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ISO 9001

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MI Issue 6

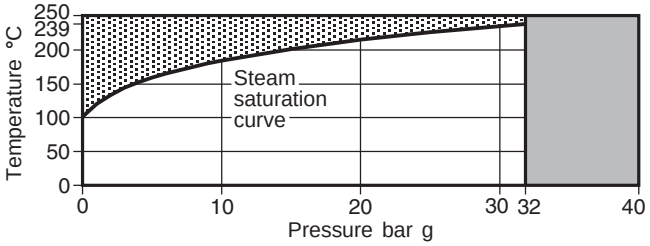
DIVA
Saturated Steam Flowmeter

Description
The Spirax Sarco DIVA flowmeter is designed for use on saturated steam only and operates by measuring the strain produced on a moving cone by an instantaneous flowrate. This strain is then converted into density compensated mass flowrate and is transmitted via a single loop powered 4-20 mA and pulsed output.

Sizes and pipe connections
DN50, DN80 and DN100
The DIVA is of wafer design, suitable for fitting between the following flanges:
EN 1092 PN16, PN25 and PN40
BS 10 Table H
ANSI B 16.5 Class 150 and Class 300
Japanese Industrial Standard JIS 20
Korean Standard KS 20

Note:
The Spirax Sarco DIVA flowmeter should be installed in pipework manufactured to BS 1600 or ANSI/ASME B 36.10 Schedule 40. For systems with different standards/schedules, spool pieces manufactured from BS 1600 or ANSI/ASME B 36.10 Schedule 40 pipe should be used. If this is not possible, please contact Spirax Sarco.

Pressure/temperature limits



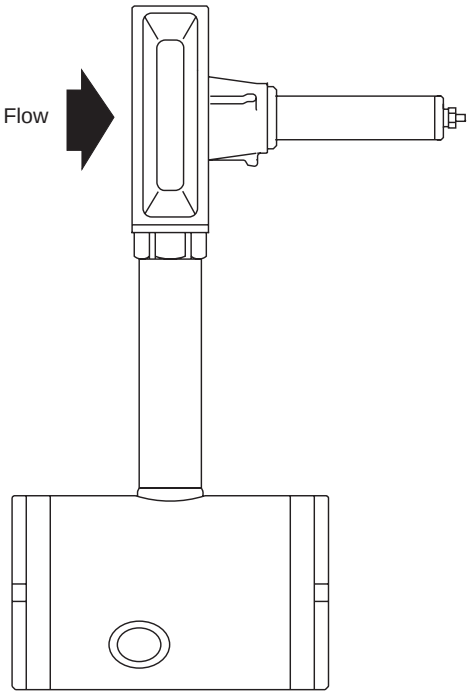
The product **must not** be used in this region.

The product should not be used in this region due to software limitations.

Body design conditions		PN40
Maximum design pressure		32 bar g @ 250°C
Maximum design temperature		250°C
Minimum design temperature		0°C
Maximum operating pressure	Horizontal flow	32 bar g @ 239°C
	Vertical flow	11 bar g @ 188°C
Minimum operating pressure		0.6 bar g
Maximum operating temperature (saturation)		239°C
Minimum operating temperature **Note:** For lower operating temperatures consult Spirax Sarco.		0°C
Maximum electronics ambient temperature		55°C
Maximum electronics humidity level		90% RH (non-condensing)
Designed for a maximum cold hydraulic test pressure of 52 bar g		

Materials

Body	Stainless steel S.316
Internals	431 S29/S303/S304/S316
Spring	Inconel X750 or equivalent
Stem	Stainless steel 431 S29
Housing	Aluminium HE30



Technical data

IP rating	IP65 with correct cable glands
Power supply	Loop powered nominal 24 Vdc
Outputs	4-20 mA (proportional to mass flow)
	Pulsed output (V_{max} 28 Vdc R_{min} 10 kΩ)
Communication port	EIA 232C (RS 232)

Performance
The Spirax Sarco DIVA flowmeter has inbuilt electronics which gives a density compensated output. A LCD display is incorporated within the electronics head, which is accessible via the screw cap (A window end cap is available as an optional extra). The M750 display unit can be used to provide a remote display and totaliser function if required, utilising the linear output.

System uncertainty, to 95% confidence (2 STD): (in accordance with ISO 17025)

± 2% of measured value from 10% to 100% of maximum rated flow.
± 0.2% FSD, from 2% to 10% of maximum rated flow.
Turndown : up to 50:1

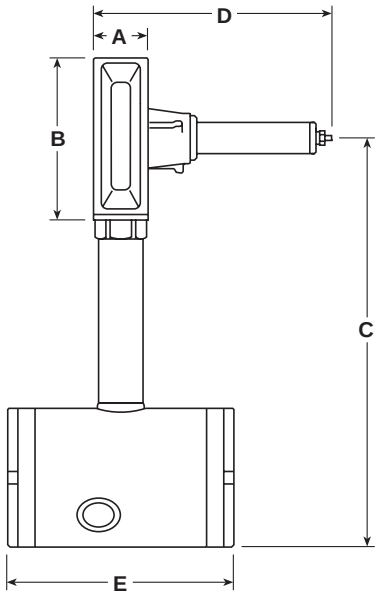
As the DIVA is a self contained unit the uncertainty quoted is for the complete system. Many flowmeters claim a pipeline unit uncertainty and for a true system uncertainty, the individual uncertainty values of any associated equipment, such as DP cells, need to be added to the pipeline value.

Pressure drop
The pressure drop across the DIVA is nominally 750 mbar (300 ins water gauge) at maximum rated flow for the DN50, and 500 mbar (200 inches water gauge) for the DN80 and DN100.

Local regulations may restrict the use of this product to below the conditions quoted.
In the interests of development and improvement of the product, we reserve the right to change the specification.

Dimensions/weights (approximate) in mm and kg

Size	A	B	C	D	E	Weight
DN50	35	103	265	155	145	3.35
DN80	45	138	285	150	145	5.25
DN100	60	162	315	205	145	8.20



DIVA flow capacities and pressure drops

Flowmeter type	Maximum Q_E l/min	Maximum DP in Wg	Maximum DP mbar
DN50	300	300	750
DN80	770	200	498
DN100	1 200	200	498

Where Q_E = Equivalent water flowrate (l/min)

Sizing the DIVA flowmeter for saturated steam (kg/h) (Horizontal orientation)

Maximum flowrates in kg/h at different pressures (bar g).

Notes:

1 - Maximum steam flowrates are calculated at maximum differential pressure.

2 - For vertical capacities please contact Spirax Sarco.

3 - The table below is a guide only.

Size	Steam pressure bar g		3	5	7	10	12	15	20	25	30	32
DN50	Q_E = 300	Maximum flow	759	960	1 126	1 335	1 458	1 626	1 871	2 094	2 296	2 374
		Minimum flow	20	25	28	33	36	40	46	51	56	58
DN80	Q_E = 770	Maximum flow	1 973	2 482	2 901	3 434	3 746	4 173	4 799	5 369	5 884	6 082
		Minimum flow	44	54	62	73	79	87	100	111	121	125
DN100	Q_E = 1 200	Maximum flow	3 275	4 030	4 661	5 469	5 945	6 600	7 563	8 442	9 238	9 544
		Minimum flow	68	83	95	111	121	134	153	171	186	193

Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions (IM-P337-18 and IM-P337-21) supplied with the product.

The following main points are given for guidance only:

1. The DIVA flowmeter 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 Spirax Sarco DIVA is installed downstream of two 90 degree bends in two planes, a pressure reducing valve or a partly 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 and there should be no intrusive weld beads on the internal diameter. It is also recommended that slip-on flanges are used to avoid this.

3. Care should be taken to install the DIVA flowmeter concentrically in the line. If this is not done, flow measurement errors may occur.

4. The DIVA flowmeter can be installed in any orientation up to a line pressure of 11 bar g.

5. As for all steam flowmetering installations, 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.

How to order

Example: 1 off Spirax Sarco DN100 DIVA saturated steam flowmeter for installation between EN 1092 PN40 flanges. For use on saturated steam at 10 bar g, maximum flow 5 575 kg/h.

Note: For details of the optional remote display see the relevant Spirax Sarco M750 literature.