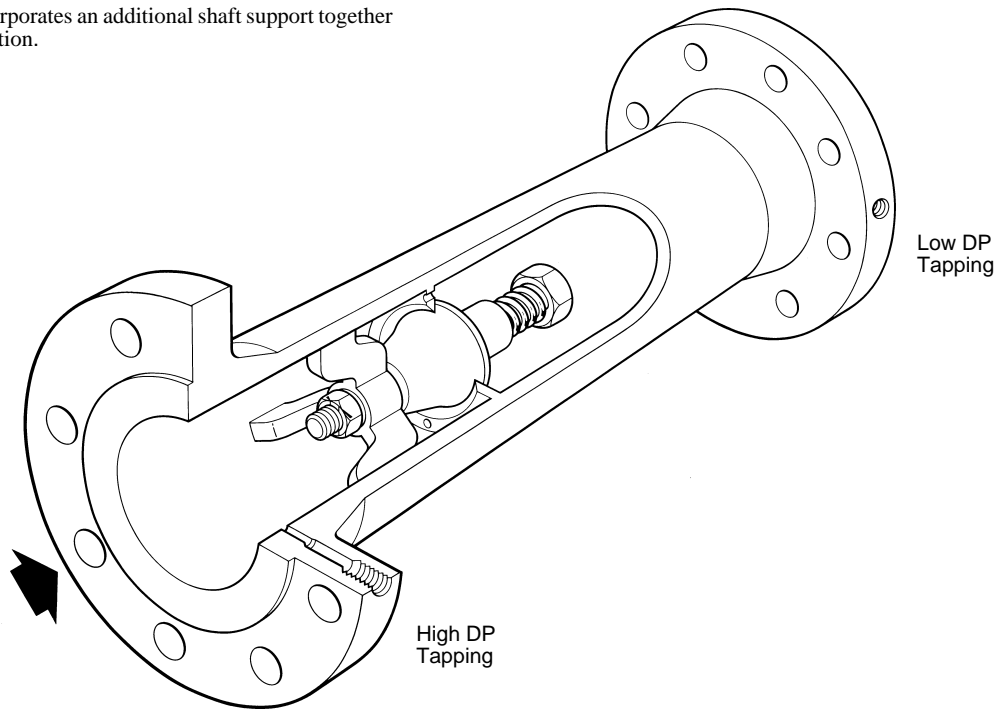


spirax /sarco®

Gilflo Flowmeters - 'Spool' Pipeline Unit

Note: 12" flowmeter incorporates an additional shaft support together with a revised spring location.



DESCRIPTION

The Gilflo 'Spool' flowmeter is installed in the pipeline and produces a differential pressure which is related to the rate of flow. It can be used with most industrial fluids, gases and both saturated and superheated steam.

SIZES AND PIPE CONNECTIONS

3", 4", 6", 8" and 12"
Flanges available to ANSI B.16.5 class 300

LIMITING CONDITIONS

Minimum operating pressure	9 psig
Maximum operating pressure	740 psig
Minimum operating temperature	-58°F
Maximum operating temperature	842°F
Maximum viscosity	30 centipoise

TURNDOWN

The Gilflo will provide accurate measurement over a flow range of 100:1.

ACCURACY

To achieve accuracy of a $\pm 1\%$ of reading, all Gilflo meters must be used in conjunction with a device capable of performing electronic linearism such as:

- M640 Steam Mass Flow Transmitter
- M700 Flow Computer (version 9-16)
- Customer's EMS, DCS or equivalent
- M240G Steam Flow Computer
- M250G Gas Flow Computer

Note: When used with M240G/M250G flow computers, Gilflo accuracy is $\pm 1\%$ of reading from 5% to 100% of maximum rated flow. For flows from 1% to 5% of maximum rated flow, accuracy will be better than $\pm 1\%$ FSD.

REPEATABILITY

The Gilflo is repeatable to better than 0.25%.

PRESSURE DROP

Less than 140 inches H₂O (349 mbar) at rated capacity

FLOW CAPACITY

To determine the maximum flow capacity of a Gilflo 'Spool', it is necessary to calculate the equivalent water flowrate (Q_e). See under the section "Sizing the Gilflo 'Spool' flowmeter".

MATERIALS OF CONSTRUCTION

Body	Carbon Steel	ASTM A105/A106/A234
Internals	Mostly Stainless Steel	S304/S316
Spring	Inconel X750	

Gilflo Flowmeters - 'Spool' Pipeline Unit

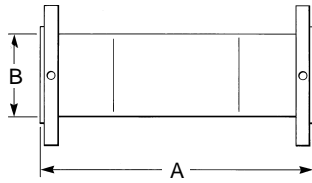
DIMENSIONS / WEIGHTS (approximate) in inches and lbs

SIZE	A	B	Weight
3"	13	3.5	37
4"	21	4.5	81
6"	28	6.6	167
8"	31	8.6	191
12"	40	13	240

H.P. and L.P. pressure tappings are threaded 1/4" NPT (female).

INSTALLATION

A separate installation booklet is supplied with each Gilflo 'Spool' flowmeter. The following main points are given for guidance:



1. The Gilflo should be installed with a minimum of 6 straight pipe diameters upstream and 3 downstream. No valves, fittings or cross sectional changes permitted within these pipe lengths. Where an increase in pipe diameter is necessary upstream of a Gilflo flowmeter, the length of straight pipe should be increased to 12 diameters. Similarly, where a Gilflo flowmeter is installed downstream of two 90° bends in two planes, a pressured reducing valve or a partially open valve, 12 pipe diameters should be allowed.

2. The Gilflo flowmeter should normally be mounted horizontally. Vertical installation (with flow vertically downward) is also permissible and must be specified when ordering. Ensure flow is in the correct direction and avoid reverse flow.

3. For steam applications, good basic steam engineering practice should be followed:-

- Ensure all pipework is adequately insulated.
- Ensure correct line drainage through adequate trapping.
- Where practicable, fit a steam separator upstream of the flowmeter. This should be drained using a float trap set.
- Ensure good alignment and support of all associated pipework.
- Achieve line size reduction by the use of eccentric reducers.
- Avoid close installation (less than 25 pipe diameters) upstream or downstream of a pressure reducing valve or modulating valve.

See the "Gilflo flowmeters - system overview" TIS 8.008 which provides information of a Gilflo metering system.

MAINTENANCE

There are no user serviceable parts within the 'Gilflo' Spool flowmeter. Mechanical checks to confirm correct operation are described in the manuals that accompanies the flowmeters.

SIZING THE GILFLO 'SPOOL' FLOWMETER

1. Determine Equivalent Water Flowrate (Q_e) in U.S. gpm using formulas:

Liquids:

$$Q_e = \frac{m}{500} \sqrt{\frac{D_e}{D_i}} \quad \text{or} \quad Q_e = Q_i \sqrt{\frac{D_i}{D_e}}$$

- Q_e = equivalent flow rate of water at 70°F (U.S. gpm)
- m = maximum flow rate of service liquid (lb/hr)
- D_e = density of water at calibration (62.305 lb/ft³)
- D_i = density of service liquid (lb/ft³)
- Q_i = maximum flow rate of service liquid (US gpm)

Gases:

$$Q_e = \sqrt{\frac{(0.0158) \times m}{D \times \frac{P_f}{P_s} \times \frac{T_s}{T_f}}}$$

$$\text{or } Q_e = (0.948) \times Q_g \sqrt{D \times \frac{P_s}{P_f} \times \frac{T_f}{T_s}}$$

- Q_e = water equivalent flow rate at 70°F (U.S. gpm)
- m = maximum flow rate of gas (lb/hr)
- D = gas density at 14.7 psia, 520°R (60°F) (lb/ft³)
- P_f = flowing pressure of gas (psia)
- P_s = standard atmospheric pressure (14.7 psia)
- T_s = standard absolute temperature (520°R)
- T_f = flowing temperature of gas (°R = °F + 460)
- Q_g = maximum flow rate of gas (SCFM)

Steam:

$$Q_e = (0.0158) \times m \sqrt{v}$$

- Q_e = water equivalent flow rate at 70°F (U.S. gpm)
- m = maximum flow rate of steam (lb/hr)
- v = specific volume of steam at normal pressure and temperature (ft³/lb)

2. Select from the table below the meter with a Q_e max. that most closely matches (but exceeds) the application Q_e determined in step 1.

Note: These equivalent water flowrates are based on a differential pressure of 140 inches H₂O (349 mbar). For saturated steam flow measurement, the table below gives flow capacities in lb/h.

size	Qe max (gpm)	15 psig	50 psig	75 psig	100 psig	150 psig	200 psig	400 psig
3"	97	1671	2419	2825	3184	3794	4321	6007
4"	249	4302	6230	7276	8199	9771	11129	15469
6"	440	7598	11002	12849	14479	17255	19653	27318
8"	1045	18033	26113	30498	34366	40954	46646	64838
12"	1958	33777	48912	57125	64371	76711	87373	121448

Note: These capacities are based on a differential pressure across the meter of 140 inches H₂O (349 mbar). Minimum flow is 1% of maximum (100:1 turndown).

HOW TO ORDER

1 - 6" Spirax Sarco Gilflo 'Spool' flowmeter flanged to ANSI B-16-5 class 300.