfflineOpen	373	2W2A OfflineOpen
374	2V3A OfflineOpen	374	2V3A OfflineOpen	374	2V3A OfflineOpen	374	2V3A OfflineOpen
375	2U4A OfflineOpen	375	2U4A OfflineOpen	375	2U4A OfflineOpen	375	2U4A OfflineOpen
376	2W5A OfflineOpen	376	2W5A OfflineOpen	376	2W5A OfflineOpen	376	2W5A OfflineOpen
377	2V6A OfflineOpen	377	2V6A OfflineOpen	377	2V6A OfflineOpen	377	2V6A OfflineOpen
378	2U1B OfflineOpen	378	2U1B OfflineOpen	378	2U1B OfflineOpen	378	2U1B OfflineOpen
379	2W2B OfflineOpen	379	2W2B OfflineOpen	379	2W2B OfflineOpen	379	2W2B OfflineOpen
380	2V3B OfflineOpen	380	2V3B OfflineOpen	380	2V3B OfflineOpen	380	2V3B OfflineOpen
381	2U4B OfflineOpen	381	2U4B OfflineOpen	381	2U4B OfflineOpen	381	2U4B OfflineOpen
382	2W5B OfflineOpen	382	2W5B OfflineOpen	382	2W5B OfflineOpen	382	2W5B OfflineOpen
383	2V6B OfflineOpen	383	2V6B OfflineOpen	383	2V6B OfflineOpen	383	2V6B OfflineOpen
384	2U1C OfflineOpen	384	2U1C OfflineOpen	384	2U1C OfflineOpen	384	2U1C OfflineOpen
385	2W2C OfflineOpen	385	2W2C OfflineOpen	385	2W2C OfflineOpen	385	2W2C OfflineOpen
386	2V3C OfflineOpen	386	2V3C OfflineOpen	386	2V3C OfflineOpen	386	2V3C OfflineOpen
387	2U4C OfflineOpen	387	2U4C OfflineOpen	387	2U4C OfflineOpen	387	2U4C OfflineOpen
388	2W5C OfflineOpen	388	2W5C OfflineOpen	388	2W5C OfflineOpen	388	2W5C OfflineOpen
389	2V6C OfflineOpen	389	2V6C OfflineOpen	389	2V6C OfflineOpen	389	2V6C OfflineOpen
390	2U1A OfflineShrt	390	2U1A OfflineShrt	390	2U1A OfflineShrt	390	2U1A OfflineShrt
391	2W2A OfflineShrt	391	2W2A OfflineShrt	391	2W2A OfflineShrt	391	2W2A OfflineShrt
392	2V3A OfflineShrt	392	2V3A OfflineShrt	392	2V3A OfflineShrt	392	2V3A OfflineShrt
393	2U4A OfflineShrt	393	2U4A OfflineShrt	393	2U4A OfflineShrt	393	2U4A OfflineShrt
394	2W5A OfflineShrt	394	2W5A OfflineShrt	394	2W5A OfflineShrt	394	2W5A OfflineShrt
395	2V6A OfflineShrt	395	2V6A OfflineShrt	395	2V6A OfflineShrt	395	2V6A OfflineShrt

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
396	2U1B OfflineShrt	396	2U1B OfflineShrt	396	2U1B OfflineShrt	396	2U1B OfflineShrt
397	2W2B OfflineShrt	397	2W2B OfflineShrt	397	2W2B OfflineShrt	397	2W2B OfflineShrt
398	2V3B OfflineShrt	398	2V3B OfflineShrt	398	2V3B OfflineShrt	398	2V3B OfflineShrt
399	2U4B OfflineShrt	399	2U4B OfflineShrt	399	2U4B OfflineShrt	399	2U4B OfflineShrt
400	2W5B OfflineShrt	400	2W5B OfflineShrt	400	2W5B OfflineShrt	400	2W5B OfflineShrt
401	2V6B OfflineShrt	401	2V6B OfflineShrt	401	2V6B OfflineShrt	401	2V6B OfflineShrt
402	2U1C OfflineShrt	402	2U1C OfflineShrt	402	2U1C OfflineShrt	402	2U1C OfflineShrt
403	2W2C OfflineShrt	403	2W2C OfflineShrt	403	2W2C OfflineShrt	403	2W2C OfflineShrt
404	2V3C OfflineShrt	404	2V3C OfflineShrt	404	2V3C OfflineShrt	404	2V3C OfflineShrt
405	2U4C OfflineShrt	405	2U4C OfflineShrt	405	2U4C OfflineShrt	405	2U4C OfflineShrt
406	2W5C OfflineShrt	406	2W5C OfflineShrt	406	2W5C OfflineShrt	406	2W5C OfflineShrt
407	2V6C OfflineShrt	407	2V6C OfflineShrt	407	2V6C OfflineShrt	407	2V6C OfflineShrt
408	3U1B OnlineOpen	408	3U1B OnlineOpen	408	3U1B OnlineOpen	408	3U1B OnlineOpen
409	3W2B OnlineOpen	409	3W2B OnlineOpen	409	3W2B OnlineOpen	409	3W2B OnlineOpen
410	3V3B OnlineOpen	410	3V3B OnlineOpen	410	3V3B OnlineOpen	410	3V3B OnlineOpen
411	3U4B OnlineOpen	411	3U4B OnlineOpen	411	3U4B OnlineOpen	411	3U4B OnlineOpen
412	3W5B OnlineOpen	412	3W5B OnlineOpen	412	3W5B OnlineOpen	412	3W5B OnlineOpen
413	3V6B OnlineOpen	413	3V6B OnlineOpen	413	3V6B OnlineOpen	413	3V6B OnlineOpen
414	4U1C OnlineOpen	414	4U1C OnlineOpen	414	4U1C OnlineOpen	414	4U1C OnlineOpen
415	4W2C OnlineOpen	415	4W2C OnlineOpen	415	4W2C OnlineOpen	415	4W2C OnlineOpen
416	4V3C OnlineOpen	416	4V3C OnlineOpen	416	4V3C OnlineOpen	416	4V3C OnlineOpen
417	4U4C OnlineOpen	417	4U4C OnlineOpen	417	4U4C OnlineOpen	417	4U4C OnlineOpen
418	4W5C OnlineOpen	418	4W5C OnlineOpen	418	4W5C OnlineOpen	418	4W5C OnlineOpen
419	4V6C OnlineOpen	419	4V6C OnlineOpen	419	4V6C OnlineOpen	419	4V6C OnlineOpen
420	3U1B OnlineShrt	420	3U1B OnlineShrt	420	3U1B OnlineShrt	420	3U1B OnlineShrt
421	3W2B OnlineShrt	421	3W2B OnlineShrt	421	3W2B OnlineShrt	421	3W2B OnlineShrt
422	3V3B OnlineShrt	422	3V3B OnlineShrt	422	3V3B OnlineShrt	422	3V3B OnlineShrt
423	3U4B OnlineShrt	423	3U4B OnlineShrt	423	3U4B OnlineShrt	423	3U4B OnlineShrt
424	3W5B OnlineShrt	424	3W5B OnlineShrt	424	3W5B OnlineShrt	424	3W5B OnlineShrt
425	3V6B OnlineShrt	425	3V6B OnlineShrt	425	3V6B OnlineShrt	425	3V6B OnlineShrt
426	4U1C OnlineShrt	426	4U1C OnlineShrt	426	4U1C OnlineShrt	426	4U1C OnlineShrt
427	4W2C OnlineShrt	427	4W2C OnlineShrt	427	4W2C OnlineShrt	427	4W2C OnlineShrt
428	4V3C OnlineShrt	428	4V3C OnlineShrt	428	4V3C OnlineShrt	428	4V3C OnlineShrt
429	4U4C OnlineShrt	429	4U4C OnlineShrt	429	4U4C OnlineShrt	429	4U4C OnlineShrt
430	4W5C OnlineShrt	430	4W5C OnlineShrt	430	4W5C OnlineShrt	430	4W5C OnlineShrt
431	4V6C OnlineShrt	431	4V6C OnlineShrt	431	4V6C OnlineShrt	431	4V6C OnlineShrt
432	3U1B OfflineOpen	432	3U1B OfflineOpen	432	3U1B OfflineOpen	432	3U1B OfflineOpen
433	3W2B OfflineOpen	433	3W2B OfflineOpen	433	3W2B OfflineOpen	433	3W2B OfflineOpen

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
434	3V3B OfflineOpen	434	3V3B OfflineOpen	434	3V3B OfflineOpen	434	3V3B OfflineOpen
435	3U4B OfflineOpen	435	3U4B OfflineOpen	435	3U4B OfflineOpen	435	3U4B OfflineOpen
436	3W5B OfflineOpen	436	3W5B OfflineOpen	436	3W5B OfflineOpen	436	3W5B OfflineOpen
437	3V6B OfflineOpen	437	3V6B OfflineOpen	437	3V6B OfflineOpen	437	3V6B OfflineOpen
438	4U1C OfflineOpen	438	4U1C OfflineOpen	438	4U1C OfflineOpen	438	4U1C OfflineOpen
439	4W2C OfflineOpen	439	4W2C OfflineOpen	439	4W2C OfflineOpen	439	4W2C OfflineOpen
440	4V3C OfflineOpen	440	4V3C OfflineOpen	440	4V3C OfflineOpen	440	4V3C OfflineOpen
441	4U4C OfflineOpen	441	4U4C OfflineOpen	441	4U4C OfflineOpen	441	4U4C OfflineOpen
442	4W5C OfflineOpen	442	4W5C OfflineOpen	442	4W5C OfflineOpen	442	4W5C OfflineOpen
443	4V6C OfflineOpen	443	4V6C OfflineOpen	443	4V6C OfflineOpen	443	4V6C OfflineOpen
444	3U1B OfflineShrt	444	3U1B OfflineShrt	444	3U1B OfflineShrt	444	3U1B OfflineShrt
445	3W2B OfflineShrt	445	3W2B OfflineShrt	445	3W2B OfflineShrt	445	3W2B OfflineShrt
446	3V3B OfflineShrt	446	3V3B OfflineShrt	446	3V3B OfflineShrt	446	3V3B OfflineShrt
447	3U4B OfflineShrt	447	3U4B OfflineShrt	447	3U4B OfflineShrt	447	3U4B OfflineShrt
448	3W5B OfflineShrt	448	3W5B OfflineShrt	448	3W5B OfflineShrt	448	3W5B OfflineShrt
449	3V6B OfflineShrt	449	3V6B OfflineShrt	449	3V6B OfflineShrt	449	3V6B OfflineShrt
450	4U1C OfflineShrt	450	4U1C OfflineShrt	450	4U1C OfflineShrt	450	4U1C OfflineShrt
451	4W2C OfflineShrt	451	4W2C OfflineShrt	451	4W2C OfflineShrt	451	4W2C OfflineShrt
452	4V3C OfflineShrt	452	4V3C OfflineShrt	452	4V3C OfflineShrt	452	4V3C OfflineShrt
453	4U4C OfflineShrt	453	4U4C OfflineShrt	453	4U4C OfflineShrt	453	4U4C OfflineShrt
454	4W5C OfflineShrt	454	4W5C OfflineShrt	454	4W5C OfflineShrt	454	4W5C OfflineShrt
455	4V6C OfflineShrt	455	4V6C OfflineShrt	455	4V6C OfflineShrt	455	4V6C OfflineShrt
456	DAN Comm Loss	456	DAN Comm Loss	456	DAN Comm Loss	456	DAN Comm Loss
457	Mstr Transfr Err	457	Mstr Transfr Err	457	Mstr Transfr Err	457	Mstr Transfr Err
458	PD Capacity Low	458	PD Capacity Low	458	PD Capacity Low	458	PD Capacity Low
459	Main VSB	459	Main VSB	459	Main VSB	459	Main VSB
460	Sync VSB	460	Sync VSB	460	Sync VSB	460	Sync VSB
461	DC Neutral VSB	461	DC Neutral VSB	461	DC Neutral VSB	461	DC Neutral VSB
462	InpLockOut 5Min	462	InpLockOut 5Min	462	InpLockOut 5Min	462	InpLockOut 5Min
463	InpLockOut Indef	463	InpLockOut Indef	463	InpLockOut Indef	463	InpLockOut Indef
464	Process Var Loss	464	Process Var Loss	464	Process Var Loss	464	Process Var Loss
465	Fault Code 465	465	Capability Limit	465	Capability Limit	465	Capability Limit
466	Fault Code 466	466	Sp App Card Loss	466	Sp App Card Loss	466	Sp App Card Loss
467	Fault Code 467	467	High AirPressure	467	High AirPressure	467	High AirPressure
468	Fault Code 468	468	InvOvrVoltage SW	468	InvOvrVoltage SW	468	InvOvrVoltage SW
469	Fault Code 469	469	Fault Code 469	469	Hub Comm Loss	469	Hub Comm Loss
470	Fault Code 470	470	Fault Code 470	470	Enc ID Mismatch	470	Enc ID Mismatch
471	Fault Code 471	471	Fault Code 471	471	Fault Code 471	471	OVH Overspeed

7.*xxx*		8.*xxx*		9.*xxx*		10.*xxx*	
		472	LR Double Fans	472	LR Double Fans	472	LR Double Fans
		473	Cnv Double Fans	473	Cnv Double Fans	473	Cnv Double Fans
		474	CMC Double Fans	474	CMC Double Fans	474	CMC Double Fans
		475	UV Blcked Inlet	475	UV Blcked Inlet	475	UV Blcked Inlet
		476	VW Blcked Inlet	476	VW Blcked Inlet	476	VW Blcked Inlet
		477	CMC Blcked Exhst	477	CMC Blcked Exhst	477	CMC Blcked Exhst
		478	UV Blcked Exhst	478	UV Blcked Exhst	478	UV Blcked Exhst
		479	VW Blcked Exhst	479	VW Blcked Exhst	479	VW Blcked Exhst
		480	CMC Blcked Inlet	480	CMC Blcked Inlet	480	CMC Blcked Inlet
		481	LR Fan1 Ctctr	481	LR Fan1 Ctctr	481	LR Fan1 Ctctr
		482	Cnv Fan3 Ctctr	482	Cnv Fan3 Ctctr	482	Cnv Fan3 Ctctr
		483	Cnv Fan4 Ctctr	483	Cnv Fan4 Ctctr	483	Cnv Fan4 Ctctr
		484	Cnv Fan5 Ctctr	484	Cnv Fan5 Ctctr	484	Cnv Fan5 Ctctr
		485	Cnv Fan6 Ctctr	485	Cnv Fan6 Ctctr	485	Cnv Fan6 Ctctr
		486	Cnv Fan7 Ctctr	486	Cnv Fan7 Ctctr	486	Cnv Fan7 Ctctr
		487	CMC Fan9 Ctctr	487	CMC Fan9 Ctctr	487	CMC Fan9 Ctctr
		488	2U Over Temp	488	2U Over Temp	488	2U Over Temp
		489	2V Over Temp	489	2V Over Temp	489	2V Over Temp
		490	2W Over Temp	490	2W Over Temp	490	2W Over Temp
		491	Inv Hs Over Temp	491	Inv Hs Over Temp	491	Inv Hs Over Temp
		492	2U Airflow Loss	492	2U Airflow Loss	492	2U Airflow Loss
		493	2V Airflow Loss	493	2V Airflow Loss	493	2V Airflow Loss
		494	2W Airflow Loss	494	2W Airflow Loss	494	2W Airflow Loss
		495	Inv Airflow Loss	495	Inv Airflow Loss	495	Inv Airflow Loss
		496	TFB 2U Fbk Error	496	TFB 2U Fbk Error	496	TFB 2U Fbk Error
		497	TFB 2V Fbk Error	497	TFB 2V Fbk Error	497	TFB 2V Fbk Error
		498	TFB 2W Fbk Error	498	TFB 2W Fbk Error	498	TFB 2W Fbk Error
		499	Inv TFBFbk Error	499	Inv TFBFbk Error	499	Inv TFBFbk Error
		500	2U Temp Sensor	500	2U Temp Sensor	500	2U Temp Sensor
		501	2V Temp Sensor	501	2V Temp Sensor	501	2V Temp Sensor
		502	2W Temp Sensor	502	2W Temp Sensor	502	2W Temp Sensor
		503	InvHS TempSensor	503	InvHS TempSensor	503	InvHS TempSensor
		504	Junction OvrTemp	504	Junction OvrTemp	504	Junction OvrTemp
		505	Cnv Airflow Loss	505	Cnv Airflow Loss	505	Cnv Airflow Loss
		506	TFB Loss	506	TFB Loss	506	TFB Loss
		507	Fault Code 507	507	High AmbientTemp	507	High AmbientTemp
		508	Fault Code 508	508	Fault Code 508	508	Fault Code 508
		509	Fault Code 509	509	Fault Code 509	509	Fault Code 509
		510	Fault Code 510	510	Fault Code 510	510	Fault Code 510

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
		511	Fault Code 511	511	Fault Code 511	511	Fault Code 511
		512	Fault Code 512	512	Fault Code 512	512	Fault Code 512
		513	Fault Code 513	513	Fault Code 513	513	Fault Code 513
		514	Fault Code 514	514	Fault Code 514	514	Fault Code 514
		515	Fault Code 515	515	Fault Code 515	515	Fault Code 515
		516	Fault Code 516	516	Fault Code 516	516	Fault Code 516
		517	Fault Code 517	517	Fault Code 517	517	Fault Code 517
		518	Fault Code 518	518	Fault Code 518	518	Fault Code 518
		519	Fault Code 519	519	Fault Code 519	519	Fault Code 519
		520	DBSE1DiagFbkLoss	520	DBSE1DiagFbkLoss	520	DBSE1DiagFbkLoss
		521	DBSE2DiagFbkLoss	521	DBSE2DiagFbkLoss	521	DBSE2DiagFbkLoss
		522	DBSE3DiagFbkLoss	522	DBSE3DiagFbkLoss	522	DBSE3DiagFbkLoss
		523	DBSE4DiagFbkLoss	523	DBSE4DiagFbkLoss	523	DBSE4DiagFbkLoss
		524	DBSH1DiagFbkLoss	524	DBSH1DiagFbkLoss	524	DBSH1DiagFbkLoss
		525	DBSH2DiagFbkLoss	525	DBSH2DiagFbkLoss	525	DBSH2DiagFbkLoss
		526	DBSH3DiagFbkLoss	526	DBSH3DiagFbkLoss	526	DBSH3DiagFbkLoss
		527	DBSH4DiagFbkLoss	527	DBSH4DiagFbkLoss	527	DBSH4DiagFbkLoss
		528	DBSE1GatingLoss	528	DBSE1GatingLoss	528	DBSE1GatingLoss
		529	DBSE2GatingLoss	529	DBSE2GatingLoss	529	DBSE2GatingLoss
		530	DBSE3GatingLoss	530	DBSE3GatingLoss	530	DBSE3GatingLoss
		531	DBSE4GatingLoss	531	DBSE4GatingLoss	531	DBSE4GatingLoss
		532	DBSH1GatingLoss	532	DBSH1GatingLoss	532	DBSH1GatingLoss
		533	DBSH2GatingLoss	533	DBSH2GatingLoss	533	DBSH2GatingLoss
		534	DBSH3GatingLoss	534	DBSH3GatingLoss	534	DBSH3GatingLoss
		535	DBSH4GatingLoss	535	DBSH4GatingLoss	535	DBSH4GatingLoss
		536	DBSE1Offline	536	DBSE1Offline	536	DBSE1Offline
		537	DBSE2Offline	537	DBSE2Offline	537	DBSE2Offline
		538	DBSE3Offline	538	DBSE3Offline	538	DBSE3Offline
		539	DBSE4Offline	539	DBSE4Offline	539	DBSE4Offline
		540	DBSH1Offline	540	DBSH1Offline	540	DBSH1Offline
		541	DBSH2Offline	541	DBSH2Offline	541	DBSH2Offline
		542	DBSH3Offline	542	DBSH3Offline	542	DBSH3Offline
		543	DBSH4Offline	543	DBSH4Offline	543	DBSH4Offline
		544	DBSE1Online	544	DBSE1Online	544	DBSE1Online
		545	DBSE2Online	545	DBSE2Online	545	DBSE2Online
		546	DBSE3Online	546	DBSE3Online	546	DBSE3Online
		547	DBSE4Online	547	DBSE4Online	547	DBSE4Online
		548	DBSH1Online	548	DBSH1Online	548	DBSH1Online
		549	DBSH2Online	549	DBSH2Online	549	DBSH2Online

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
		550	DBSH3Online	550	DBSH3Online	550	DBSH3Online
		551	DBSH4Online	551	DBSH4Online	551	DBSH4Online
		552	LC XIO NotAssgnd	552	LC XIO NotAssgnd	552	LC XIO NotAssgnd
		553	HP XIO NotAssgnd	553	HP XIO NotAssgnd	553	HP XIO NotAssgnd
		554	SA XIO NotAssgnd	554	SA XIO NotAssgnd	554	SA XIO NotAssgnd
		555	Fault Code 555	555	Fault Code 555	555	Fault Code 555
		556	Fault Code 556	556	Fault Code 556	556	Fault Code 556
		557	Fault Code 557	557	Fault Code 557	557	Fault Code 557
		558	Fault Code 558	558	Fault Code 558	558	Fault Code 558
		559	Fault Code 559	559	Fault Code 559	559	Fault Code 559
		560	Fault Code 560	560	Fault Code 560	560	Fault Code 560
		561	Fault Code 561	561	Fault Code 561	561	Fault Code 561
		562	Fault Code 562	562	Fault Code 562	562	Fault Code 562
		563	Fault Code 563	563	Fault Code 563	563	Fault Code 563
		564	Fault Code 564	564	Fault Code 564	564	Fault Code 564
		565	Fault Code 565	565	Fault Code 565	565	Fault Code 565
		566	Fault Code 566	566	Fault Code 566	566	Fault Code 566
		567	Fault Code 567	567	Fault Code 567	567	Fault Code 567
		568	DB Resis OvrTemp	568	DB Resis OvrTemp	568	DB Resis OvrTemp
		569	DBAmbientOvrTemp	569	DBAmbientOvrTemp	569	DBAmbientOvrTemp
		570	DB Airflow Fault	570	DB Airflow Fault	570	DB Airflow Fault
		571	DB Resis Sensor	571	DB Resis Sensor	571	DB Resis Sensor
		572	DB AmbientSensor	572	DB AmbientSensor	572	DB AmbientSensor
		573	DB Airflow Sensor	573	DB Airflow Sensor	573	DB Airflow Sensor
		574	DB TFB Loss	574	DB TFB Loss	574	DB TFB Loss
		575	DBR Overload	575	DBR Overload	575	DBR Overload
		576	Fault Code 576	576	Fault Code 576	576	Fault Code 576
		577	Fault Code 577	577	Fault Code 577	577	Fault Code 577
		578	Fault Code 578	578	Fault Code 578	578	Fault Code 578
		579	Fault Code 579	579	Fault Code 579	579	Fault Code 579
		580	Fault Code 580	580	Fault Code 580	580	Fault Code 580
		581	Fault Code 581	581	Fault Code 581	581	Fault Code 581
		582	Fault Code 582	582	Fault Code 582	582	Fault Code 582
		583	DriveApplication	583	DriveApplication	583	DriveApplication
				584	LR Blcked Inlet	584	LR Blcked Inlet
				585	LR Blcked Exhst	585	LR Blcked Exhst
				586	Xternal LR Fan	586	Xternal LR Fan
				587	Xternal CNV Fan	587	Xternal CNV Fan

7.*xxx*		8.*xxx*		9.*xxx*		10.*xxx*	
				588	Fault Code 588	588	Fault Code 588
				589	Fault Code 589	589	Fault Code 589
				590	Fault Code 590	590	Fault Code 590
				591	Fault Code 591	591	Fault Code 591
				592	Fault Code 592	592	Fault Code 592
				593	Fault Code 593	593	Fault Code 593
				594	Fault Code 594	594	Fault Code 594
				595	Fault Code 595	595	Fault Code 595
				596	Fault Code 596	596	Fault Code 596
				597	Fault Code 597	597	Fault Code 597
				598	Fault Code 598	598	Fault Code 598
				599	Fault Code 599	599	Fault Code 599
						600	Master Comm Flt
						601	CRC Fault
						602	Arbitration Loss
						603	Duplct Node Flt
						604	Login Declined
						605	Low Capacity Flt
						606	Self Test Flt
						607	RPM Exceed HiLmt
						608	RPM Exceed LoLmt
						609	Op Mode Conflict
						616	Config Fault1
						617	Config Fault2
						618	STO Req Fault
						619	Short STO Req
						620	STO Gating Flt
						624	Rec OIBB Com Flt
						625	Config Fault Rec
						628	Inv OIBB Com Flt
						629	Config Fault Inv
						633	Rec WtchDg T Out
						634	Rec PS Out Rng
						635	Rec Temp Out Rng
						636	Rec NSR PS Rng
						639	Rec General Flt
						640	Rec S1 Stuck
						641	Rec S2 Stuck
						643	RecSTOInp Invld
						644	Rec S3 Timeout

7.*xxx*		8.*xxx*		9.*xxx*		10.*xxx*	
						645	Rec A1 Fault
						646	Rec A1 PwrSupply
						647	Rec A2GateBufFlt
						648	Fault Code 648
						649	Fault Code 649
						650	Fault Code 650
						656	Rec OIB Detected
						657	Rec InpCtctrClsd
						658	Rec PSD Fault
						659	Rec Gate Act Flt
						665	Inv WtchDg T Out
						666	Inv PS Out Rng
						667	Inv Temp Out Rng
						668	Inv NSR PS Rng
						671	Inv General Flt
						672	Inv S1 Stuck
						673	Inv S2 Stuck
						675	Inv STOInp Invld
						676	Inv S3 Timeout
						677	Inv A1 Fault
						678	Inv A1 PwrSupply
						679	Inv A2GateBufFlt
						680	Fault Code 680
						681	Fault Code 681
						682	Fault Code 682
						688	Inv OIB Detected
						689	Inv InpCtctrClsd
						690	Inv PSD Fault
						691	Inv Gate Act Flt

Notes:

Warning Codes

Listed Numerically

7.xxx		8.xxx		9.xxx		10.xxx	
1	External 1	1	External 1	1	External 1	1	External 1
2	External 2	2	External 2	2	External 2	2	External 2
3	External 3	3	External 3	3	External 3	3	External 3
4	External 4	4	External 4	4	External 4	4	External 4
5	External 5	5	External 5	5	External 5	5	External 5
6	External 6	6	External 6	6	External 6	6	External 6
7	External 7	7	External 7	7	External 7	7	External 7
8	External 8	8	External 8	8	External 8	8	External 8
9	External 9	9	External 9	9	External 9	9	External 9
10	External 10	10	External 10	10	External 10	10	External 10
11	External 11	11	External 11	11	External 11	11	External 11
12	External 12	12	External 12	12	External 12	12	External 12
13	External 13	13	External 13	13	External 13	13	External 13
14	External 14	14	External 14	14	External 14	14	External 14
15	External 15	15	External 15	15	External 15	15	External 15
16	External 16	16	External 16	16	External 16	16	External 16
17	Stnd IO Config	17	Stnd IO Config	17	Stnd IO Config	17	Stnd IO Config
18	Stnd IO Conflict	18	Stnd IO Conflict	18	Stnd IO Conflict	18	Stnd IO Conflict
19	Ext Flt Config	19	Ext Flt Config	19	Ext Flt Config	19	Ext Flt Config
20	Ext Flt Conflict	20	Ext Flt Conflict	20	Ext Flt Conflict	20	Ext Flt Conflict
21	Liqd IO Config	21	Liqd IO Config	21	Liqd IO Config	21	Liqd IO Config
22	Liqd IO Conflict	22	Liqd IO Conflict	22	Liqd IO Conflict	22	Liqd IO Conflict
23	LogixIO Config	23	LogixIO Config	23	LogixIO Config	23	LogixIO Config
24	LogixIO Conflict	24	LogixIO Conflict	24	LogixIO Conflict	24	LogixIO Conflict
25	Warning Code 25	25	HPipeIO Config	25	HPipeIO Config	25	HPipeIO Config
26	Warning Code 26	26	HPipeIO Conflict	26	HPipeIO Conflict	26	HPipeIO Conflict
27	Warning Code 27	27	SpecApp Config	27	SpecApp Config	27	SpecApp Config
28	Warning Code 28	28	SpecApp Conflict	28	SpecApp Conflict	28	SpecApp Conflict
29	Warning Code 29	29	FlexIO Config	29	Warning Code 29	29	Warning Code 29
30	Warning Code 30	30	FlexIO Conflict	30	Warning Code 30	30	Warning Code 30
31	Warning Code 31	31	Warning Code 31	31	Warning Code 31	31	Warning Code 31

7.*xxx*		**8.*xxx***		**9.*xxx***		**10.*xxx***	
32	Warning Code 32	32	Warning Code 32	32	Warning Code 32	32	Warning Code 32
33	Pump Failure	33	Pump Failure	33	Pump Failure	33	Pump Failure
34	HeatExchnger Fan	34	HeatExchnger Fan	34	HeatExchnger Fan	34	HeatExchnger Fan
35	Coolant Temp Low	35	Coolant Temp Low	35	Coolant Temp Low	35	Coolant Temp Low
36	CoolantTemp High	36	CoolantTemp High	36	CoolantTemp High	36	CoolantTemp High
37	ConductivityHigh	37	ConductivityHigh	37	ConductivityHigh	37	ConductivityHigh
38	CoolantLevel Low	38	CoolantLevel Low	38	CoolantLevel Low	38	CoolantLevel Low
39	Warning Code 39	39	Warning Code 39	39	Warning Code 39	39	Warning Code 39
40	Warning Code 40	40	Warning Code 40	40	Warning Code 40	40	Warning Code 40
41	Warning Code 41	41	Warning Code 41	41	Warning Code 41	41	Warning Code 41
42	TempFeedbackLoss	42	TempFeedbackLoss	42	TempFeedbackLoss	42	TempFeedbackLoss
43	Warning Code 43	43	Warning Code 43	43	Warning Code 43	43	Warning Code 43
44	Warning Code 44	44	Warning Code 44	44	Warning Code 44	44	Warning Code 44
45	Warning Code 45	45	Warning Code 45	45	Warning Code 45	45	Warning Code 45
46	Warning Code 46	46	Warning Code 46	46	Warning Code 46	46	Warning Code 46
47	Warning Code 47	47	Warning Code 47	47	Warning Code 47	47	Warning Code 47
48	Warning Code 48	48	Warning Code 48	48	Warning Code 48	48	Warning Code 48
49	Adapter 1 Loss	49	Adapter 1 Loss	49	Adapter 1 Loss	49	Adapter 1 Loss
50	Adapter 2 Loss	50	Adapter 2 Loss	50	Adapter 2 Loss	50	Adapter 2 Loss
51	Adapter 3 Loss	51	Adapter 3 Loss	51	Adapter 3 Loss	51	Adapter 3 Loss
52	Adapter 4 Loss	52	Adapter 4 Loss	52	Adapter 4 Loss	52	Adapter 4 Loss
53	Adapter 5 Loss	53	Adapter 5 Loss	53	Adapter 5 Loss	53	Adapter 5 Loss
54	Adapter 6 Loss	54	Adapter 6 Loss	54	Adapter 6 Loss	54	Adapter 6 Loss
55	Speed Cmd Loss	55	Refrnce Cmd Loss	55	Refrnce Cmd Loss	55	Refrnce Cmd Loss
56	Warning Code 56	56	Warning Code 56	56	Warning Code 56	56	Warning Code 56
57	Warning Code 57	57	Warning Code 57	57	Warning Code 57	57	Warning Code 57
58	Tuning Abort	58	Tuning Abort	58	Tuning Abort	58	Tuning Abort
59	Drv in Test Mode	59	Drv in Test Mode	59	Drv in Test Mode	59	Drv in Test Mode
60	Regulator Limit	60	Regulator Limit	60	Regulator Limit	60	Regulator Limit
61	R Stator High	61	R Stator High	61	R Stator High	61	R Stator High
62	Autotune TimeLmt	62	Autotune TimeLmt	62	Autotune TimeLmt	62	Autotune TimeLmt
63	Inertia High	63	Inertia High	63	Inertia High	63	Inertia High
64	L Input Low	64	L Input Low	64	L Input Low	64	L Input Low
65	L Input High	65	L Input High	65	L Input High	65	L Input High
66	T DC Link Low	66	T DC Link Low	66	T DC Link Low	66	T DC Link Low
67	T DC Link High	67	T DC Link High	67	T DC Link High	67	T DC Link High
68	L Leakage Low	68	L Leakage Low	68	L Leakage Low	68	L Leakage Low
69	L Leakage High	69	L Leakage High	69	L Leakage High	69	L Leakage High

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
70	L Magnetize Low	70	L Magnetize Low	70	L Magnetize Low	70	L Magnetize Low
71	L Magnetize High	71	L Magnetize High	71	L Magnetize High	71	L Magnetize High
72	T Rotor Low	72	T Rotor Low	72	T Rotor Low	72	T Rotor Low
73	T Rotor High	73	T Rotor High	73	T Rotor High	73	T Rotor High
74	Input Prot'n #1	74	Input Prot'n #1	74	Input Prot'n #1	74	Input Prot'n #1
75	IsoTx/ReacOvrTmp	75	IsoTx/ReacOvrTmp	75	IsoTx/ReacOvrTmp	75	IsoTx/ReacOvrTmp
76	DCLnk OvrTemp	76	DCLnk OvrTemp	76	DCLnk OvrTemp	76	DCLnk OvrTemp
77	Motor Protection	77	Motor Protection	77	Motor Protection	77	Motor Protection
78	Input Prot'n #2	78	Input Prot'n #2	78	Input Prot'n #2	78	Input Prot'n #2
79	Auxillary Prot'n	79	Auxillary Prot'n	79	Auxillary Prot'n	79	Auxillary Prot'n
80	Warning Code 80	80	Warning Code 80	80	Warning Code 80	80	Warning Code 80
81	Warning Code 81	81	Warning Code 81	81	Warning Code 81	81	Warning Code 81
82	Warning Code 82	82	Warning Code 82	82	Warning Code 82	82	Warning Code 82
83	Warning Code 83	83	Warning Code 83	83	Warning Code 83	83	Warning Code 83
84	Warning Code 84	84	Warning Code 84	84	Warning Code 84	84	Warning Code 84
85	Warning Code 85	85	Warning Code 85	85	Warning Code 85	85	Warning Code 85
86	Warning Code 86	86	Warning Code 86	86	Warning Code 86	86	Warning Code 86
87	Warning Code 87	87	Warning Code 87	87	Warning Code 87	87	Warning Code 87
88	Warning Code 88	88	Warning Code 88	88	Warning Code 88	88	Warning Code 88
89	Warning Code 89	89	Warning Code 89	89	Warning Code 89	89	Warning Code 89
90	XIO Card #1 Loss	90	XIO Card #1 Loss	90	XIO Card #1 Loss	90	XIO Card #1 Loss
91	XIO Card #2 Loss	91	XIO Card #2 Loss	91	XIO Card #2 Loss	91	XIO Card #2 Loss
92	XIO Card #3 Loss	92	XIO Card #3 Loss	92	XIO Card #3 Loss	92	XIO Card #3 Loss
93	XIO Card #4 Loss	93	XIO Card #4 Loss	93	XIO Card #4 Loss	93	XIO Card #4 Loss
94	XIO Card #5 Loss	94	XIO Card #5 Loss	94	XIO Card #5 Loss	94	XIO Card #5 Loss
95	XIO Card #6 Loss	95	XIO Card #6 Loss	95	XIO Card #6 Loss	95	XIO Card #6 Loss
96	NVRAM Cleared	96	NVRAM Cleared	96	NVRAM Cleared	96	NVRAM Cleared
97	Parameter Range	97	Parameter Range	97	Parameter Range	97	Parameter Range
98	Invalid AlarmBit	98	Invalid AlarmBit	98	Invalid AlarmBit	98	Invalid AlarmBit
99	Invalid DIM	99	Invalid DIM	99	Invalid DIM	99	Invalid DIM
100	Queues Cleared	100	Queues Cleared	100	Queues Cleared	100	Queues Cleared
101	SpdProfile Limit	101	SpdProfile Limit	101	SpdProfile Limit	101	SpdProfile Limit
102	Phantom Alarm	102	Phantom Alarm	102	Phantom Alarm	102	Phantom Alarm
103	Warning Code 103	103	Warning Code 103	103	Warning Code 103	103	Warning Code 103
104	AC/DC#1Redundant	104	AC/DC#1Redundant	104	AC/DC#1Redundant	104	AC/DC#1Redundant
105	AC/DC#2Redundant	105	AC/DC#2Redundant	105	AC/DC#2Redundant	105	AC/DC#2Redundant
106	AC/DC#3Redundant	106	AC/DC#3Redundant	106	AC/DC#3Redundant	106	AC/DC#3Redundant
107	AC/DC#4Redundant	107	AC/DC#4Redundant	107	AC/DC#4Redundant	107	AC/DC#4Redundant

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
108	AC/DC#1 AC Fail	108	AC/DC#1 AC Fail	108	AC/DC#1 AC Fail	108	AC/DC#1 AC Fail
109	AC/DC#2 AC Fail	109	AC/DC#2 AC Fail	109	AC/DC#2 AC Fail	109	AC/DC#2 AC Fail
110	AC/DC#3 AC Fail	110	AC/DC#3 AC Fail	110	AC/DC#3 AC Fail	110	AC/DC#3 AC Fail
111	AC/DC#4 AC Fail	111	AC/DC#4 AC Fail	111	AC/DC#4 AC Fail	111	AC/DC#4 AC Fail
112	Control Pwr Loss	112	Control Pwr Loss	112	Control Pwr Loss	112	Control Pwr Loss
113	UPS on Bypass	113	UPS on Bypass	113	UPS on Bypass	113	UPS on Bypass
114	UPS on Battery	114	UPS on Battery	114	UPS on Battery	114	UPS on Battery
115	UPS Battery Low	115	UPS Battery Low	115	UPS Battery Low	115	UPS Battery Low
116	UPS Failed	116	UPS Failed	116	UPS Failed	116	UPS Failed
117	XIO Power Loss	117	XIO Power Loss	117	XIO Power Loss	117	XIO Power Loss
118	CtrlI5V Redundant	118	CtrlI5V Redundant	118	CtrlI5V Redundant	118	CtrlI5V Redundant
119	Warning Code 119	119	Warning Code 119	119	Warning Code 119	119	Warning Code 119
120	Hub Comm Loss	120	Hub Comm Loss	120	Hub Comm Loss	120	Hub Comm Loss
121	Duplicate Master	121	Duplicate Master	121	Duplicate Master	121	Duplicate Master
122	Declined Master	122	Declined Master	122	Declined Master	122	Declined Master
123	Slave RfsdMaster	123	Slave RfsdMaster	123	Slave RfsdMaster	123	Slave RfsdMaster
124	Invalid Mstr Req	124	Invalid Mstr Req	124	Invalid Mstr Req	124	Invalid Mstr Req
125	Xfer Disabled	125	Xfer Disabled	125	Xfer Disabled	125	Xfer Disabled
126	Warning Code 126	126	Warning Code 126	126	Warning Code 126	126	Warning Code 126
127	Warning Code 127	127	Warning Code 127	127	Warning Code 127	127	Warning Code 127
128	Slave 0 Comm	128	Slave 0 Comm	128	Slave 0 Comm	128	Slave 0 Comm
129	Slave 1 Comm	129	Slave 1 Comm	129	Slave 1 Comm	129	Slave 1 Comm
130	Slave 2 Comm	130	Slave 2 Comm	130	Slave 2 Comm	130	Slave 2 Comm
131	Slave 3 Comm	131	Slave 3 Comm	131	Slave 3 Comm	131	Slave 3 Comm
132	Slave 4 Comm	132	Slave 4 Comm	132	Slave 4 Comm	132	Slave 4 Comm
133	Slave 5 Comm	133	Slave 5 Comm	133	Slave 5 Comm	133	Slave 5 Comm
134	Slave 6 Comm	134	Slave 6 Comm	134	Slave 6 Comm	134	Slave 6 Comm
135	Slave 7 Comm	135	Slave 7 Comm	135	Slave 7 Comm	135	Slave 7 Comm
136	Motor OvrLoad	136	Motor OvrLoad	136	Motor OvrLoad	136	Motor OvrLoad
137	Motor Cap Range	137	Motor Cap Range	137	Motor Cap Range	137	Motor Cap Range
138	Motor Load Loss	138	Motor Load Loss	138	Motor Load Loss	138	Motor Load Loss
139	Motor OvrVoltage	139	Motor OvrVoltage	139	Motor OvrVoltage	139	Motor OvrVoltage
140	Warning Code 140	140	Warning Code 140	140	Warning Code 140	140	Warning Code 140
141	Bypass OvrVolt	141	Bypass OvrVolt	141	Bypass OvrVolt	141	Bypass OvrVolt
142	Bypass UnderVolt	142	Bypass UnderVolt	142	Bypass UnderVolt	142	Bypass UnderVolt
143	Bypass VoltUnbal	143	Bypass VoltUnbal	143	Bypass VoltUnbal	143	Bypass VoltUnbal
144	Bypass Phase Seq	144	Bypass Phase Seq	144	Bypass Phase Seq	144	Bypass Phase Seq
145	SyncXfer Failure	145	SyncXfer Failure	145	SyncXfer Failure	145	SyncXfer Failure
146	DeSync Delay	146	DeSync Delay	146	DeSync Delay	146	DeSync Delay

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
147	Tach Loss	147	Encoder Loss	147	Encoder Loss	–	–
148	Tach Direction	148	EncoderDirection	148	EncoderDirection	–	–
149	Tach PhaseA Loss	149	Encoder PhA Loss	149	Encoder PhA Loss	–	–
150	No Tach InstalId	150	NoEncoderInstlId	150	NoEncoderInstlId	150	NoEncoderInstlId
151	Tach PhaseB Loss	151	Encoder PhB Loss	151	Encoder PhB Loss	–	–
152	Drive OvrLoad	152	Drive OvrLoad	152	Drive OvrLoad	152	Drive OvrLoad
153	Master UnderVolt	153	Master UnderVolt	153	Master UnderVolt	153	Master UnderVolt
154	Slave1 UnderVolt	154	Slave1 UnderVolt	154	Slave1 UnderVolt	154	Slave1 UnderVolt
155	Slave2 UnderVolt	155	Slave2 UnderVolt	155	Slave2 UnderVolt	155	Slave2 UnderVolt
156	DCLnk OvrCurrent	156	DCLnk OvrCurrent	156	DCLnk OvrCurrent	156	DCLnk OvrCurrent
157	Rec OvrVoltage	157	Rec OvrVoltage	157	Rec OvrVoltage	157	Rec OvrVoltage
158	Line Synch Loss	158	Line Synch Loss	158	Line Synch Loss	158	Line Synch Loss
159	InpCtctrFeedback	159	InpCtctrFeedback	159	InpCtctrFeedback	159	InpCtctrFeedback
160	Warning Code 160	160	GatePwrSup V Low	160	–	160	–
161	Line Loss	161	Line Loss	161	Line Loss	161	Line Loss
162	RecHSnk OvrTemp	162	RecHSnk OvrTemp	162	RecHSnk OvrTemp	162	RecHSnk OvrTemp
163	RecChB OvrTemp	163	RecChB OvrTemp	163	RecChB OvrTemp	163	RecChB OvrTemp
164	Bus Transient	164	Bus Transient	164	Bus Transient	164	Bus Transient
165	Line Cap Range	165	Line Cap Range	165	Line Cap Range	165	Line Cap Range
166	RAM Battery Low	166	RAM Battery Low	166	RAM Battery Low	166	RAM Battery Low
167	DC Link Range	167	DC Link Range	167	DC Link Range	167	DC Link Range
168	RecHSnk Sensor	168	RecHSnk Sensor	168	RecHSnk Sensor	168	RecHSnk Sensor
169	RecChB Sensor	169	RecChB Sensor	169	RecChB Sensor	169	RecChB Sensor
170	RecHSnk FbrOptic	170	RecHSnk FbrOptic	170	RecHSnk FbrOptic	170	RecHSnk FbrOptic
171	RecChB FbrOptic	171	RecChB FbrOptic	171	RecChB FbrOptic	171	RecChB FbrOptic
172	Rec DC Cur Gain	172	Rec DC Cur Gain	172	Rec DC Cur Gain	172	Rec DC Cur Gain
173	Rec Gate Pwr Sup	173	Rec Gate Pwr Sup	173	Rec Gate Pwr Sup	173	Rec Gate Pwr Sup
174	Rec AC Cur Gain	174	Rec AC Cur Gain	174	Rec AC Cur Gain	174	Rec AC Cur Gain
175	Stack Depth	175	Stack Depth	175	Stack Depth	175	Stack Depth
176	BlkBox NVRAM Clr	176	DataRecorder Clr	176	DataRecorder Clr	176	DataRecorder Clr
177	Warning Code 177	177	DB GatePwrSupply	177	DB GatePwrSupply	177	DB GatePwrSupply
178	Warning Code 178	178	Warning Code 178	178	2U GatePS V Low	178	2U GatePS V Low
179	Warning Code 179	179	Warning Code 179	179	2V GatePS V Low	179	2V GatePS V Low
180	Warning Code 180	180	Warning Code 180	180	2W GatePS V Low	180	2W GatePS V Low
181	Warning Code 181	181	Warning Code 181	181	Inv GatePS V Low	181	Inv GatePS V Low
182	Warning Code 182	182	Warning Code 182	182	Warning Code 182	182	Warning Code 182
183	Warning Code 183	183	Warning Code 183	183	Warning Code 183	183	InpFilter Tuning
184	Input CtctrOpen	184	Input CtctrOpen	184	Input CtctrOpen	184	Input CtctrOpen

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
185	Input CtctrClsd	185	Input CtctrClsd	185	Input CtctrClsd	185	Input CtctrClsd
186	Output CtctrOpen	186	Output CtctrOpen	186	Output CtctrOpen	186	Output CtctrOpen
187	Output CtctrClsd	187	Output CtctrClsd	187	Output CtctrClsd	187	Output CtctrClsd
188	Bypass CtctrOpen	188	Bypass CtctrOpen	188	Bypass CtctrOpen	188	Bypass CtctrOpen
189	Bypass CtctrClsd	189	Bypass CtctrClsd	189	Bypass CtctrClsd	189	Bypass CtctrClsd
190	Input IsoSwOpen	190	Input IsoSwOpen	190	Input IsoSwOpen	190	Input IsoSwOpen
191	Output IsoSwOpen	191	Output IsoSwOpen	191	Output IsoSwOpen	191	Output IsoSwOpen
192	Bypass IsoSwOpen	192	Bypass IsoSwOpen	192	Bypass IsoSwOpen	192	Bypass IsoSwOpen
193	Input IsoSwClsd	193	Input IsoSwClsd	193	Input IsoSwClsd	193	Input IsoSwClsd
194	Output IsoSwClsd	194	Output IsoSwClsd	194	Output IsoSwClsd	194	Output IsoSwClsd
195	Bypass IsoSwClsd	195	Bypass IsoSwClsd	195	Bypass IsoSwClsd	195	Bypass IsoSwClsd
196	No Output Ctctr	196	No Output Ctctr	196	No Output Ctctr	196	No Output Ctctr
197	InputClose Delay	197	InputClose Delay	197	InputClose Delay	197	InputClose Delay
198	Warning Code 198	198	Anlg PwrLmt Loss	198	Anlg PwrLmt Loss	198	Anlg PwrLmt Loss
199	Warning Code 199	199	Air HighPressure	199	Air HighPressure	199	Air HighPressure
200	Conv Fan1 Ctctr	200	Conv Fan1 Ctctr	200	Conv Fan1 Ctctr	200	Conv Fan1 Ctctr
201	Conv Fan2 Ctctr	201	Conv Fan2 Ctctr	201	Conv Fan2 Ctctr	201	Conv Fan2 Ctctr
202	IsoTx Fan1 Ctctr	202	IsoTx Fan1 Ctctr	202	IsoTx Fan1 Ctctr	202	IsoTx Fan1 Ctctr
203	IsoTx Fan2 Ctctr	203	IsoTx Fan2 Ctctr	203	IsoTx Fan2 Ctctr	203	IsoTx Fan2 Ctctr
204	Convrtr AirFlow	204	Convrtr AirFlow	204	Low AirPresure	204	Low AirPresure
205	IsoTx AirFlow	205	IsoTx AirFlow	205	IsoTx AirPresure	205	IsoTx AirPresure
206	Convrtr Fans On	206	Convrtr Fans On	206	Convrtr Fans On	206	Convrtr Fans On
207	IsoTx Fans On	207	IsoTx Fans On	207	IsoTx Fans On	207	IsoTx Fans On
208	Convrtr Fan1Loss	208	Convrtr Fan1Loss	208	Convrtr Fan1Loss	208	Convrtr Fan1Loss
209	Convrtr Fan2Loss	209	Convrtr Fan2Loss	209	Convrtr Fan2Loss	209	Convrtr Fan2Loss
210	IsoTx Fan1 Loss	210	IsoTx Fan1 Loss	210	IsoTx Fan1 Loss	210	IsoTx Fan1 Loss
211	IsoTx Fan2 Loss	211	IsoTx Fan2 Loss	211	IsoTx Fan2 Loss	211	IsoTx Fan2 Loss
212	Drv Maintenance	212	Drv Maintenance	212	Drv Maintenance	212	Drv Maintenance
213	Inv Gate Pwr Sup	213	Inv Gate Pwr Sup	213	Inv Gate Pwr Sup	213	Inv Gate Pwr Sup
214	Warning Code 214	214	PFC Disabled	214	PFC Disabled	214	PFC Disabled
215	Warning Code 215	215	Cable Resistance	215	Cable Resistance	215	Cable Resistance
216	InvHSnk OvrTemp	216	InvHSnk OvrTemp	216	InvHSnk OvrTemp	216	InvHSnk OvrTemp
217	Ambient OvrTemp	217	Ambient OvrTemp	217	Ambient OvrTemp	217	Ambient OvrTemp
218	InvHSnk Sensor	218	InvHSnk Sensor	218	InvHSnk Sensor	218	InvHSnk Sensor
219	Ambient Sensor	219	Ambient Sensor	219	Ambient Sensor	219	Ambient Sensor
220	InvHSnk FbrOptic	220	InvHSnk FbrOptic	220	InvHSnk FbrOptic	220	InvHSnk FbrOptic
221	Ambient FbrOptic	221	Ambient FbrOptic	221	Ambient FbrOptic	221	Ambient FbrOptic
222	Inv OvrVoltage	222	Inv OvrVoltage	222	Inv OvrVoltage	222	Inv OvrVoltage
223	Inv AC Cur Gain	223	Inv AC Cur Gain	223	Inv AC Cur Gain	223	Inv AC Cur Gain

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
224	AIn1 Calib Error	224	AIn1 Calib Error	224	AIn1 Calib Error	224	AIn1 Calib Error
225	AIn2 Calib Error	225	AIn2 Calib Error	225	AIn2 Calib Error	225	AIn2 Calib Error
226	AIn3 Calib Error	226	AIn3 Calib Error	226	AIn3 Calib Error	226	AIn3 Calib Error
227	PFC IdcLimit	227	PFC IdcLimit	227	PFC IdcLimit	227	PFC IdcLimit
228	PFC Flux Limit	228	PFC Flux Limit	228	PFC Flux Limit	228	PFC Flux Limit
229	Process Var Loss	229	Process Var Loss	229	Process Var Loss	229	Process Var Loss
230	Warning Code 230	230	Rectifier 5Pulse	230	Rectifier 5Pulse	230	Rectifier 5Pulse
231	Warning Code 231	231	MaxDrvCapability	231	MaxDrvCapability	231	MaxDrvCapability
232	U1A Online	232	U1A Online	232	U1A Online	232	U1A Online
233	W2A Online	233	W2A Online	233	W2A Online	233	W2A Online
234	V3A Online	234	V3A Online	234	V3A Online	234	V3A Online
235	U4A Online	235	U4A Online	235	U4A Online	235	U4A Online
236	W5A Online	236	W5A Online	236	W5A Online	236	W5A Online
237	V6A Online	237	V6A Online	237	V6A Online	237	V6A Online
238	U1B Online	238	U1B Online	238	U1B Online	238	U1B Online
239	W2B Online	239	W2B Online	239	W2B Online	239	W2B Online
240	V3B Online	240	V3B Online	240	V3B Online	240	V3B Online
241	U4B Online	241	U4B Online	241	U4B Online	241	U4B Online
242	W5B Online	242	W5B Online	242	W5B Online	242	W5B Online
243	V6B Online	243	V6B Online	243	V6B Online	243	V6B Online
244	U1C Online	244	U1C Online	244	U1C Online	244	U1C Online
245	W2C Online	245	W2C Online	245	W2C Online	245	W2C Online
246	V3C Online	246	V3C Online	246	V3C Online	246	V3C Online
247	U4C Online	247	U4C Online	247	U4C Online	247	U4C Online
248	W5C Online	248	W5C Online	248	W5C Online	248	W5C Online
249	V6C Online	249	V6C Online	249	V6C Online	249	V6C Online
250	U1A Offline	250	U1A Offline	250	U1A Offline	250	U1A Offline
251	W2A Offline	251	W2A Offline	251	W2A Offline	251	W2A Offline
252	V3A Offline	252	V3A Offline	252	V3A Offline	252	V3A Offline
253	U4A Offline	253	U4A Offline	253	U4A Offline	253	U4A Offline
254	W5A Offline	254	W5A Offline	254	W5A Offline	254	W5A Offline
255	V6A Offline	255	V6A Offline	255	V6A Offline	255	V6A Offline
256	U1B Offline	256	U1B Offline	256	U1B Offline	256	U1B Offline
257	W2B Offline	257	W2B Offline	257	W2B Offline	257	W2B Offline
258	V3B Offline	258	V3B Offline	258	V3B Offline	258	V3B Offline
259	U4B Offline	259	U4B Offline	259	U4B Offline	259	U4B Offline
260	W5B Offline	260	W5B Offline	260	W5B Offline	260	W5B Offline
261	V6B Offline	261	V6B Offline	261	V6B Offline	261	V6B Offline
262	U1C Offline	262	U1C Offline	262	U1C Offline	262	U1C Offline

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
263	W2C Offline	263	W2C Offline	263	W2C Offline	263	W2C Offline
264	V3C Offline	264	V3C Offline	264	V3C Offline	264	V3C Offline
265	U4C Offline	265	U4C Offline	265	U4C Offline	265	U4C Offline
266	W5C Offline	266	W5C Offline	266	W5C Offline	266	W5C Offline
267	V6C Offline	267	V6C Offline	267	V6C Offline	267	V6C Offline
268	2U1A Online	268	2U1A Online	268	2U1A Online	268	2U1A Online
269	2W2A Online	269	2W2A Online	269	2W2A Online	269	2W2A Online
270	2V3A Online	270	2V3A Online	270	2V3A Online	270	2V3A Online
271	2U4A Online	271	2U4A Online	271	2U4A Online	271	2U4A Online
272	2W5A Online	272	2W5A Online	272	2W5A Online	272	2W5A Online
273	2V6A Online	273	2V6A Online	273	2V6A Online	273	2V6A Online
274	2U1B Online	274	2U1B Online	274	2U1B Online	274	2U1B Online
275	2W2B Online	275	2W2B Online	275	2W2B Online	275	2W2B Online
276	2V3B Online	276	2V3B Online	276	2V3B Online	276	2V3B Online
277	2U4B Online	277	2U4B Online	277	2U4B Online	277	2U4B Online
278	2W5B Online	278	2W5B Online	278	2W5B Online	278	2W5B Online
279	2V6B Online	279	2V6B Online	279	2V6B Online	279	2V6B Online
280	2U1C Online	280	2U1C Online	280	2U1C Online	280	2U1C Online
281	2W2C Online	281	2W2C Online	281	2W2C Online	281	2W2C Online
282	2V3C Online	282	2V3C Online	282	2V3C Online	282	2V3C Online
283	2U4C Online	283	2U4C Online	283	2U4C Online	283	2U4C Online
284	2W5C Online	284	2W5C Online	284	2W5C Online	284	2W5C Online
285	2V6C Online	285	2V6C Online	285	2V6C Online	285	2V6C Online
286	2U1A Offline	286	2U1A Offline	286	2U1A Offline	286	2U1A Offline
287	2W2A Offline	287	2W2A Offline	287	2W2A Offline	287	2W2A Offline
288	2V3A Offline	288	2V3A Offline	288	2V3A Offline	288	2V3A Offline
289	2U4A Offline	289	2U4A Offline	289	2U4A Offline	289	2U4A Offline
290	2W5A Offline	290	2W5A Offline	290	2W5A Offline	290	2W5A Offline
291	2V6A Offline	291	2V6A Offline	291	2V6A Offline	291	2V6A Offline
292	2U1B Offline	292	2U1B Offline	292	2U1B Offline	292	2U1B Offline
293	2W2B Offline	293	2W2B Offline	293	2W2B Offline	293	2W2B Offline
294	2V3B Offline	294	2V3B Offline	294	2V3B Offline	294	2V3B Offline
295	2U4B Offline	295	2U4B Offline	295	2U4B Offline	295	2U4B Offline
296	2W5B Offline	296	2W5B Offline	296	2W5B Offline	296	2W5B Offline
297	2V6B Offline	297	2V6B Offline	297	2V6B Offline	297	2V6B Offline
298	2U1C Offline	298	2U1C Offline	298	2U1C Offline	298	2U1C Offline
299	2W2C Offline	299	2W2C Offline	299	2W2C Offline	299	2W2C Offline
300	2V3C Offline	300	2V3C Offline	300	2V3C Offline	300	2V3C Offline
301	2U4C Offline	301	2U4C Offline	301	2U4C Offline	301	2U4C Offline

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
302	2W5C Offline	302	2W5C Offline	302	2W5C Offline	302	2W5C Offline
303	2V6C Offline	303	2V6C Offline	303	2V6C Offline	303	2V6C Offline
304	2U1A OnlineShrt	304	2U1A OnlineShrt	304	2U1A OnlineShrt	304	2U1A OnlineShrt
305	2W2A OnlineShrt	305	2W2A OnlineShrt	305	2W2A OnlineShrt	305	2W2A OnlineShrt
306	2V3A OnlineShrt	306	2V3A OnlineShrt	306	2V3A OnlineShrt	306	2V3A OnlineShrt
307	2U4A OnlineShrt	307	2U4A OnlineShrt	307	2U4A OnlineShrt	307	2U4A OnlineShrt
308	2W5A OnlineShrt	308	2W5A OnlineShrt	308	2W5A OnlineShrt	308	2W5A OnlineShrt
309	2V6A OnlineShrt	309	2V6A OnlineShrt	309	2V6A OnlineShrt	309	2V6A OnlineShrt
310	2U1B OnlineShrt	310	2U1B OnlineShrt	310	2U1B OnlineShrt	310	2U1B OnlineShrt
311	2W2B OnlineShrt	311	2W2B OnlineShrt	311	2W2B OnlineShrt	311	2W2B OnlineShrt
312	2V3B OnlineShrt	312	2V3B OnlineShrt	312	2V3B OnlineShrt	312	2V3B OnlineShrt
313	2U4B OnlineShrt	313	2U4B OnlineShrt	313	2U4B OnlineShrt	313	2U4B OnlineShrt
314	2W5B OnlineShrt	314	2W5B OnlineShrt	314	2W5B OnlineShrt	314	2W5B OnlineShrt
315	2V6B OnlineShrt	315	2V6B OnlineShrt	315	2V6B OnlineShrt	315	2V6B OnlineShrt
316	2U1C OnlineShrt	316	2U1C OnlineShrt	316	2U1C OnlineShrt	316	2U1C OnlineShrt
317	2W2C OnlineShrt	317	2W2C OnlineShrt	317	2W2C OnlineShrt	317	2W2C OnlineShrt
318	2V3C OnlineShrt	318	2V3C OnlineShrt	318	2V3C OnlineShrt	318	2V3C OnlineShrt
319	2U4C OnlineShrt	319	2U4C OnlineShrt	319	2U4C OnlineShrt	319	2U4C OnlineShrt
320	2W5C OnlineShrt	320	2W5C OnlineShrt	320	2W5C OnlineShrt	320	2W5C OnlineShrt
321	2V6C OnlineShrt	321	2V6C OnlineShrt	321	2V6C OnlineShrt	321	2V6C OnlineShrt
322	2U1A OfflineShrt	322	2U1A OfflineShrt	322	2U1A OfflineShrt	322	2U1A OfflineShrt
323	2W2A OfflineShrt	323	2W2A OfflineShrt	323	2W2A OfflineShrt	323	2W2A OfflineShrt
324	2V3A OfflineShrt	324	2V3A OfflineShrt	324	2V3A OfflineShrt	324	2V3A OfflineShrt
325	2U4A OfflineShrt	325	2U4A OfflineShrt	325	2U4A OfflineShrt	325	2U4A OfflineShrt
326	2W5A OfflineShrt	326	2W5A OfflineShrt	326	2W5A OfflineShrt	326	2W5A OfflineShrt
327	2V6A OfflineShrt	327	2V6A OfflineShrt	327	2V6A OfflineShrt	327	2V6A OfflineShrt
328	2U1B OfflineShrt	328	2U1B OfflineShrt	328	2U1B OfflineShrt	328	2U1B OfflineShrt
329	2W2B OfflineShrt	329	2W2B OfflineShrt	329	2W2B OfflineShrt	329	2W2B OfflineShrt
330	2V3B OfflineShrt	330	2V3B OfflineShrt	330	2V3B OfflineShrt	330	2V3B OfflineShrt
331	2U4B OfflineShrt	331	2U4B OfflineShrt	331	2U4B OfflineShrt	331	2U4B OfflineShrt
332	2W5B OfflineShrt	332	2W5B OfflineShrt	332	2W5B OfflineShrt	332	2W5B OfflineShrt
333	2V6B OfflineShrt	333	2V6B OfflineShrt	333	2V6B OfflineShrt	333	2V6B OfflineShrt
334	2U1C OfflineShrt	334	2U1C OfflineShrt	334	2U1C OfflineShrt	334	2U1C OfflineShrt
335	2W2C OfflineShrt	335	2W2C OfflineShrt	335	2W2C OfflineShrt	335	2W2C OfflineShrt
336	2V3C OfflineShrt	336	2V3C OfflineShrt	336	2V3C OfflineShrt	336	2V3C OfflineShrt
337	2U4C OfflineShrt	337	2U4C OfflineShrt	337	2U4C OfflineShrt	337	2U4C OfflineShrt
338	2W5C OfflineShrt	338	2W5C OfflineShrt	338	2W5C OfflineShrt	338	2W5C OfflineShrt
339	2V6C OfflineShrt	339	2V6C OfflineShrt	339	2V6C OfflineShrt	339	2V6C OfflineShrt

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
		340	LR Fan1 Ctctr	340	LR Fan1 Ctctr	340	LR Fan1 Ctctr
		341	LR Fan2 Ctctr	341	LR Fan2 Ctctr	341	LR Fan2 Ctctr
		342	CNV Fan3 Ctctr	342	CNV Fan3 Ctctr	342	CNV Fan3 Ctctr
		343	CNV Fan4 Ctctr	343	CNV Fan4 Ctctr	343	CNV Fan4 Ctctr
		344	CNV Fan5 Ctctr	344	CNV Fan5 Ctctr	344	CNV Fan5 Ctctr
		345	CNV Fan6 Ctctr	345	CNV Fan6 Ctctr	345	CNV Fan6 Ctctr
		346	CNV Fan7 Ctctr	346	CNV Fan7 Ctctr	346	CNV Fan7 Ctctr
		347	CNV Fan8 Ctctr	347	CNV Fan8 Ctctr	347	CNV Fan8 Ctctr
		348	CMC Fan9 Ctctr	348	CMC Fan9 Ctctr	348	CMC Fan9 Ctctr
		349	CMC Fan10 Ctctr	349	CMC Fan10 Ctctr	349	CMC Fan10 Ctctr
		350	SavedFanData Clr	350	SavedFanData Clr	350	SavedFanData Clr
		351	Warning Code 351	351	LR Blcked Inlet	351	LR Blcked Inlet
		352	Warning Code 352	352	LR Blcked Exhst	352	LR Blcked Exhst
		353	Warning Code 353	353	Warning Code 353	353	Warning Code 353
		354	Warning Code 354	354	Warning Code 354	354	Warning Code 354
		355	Warning Code 355	355	Warning Code 355	355	Warning Code 355
		356	LiqCool Leakage	356	LiqCool Leakage	356	LiqCool Leakage
		357	DB Fan Ctctr	357	DB Fan Ctctr	357	DB Fan Ctctr
		358	DB Fan ON	358	DB Fan ON	358	DB Fan ON
		359	DB High Amb Temp	359	DB High Amb Temp	359	DB High Amb Temp
		360	DB Disabled	360	DB Disabled	360	DB Disabled
		361	DB Ambient Loss	361	DB Ambient Loss	361	DB Ambient Loss
		362	DB Low Airflow	362	DB Low Airflow	362	DB Low Airflow
		363	DB AirflowSensor	363	DB AirflowSensor	363	DB AirflowSensor
		364	DBOvrTemperature	364	DBOvrTemperature	364	DBOvrTemperature
		365	DB Temp Sensor	365	DB Temp Sensor	365	DB Temp Sensor
		366	DB TFB DataError	366	DB TFB DataError	366	DB TFB DataError
		367	DBR Overload	367	DBR Overload	367	DBR Overload
		368	InvOvrVoltage SW	368	InvOvrVoltage SW	368	InvOvrVoltage SW
		369	Warning Code 369	369	Restart Xpired	369	Restart Xpired
		370	Warning Code 370	370	Warning Code 370	370	Warning Code 370
		371	Warning Code 371	371	Warning Code 371	371	Warning Code 371
		372	Rs Tune Skipped	372	Rs Tune Skipped	372	Rs Tune Skipped
		373	RStator Low	373	RStator Low	373	RStator Low
		374	Inertia Low	374	Inertia Low	374	Inertia Low
		375	Warning Code 375	375	Rotor Not Locked	375	Rotor Not Locked
		376	Warning Code 376	376	Warning Code 376	376	Rotor Not Moved
		377	Warning Code 377	377	Warning Code 377	377	M Cap Comp High
		378	Warning Code 378	378	Warning Code 378	378	Warning Code 378

7.xxx		***8.xxx***		***9.xxx***		***10.xxx***	
		379	Warning Code 379	379	Warning Code 379	379	Warning Code 379
		380	Warning Code 380	380	Warning Code 380	380	Warning Code 380
		381	Warning Code 381	381	Warning Code 381	381	Warning Code 381
		382	Warning Code 382	382	Warning Code 382	382	Warning Code 382
		383	Warning Code 383	383	Warning Code 383	383	Warning Code 383
		384	Warning Code 384	384	Warning Code 384	384	Warning Code 384
		385	Warning Code 385	385	Warning Code 385	385	Warning Code 385
		386	Warning Code 386	386	Warning Code 386	386	Warning Code 386
		387	Warning Code 387	387	Warning Code 387	387	Warning Code 387
		388	2U Low Airflow	388	2U Low Airflow	388	2U Low Airflow
		389	2V Low Airflow	389	2V Low Airflow	389	2V Low Airflow
		390	2W Low Airflow	390	2W Low Airflow	390	2W Low Airflow
		391	Inv Low Airflow	391	Inv Low Airflow	391	Inv Low Airflow
		392	2U AirflowSensor	392	2U AirflowSensor	392	2U AirflowSensor
		393	2V AirflowSensor	393	2V AirflowSensor	393	2V AirflowSensor
		394	2W AirflowSensor	394	2W AirflowSensor	394	2W AirflowSensor
		395	Inv AirflwSensor	395	Inv AirflwSensor	395	Inv AirflwSensor
		396	2U Temp Sensor	396	2U Temp Sensor	396	2U Temp Sensor
		397	2V Temp Sensor	397	2V Temp Sensor	397	2V Temp Sensor
		398	2W Temp Sensor	398	2W Temp Sensor	398	2W Temp Sensor
		399	Inv Temp Sensor	399	Inv Temp Sensor	399	Inv Temp Sensor
		400	Warning Code 400	400	Warning Code 400	400	Warning Code 400
		401	Warning Code 401	401	Warning Code 401	401	Warning Code 401
		402	Warning Code 402	402	Warning Code 402	402	Warning Code 402
		403	Warning Code 403	403	Warning Code 403	403	Warning Code 403
		404	Junction OvrTemp	404	Junction OvrTemp	404	Junction OvrTemp
		405	Low Cnv Airflow	405	Low Cnv Airflow	405	Low Cnv Airflow
		406	High AmbientTemp	406	High AmbientTemp	406	High AmbientTemp
		407	TFB FbkData Err	407	TFB FbkData Err	407	TFB FbkData Err
		408	Warning Code 408	408	Warning Code 408	408	Warning Code 408
		409	Warning Code 409	409	Warning Code 409	409	Warning Code 409
		410	Warning Code 410	410	Warning Code 410	410	Warning Code 410
		411	Warning Code 411	411	Warning Code 411	411	Warning Code 411
		412	Warning Code 412	412	Warning Code 412	412	Warning Code 412
		413	Warning Code 413	413	Warning Code 413	413	Warning Code 413
		414	Warning Code 414	414	Warning Code 414	414	Warning Code 414
		415	Warning Code 415	415	Warning Code 415	415	Warning Code 415
		416	Warning Code 416	416	Warning Code 416	416	Warning Code 416
		417	Warning Code 417	417	Warning Code 417	417	Warning Code 417

7.*xxx*		8.*xxx*		9.*xxx*		10.*xxx*	
		418	Warning Code 418	418	Warning Code 418	418	Warning Code 418
		419	Warning Code 419	419	Warning Code 419	419	Warning Code 419
		420	DBSE1Online	420	DBSE1Online	420	DBSE1Online
		421	DBSE2Online	421	DBSE2Online	421	DBSE2Online
		422	DBSE3Online	422	DBSE3Online	422	DBSE3Online
		423	DBSE4Online	423	DBSE4Online	423	DBSE4Online
		424	DBSH1Online	424	DBSH1Online	424	DBSH1Online
		425	DBSH2Online	425	DBSH2Online	425	DBSH2Online
		426	DBSH3Online	426	DBSH3Online	426	DBSH3Online
		427	DBSH4Online	427	DBSH4Online	427	DBSH4Online
		428	Warning Code 428	428	Warning Code 428	428	Warning Code 428
		429	Warning Code 429	429	Warning Code 429	429	Warning Code 429
		430	Warning Code 430	430	Warning Code 430	430	Warning Code 430
		431	Warning Code 431	431	Warning Code 431	431	Warning Code 431
		432	Warning Code 432	432	Warning Code 432	432	Warning Code 432
		433	Warning Code 433	433	Warning Code 433	433	Warning Code 433
		434	Warning Code 434	434	Warning Code 434	434	Warning Code 434
		435	Warning Code 435	435	Warning Code 435	435	Warning Code 435
		436	2U High Amb Temp	436	2U High Amb Temp	436	2U High Amb Temp
		437	2U Low Amb Temp	437	2U Low Amb Temp	437	2U Low Amb Temp
		438	2V High Amb Temp	438	2V High Amb Temp	438	2V High Amb Temp
		439	2V Low Amb Temp	439	2V Low Amb Temp	439	2V Low Amb Temp
		440	2W High Amb Temp	440	2W High Amb Temp	440	2W High Amb Temp
		441	2W Low Amb Temp	441	2W Low Amb Temp	441	2W Low Amb Temp
		442	Inv High Ambient	442	Inv High Ambient	442	Inv High Ambient
		443	Inv Low Ambient	443	Inv Low Ambient	443	Inv Low Ambient
		444	2U Ambient Loss	444	2U Ambient Loss	444	2U Ambient Loss
		445	2V Ambient Loss	445	2V Ambient Loss	445	2V Ambient Loss
		446	2W Ambient Loss	446	2W Ambient Loss	446	2W Ambient Loss
		447	Inv Ambient Loss	447	Inv Ambient Loss	447	Inv Ambient Loss
		448	2U Over Temp	448	2U Over Temp	448	2U Over Temp
		449	2V Over Temp	449	2V Over Temp	449	2V Over Temp
		450	2W Over Temp	450	2W Over Temp	450	2W Over Temp
		451	Inv HS Over Temp	451	Inv HS Over Temp	451	Inv HS Over Temp
		452	RefSlct Conflict	452	RefSlct Conflict	452	RefSlct Conflict
		453	Warning Code 453	453	Warning Code 453	453	Warning Code 453
		454	Warning Code 454	454	Warning Code 454	454	Warning Code 454
		455	Warning Code 455	455	Warning Code 455	455	Warning Code 455

7.*xxx*		8.*xxx*		9.*xxx*		10.*xxx*	
		456	Warning Code 456	456	Warning Code 456	456	Warning Code 456
		457	Warning Code 457	457	Warning Code 457	457	Warning Code 457
		458	Warning Code 458	458	Warning Code 458	458	Warning Code 458
		459	Warning Code 459	459	Warning Code 459	459	Warning Code 459
		460	Warning Code 460	460	Warning Code 460	460	Warning Code 460
		461	Warning Code 461	461	Warning Code 461	461	Warning Code 461
		462	Warning Code 462	462	Warning Code 462	462	Warning Code 462
		463	Warning Code 463	463	Warning Code 463	463	Warning Code 463
		464	Warning Code 464	464	Warning Code 464	464	Warning Code 464
		465	Warning Code 465	465	Warning Code 465	465	Warning Code 465
		466	Warning Code 466	466	Warning Code 466	466	Warning Code 466
		467	Warning Code 467	467	Warning Code 467	467	Warning Code 467
		468	LR Fan1 Aux	468	LR Fan1 Aux	468	LR Fan1 Aux
		469	LR Fan2 Aux	469	LR Fan2 Aux	469	LR Fan2 Aux
		470	Cnv Fan3 Aux	470	Cnv Fan3 Aux	470	Cnv Fan3 Aux
		471	Cnv Fan4 Aux	471	Cnv Fan4 Aux	471	Cnv Fan4 Aux
		472	Cnv Fan5 Aux	472	Cnv Fan5 Aux	472	Cnv Fan5 Aux
		473	Cnv Fan6 Aux	473	Cnv Fan6 Aux	473	Cnv Fan6 Aux
		474	Cnv Fan7 Aux	474	Cnv Fan7 Aux	474	Cnv Fan7 Aux
		475	Cnv Fan8 Aux	475	Cnv Fan8 Aux	475	Cnv Fan8 Aux
		476	CMC Fan9 Aux	476	CMC Fan9 Aux	476	CMC Fan9 Aux
		477	CMC Fan10 Aux	477	CMC Fan10 Aux	477	CMC Fan10 Aux
		478	UV Blcked Inlet	478	UV Blcked Inlet	478	UV Blcked Inlet
		479	VW Blcked Inlet	479	VW Blcked Inlet	479	VW Blcked Inlet
		480	CMC Blcked Inlet	480	CMC Blcked Inlet	480	CMC Blcked Inlet
		481	CMC Blcked Exhst	481	CMC Blcked Exhst	481	CMC Blcked Exhst
		482	UV Blcked Exhst	482	UV Blcked Exhst	482	UV Blcked Exhst
		483	VW Blcked Exhst	483	VW Blcked Exhst	483	VW Blcked Exhst
				484	Warning Code 484	484	Warning Code 484
				485	Warning Code 485	485	Warning Code 485
				486	Encoder PhZ Loss	486	Encoder PhZ Loss
				487	AbsEncPhaseLoss	487	AbsEncPhaseLoss
				488	Warning Code 488	488	Warning Code 488
				489	Warning Code 489	489	Warning Code 489
				490	Warning Code 490	490	Warning Code 490
				491	Warning Code 491	491	Warning Code 491
				492	Warning Code 492	492	Warning Code 492
				493	Warning Code 493	493	Warning Code 493
				494	Warning Code 494	494	Warning Code 494

7.*xxx*		**8.*xxx***		**9.*xxx***		**10.*xxx***	
				495	Warning Code 495	495	Warning Code 495
				496	Warning Code 496	496	Warning Code 496
				497	Warning Code 497	497	Warning Code 497
				498	Warning Code 498	498	Warning Code 498
				499	Warning Code 499	499	Warning Code 499
						500	DuplctMaster Wrn
						501	CRC Warning
						502	Arbitration Warn
						503	Master Txfr Warn
						504	New Master
						505	Minimum Capacity
						506	DCSL Not Enabled
						507	DCSL Conflict
						516	HPTC Config Err
						517	HPTC Conflict
						518	Spd BW Reduced

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products. At http://www.rockwellautomation.com/support you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at https://rockwellautomation.custhelp.com/ for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/services/online-phone.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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