

# spirax/sarco®

## Gilflo ILVA Flowmeter

### DESCRIPTION

The Gilflo ILVA flowmeter operates on the spring loaded variable area principle and produces a differential pressure related to the rate of flow. It can be used with both saturated and superheated steam, gases and most industrial fluids.

### LIMITING CONDITIONS

The maximum pressure and temperature limitations are the same as the specified flange ratings with an overall maximum temperature of 842°F. Minimum operating temperature -58°F. Minimum operating pressure 9 psig. Maximum viscosity 30 centipoise.

### TURNDOWN

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

### ACCURACY

To achieve accuracy of a  $\pm 1\%$  of reading, all Gilflo ILVA 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 ILVA 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 ILVA is repeatable to better than 0.25%.

### PRESSURE DROP

The pressure drop across the Gilflo ILVA pipeline unit is 200 inches water gauge at maximum rated flow.

### FLOW CAPACITY

To determine the capacity of the Gilflo ILVA for different fluids, it is necessary to calculate the Equivalent Water Flowrate  $Q_w$  (in U.S. gpm) as described under the section "sizing the Gilflo ILVA," then selecting the appropriate size of meter from the table.

### CONSTRUCTION MATERIALS

Body	Stainless Steel S.316
Internals	431 S29/S303/S304/S316
Spring	Inconel X750 or equivalent

### SIZES AND PIPE CONNECTIONS

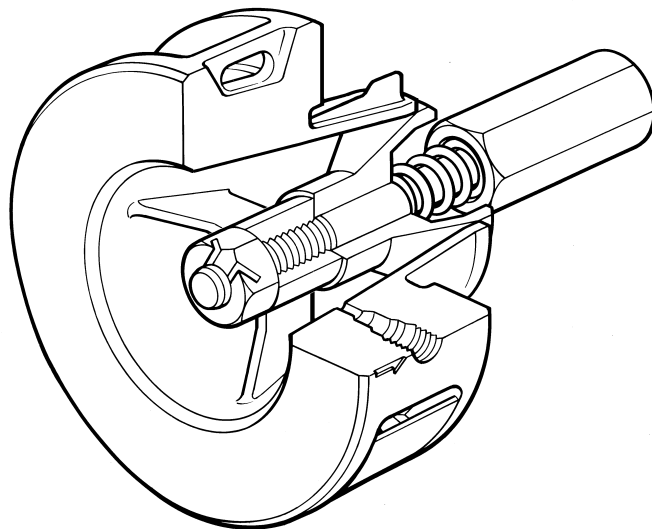
2", 3", 4", 6", and 8"

Suitable for fitting between the following flanges  
ANSI B 16.5 class 150, 300, 600.

### HOW TO SPECIFY

6" Spirax Sarco Gilflo ILVA flowmeter for installation between ANSI 150 flanges. Body material 316 stainless steel. Flow medium saturated steam at 150 psig, maximum flow 20,000 lb/h.

For a general description of the Gilflo ILVA metering system, see TIS 8.010 which also gives details of associated equipment.

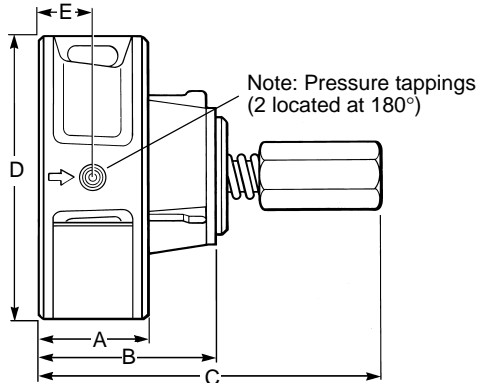


# Gilflo ILVA Flowmeter

## DIMENSIONS (approximate) in inches

Size	A	B	C	D	E	Weight (lb)
2"	1.38	2.48	5.12	4.06	.689	4.4
3"	1.77	3.07	6.3	5.43	.886	8.6
4"	2.95	4.06	8.19	6.38	1.48	18.3
6"	2.95	5.28	11.81	8.58	1.48	31.3
8"	3.35	6.34	14.17	10.75	1.67	52.0

Note: Pressure tapplings are threaded 1/4" NPT



## INSTALLATION

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

- The Gilflo ILVA should be mounted with a minimum of 6 straight pipe diameters upstream and 3 downstream. No valves, fittings or cross sectional changes are permitted within these pipe lengths. Where an increase in nominal pipe diameter is required upstream of the meter, the length of straight pipe should be increased to 12 diameters. Similarly, where a Gilflo ILVA is installed downstream of two 90 degree bends in two planes, a pressure reducing valve or a partially open valve, 12 upstream pipe diameters should be allowed.
- Care should be taken to install the Gilflo ILVA concentrically in the line. If this is not done, flow measurement errors may occur.
- The Gilflo ILVA should be mounted horizontally. For vertical installations, consult Spirax Sarco.
- For steam applications, good basic steam engineering practices should be followed:

Correct line drainage through adequate trapping.

Good alignment and support of associated pipework.

Line size changes achieved by the use of eccentric reducers.

- See TIS 8.010 which provides an overview of the Gilflo ILVA metering system and further installation details.

## MAINTENANCE

There are no user serviceable parts in the Gilflo ILVA. A visual check together with confirmation that the orifice/cone reference dimension is within tolerance is possible. Full details are included in the manual that accompanies the meter.

## -sizing the Gilflo ILVA for SATURATED STEAM - LB/H

Maximum flow rates in lb/h at different pressures (psig)

**Note:** Maximum steam flow rates are calculated at a differential pressure across the Gilflo ILVA pipeline unit of 200 ins H<sub>2</sub>O.

Size		15 psig	50 psig	75 psig	100 psig	150 psig	200 psig	400 psig	600 psig
2"	Maximum flow	682	988	1153	1299	1549	1764	2451	3009
	Minimum flow	7	10	12	13	15	18	25	30
3"	Maximum flow	2677	3877	4528	5103	6081	6926	9627	11815
	Minimum flow	27	39	45	51	60	69	96	118
4"	Maximum flow	8238	11930	13933	15700	18710	21310	29621	36355
	Minimum flow	82	119	139	157	187	213	296	363
6"	Maximum flow	13273	19220	22448	25295	30144	34333	47723	58571
	Minimum flow	132	192	224	252	301	343	477	585
8"	Maximum flow	26088	37778	44121	49718	59249	67483	93801	115123
	Minimum flow	260	377	441	497	592	674	938	1151

## -sizing the Gilflo ILVA Meter

In order to determine the flow capacity of a Gilflo ILVA pipeline unit, it is necessary to calculate the Equivalent Water Flowrate (Q<sub>e</sub>) based on the anticipated actual flow.

Figure 2 is then used to select the appropriate unit.

- Determine Equivalent Water Flowrate (Q<sub>e</sub>) in U.S. gpm:

**Liquids:**

$$Q_e = \frac{m}{500} \sqrt{\frac{D_e}{D_f}} \quad \text{or} \quad Q_e = Q_f \sqrt{\frac{D_f}{D_e}}$$

Q<sub>e</sub> = equivalent flow rate of water at 70°F (U.S. gpm)

m = maximum flow rate of service liquid (lb/hr)

D<sub>e</sub> = density of water at calibration (62.305 lb/ft<sup>3</sup>)

D<sub>f</sub> = density of service liquid (lb/ft<sup>3</sup>)

Q<sub>f</sub> = maximum flow rate of service liquid (US gpm)

**Gases:**

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

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

Q<sub>e</sub> = 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/ft<sup>3</sup>)

P<sub>f</sub> = flowing pressure of gas (psia)

P<sub>s</sub> = standard atmospheric pressure (14.7 psia)

T<sub>s</sub> = standard absolute temperature (520°R)

T<sub>f</sub> = flowing temperature of gas (°R=°F + 460)

Q<sub>g</sub> = maximum flow rate of gas (SCFM)

**Steam:**

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

Q<sub>e</sub> = 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 (ft<sup>3</sup>/lb)

- Select from the table below the Gilflo ILVA meter with a maximum Q<sub>e</sub> that closely matches (but exceeds) the application Q<sub>e</sub> determined in step 1.

Meter size	Max. Q <sub>e</sub> U.S. gpm	Max. DP ins Wg
2"	40	200
3"	158	200
4"	485	200
6"	781	200
8"	1,535	200