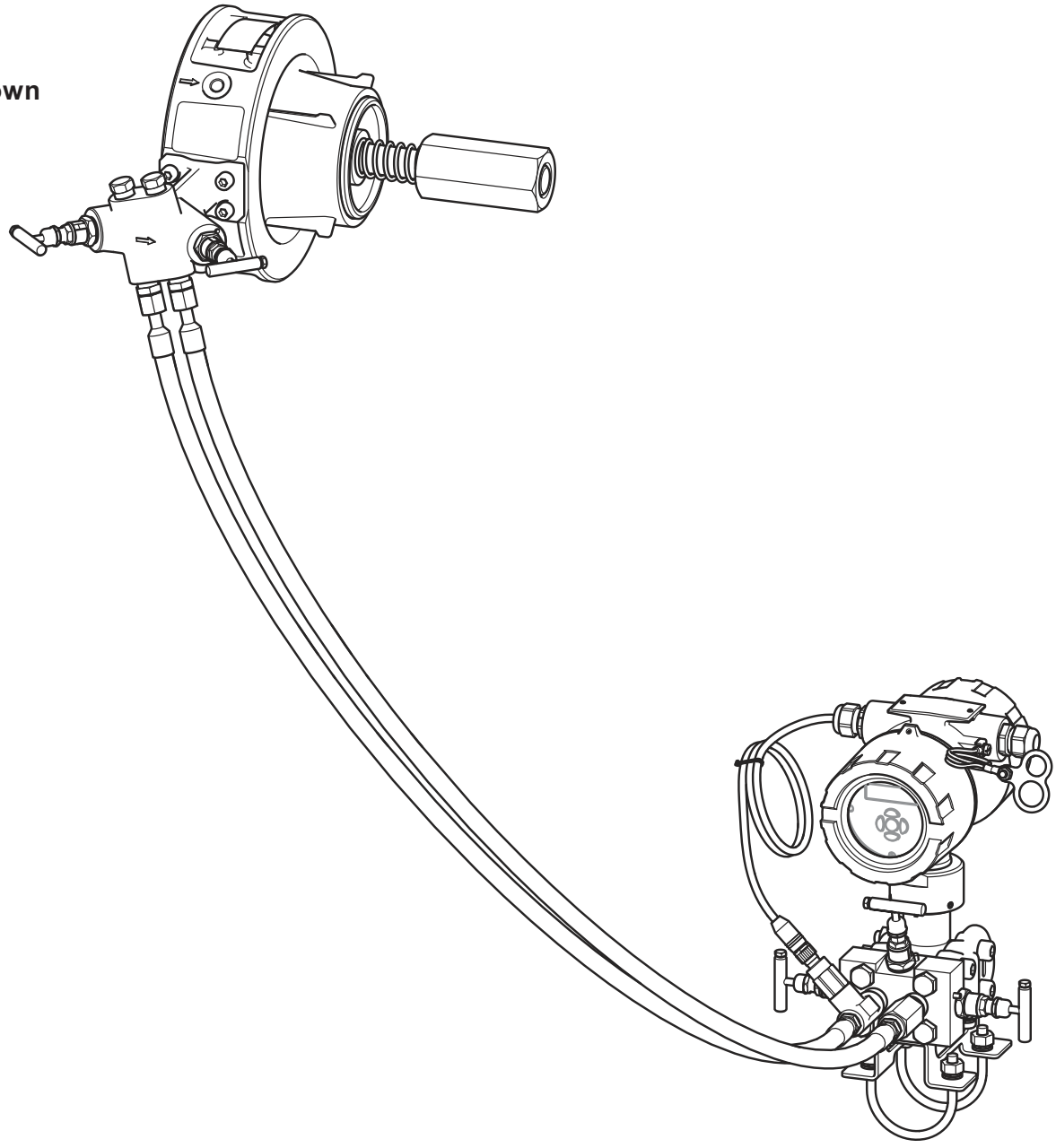
ILVA20 Flowmeter and MVT10 Differential Pressure Transmitter for Saturated and Superheated Steam Service

DN150 shown



Description

The Spirax Sarco DN150 to DN300 (6" to 12") flowmeter with MVT10 is a calibrated system 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 EU Pressure Equipment Directive/UK Pressure Equipment (Safety) Regulations, carries the CE / UKCA marks and falls within the following PED categories:

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
UK Electromagnetic Compatibility Regulations 2016	
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 (6", 8", 10" and 12") 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.

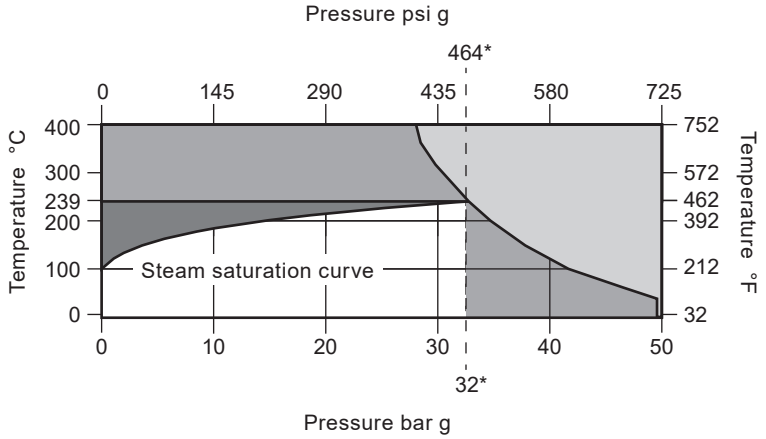
Materials

Flowmeter body	Stainless steel	
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	49.6 bar g @ 21 °C	719 psi g @ 70 °F
Maximum design temperature	400 °C @ 29.4 bar g	752 °F @ 426 psi g
Minimum design temperature	0 °C (non-freezing)	32 °F
Maximum operating pressure	* 32 bar g @ 239 °C	* 464 psi g @ 462 °F
Minimum operating pressure	0.6 bar g	9 psi g
Maximum operating temperature (saturation)	239 °C	462 °F
Minimum operating temperature	0 °C (non-freezing)	32 °F
Maximum electronics ambient temperature	55 °C	131 °F
Minimum ambient temperature	0 °C	32 °F
Maximum electronics humidity level		90% RH (non-condensing)
Designed for a maximum cold hydraulic test pressure of:	50 bar g	725 psi g
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 is a calibrated system and consists of two parts, the ILVA20 (pipeline element) and the MVT10 (differential pressure transmitter) that includes the electronics, display and static pressure transmitter.

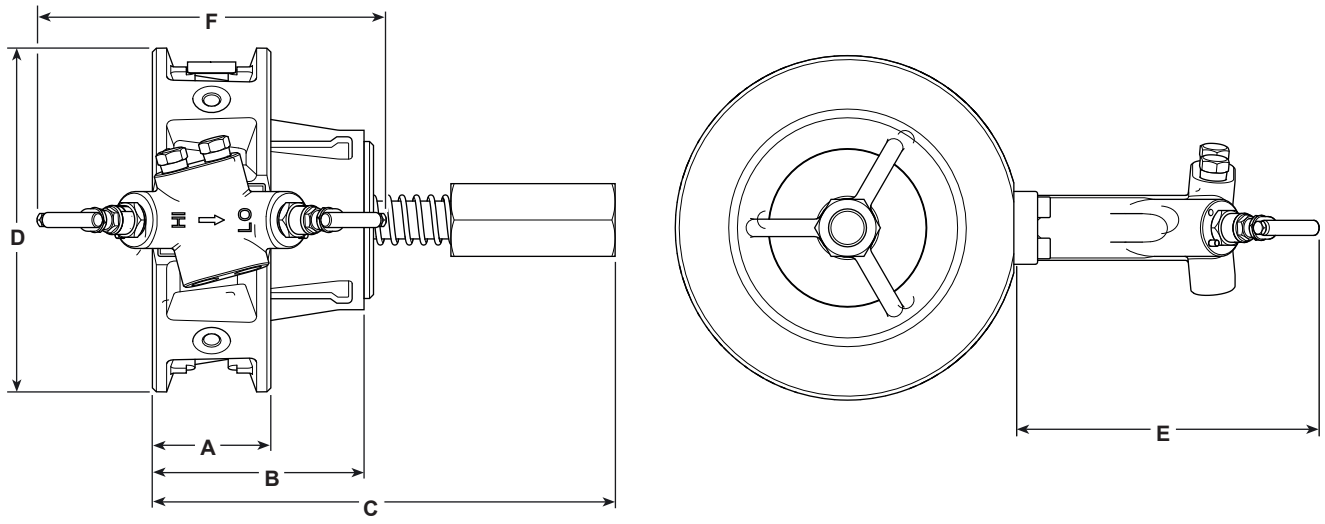
The MVT10 flowmeter has inbuilt electronics which give a density compensated output. An LCD display is incorporated within the electronics head. The M750 display unit can be used to provide a remote display function if required, utilising the 4 - 20 mA output.

±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.

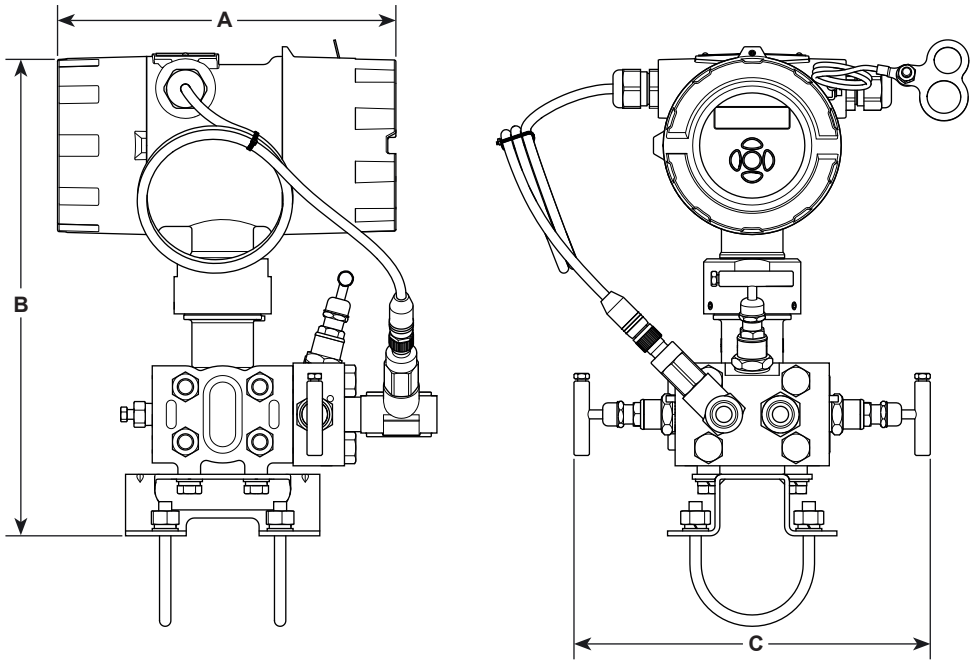
Flow	**kg/h (lbs)**	**0.6 (8)**	**1 (15)**	**3 (44)**	**5 (73)**	**7 (102)**	**10 (145)**	**12 (174)**	**15 (218)**	**20 (290)**	**25 (363)**	**30 (435)**	**32 (464)**
		Pressure bar g (psi g)											
DN150 (6")	**Max**	5386 (11874)	5981 (13836)	8301 (18301)	10071 (22203)	11562 (25490)	13487 (29734)	14631 (31661)	16200 (35715)	18538 (40869)	20639 (45501)	22573 (49765)	23311 (51392)
	Min	108 (238)	120 (265)	166 (366)	201 (443)	231 (509)	270 (595)	293 (646)	324 (714)	371 (818)	413 (911)	451 (994)	466 (1027)
DN200 (8")	**Max**	10586 (23338)	11757 (25920)	16317 (35973)	19795 (43641)	22726 (50102)	26509 (58442)	28757 (63398)	31840 (70195)	36437 (80330)	40566 (89433)	44368 (97815)	45817 (101009)
	Min	212 (467)	235 (518)	326 (719)	396 (814)	455 (873)	530 (1003)	575 (1168)	637 (1268)	729 (1404)	811 (1607)	887 (1788)	916 (2019)
DN250 (10")	**Max**	14393 (31731)	15985 (35241)	22185 (48910)	26915 (59337)	30899 (68099)	36043 (79461)	39099 (86199)	43292 (95443)	49541 (109219)	55156 (121598)	60325 (132994)	62295 (137337)
	Min	288 (635)	320 (705)	444 (979)	538 (1186)	618 (1362)	721 (1590)	782 (1724)	866 (1909)	991 (2185)	1103 (2432)	1206 (2659)	1246 (2847)
DN300 (12")	**Max**	20382 (44935)	22637 (49311)	31417 (69263)	38115 (84029)	43758 (96470)	51042 (112528)	55369 (122068)	61307 (135159)	70157 (154670)	78107 (172197)	85428 (188337)	88218 (194488)
	Min	408 (899)	453 (999)	628 (1385)	762 (1679)	875 (1929)	1021 (2251)	1107 (2441)	1226 (2703)	1403 (3093)	1562 (3364)	1709 (3768)	1764 (3889)

ILVA20 Dimensions/weights (approximate) in mm (inches) and kg (lbs)



Size		A	B	C	D	E	F	Weight
DN150	(6")	75 (3)	134 (5.3)	293 (11.5)	218 (8.5)	193 (7.6)	221 (8.7)	18 (40)
DN200	(8")	85 (3.3)	161 (6.3)	354 (13.9)	273 (10.7)			28 (62)
DN250	(10")	104 (4)	204 (8)	443 (17.4)	330 (13)			47 (104)
DN300	(12")	120 (4.7)	250 (9.8)	540 (21.2)	385 (15.1)			70 (154)

MVT10 Dimensions/weights (approximate) in mm (inches) and kg (lbs)



'U' bolts to suit DN50 pipe

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

A	B	C	Weight
209 (8.2)	264 (10.3)	220 (8.6)	8 (17)

The ILVA20/MVT10 can be supplied with either 1 m or 2 m 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	1 m (3.2 ft)	0.5 (1.1) (pair)
	2 m (6.5 ft)	1 (2.2) (pair)

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

3374384 - MVT10 spares kit (Option 1)

A new MVT10 with the original ILVA20 calibration data downloaded.
Note: The system accuracy cannot be guaranteed.

3374385 - MVT10 spare (Option 2) - Full Recalibration (DN150 [6"])

3374485 - MVT10 spare (Option 2) - Full Recalibration (DN200 [8"])

3374585 - MVT10 spare (Option 2) - Full Recalibration (DN250 [10"])

3374685 - MVT10 spare (Option 2) - Full Recalibration (DN300 [12"])

The original ILVA20 returned for recalibration and a new MVT10 supplied with recalibration data.

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 10 bar g, maximum flow 10 692 kg/h.