

SAVE THESE INSTRUCTIONS

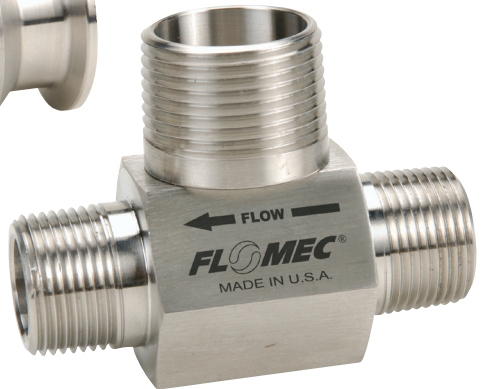


G SERIES TURBINES

Owner's Manual



Sanitary Type



Industrial Type

TABLE OF CONTENTS

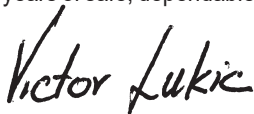
| | |
|--------------------------|----|
| General Information..... | 2 |
| Installation | 3 |
| Maintenance | 4 |
| Troubleshooting..... | 11 |
| Specifications | 12 |
| Service..... | 14 |

To the owner...

Congratulations on receiving your FLOMEC® G Series Turbine. We are pleased to provide you with a product designed to give you maximum reliability and efficiency.

Our business is the design, manufacture, and marketing of liquid handling, agricultural, and recreational products. We succeed because we provide customers with innovative, reliable, safe, timely, and competitively-priced products. We pride ourselves in conducting our business with integrity and professionalism.

We are proud to provide you with a quality product and the support you need to obtain years of safe, dependable service.



Victor Lukic, President
Great Plains Industries, Inc.

GENERAL INFORMATION

This manual will assist you in installing and maintaining your FLOMEC G Series Turbine. For best results, take the time to fully acquaint yourself with all information about all components of your G Series Turbine. If you need assistance, contact the distributor from whom you purchased your turbine.

Product Description

FLOMEC G Series Turbine flowmeters are volumetric flow measurement devices. The moving fluid is used to turn a rotor, which is suspended in the flow stream. The rotating speed of the rotor is proportional to the fluid velocity or flowrate. As the blades from a spinning rotor pass by a magnetic sensor, an AC voltage pulse is generated and transmitted to the readout instrument. Each pulse is equal to a given volume of liquid, therefore "x" number of pulses are equal to a gallon, litre, pound, barrel, etc.

Turbine Sizing

FLOMEC G Series Turbines are identified by the internal diameter of the inlet and outlet.

| | |
|------------|-------------------------|
| Model 050 | ½ inch (0.6-6.0 GPM) |
| Model 051 | ½ inch (0.8-6.0 GPM) |
| Model 075 | ¾ inch (1.6-16 GPM) |
| Model 075E | ¾ inch (2.3-23 GPM) |
| Model 100 | 1 inch (6.7-67 GPM) |
| Model 150 | 1 ½ inch (17.7-177 GPM) |
| Model 200 | 2 inch (33-330 GPM) |
| Model 300 | 3 inch (60-600 GPM) |

Turbine flowmeters should be sized in accordance to the actual flowrate and not the process pipe size. For example: a process having a flowrate of 10-20 GPM in a 1-½" process line requires either a Model 075E or Model 100 turbine flowmeter.

Another important factor to take into consideration when sizing a turbine flowmeter is instantaneous flowrate. This is extremely important when sizing a turbine flowmeter where the volume is measured per hour or per day. For example, an application where the total output is 500 barrels per day, occurring in a five hour period; the recommended turbine flowmeter should be sized according to the instantaneous flowrate:

$$(500 \div 5) \times 24 \text{ or } 2,400 \text{ barrels per day}$$

Thus, requiring an 1 ½ inch turbine flowmeter.

INSTALLATION

Turbine flowmeters are affected by both upstream and downstream process configurations. Turbine flowmeters should always be installed with a minimum of 10 pipe diameters upstream and 5 pipe diameters downstream. The only exception is the placement of the pumps, valves, etc., on the upstream end. When this occurs, 20 diameters of straight pipe should be used. The direction of flow is indicated by the arrow on the turbine. All turbine flowmeters are designed to measure flow in only one direction.

Check the items that follow once the turbine flowmeter is installed in the process line. This will ensure a successful start-up.

1. Install magnetic pickup (Figure 1).
2. Make sure that the new or correct K-factor is entered into the readout device.

NOTE: The K-factor is printed on the turbine body. The calibration report included with the product provides several points along the flow curve.

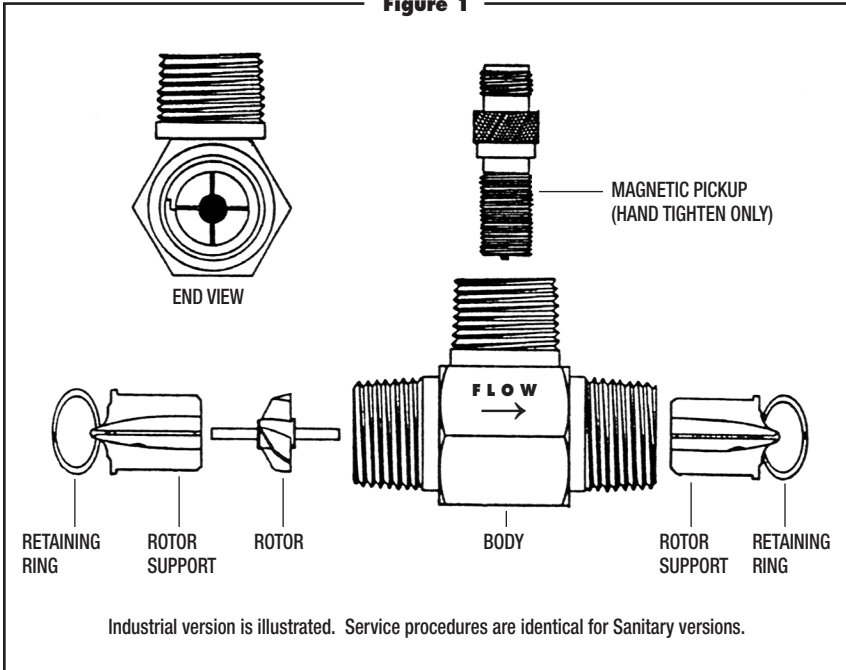
Initial Start-Up

Turbine flowmeters can be installed in the horizontal or vertical position. When installing a turbine flowmeter in the vertical position, it is important that the direction of flow be up through the turbine flowmeter.

A spool should be installed in place of the turbine flowmeter during initial start-up of a new process line. The process line should be purged, thus eliminating any solids contained in the line. Once this is completed, the spool can be removed and the turbine flowmeter installed.

NOTE: Control valves should always be installed downstream of the turbine flowmeter.

Figure 1



The turbine flowmeter should be installed in a location where the process line will remain full of liquid at all times. Otherwise, when the process line becomes empty and a valve is opened, the high velocity fluid hitting the turbine flowmeter rotor can cause severe damage.

When there is trapped air in the process line, an air eliminator should be used. This trapped air causes air pockets and these air pockets will cause the rotor to spin at a faster rate than liquid, thus resulting in incorrect readings, which results in an overstatement of actual flowrate and volume. This condition can damage the flowmeter.

⚠ WARNING

If liquid being measured contains large solids, install a filter or strainer. Without the use of a filter or strainer, damage can occur to the internal components.

In process lines where particulates are present, a filter/strainer should be used. Refer to the table below for the recommended mesh size.

| Turbine Flowmeter Size | Mesh Size |
|------------------------|-----------|
| ½ inch | 40 |
| ¾ inch | 40 |
| 1 inch | 40 |
| 1 ½ inch | 18 |
| 2 inch | 14 |
| 3 inch | 14 |

MAINTENANCE

Cleaning Procedures

G Series Sanitary Turbines are designed to be compatible with commercially accepted methods of both CIP (Cleaned-In-Place) mechanical

cleaning as well as intermittent SIP (Steam-In-Place) cleaning methods.

If CIP or SIP cleaning methods are not available, manual COP (Cleaning-Out-of-Place) methods can be used.

Care must be taken during system start-up, chemical cleaning, air purge or steam cleaning processes to ensure that the turbine rotor does not over speed as damage can result to the rotor and/or bearing. Maximum allowable over range for G Series Turbines is 125% of maximum rated flowrate for intermittent periods.

A minimum fluid velocity of 5 foot per second (1.5 meter per second) must be maintained during the CIP process to ensure adequate cleaning.

Reference: 3-A Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk and Milk Product Processing Plants, Number 605-XX as amended for procedures and recommended flowrates.

The following flowrates are recommended by the 3-A Recommended Practices 605-XX to achieve 5 FPS or 1.5 MPS in the respective Sanitary Tube size:

| SANITARY TUBE SIZE | | Flowrate |
|--------------------|-------|----------|
| O.D. | I.D. | |
| INCHES | | |
| 1.0 | .875 | 9.4 GPM |
| 1.5 | 1.375 | 24 GPM |
| 2.0 | 1.875 | 43 GPM |
| CENTIMETERS | | |
| 2.5 | 2.22 | 35.6 LPM |
| 3.8 | 3.50 | 90.8 LPM |
| 5.1 | 4.75 | 163 LPM |

Temperature limit for SIP cleaning is primarily limited by the temperature rating on the magnetic pickup. If the pickup temperature rating will be

exceeded during SIP cleaning, remove it during the cleaning process or a higher temperature rated pickup should be specified. Internal components of the G Series Sanitary Turbine must be limited to less than 285° F (140° C). The temperature and pressure rating of gaskets and clamps used in the installation must also be taken into consideration when determining cleaning parameters.

Minimum requirements for effective sterilization with SIP cleaning are to maintain 250° F (121° C) at the coldest point in the system for a minimum of 30 minutes. This requires a minimum of 15.3 psig (106 kPa) saturated steam pressure. Normal recommended maximums for SIP cleaning on G Series meters is 285° F (140° C) and 39 psig (269 kPa) saturated steam pressure.

Disassembling the Turbine

1. Disconnect the turbine flowmeter cable from the magnetic pickup. Refer to Figure 1.
2. Remove the magnetic pickup.
3. Ensure that the process line is depressurized and empty prior to removal of the turbine flowmeter. Remove the turbine flowmeter from the process line.
4. Using a small screwdriver or similar tool, insert it into the radius notch of the retaining ring, pull away from the groove and up, removing the retaining ring from one end of the turbine flowmeter. This will allow the support to slide out of the turbine flowmeter body. Remove the rotor before proceeding to the other support.

NOTE: To remove the other support, simply repeat this operation.

5. Once the turbine flowmeter is taken apart, inspect the turbine flowmeter body for signs of wear or defects. The body bore should be smooth and show no evidence

of wear.

NOTE: Do not install a new replacement kit into a turbine flowmeter body that shows significant signs of wear.

6. Examine the rotor for broken and/or bent blades. Remove any foreign matter.
7. Examine the supports for signs of deterioration, such as wear marks and/or burrs along the outer edge of the support vanes.
8. When the rotor or the supports show any sign of deterioration, a new replacement kit should be installed. Do not install a new replacement kit into a defective turbine flowmeter body.

Replacement Kits

A replacement kit is comprised of all the internal component parts within the turbine flowmeter. A replacement kit consists of the following:

| Parts Description | Quantity |
|-------------------|----------|
| Rotor Assembly | 1 |
| Support Assembly* | 2 |
| Retaining Ring | 2 |

* The support assemblies come complete with bushings and thrust balls, which are factory installed. Proper selection of bearing material is critical when ordering a new replacement kit.

FLOMEC® supports are identical in design, thus eliminating assembly error. Each support incorporates a thrust bearing, which allows for bidirectional flow and prevents damage to the rotor and/or supports in the event the turbine flowmeter is installed backwards with respect to the direction of flow.

Notice that the direction of flow is displayed on the body of the turbine flowmeter. This is important when installing the rotor and also denotes the direction in which the turbine flowmeter was calibrated.

NOTE: FLOMEC® rotors are tapered on one end (except $\frac{1}{2}$ " and $\frac{3}{4}$ "). The tapered end should be installed on the inlet side. See Figure 1. The $\frac{1}{2}$ " and $\frac{3}{4}$ " rotors are marked with a point on the hub and should be installed with the marked side of the rotor hub on the inlet side.

1. Install a support on the inlet side (where the flow starts), placing a vane between the notches in the turbine flowmeter body. Install a retaining ring – this will keep the support in place.
2. Place the rotor with the shaft in the support that has not been installed. Hold the turbine flowmeter body with the open end down and slide the rotor and support into the turbine flowmeter body. Make sure the vane is placed between the notches.

3. Once the support is in place, install the retaining ring.
4. Blow into the turbine flowmeter to ensure the rotor spins freely. Installation of the replacement kit is complete and the turbine flowmeter can be reinstalled into the process line.
5. Install the magnetic pickup. **HAND TIGHTEN ONLY.**

NOTE: Be sure to use the proper magnetic pickup, cable and connector for the application.

6. Enter the new K-factor supplied with the replacement kit into the electronic readout device. (Refer to the calibration report.)

NOTE: All internal replacement kits are factory calibrated and are supplied with a five point calibration report.

Figure 2

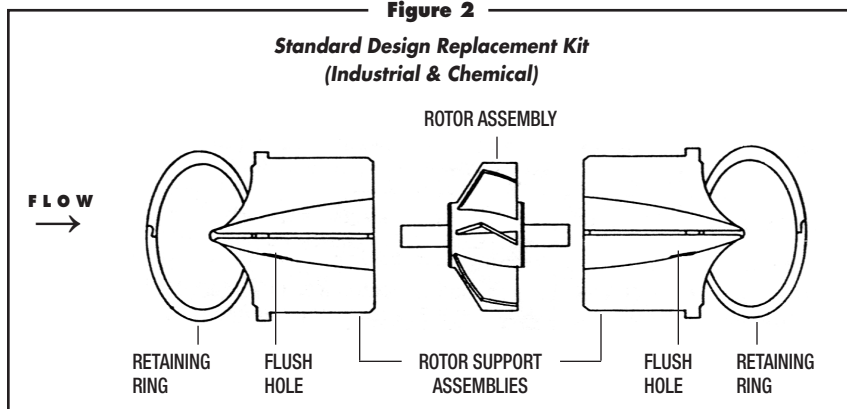
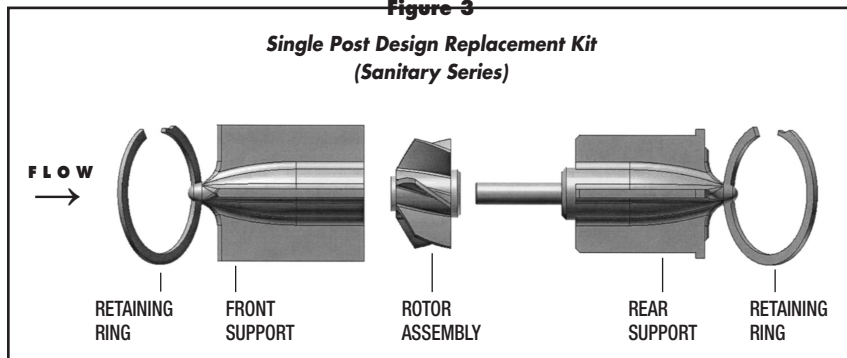


Figure 3



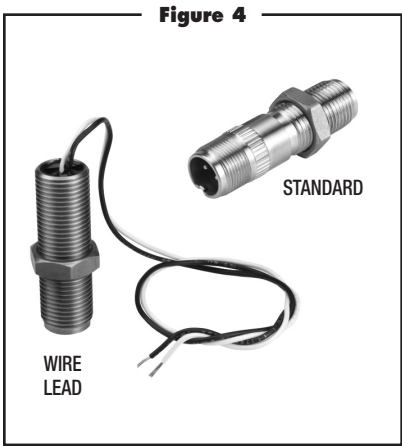
| Replacement Kits for Industrial Turbine Flowmeters | | | | | |
|--|-----------------------------------|----------------------|----------|-----------------------|----------|
| Size | Flow Range (Litres Per Minute) | Tungsten Carbide* | | High Density Plastic* | |
| | | Model | Part No. | Model | Part No. |
| ½ in. | 2.2-22 LPM | | | GNP-050 GSCP-050 | 80508032 |
| ½ in. | 3.0-22 LPM | GNT-051 GFT-051 | 80518031 | GNP-051 GSCP-051 | 80518032 |
| | | GNT-051H GFT-051H | 80518081 | | |
| ¾ in. | 6-60 LPM | GNT-075 GFT-075 | 80758031 | GNP-075 GSCP-075 | 80758032 |
| | | GNT-075H GFT-075H | 80758081 | | |
| ¾ in. E | 8.7-87 LPM | GNT-075E GFT-075E | 80768031 | GNP-075E GSCP-075E | 80768032 |
| | | GNT-75EH GFT-75EH | 80768081 | | |
| 1 in. | 25.2-252 LPM | GNT-100 GFT-100 | 81008031 | GNP-100 GSCP-100 | 81008032 |
| | | GNT-100H GFT-100H | 81008081 | | |
| 1 ½ in. | 67-670 LPM | GNT-150 GFT-150 | 81508031 | GNP-150 GSCP-150 | 81508032 |
| | | GNT-150H GFT-150H | 81508081 | | |
| 2 in. | 125-1,250 LPM | GNT-200 GFT-200 | 82008031 | GNP-200 GSCP-200 | 82008032 |
| | | GNT-200H GFT-200H | 82008081 | | |
| 3 in. | 227-2,270 LPM | GNT-300 GFT-300 | 83008031 | | |

* Sleeve Bearing

| Replacement Kits for Sanitary Turbine Flowmeters (GSCPS) | | | |
|--|------------------------------------|-------------|----------|
| Size | Flow Range (Gallons Per Minute) | Single Post | |
| | | Model | Part No. |
| 1 in. | 6.7 - 67 GPM | GSCPS | 81008074 |
| 1 ½ in. | 17.7 - 177 GPM | GSCPS | 81508074 |
| 2 in. | 33 - 330 | GSCPS | 82008074 |

Magnetic Pickups

GPI® offers two types of magnetic pickups: Standard and Wire Lead. See Figure 4.



When choosing a magnetic pickup, the turbine meter and electronics are generally already known. Electronics can be either Local or Remote. Remote electronics include FLOMEC® Remote Displays or output to customer supplied equipment. Follow the next three steps when choosing a magnetic pickup.

1. Select your size: ½ in. or ¾ to 3 in.
2. Choose Local or Remote/Output. Local uses a wire lead pickup. Remote/Output requires a connector.
3. Choose either Sine Wave or Square Wave as your signal type. Sine Wave does not require external power for sensor and can be used with battery powered displays. Square Wave means sensor power is required.

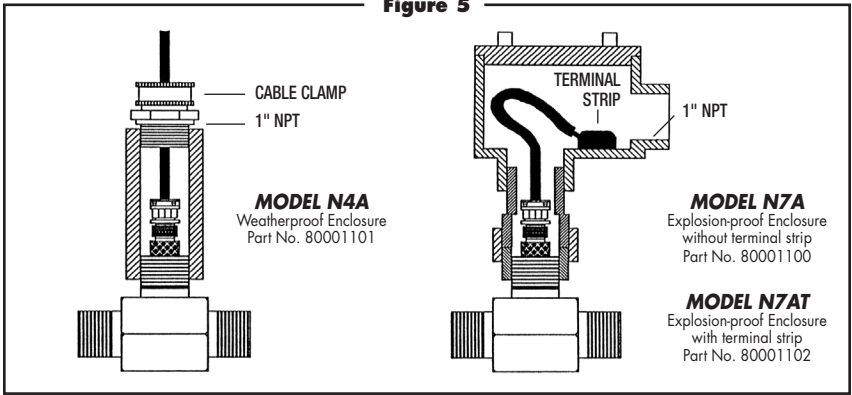
| Selection Guide for ½ in. Turbine Meters | | | |
|---|----------|--|------------|
| Magnetic Pickup Type | Part No. | Application | Cable Type |
| Wire Lead Low Drag | 81006001 | Use with Model 051. Meter mount electronics. Temperature range: -100° F to +250° F. Sine wave output. | None |
| Low Drag | 81006000 | Use with Model 051. Remote mount electronics. Temperature range: -450° F to +450° F. Sine wave output. | S |
| High Temp. Low Drag | 81007001 | Use with Model 051. Remote mount electronics. Temperature range: -450° F to +800° F. Sine wave output. | None |
| RF Digital | 81005002 | Use with Models 050 or 051. Temperature range: -40° F to +248° F. Square wave, open collector output. 7-30 VDC required. | D |
| Selection Guide for ¾ in. to 3 in. Turbine Meters | | | |
| Wire Lead Standard | 81003000 | Meter mount electronics. Temperature range: -100° F to +250° F. Sine wave output. | None |
| Standard | 81001000 | Remote mount electronics. Temperature range: -100° F to +250° F. Sine wave output. | S |
| Herm/High Temp. | 81002000 | Remote mount electronics. Temperature range: -450° F to +258° F. Sine wave output. | H or T |
| High Temp. Standard | 81007000 | Remote mount electronics. Temperature range: -450° F to +800° F. Sine wave output. | H or T |
| Active Digital | 81004000 | Remote mount electronics. Temperature range: -40° F to +248° F. Square wave, open collector output, 5-32 VDC required. Signal Output: 0-10 V, NPN. | D |

Magnetic Pickup Enclosures

Pickup Enclosures are optional on G Series Turbine Meters. Choose from three pickup enclosures: Model N4A

is the weatherproof enclosure. For explosion-proof enclosures, choose N7A for the enclosure without the terminal strip or the N7AT with the terminal strip. See Figure 5.

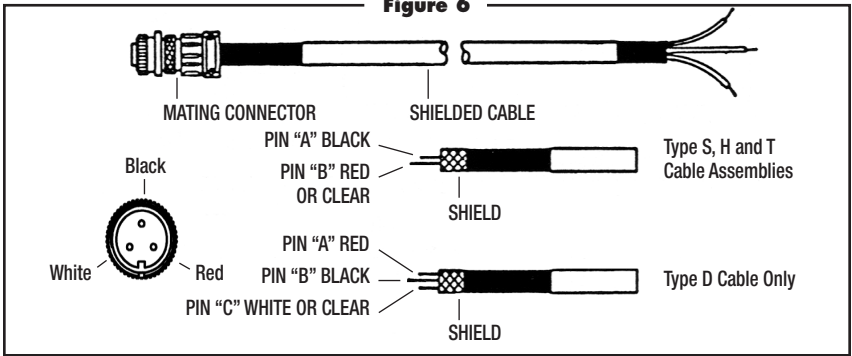
Figure 5



Cable Assemblies

Cable Assemblies include the connector.

Figure 6



Cable Length Selection Guide

| Cable Length | Type "S" Standard (2 Conductor) | Type "D" Digital or RF (3 Conductor) | Type "H" Water Resistant (2 Conductor) | Type "T" Hi-Temperature (2 Conductor) |
|--------------|---------------------------------|--------------------------------------|--|---------------------------------------|
| 8 inch | 83001001 | 83002001 | 83003001 | 83004001 |
| 5 feet | 83001005 | 83002005 | 83003005 | 83004005 |
| 10 feet | 83001010 | 83002010 | 83003010 | 83004010 |
| 15 feet | 83001015 | 83002015 | 83003015 | 83004015 |
| 20 feet | 83001020 | 83002020 | 83003020 | 83004020 |
| 25 feet | 83001025 | 83002025 | 83003025 | 83004025 |
| 30 feet | 83001030 | 83002030 | 83003030 | 83004030 |
| 40 feet | 83001040 | 83002040 | 83003040 | 83004040 |
| 50 feet | 83001050 | 83002050 | 83003050 | 83004050 |
| 75 feet | 83001075 | 83002075 | 83003075 | 83004075 |
| 100 feet | 83001100 | | | |
| 125 feet | 83001125 | | | |

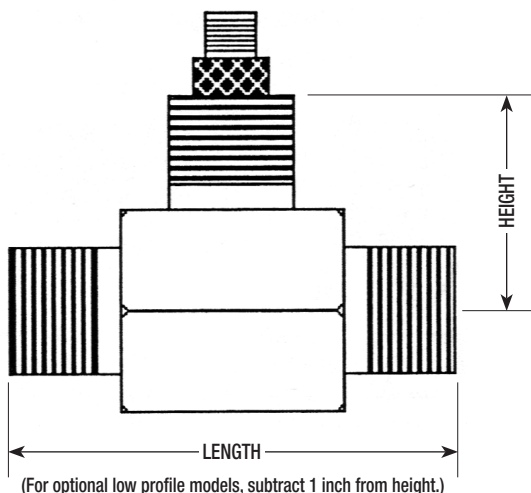
FLOW RANGES

| Size | Gallons Per Minute | | Litres Per Minute | | Frequency Output |
|---------|--------------------|------|-------------------|------|------------------|
| | Min. | Max. | Min. | Max. | |
| ½ in. | 0.6 | 6.0 | 2.2 | 22 | 100 - 1000 Hz |
| ½ in. | 0.8 | 6.0 | 3.0 | 22 | 125 - 1000 Hz |
| ¾ in. | 1.6 | 16 | 6.0 | 60 | 100 - 1000 Hz |
| ¾ in. E | 2.3 | 23 | 8.7 | 87 | 100 - 1000 Hz |
| 1 in. | 6.7 | 67 | 25.2 | 252 | 100 - 1000 Hz |
| 1 ½ in. | 17.7 | 177 | 67.0 | 670 | 100 - 1000 Hz |
| 2 in. | 33 | 330 | 124.9 | 1249 | 100 - 1000 Hz |
| 3 in. | 60 | 600 | 227.1 | 2271 | 50 - 500 Hz |

DIMENSIONS

| Size | NPT & Flared | | Flanged | | Sanitary Clamp | | Tri-Clover Clamp | |
|---------|--------------|--------|---------|--------|----------------|--------|------------------|--------|
| | Height | Length | Height | Length | Height | Length | Height | Length |
| ½ in. | 2.562 | 2.750 | — | — | — | — | 2.562 | 2.750 |
| ½ in. | 2.562 | 2.750 | — | — | — | — | 2.562 | 2.750 |
| ¾ in. | 2.625 | 3.250 | 2.00 | 5.50 | — | — | 2.625 | 3.250 |
| ¾ in. E | 2.625 | 3.250 | 2.00 | 5.50 | — | — | 2.625 | 3.250 |
| 1 in. | 2.75 | 3.562 | 2.125 | 5.50 | 2.75 | 3.562 | 2.75 | 3.562 |
| 1 ½ in. | 3.00 | 4.594 | 2.50 | 6.00 | 3.00 | 4.594 | 3.00 | 4.594 |
| 2 in. | 3.25 | 6.063 | 3.00 | 6.50 | 3.25 | 6.063 | 3.25 | 6.063 |
| 3 in. | 3.50 | 10.00 | 3.75 | 10.00 | — | — | — | — |

Dimensions are provided in inches.



TROUBLESHOOTING

| Symptom | Probable Cause | Solution |
|--|--|--|
| A. MORE VOLUME/ OUTPUT THAN DISPLAYED OR REGISTERED | 1. Rotor may drag due to foreign matter obstruction. | Check for debris inside the meter. Clean and reassemble. |
| | 2. Magnetic pickup not screwed down all the way into the turbine flowmeter body. This causes it not to detect all the rotor blades as they pass. | Screw the magnetic pickup all the way down into the turbine flowmeter body. Hand-tighten only. |
| | 3. Turbine flowmeter installed backwards. | Install the turbine flowmeter in accordance with the process flow direction. |
| | 4. Turbine flowmeter rotor installed backwards. | Install the turbine flowmeter rotor in accordance with the process flow direction. |
| | 5. K-factor is too high in electronic/readout device. | Verify K-factor used. K-factor should be decreased. |
| B. LESS VOLUME/ OUTPUT THAN DISPLAYED OR REGISTERED | 1. Caused by trapped air in the process line. | Install an air eliminator up-stream of turbine flowmeter. |
| | 2. K-factor is too low in electronic/readout device. | Verify K-factor used. K-factor should be increased. |

SPECIFICATIONS

Accuracy*: $\pm 0.5\%$ of the true flow at any point within the linear range of the turbine flowmeter.

Linearity*: $\pm 0.5\%$ of the mean K-factor throughout the linear range.

Repeatability*: $\pm 0.1\%$ of the indicated flow throughout the linear range.

Response Time:

½ in. to 2 in: 2-5 milliseconds for step change in flowrate.

3 in: 10-25 milliseconds for step change in flowrate.

Frequency Output:

(over the linear range)

½ in. (051): 125 - 1000 Hz

½ in. to 2 in: 100 - 1000 Hz

3 in: 50 - 500 Hz

Voltage Output:

½ in. to 2 in: Approx. 100 mV @ 100 Hz to 1.0-volt (r.m.s.) @ 1000 Hz

3 in: Approx. 80 mV @ 50 Hz to 800 mV (r.m.s.) @ 500 Hz

Maximum Overrange: to 125% of maximum flowrate for intermittent periods.

Operating Temperature:

GNP: -100° F to +185° F
(-74° C to +85° C)

GNT: -100° F to +225° F
(-74° C to +107° C)

GNT (High Temp):
-450° F to +800° F
(-268° C to +427° C)

GSCP: -100° F to +185° F
(-74° C to +85° C)

GSCPS: -100° F to +225° F
(-70° C to +107° C)

* Data based on water calibration
@ 77° F (25° C).

Standard Materials of Construction

GNT, GBT, GFT and GIT

Housing and Supports: 316 Stainless Steel

Rotor: CD4MCu Stainless Steel

Shaft: Tungsten Carbide

Sleeve Bearings: Tungsten Carbide

Thrust Bearings: Tungsten Carbide

Retaining Rings: 300 Series Stainless Steel

GNP, GBP, GFP, GIP and GSCP

Housing and Supports: 316 Stainless Steel

Rotor: CD4MCu Stainless Steel

Shaft: 316 Stainless Steel

Sleeve Bearings: PTFE Rulon®

Thrust Bearings: 440C Stainless Steel

Retaining Rings: 300 Series Stainless Steel

GSCPS

Housing and Supports: 316 Stainless Steel

Rotor: Nickel Plated CD4MCu Stainless Steel

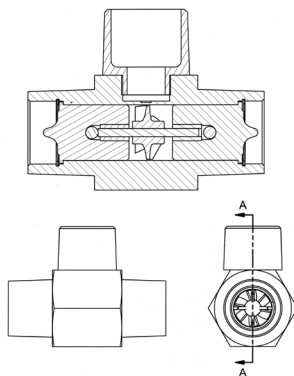
Shaft: 316 Stainless Steel

Sleeve/Thrust Bearing: PEEK

Retaining Rings: 300 Series Stainless Steel

Figure 7

Materials of Construction
Industrial turbine flowmeter shown here.



Flow Related Formulas

$$\text{GPM} = \frac{\text{Hz} \times 60}{\text{K-factor}}$$

$$\text{Hz} = \frac{\text{GPM} \times \text{K-factor}}{60}$$

$$\text{K-factor} = \frac{\text{Hz} \times 60}{\text{GPM}}$$

$$\text{Pulses Per Litre} = \frac{\text{K-factor}}{3.785}$$

$$\text{Pulses Per Barrel} = \text{K-factor} \times 42$$

$$\text{Pulses Per Cubic Meter} = \frac{\text{K-factor}}{.003785}$$

$$\text{Pulses Per Pound} = \frac{\text{K-factor}}{\text{Pounds Per Gallon}}$$

$$\text{GPM} = \frac{\text{Pounds Per Hour}}{500 \times \text{S.G.}}$$

$$\text{Pounds Per Hour} = 500 \times \text{S.G.} \times \text{GPM}$$

$$\text{Pounds Per Gallon} = \text{S.G.} \times 8.33 \text{ (Water)}$$

$$\text{BPH} = \text{GPM} \times 1.42857$$

$$\text{BPD} = \text{GPM} \times 34.286$$

$$\text{BPM} = \text{GPM} \times 0.238$$

$$\text{GPS} = \text{GPM} \times .01666$$

$$\text{GPD} = \text{GPM} \times 1440.0$$

$$\text{GPM} = \text{BPD} \times .029167$$

$$\text{GPM} = \text{BPH} \times 0.7$$

$$\text{CFM} = \text{GPM} \times .13368$$

$$\text{BPH} = \text{Barrels Per Hour}$$

$$\text{BPD} = \text{Barrels Per Day}$$

$$\text{BPM} = \text{Barrels Per Minute}$$

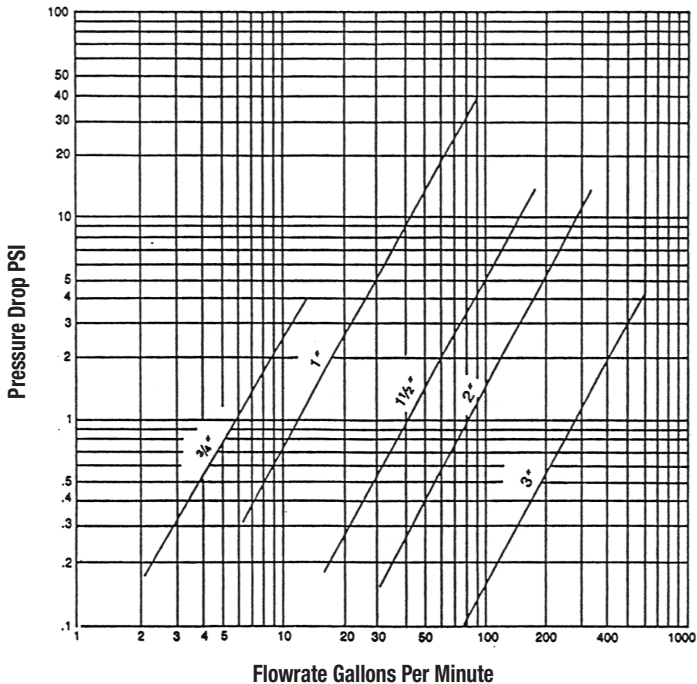
$$\text{CFM} = \text{Cubic Feet Per Minute}$$

$$\text{GPS} = \text{Gallons Per Second}$$

$$\text{GPD} = \text{Gallons Per Day}$$

$$\text{GPM} = \text{Gallons Per Minute}$$

Pressure Drop vs. Flowrate



For estimating pressure drops on liquids other than water, use the following formulas:

$$P = [\text{VISC (CPS)}]^{1/4} \times [\text{S.G.}]^{3/4} [\text{PH } 0]$$

Where: CPS = Absolute Viscosity in Centipoise
 SG = Specific Gravity
 PH 0 = Pressure Drop at the Operating Flowrate from the Chart

SERVICE

For warranty consideration, parts, or other service information, please contact your local distributor. If you need further assistance, call the GPI® Customer Service Department during normal business hours.

1-888-996-3837

To obtain prompt, efficient service, always be prepared with the following information:

1. The model number of your turbine.
2. The serial number of your turbine.
3. Specific information about part numbers and descriptions.

For warranty work always be prepared with your original sales slip or other evidence of purchase date.

Returning Parts

Please contact the factory before returning any parts. It may be possible to diagnose the trouble and identify needed parts in a telephone call. GPI can also inform you of any special handling requirements you will need to follow covering the transportation and handling of equipment which has been used to transfer hazardous or flammable liquids.

CAUTION

Do not return turbines without specific authority from the GPI Customer Service Department. Due to strict regulations governing transportation, handling, and disposal of hazardous or flammable liquids, GPI will not accept turbines for rework unless they are completely free of liquid residue.

CAUTION

Turbines not flushed before shipment can be refused and returned to the sender.

Limited Warranty Policy

Great Plains Industries, Inc. 5252 E. 36th Street North, Wichita, KS USA 67220-3205, hereby provides a limited warranty against defects in material and workmanship on all products manufactured by Great Plains Industries, Inc. This product includes a 1 year warranty. Manufacturer's sole obligation under the foregoing warranties will be limited to either, at Manufacturer's option, replacing or repairing defective Goods (subject to limitations hereinafter provided) or refunding the purchase price for such Goods theretofore paid by the Buyer, and Buyer's exclusive remedy for breach of any such warranties will be enforcement of such obligations of Manufacturer. The warranty shall extend to the purchaser of this product and to any person to whom such product is transferred during the warranty period.

The warranty period shall begin on the date of manufacture or on the date of purchase with an original sales receipt. This warranty shall not apply if:

- A. the product has been altered or modified outside the warrantor's duly appointed representative;
- B. the product has been subjected to neglect, misuse, abuse or damage or has been installed or operated other than in accordance with the manufacturer's operating instructions.

To make a claim against this warranty, contact the GPI Customer Service Department at 316-686-7361 or 888-996-3837. Or by mail at:

Great Plains Industries, Inc.
5252 E. 36th St. North
Wichita, KS, USA 67220-3205

The company shall, notify the customer to either send the product, transportation prepaid, to the company at its office in Wichita, Kansas, or to a duly authorized service center. The company shall perform all obligations imposed on it by the terms of this warranty within 60 days of receipt of the defective product.

GREAT PLAINS INDUSTRIES, INC., EXCLUDES LIABILITY UNDER THIS WARRANTY FOR DIRECT, INDIRECT, INCIDENTAL AND CONSEQUENTIAL DAMAGES INCURRED IN THE USE OR LOSS OF USE OF THE PRODUCT WARRANTED HEREUNDER.

The company herewith expressly disclaims any warranty of merchantability or fitness for any particular purpose other than for which it was designed.

This warranty gives you specific rights and you may also have other rights which vary from U.S. state to U.S. state.

Note: In compliance with MAGNUSON MOSS CONSUMER WARRANTY ACT – Part 702 (governs the resale availability of the warranty terms).

Wichita / Sydney



Great Plains Industries, Inc. / 888-996-3837 / GPI.net