



Proteus Industries Inc.

**RoHS Compliant!**



# 1000 Series RoHS Compliant Flow Switches

Proteus Flow Switches monitor cooling fluids and other liquid flows and trip an internal relay if the flow rate falls below an adjustable trip point flow. The relay can be used to shut down a system or process or to sound an alarm before damage is done to valuable equipment and products.

- Flow ranges from 0.05 to 60 GPM / 0.2 to 225 LPM
- Flow trip point settable across entire flow range.
- Hall Effect sensor improves performance in noisy electrical environments
- Temperature range of -20 to 100°C
- Pressure to 250 psi with metal faceplates
- CE and RoHS compliant
- Reliability underwritten by 5-year warranty

## Fail-Safe System Protection

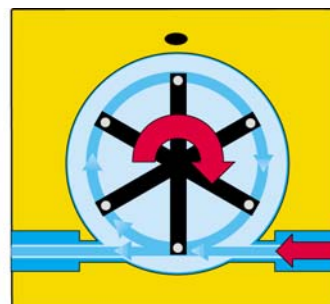
Unlike pressure activated sensors, the Proteus flow switch provides a true flow interlock – it will not be fooled by downstream blockages that maintain pressure while stopping flow. And unlike simple paddle- or vane-activated devices, particle buildup cannot jam the mechanism in the 'Flow OK' position.

The traditional Proteus active design combats the problem of particle buildup that can jam many other flow switch types. Because the rotor is constantly spinning, it clears itself of most buildup. In the unlikely event that a large object in the line interferes with the rotor, the rotor stops turning and the switch goes to its alarm condition.

When a Proteus flow switch shows fluid is flowing, there is **ALWAYS** fluid flowing through the switch.

## How It Works

The rotor spins when liquid flows through the sensor body. Magnets in the rotor switch a Hall-Effect sensor mounted in the sensor body. The resulting pulse train is converted by the 1000 Series electronics to a voltage that is compared to a voltage equivalent to the selected trip point flow.



If the measured flow rate is lower than the selected trip point flow rate, the internal relay will change state.

The trip point flow rate is easily adjusted by a screwdriver adjustment of the 20-turn potentiometer.

## Easy Trip Point Adjustment

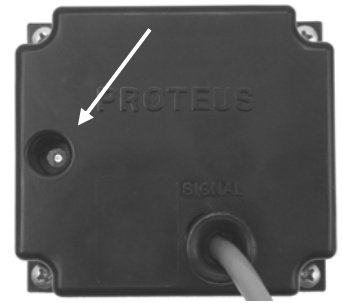
The trip point adjustment is accessible by peeling back the label on the rear of the electronics cover



The potentiometer used to select the trip point is positioned in a recess so that it cannot be adjusted by accident.

Turning the screw clockwise increases the trip point flow.

Turning the screw counter-clockwise decreases the trip point flow.



## Flow Visibility



The clear polysulfone faceplate allows the rotor to be viewed, telling you at a glance if your cooling fluid is flowing.

Optional metal faceplates allow brass and stainless steel flow switches to be operated at pressures up to 250 psi (1720 KPa).

## Simple Maintenance

The faceplate may be easily removed to clean the flow chamber if necessary.

Rebuild kits to restore original performance are available.



## Matching a flow switch to your application

1. Select a material that is chemically compatible with your liquid.
2. Check operational temperature and pressure limits to identify suitable materials.
3. Select a flow switch with a range so that
  - a. your nominal flow rate is around 50-60% of the upper flow range of the switch, and
  - b. your maximum flow rate is less than the upper flow limit of the switch.
4. For specialized heat transfer fluids such as Galden® or Fluorinert®, or if using positionable elbows, select SAE straight-thread connections.

## Flow Ranges, Materials and Connections

*Flow ranges listed are for water at 25°C.*

Flow Range		Connection	Part Number		
GPM	LPM		Polypropylene	Brass	316 Stainless Steel
0.05 – 0.3	0.2 – 1.5	¼" FNPT		01004BN03	01004SN03
0.06 – 0.6	0.3 – 2.3	¼" FNPT	01004PN06		
0.1 – 1.0	0.4 – 3.8	¼" FNPT	01004PN1	01004BN1	01004SN1
0.2 – 2.5	0.75 – 9.5	¼" FNPT	01004PN2	01004BN2	01004SN2
0.2 – 2.5	0.75 – 9.5	9/16"-18 SAE			01006SA2
0.3 – 4.5	1.1 – 17	¼" FNPT	01004PN4	01004BN4	01004SN4
0.3 – 4.5	1.1 – 17	9/16"-18 SAE			01006SA4
0.6 – 9.0	2.3 – 34	3/8" FNPT		01006BN9	01006SN9
0.6 – 10.0	2.3 – 38	3/8" FNPT	01006PN10		
0.8 – 10	3 – 38	3/4"-16 SAE			01008SA10
1.0 – 14	3.8 – 53	½" FNPT	01008PN14	01008BN14	01008SN14
1.2 – 16	4.5 – 60	¾" FNPT		01012BN16	01012SN16
1.2 – 16	4.5 – 60	1 1/16"-12 SAE			01012SA16
1.5 – 19	6 – 72	¾" FNPT	01012PN19		
3 – 40	11 – 150	¾" FNPT		01012BN40	01012SN40
4 – 40	15 – 150	1" FNPT		01016BN40	01016SN40
4 – 40	15 – 150	1 1/16"-12 SAE			01016SA40
4 – 50	15 – 190	1" FNPT	01016PN50		
5 – 60	18 – 225	1" FNPT		01016BN60	01016SN60

**For assistance in selecting the flow switch best suited to your flow control task, contact Technical Support at (650) 964 4163 or [tech@proteusind.com](mailto:tech@proteusind.com).**

## Temperature & Pressure Operating Limits

Flow Sensor Material	Faceplate Material	Temperature Limit*		Pressure Limit	
		°C	°F	PSI	kPA
Brass	Clear polysulfone	90	194	100	690
Polypropylene	Clear polysulfone	70	158	75	515
Stainless Steel	Clear polysulfone	90	194	100	690

## Extend Pressure Temperature Ranges with Metal Faceplates

Flow Sensor Material	Faceplate Material	Temperature Limit*		Pressure Limit	
		°C	°F	PSI	kPA
Brass	Brass	100	212	250	1720
Stainless Steel	Stainless Steel	100	212	250	1720

\* This is the fluid temperature that can be sustained with the flow switch cooled by ambient air at 20°C.

**Need to operate above 100°C?** Customized versions of 1000 Series flow switches have been proven in operation with fluid temperatures from -40°C to 170°C. For information on low- and high-temperature capability, contact **Technical Support** at (650) 964-4163 or by email at [tech@proteusind.com](mailto:tech@proteusind.com).

## Operating Characteristics

Flow Ranges	As stated above. Switch is functional across entire stated flow range.
Fluid Temperature	Dew point to 100°C. <i>Not suited for operation in a condensing environment</i>
Pressure Drop	< 10 psi at maximum flow rate for all versions except 01004BN05, 01004SN05 and 01004PN06. <i>Contact Technical Support at (650) 964-4163 for information on these low range flow switches.</i>
Input Voltage	24 VDC ± 10%. Electronics are protected for over-voltage and reverse polarity errors.
Switch type	Relay closure, Normally Open and Normally Closed contacts provided.
Relay Rating	SPDT, 3A at 30 V-DC for a non-inductive load. Mechanical rating > 10 <sup>6</sup> cycles.
Hysteresis	Approximately 5% of flow range.
Electrical Connection	5 x 22 AWG stranded, cabled conductors
Power Requirement	40 mA
Materials of Construction	All materials are RoHS compliant.
Kinematic Viscosity	For use with liquids with kinematic viscosities to 120 centistokes at operating temperature.

## Other Wetted Materials

Component	Available Materials	
	Standard	Optional
Rotor	PPS	Kynar®
O-Ring	Viton®	Buna-N, Silicone rubber, etc
Rotor Shaft	316 Stainless Steel	Alumina, Sapphire

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## Wiring

Color	Function
Brown	Supply Voltage 24 VDC
White	Supply Common 0 VDC
Black	Relay Common
Red	Relay NO (Normally Open) Contact
Green	Relay NC (Normally Closed) Contact

## Proteus – Customization Experts

Bring us your specifications and let us create a flow switch or metering flow switch that exactly meets your requirements. Materials can be modified for improved compatibility with your liquid. Flow ranges can be matched to large connections. High- and low-temperature adaptations can be implemented.

Fittings will be properly positioned, your whole unit will be certified to be leak tight, and all electrical connections will have been tested end-to-end. Our lean manufacturing processes and ISO 9001-certified procedures ensure that your devices will arrive on time, every time, ready for use.



## Proteus Industries Inc.

340 Pioneer Way, Mountain View, CA 94041  
 Tel: (650) 964-4163 Fax: (650) 965-0304  
[www.proteusind.com](http://www.proteusind.com) [sales@proteusind.com](mailto:sales@proteusind.com)

Information in this document was correct at the time of printing; however, specifications are subject to alteration as Proteus Industries' continuous improvement processes establish new capabilities.

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