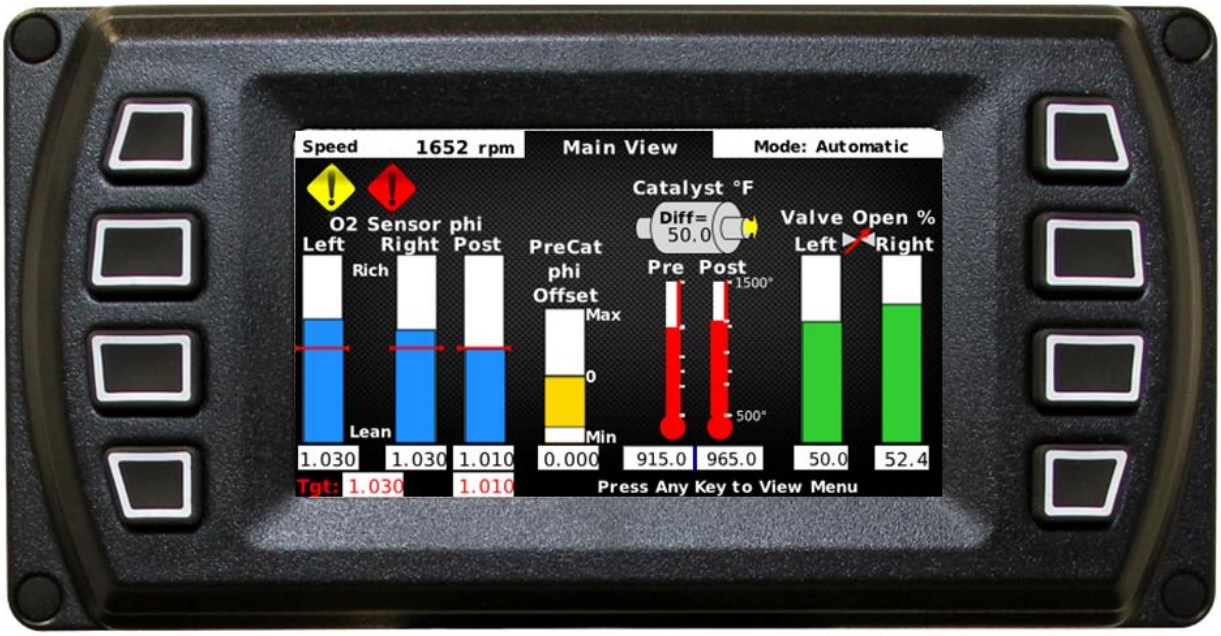
FW MURPHY®
PRODUCTION CONTROLS



AFR-64R and AFR-64L

Optional PV450 Display

Addendum to AFR-64 Operation Manual

Please read operation manual for hazard and safety advisement

00-02-0926
2016-07-27
Section 40

Warranty - A limited warranty on materials and workmanship is given with this FW Murphy product.
A copy of the warranty may be viewed or printed by going to http://www.fwmurphy.com/warranty

Please read the following information before installing.

BEFORE BEGINNING INSTALLATION OF THIS FW MURPHY PRODUCT:

- Read and follow all installation instructions.
- Please contact an FW Murphy U.S. Master Distributor immediately if you have any questions. http://www.fwmurphy.com/where-to-buy/us-sales-distributors
- Additional contact information is located on the back page of this document.
- To locate or download the latest documentation and software files. Open the AFR landing page http://www.fwmurphy.com/afr select literature, **Login to the Emissions Controls Products Extranet** and request an account if you don't already have one.

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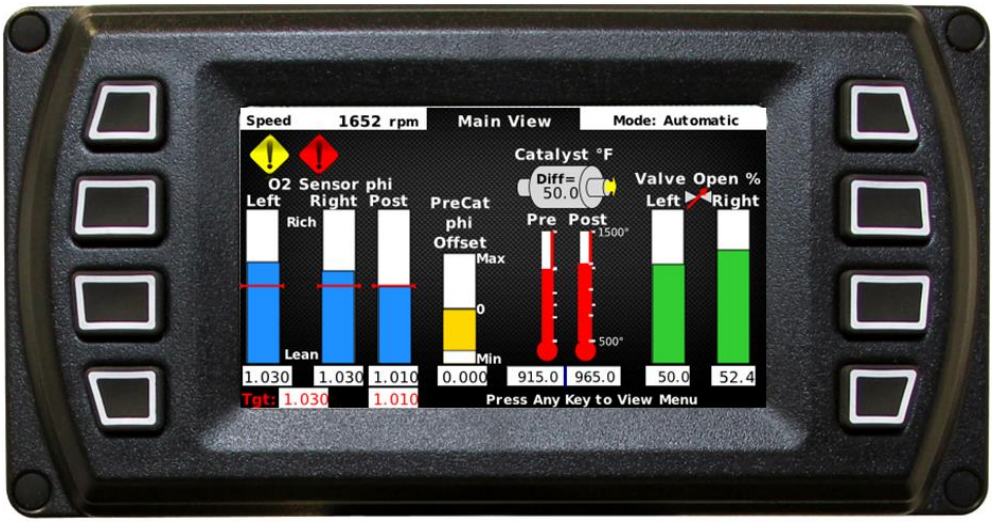
Overview

The AFR-64R and AFR-64L are available with the optional PV450 display mounted in the controller's enclosure, or the display can be purchased separately for remote mount. The same display is used for both products. It automatically detects the product to which it is connected.

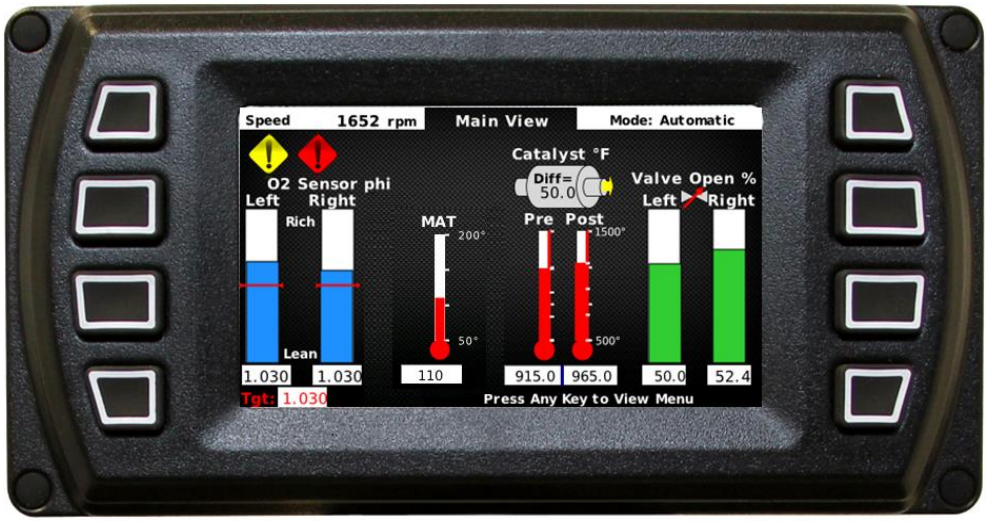
This display allows the user to view important controller parameters, clear alarms and temporarily place the controller into Manual Mode allowing the fuel control valve position to be manually manipulated. All other functionality (including initial setup) is performed with a Windows-based laptop running the software that ships with each controller on the included CD. Please refer to the main manual for the AFR-64R or AFR-64L for non-PV450 related information.

Main View

On the Main View screen, the user can monitor the operation of the AFR-64R or AFR-64L controller.



AFR-64R Main View Screen



AFR-64L Main View Screen

Staring at the top left corner of the Main View screen:

Engine Speed: Actual engine speed is calculated by the number of pulses per revolution entered by the user during the system setup.

Fault and Warning Indicators: The yellow symbol is an indicator that the fault relay has been activated and an active fault is present. The red symbol is an indicator that the shut-down relay has been activated and a shut-down fault is active.

O2 Sensor Phi Values: These are the values read from the Left Bank, Right Bank and Post-catalyst oxygen sensors and are used to determine the air-to-fuel ratio of the engine by measuring the excess exhaust oxygen concentration. If the engine is set up for a single bank application, the Right Bank sensor value will read OFF. If the post-catalyst oxygen sensor is turned off, the Post-catalyst sensor field will also read OFF. Note: the AFR-64L does not have post-catalyst sensors; therefore, the Main View does not show this.

Target Values: These are the desired phi targets for pre-catalyst and post-catalyst control (if equipped).

PreCat Phi Offset (AFR-64R only): This value indicates the amount of offset that has been applied to the pre-catalyst target to achieve the desired post-catalyst target. This value is only active if the post-catalyst sensor is used.

MAT - Manifold Air Temperature (AFR-64L only): The MAT gage shows the engine's manifold air temperature.

Catalyst Temperatures: The pre-catalyst and post-catalyst temperatures are displayed here along with the calculated differential between the two (post-cat minus pre-cat). If the catalyst thermocouples are not used, these values show ambient temperature inside of the enclosure.

Valve Position: These values are the commanded positions for the Left Bank and Right Bank fuel control valves.

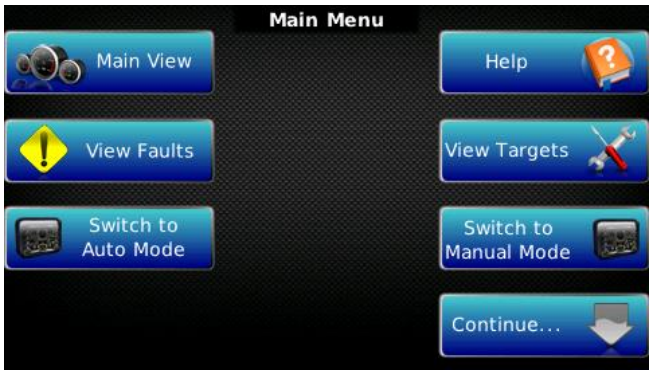
Mode: This field will indicate whether the valve control is in Automatic or Manual. While in automatic, the controller determines the valve position based on feedback from the oxygen sensors. While in manual, the user determines the valve position. Manual valve control can be accessed through the Main Menu. Note: Manual mode can only be entered while the engine is running.

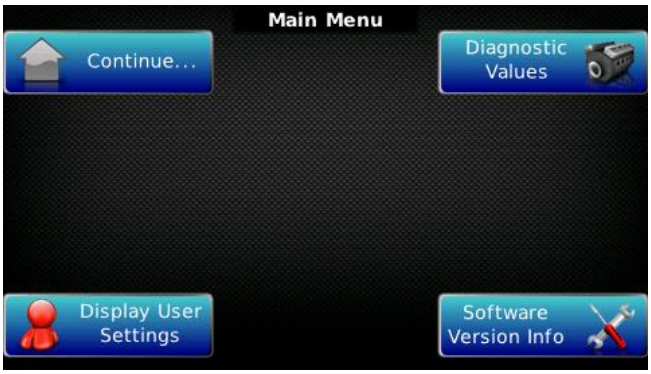
Press any button to access the Main Menu

Help Screens

Some screens will have a help button, which will provide contextually relevant information about the given screen.

Main Menu Screens

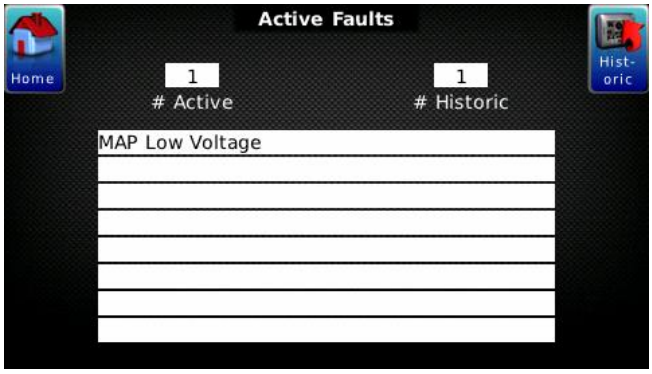




From this menu, every point of interest of the controller can be accessed.

View Fault Screens

Active Faults

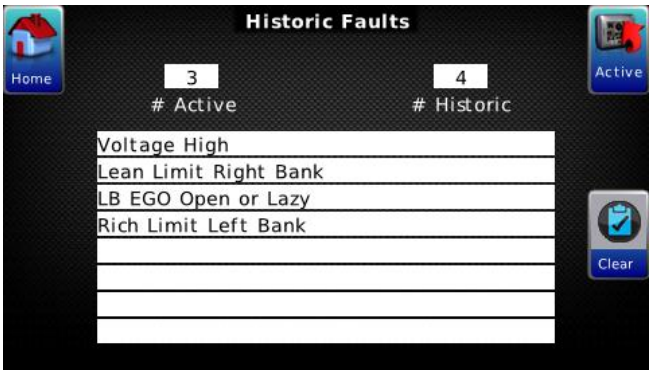


This screen shows all of the active or ongoing faults. At the top of the screen is a quick reference of the number of active and historic faults. The active fault screen will show up to eight concurrent faults. Any faults greater than eight will be hidden.

Pressing the Historic button will take you to the list of previous faults.

Pressing the Home button will return the user to the Main Menu screen.

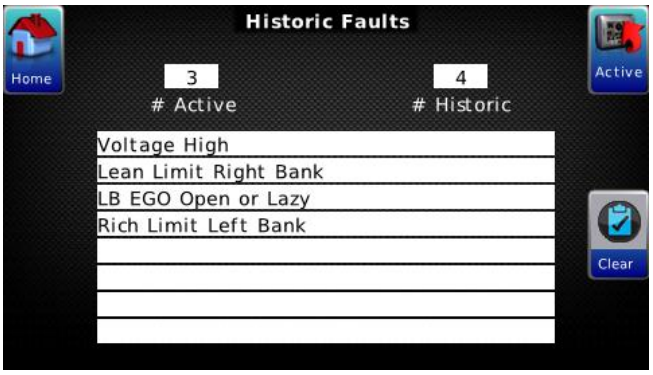
Historic Faults



The Historic fault screen is accessed through the Active Fault screen by selecting the Historic button. This screen shows all faults that have occurred but are no longer active. Up to eight most recent historic fault events can be shown. Any number of faults greater than eight are hidden. From here faults can be cleared.

Clearing Faults

Pressing the Clear button on the Historic Faults screen will purge all of the faults (both active and historic), but all active faults will return within 10 seconds. (The controller displays an active fault on both the active and historic pages. The difference being an active fault will disappear from the active fault page when the fault ceases while it will remain on the historic fault page until it is cleared or the number of historic faults that have accumulated have exceeded eight in number.)



Pressing the Active button will take you to the list of active faults.

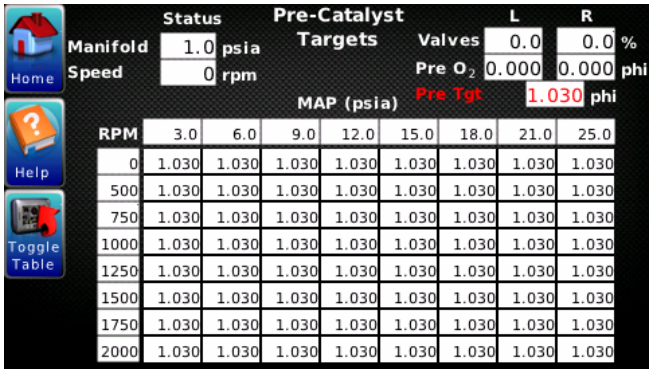
Pressing the Home button will return the user to the Main Menu screen.

Switching to Auto Mode (Automatic Mode)

Selecting Switch to Auto Mode on the Main Menu will place the controller in Automatic Mode where the controller monitors the signals from the oxygen sensors and manipulates the fuel controls valves to maintain the air/fuel targeted set point (as opposed to Manual Mode where the user can manually control the fuel valve position).

Viewing Targets Screens

View Pre-catalyst Targets Table

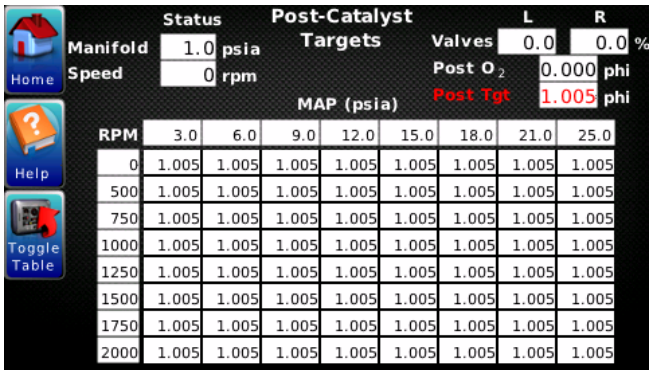


Selecting View Targets on the Main Menu will display the Pre-Catalyst Targets Screen. Multi-set point control is achieved through an 8 x 8 matrix of user set targets (using a laptop) from which the controller interpolates a final set point value.

Engine load is characterized by the intersection of engine RPM (along the left of the table) and manifold absolute pressure (along the top of the table). A pre-catalyst setpoint is interpolated from among the nearest four cells bracketing the engine's current rpm and manifold pressure. The resulting target is displayed in the upper right portion of the screen next to Pre Tgt (Pre Target).

On the AFR-64R, pressing Toggle Table on this screen will display the post-catalyst table which behaves the same as the pre-catalyst table. **Note: the Toggle button will not be present on the AFR-64L because it does not use a post-catalyst sensor.**

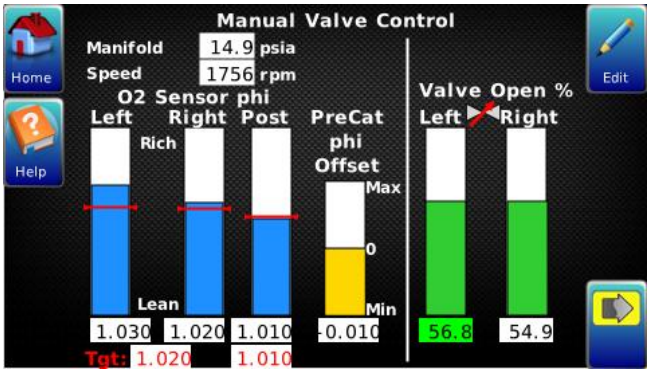
Viewing Post-catalyst Targets Table



On the Pre-catalyst Targets screen, pressing the Toggle Table button will show the post-catalyst table. **Note: the Toggle button will not be present on AFR-64L because it does not use a post-catalyst sensor.**

The post-catalyst table behaves the same as the pre-catalyst table. The post-catalyst target interpolated from the table is displayed in the upper right portion of the screen next to Post Tgt (Post Target). The post-catalyst target is used to calculate a pre-catalyst target offset and is an advanced feature of the AFR-64R. See the main manual for details.

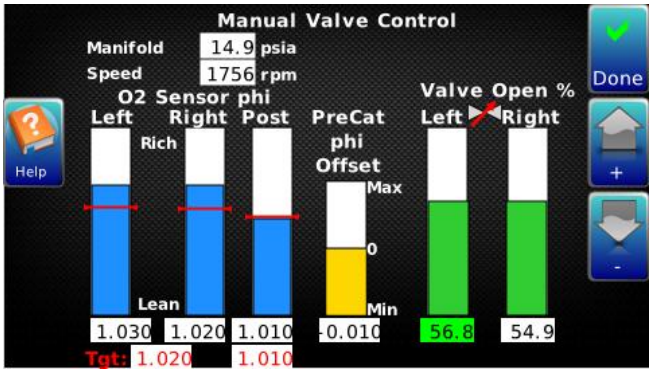
Manual Valve Control Screen (Manual Mode)



Choosing Switch to Manual Mode from the Main Menu will cause the controller to toggle to Manual Mode and lock the valves into a fixed position. The cursor will default to the left valve and can be moved to the right valve using the right arrow button.

Note: manual valve operation can only occur while the engine is running. If the engine is stopped, the controller will not allow a manual valve position to be set.

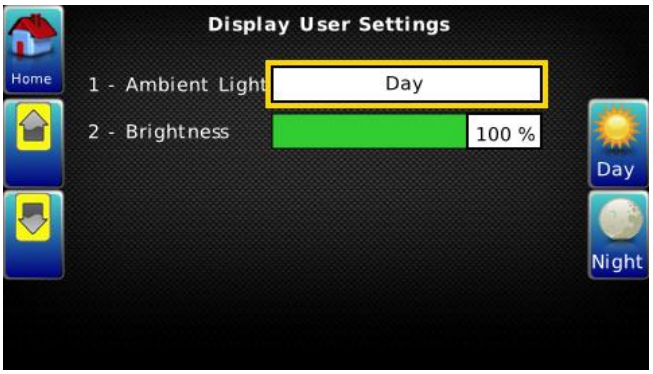
Once the desired valve is selected using the left and right arrows, pressing the Edit button will take the user to the adjustment screen.



The user can adjust the valve position up or down using the + or – buttons. Pressing the Done button will complete the adjustment and take the user back to the Manual Valve Control screen.

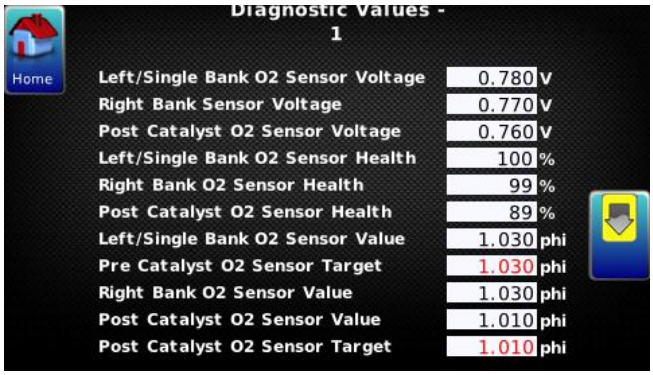
Note: The controller will remain in Manual mode until either the engine is shut down (in which case the controller will switch back to Auto Mode when the engine is restarted) or until the user selects Switch to Auto Mode from the Main Menu screen.

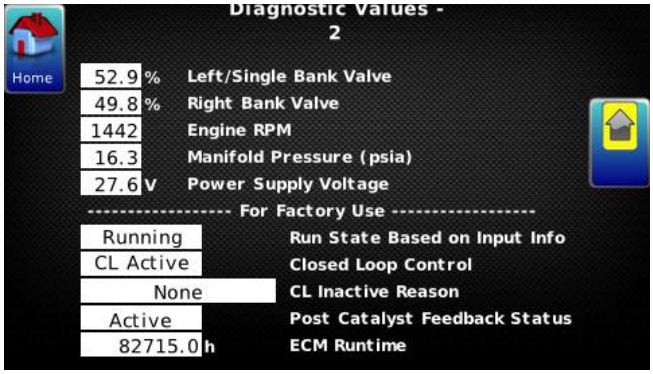
Display User Setting Screen



From this screen the user can adjust the Ambient Light and Brightness to the desired setting.

Diagnostic Value Screens

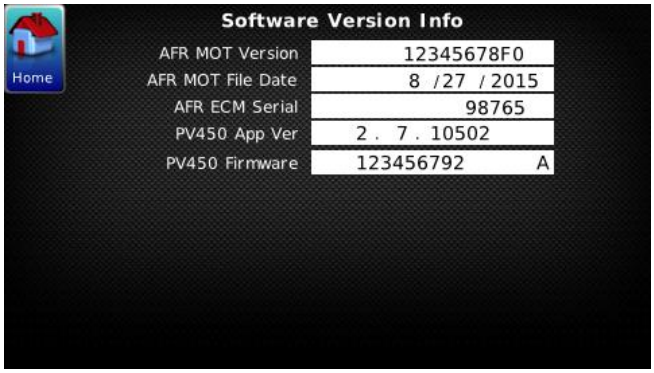




On these screens, the user can view key values of the controller on one page:

- Left Bank, Right Bank and Post-catalyst oxygen sensor voltages
- Left Bank, Right Bank and Post-catalyst oxygen sensor health
- Left Bank, Right Bank and Post-catalyst oxygen actual phi values
- Left Bank, Right Bank and Post-catalyst oxygen phi targets
- Left Bank and Right Bank valve positions
- Engine RPM and Intake Manifold Pressure
- Battery voltage at the ECM
- Basic operational state of the system as well as the ECM run hours (Note: this is not an engine hour meter.)

Software Version Info Screen



This screen shows software related information that is loaded on the ECM and on the PV450 display.

The ECM serial number is also displayed.

Replacement Part Numbers

The following parts associated with the optional display are available through a FW Murphy distributor:

Part Number	Description	Note
47700075	PV450NV-07-CSA-AFR	ARF PV450 Display (includes gasket and mounting hardware)
78000962	CABLE, COMM, PV450, RS485	Replacement Display Communications Cable, 27”
78000833	CABLE, COMM, PVW-450-D-RS485-72	Remote Mount Display Communications Cable, 6”
78001024	PVW-450-B-PWR-27 W/2A FUSE	Replacement Display Power Cable, Fused, 27”
78001153	PVW-450-B-PWR-72 W/2A FUSE	Replacement Display Power Cable, Fused, 6”
47700098	2 Amp Fuse – Bag of 5, Bussman ATC-2	Replacement Fuses for Display

Fuse Replacement

The PV450 Display power cable comes with an installed 2 Amp, Bussman ATC-2 fuse. The same or equivalent should be used when replacing.

This fuse may be obtained through a FW Murphy distributor using the FW Murphy part number listed in the Replacement Part Numbers section of this document.

Specifications for PV450 Display

PV450 Display

Input Power	8-32VDC; CSA certified; 2 Amps max and 30VDC max
Environmental	IP66 front and back
Operation temp	-40º F to 185º F (-40º C to 85º C) CSA certified; -22º F to 158º F (-30º C to 70º C)

Notes

Notes

FW MURPHY PRODUCTION CONTROLS

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