

MPT Electric Fire Pump Controller

Alarm Messages and Troubleshooting Guide

This manual provides alarm descriptions, troubleshooting steps, and alarm set point configuration information for Metron MPT Fire Pump Controllers and MPT Electric Fire Pump Controllers with Metron Transfer Switch (MTS).

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History of Changes

Rev. No.	Date	Description of Changes
A	May 2016	Initial Release
B	November 2016	Update text so manual can be used with non-MTS controllers.

Introduction

This manual provides alarm descriptions, troubleshooting steps, and alarm set point configuration information for all alarm conditions for the controller.

For instructions for navigating the Operator Interface Device (OID) and for configuration set points, please refer to Publication 245, *MPT Electric Fire Pump Controller with MTS Setup and Operating Instructions*.

NOTICE Read these instructions thoroughly before troubleshooting the controller. If there are still questions, contact your Metron factory representative for assistance.

Precautions

CAUTION To avoid risk of **SERIOUS INJURY or DEATH**, and to avoid damage to the controller, **READ THIS SECTION CAREFULLY**. If questions or concerns still exist, contact the Metron factory for further clarification.



ARC FLASH

Do not operate controls or open covers without appropriate personal protection equipment. Failure to comply may result in **SERIOUS INJURY or DEATH!** Refer to NFPA70E for PPE requirements.



HAZARD

If work must be carried out on the motor or controller, ensure the controller is **ISOLATED AND LOCKED OFF** from the AC mains supply before work commences. Lockout/Tag out procedures should be followed in accordance with NFPA standard and any local standards that may apply.

On application of power, to prevent automatic starting of the motor press and hold the **STOP** key. The system will be in a configuration mode and will not start the motor. Configuration mode will last for five (5) minutes, unless the on-screen "Exit Config Mode" button is pressed.

Pressure Alarms

Low Pressure

Description

System pressure is at or below the configured low pressure level. The alarm is configured per the user's discretion and may be disabled.

Troubleshooting

- If typical system pressure is causing the alarm, lower the *Low Pressure Level* set point. If a valid low pressure condition occurs routinely, but quickly returns to the typical system pressure level (i.e., the Jockey pump boosts pressure), increase the *Low Pressure Alarm Delay* set point to prevent nuisance alarms and motor starts.
- Verify pressure readings on display are correct.
- Calibrate pressure readings
- Replace the transducer

Related Set Points

Pressure Settings: Low Pressure Alarm Option

Pressure Settings: Low Pressure Level

Pressure Settings: Low Pressure Alarm Delay

High Pressure

Description

System Pressure is at or above the configured high pressure level. The alarm is configured per the user's discretion and may be disabled.

Troubleshooting

- If typical system pressure is causing the alarm, increase the *High Pressure Level* set point. If a valid high pressure condition occurs routinely, but quickly returns to the typical system pressure level, increase the *High Pressure Alarm Delay* set point to prevent nuisance alarms.
- Verify pressure readings on display are correct.
- Calibrate pressure readings

- Replace the transducer.

Related Set Points

Pressure Settings: High Pressure Alarm Option

Pressure Settings: High Pressure Level

Pressure Settings: High Pressure Alarm Delay

Pressure Transducer Fault

Description

This critical alarm occurs because there is a problem with the pressure transducer or its wiring.

Troubleshooting

- Check transducer cable.

Related Set Points

None

Low Intake

Description

The low intake contact at Input 54/55 on the 12 Channel I/O board is not in its normal position. This alarm will only occur while the motor is running.

Troubleshooting

- If a low intake condition has occurred, the issue is external to the MPT controller. If a false alarm occurred, verify that the *Low Intake Contact Type* set point is configured properly.
- If the system is not equipped with low intake monitoring equipment, set the *Low Intake Contact Type* set point to “N/O” and do not connect any wires to Input 54/55 on the 12-Channel I/O board. Input 54/55 cannot be reused for any other purpose.
- Check the wiring connected to the 12 Ch IO board TB2 input 54/55.

Related Set Points

Stop Settings: Low Intake Shutdown

Stop Settings: Low Intake Alarm Delay

Stop Settings: Low Intake Auto Reset

Stop Settings: Low Intake Contact Type

Normal Source Power Alarms

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Normal Source Phase Reversal

Description

This alarm occurs when a phase reversal is detected on the normal source.

Troubleshooting

Insure that both the normal source and the emergency source have the same phase rotation. If the phase rotation is different between the two sources, correct one of the sources.

Once both sources have the same phase rotation, if the phase reversal alarm is still exists, toggle the settings for the *Phase Order* set point.

Next, verify that the motor spins in the correct direction. If the motor spins in the opposite direction, the motor power wires must be corrected.

Related Set Points

Normal Power Parameters: Phase Order

Phase Failure on AB/BC/AC

Description

The voltage on the specified phase is at or below 85% of the nominal system voltage.

Troubleshooting

- Verify incoming voltage is correct across all three phases.
- Is the alarm interemittent?
- This alarm indicates a problem with the normal source power supply. To avoid nuisance alarms caused by momentary dips in voltage, the *Phase Loss Alarm Delay* set point may be adjusted.

Related Set Points

Normal Power Parameters: Phase Loss Alarm Delay

Loss of Normal Power

Description

This alarm indicates that normal source voltage has dropped below 120V on all phases.

Troubleshooting

- Verify incoming voltage is correct.
- If line side voltage for the normal source is available:
 - Verify that the normal source circuit breaker has not tripped by turning the normal source power isolation switch to the off position and then back to the on position.

Related Set Points

None

Normal Source Low Voltage

Description

This alarm indicates that normal source voltage on at least one phase is at or below the configured *Low Voltage Percentage* set point.

Troubleshooting

- Verify incoming voltage is correct across all three phases.
- If typical normal source voltage is causing the alarm, lower the *Low Voltage Percentage* set point (default is 90% of nominal). If a valid under voltage alarm occurs routinely, but quickly returns to the typical normal source voltage, increase the *Low Voltage Alarm Delay* set point to prevent nuisance alarms.
- This alarm is configurable per the user's discretion and may be disabled by configuring the *Low Voltage Percentage* set point to its lowest value.

Related Set Points

Normal Power Parameters: Low Voltage Percentage

Normal Power Parameters: Low Voltage Alarm Delay

Normal Source High Voltage

Description

Normal source voltage on at least one phase is at or above the configured *High Voltage Percentage* set point.

Troubleshooting

- Verify incoming voltage is correct across all three phases.
- If typical normal source voltage is causing the alarm, increase the *High Voltage Percentage* set point (default is 115% of nominal). If a valid over voltage condition occurs routinely, but quickly returns to the typical normal source voltage, increase the *High Voltage Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

High Voltage Percentage
High Voltage Alarm Delay

Normal Source Under Frequency

Description

Normal source frequency on at least one phase is at or below the configured *Under Frequency % of Nominal* set point.

Troubleshooting

If typical normal source frequency is causing the alarm, lower the *Under Frequency % of Nominal* set point. If a valid under frequency alarm occurs routinely, but quickly returns to the typical normal source voltage, increase the *Under Frequency Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

Normal Power Parameters: Under Frequency % of Nominal
Normal Power Parameters: Under Frequency Alarm Delay

Normal Source Over Frequency

Description

Normal source frequency on at least one phase is at or above the configured *Over Frequency % of Nominal* set point.

Troubleshooting

If typical normal source frequency is causing the alarm, lower the *Over Frequency % of Nominal* set point. If a valid under frequency alarm occurs

routinely, but quickly returns to the typical normal source voltage, increase the *Over Frequency Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

Normal Power Parameters: Over Frequency % of Nominal

Normal Power Parameters: Over Frequency Alarm Delay

Supervisory Power Failure

Description

This alarm indicates a loss of supervisory power, which is external to the MPT controller. The input for the alarm is normally closed and is located at Input 56/57 on the 12-Channel I/O board.

Troubleshooting

- Check for Supervisor Power 120VAC on terminals 207/211.
- If a supervisory power 120VAC is available, check the wiring from the 12-Channel I/O board to terminals 207/211. See field connection schematic page 1 on door of the enclosure.
- NOTE: this alarm relates to a factory-installed option and is not available on all controllers.

Related Set Points

Start Settings: Supervisory Power Failure Start

Start Settings: Supervisory Power Failure Start Delay

Emergency Source Power Alarms

This section only applies to controllers equipped with MTS.

CAUTION



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Emergency Source Isolation Switch Open

Description

The emergency power source isolation switch is in the off position.

Troubleshooting

- Turn the emergency power source isolation switch to the on position.
- Verify that the circuit breaker has not tripped by turning the emergency power source isolation switch to the off position, and then back to the on position.
- Check the wiring per the system schematic on the enclosure door.

Related Set Points

None

Emergency Source Phase Reversal

Description

This alarm occurs when a phase reversal is detected on the emergency source.

Troubleshooting

Insure that both the normal source and the emergency source have the same phase rotation. If the phase rotation is different between the two sources, correct one of the sources.

Once both sources have the same phase rotation, if the phase reversal alarm still exists, toggle the settings for the *Phase Order* set point.

Next, verify that the motor spins in the correct direction. If the motor spins in the opposite direction, the motor power wires must be corrected.

Related Set Points

Normal Power Parameters: Phase Order

Emergency Phase Failure on AB/BC/AC

Description

The voltage on the specified phase is at or below 85% of the nominal system voltage.

Troubleshooting

- Verify incoming voltage is correct.
- This alarm indicates a problem with the emergency source power supply. To avoid nuisance alarms caused by momentary dips in voltage, the *Phase Loss Alarm Delay* set point may be adjusted.

Related Set Points

Emergency Power Parameters: Phase Loss Alarm Delay

Loss of Emergency Power

Description

This alarm indicates that emergency source voltage has dropped below 120V on all phases. This alarm only occurs if the *Emergency Source Type* set point is configured as *Utility*.

Troubleshooting

- Verify side voltage for the emergency source is available:
- Verify that the emergency source circuit breaker has not tripped by turning the emergency source power isolation switch to the off position and then back to the on position.

Related Set Points

Transfer Switch Settings: Emergency Source Type

Genset Fail to Start

Description

This alarm indicates that emergency source voltage was not detected after the genset start relay was energized. This alarm only occurs if the *Emergency Source Type* set point is configured as *Genset*.

Troubleshooting

- Verify the Emergency Source Isolation Switch is not open.
- Verify the Engine Start contact closed.

Related Set Points

Transfer Switch Settings: Emergency Source Type

Emergency Source Low Voltage

Description

This alarm indicates that emergency source voltage on at least one phase is at or below the configured *Low Voltage Percentage* set point.

Troubleshooting

- Verify incoming voltage is correct across all three phases.
- If typical emergency source voltage is causing the alarm, lower the *Low Voltage Percentage* set point (default is 90% of nominal). If a valid under voltage alarm occurs routinely, but quickly returns to the typical emergency source voltage, increase the *Low Voltage Alarm Delay* set point to prevent nuisance alarms.
- This alarm is configurable per the user's discretion and may be disabled by configuring the *Low Voltage Percentage* set point to its lowest value.

Related Set Points

Emergency Power Parameters: Low Voltage Percentage

Emergency Power Parameters: Low Voltage Alarm Delay

Emergency Source High Voltage

Description

Emergency source voltage on at least one phase is at or above the configured *High Voltage Percentage* set point.

Troubleshooting

- Verify incoming voltage is correct across all three phases.
- If typical emergency source voltage is causing the alarm, increase the *High Voltage Percentage* set point (default is 115% of nominal). If a valid over voltage condition occurs routinely, but quickly returns to

the typical emergency source voltage, increase the *High Voltage Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

High Voltage Percentage
High Voltage Alarm Delay

Emergency Source Under Frequency

Description

Emergency source frequency on at least one phase is at or below the configured *Under Frequency % of Nominal* set point.

Troubleshooting

- If the emergency source is a Genset verify operation.
- If typical normal source frequency is causing the alarm, lower the *Under Frequency % of Nominal* set point. If a valid under frequency alarm occurs routinely, but quickly returns to the typical normal source voltage, increase the *Under Frequency Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

Emergency Power Parameters: Under Frequency % of Nominal
Emergency Power Parameters: Under Frequency Alarm Delay

Emergency Source Over Frequency

Description

Emergency source frequency on at least one phase is at or above the configured *Over Frequency % of Nominal* set point.

Troubleshooting

- If the emergency source is a Genset verify operation.
- If typical emergency source frequency is causing the alarm, lower the *Over Frequency % of Nominal* set point. If a valid under frequency alarm occurs routinely, but quickly returns to the typical normal source voltage, increase the *Over Frequency Alarm Delay* set point to prevent nuisance alarms.

Related Set Points

Emergency Power Parameters: Over Frequency % of Nominal
Emergency Power Parameters: Over Frequency Alarm Delay

Motor Alarms

Fail to Start

Description

This alarm indicates that the controller attempted to energize the Run Contact, but no motor current was detected and the Run Contact feedback was not detected.

Troubleshooting

- Verify current on each of the phases.
- The run contactor/aux contacts did not close.
- Check wiring to the run contactor's coil.
- Check the run contactor's coil.
- Check run contactor operation.

Related Set Points

Motor Parameters: No Load/Fail to Start Time Delay

No Load

Description

This alarm indicates that the controller energized the Run Contact and the Run Contact feedback was detected, but the motor current did not exceed the configured *No Load Amps % of FLA* set point level.

Troubleshooting

- Verify current on each of the phases.
- Check the wiring from the run contactor to the motor.
- Check the motor continuity.

Related Set Points

Motor Parameters: No Load/Fail to Start Time Delay

Motor Parameters: No Load Amps % of FLA

Run Contact Fault

Description

This alarm indicates that the controller energized the Run Contact and the motor started, but the Run Contact feedback was not detected.

Troubleshooting

Check wiring to 12 Ch IO board HC90775 Input 2-42/43. Check operation of run contactor Aux contact.

Related Set Points

None

Motor Overload

Description

This alarm indicates that the motor current exceeded the configured *Overload Alarm % of FLA* set point level (default is 300%).

Troubleshooting

- Verify motor FLA with controller nameplate ratings.
- Is the alarm intermittent?
- If the motor overload alarm occurs momentarily, but then clears, increase the *Overload Alarm Time Delay* set point value.
- Verify that the configured *Overload Alarm % of FLA* set point value is not within the acceptable level for the motor.
- Check the motor.

Related Set Points

Motor Parameters: Overload Alarm % of FLA

Motor Parameters: Overload Alarm Time Delay

Motor Parameters: Overload Shunt Trip Time

Locked Rotor

Description

This alarm indicates that the motor current exceeded the configured Locked Rotor Alarm % of FLA set point value for at least three (3) seconds (default of 600%).

Troubleshooting

- Is the alarm intermittent?
- Check motor operation

Related Set Points

Motor Parameters: Locked Rotor Alarm % of FLA

Motor Parameters: Locked Rotor Alarm Delay

Start Contact Fault

Description

This alarm indicates that the when starting the motor, the Start Contact feedback was not detected.

This alarm only occurs for models MPT420, MPT430, and MPT435.

Troubleshooting

- Check wiring going to the start contactor per the system schematic on the enclosure door.
- Check start contactor coil.

Related Set Points

None

Soft Start Fault

Description

This alarm indicates that a soft start fault has occurred.

This alarm only occurs for model MPT700.

Troubleshooting

- Verify the soft starter operation.
- Check soft starter wiring per the system schematic on the enclosure door.

Related Set Points

None

Transfer Switch Fault (MTS Only)

Description

This alarm indicates that the transfer switch position indicator has a fault.

Troubleshooting

- Check position of transfer switch.
- Verify transfer switch operation.

Related Set Points

None

Low Zone Fail to Start

Description

This alarm indicates that the low zone run signal was not detected at Input 60/61 on the 12-Channel I/O board.

Troubleshooting

- Verify low zone controller is operational.
- Check wiring to the 12-Channel I/O board TB2-Input 60/61.

Related Set Points

High Zone Settings: High Zone Option
High Zone Settings: Low Zone Start Delay
High Zone Settings: Always Start

Low Zone Quit

Description

This alarm indicates that the low zone run signal at Input 60/61 on the 12-Channel I/O board was lost.

Troubleshooting

- Verify low zone controller is operational.
- Check wiring to the 12-Channel I/O board TB2-Input 60/61.

Related Set Points

High Zone Settings: High Zone Option
High Zone Settings: Low Zone Start Delay
High Zone Settings: Always Start

Hardware Alarms

Low/Missing Clock Battery

Description

The clock backup battery has low voltage, is faulty, or is missing.

Troubleshooting

Replace coin battery on HC90772002 board with the exact part number.

Related Set Points

None

Problem with Power Comms PCB Hub

Description

This alarm indicates that I/O communication with the Power Comms Hub board is not working as expected.

Troubleshooting

- Verify cables are securely connected to the board.
- Verify that the 12-Channel I/O board/Power Monitor board is not causing the problem:
 1. With power turned off, disconnect the 12-Channel I/O board and the Power Monitor board from the Power Comms board.
 2. Reapply power.
 3. If the “Problem with Power Comms PCB” alarm reoccurs, replace the Power Comms Hub board (P/N HC90773).
 4. If the “Problem with Power Comms PCB” alarm *does not* occur, the issue may be with the 12-Channel I/O board or Power Monitor board. Refer to the Troubleshooting steps for those boards.

Problem with 12-Channel I/O PCB

Description

This alarm indicates that I/O communication with the 12-Channel I/O board is not working as expected.

Troubleshooting

- Verify cables are securely connected to the board.

- Verify that the issue is not with the Power Comms Hub board:
 1. With power turned off, disconnect the 12-Channel I/O board from the Power Comms board PC1 connector, and reconnect to the PC 4 connector.
 2. Reapply power.
 3. If the “Problem with 12-Channel I/O PCB” alarm reoccurs, replace the 12-Channel I/O board (P/N HC90775).
 4. If the “Problem with 12-Channel I/O PCB” alarm *does not* occur, the issue may be with the PC1 connector on the Power Comms Hub board. Replace the Power Comms Hub board (P/N HC90773).

Problem with Power Monitor PCB

Description

This alarm indicates that I/O communication with the Power Monitor board is not working as expected.

Troubleshooting

- Verify cables are securely connected to the board.
- Verify the the issue is not with the Transfer Switch Interface board:
 - With power turned off, disconnect the Transfer Switch Interface board from the Power Monitor board, and then reapply power.
 - If the “Problem with Power Monitor PCB” alarm *does not* reoccur, replace the Transfer Switch board (P/N HC90764).
- Verify that the issue is not with the Power Comms Hub board:
 - With power turned off, disconnect the Power Monitor board from the Power Comms board PC2 connector, and reconnect to the PC 4 connector.
 - Reapply power.
 - If the “Problem with Power Monitor PCB” alarm reoccurs, replace the Power Monitor board (P/N HC90764).
 - If the “Problem with Power Monitor PCB” alarm *does not* occur, the issue may be with the PC2 connector on the Power Comms Hub board. Replace the Power Comms Hub board (P/N HC90773).

Problem with Transfer Sw. PCB

Description

This alarm indicates that I/O communications with the Transfer Switch board is not working as expected.

Troubleshooting

- Verify cables are securely connected to the board.
- Replace the Transfer Switch Interface board (P/N HC90764).

Troubleshooting

1. The displayed voltage does not match my calibrated voltmeter readings.
 - Calibrate the voltage.
 - Replace the Power Monitor board HC90763

2. This displayed motor current does not match my calibrated ammeter readings.
 - Calibrate the current
 - Replace the Power Monitor board HC90763.

3. This displayed system pressure does not match my calibrated pressure guage.
 - Calibrate the pressure readings.
 - Replace the transducer.

Replacement Parts

For replacement parts, contact your local Metron sales office or the Metron factory at:

United States	Telephone: +1 (336) 434-2800 ext. 202 FAX: +1 (336) 434-2809 Email: salesmail@metroninc.com
Europe	Telephone: +44 (0) 1476 516130 Email: jmcivor@metroninc.com

Technical Support

United States	For 24-hour technical support: Telephone: +1 (336) 434-2800 ext. 183 Email: fpctechsupport@metroninc.com
Europe	Service & Commissioning Telephone: +44 (0) 1476 516129 Email: wrichardson@metroninc.com Emergency Contact: Telephone: +44 (0) 7730 050100

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