

# 6000 Series

Pulse Output  
Flow Meters



**TECHNICAL REFERENCE MANUAL**

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## Section 1: Overview

### Introduction

This document provides comprehensive technical information about the Proteus 6000 Series pulse output flow meter. Product features, specifications and operating instructions described in this manual are valid for standard models and may not be applicable to customized versions.


### Important Safety Information

**NOTE** and **CAUTION** statements are used throughout this manual to highlight important operational and safety information.

<b>NOTE</b>	<b>NOTE</b> statements provide additional information that is important to the successful operation of the device.
	
<b>CAUTION!</b>	<b>CAUTION</b> statements identify conditions or practices that could result in damage to equipment or other property.
	
<b>WARNING!</b>	<b>WARNING</b> statements identify conditions or practices that could result in personal injury or loss of life.
	

Taking proper precautions to avoid damage to your instrument's sensors during installation helps to ensure consistent, error-free operation, which lowers costs and assists on-time completion of your work.

The safety-related statements contained in these instructions provide an alert to installers and operators to take sensible steps to allow your instrument to operate correctly the first time and every time.

<b>NOTE</b>	
	<b>It is recommended that the installation of this product be performed by qualified service personnel only.</b>

### Technical Support

For technical or applications assistance, contact:

**Proteus Industries Inc.**  
340 Pioneer Way  
Mountain View, CA 94041  
Phone: (650) 964-4163  
Fax: (650) 965-0304  
E-mail: [tech@proteusind.com](mailto:tech@proteusind.com)

### Warranty

Proteus 6000 Series flow meters are manufactured under ISO 9001 certified processes and are warranted to be free from defects in materials and workmanship for five (5) years from the date of shipment. The full text of this limited warranty is available on the Proteus Industries website at [www.proteusind.com/warranty](http://www.proteusind.com/warranty).

## Section 2: Features and Functions

- **Flow ranges from 0.2 to 227 LPM / 0.06 to 60 GPM**

- **5–24 VDC pulsed PNP and NPN outputs for easy interfacing with your PLC.**

The amplitude of the pulse output signal is within 5% of the input voltage.

The output frequency is proportional to flow rate through the meter. At the maximum flow range, the output frequency is approximately 240 Hz. At the minimum flow rate, the frequency is approximately 10 Hz.

- **Directly interface to batching, data logging and multi-channel controller accessories.**

6000 Series flow meters provide a digital pulse input to compatible programmable process monitors or controllers for convenient control and reporting flexibility.

- **The Hall-effect sensor, protected from reverse polarity and over-voltage, provides reliable outputs in noisy electrical environments.**

- **Stainless steel faceplate extends operating range**

Optional stainless steel or brass faceplates enable brass and stainless steel versions of 6000 Series flow meters to be operated with liquid temperatures from -40° to 110 °C / -40 to 230 °F and pressures to 1724 kPa / 250 psi.

- **Compact Design**

6000 Series instrument depths vary with connection size. Outline and 3-dimensional drawings are available on the Proteus Industries website at [www.proteusind.com/6000](http://www.proteusind.com/6000).

- **A Viton® O-ring provides the liquid seal**

Other materials are optionally available for enhanced chemical compatibility with specialized coolants. Contact Proteus Technical Support for information.

## Section 3: How the Flow Sensor Works

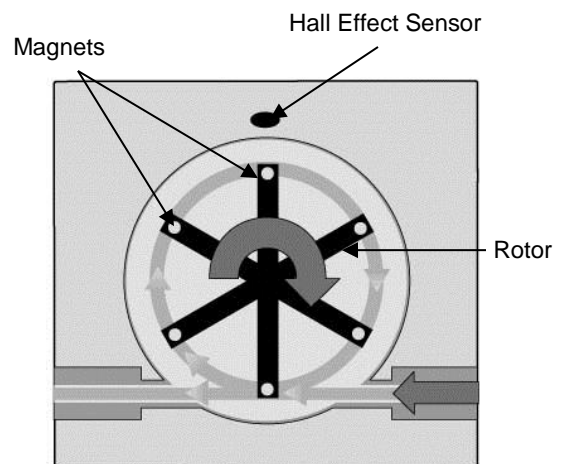
The rotor spins when liquid flows through the meter.

Magnets in the rotor switch a Hall-effect sensor mounted in the meter body.

The resulting pulse train is converted by the electronics to a voltage that is equal to the supply voltage. The proportional frequency pulses may be read by your electronics or a display or intelligent multi-channel monitor supplied by Proteus.

### Metering

Flow characterization curves are traceable to a NIST reference. Linearity is better than  $\pm 1.5\%$ .




## Section 4: Specifications and Performance

### Flow Ranges, Materials and Connections

MODEL NUMBER			FLOW RANGE*		CONNECTIONS
POLYPROPYLENE	BRASS	STAINLESS STEEL	LPM	GPM	
06004PN06	06004BN06	06004SN06	0.23 – 2.3	0.06 – 0.6	1/4" FNPT
06004PN1	06004BN1	06004SN1	0.4 – 5.3	0.1 – 1.4	1/4" FNPT
06004PN2	06004BN2	06004SN2	0.95 – 9.5	0.25 – 2.5	1/4" FNPT
		06004SA2	0.95 – 9.5	0.25 – 2.5	9/16-18 SAE
06004PN4	06004BN4	06004SN4	1.1 – 17	0.3 – 4.5	1/4" FNPT
		06004SA4	1.1 – 17	0.3 – 4.5	9/16-18 SAE
	06006BN9	06006SN9	2.3 – 34	0.6 – 9.0	3/8" FNPT
06006PN10			2.3 – 38	0.6 – 10	3/8" FNPT
		06008SA10	3.0 – 38	0.8 – 10	3/4-16 SAE
06008PN14	06008BN14	06008SN14	5.3 – 53	1.4 – 14	1/2" FNPT
		06012SA16	4.5 – 61	1.2 – 16	1 1/16-12 SAE
	06012BN16	06012SN16	4.5 – 61	1.2 – 16	3/4" FNPT
06012PN19			5.7 – 72	1.5 – 19	3/4" FNPT
	06012BN40	06012SN40	11 – 151	3.0 – 40	3/4" FNPT
		06016SA40	15 – 151	4.0 – 40	1 5/16-12 SAE
	06016BN40	06016SN40	15 – 151	4.0 – 40	1" FNPT
06016PN50			15 – 189	4.0 – 50	1" FNPT
	06016BN50	06016SN50	19 – 227	5.0 – 60	1" FNPT

\*Listed flow ranges are for water at 20 °C / 68 °F.

CAUTION!	
	<p><b>DO NOT</b> exceed the maximum rated flow rate of your 6000 Series flow meter.</p> <p>Extended operation above the rated maximum flow rate of the instrument will reduce its usable life.</p>

### Temperature & Pressure Operating Limits

FLOW BODY MATERIAL	FACEPLATE MATERIAL	TEMPERATURE LIMIT*		OPERATING PRESSURE LIMIT		BURST PRESSURE (5:1)	
		°C	°F	kPa	psi	kPa	psi
Polypropylene	Clear Polysulfone	70	158	517	75	2586	375
Brass	Clear Polysulfone	100	212	689	100	3447	500
	Brass	110	230	1724	250	8618	1250
Stainless Steel	Clear Polysulfone	100	212	689	100	3447	500
	Stainless Steel	110	230	1724	250	8618	1250

\*This is the fluid temperature that can be sustained with the flow meter cooled by ambient air at 20 °C / 68 °F.

**Need to operate above 110 °C / 230 °F?** Customized versions of 6000 Series flow meters formed from brass and stainless steel have been proven in operation with liquid temperatures ranging from -40°C to 170°C / -40 to 338 °F. For information on extreme-temperature capabilities, please contact Proteus Applications Support at [tech@proteusind.com](mailto:tech@proteusind.com) or (650) 964-4163.

## WARNING!



**DO NOT exceed the temperature limit of the flow sensor body or faceplate material.**  
 Operation above the rated temperature can cause failure and create a hazard to operators and equipment.

## WARNING!



**DO NOT exceed the pressure limit of the flow sensor body or faceplate material.**  
 Operation above the rated pressure can cause failure and create a hazard to operators and equipment.

### Operating Characteristics

<b>OUTPUT FREQUENCY</b>	~ 240 Hz at maximum flow rate.
<b>PRESSURE DROP</b>	< 69 kPa / 10 psi at the maximum flow rate for all models except 06004PN06, 06004BN06, and 06004SN06.*
<b>INPUT VOLTAGE</b>	5–24 VDC ± 10% with over-voltage and reverse polarity protection
<b>OUTPUT VOLTAGE</b>	Square wave with the same amplitude as the input voltage
<b>OUTPUT SOURCING</b>	Current sinking (NPN) & current sourcing (PNP) outputs
<b>LINEARITY</b>	Better than ±1.5% from 10% to 100% of full scale
<b>REPEATABILITY</b>	Better than ±0.4% above 10% of full scale
<b>CHARACTERIZATION</b>	Typical flow response curves developed for water at 22–25 °C / 72–77 °F are available for each model. Flow response varies from unit to unit. Unit-specific characterization conformance reports can be purchased by specifying part number 0980 when placing your order.
<b>ELECTRICAL CONNECTIONS</b>	4×22 AWG stranded, cabled conductors with FEP insulation and jacket
<b>POWER REQUIREMENT</b>	< 10 mA
<b>STANDARDS AND COMPLIANCE</b>	CE conformity • RoHS and REACH compliance
<b>KINEMATIC VISCOSITY</b>	For use with liquids with kinematic viscosities to 120 centistokes at operating temperature

\*Contact Proteus Application Support for more information.


### Other Wetted Materials

COMPONENT	AVAILABLE MATERIALS	
	STANDARD	OPTIONAL
Rotor	PPS	Kynar®
O-Ring	Viton®	Buna-N, Silicone Rubber
Rotor Shaft	316 Stainless Steel	Alumina

## Section 5: Physical Installation

### Sensor Orientation

6000 Series flow meters should only be installed in a horizontal pipeline.

<b>CAUTION!</b>	
	<b>If the meter is mounted in a vertical pipeline, any leakage from the topmost connection could enter the unit and cause permanent damage to the electronics.</b>


For the best results, the meter should be mounted with the faceplate in the vertical plane. Mounting the device with the flow connections uppermost can help eliminate entrained air from your system.

### Pipe or Tube Mounting

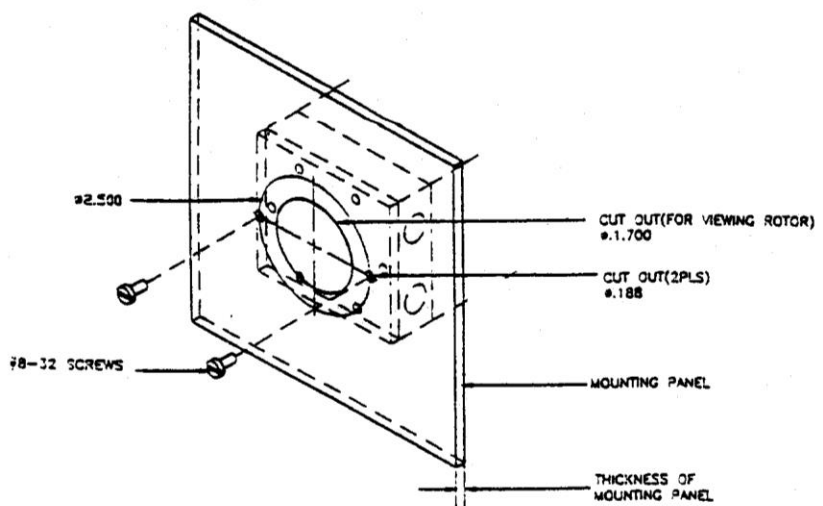
If rigid piping or tubing is used, a 6000 Series flow meter can be supported by direct connection to the pipe or tubing.

### Panel Mounting


To mount the sensor behind a panel, a minimum of two (2) of the faceplate securing screws will need to be replaced with longer screws to compensate for the thickness of the panel. Ensure that the screws are not so long that they will touch the bottom of the tapped hole, or rip through the back of a plastic body if over-tightened.


<b>CAUTION!</b>	
	<b>Use washers with a larger diameter than the countersinks in the faceplate in order to spread the load. Otherwise, cracks can form on the faceplate as a result of the extra stress on the countersinks.</b>

1. Prepare the mounting panel by evenly spacing up to six (6) holes on a 65.3 mm / 2.5 in. bolt circle for the #8-32 securing screws circle. Using the two (2) holes on the horizontal plane is usually sufficient to support smaller sensors with metal bodies and all sensors with plastic bodies.
2. If you wish the rotor to be visible, cut a 43.2 mm / 1.70 in. diameter hole with the same center as the bolt circle.
3. Remove two (2) or more screws securing the faceplate to the sensor body.
4. Place the sensor behind the panel and insert the longer screws through the panel and into the sensor body.
5. Secure the screws in the body with a torque of approximately 10 in-lb (finger tight with a flat-head screwdriver).




## Section 6: Plumbing Connections

<b>NOTE</b>	
	<b>It is recommended that connections to brass or stainless steel flow sensors be made with similar materials to minimize potential corrosion damage.</b>

<b>CAUTION!</b>	
	<b>DO NOT install metal fittings into units with polypropylene bodies.</b> <b>The over-tightening of metal fittings in polypropylene bodies can permanently damage the threads and prevent the creation of leak-free connections.</b>

### Minimum Pipe/Connection Inside Diameter

The flow response of a 6000 Series flow meter, and thus its accuracy, may be affected by the inside diameter (ID) of the incoming pipe as well as any devices attached to the inlet connection and any nearby upstream devices.

<b>NOTE</b>	
	<b>The inside diameter (ID) of the inlet pipe or through-hole of a tube connector, hose barb, or other connecting element must be greater than or equal to the ID of the flow meter.</b>

The table below shows the minimum pipe/connection IDs necessary for standard 6000 Series products. If the ID of your pipe or fitting is less than the ID of your instrument, the flow response values may not be correct. Correct flow response characteristics can be developed to allow 6000 Series instruments to be used with connecting elements with IDs smaller than those shown or to be used with elbows attached directly to the inlet. For more information, please contact Proteus Applications Support.

MODEL NUMBER			MINIMUM I.D. OF INLET CONNECTION		MINIMUM STRAIGHT RUN OF PIPE AT INLET	
POLYPROPYLENE	BRASS	STAINLESS STEEL				
06004PN06	06004BN06	06004SN06	2.362 mm	0.093 in	23.62 mm	0.93 in
06004PN1	06004BN1	06004SN1	3.175 mm	0.125 in	31.75 mm	1.25 in
06004PN2	06004BN2	06004SN2	4.775 mm	0.188 in	47.75 mm	1.88 in
		06004SA2	4.775 mm	0.188 in	47.75 mm	1.88 in
06004PN4	06004BN4	06004SN4	6.858 mm	0.270 in	68.58 mm	2.70 in
		06004SA4	6.858 mm	0.270 in	68.58 mm	2.70 in
	06006BN9	06006SN9	9.398 mm	0.370 in	93.98 mm	3.70 in
06006PN10			9.398 mm	0.370 in	93.98 mm	3.70 in
		06008SA10	10.16 mm	0.400 in	101.6 mm	4.00 in
06008PN14	06008BN14	06008SN14	11.68 mm	0.460 in	116.8 mm	4.60 in
		06012SA16	15.49 mm	0.610 in	154.9 mm	6.10 in
	06012BN16	06012SN16	15.49 mm	0.610 in	154.9 mm	6.10 in
06012PN19			15.49 mm	0.610 in	154.9 mm	6.10 in
	06012BN40	06012SN40	20.32 mm	0.800 in	203.2 mm	8.00 in
		06016SA40	22.10 mm	0.870 in	221.0 mm	8.70 in
	06016BN40	06016SN40	22.10 mm	0.870 in	221.0 mm	8.70 in
06016PN50			22.10 mm	0.870 in	221.0 mm	8.70 in
	06016BN50	06016SN50	25.40 mm	1.000 in	254.0 mm	10.0 in




## Proximity to Other Devices

The flow response of 6000 Series flow meters may be affected by the form of any devices attached to the inlet connection as well as any nearby upstream devices. Elbows, T-pieces, valves, or filters located immediately upstream from the flow meter can introduce a swirling motion to the liquid flow, reducing the linear velocity of the flow stream. 6000 Series meters are typically unaffected by the form or proximity of downstream devices.

To ensure optimum performance, a run of straight pipe with a length of **at least 10 times the pipe ID** should be present between the meter and any upstream devices. Refer to the table above to identify the minimum straight-pipe length required for your model.

## Flow Direction

6000 Series flow meters with upper flow limits below 7.6 LPM / 2.0 GPM are sensitive to flow direction.

NOTE	
	For instruments with an upper flow limit below 7.6 LPM / 2.0 GPM (model numbers ending in <b>N06</b> or <b>N1</b> ), liquid flow should only be introduced into the device through the orifice labeled "IN" on the right-hand side of the body.


The performance of all other 6000 Series models is **not** sensitive to flow direction. Liquid flow may be introduced through either orifice.

## Filtering

Your circulating liquid may contain particles. While not essential to the operation of the flow sensor, it is good practice to filter your liquid. A 100-micron filter is often used to remove rust and other particles from the liquid. This can increase the usable lifetime of pumps and other fluid system components as well as reduce wear in the sensor.

## Making NPT Pipe Thread Connections

Pipe threads seal by making metal-to-metal or plastic-to-plastic contact between male and female components. Consequently, they are particularly prone to the damaging effects of galling, which occurs when two surfaces move against each other under pressure. For this reason, it is essential to use a high-quality lubricating and sealing material when installing pipe threads. It is recommended that you use a non-hardening pipe sealant, such as Teflon<sup>®</sup> (PTFE) tape or paste, on pipe threads to create leak-tight and lubricated junctions at all connection points.

CAUTION!	
	<b>DO NOT use anaerobic pipe sealants such as Loctite<sup>®</sup> or Swak<sup>®</sup> brand sealants with 6000 Series products fitted with polysulfone faceplates. The aggressive chemical nature of solvent vapors arising from these materials can cause cracks to develop in the faceplate materials.</b>

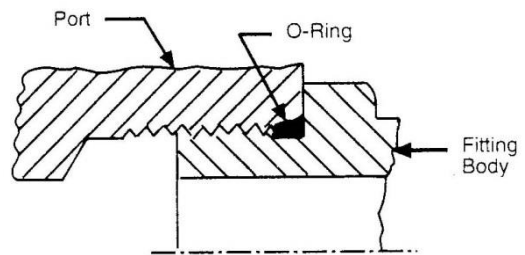
- DO NOT over-tighten connections. Refer to installation instructions for the mating fittings for information on torque requirements.
- Leak testing of all connections in your flow circuit is recommended. Pressurizing the system with air and external testing with a diluted soap solution can help identify leaking connections.

## Making SAE Straight-Thread Connections

With SAE connections, an O-ring makes the seal while the threads hold the connecting assembly in place. Straight-thread connections should receive a small amount of high-pressure lubricant before installation to prevent galling.

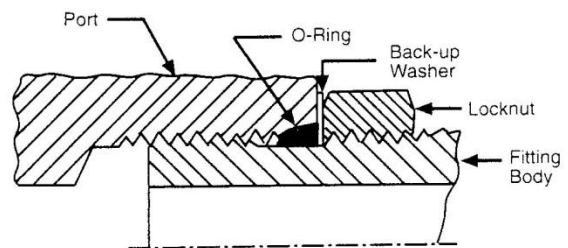
### Non-adjustable fittings

1. Bring the non-adjustable fitting into firm contact with the face of the port, using a wrench.
2. Check to be certain that the O-ring fits easily into the non-threaded receiving area of the port, and is not pinched.



### Adjustable fittings

1. Ensure that the locknut is positioned so the back-up washer is in contact with the beginning of the threads farthest from the end of the fitting.
2. Screw the fitting into the port until the back-up washer contacts the sealing face.
3. Check to be certain that the O-ring fits easily into the non-threaded receiving area of the port, and is not pinched or damaged.
4. Unscrew the fitting a maximum of one turn to position it in the desired direction.
5. Tighten the locknut firmly against the back-up washer so the fitting assembly is held securely in place.



## NOTE





**Air bubbles entrained between the rotor spokes reduce resistance to the rotation of the rotor and allow the rotor to spin faster. As a result, the instrument will register a higher-than-actual flow rate until all air bubbles have been eliminated from the flow cavity.**

**The air bubbles may disperse out of the flow cavity over several hours of operation. The rate of dispersion is speeded by mounting the instrument with the flow path uppermost. Pulsing the liquid flow by rapidly increasing and decreasing the flow rate through the system can also assist by accelerating the bubbles toward the outlet port.**

## Section 7: Electrical Connections

Standard 6000 Series products are fitted with a 4-core cable for connection to the user's control system.

CAUTION!	
	The installation of this product should only be performed by personnel familiar with the electrical circuitry and control functions of the system in which it is to be installed.

CAUTION!	
	The electronics in a 6000 Series flow meter are sensitive to electrostatic discharge (ESD). Proper ESD precautions should be taken when handling the instrument's electronic components.

1. Locate the 5–24 VDC power source and turn it OFF.
2. Connect the **BLACK** wire to the negative (-DC) of the power source.

3. If connecting to an input such as an opto-isolator or current loop that requires a current source, connect the input to the **WHITE** wire.


For all other applications, connect the input to the **GREEN** wire.

4. Connect the **RED** wire to the positive (+DS) of the power source.
5. Confirm that all wire connections are secure.
6. Turn the DC power source ON.
7. If necessary, adjust the DC voltage to between 5 and 24 VDC.

WIRE COLOR	FUNCTION
Red	Supply voltage (+5–24 VDC)
Black	Supply common (0 VDC)
Green	Current-sinking (NPN) output
White	Current-sourcing (PNP) output


## Section 8: Flow Measurement

The pulse output of a 6000 Series flow meter is directly proportional to the volumetric flow rate of the liquid passing through the device. The output is approximately linear and scalable within the meter's flow range; however, the flow response curve does **not** pass through zero.

<b>NOTE</b>	
	<b>6000 Series flow meters are NOT calibrated devices. There is minor variation in the flow response from unit to unit.</b>


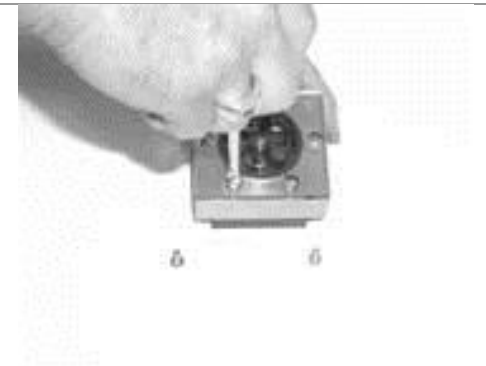

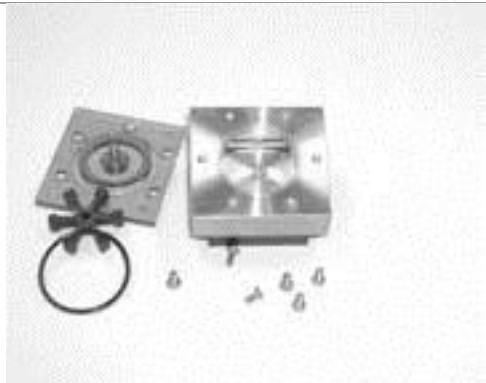
The table below lists the typical output frequencies at the lower and upper flow limits of standard 6000 Series products.

MODEL NUMBER			LOWER FLOW LIMIT			UPPER FLOW LIMIT		
POLYPROPYLENE	BRASS	STAINLESS STEEL	LPM	GPM	Hz	LPM	GPM	Hz
06004PN06	06004BN06	06004SN06	0.23	0.06	8	2.3	0.6	151
	06004BN1	06004SN1	0.4	0.1	11	5.3	1.4	155
06004PN1			0.4	0.1	20	5.3	1.4	242
	06004BN2	06004SN2	0.95	0.25	15	9.5	2.5	229
06004PN2			0.95	0.25	20	9.5	2.5	240
		06004SA2	0.95	0.25	14	9.5	2.5	220
	06004BN4	06004SN4	1.1	0.3	11	17	4.5	216
06004PN4			1.1	0.3	20	17	4.5	240
		06004SA4	1.1	0.3	11	17	4.5	216
	06006BN9	06006SN9	2.3	0.6	11	34	9.0	227
06006PN10			2.3	0.6	20	38	10	240
		06008SA10	3.0	0.8	20	38	10	240
	06008BN14	06008SN14	5.3	1.4	13	53	14	250
06008PN14			5.3	1.4	20	53	14	240
		06012SA16	4.5	1.2	12	61	16	189
	06012BN16	06012SN16	4.5	1.2	12	61	16	189
06012PN19			5.7	1.5	20	72	19	240
	06012BN40	06012SN40	11	3.0	15	151	40	229
		06016SA40	15	4.0	15	151	40	188
	06016BN40	06016SN40	15	4.0	15	151	40	188
06016PN50			15	4.0	20	151	50	240
	06016BN50	06016SN50	19	5.0	20	227	60	240

<b>NOTE</b>	
	<p>The flow ranges for each model are valid for water at 20 °C / 68 °F. The use of a different fluid type and/or temperature can alter the flow response of the sensor.</p> <p>Specialized flow characterization of the flow response of an individual flow meter is available for an additional charge. Please contact Proteus Applications Support at <a href="mailto:tech@proteusind.com">tech@proteusind.com</a> or (650) 964-4163 for more information.</p>

## Section 9: Cleaning and Maintenance

Maintenance of the 6000 Series flow meters is normally limited to cleaning the chamber in which the rotor spins and annual re-characterization. The frequency of cleaning will vary with the type of fluid being run and the cleanliness of that fluid. In most cases, annual cleaning immediately prior to re-characterization is sufficient.

Cleaning a 6000 Series Flow Meter	
<p>1. Turn OFF the liquid flow in your flow circuit and remove the flow meter from your system.</p> <p>Place the unit on a clean surface.</p>	 A photograph showing a square flow meter with a circular window on top and a screwdriver lying next to it on a white surface.
<p>2. Remove and retain the six (6) screws securing the faceplate.</p>	 A close-up photograph of a hand using a screwdriver to turn a screw on the top faceplate of the flow meter. Two screws are shown lying on the surface below.
<p>3. Remove the faceplate from the flow meter.</p>	 A photograph showing a hand lifting the circular faceplate off the flow meter. The faceplate has six screws around its perimeter. The screws are shown lying on the surface below.
<p>4. Remove the rotor and stainless steel shaft from the flow cavity.</p> <p>Remove the O-ring from the faceplate</p>	 A photograph showing the disassembled components of the flow meter. The faceplate is on the left with an O-ring and a star-shaped rotor assembly. The main flow meter body is on the right. Six screws are scattered on the surface between the two parts.

## Cleaning a 6000 Series Flow Meter

5. Using a soft cloth dampened with water, alcohol or a light detergent solution, clean debris and dirt from the rotor, the stainless steel shaft, the inside surfaces of faceplate and the surfaces of the flow cavity.

6. Inspect the bearing surface of the rotor.  
If the bearing surface is worn or not round, replace the rotor.

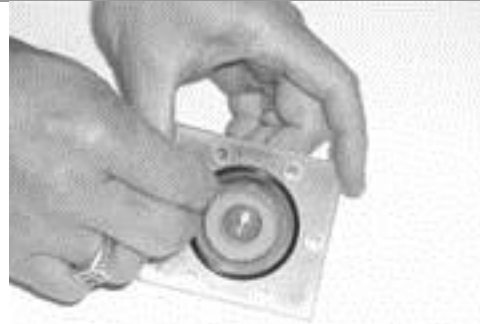
Inspect the stainless steel shaft.

If the shaft shows signs of scoring or other wear, replace the shaft or the whole faceplate assembly.

7. Inspect the O-ring to ensure that it is not brittle, cracked or otherwise damaged.

If necessary replace with a #132 O-ring of a material compatible with the liquid being passed through the flow meter.

Position the O-ring on the inner rim of the faceplate.



8. Place the rotor in the flow cavity.

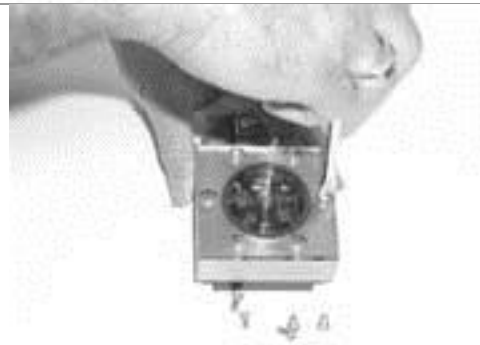
Position the shaft (or the faceplate) to locate the shaft in the rotor.



9. Position the faceplate so that the holes in the faceplate are aligned with the screw holes in the front of the flow sensor body.

Replace the 6 securing screws.

Tighten the screws to a torque of 10 in-lb (hand tighten with a normal screwdriver).




11. Install the flow meter in your system.

Turn on liquid flow and check for leaks at the faceplate and connecting ports.

Tighten all connections as required to eliminate leaks.

## Section 10: Characterization and Re-characterization

NOTE	
	<p>6000 Series flow meters are characterized by Proteus with water temperatures ranging from 22–28 °C / 72–82 °F.</p> <p>The use of a different fluid type and/or temperature can alter the flow response of the sensor, as can the way in which the sensor is connected to your system (as described in Section 7: Plumbing Connections).</p> <p>Specialized flow characterization of the flow response of an individual flow meter is available for an additional charge. Please contact Proteus Applications Support at <a href="mailto:tech@proteusind.com">tech@proteusind.com</a> or (650) 964-4163 for more information.</p>

### Checking Flow Meter Response

The frequency at which the flow response curve of a 6000 Series flow meter should be checked is determined by the accuracy and stability requirements of each application.

Note that no actual calibration adjustments can be made with this flow meter. The response factor or response curve of the flow meter must be measured, and the new response characteristic or flow response coefficients must be entered to the controlling processor.

### Characterization by Proteus

To obtain a price quotation and a Return Material Authorization (RMA) number for re-characterization of your flow sensor, contact Proteus Customer Service at [sales@proteusind.com](mailto:sales@proteusind.com) or (650) 964-4163.

When received at Proteus, your flow meter will be re-characterized as follows:

1. The output of your meter will be measured and recorded in the as-received state.
2. The rotor, stainless steel shaft and sealing O-ring will be replaced.
3. The flow cavity will be cleaned and the device reassembled.
4. The unit will be re-characterized against reference standards whose calibrations are statistically controlled against NIST-traceable standards.
5. If characterization is requested, a new characterization certificate will be issued
6. A new characterization label will be attached to the flow meter.

Direct characterization against NIST-traceable standards is optionally available.