



# S-Series (SPX, SPT) Low Flow Meter Instructions

## General Information

These versatile impeller flowmeters in 3/8" to 1" nominal pipe size employ jewel bearings for very low minimum flows. The 6-24 VDC pulse output of these meters is compatible with many different types of control, including a full range of SeaMetrics rate displays and controls. The SeaMetrics FT420 provides flow rate and total flow, with 4-20 mA output. For metering pump pacing or interfacing with lowspeed counters, the PD10 divider is recommended. The AO55 is a blind 4-20mA transmitter.

S-Series meters are available in 3/8" to 1" nominal sizes. The SPX body material is polypropylene, with transparent acrylic covers for visual flow indication. Polypropylene covers are available as an option.

The SPT is available standard with TFE housing, TFE cover, PVDF rotor, ceramic shaft, choice of o-ring material (EPDM or Viton), and optional silicon carbide shaft.

## Specifications

### Connections

3/8", 1/2", 3/4", 1"  
Female NPT standard,  
SAE thread optional

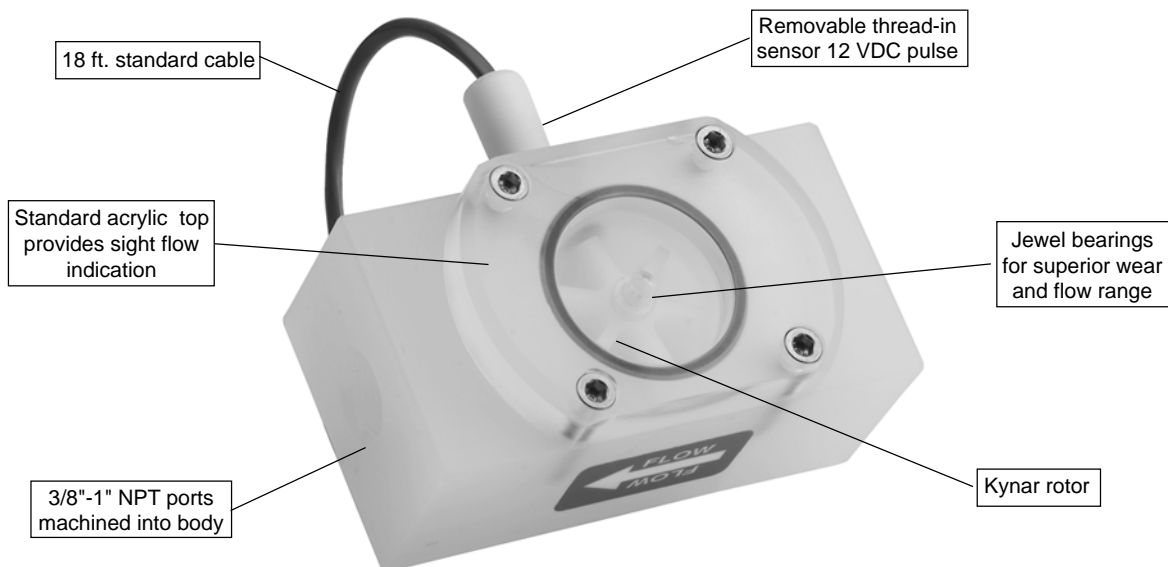
### Materials

Body	SPX: Polypropylene, SPT: TFE
Cover	SPX: Acrylic, Polypro optional SPT: TFE
Rotor	PVDF
Shaft	SPX: Nickel tungsten carbide, zirconia ceramic optional SPT: zirconia ceramic, silicon carbide optional
Bearings	Ruby
Max. Temperature	160° F (70°C)
Max. Pressure	150 PSI (10 bar)
Accuracy	±1% FS

### Flow Rates

Size	GPM	LPM
3/8"	0.07 - 5	0.27 - 18.9
1/2"	0.1 - 10	0.38 - 37.9
3/4"	0.2 - 20	0.75 - 75
1"	0.5 - 40	1.90 - 150

## Features



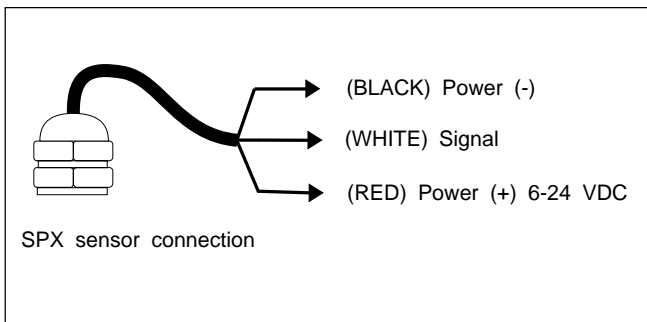
## Installation

**Piping Requirements.** Standard fittings are female NPT. If the piping connected to the meter is metallic, care should be taken not to overtighten. Straight pipe of at least five diameters upstream of the meter is recommended. Vertical, horizontal, or inverted (lens down) installations are all acceptable.



**Warning:** This meter has low-friction bearings. Do not at any time test operation of the meter with compressed air. Doing so will subject it to rotational speeds many times those for which it was designed, and will certainly damage the rotor, shaft, and/or bearings.

**Electrical Connections.** There are three conductors to the sensor, two for positive and negative power and one for the signal. See the diagram below for color coding.



## Nominal K-factor



## Repair

**Rotor Replacement.** There is only one moving part to this meter. The bearings are made of ruby, which rarely wears out, and will not need replacement unless they have been physically damaged by severe shock. The shaft is integrally molded into the rotor, and shaft and rotor are replaced as one part. To replace the rotor, remove all pressure from the meter. Then remove the four screws which hold the lens (or cover) in place. Lift the lens, then remove the rotor. When putting in the new rotor, be sure that the end of the shaft is started into the bearing **before the lens is put into place.** **When putting on the lens, be sure that the shaft is also started into the upper bearing before lowering the lens into place.** If any resistance is met when the lens is replaced, the shaft is not started into one of the bearings. Check that the lens o-ring is also in place, then replace the four screws and tighten.

**Sensor Replacement.** The sensor ordinarily does not need replacement unless it is electrically damaged. If replacement is necessary, unthread the sensor by hand. Thread the replacement sensor in and tighten by hand.

## Field Replacement of Sensor



## Connecting to non-SeaMetrics Control Devices

It is often desirable to connect an S-Series flow sensor to a PLC or industrial computer board, and the sensors are well suited for this. Typically it can be connected directly, or with a single resistor added. The S-Series pickup sensors are GMR devices which need 5-24 Volts DC and 2 mA current, and they are current sinking (NPN).

These sensors can connect directly to a PLC or computer board if:

1. The sensor power on the PLC is 5 - 24 VDC (VDC is typical).
2. The sensor power supply can provide at least 2 mA (100 mA is typical.)
3. The sensor input on the PLC can accept a current sinking device.

See Figure 1 for connections.

If the PLC input only accepts current sourcing devices, a pull-up resistor must be added. Connection of this resistor is shown in Figure 2. Typically, on a 24 VDC input a 2.2 K Ohm resistor will be effective.

Since the three-wire pickup sensors are solid state, they do not exhibit switch bounce and can be used at relatively high frequencies.

If the PLC is equipped with a 4-20 mA analog input module, it is necessary to order the flow sensor with some form of 4-20 mA transmitter. Two options are the AO55 blind transmitter and FT420 indicating transmitter. Follow the connection diagrams for these products to connect to the analog input.

### Input Designed for Current Sinking (NPN) Devices

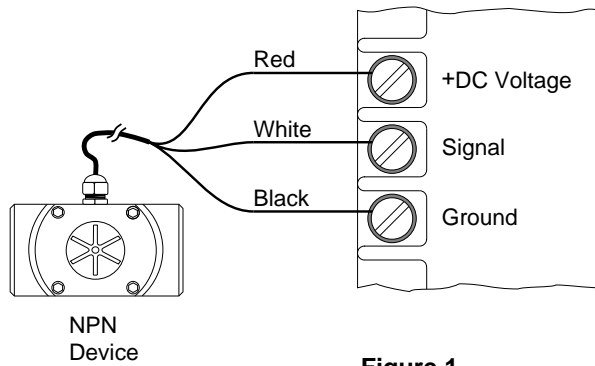


Figure 1

### Input Designed for Current Sourcing (PNP) Devices

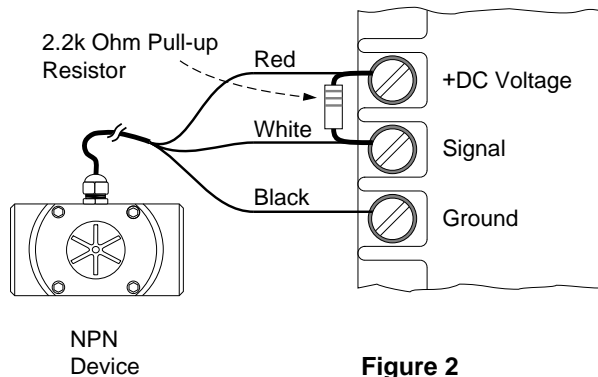
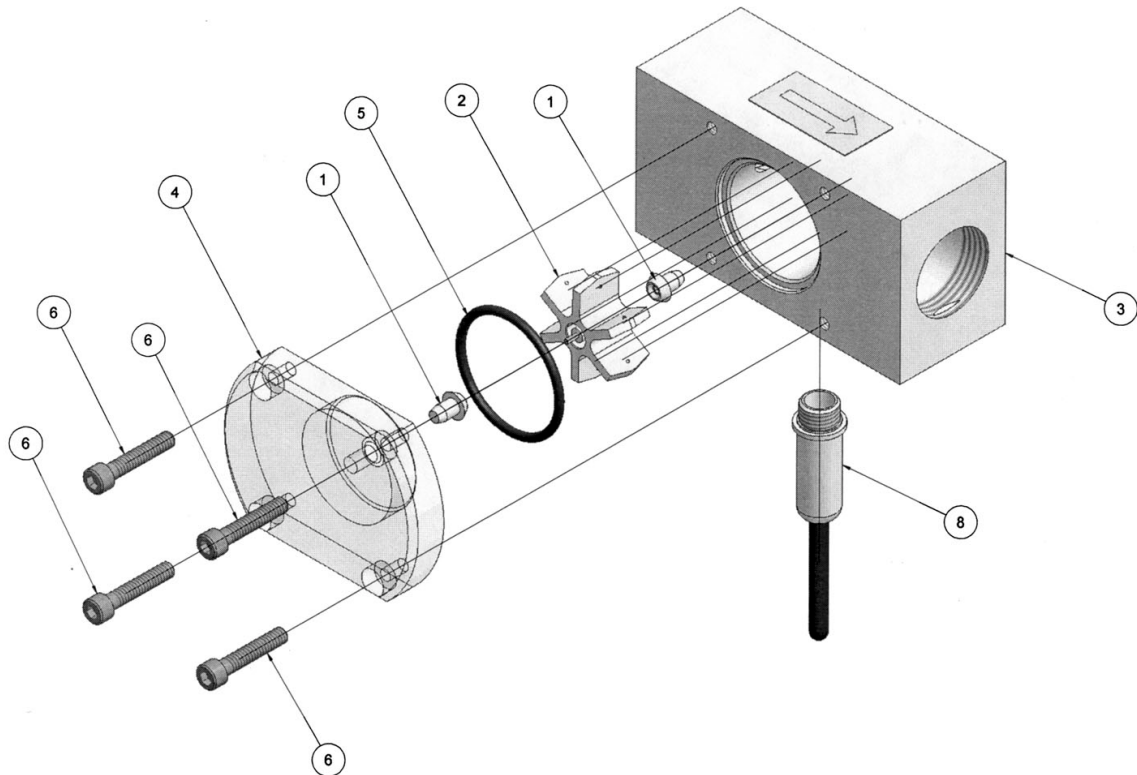


Figure 2

## SPX, SPT Parts Listing

1	Bearing Assembly	16772 (2 each)
2*	Rotor with Shaft	11127 (Kynar/ceramic/2 magnet) 11129 (Kynar/carbide/2 magnet) 11133 (Kynar/silicon/2 magnet) 11132 (Kynar/ceramic/6 magnet) 11130 (Kynar/carbide/6 magnet) 26456 (Kynar/silicon/6 magnet)
3	Body	
4	SPX Lens SPT Lens	16018 (Polypro) 16022 (acrylic) 26174 (TFE)
5*	O-Ring: EPDM VITON	25081 16455
6	SPX Screw SPT Screw SPT Hexnuts	07687 (4 each) 07685 (4 each) 07705 (4 each)
7	Flow Direction Tag	19036
8*	Sensor	26310

\*recommended spare parts



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