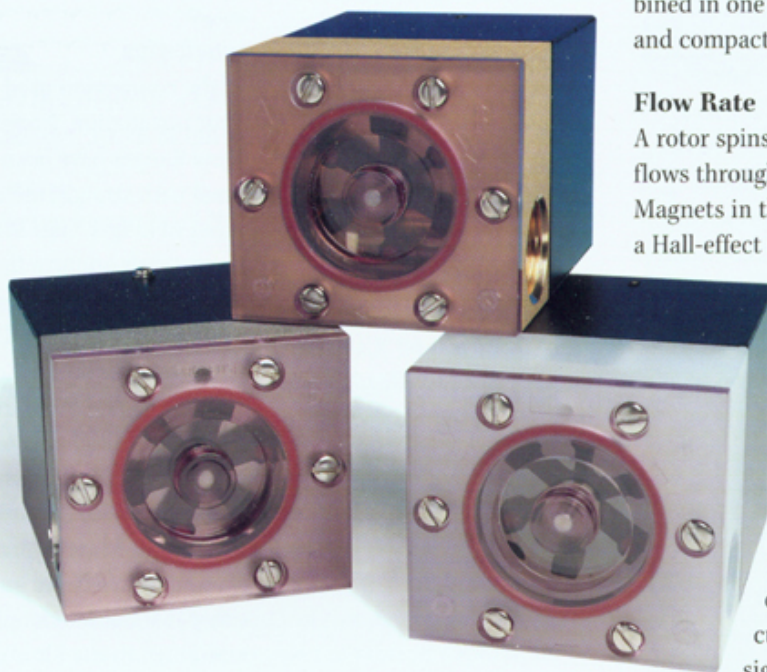


# Proteus

## FluidVision™

### Liquid Flow Rate, Temperature and Pressure Measurement

- ◆ Flow Rate from 0.08 to 60.0 GPM, 0.3 to 230 LPM.
- ◆ Temperature from -40 °C to 125 °C
- ◆ Pressure to 250 psi
- ◆ 0-5 VDC or 4-20 mA outputs
- ◆ Customization available for OEM's
- ◆ Relay trip point
- ◆ Five Year Warranty



*Founded in 1978, Proteus Industries develops, manufactures and markets a range of liquid flow sensors monitoring hundreds of thousands of semiconductor processing systems, vacuum systems, high-powered lasers and liquid cooled industrial machinery. Proteus obtained ISO-9001 Registration in 1995.*

FluidVision sensors measure flow rate, temperature and pressure of water, water/glycol mixtures, Galden™, Fluorinert™ and other liquids. All sensors are combined in one unit for an easy and compact installation.

#### Flow Rate

A rotor spins when liquid flows through the meter. Magnets in the rotor switch a Hall-effect sensor mounted

in the sensor body. The resulting pulse train is converted by the electronics to a flow rate, which is output as 0-5 VDC or 4-20 mA current loop signals depending on model selection. User-adjustable flow, temperature and pressure trip points can be linked to a relay output. If the polysulfone faceplate is selected, the spinning rotor gives a visual indication of flow. Refer to Table 1 for available flow ranges. User-adjustable flow, temperature and pressure trip points can be linked to the relay output.

#### Temperature

An electronic transducer embedded in a stainless steel probe senses the temperature of the flowing liquid over the range of -40 to 125 °C. Temperature output is available as 0-5 VDC or 4-20 mA current loop signals depending on model selection. A user-adjustable temperature trip point can be linked to the relay output.

#### Pressure

This optional transducer measures pressure to the maximum rating of the selected flow sensor material, generally 100 psi (700 kPa) with polysulfone face plates and 250 psi (1750 kPa) with metal face plates. Pressure output is available as 0-5 VDC or 4-20 mA current loop signals depending on model selection. A user-adjustable pressure trip point can be linked to the relay output.



## Relay and LED Output

A relay allows the user to set alarm levels for low flow rate, high temperature and high pressure. The single relay will trip if any alarm level is detected. Three bright LED's are green for a normal condition, or red for an alarm condition for each flow parameter. The relay allows a local safety alarm and switching independent of your controller or PLC.

This can provide a redundant safety capability. If a relay is not needed, it may be omitted on the 0-5 VDC output models.

## Electrical connectors

Electrical input and outputs are provided on an eight-pin socket. NC or NO output of the relay is provided on a

three-pin socket. Mating plugs with wire terminals are included. Contact Proteus Applications if custom cables or other outputs are required.

## Customization

Our rapid customization process allows us to meet OEM's special requirements for electrical cables, fittings or other modifications to the standard product.

## Certifications

FluidVision is CE marked for compliance with EU Directive 89/336/EEC for Electromagnetic Compatibility. It has been Safety Certified by RWTUV as a low voltage, Class III device. With the relay installed, FluidVision conforms with the safety-related interlock requirements of SEMI S2-93.



*Digital panel meters can provide local display of your flow parameters.*

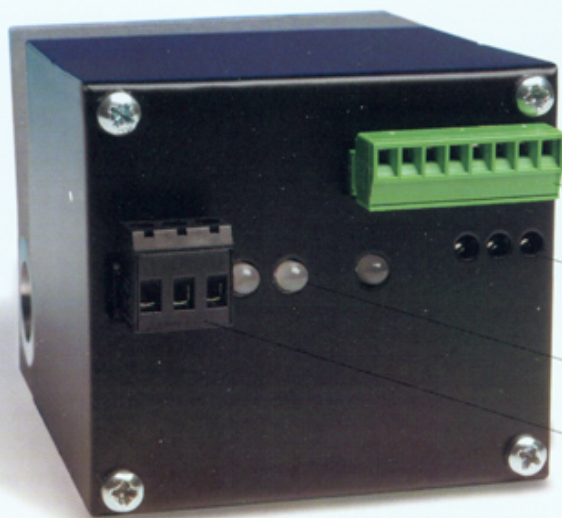
## Display Your Flow Parameters

Flow rate, temperature and pressure values can be displayed on compact digital voltmeters. One meter is needed for each parameter. Flow rate can be presented in GPM or LPM, temperature in °C or °F, and pressure in PSI or kPa. The LCD displays provide 3-1/2 digit readability with 0.6" high characters and require 4 mA at 9-28 VDC. The operating temperature range is 0-60 °C. Model numbers for LCD displays are included in the FluidVision Price List.

## Flow Ranges and Connections

FluidVision measures the linear velocity of the liquid stream to determine the flow rate. Thus the actual flow rate may be dependent on the internal diameter and form of the connection used in your installation. Nominal Flow Ranges have been developed with straight metal pipes of longer than 10x ID to establish uniform flow at the input of the flow sensor. Fittings with smaller ID's will accelerate the liquid stream, creating higher measured frequencies, higher pressure drop across the flow sensor, and may reduce the available flow range. More information on these effects and other installation details are contained in the FluidVision Operations Manual, accessible from the Proteus Web Site, [www.proteusind.com](http://www.proteusind.com) or from Proteus Applications personnel.

Calibration of FluidVision flow sensors with the fittings you will use in your installation is the most certain way to eliminate these effects. Contact Proteus Applications to ensure that your FluidVision sensors are calibrated exactly to your requirements.



Power Output Connections

Trip Point Settings

Status Lights

Relay Connection

*Electrical connections, status lights and trip point settings on the back of unit. Mating connections are included. Trip point settings can be specified when ordering or set by user.*



## FluidVision Specifications

### Flow Rate Ranges

Models covering flow ranges from 0.08 to 60.0 GPM (0.3 to 230 LPM) are available. The flow range of each model is shown in the Table 1.

### Fluid Temperature Range

Compatible with fluid temperatures from 0 °C to 85 °C (32 to 185 °F). Contact Proteus Applications for operation from -40 to 125 °C (-40 to 255 °F).

### Pressure Range

Fluid pressures may be measured from 0 psi to the maximum allowed pressure, 100 psi (700 kPa) for polysulfone and polycarbonate faceplates, 250 psi (1750 kPa) for metal faceplates.

### Device Accuracy

Device accuracy is the measurement capability of the sensor. This information should be read in conjunction with the Calibration information below.

### Flow Rate

Linearity (maximum):  $\pm 1.5\%$  of full-scale

Repeatability:  $\pm 0.5\%$  of full-scale

### Temperature

Linearity (maximum):  $\pm 1$  °C (0-100 °C)

### Pressure

Linearity (maximum):  $\pm 1$  PSI (0-100 psi)

$\pm 3$  PSI (0-250 psi)

For Expanded Uncertainty using ANSI/NIST Technical Note 1297, see the Proteus Web Site.

### Calibration

A statement of conformance is provided with all 700 Series sensors. The standard flow rate and pressure calibration is based on water at ambient temperature. Our calibration accuracy is maintained by statistical comparison with NIST traceable standards. NIST-Traceable Calibration Reports for ambient water or other liquids or temperatures are available at extra charge on request.

Flow rate calibration is dependent on plumbing fittings. The User's Manual gives fitting ID's and other information about our standard calibration. Calibrations can also be done using your fittings. Please contact Proteus Applications for assistance with any special calibration needs.

### Wetted Materials

**Body:** Brass, 316 stainless steel or polypropylene

**Face Plate:** Polysulfone, brass or 316 stainless steel.

Polycarbonate for 770 models. Metal face plates are available for use with 70x, 750 and 760 models with metal bodies.

**Rotor:** Carbon fiber filled Nylon. TRA-BOND 2222 epoxy.

**Shaft:** 316 stainless steel

**O-ring:** Silicone rubber

Custom materials are available to match your specialized requirements. Please contact Proteus Applications for assistance.

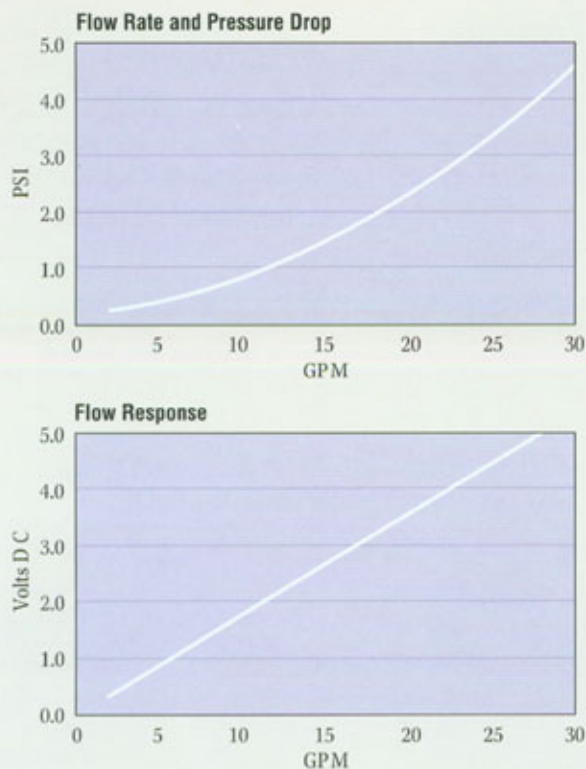
**Fluid Viscosity:** to 120 centipoise. Please contact Proteus Applications when using liquids other than water.

Table 1: Flow Range

Model Number	Pipe Connection	Flow Range	
		GPM	LPM
701	1/4" FNPT	0.1-1.0	0.4-3.8
705	1/4" FNPT	0.5-2.5	1.9-9.5
703	1/4" FNPT	0.8-6.0	3.0-22
704	1/4" FNPT	0.08-0.8	0.3-3.0
750	1/2" FNPT	1.5-12.0	5-45
755	1/2" FNPT	4.0-20.0	15-75
760	3/4" FNPT	6.0-30.0	23-115
770	1" FNPT	10.0-60.0	38-230

Table 2: Dimensions

Model	Units	Height	Width	Body Depth	
				Metal	Polypro
70X	Inches	2.8	3.0	3.9	3.9
	cm	7.0	7.6	9.9	9.9
750/755	Inches	2.8	3.0	4.0	4.5
	cm	7.0	7.6	10.2	11.5
760	Inches	2.8	3.0	4.5	4.5
	cm	7.0	7.6	11.4	11.4
770	Inches	3.2	3.6	5.2	5.2
	cm	8.0	9.2	13.2	13.2



*These representative curves illustrate the small pressure drop (top) and extremely linear and wide flow response (bottom) typical of FluidVision flow sensors. In this case a custom-designed flow sensor with a velocity-defining orifice of 0.700" ID in a brass body with 3/4" FNPT connections was characterized on Proteus' NIST-traceable flow calibration system. Please see our web site for detailed data on the full model range.*

### Sensor Outputs

Analog Output: 0-5 VDC or 4-20 mA current loop depending on model selection, with individual outputs for flow rate, temperature and pressure. Contact Proteus Applications for other output forms.

Relay Output: 3A at 30 VDC. Relay may be set to trip on any one or more of low flow rate, high temperature and high pressure.

### Electrical Input

24 VDC  $\pm 10\%$ , maximum 100 mA.

### Quality, Delivery and Warranties

Proteus is an ISO-9001 certified manufacturer. FluidVision's quality is backed by our five year warranty, stated in full on our FluidVision price list. Calibrations are guaranteed for one year. We are committed to rapid and on-time shipment.



## Proteus Industries Inc.

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FluidVision™ is a registered trademark of Proteus Industries Inc.

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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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