NASSAR® ELECTRONICS

SINCE 1973

User Manual

PUMP MONITOR
MODEL
PM-22





The best solutions for
automation and protection

Aug- 2026

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Description

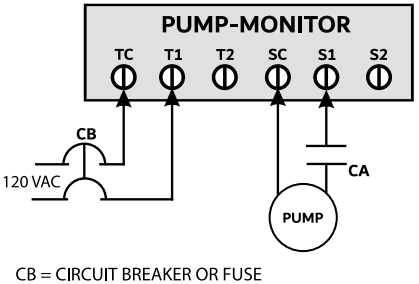
The PM-22 Series is a variety of pump monitors designed to protect single-phase pumps from dry-well, dead-head, jammed impeller, waterlogged tanks, rapid cycling, under/over voltage and over/underload. It includes an LCD display that shows the voltage, current, power consumption and faults. The trip point is user-adjustable and it also features automatic calibration allowing adjustments for specific pumping applications, reducing the possibility of false or nuisance tripping. A unique microcontroller-based sensing circuit constantly monitors the power and line voltage for fluctuations.
When a fault is detected the PM-22 after the trip delay— will turn off the pump . The user can select automatic or manual reset, when automatic reset is selected the PM -22 will turn on the pump after the restart delay (delay is user -adjustable).
The PM-22 has an internal contactor capable of starting motors up to 1.5 HP.

Wiring

The PM-22 is used in single phase pumps with a current consumption in the range of 4 to 15 Amps. This unit should be mounted in a convenient location in or near the pump control box. If the location is wet or dusty a NEMA 3R, 4, or 12 enclosure should be used.

The PM-22 must be protected by a fuse or circuit breaker to avoid any damage. The following diagrams show how to connect the PM-22 depending on the supply voltage available:

120VAC SUPPLY VOLTAGE

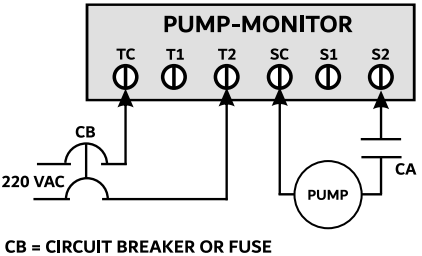


CB = CIRCUIT BREAKER OR FUSE
CA = CONTROL CONTACT

Features

- **Protects pumps from dry-well, dead-head, jammed impeller, waterlogged tanks, rapid cycling, under /over voltage, and over/underload.**
- **Starts motors up to 1.5 HP without the need of an external contactor.**
- **Stores faults on memory.**
- **LCD displays: Line voltages, current, power, failures, time delays, and a setup menu.**
- **Auto calibration.**
- **Manual or automatic reset.**

220 VAC SUPPLY VOLTAGE



CB = CIRCUIT BREAKER OR FUSE

CA = CONTROL CONTACT

The contact "CA" could be a pressure or float switch, a manual switch or any other control used to start/stop the pump automatically or manually.

DANGER!

Potentially hazardous voltages are present. Electrical shock can cause death or serious injury. Installation should be done by qualified personnel following all National, State & Local Codes.

BE SURE TO REMOVE ALL POWER SUPPLYING THIS EQUIPMENT BEFORE CONNECTING OR DISCONNECTING THE WIRING.
READ THE INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

Supply Voltage Selection

When the Pump-Monitor is turned ON for the first time it will ask the user to input if the supply voltage is 220VAC or 120VAC. This selection is done to calibrate the voltage readings.

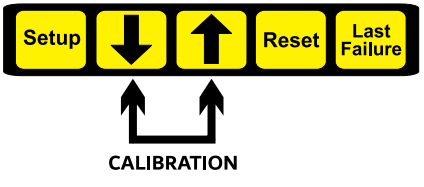


Once the supply voltage is selected it won't ask the user again for this setup. If the supply voltage configuration needs to be changed, power off the PM-22 by removing the supply voltage. Then keep the Reset button pressed while you turn ON the PM-22 again. If done correctly the PM-22 will ask for the supply voltage again.

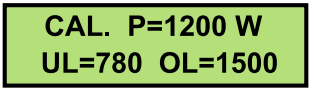
Automatic calibration

Before the PM-22 unit is ready to be used it MUST BE CALIBRATED. Calibration may be performed as many times as desired.
Important Note: Please make sure the PM-22 is calibrated during normal pumping conditions.

While the pump is operating press and hold both arrow buttons until LCD displays the calibration.







The PM-22 measures the power and sets the calibration for underload (UL) at 65% of the power consumption and at 125% for overload (OL). These are the recommended values, but they can be manually adjusted later if desired.
The calibration is permanently stored, it does not need to be recalibrated if power is lost.

Verify that the pump is running normally (i.e. the system is pumping water and the motor current is normal). Try to achieve the maximum water flow rate. Calibration on a fully recovered well is recommended. The calibration may be repeated to assure that setup was done when the pump was running under normal conditions.

Setup

To adjust the setup parameters press and hold the SETUP button:

LANGUAGE SELECTION
The screen will show the language selection setting.

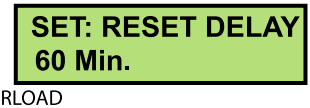


Use the ARROW UP button to select English or the ARROW DOWN button to select Spanish.

Press the SETUP button to select between manual or automatic reset. Press the downwards arrow button to choose MANUAL reset or the upwards arrow button to choose AUTOMATIC reset.



RESET DELAY
Press the SETUP button again. If the AUTOMATIC option is selected the reset delay setup will be shown. Press the up or down arrow buttons to adjust the desired reset delay from 1 to 120 minutes.



UNDERLOAD
Proceed by pressing again the SETUP button, the underload trip value will be displayed. This setup allows to modify the underload protection if the automatic calibration adjustment was not appropriate. The PM-22 will disconnect the pump if the power is below the selected value.



Use the arrow buttons to set up the desired value in 10W increments. If the button is kept pressed it will move by 100W increments.

OVERLOAD
When pressing the SETUP button the overload setup is displayed. This setup allows to modify the overload protection if the automatic calibration adjustment was not appropriate. The PM-22 will disconnect the pump if the power is above the selected value.

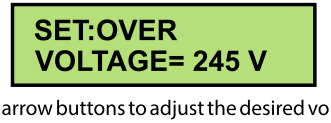


Use the arrow buttons to set up the desired value in 10W increments. If the button is kept pressed it will move by 100W increments. The overload value should not be less than the underload value. If this happens an error will be displayed until the overload setting is increased.

UNDER VOLTAGE
Press the SETUP button and the low voltage setup will be displayed , if the voltage is under this value the pump will shut down.



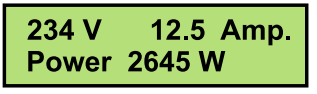
OVERVOLTAGE
Finally, press the SETUP button and the over voltage setup will be displayed , if the voltage is over this value the pump will shut down.



Use the arrow buttons to adjust the desired voltage. Press SETUP again to exit.

Operation

NORMAL CONDITIONS:
The Pump LED is ON when the pump start, and the Failure LED is OFF, the display shows the voltage, current and power consumption.



FAULTS:
If a failure occurs the Failure LED turns ON and the LCD diplays the fault during trip delay. After the trip delay the pump will shut down.

Fault Examples









If the pump presents an overload or underload condition, the power consumption will be displayed on the screen. This is useful when the system presents considerable load variation and the automatic calibration values need to be adjusted.

AUTOMATIC RESET:
After a failure has occured (except under/over voltage), the PM-22 will start to count down the time set on the restart delay (if the automatic reset is enabled). The pump will restart when the timer finishes.

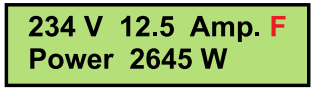


The display shows the time left to restart the motor. If it's required to restart without waiting, press the "Reset" button to start the motor immediately.

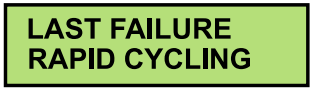
MANUAL RESET:
If the PM-22 is set to manual reset it will not restart the motor until the RESET button is pressed and the fault condition is no longer present.



FAILURE MEMORY:
Failures are stored in the internal memory. When a failure is detected a letter "F" will appear in the first line on the right upper side of the display indicating a failure has occured.



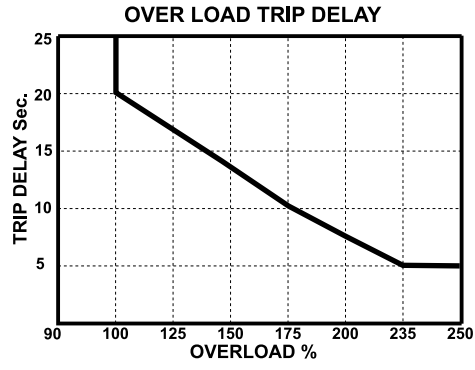
To check what failure occured, press the LAST FAILURE button. The last failure will be shown for 3 s and then it will be erased automatically.



UNDERLOAD PROTECTION
The PM-22 protects the motor when a loss of suction is detected. When this happens, the motor uses less power and the PM-22 shuts down the motor after a 5 s trip delay.

The underload setup is set at 65 % of the power consumption during automatic calibration, but it can also be adjusted manually.
In the unusual event that the system has a wide power variation and it's consumption goes below 65% there will be a false triggering of the underload protection.
In this case underload should be adjusted manually to a lower value in the setup menu .

OVERLOAD PROTECTION
The PM-22 protects the motor when an overload is detected, when this happens the motor uses more power and the PM-22 shuts down the motor after a trip delay as shown in the graphic below.



The overload trip point is set to 125% of the power consumption during automatic calibration, but it can also be adjusted manually.

UNDER VOLTAGE PROTECTION
The PM-22 protects the motor if the voltage drops from normal conditions. It shuts down the motor after a 5 s trip delay. The under voltage protection is user-adjustable.

To reset from this fault, the voltage has to increase 2% above the under voltage value.

OVER VOLTAGE PROTECTION
The PM-22 protects the motor if the voltage is over from normal conditions. It shuts down the motor after a 5 s trip delay. The over voltage protection is user-adjustable.

To reset from this fault, the voltage has to decrease 2% above the over voltage value.

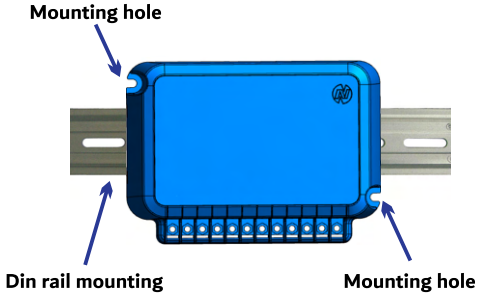
RAPID CYCLING PROTECTION
Pumps heat up if they are started very frequently. Such heating could damage the pump even if an overload is not present.

When the PM-22 detects that the pump starts more than 4 times per minute, it will shutdown the pump to prevent any damage.

Mounting options & Dimensions

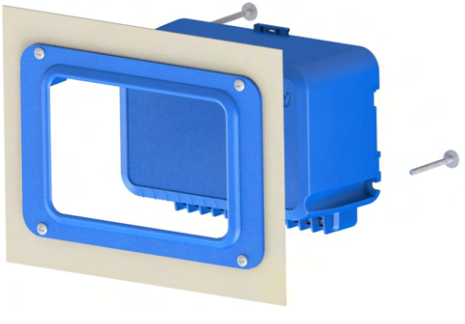
This unit can be mounted on a standard 35 mm DIN rail or screwed into a surface using the screws included in the package.

Enclosure Dimensions: 5.7 x 4.1 x 2.4 in



Panel mounting

Panel mounting for this equipment is available using the adapter plate model **PMF-237** (sold separately). Mounting on a panel door allows to visualize the LED indicators , it also makes setup adjustments easier. If this unit is panel mounted, the panel needs to be installed **indoors.**





Specifications

SUPPLY VOLTAGE	120/220 VAC ± 15 %, 50/60 Hz
VOLTAGE ACCURANCY	0.7 % ± 1 Digit
CURRENT ACCURANCY	0.7 % ± 1 Digit
OVER VOLTAGE RANGE	120-140/ 220-260 VAC
UNDER VOLTAGE RANGE	90-120/190 - 220 VAC
OUTPUT CONTACT RATING	15 Amps @ 220 VAC, 1.5 HP @ 220 VAC, 1 HP @ 120 VAC
CONTACT LIFE	100,000 operations
TRIP DELAY UNDER LOAD/VOLTAGE	5 seconds.
RESTART DELAY	1 to 120 minutes or manual reset.
RAPID CYCLING	4 start/stop cycles in 60 seconds
OPERATON TEMPERATURE	5 to + 149 °F (-15 to + 65 °C)
STORAGE TEMPERATURE	-4 to + 158 °F (-20 to + 70 °C)
INPUT POWER	4 W Approx. *Specifications subject to change without notice.
WEIGHT	17.6 oz

WARRANTY

These products are warranted to be free from defects in workmanship or material under normal service and use for a period of three (3) years from date of manufacture. Nassar Electronics shall, at its option, repair or replace F.O.B. point of manufacture the portion of the product found by Nassar Electronics to be defective. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources or environmental conditions, accident, misuse, improper installation, modification, repair, use of unauthorized replacement parts, storage or handling, or any other cause not the fault of Nassar Electronics are not covered by this limited warranty, and shall be at the buyer's expense. All costs of dismantling, reinstallation and freight, and the time and expenses shall be borne by the buyer.

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