



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 most industrial fluids, gases and both saturated and superheated steam. A general description of the ILVA flowmetering system and its associated equipment is given in a separate TI sheet.

Sizes and pipe connections

2", 3" 4", 6", 8". For 10" and 12" sizes see separate literature.

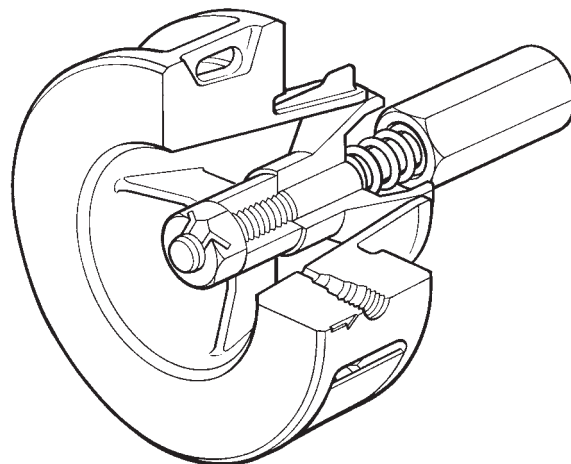
Suitable for fitting between the following flanges:

- EN 1092 PN16, PN25 and PN40.
- BS 10 Table H.
- ASME B 16.5 Class 150, 300 and 600.
- JIS 20.
- KS 20.

The Gilflo ILVA flowmeter should be installed in pipework manufactured to BS 1600 or ASME B 36.10 Schedule 40. For different pipe standards/schedules downstream spool pieces with equivalent internal diameter as in BS 1600 or ASME B 36.10 Schedule 40 should be used. If this is not possible, please contact Spirax-Sarco Limited.

Materials

Part	Material
Body	Cast stainless steel S.316 (CF8M/1.4408)
Internals	431 S29/S303/S304/S316
Spring	Inconel X750



Performance

The Gilflo ILVA is designed to be used in conjunction with linearising electronics such as the range of flow computers or M750 display unit. Alternatively the output signal linearisation can be performed on an EMS/BEMS or equivalent.

Accuracy when used with Spirax Sarco flow computers or M750:

±1% of measured value from 5% to 100% of maximum rated flow.

±0.1% FSD from 1% to 5% of maximum rated flow.

Repeatability better than 0.25%

Turndown: up to 100:1

Caution: Scanner 2000 steam mass flow transmitters are uniquely configured at the factory to work with a single, specific Gilflo ILVA flowmeter. For correct operation the configured Scanner 2000 transmitter must always be installed with its allocated flowmeter. Labels on the packaging give the serial numbers of the matched products.

Pressure drop

The maximum pressure drop across the Gilflo ILVA pipeline unit is 498 m bar (200 ins water gauge) at maximum rated flow.

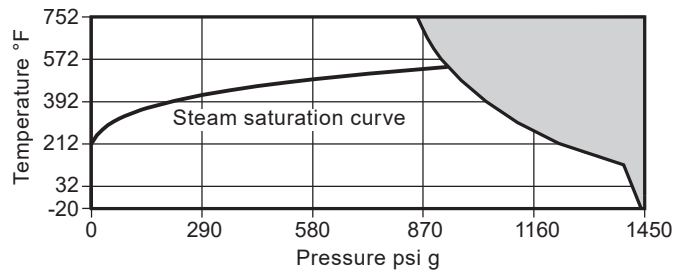
Flow capacity

To determine the capacity of the Gilflo ILVA for different fluids, it is necessary to calculate the equivalent water flowrate Q^E (in US gpm) as described in Step 1, under the section 'sizing the Gilflo ILVA' then selecting the appropriate size of flowmeter from the Table under Step 2 overleaf.

How to order

Example: 1 off Spirax Sarco 6" Gilflo ILVA flowmeter for installation between flanges to ASMA B 16.5 Class 300. Body material 316 stainless steel. Flow medium saturated steam at 150 psig, maximum flow 16,000 lb/h.

Pressure/temperature limits



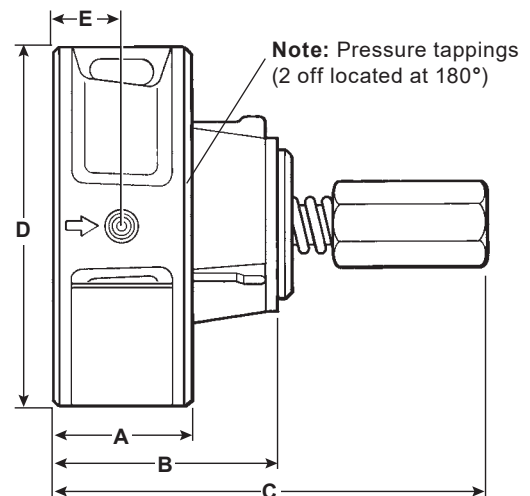
The product **must not** be used in this region.

Body design conditions	ASME 600
PMA Maximum allowable pressure	1479 psi g @ 68°F
TMA Maximum allowable temperature	752°F @ 580 psi g
Minimum allowable temperature	-58°F
PMO Maximum operating pressure is dependant on the flange specification	
Minimum operating pressure	9 psi g
TMO Maximum operating temperature	752°F @ 580 psi g
Minimum operating temperature	-20°F
Note: For lower operating temperatures consult Spirax Sarco	
Maximum viscosity	30 centipoise
ΔPMX Maximum differential pressure	200 ins Wg
Designed for a maximum cold hydraulic test pressure of:	2,248 psi g

Dimensions / weights (approximate) in inches and lbs.

Size	A	B	C	D	E	Weight
2"	1.38	2.48	5.51	4.06	0.69	4.4
3"	1.77	3.07	5.91	5.43	0.89	8.6
4"	2.36	4.06	8.07	6.38	1.18	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 tapings are threaded 1/4" NPT



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Installation note:

The following main points are given here for guidance:

1. 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 flowmeter, 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.

2. It is important that the internal upstream and downstream diameters of pipe are smooth. Ideally seamless pipes should be used. It is recommended that slip-on flanges be used to avoid any intrusive weld beads on the internal diameter of the pipe.
3. Care should be taken to install the Gilflo ILVA concentrically in the line. If this is not done, flow measurement errors may occur.
4. The Gilflo ILVA should be mounted horizontally. For vertical installations, consult Spirax Sarco.
5. 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.

Maintenance note:

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.

Sizing the Gilflo ILVA for saturated steam - lb/h

Minimum and maximum flowrates in lb/h at different pressures (psi g)

Note: Maximum steam flowrates are calculated at maximum differential pressure.

Size	Steam pressure: psi g								
	15 psi g	50 psi g	75 psi g	100 psi g	150 psi g	200 psi g	400 psi g	600 psi g	
2"	Maximum	682	988	1153	1299	1549	1764	2451	3009
	Minimum	7	10	12	13	15	18	25	30
3"	Maximum	2677	3877	4528	5103	6081	6926	9627	11815
	Minimum	27	39	45	51	60	69	96	118
4"	Maximum	5492	7953	9288	10466	12473	14206	19747	24236
	Minimum	55	79	93	105	125	142	197	242
6"	Maximum	13273	19220	22448	25295	30144	34333	47723	58571
	Minimum	132	192	224	252	301	343	477	585
8"	Maximum	26088	37778	44121	49718	59249	67483	93801	115123
	Minimum	261	377	441	497	592	674	938	1151

How to order example: 1 off Spirax Sarco 2" Gilflo ILVA flowmeter suitable for fitting between ASME B 16.5 Class 150 flanges.

Sizing the Gilflo ILVA flowmeter

In order to determine the flow capacity of a Gilflo ILVA pipeline unit, it is necessary to calculate the equivalent water flowrate (Q_e) based on the anticipated actual flow (see Step 1).

Step 1.

Determine equivalent water flowrate (Q_e) in US gpm:-

Liquids

$$Q_e = \frac{m}{500} \sqrt{\frac{D_e}{D_l}} \quad \text{or} \quad Q_e = Q_l \sqrt{\frac{D_l}{D_e}}$$

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_l = density of service liquid (lb/ft³)

Q_l = maximum flow rate of service liquid (US gpm)

Gases

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

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 psi a, 520°R (60°F) (lb/ft³)

P_f = flowing pressure of gas (psi a)

P_s = standard atmospheric pressure (14.7 psi a)

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)

Step 2.

Select from the table below the Gilflo ILVA meter with a maximum Q_e that closely matches (but exceeds) the application Q_e determined in step 1. In practice, it will often be the line size that determines the choice of the flowmeter.

Meter size	Q_e US Gal/min		Maximum DP ins Wg
	Maximum	Minimum	
2"	40	0.4	200
3"	158	1.6	200
4"	317	3.2	200
6"	781	7.8	200
8"	1535	15.4	200