Sanitary Type Electronic Flow Switches

Industries

Pharmaceutical

Food and Beverage

Biotechnology

Semiconductor

Water Treatment

SX Series

Ameritrol, Inc.

Instruments and Controls

Features

- No Moving Parts
- 316L Stainless Steel
- Temperatures to 350F
- Pressures to 3000 PSIG
- Field Programmable for Flow, Level, or Temperature
- Explosion Proof Enclosures
- Low Flow Rate Detection
- Sanitary Process Connections
- 3A Food Design
- Reliable and Cost Effective
- Special RA Polish & Electropolishing

Applications

Pump Related Applications

- Low Flow Shutoff of Pumps
- Seal Water Leakage
- Bearing Lubrication Monitor
- Cavitation Alarm
- Chemical Feeder Pump Flow

General Applications

- Flow Indication/Verification
- Air/Gas and Vent Flow
- Deionized Water Sensor
- Agitation Monitor
- Rupture Disc/Relief Valve Monitor

Specifications

Sensor Head

Material of Construction:	316L Stainless Steel Standard
Operating Temperature:	-50 to 350F (-46 to 177C)
Operating Pressure:	Vacuum to 3000 PSIG (206 Bar)
Response Time:	From 3 Seconds
Repeatability:	+/- 0.5% of Range at Constant Conditions
Process Connection:	1/1.5” Ferrule Option 2”, 3”, 4” Ferrule
Probe Length:	1.8”; Option Customer Specified

Electronics

Housing:	Powder Coated Explosion Proof, UL/CSA Rated to Class 1, Div. 1 & 2, Group B,C,D; Class II, Div. 1 & 2, Group E,F,G; Class III. FM Option
Temperature:	-50 to 150F (-46 to 65C)
Power Input:	90-135 VAC, 50/60 Hz, 4 Watts Option 24 VDC/VAC, 200-240VAC
Relay Output:	SPDT 3 Amps Resistive Option DPDT and 10 Amps Res.
Electrical Connection:	1” FNPT
Shipping Weight:	5 lbs

Operation

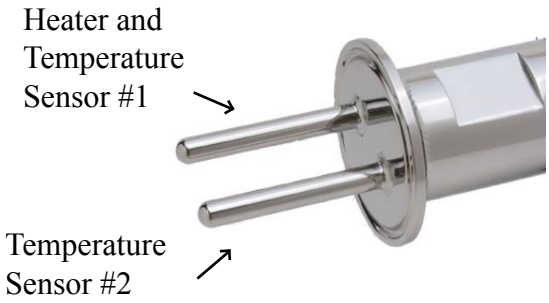
The SX sanitary series flow switch has been designed to meet the most critical flow detection applications in the food, pharmaceutical, biotechnology, and water treatment industries. Quick disconnect tri-clamps are standard with special finishes for 3A applications and polished/electropolished for biotechnology and pharmaceutical use.

The thermal dispersion principle of operation features no moving parts exposed to the process. The instrument operates by measuring a temperature differential between a heated and a reference temperature sensor (see figure 1). An extremely low power heating element is attached to a temperature sensor and a second temperature sensor is isolated from the heater to provide compensation for changing process temperature. The electronics measure the differential and can be adjusted to switch at any flow listed in the flow switch range chart.

Extremely low flow rates such as .04 GPM in a 1" line can be detected with rangeability up to 300:1. These flow switches can be used in virtually all liquids, gases, and slurries.

The electronics are available with single or dual switch points. The instrument can be easily field programmed to detect flow, level or temperature.

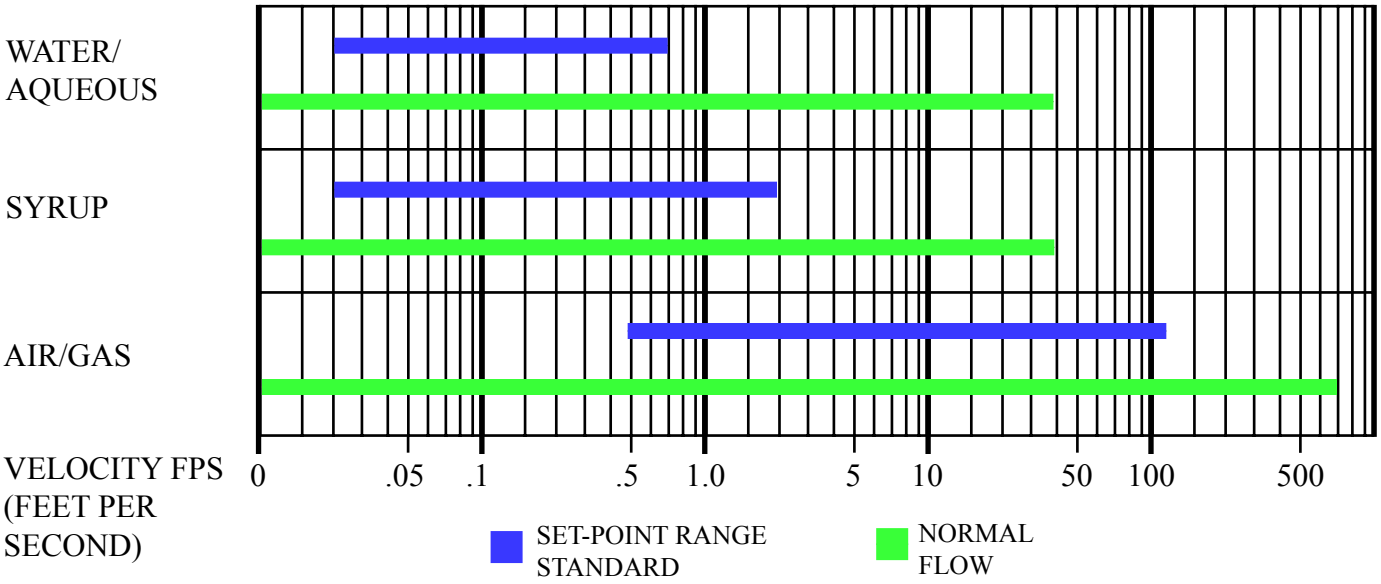
Relay outputs are standard and are offered with several different configurations and contact ratings. Remote mounting of the electronics is also available.



Temperature Differential = Temperature Sensor #1 Minus Temperature Sensor #2

Figure 1

Flow Switch Rangeabilty



Conversion Table

Volumetric (GPM or CFM) to Velocity (Feet per Second - FPS)

Pipe Size	**1/8"**	**1/4"**	**3/8"**	**1/2"**	**3/4"**	**1"**	**1.25"**	**1.5"**	**2"**	**2.5"**	**3"**	**3.5"**	**4"**	**5"**	**6"**
Liquid Multiplier	5.65	3.08	1.68	1.06	.602	.371	.215	.158	.096	.067	.0434	.0325	.0252	.0160	.0111
Air Multiplier	42.19	23.06	12.57	7.91	4.50	2.78	1.61	1.18	.716	.502	.325	.243	.188	.120	.083

Tube Size	**1/2"**	**3/4"**	**1"**	**1.5"**	**2"**	**3"**	**4"**	**6"**
Liquid Multiplier	2.21	.884	.473	.200	.1086	.0476	.0265	.01162
Air Multiplier	16.5	6.61	3.53	1.49	.812	.356	.198	.0869

Examples:

1) 100 CFM in 3" Tube = 100 x .356 = 35.6 FPS

2) 10 GPM in 3" Tube = 10 x .0476 = .476 FPS

PART NUMBER/ ORDER ENTRY SPECIFICATION
SX SERIES SANITARY FLOW SWITCH

SX- [ ][ ][ ][ ] - [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

PROCESS CONNECTION

3/4" Ferrule	0	7	5	5
1" / 1.5" Ferrule	**1**	**0**	**0**	**5**
2" Ferrule	2	0	0	5
3" Ferrule	3	0	0	5
4" Ferrule	4	0	0	5

OPTIONS - NO ENTRY REQUIRED FOR BOXES WITH X

INSERTION LENGTH	
1.8" STANDARD	**X**
SPECIAL - SPECIFY LENGTH IN INCHES [ ][ ]	
POWER INPUT	
117 VAC (90-132VAC)	**X**
24 VDC (-10, +20%) 24 VAC (+/- 10%)	D
200-240 VAC	E
PROCESS TEMPERATURE	
-50F TO +350F	**X**
REMOTE ELECTRONICS	**R**
CABLE TYPE PVC (200F)	H
CABLE TYPE TEFLON (500F)	I
CABLE LENGTH FEET	
RELAY OUTPUTS [ ][ ]	
SPDT 3 AMP RESISTIVE	**X**
SPDT 10 AMP RESISTIVE	J
DPDT 3 AMP RESISTIVE	K
DPDT 10 AMP RESISTIVE	L

DUAL SWITCH POINTS	
SPDT 3 AMP RESISTIVE	M
SPDT 10 AMP RESISTIVE	N
HOUSINGS	
U.L. APPROVED	**X**
F.M. APPROVED	P
CENELEC APPROVED	Q
STAINLESS STEEL TAG	T
SPECIAL ELECTROPOLISHING CONTACT MANUFACTURER	

Example: SX-1005
SX Series flow switch with 1" ferrule process connection, 1.8" insertion length, 117 VAC power input, -50 to 350 process temperature, single switch point with 3 amp contact rating.

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