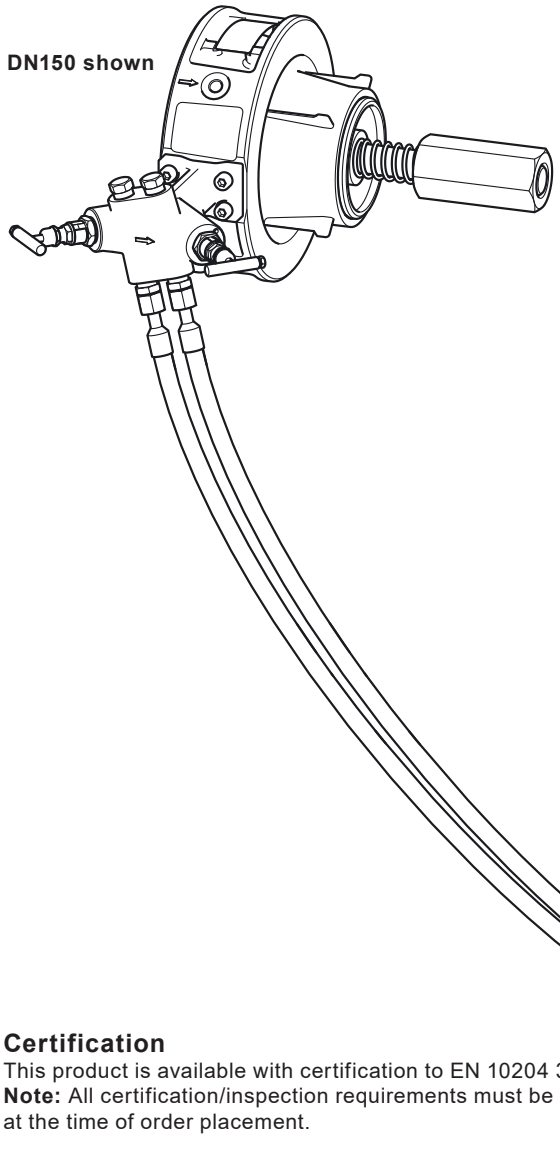
ILVA20 Flowmeter and MVT10 Differential Pressure Transmitter for Saturated and Superheated Steam Service

Description

The Spirax Sarco DN150 to DN300 flowmeter is designed for use on saturated and superheated steam only, and can also be used as a net energy meter on steam applications. It operates on the spring loaded variable area principle and produces a differential pressure related to the rate of flow. The Electronics provide current loop, frequency, RS485 and Modbus outputs. Steam flow is density corrected. Pipeline pressure is also measured.

Standards

This flowmeter complies with the requirements of the Pressure Equipment Directive (PED), carries the CE and falls within the following PED categories:



DN150 shown

Product		Group 1 Gases	Group 2 Gases	Group 1 Liquids	Group 2 Liquids
ILVA20	DN150 - DN200	3	3	2	SEP
	DN250 - DN300	3	3	2	1

IP rating	IP65 with correct cable glands
Electromagnetic Compatibility Directive	2014/30/EU
Calibration	ISO 17025
Designed to ASME BPVC section V111	
Safety requirement for electrical equipment for measurement, control, and laboratory use	EN61010-1:2010 UL/CSA 61010-1:2012 (third edition)
IP Testing	EN60529:1992/A2:2013
Electromagnetic Compatibility – Emissions and Immunity	EN 61326-2-3:2013
Sine Vibration Sequence	EN61298-3:2008 Section 7
Transportation Vibration	EN60068-2-6:2008

Certification

This product is available with certification to EN 10204 3.1.
Note: All certification/inspection requirements must be stated at the time of order placement.

Sizes and pipe connections

Available in DN150, DN200, DN250 and DN300 pipeline sizes.
This flowmeter is a wafer design suitable for fitting between the following flanges:

- EN 1092-1 PN16, PN25 and PN40
- ASME B 16.5 Class 150 and 300
- Japanese Industrial Standard JIS 20
- Korean Standard KS 20

Note:
The Spirax Sarco flowmeter should be installed in pipework manufactured to BS 1600, ASME B 36.10 Schedule 40 or EN 10216-2/EN10216-5 equivalent.

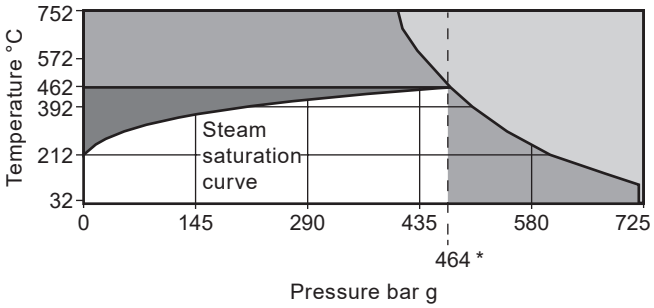
Materials

Flowmeter body	Stainless steel	1.4408 CF8M
Internals	Stainless steel	316
2 way manifold	Stainless steel	1.4408 CF8M
3 way manifold	Stainless steel	316L
Impulse hoses	Stainless steel	
MVT housing	Aluminium	Copper free aluminium, max 0.5 mg
Pressure sensor	Stainless steel	
Spring	Inconel X750	

Technical data

Power supply	24 Vdc if it is loop powered
	24 Vdc, 0.25 A when using an RS 485
Outputs	4-20 mA loop (proportional to mass flow)
Pulsed output	V max. 28 Vdc, R min. 10 kΩ
Communications port	RS485/Modbus

Pressure/temperature limits



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

Outside of operating range.

Steam is superheated in this area.

Maximum design pressure	719.4 psi @ 69.8°F
Maximum design temperature	752°F @ 426.4 psi
Minimum design temperature	32 °F (non-freezing)
Maximum operating pressure	* 464.1 psi @ 462.2 °F
Minimum operating pressure	8.7 psi
Maximum operating temperature (saturation)	462.2 °F
Minimum operating temperature	32 °F (non-freezing)
Maximum electronics ambient temperature	131 °F
Minimum ambient temperature	32 °F
Maximum electronics humidity level	90% RH (non-condensing)
Designed for a maximum cold hydraulic test pressure of:	725.2 psi
Glass on the display is rated for impact of maximum	4J
Environment Protection	IP65

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

Performance
The Flowmeter has two parts, the ILVA20 (pipeline element) and the MVT10 (differential pressure transmitter) that includes the electronics, display and static pressure transmitter.

The MVT10 flowmeter has inbuilt electronics which give a density compensated output. An LCD display is incorporated within the electronics head. The M750 display unit can be used to provide a remote display function if required, utilising the 4 - 20 mA output.

±2% of measured value from 12% to 100% of maximum rated flow.
±0.5 %FSD from 2%-12% of flow.

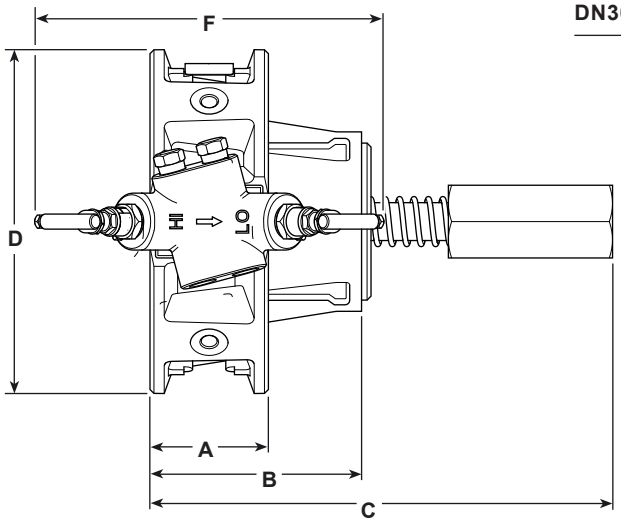
Turndown	50:1 typical
Flowmeter sizing	To view the sizing suite, please go to http://prs.spiraxsarco.com/sizingsuite.

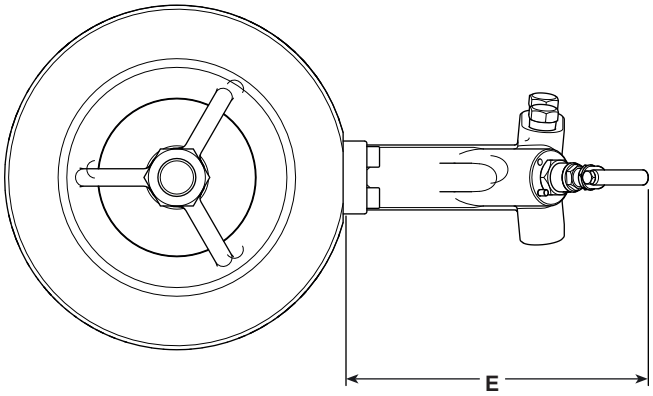
Flow (lb/h)								
		Pressure psi						
		8.7	**14.5**	**43.5**	**72.5**	**101.5**	**145.0**	**174.0**
DN150	**Max**	12182.74	13529.77	18781.18	22784.77	26160.05	23571.83	33106.82
	Min	242.50	268.96	374.79	454.15	522.50	469.59	661.39
DN200	**Max**	23007.44	25553.78	35472.38	43034.23	49407.80	57637.65	62525.30
	Min	458.56	509.27	707.68	859.80	987.67	1150.81	1250.02
DN250	**Max**	33000.99	36656.26	50880.49	61727.23	70872.0	82673.35	89688.46
	Min	659.18	731.94	1016.33	1232.38	1415.37	1653.47	1792.36
DN300	**Max**	46063.39	51162.68	71017.51	86156.65	98919.21	115392.15	125180.68
	Min	919.33	1022.94	1419.78	1721.81	1977.55	2306.04	2502.25

Flow (lb/h)						
		Pressure psi				
		217.6	**290.1**	**362.6**	**435.1**	**464.1**
DN150	**Max**	36656.26	41903.26	46700.52	51052.45	52723.55
	Min	731.94	837.76	932.56	1020.74	1053.81
DN200	**Max**	69231.76	79141.54	88202.54	96421.38	99576.19
	Min	1384.50	1580.71	1763.70	1926.84	1990.77
DN250	**Max**	99305.02	113520.43	126516.68	138307	142833.09
	Min	1984.16	2268.56	2528.70	2764.60	2854.99
DN300	**Max**	138604.62	158444.02	176585.86	193038.96	199357.41
	Min	2771.21	3168.04	3529.60	3860.29	3985.96

ILVA20 Dimensions/weights
(approximate) in inches and lbs

Size	A	B	C	D	E	F	Weight
DN150	2.95	5.28	11.54	8.58	7.59	8.70	39.68
DN200	3.35	6.34	13.94	10.75			61.73
DN250	4.09	8.03	17.44	12.99			103.62
DN300	4.72	9.84	21.06	15.16			154.32





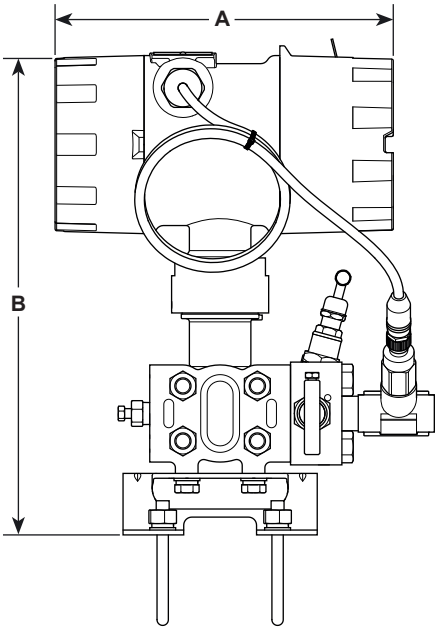
MVT10 Dimensions/weights
(approximate) in inches and lbs

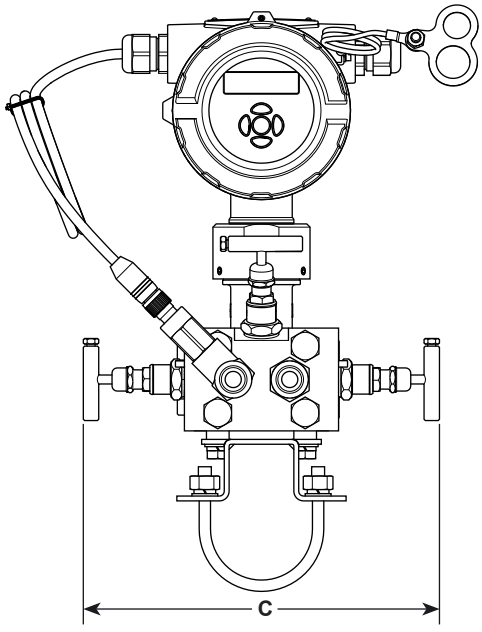
MVT10 mass flow transmitter, manifold, impulse hoses and fixing clamp

A	B	C	Weight
8.23	10.39	8.6	17.64

The ILVA20/MVT10 can be supplied with either 3.28 ft or 6.56 ft long impulse hoses, with ⅜" NPT screwed ends.
It can also be supplied without hoses (Hard piping supplied by customer).

Impulse hoses		Weight
⅜" NPT	3.28 ft	1.10 (pair)
⅜" NPT	6.56 ft	2.20 (pair)





'U' bolts to suit DN50 pipe

Safety information, installation and maintenance
For full details see the Installation and Maintenance Instructions (IM-P337-69) supplied with the product.

Installation note
The following main points are given here for guidance only:
The 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 a single plain bend or 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 flowmeter is installed downstream of two 90° bends in two planes, a pressure reducing valve or a partially open valve, 12 pipe diameters should be allowed upstream and 6 downstream.

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.

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

The flowmeter should be mounted horizontally. For vertical installations, consult Spirax Sarco.

For steam applications, good basic steam engineering practices should be followed:

- Correct pipeline drainage through adequate trapping.
- Good alignment and support of associated pipework.
- Pipeline size changes achieved by the use of eccentric reducers.

Spare parts
The spare parts available are detailed below. No other parts are supplied as spares.

3374380 - Gasket and fastener spares kit
3374381 - 2 way manifold and fastener spares kit
3374382 - Pressure sensor and cable spares kit
3374383 - Electronics spares kit

Disposal
The product is recyclable. No ecological hazard is anticipated with the disposal of this product providing due care is taken.

How to order
Example: 1 off Spirax Sarco DN150 flowmeter for installation between EN 1092 PN40 flanges. The flow medium is saturated steam at 145.04 psi, maximum flow 23571.83 lb/h.