

FluidWatch®

Leak Detection System

Installation and Operation Manual

FW 25-50

FW 25-75

FW 25-100

FW XX-XXX

PERMALERT

Environmental Specialty Products



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Please check the PermAlert website, www.permalert.com, for the latest revision of this manual.

The manual is typically revised at least once a year. The revision date is on the back cover.

Contact techsupport@permalert.com for technical assistance with the FluidWatch system.

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FluidWatch Installation Manual

1 Introduction

The following instructions describe the installation and operating procedures for FluidWatch Models FW 25-50, FW 25-75 and FW 25-100 Leak Detection Monitoring Systems. Custom length systems are also available.

This revision of the manual references the version 6 circuit board. The circuit board version can be identified by the serial number, which begins with "M1", and the label on the panel, which has integral status LEDs and "Test" and "Silence" buttons.

The FluidWatch system consists of a solid-state electronic monitoring unit connected by jumper cable to a sensor cable.

The following general precautions should be observed:

1. Read this manual carefully before beginning installation. Do not use substitute materials or short cut recommended procedures. Understanding and following these instructions is essential to avoid installation problems.
2. Check packing list quantities with received items. Any shortages or damage to materials received should be reported immediately to the delivering carrier.
3. Care must be taken to store all FluidWatch components in a dry and protected area at all times. Electronic monitoring units should be wrapped and sealed with plastic.
4. Electrical work should be performed by a qualified electrician and conform to all local electrical codes.

2 Theory of Operation

The FluidWatch Leak Detection Monitoring System has been engineered to monitor small areas for water and water-based liquids. Typical applications include unmanned equipment rooms, small raised floor areas and small tanks. The system continuously monitors the capacitance of the sensor cable and detects changes from the initial value. Just seconds after the coaxial sensor cable contacts water, the unit turns on a red LED, switches two relays and sounds a horn. The sensor cable quickly dries in place after the leak is cleaned up and the system can be put back on-line.

3 Cable Installation

Each FluidWatch system is a complete kit that includes 25 feet of jumper cable, a length of sensor cable, cable clips and cable tags. The lengths of sensor and jumper cables should not be shortened, even if there is excess cable for an installation. The excess cable should be positioned out of the way so it will not be damaged. The adhesive backed cable clips are provided to attach the jumper and sensor cables to the floor. Approximately one clip per five feet of cable is provided. Cable identification tags are also provided to attach to the cable and identify it as a leak detection cable.

The sensor cable is typically placed around the perimeter of a room or around a piece of equipment that is to be monitored for leaks. The cable should be protected from people walking on it or equipment being placed on it. Connect the jumper cable from the external UHF connector on the monitoring unit to the sensor cable. The UHF connector between the sensor and jumper cables should be tightened **gently** with pliers.

4 Monitoring Unit Installation

The panel is designed to be permanently mounted indoors in a dry area where it will not be exposed to vibration, shock, high temperatures or humidity. The maximum ambient operating temperature is 122°F [50°C]. Open the panel door to access the four panel mounting holes, as shown in figure 1.

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Warning: Do not mount the FluidWatch panel in a hazardous location. The panel and sensing string must be in an ordinary location.

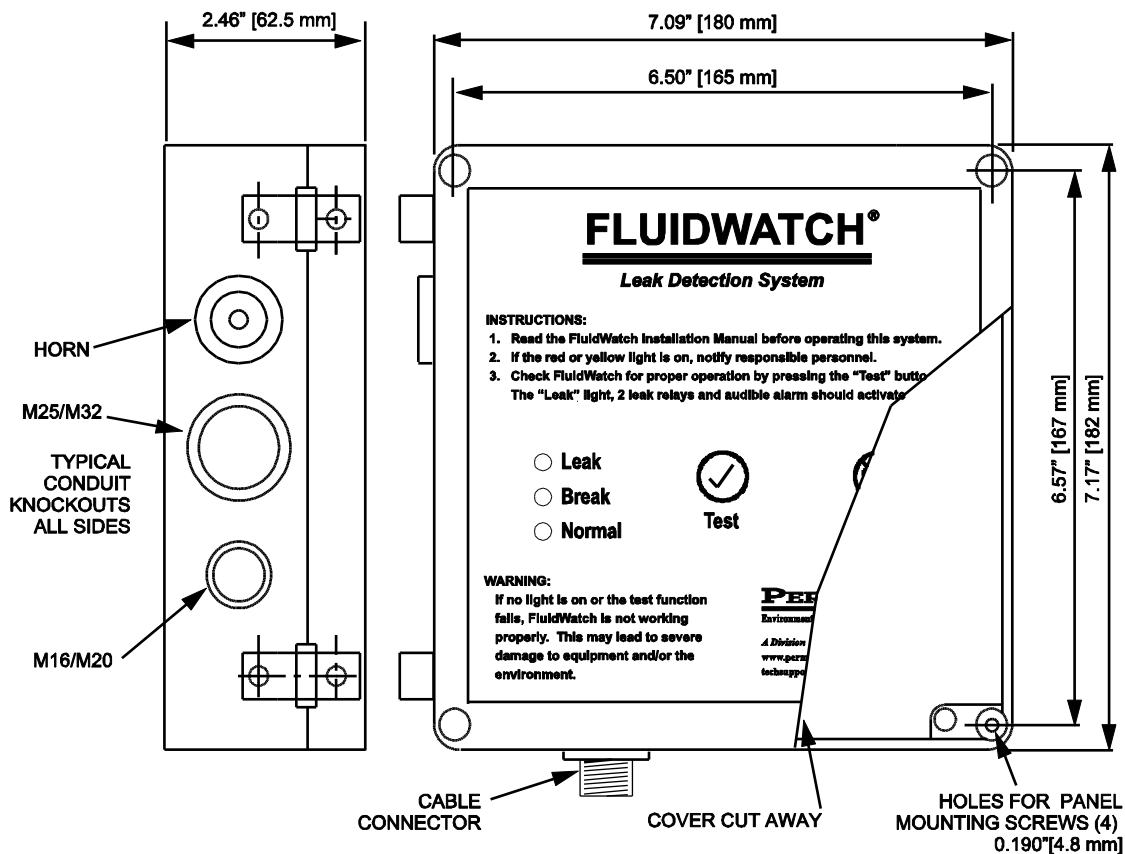


Figure 1
FluidWatch Mounting Dimensions

5 Power Requirement

FluidWatch must be permanently wired to instrument-quality power using appropriate conduit, fittings, and wiring. Refer to figures 1 and 2 for wiring details.

There are 3 knockouts (KO) on each side of the enclosure to be used for conduits. The system board should be removed from the enclosure when a KO is removed to prevent accidental damage to the board.

Each KO is dual-sized with two grooves. Insert a small flat blade screw driver in the groove for the desired size and apply a sharp rap with your hand or a hammer to remove the KO. It is recommended to use the KOs on the right side or bottom of the enclosure.

FluidWatch contains a universal power supply for AC operation, connected to terminal T2. The power requirement is 110-240 VAC, 50 / 60 Hz, 10 VA. AC Fuse (F1) is a 1 A, 250 V, time-delay, 5 x 15 mm fuse.

A suitable external over-current protection device, such as a fuse or circuit breaker (15 A), and disconnect device is recommended. The over-current protection and disconnect devices should be installed on all ungrounded conductors, i.e. the terminal marked hot (L) (and neutral (N) terminal if ungrounded for 240 VAC). The disconnect device should be located near the equipment and

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marked with appropriate ON (I) OFF (O) markings as specified by local codes. The ground conductor wire should be green with a yellow stripe and be connected to the grounding connection, which is the mounting screw centered on the right side of the system board as shown. Installation should be performed by qualified personal in accordance with local codes and procedures.

FluidWatch can also be powered by a 24 VDC, 3 W, over current protected power source at terminal T6. DC Fuse (F2) is a 0.25 A, 250 V, time-delay, 5 x 15 mm fuse.

Note the board is labeled + and - for the polarity of the 24 VDC leads. If DC voltage wires are reversed, the DC Reversed Polarity LED turns on.

There are 3 switches to configure the power for the system.

1. AC/DC Select Switch (SW1) is placed in the “up” position for DC power and in the “down” position for AC power.
2. DC Switch (SW2) is the DC on/off switch. If the system is connected to DC power, this switch is used to turn the panel on/off.
3. AC Switch (SW3) is the AC on/off switch. This switch turns the panel on/off when using AC power.

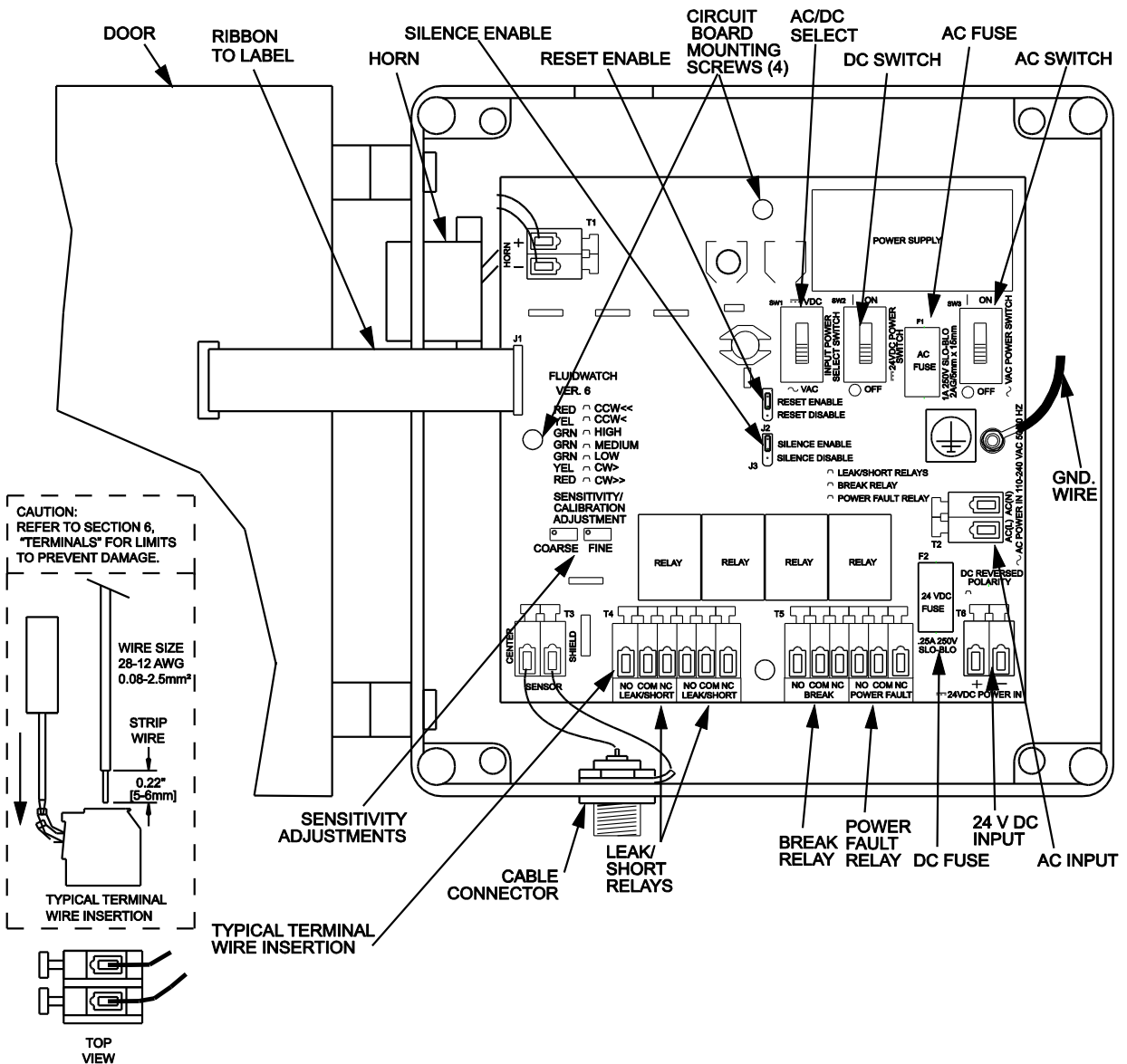


Figure 2
FluidWatch Panel Wiring

6 System Configuration

There are user selectable options for configuring the FluidWatch Leak Detection System. Refer to Figure 2 to locate different jumpers and terminal strips, which are referenced in the following descriptions. Jumpers are rectangular plugs that connect two pins together on the circuit board. **Power to the unit should be turned off when connecting any internal wiring to the monitoring unit.**

Terminals

The terminals on the PAL-AT system board use a quick-connect design that provides an easy, fast and robust connection. A flat blade screwdriver, 1/8" [3.5 mm], is used to press down on the terminal lever and open the terminal for easy wire insertion. Release the lever, and the wire is tightly clamped. **The acceptable wire size for connection to any terminal, including the mains, is 28 - 12 AWG [0.08-2.5 mm²].** The terminals can accommodate solid or stranded wires. **If ferrules are used with stranded wire, the maximum wire size is 14 AWG [1.5 mm²].** Refer to the detail located at the lower left side of figure 2. **Caution: The lever only travels 1/8" [3.5 mm] to open the terminal completely, and only requires 5 - 8 lbs [2-4 kg] force. Do not exceed these limits or the terminal will be damaged.**

Sensitivity/Calibration

The sensitivity can be adjusted to Low, Medium, or High. High sensitivity requires about (1) one foot of wet cable to go into alarm. Medium sensitivity requires (3) three feet of wet cable and low sensitivity requires approximately (10) ten feet. Sensitivity is affected by total cable length.

FluidWatch is factory set for medium sensitivity but may need to be adjusted after installation if the cable length is changed or different sensitivity is desired.

Two resistors, one labeled "Coarse" and one labeled "Fine", are used to change sensitivity. Each resistor screw can be turned up to 12 complete revolutions. There are 7 Sensitivity Adjustment LEDs that indicate the setting and enable calibration without a meter.

Connect the sensing string cable to the external connector and turn on the FluidWatch panel. If a red or yellow LED is on, the unit is out of calibration and must be recalibrated. If any of the green LEDs are on, the sensitivity is set to the respective setting.

If the "Coarse" or "Fine" screws are turned clockwise (CW), the next LED up in the row is selected. If a screw is turned counter-clockwise (CCW), the next LED down in the row is selected.

Note which LED is on and, using a small screwdriver, turn the "Coarse" adjustment slowly in the direction required until the correct green LED is on. If the adjustment is too sensitive using "Coarse" to select the correct green LED, try the "Fine" adjustment.

If the fine adjustment seems to have no effect, reset it to the middle of its 12-turn range. To do this, turn the screw 15 complete revolutions CW and then turn it 6 complete revolutions CCW. Then repeat the "Coarse" adjustment followed with "Fine".

Output Relays

There are four SPDT output relays on the system board. The relays are rated for 10A, 250 VAC and are connected to terminal strips T4 and T5.

Terminals NO, COM and NC refer to the normally-open, common and normally-closed contacts for the relay in the non-powered, or "shelf", condition. In this state, COM-NC terminals are connected. When a relay is energized, COM-NO terminals are connected.

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The 2 relays connected to terminal T4 energize when the FluidWatch system detects a leak or short. The relays reset automatically when the fault clears.

The Break relay at T5 energizes when a break is detected and resets when the break clears.

The Power Fault relay at T5 is always energized when the panel is on.

Reset Enable

Jumper J2 is normally set to the top 2 pins, "Reset Enable", to allow the system to automatically silence the alarm if the cable dries. To disable this feature and require the system to be manually silenced by pressing the "Silence" button, move jumper J2 to the bottom 2 pins, "Reset Disable".

Silence Enable

Jumper J3 is normally set to the top 2 pins, "Silence Enable", to allow the alarm to be silenced from the switch on the front panel. To disable the silence switch so it cannot silence the alarm, move jumper J3 to the bottom 2 pins, "Silence Disable".

The Silence function does not affect the state of the relays.

7 Operating

The FluidWatch system uses an LED "**traffic light**" display on the label to indicate status: **GREEN for normal, YELLOW for a cable break and RED for a wet (or shorted) cable**. The alarm unit activates an audible alarm and two relays when a leak (or short) occurs. One relay is activated when a break occurs.

When power is supplied to the unit, the green LED should turn on after a second. If the yellow LED is on, there is a cable break. If the red LED is on, water is in contact with the sensor cable or there is a short in the cable. Take action to verify this and notify responsible personnel. Once the water has been cleaned up the sensor cable will dry quickly and the green LED will turn on.

If the cable is dry and the red LED is still lit, check the cable for a short. Equipment may have been placed on the cable and damaged the cable. An ohmmeter can be used to make sure the center conductor of the cable is not in contact with the cable shield. Disconnect the UHF connector at the panel and connect the ohmmeter leads to the center pin and the housing of the cable connector. The reading should show an open circuit (O.L).

There are only two operator buttons on the front label: one is used to periodically test the system and the other to silence the alarm. The silence button can be disabled via an internal switch to prevent unauthorized alarm silencing.

8 Test

Push the test button on the label to verify that the system is operating properly. The test button should activate the red LED, audible alarm and leak relays. When the test button is released, the unit will reset after 3 or 4 seconds.

If FluidWatch fails to respond as expected, recheck all connections and jumpers on the monitoring unit. Check the wires connected to the terminal strips. The horn leads go to T1, + (red) and - (black). The UHF connector has the center wire connected to T3 (center) and the shield wire connected to T3 (shield). The label ribbon cable connects to connector J1. If further assistance is needed, contact PermAlert ESP.

Warranty

Seller warrants that the PermAlert Leak Detection System (the "System") will be free from defects in materials and workmanship for a period of twelve (12) months from the date of first use of the System or eighteen (18) months from the date of shipment by Seller to Buyer of the System; whichever is earlier. Seller is not responsible for damage to the System occurring in transit or arising from the installation, alteration or repair of the System by persons other than Seller's employees, or from any abnormal or improper use of, negligence with respect to or accident affecting the System. Expendable service parts, such as probes, are not warranted by Seller. Seller's sole obligation and liability, and Buyer's sole remedy, under this warranty shall be the repair or replacement, at Seller's election, by Seller of any defective materials or workmanship covered by this warranty, without the charge to Buyer. Repaired or replacement materials shall be delivered to Buyer f.o.b. Seller's plant or f.o.b. such other location as Seller shall designate. Seller shall not be responsible for any product returned to Seller without Seller's prior express consent. No claim shall be permitted under the warranty contained herein unless Buyer notifies Seller in writing within ten (10) days after Buyer first hears of facts giving rise to any such claim and unless notice is given within the warranty period as provided above. In order to be valid, any notice sent to Seller in connection with said claim under this warranty must reasonably specify the defect which is the subject of such claim. Buyer shall be responsible for testing and inspecting the System promptly after receipt and thereafter at such intervals as are reasonably prudent so as to inform Seller of any defects which exist in the System. Notwithstanding the filing of a claim hereunder, this warranty shall expire after the warranty period in respect to materials and workmanship which are not then the subject of a proper claim.

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Environmental Specialty Products

A Division of Perma-Pipe, Inc.

7720 North Lehigh Avenue
Niles, Illinois 60714-3491

Phone (847) 966-2190

Fax (847) 470-1204

www.permalert.com