

Supercal 5S (USA)

Static Heat- and Cooling Meter
DN 15 - DN 500

Your benefits

- Fluid oscillation principle:
  High stability and repeatability for a longterm and accurate measurement, even with poor water quality
- No moving parts:
  Not sensitive to dirt and liquids with changing viscosity
- No straight section necessary up to NPS 1½" and only 3 NPS necessary for NPS 2" and up:
  High flexibility in building planning
- Rugged and durable calculator:
  Particularly rugged construction of the casing and the mechanical and electrical connections
- NFC Interface:
  For a simplified and user-friendly calculator configuration on site

Applications

- High-end device for building management
- All applications in district heating and cooling or building automation
- Optimally suited for glycol and other mixtures
- As a replacement for mechanical impeller heat meters

Properties

- Exchangeable measuring head
- Common spare parts from q_p 4,4 up to 6604,3 gpm
- Complete range of pipes q_p 4,4-6604,3 gpm
- Dynamic flow range:
  1 : 100 at q_p 4,4-110 gpm
  1 : 50 at q_p 176,1-1761,1 gpm
  1 : 25 at q_p 3522,2 - 6604,3 gpm
- Protection class of flow sensor IP68
- For horizontal, up- and downstream pipes, threaded and flange fittings
- Direct pick-up of voltage pulses without reflectors
- Self-cleaning effect due to the fluid oscillating characteristic
- Corrosion resistant materials without moving parts (no wear)
- Temperature sensor Pt 500 (2- or 4-wires)
- Exchangeable calculator electronics while wiring remains in place
- Large, illuminated dot-matrix display (128 x 64 pixel)
- Freely configurable tariff and data logger functions (up to 2'175 entries)
- Battery (12+1-year) or mains powered for increased flexibility
- Integrated backup battery for metrological part
- Standard EN 1434 class 2
- CE Conformity according European Measuring Instruments Directive (MID) or Conformity according to the Directive Measurement Canada

Options

- Up to 2 option cards can be retrofitted, either Ex-Factory or on site, or replaced at any time without affecting the approval of the calculator:
  - M-Bus according to EN 13757
  - BACnet MS/TP (RS485) / Modbus (RS485) – requires mains supply
  - 2 Analogue outputs, 0-20 mA, 4-20 mA, 0(2)-10 V DC – requires mains supply

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Technical Data

Volume measuring meter			Threaded connection, G ¾'' - G 2" (NPS ½ - NPS 1½)					
Nominal diameter	NPS	inch	(½)	(¾)	(½)	(¾)	(1)	(1½)
Operating pressure	PN	psi	232 or 362					
Connection thread on meter	G...A	Inch	¾	1	¾	1	1¼	2
Connection thread on coupling	R...	Inch	½	¾	½	¾	1	1½
Nominal flow rate	q_p	gpm	4,4		6,6	11	15,4	26,4	44
Maximum flow rate	q_s	gpm	8,8		13,2	22	30,8	52,8	88
Minimum flow rate	q_i	gpm	0,04		0,06	0,11	0,15	0,26	0,44
Low flow threshold value		gpm	0,030		0,066		0,11	0,185	0,31
Kvs value		gpm	9,2	9,06	23,95	22,94	32,85	58,59	92,02
Pressure loss at q_p		psi	2,9	3,63	1,3	3,63	2,32		3,63
Maximum temperature		°F	266					
Standard measuring range	q_i/q_p		1:100					
Material			Brass					
Standard			EN ISO 228-1					

Dimensions								
Length without couplings	**L**	**Inch**	**4,33**	**7,48**	**4,33**	**7,48**	**10,24**	**11,81**
Total height	H	Inch	3,11				4,13	4,8
Meter depth	D	Inch	4,92				3,07	
Meter weight		lbs	6,4	7,1	6,4	7,1	7,7	9.9
Figure Number			1				2	

Volume measuring meter			ANSI-Flanged connection, NPS 2 - NPS 8						
Nominal pipe size	NPS	inch	2	2½	3	4	5	6	8
Class			150						
Nominal flow rate	q_p	gpm	66	110,1	176,1	264,2	440,2	660,4	1100,7
Maximum flow rate	q_s	gpm	132	220	352,2	528,35	880,4	1320,9	2201,4
Minimum flow rate	q_i	gpm	0,66	1,1	3,52	5,28	8,8	13,2	22,01
Low flow threshold value		gpm	0,46	0,77	2,64	3,7	4,4	9,3	15,41
Kvs value		gpm	139,13	228,06	625,2	924,6	1510,18	2263,07	3773,26
Pressure loss at q_p		psi	3,63		1,3	1,45			
Maximum temperature		°F	266						
Standard measuring range	q_i/q_p		1:100		1:50				
Material			Spheroidal cast iron						Stainless steel
Standard			ASME B16.42-2016						ASME B16.5-2003

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Dimensions									
Length	**L**	**Inch**	**10.63**	**11,81**		**14,17**	**9,84**	**11,81**	**13,78**
Total height	H	Inch	6,22	7,13	7,56	8,82	10,16	10,83	NA
Meter depth	D	Inch	5,39	6,57	6,93	8,46	10,04	10,31	13,59
Øk	Øk	Inch	4,75	5,5	6	7,5	8,47	9,5	11,75
Bolts			4			8			
Meter weight		lbs	21,6	NA	34,6	37,7	38,4	60,8	NA
Figure Number			3						

Volume measuring meter			DIN-Flanged connection, NPS 1 - NPS 6, Material: Brass or Spheroidal cast iron								
Nominal diameter	**NPS**	**inch**	**1**	**1**	**1½**	**2**	**2½**	**3**	**4**	**5**	**6**
Operating pressure	**PN**	**psi**	**232 or 362**						**232**		
Nominal flow rate	**q_p**	**gpm**	**15,4**	**26,4**	**44**	**66**	**110,1**	**176,1**	**264,1**	**440,2**	**660,4**
Maximum flow rate	q_s	gpm	30,8	52,8	88	132,1	220,1	352,2	528,2	880,4	1320,8
Minimum flow rate	q_i	gpm	0,15	0,26	0,44	0,66	1,1	3,52	5,28	8,8	13,2
Low flow threshold value		gpm	0,066	0,132	0,22	0,46	0,77	2,47	2,64	4,4	6,6
Kvs value		gpm	32,82	58,96	91,96	139,13	228,07	625,2	924,6	1510,18	2263,07
Pressure loss at q_p		psi	2,32		3,63		1,3		1,45		
Maximum temperature		°F	266								
Standard measuring range	q_i/q_p		1:100				1:50				
Material			Brass			Spheroidal cast iron					
Standard			DIN-EN 1092-1 / DIN 2501 / ISO 7005-3			DIN-EN 1092-1 / DIN 2501 / ISO 7005-1					

Dimensions									
Length	**L**	**Inch**	**10,24**	**11,81**	**10,63**	**11,81**		**14,17**	**9,84**	**11,81**
Total height	H	Inch	5,28	6,19	6,74	7,44	8	8,9	10	11,26
Meter depth	D	Inch	4,53	5,9	6,5	7,29	7,88	8,67	9,85	11,22
Øk	Øk	Inch	3,35	4,33	4,93	5,7	6,3	7,09	8,27	9,45
Bolts			4		8					
Meter weight		lbs	12	18	20,1	24,7	28,9	41,9	35,3	60
Figure Number			3							

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Volume measuring meter			DIN-Flanged connection, NPS 2 - NPS 20, Material: Stainless steel or Steel															
Nominal pipe size	NPS	inch	2	2½	3	4		5		6		8		10		14		20	
Operating pressure	PN	psi	232 or 362			232	362	232	362	232	362	232	362	232	362	145	232	145	232
Nominal flow rate	q_p	gpm	66	110	176.1	264.1		440.2		660.4		1100.7		1761.1		3522.2		6604.3	
Maximum flow rate	q_s	gpm	132	220	352.2	528.2		880.4		1320.8		2201.4		3522.2		7044.4		13208.6	
Minimum flow rate	q_i	gpm	0.66	1.1	3.52	5.28		8.8		13.2		22.01		35.22		140.89		264.17	
Low flow threshold value		gpm	0.33	0.55	1.76	2.64		4.4		6.6		11		17.61		70.44		132.08	
Kvs value		gpm	139.13	228.06	625.2	924.6		1510.18		2263.07		3773.26		6040.73		11742.4		22014.3	
Pressure loss at q_p		psi	3.63		1.3	1.45													
Maximum temperature		°F	266																
Standard measuring range	q_i/q_p		1:100		1:50											1:25			
Material			Stainless steel													Steel			
Standard			DIN-EN 1092-1 / DIN 2501 / ISO 7005-1																

Dimensions																							
Length	L	inch	10.63	11.81	8.86	11.81	9.84	14.17	9.84	14.17	9.84		11.81	19.69	11.81	19.69	13.78		17.71		19.69			
Total height	H	inch	6.74	7.44	8		8.9		9.26		10	10.63	11.26		11.82		13.39	14.18	15.95	16.74	19.89	20.48	26.38	28.15
Meter depth	D	inch	6.5	7.29	7.88		8.67		9.26		9.85	10.63	11.22		11.82		13.39	14.18	15.95	16.74	19.89	20.48	26.38	28.15
Øk	Øk	inch	4.93	5.7	6.3		7.09		7.5		8.27	8.67	9.45		9.85		11.62	12.2	13.98	14.57	18.11	18.5	24.41	25.6
Bolts			4		8												12				16		20	
Meter weight		lbs	20.1	24.7	31.8	28.9	31	41.9	31	41.9	35.3		60	50.7	60	50.7	66.2		84		198.5	231.5	287	430
Figure Number			3																				

Dimension Diagram

Figure 1

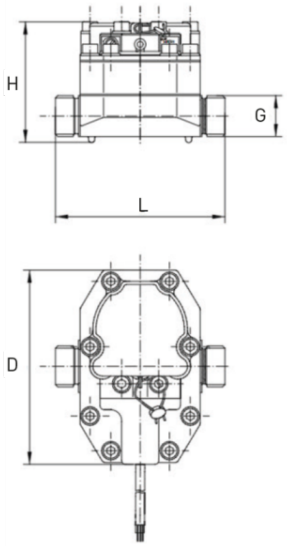


Figure 2

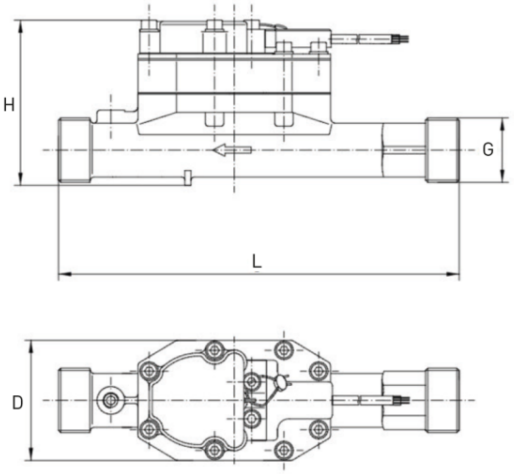
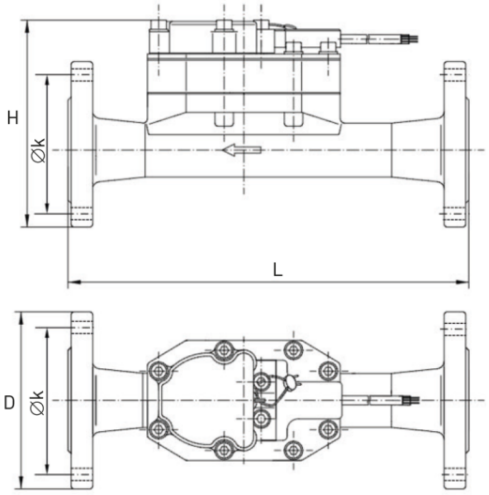
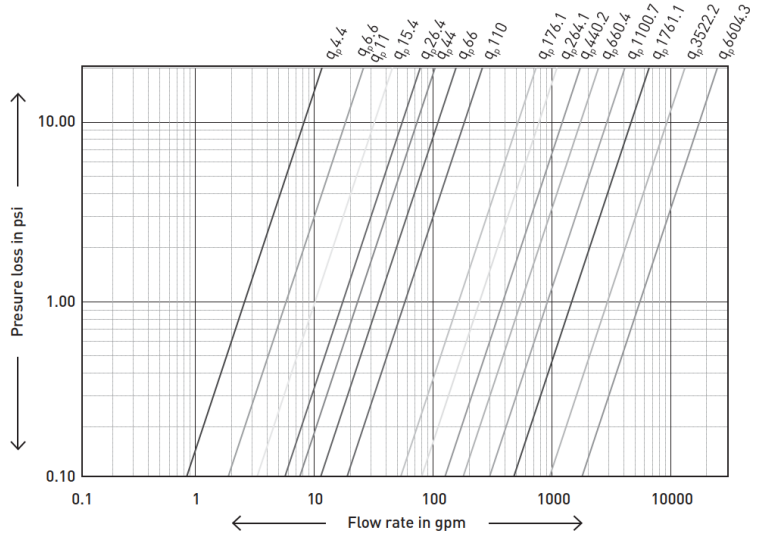


Figure 3



Typical Head Loss Curve



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Calculator

Calculator	
Dimensions (HxWxD)	6.22 x 5.63 x 2.11"
Environment class C	E1/M1
Temperature sensor type	2- and 4-wire, Pt 500
Absolute temperature range	-4 °F to 392 °F
Approved temperature range	33.8 °F to 392 °F
Absolute temperature difference	1 K to 150 K
Homologation temperature difference	3 K to 150 K
Response limit	0.2 K
Temperature resolution t (display)	0.1 °C
Temperature resolution Δt (display)	0.01 K
Measurement accuracy	Better than requirements according to EN1434-1
Measuring cycle temperature measurement - Battery operated (D-cell) - Mains operated	 10 s to 30 s (depends on flow rate) 3 s to 30 s (depends on flow rate)
Ambient temperature in operation	41 °F to 131 °F
Transport and storage temperature	-4 °F to 158 °C (dry environment)
Ambient humidity	<93% relative humidity
Display	Illuminated (if mains powered) dotmatrix display (128 x 64 pixel)
Display units	9 digits, MWh, m^3, °C, K
Additional pulse inputs	Energy or volume
Protection class	IP65 in accordance to IEC 60529
Power supply options	Battery D-cell (12+1-year lifetime) OR Mains, 110-230 V AC, 50/60 Hz OR Mains, 12-42 V DC or 12-36 V AC
2 additional pulse inputs	Max. 200 Hz, 0-30 V DC
2 open collector pulse outputs	Max. 200 Hz, 0-60 V DC
Optical Interface	According to IEC 62056-21:2002
NFC Interface	According to ISO/IEC 14443 Type A
M-Bus Interface	According to EN 13757-2/3 Baudrate: 300 to 9'600 Bit/s 1 M-Bus standard unit load (1,5 mA)

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Temperature sensor

Temperature sensor	
Sensor element	Pt 500
Connection diagram	2- or 4-wire
Installation length	Depends on meter size

Flow sensor

Flow sensor	
Approved temperature range	41 °F to 266 °F
Environment temperature	41 °F to 131 °F
Storage temperature	-13 °F to 158 °F
Protection class	IP68

Installation

Pipeline: horizontal

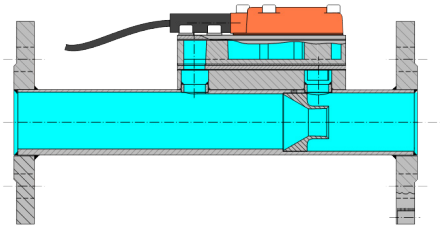
vertical

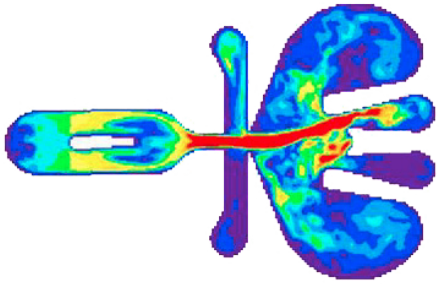
Meter head (for horizontal installation): +/- 45°



The principle of fluid oscillator flow sensor

The main part of the flow passes through a Venturi nozzle in the pipe, creating the differential pressure to bypass the other part of the flow through the fluid oscillator.
In the oscillator the liquid is led to a nozzle and accelerated to a jet. Opposite of the nozzle the jet is redirected to the left or right into a channel that leads upwards to the sensor head equipped with a piezo sensor. The pressure of the liquid on the sensor creates an electrical pulse. The liquid flows back to the pipe through a return loop and redirects the jet into the other channel where the action is repeated and fluid oscillation is created. The frequency of this oscillation is linear proportional to the volume flow. A supplementary benefit is the self cleaning effect due to the oscillating character.





The animated top view on the oscillator shows the differences of velocity of the liquid. The jet accelerated by the nozzle with the highest velocity in red, slow velocity in blue.

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