

CE



User's Guide



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FLSW3400 & 3500 Series Optical Sensor Switch



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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.
WARNING: These products are not designed for use in, and should not be used for, patient-connected applications.

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WARRANTY

(1) UNPACKING THE Optical Sensor Switch

1.1 Inspect Package for External Damage

Your **Optical Sensor Switch** was carefully packed in a sturdy cardboard carton, with anti-static cushioning materials to withstand shipping shock. Upon receipt, inspect the package for possible external damage. In case of external damage to the package contact the shipping company immediately.

1.2 Unpack the Optical Sensor Switch

Open the carton carefully from the top and inspect for any sign of concealed shipping damage. Please keep all packing and notify Omega Customer Service of any damage.

When unpacking the instrument please make sure that you have all the items indicated on the Packing List. Please report any shortages promptly.

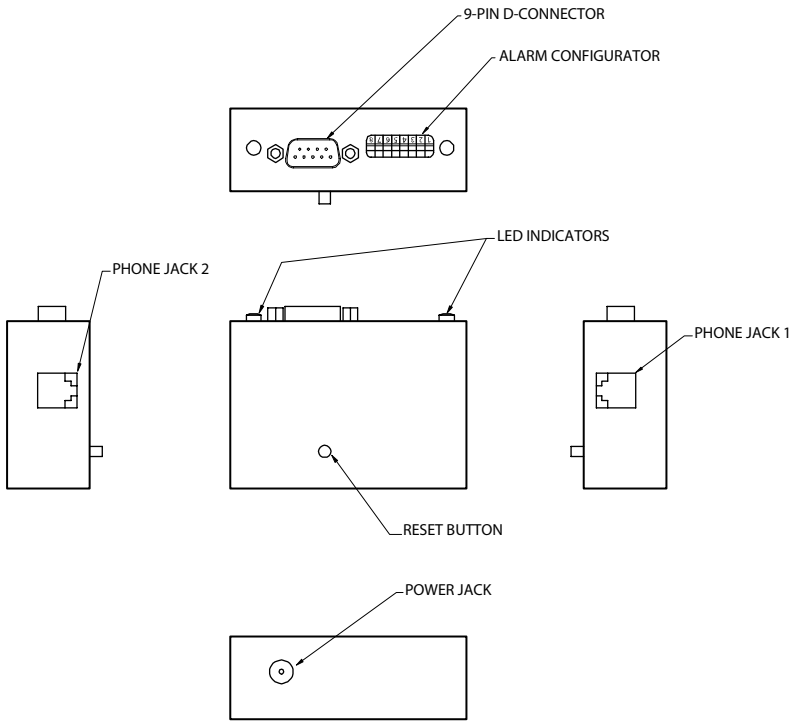
1.3 Returning Merchandise for Repair

Please contact the customer service representative at 1-800-826-6342 ext. 2208 for a **Return Authorization Number (AR)**.

It is mandatory that any equipment returned for servicing be purged and neutralized of any dangerous contents including but not limited to toxic, bacterially infectious, corrosive or radioactive substances.

2. DESCRIPTION

The 150mm High /Low Alarm Flow Meter with **Optical Sensor Switch** is a noninvasive means for detection of a HI or LOW flow. This sensor is ideal for signaling an alarm, cutoff valve, or other device when the float passes the detector. A small LED sensor and receiver are mounted on one side of the flow meter. The float inside the flow tube is detected as it passes across the beam of light. Sensor can be used to detect float passage beyond the set point of the sensor, or also can be set to monitor float position at a specific level, signaling when float is outside of the range of the sensor light beam. Device can be configured to activate relay and/or audible buzzer alarm.



3. INSTALLATION

3.1 Electrical Connections

The Optical Sensor Switch requires a +12VDC power supply with a minimum current rating of 250 mA. Operating power and alarm reset signals are supplied via the 9-pin "D" connector located at the

side of the Optical Sensor Switch. Alternatively power can be connected via the DC power jack on the bottom side of the unit. If you are using your own power supply, be sure that the voltage level is between +12 and +15 Vdc.



SUPPLYING DC POWER TO THE POWER JACK AND THE "D" CONNECTOR AT THE SAME TIME WILL DAMAGE THE METER. DC POWER JACK POLARITY IS CENTER POSITIVE.

The DIP switch, located near 9-pin D-connector can be used to set up custom settings separately for High and Low alarm.

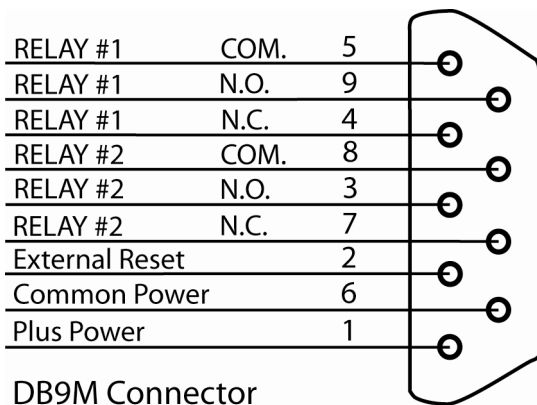


Figure 3.1, Optical Sensor Switch 9-Pin "D" Connector Configuration.



WARNING: DO NOT CONNECT POWER SUPPLY WITH MORE THAN 15Vdc VOLTAGE.



Important notes:

In general, "D" Connector numbering patterns are standardized. There are, however, some connectors with nonconforming patterns and the numbering sequence on your mating connector may or may not coincide with the numbering sequence shown in our pin configuration table above. It is imperative that you match the appropriate wires in accordance with the correct sequence regardless of the particular numbers displayed on your mating connector.

Make sure power is OFF when connecting or disconnecting any cables in the system.

The power input is protected by a 600mA M (medium time-lag) resettable fuse. If a shorting condition or polarity reversal occurs, the fuse will cut power to the valve circuit. Disconnect the power to the unit, remove the faulty condition, and reconnect the power. The fuse will reset once the faulty condition has been removed.

Use of the Optical Sensor Switch in a manner other than that specified in this manual may impair the protection provided by the equipment.

4. SPECIFICATIONS

Materials of Construction:

End Blocks: Aluminum or 316 Stainless Steel

Elastomers: Buna® & Viton® (Aluminum), Viton® (316 SS)

Flow Tube: Borosilicate glass

Power input: 12VDC (15VDC maximum), Recommended Power Supply at least 250mA regulated, peak to peak max 100mV.

Power Consumption: Less than 200mA

Accuracy: +/- 2% of full scale

Repeatability: 0.5% of full scale

Ambient Temperature: 0-70 deg. C

Response Time: 500 milliseconds

Source of Light: 650nm, red LED

Light immunity: Pulse modulated

Dry Contact Closures: 2 normally open, and normally closed relays (1A, 30Vdc max.)

Alarm: 70 dB audible buzzer and/or visual LED

Alarm Options: High, Low, or High/Low

Buzzer: User configurable, momentary or latch

Reset: Reset button or remote through "D"-connector, to disable relay or buzzer (remote Reset is TTL compatible active Low)

Environmental (per IEC 664): Installation Level II; Pollution Degree

Ambient Temperature: 32°F to 122°F (0°C to 50°C).

5. CE Compliance

Any model Optical Sensor Switch bearing a CE marking on it, is in compliance with the below stated test standards currently accepted.

EMC Compliance with 89/336/EEC as amended;
Emission Standard: EN 55011:1991, Group 1, Class B
Immunity Standard: EN 55082-1:1992

6. OPERATING INSTRUCTIONS

The Optical Sensor Switch requires a +12VDC power supply with a minimum current rating of 250 mA. During initial power up of the Optical Sensor Switch with no flow conditions the red LED on the retro reflective sensors will be “On”. This is an indication that power is on and the sensors are ready for operation. When alarm conditions become “true”, the red LED on the top of the retro reflective sensors goes to “Off”. The retro reflective sensors can be positioned in any position along the flow meter tube, except directly in front of each other.



WARNING: Do not install the sensors closer than 10 mm from one another. Doing so may trigger a false alarm condition.

6.1 DIP switch configuration

In order to activate the alarm sensors the corresponding switch has to be installed in the “On” position on the Configuration DIP switch (see Figure 6.1). Each sensor can be separately set for Momentary or Latch operation. In addition the Relay and Buzzer can be configured individually. If for example DIP switch SW1 is set to “On”, when the left retro reflective sensor is active (Alarm Condition), the relay and green LED (on left side of the D-connector) will be energized in the LATCH mode. They will stay in the energized state without any conditions (even if the flow rate changes and the retro reflective sensor have become inactive) until the RESET button is pressed or external RESET TTL signal is applied. If momentary mode is set (DIP switch SW3 is set to “On”) the relay and green LED will be energized only when the left retro reflective sensor is active (Alarm Condition). The same is true for Buzzer settings.

All Switches Off – Disable Alarm (LED, Relays and Buzzer).

ALARM DIP SWITCH CONFIGURATION		
LEFT ALARM	RIGHT ALARM	ACTION WHEN SWITCH IS "ON"
SW1	SW5	LED and Relay are On (LATCH)
SW2	SW6	BUZZER is On (LATCH)
SW3	SW7	LED and Relay are On momentary (FOLLOW SENSOR)
SW4	SW8	BUZZER is On momentary (FOLLOW SENSOR)

Figure 6.1, Optical Sensor DIP Switch Configuration.

Each Optical Sensor Switch is shipped from the factory with the retro reflective sensors aligned and does not require additional adjustment of the focus distance. It may be necessary or desirable to perform realignment of the sensors if the flow tube was replaced or reinstalled (see p. 6.2).

6.2 Sensor Alignments

- 6.2.1** Position the sensor on the side panel of the flow tube until the upper small alignment screw becomes visible through the service hole on the side panel.
- 6.2.2** Using a small 1/16 hex wrench unscrews the alignment screw for 1 – 2 turns in order to release the sensor. Note: Do not completely remove the alignment screw!
- 6.2.3** Perform the same procedure (6.2.2) for the second alignment screw at the opposite side of the side panel.
- 6.2.4** Position the sensor on the side panel of the flow tube until the bottom small alignment screw becomes visible through the service hole on the side panel.
- 6.2.5** Perform 6.2.2 and 6.2.3 for the bottom alignment screws. This will release the sensor and will allow positioning it in the horizontal plane in order to change the focus distance.
- 6.2.6** Adjust the flow rate through the flow tube until the float will cross the red LED beam. Find the correct position of the sensor by moving the sensor in the horizontal plane (toward or against the flow tube) until the red LED light on the top of the sensor will go off.
- 6.2.7** Carefully secure the two bottom and two upper alignment screws.

7. TROUBLESHOOTING

7.1 Common Conditions

Your Optical Sensor Switch was thoroughly checked at numerous quality control points during and after manufacturing and assembly operations. It was carefully packed to prevent damage during shipment. Should you feel that the instrument is not functioning properly please check for the following common conditions first:

Are all cables connected correctly?

Are there any leaks in the installation?

Is the power supply correctly selected according to requirements? When several devices are used a power supply with appropriate current rating should be selected.

Were the connector pinouts matched properly? When interchanging with other manufacturers' equipment, cables and connectors must be carefully wired for correct pin configurations.

7.2 Troubleshooting Guide

Indication	Likely Reason	Remedy
No red LED light on the top of the Tyne-Eye retro reflective sensors	Power supply off	Check connection of the power supply
	Tyne-Eye sensor cable or connector malfunction	Check cable or connection from sensor to the Optical Sensor Switch
	Wrong alignment of the Tyne-Eye retro reflective sensor	Perform alignment procedure for corresponding Tyne-Eye retro reflective sensor (see p.6.2 for detailed instructions)
Buzzer or Relay does not work	Wrong configuration of the DIP switch	Make correct configuration of the DIP switch according to Figure 6.1
	Pc board defect	Return to factory for replacement
The retro reflective sensor does not react on passing float (the red LED does not switch to Off)	Wrong alignment of the retro reflective sensor	Perform alignment procedure for the corresponding retro reflective sensor (see p.6.2 for detailed instructions)

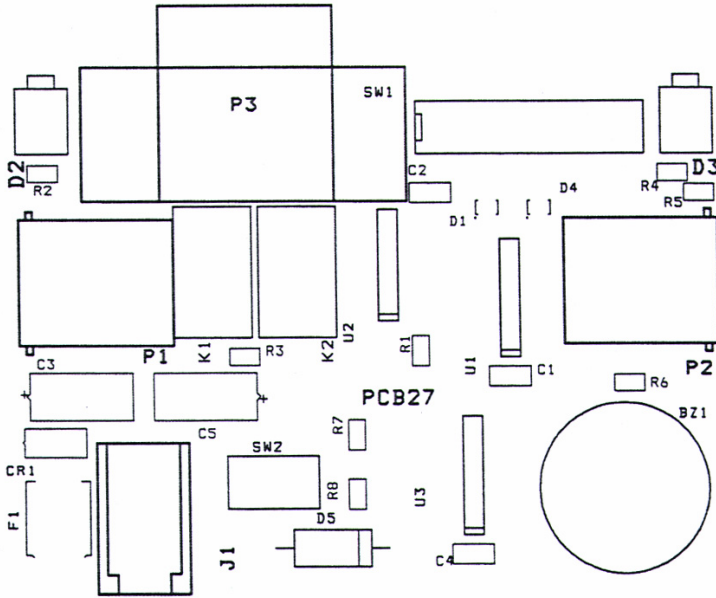
For best results it is recommended that instruments are returned to the factory for servicing. See section 1.3 for return procedures.

7.3 Technical Assistance

Omega® Engineering will provide technical assistance over the phone to qualified repair personnel. Please call our Technical Assistance at 800-872-9436 ext. 2298. Please have your Serial Number and Model Number ready when you call.

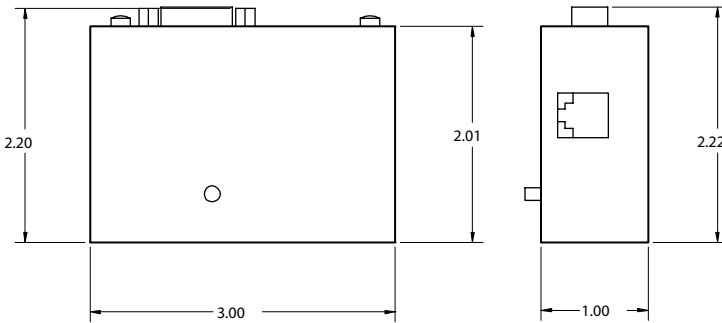
APPENDIX 1

COMPONENTS DIAGRAM



APPENDIX 2

DIMENSIONAL DRAWINGS



NOTES: Omega® reserves the right to change designs and dimensions at its sole discretion at any time without notice. For certified dimensions please contact Omega®.



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 which wear are not warranted, including but not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by it will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESS OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

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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.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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