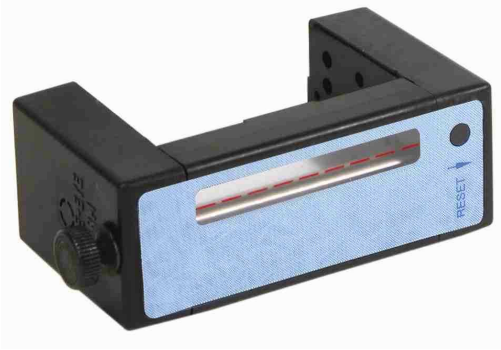
User's Guide



FL-2000-AL
Flowmeter Alarm

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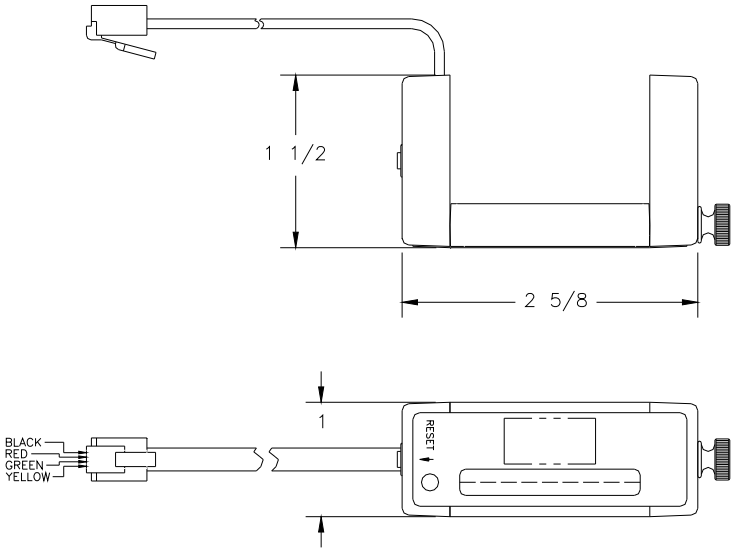
SPECIFICATIONS

Body Material:	ABS
Spacer Material:	SBR Rubber
Operating Temperature:	0-70°C; 32-160°F
Supply Voltage:	5VDC Regulated
Supply Current:	250mA
Output Signal: (Requires Advanced Power Supply)	0-5 Volt logic signal
Buzzer Volume:	90dB
Connector:	RJ11
Environmental:	Splash Resistant



DESCRIPTION

The FL-2000-AL Alarm is a non-contact sensor designed to alert when flow rates exceed defined thresholds. The FL-2000-AL Alarm provides red and green LED's visual status indicators, and a buzzer as an audible indicator of flow rate status.

FEATURES

- Detects flow rates that exceed user settings.
- Integral red and green LED's and audible buzzer indicate operating state.
- Low-level digital output (on / off) represents operating state (See Output Connector Section for details).
- Latching and Self-resetting modes.
  - Latching mode will alarm continuously after a flow rate error, until the user resets the unit.
  - Self-reset mode will stop alarming when flow returns to desired range, but will light both red and green LED's to indicate that an error had occurred.
- No calibration necessary.
- Rugged, splash resistant enclosure.
- Low power 5V input.
  - Power options include basic supply or supply with battery back up and logic output.
- Multiple units may be installed on a single flow meter to provide multiple thresholds.
- Non-contact sensing system will not be damaged by contaminants in flow stream.
- Field installable while the flow meter is in use.

INSTALLATION

The FL-2000-AL Alarm is attached to a FL-2000 series acrylic flowmeter by placing the unit flush onto the front of the flow meter and tightening the thumbscrew. Included snap fit spacers (See Diagram 1) allow the unit to fit various FL-2000 series flowmeters. See Table 1 to determine the proper pair of spacers to use for a given flowmeter. The spacers are packed as a pair and are labeled on the end near the sensing holes. The FL-2000-AL Alarm may be installed in an upward or downward orientation. The sensing line is offset to one end to allow two FL-2000-AL Alarms to be installed over a narrow range on the flowmeter.

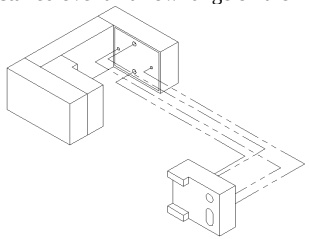


DIAGRAM 1, SPACER INSTALLATION

FL-2000 SERIES	GUIDE ROD	SPACER NUMBER
FL-2071 to FL-2128	Y	NO SPACER REQUIRED
FL-2001 to FL-2025	Y	ESP003
FL-2001 to FL-2025	N	ESP004
FL-2031 to FL-2057	Y	ESP005
FL-2031 to FL-2057	N	ESP006
FL-2060 to FL-2069	Y	ESP007

TABLE 1, SPACER SELECTION

The FL-2000-AL Alarm uses an optical based sensing system, it is important that the flowmeter that it is to be installed on is free of dirt, grease, and that no large scratches are present on the sides of the flowmeter. If the flowmeter appears dirty or scratched, prepare the flowmeter for installation of the FL-2000-AL Alarm by follow the cleaning instructions included with the flowmeter.

To set the alarm position, adjust the flow rate through the flow meter until the float is at the position that would indicate and alarm. Place the FL-2000-ALAlarm on the flowmeter above or below the float, and slide it towards the float until it alarms. Tighten the setscrew, return the flow to it normal rate, and reset the FL-2000-AL Alarm. (See diagram 2).

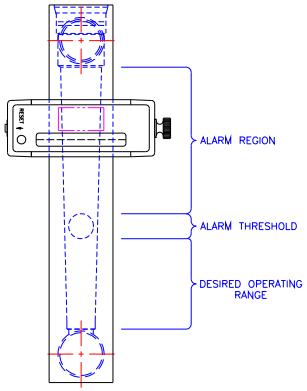


DIAGRAM 2, SETTING ALARM LOCATION

OPERATION

The FL-2000-AL Alarm may be operated in standard or self-reset mode. The unit requires no set up, and will begin to operate as soon as it is connected to its power supply, and will operate in standard mode. To operate in self-reset mode, hold the reset button while applying power. When operating without an error, the FL-2000-AL Alarm will have a green LED lit.

Standard mode: In this mode, the FL-2000-AL Alarm will alarm when the float crosses the sensing line, and will alarm until the reset button is pressed. While alarming, the red LED will be lit, the buzzer will sound, and the logic output will change state.

Self-Reset mode: In this mode, the FL-2000-AL Alarm will alarm when the float crosses the sensing line, and will reset when the float returns to the valid operating range. During normal operation, the green LED will blink to note that the FL-2000-AL Alarm is in self-reset mode. While alarming, the red LED will be lit, the buzzer will sound, and the logic output will change state. Upon returning to the valid range, the green LED will begin to blink, and the red LED will blink to denote violations have occurred since the reset button was pressed.

OUTPUT CONNECTOR AND PIN-OUT DESCRIPTION

The FL-2000-AL Alarm is provided with a male six pin modular RJ11 connector. This connector provides the power input to the FL-2000-AL Alarm, as well as the logic output. If using the basic power supply, the logic output is not available. This signal is available from a connector on the advanced power supply, or by accessing pin 3 on the connector. The pin configuration for the included cable assembly is as follows:

PIN NUMBER	SIGNAL	WIRE COLOR
1	5VDC	Black
2	N/A	Red
3	LOGIC OUT (0-5V, 10mA)	Green
4	GROUND	Yellow

TABLE 2, OUTPUT CONNECTOR DEFINITION

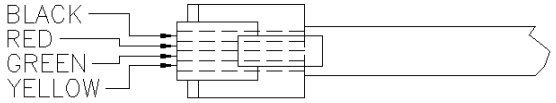


DIAGRAM 3. OUTPUT CONNECTOR

POWER SUPPLY OPTIONS

The FL-2000-AL Alarm may be powered via three different options. These include the basic supply; the advanced supply with universal input and battery backup, or the unit may be powered by the user (See Table 2 for pin definitions).

OPTION	INPUT	PART #
Basic Supply	120V AC (US plug only)	FL-2000-PW
Advanced Supply w/Backup	100-240V AC; 9V Battery (International plugs)	FL-2000-PWA
User Supplied	Regulated 5VDC; 250mA	N/A

TABLE 3, POWER SUPPLY OPTIONS

The advanced supply accepts AC power via a universal input adapter, which comes with interchangeable US, European, and Asian style plugs. In addition, a 9V battery is used as battery backup during a power failure. A fully charged 9V battery provides over two (2) hours of backup with the FL-2000-AL Alarm in alarm condition. Backup time is longer if the FL-2000-AL Alarm is operating in a clear state. The supply also has a connector for access to the logic output signal. The signal high (5V) when clear, and low (0V) when alarming. The signal can source up to 25mA.

TROUBLESHOOTING

Problem	Solution
Unit fails to operate	Ensure that the unit is powered correctly. Power the unit through an UPS to provide reliable power.
Unit does not fit properly on flowmeter	Ensure that proper spacers are being used and are properly installed. Ensure that the unit is tight by checking the thumbscrew.
Unit does not alarm on flow violation	Ensure that proper spacers are being used. Avoid shining bright light on the unit or flowmeter, it may cause false readings. Ensure that the unit is powered correctly.
Unit alarms when placed on unit, will not reset	Ensure that proper spacers are being used. Ensure that the flow tube is free of build up, clean if necessary. Ensure that sides of flowmeter are free of dirt, grease, and major scratches. If used on a liquid meter, ensure that liquid is clear and free of bubbles.
Unit will not stay in Self-Reset mode.	Ensure that the unit is powered correctly. Unit defaults to standard mode at power-up.
Unit alarms without a flow violation	Ensure that unit is tight by checking thumbscrew. If used on a liquid meter, ensure that liquid is clear and free of bubbles.
Spacers will not attach to unit.	Loosen the thumbscrew to facilitate spacer installation.

WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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