VLM20
In-line Vortex Flowmeter

Description

The VLM20 In-line Vortex Flowmeter utilises three primary sensing elements to measure the mass flowrate of steam, liquids and gases:

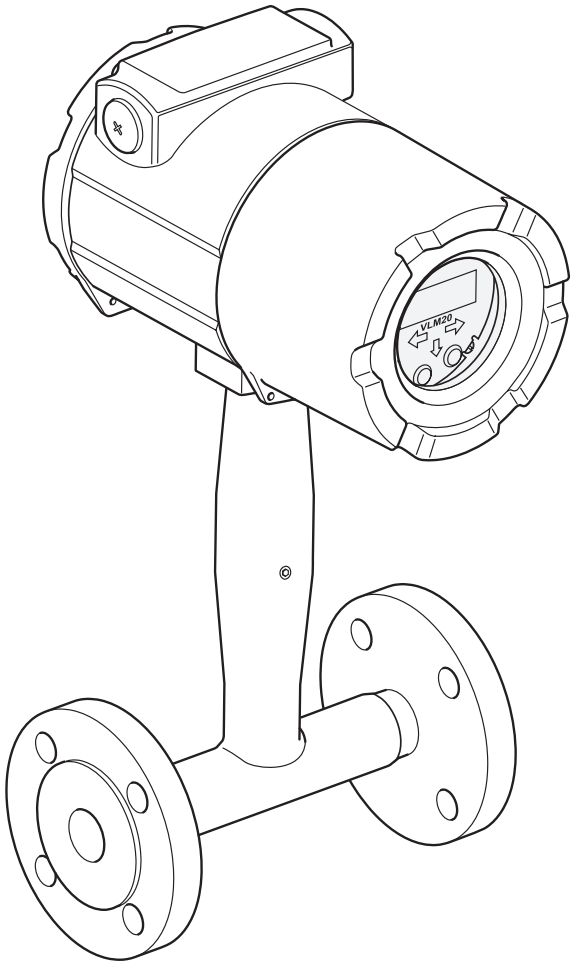
- Vortex shedding velocity sensor
- RTD temperature sensor
- Solid-state pressure transducer

Compliance

- Electromagnetic Compatibility Directive
- Low Voltage Directive
- Pressure Equipment Directive

Principle of operation

Vortex flowmeters measure the flow of liquid, gas and steam by detecting the frequency at which vortices are alternately shed from a bluff body. According to proven laws of physics, the frequency at which the vortices are alternately shed is directly proportional to the flow velocity.
In-line vortex flowmeters measure flow by detecting the local velocity at a strategically located position within the pipe. The VLM20 detects the frequency at which vortices are alternately shed from the bluff body located within the sensor head.
The VLM20 uses the local velocity, along with other parameters, such as fluid type, pipe size and Reynolds number to calculate the average pipe velocity, and consequently, the volumetric flowrate.



VLM20 range and benefits

The **VLM20-V** delivers a direct reading of volumetric flowrate, generally the most cost-effective solution for liquid flow monitoring, in applications ranging from general water flows to hydrocarbon fuel flow measurement.

The **VLM20-VT** integrates a precision 1000 Ω platinum RTD temperature sensor that can be used to calculate and output a compensated mass reading. This device is typically used to measure flowrates of saturated steam.

The **VLM20-VTP** offers you flow computer functionality in a compact field device. This multivariable instrument incorporates temperature and pressure sensors to provide an instantaneous reading of the compensated mass flowrate of gases, liquids and steam. In addition to outputs for totalized mass and alarm settings, the field-configurable electronics deliver up to three analogue 4 - 20 mA outputs of five process measurements, including volumetric flowrate, mass flowrate, pressure, temperature and density.

The **VLM20-EM** Energy Monitoring option permits real-time calculation of energy consumption for a facility or process. The meter can be programmed to measure steam, hot water or chilled water. The VLM20-EM flowmeter monitors one side of the process, either sent or returned, and uses the input from a second separate temperature sensor on the opposite leg of the process to calculate the change in energy. Selectable energy units include BTU, joules, calories, Watt-hours, Megawatt-hours and Horsepower-hours. The local or remote electronics indicate two temperatures, delta T, mass total and energy total.

Sizes and pipe connections

Flanged
DN15, DN20, DN25, DN40, DN50, DN80, DN100, DN150, DN200, DN250 and DN300
Flanged EN 1092-1 PN16, PN40, PN63 and PN100 connections
or
½", ¾", 1", 1½", 2", 3", 4", 6", 8", 10" and 12"
Flanged ASME 16.5 Class 150, 300 and 600 connections
Wafer type
DN15, DN20, DN25, DN40, DN50, DN80 and DN100 suitable for fitting between EN 1092-1 PN40/PN63 flanges
or
½", ¾", 1", 1½", 2", 3" and 4" suitable for fitting between ASME B16.5 Class 300/600 flanges

Technical data

Wetted materials		316L stainless steel, plus: • DuPont Teflon® based thread sealant on models with pressure transducer	
Application		Any gas, liquid or steam compatible with 316L stainless steel and other listed wetted materials. Not recommended for multi-phase fluids	
Environmental	**LVD**	Electrical Safety EN61010-1:2010	
		Overvoltage Category	II
		Pollution Degree	2
	EMC	Emissions	Group 1, Class A (Suitable for Industrial Environments only)
		Immunity	Suitable for Industrial Environments
	Enclosure	Type 4X of NEMA Type 4X, IP66	

Pressure transducer ratings	**Full-scale operating pressue**		**Maximum over-range pressure**	
	2 bar a	30 psi a	4 bar a	60 psi a
	7 bar a	100 psi a	14 bar a	200 psi a
	20 bar a	300 psi a	41 bar a	600 psi a
	34 bar a	500 psi a	64 bar a	1 000 psi a
	100 bar a	1 500 psi a	175 bar a	2 500 psi a

Technical data (continued)

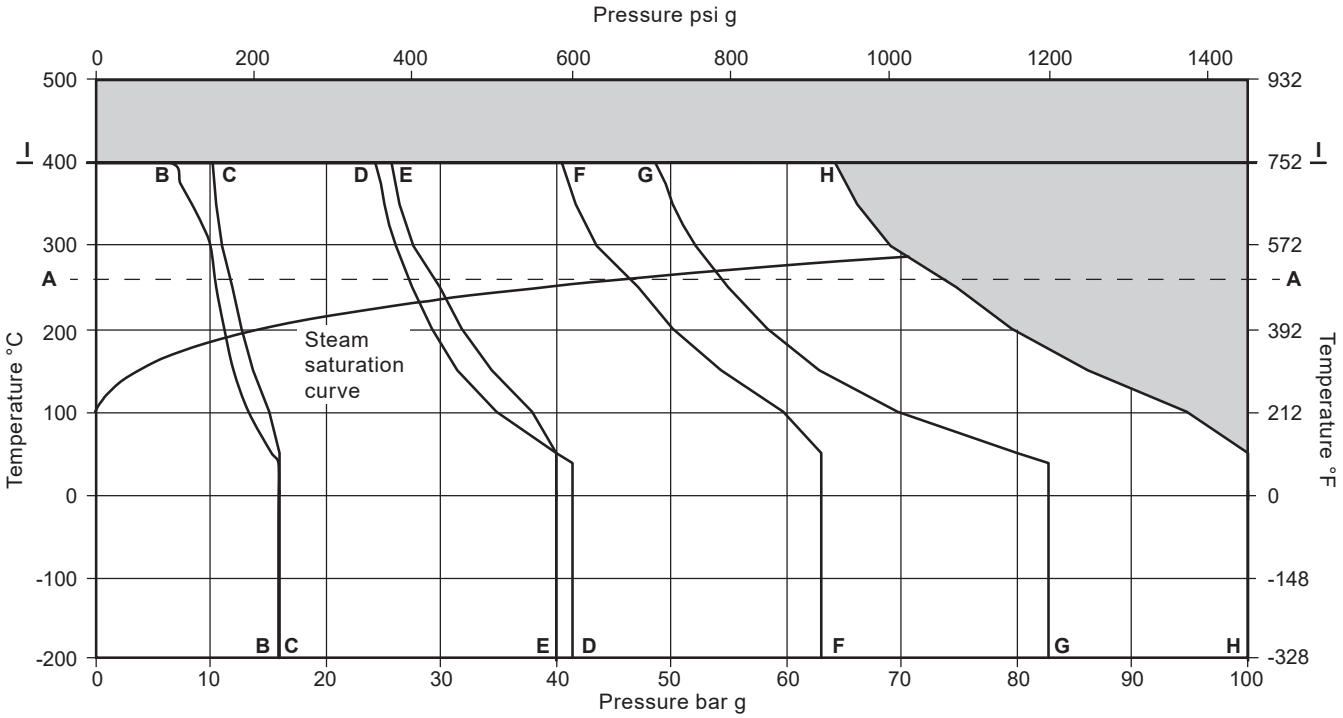
Pressure ratings	**Style connection**	**Rating**
	Flanged	ASME Class 150
		ASME Class 300
		ASME Class 600
		EN 1092-1 PN16
		EN1092-1 PN40
		EN 1092-1 PN63
		EN 1092-1 PN100, DN15 - DN200 only
	Wafer	For installing between ½" to 4" ASME Class 300/600 or DN15 to DN100 EN 1092-1 PN40/PN63 flanges

Power requirements	**DL** option - 12 to 36 Vdc, 25 mA, 1 W maximum, Loop powered (single output)	
	DH option - 12 to 36 Vdc, 300 mA, 9 W maximum, (multiple outputs)	
	AC option - 100 to 240 Vac, 50/60 Hz line power, 5 W maximum (multiple outputs)	
Display	Alphanumeric 2 line x 16 character LCD digital display	
	Six pushbuttons for full field configuration	
	Pushbuttons can be operated with magnetic wand without removal of the enclosure covers	
	Display can be mounted in 90° intervals for better viewing	
Output signals	**Analogue**	4 - 20 mA
	Alarm	Solid state relay, 40 Vdc
	Totalizer pulse	50 millisecond pulse, 40 Vdc
	Volumetric or Loop powered mass	One analogue, one totalizer pulse, HART®, scaled frequency output
	Multivariable option 1	Up to three analogue signals, three alarms, one totaliser pulse, HART®, scaled frequency output
	Multivariable option 2	Modus RTU or BACnet MS/TP compatible process monitoring
Conduit connections	**PED version**	2 x M20 female ports

Technical data (continued)

Pressure/temperature limits - VLM20

Material - 316L



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

A - A Standard temperature version limit (260 °C). Plus lower limit of high temperature version.

B - B ASME Class 150

C - C EN 1092-1 PN16

D - D ASME Class 300

E - E EN 1092-1 PN40

F - F EN 1092-1 PN63

G - G ASME Class 600

H - H EN 1092-1 PN100

I - I High temperature version limit (400 °C).

Body material: 316L

***Note:** -40 °C (-40 °F)

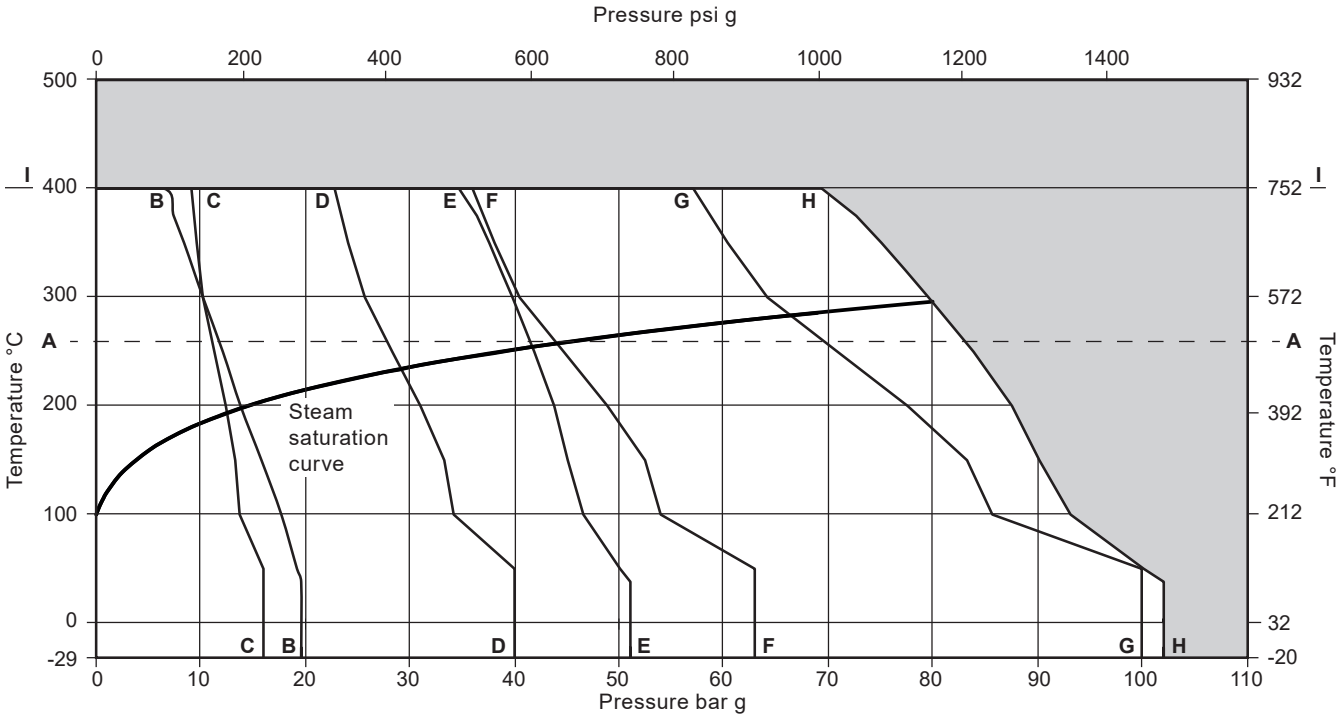
Body design conditions		PN16	PN40	PN63	PN100
PMA	Maximum allowable pressure	16 bar g @ 50 °C	40 bar g @ 50 °C	63 bar g @ 50 °C	100 bar g @ 50 °C
TMA	Maximum allowable temperature	400 °C @ 10.2 bar g	400 °C @ 25.7 bar g	400 °C @ 40.5 bar g	400 °C @ 64.2 bar g
Minimum allowable temperature		-200 °C (* see note above)			
PMO	Maximum operating pressure for saturated steam	12.8 bar g	30.4 bar g	46.5 bar g	70.5 bar g
TMO	Maximum operating temperature for saturated steam	195 °C	238 °C	261 °C	287 °C
Maximum process temperature	Standard version	260 °C			
	High temperature version	400 °C			
Minimum process temperature		-200 °C			
Electronic ambient temperature range	Operating	-40 to 60 °C			
	Storage	-40 to 85 °C			
Designed for a maximum cold hydraulic test pressure		24 bar	60 bar	94.5 bar	150 bar

Body design conditions		Class 150	Class 300	Class 600
PMA	Maximum allowable pressure	230 psi g @ 100 °F	600 psi g @ 100 °F	1200 psi g @ 100 °F
TMA	Maximum allowable temperature	750 °F @ 95 psi g	750 °F @ 355 psi g	750 °F @ 705 psi g
Minimum allowable temperature		-328 °F (* see note above)		
PMO	Maximum operating pressure for saturated steam	166 psi g	408 psi g	780 psi g
TMO	Maximum operating temperature for saturated steam	374 °F	451 °F	518 °F
Maximum process temperature	Standard version	500 °F		
	High temperature version	750 °F		
Minimum process temperature		-328 °F		
Electronic ambient temperature range	Operating	-40 to 140 °F		
	Storage	-40 to 185 °F		
Designed for a maximum cold hydraulic test pressure		345 psi g	900 psi g	1800 psi g

Technical data (continued)

Pressure/temperature limits - VLM20

Material - A105



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

A - A Standard temperature version limit (260 °C). Plus lower limit of high temperature version.

B - B ASME Class 150

C - C EN 1092-1 PN16

D - D EN 1092-1 PN40

E - E ASME Class 300

F - F EN 1092-1 PN63

G - G EN 1092-1 PN100

H - H ASME Class 600

I - I High temperature version limit (400 °C).

Body material: A105

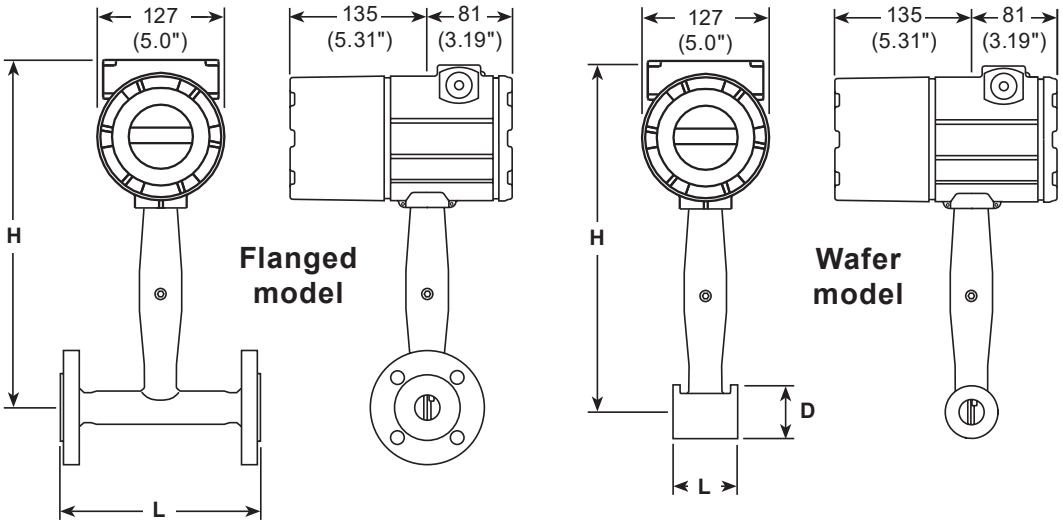
Body design conditions		PN16	PN40	PN63	PN100
PMA	Maximum allowable pressure	16 bar g @ 50 °C	40 bar g @ 50 °C	63 bar g @ 50 °C	100 bar g @ 50 °C
TMA	Maximum allowable temperature	400 °C @ 9.1 bar g	400 °C @ 22.8 bar g	400 °C @ 36.0 bar g	400 °C @ 57.1 bar g
Minimum allowable temperature		-29 °C			
PMO	Maximum operating pressure for saturated steam	12.5 bar g	29.3 bar g	44 bar g	66.5 bar g
TMO	Maximum operating temperature for saturated steam	195 °C	235 °C	258 °C	283 °C
Maximum process temperature	Standard version	260 °C			
	High temperature version	400 °C			
Minimum process temperature		-29 °C			
Electronic ambient temperature range	Operating	-29 to 60 °C			
	Storage	-29 to 85 °C			
Designed for a maximum cold hydraulic test pressure		24 bar	60 bar	94.5 bar	150 bar

Body design conditions		Class 150	Class 300	Class 600
PMA	Maximum allowable pressure	285 psi g @ 100 °F	740 psi g @ 100 °F	1480 psi g @ 100 °F
TMA	Maximum allowable temperature	750 °F @ 95 psi g	750 °F @ 505 psi g	750 °F @ 1015 psi g
Minimum allowable temperature		-20 °F		
PMO	Maximum operating pressure for saturated steam	202 psi g	605 psi g	1159 psi g
TMO	Maximum operating temperature for saturated steam	390 °F	490 °F	563 °F
Maximum process temperature	Standard version	500 °F		
	High temperature version	750 °F		
Minimum process temperature		-20 °F		
Electronic ambient temperature range	Operating	-20 to 140 °F		
	Storage	-20 to 185 °F		
Designed for a maximum cold hydraulic test pressure		345 psi g	900 psi g	1800 psi g

Performance specifications

Accuracy		Mass flowrate accuracy for gas and steam based on 50 - 100% of pressure range			
Process variables		**Liquids**	**Gas and steam**	**Repeatability**	**Stability over 12 months**
	Mass flowrate	±1% of rate	±1.5% of rate	±0.2% of rate	± 0.2% of rate
	Volumetric flowrate	±0.7% of rate	±1% of rate	±0.1% of rate	± Negligible
	Temperature	±1 °C (±2 °F)	±1 °C (±2 °F)	±0.1 °C (±0.2 °F)	± 0.5 °C (± 0.9 °F)
	Pressure	±0.3% of full-scale	±0.3% of full-scale	±0.05% of full-scale	± 0.1% of full-scale
	Density	±0.3% of reading	±0.5% of reading	±0.1% of reading	± 0.1% of reading
Response time		Adjustable from 1 to 100 seconds			

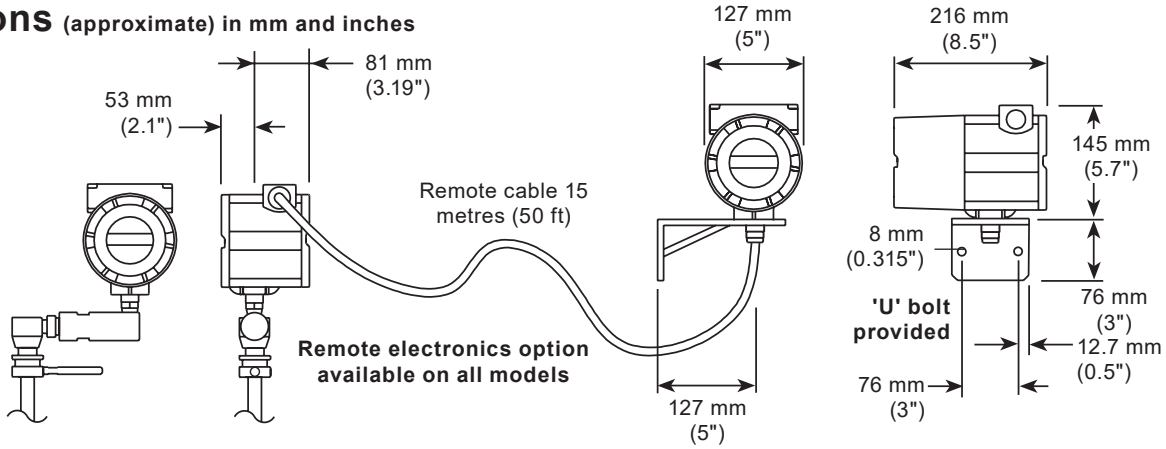
Dimensions (approximate) in mm and inches



Metric	Imperial	Flanged						Wafer							
		L				H		L				D		H	
		Suffix code 2		Suffix code 4				Suffix code 2		Suffix code 4					
		mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches	mm	inches
DN15	½"	116	4.57"	200	7.87"	343	13.5"	116	4.57"	65	2.56"	35	1.4"	343	13.5"
DN20	¾"	122	4.8"	200	7.87"	343	13.5"	122	4.80"	65	2.56"	43	1.7"	343	13.5"
DN25	1"	126	4.96"	200	7.87"	343	13.5"	70	2.76"	65	2.56"	51	2.0"	343	13.5"
DN40	1½"	140	5.51"	200	7.87"	351	13.8"	70	2.76"	65	2.56"	73	2.9"	351	13.8"
DN50	2"	153	6.02"	200	7.87"	356	14.0"	75	2.95"	65	2.56"	92	3.6"	356	14.0"
DN80	3"	175	6.89"	200	7.87"	371	14.6"	100	3.94"	65	2.56"	127	5.0"	371	14.6"
DN100	4"	203	7.99"	250	9.84"	384	15.1"	120	4.72"	65	2.56"	157	6.2"	384	15.1"
DN150	6"	229	9.02"	300	11.81"	411	16.2"								
DN200	8"	267	10.51"	300	11.81"	437	17.2"								
DN250	10"	381	15"	381	15.00"	462	18.2"								
DN300	12"	450	17.72"	450	17.72"	488	19.2"								

Dimensions (approximate) in mm and inches

Remote electronics option



Suffix code 2										
		Flanged							Wafer	
		Kg				lbs			Kg	lbs
Metric	Imperial	PN16	PN40	PN63	PN100	ASME 150	ASME 300	ASME 600	PN40/63	ASME 300/600
DN15	½"	5.5	5.7	6.1	6.6	12	13	14	4.2	9.3
DN20	¾"	5.9	6.8	7.1	8.7	13.3	15.3	16.3	4.3	9.5
DN25	1"	6.1	7	7.5	9.3	14	16	17	4.7	10.4
DN40	1½"	7.4	9.1	11.2	12.4	17	24	24	5.5	12.1
DN50	2"	9.6	10.9	15.1	17.3	22	26	28	6.4	14.1
DN80	3"	15	16.4	25.5	30.8	33.9	41.9	45.9	8.5	18.7
DN100	4"	20.8	22.3	43.6	49	48.2	69.2	88.2	10.6	23.4
DN150	6"	31	39.9	88.2	96.8	75.1	113.1	201.1		
DN200	8"	51	64.4	136	160	117.3	173.3	255.3		
DN250	10"	85.5	105.7	209.9		188.1	262.1	462.1		
DN300	12"	135.6	161	275.4		298.7	402.7	606.7		

Suffix code 4										
		Flanged							Wafer	
		Kg				lbs			Kg	lbs
Metric	Imperial	PN16	PN40	PN63	PN100	ASME 150	ASME 300	ASME 600	PN40/63	ASME 300/600
DN15	½"	5.8	6	6.4	6.9	12.3	13.3	14.3	4.1	9.1
DN20	¾"	6.2	7.1	7.4	9	13.6	15.6	16.6	4.2	9.3
DN25	1"	6.3	7.2	7.7	9.5	14.2	16.2	17.2	4.7	10.3
DN40	1½"	7.6	9.3	11.4	12.6	17.2	24.2	24.2	5.5	12.1
DN50	2"	9.8	11.1	15.3	17.5	22.2	26.2	28.2	6.4	14.1
DN80	3"	15.1	16.5	25.6	30.9	34	42	46	8.4	18.6
DN100	4"	21	22.5	43.8	49.2	48.4	69.4	88.4	10.5	23.2
DN150	6"	31.2	40.1	88.4	97	75.3	113.3	201.3		
DN200	8"	51.1	64.5	136.1	160.1	117.4	173.4	255.4		
DN250	10"	85.5	105.7	209.9		188.1	262.1	462.1		
DN300	12"	135.6	161	275.4		298.7	402.7	606.7		

Please note: Add 11 lb (5 kg) if the unit has remote electronics.

Typical Metric flowrates

Saturated steam (kg/h)

Pressure		Nominal pipe size										Carbon steel	Stainless steel
		15 mm	20 mm	25 mm	40 mm	50 mm	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm	300 mm
0.5 bar g	Min.	3	6	10	23	39	87	152	344	603	986	1 343	1 433
	Max.	25	67	111	326	545	1 220	2 124	4 815	8 434	13 791	18 771	20 029
5 bar g	Min.	6	11	18	45	75	167	290	658	1 153	1 885	2 565	2 737
	Max.	92	243	404	1 192	1 991	4 454	7 753	17 578	30 794	50 350	68 531	73 125
10 bar g	Min.	8	15	24	59	99	222	387	877	1 537	2 512	3 420	3 649
	Max.	164	432	718	2 117	3 538	7 914	13 776	31 233	54 715	89 461	121 766	129 927
15 bar g	Min.	9	17	29	71	119	266	463	1 050	1 840	3 008	4 094	4 369
	Max.	235	619	1 030	3 035	5 072	11 346	19 748	44 774	78 436	128 246	174 557	186 256
20 bar g	Min.	11	20	33	81	136	304	529	1 199	2 100	3 434	4 674	4 987
	Max.	306	807	1 342	3 956	6 610	14 785	25 734	58 347	102 213	167 122	227 472	242 718
30 bar g	Min.	13	24	40	99	165	369	641	1 454	2 548	4 165	5 670	6 050
	Max.	450	1 187	1 974	5 821	9 726	21 756	37 869	85 859	150 409	245 925	334 731	357 165

Air (Nm^3/h) at 20 °C

Pressure		Nominal pipe size										Carbon steel	Stainless steel
		15 mm	20 mm	25 mm	40 mm	50 mm	80 mm	100 mm	150 mm	200 mm	250 mm	300 mm	300 mm
0.5 bar g	Min.	3	6	11	26	43	97	169	383	671	1 097	1 494	1 594
	Max.	40	106	177	522	873	1 952	3 397	7 703	13 494	22 064	30 031	32 044
5 bar g	Min.	7	13	21	52	87	194	337	764	1 339	2 189	2 979	3 179
	Max.	161	424	705	2 078	3 472	7 765	13 516	30 644	53 683	87 774	119 471	127 478
10 bar g	Min.	9	17	29	70	117	262	456	1 035	1 813	2 964	4 034	4 304
	Max.	294	777	1 292	3 809	6 365	14 238	24 783	56 190	98 434	160 944	219 063	233 745
15 bar g	Min.	11	21	34	85	141	316	551	1 248	2 187	3 575	4 867	5 193
	Max.	429	791	1 881	5 544	9 265	20 724	36 072	81 785	143 271	234 255	318 847	340 217
20 bar g	Min.	13	24	39	97	162	363	631	1 431	2 506	4 098	5 577	5 951
	Max.	563	1 040	2 470	7 282	12 169	27 220	47 378	107 420	188 179	307 681	418 789	446 856
30 bar g	Min.	16	29	48	118	197	441	767	1 739	3 047	4 982	6 781	7 235
	Max.	832	1 536	3 651	10 764	17 987	40 233	70 028	158 774	278 141	454 773	618 997	660 483

Please Note: Nm^3/h = 0 bar g (0 psi g) and 0 °C (32 °F)

Typical Imperial flowrates

Saturated steam (lb/h)

Pressure		Nominal pipe size										Carbon steel	Stainless steel
		½"	¾"	1"	1 ½"	2"	3"	4"	6"	8"	10"	12"	12"
5 psi g	Min.	6.5	12	20	49	82	183	318	722	1 264	2 067	2 814	3 002
	Max.	50	133	221	650	1 087	2 431	4 231	9 592	16 804	27 475	37 397	39 903
100 psi g	Min.	15	27	46	112	187	418	728	1 652	2 893	4 730	6 439	6 870
	Max.	263	694	1 155	3 405	5 690	12 727	22 153	50 226	87 987	143 862	195 812	208 935
200 psi g	Min.	20	37	62	151	252	565	983	2 229	3 905	6 384	8 690	9 272
	Max.	479	1 265	2 104	6 202	10 364	23 182	40 350	91 485	160 264	262 038	356 663	380 567
300 psi g	Min.	24	45	74	182	304	680	1 184	2 685	4 703	7 690	10 467	11 169
	Max.	696	1 835	3 053	8 999	15 038	33 637	58 548	132 745	232 542	380 216	517 516	552 200
400 psi g	Min.	28	51	85	209	349	780	1 358	3 078	5 392	8 817	12 000	12 805
	Max.	914	2 412	4 012	11 828	19 765	44 211	76 953	174 474	305 643	499 740	680 202	725 790
500 psi g	Min.	31	57	95	233	389	870	1 514	3 432	6 013	9 831	13 381	14 278
	Max.	1 137	2 999	4 988	14 706	24 574	54 968	95 677	216 927	380 012	621 336	845 707	902 387

Air (SCFM) at 70 °F

Pressure		Nominal pipe size										Carbon steel	Stainless steel
		½"	¾"	1"	1 ½"	2"	3"	4"	6"	8"	10"	12"	12"
5 psi g	Min.	1.9	4	6	14	24	54	94	213	373	611	831	887
	Max.	21	56	93	275	459	1 027	1 788	4 053	7 100	11 609	15 801	16 860
100 psi g	Min.	5	9	14	35	58	130	227	515	902	1 475	2 007	2 142
	Max.	124	327	544	1 603	2 678	5 990	10 426	23 639	41 411	67 709	92 160	98 337
200 psi g	Min.	6	12	19	48	80	179	311	705	1 235	2 019	2 748	2 932
	Max.	232	613	1 019	3 004	5 020	11 229	19 545	44 313	77 628	126 925	172 759	184 337
300 psi g	Min.	8	14	24	58	97	216	377	854	1 496	2 446	3 329	3 552
	Max.	341	899	1 495	4 409	7 367	16 479	28 683	65 032	113 922	186 268	253 532	270 524
400 psi g	Min.	9	16	27	66	111	249	433	981	1 718	2 809	3 824	4 080
	Max.	449	1 186	1 973	5 815	9 717	21 737	37 834	85 781	150 271	245 699	334 424	356 837
500 psi g	Min.	10	18	30	74	124	277	482	1 093	1 915	3 131	4 261	4 547
	Max.	558	1 473	2 450	7 223	12 070	26 998	46 993	106 546	186 647	305 176	415 379	443 218

Please Note: SCFM = 0 bar g (0 psi g) and 0 °C (32 °F)

Water flowrates

Size			m^3/hr		US GPM	
			Minimum	Maximum	Minimum	Maximum
Nominal pipe size	15 mm	½"	0.17	5.0	0.7	22
	20 mm	¾"	0.3	9.2	1.3	40
	25 mm	1"	0.5	15	2.2	67
	40 mm	1 ½"	1.3	38	5.5	165
	50 mm	2"	2.1	63	9.2	276
	80 mm	3"	4.7	140	21	618
	100 mm	4"	8.1	244	36	1 075
	150 mm	6"	18	554	81	2 437
	200 mm	8"	32	970	142	4 270
	250 mm	10"	53	1 586	233	6 981
C Steel	300 mm	12"	72	2 158	317	9 502
St Steel	300 mm	12"	77	2 303	338	10 139

Sizing considerations

	Straight run piping requirements	Upstream	Downstream
Piping conditions	One 90 ° elbow before the flowmeter	10 D	5 D
	Two 90 ° elbows before the flowmeter	15 D	5 D
	Two 90 ° elbows out of plane before the flowmeter	25 D	5 D
	Reduction before the flowmeter	10 D	5 D
	Expansion before the flowmeter	20 D	5 D
	Partially open valve	25 D	5 D
	D = Internal diameter of the pipe - If there is not a sufficient straight run of pipe, a flow rectifier may be used to reduce the above diameter measurements. Consult your local Spirax Sarco representative or the factory for your specific application.		

Velocity range	Liquid	Maximum	9.144 meters/second	(30 feet/second)	
		Minimum	0.305 meters/second	(1 feet/second)	
	Gas or steam	Maximum	53.34 meters/second	(175 feet/second)	DN15 (½")
			76.20 meters/second	(250 feet/second)	DN20, DN25 (¾", 1")
			91.44 meters/second	(300 feet/second)	DN80 to DN300 (3" to 12")
		Minimum	$\frac{6.1}{\sqrt{\text{density}\left(\frac{kg}{m^3}\right)}}$	$\frac{5}{\sqrt{\text{density}\left(\frac{lb}{ft^3}\right)}}$	

How to order

Selection:

Category	Description	Suffix Code	Grey = Standard
Flowmeter	In-line multivariable mass vortex flowmeter	**VLM20**	**VLM20 -**
Electronics * Loop powered options only compatible with 2 wired RTD's	Volumetric flowmeter for liquid	**V**	**V**
	Velocity and temperature sensors	**VT**	
	Velocity, temperature and pressure sensors	**VTP**	
	Velocity, temperature and external 4 - 20 mA input (T or P)	**VTEP**	
	Velocity, external RTD temperature input, external 4 - 20 mA input (T or P) *	**VETEP**	
	Energy output option	**VTEM**	
	Energy output options with pressure sensor	**VTPEM**	
	Energy output options, temperature and external 4 - 20 mA input (T or P)	**VTEPEM**	
	Energy output options external RTD temperature input, external 4 - 20 mA input (T or P) *	**VETEPEM**	
Body size and type	DN15 ½" Nominal Bore — DN15, DN20 or DN25 connections are not available with body material in carbon steel	**04**	**24**
	DN20 ¾" Nominal Bore	**06**	
	DN25 1" Nominal Bore	**08**	
	DN40 1½" Nominal Bore	**12**	
	DN50 2" Nominal Bore	**16**	
	DN80 3" Nominal Bore	**24**	
	DN100 4" Nominal Bore	**32**	
	DN150 6" Nominal Bore	**48**	
	DN200 8" Nominal Bore	**64**	
	DN250 10" Nominal Bore	**80**	
	DN300 12" Nominal Bore	**96**	
Body material	Stainless steel 316L	**S**	**S**
	Carbon steel A105 - Not available if DN15, DN20 or DN25 connections are required	**C**	

'How to order' continued on next page

How to order (continued)

Selection:

Category	Description		Suffix Code	Grey = Standard
Connection	Flanged	ASME Class 150	**150**	**40**
		ASME Class 300	**300**	
		ASME Class 600	**600**	
		EN 1092-1 PN16	**16**	
		EN 1092-1 PN40	**40**	
		EN 1092-1 PN63	**63**	
		EN 1092-1 PN100, DN15 - DN200 only	**100**	
	Wafer	For installing between ASME Class 300/600 or EN 1092-1 PN40/PN63 flanges, only available up to DN100 (4")	**W**	
Electronics enclosure mounting	Local mount Type 4X of NEMA Type 4X, IP66 enclosure		L	**L**
	Remote electronics	Remote electronics Type 4X of NEMA Type 4X, IP66 25' cable with display	R25	
		25' (7.6 m) Armored cable with glands V meter only	A25	
		25' (7.6 m) Armored cable with glands not available on 'V' flowmeter	A25P	
		Remote electronics Type 4X of NEMA Type 4X, IP66 50' cable with display	R50	
		50' (15.2 m) Armored cable with glands V meter only	A50	
		50' (15.2 m) Armored cable with glands not available on 'V' flowmeter	A50P	
Display option	Digital display		D	**D**
Power supply	12 - 36 Vdc, 25 mA, 1 W max. required on loop powered meters, 1HL only		DL	**DL**
	12 - 36 Vdc, 300 mA, 9 W max.	These options are for use with: 1H, 1M, 1B, 3H, 3M, 3B Output/Comms	DH	
	100 - 240 Vac, 50/60 Hz line power, 5 W max.		AC	
Output signal	Loop powered	One analogue output (4 - 20 mA), one alarm, one pulse, HART® DL input power only	1HL	**1HL**
	One analogue output	4 - 20 mA, one alarm, one pulse, HART®, DH or AC option only	1H	
		4 - 20 mA, one alarm, one pulse, MODBUS RTU, DH or AC option only	1M	
		4 - 20 mA, one alarm, one pulse, BACnet MS/TP, DH or AC option only	1B	
	Three analogue output	4 - 20 mA, three alarms, one pulse, HART® (not available on 'V' flowmeter, DH or AC option only)	3H	
		4 - 20 mA, three alarms, one pulse, MODBUS RTU (not available on 'V' flowmeter, DH or AC option only)	3M	
		4 - 20 mA, three alarms, one pulse, BACnet MS/TP (not available on 'V' flowmeter, DH or AC option only)	3B	

'How to order' continued on next page

How to order (continued)

Selection:

Category	Description	Suffix Code	Grey = Standard
Process temperature	Standard temperature -200 °C to +260 °C (-330 °F to +500 °F) ** When Carbon steel body material is selected, the lower temperature is further limited to -29 °C (-20 °F)	S	**S**
	High temperature +260 °C to +400 °C (+500 °F to +750 °F)	H	
Pressure sensor	No pressure sensor	P0	**P0**
	Maximum 2 bar a (30 psi a), Proof 4 bar a (60 psi a)	P1	
	Maximum 7 bar a (100 psi a), Proof 14 bar a (200 psi a)	P2	
	Maximum 20 bar a (300 psi a), Proof 41 bar a (600 psi a)	P3	
	Maximum 34 bar a (500 psi a), Proof 64 bar a (1 000 psi a)	P4	
	Maximum 100 bar a (1 500 psi a), Proof 175 bar a (2 500 psi a)	P5	
Approvals	FM/FMC and CE marked	C	C
Face-to-face dimensions	Standard dimensions, see dimensions table (for Approval Suffix Code S only)	2	**1**
	Standard dimension, see dimensions table.	4	
	Supplied for retrofitting into the space left by either a PhD or VLM10 flowmeter (for Approval Suffix Code S only)	L	

Selection example: VLM20 - V - 24 - S - 40 - L - D - DL - 1HL - S - P0 - C - 1

How to order example:

1 off Spirax Sarco VLM20-V-24-S-40-L-D-DL-1HL-S-P0-C-1 in-line vortex flowmeter for installation between EN 1092 PN40 flanges.