STEEMCO Flowmeter for Steam

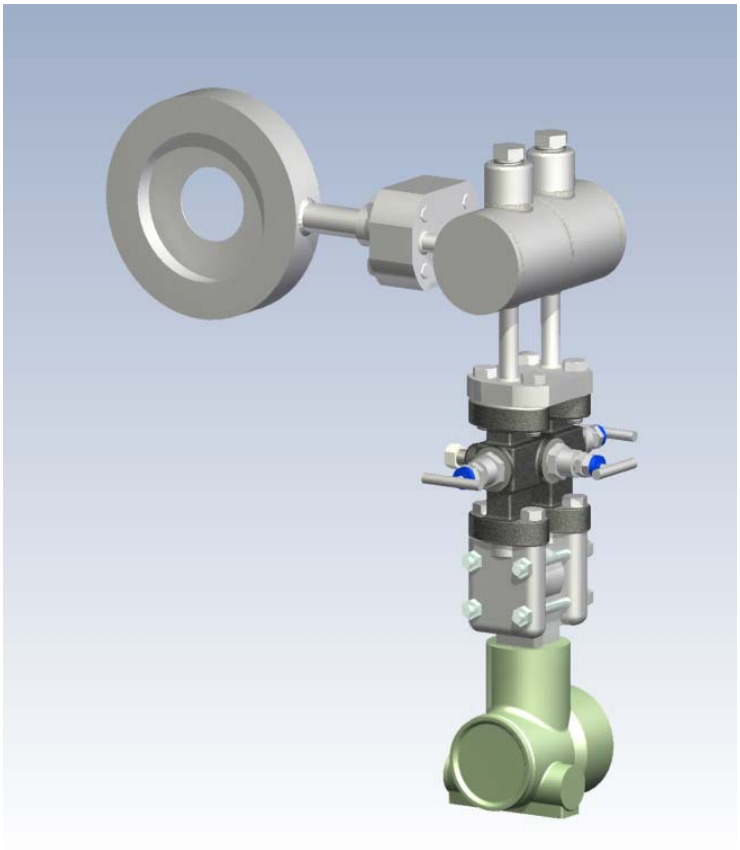
Typical Applications

The STEEMCO flow meters measure the flow of saturated and superheated steam within the process industries, including chemical, petro-chemical, pharmaceutical and the power industry.
The STEEMCO is based on the principle of measuring velocity in the pipe line, therefore the flow measurement is volumetric.
The STEEMCO flow meters are backed by international standards covering flow calculation, manufacturing tolerances, accuracy and installation requirements.
This type of bare bone technology is world wide accepted and supported by millions of successful installations.

Features

The STEEMCO flow meter features are:

Standardised product based on well proven technology.
Compact design.
Simple construction.
Standardised construction means low inventory.
No moving parts.
Not sensitive to vibrations.
The electronics delivers linear to flow output signal.
Digital indicator for local flow reading.
High accuracy.
Wide rangeability.
Easy to install.
Easy to re-calibrate.



Models with integrated manifold valve

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Construction

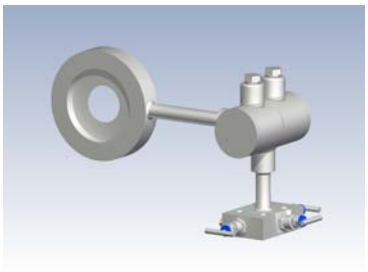
Model ST1
The STEEMCO flow meter model ST1 consists of a primary element based on the differential pressure principle, a condensing pot arrangement, a 3 valve manifold and an electronic differential pressure transmitter with digital signal processing.

Model ST2
The STEEMCO flow meter model ST2 consists of a primary element based on the differential pressure principle, an all welded integrated condensing pot arrangement, a 3 valve manifold and an electronic differential pressure transmitter.

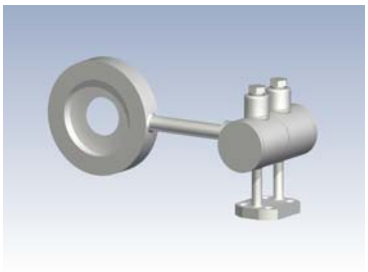
Model ST3
The STEEMCO flow meter model ST3 consists of a primary element based on the differential pressure principle, an all welded integrated condensing pot arrangement, with transmitter mounting flange, 3 valve double flanged manifold and an electronic differential pressure transmitter

The STEEMCO flow meter is mounted between flanges in sizes
from DN 40 (1½") to DN 400 (16") in pressure ratings up to PN 40 (300 lbs).

ST1 HR without manifold
Modular



ST2 HR integrated manifold
All welded



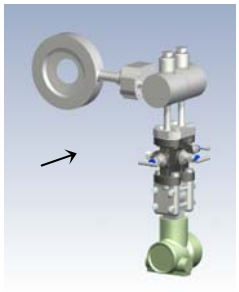
ST3 HR without manifold
All welded

Accessories

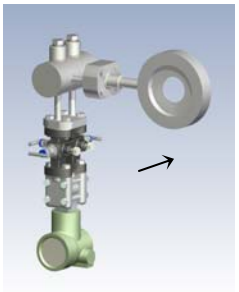
Remote electronic indicator with LCD is available for local flow indication and if required check/change of flow rate (differential pressure).

Principle of measurement

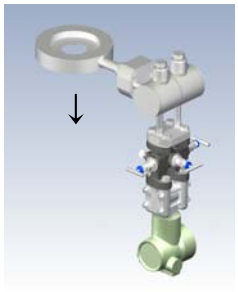
The STEEMCO is a velocity flow meter
A restriction in a pipe line changes the value of the different energies.
Based on the law of energy balance developed by Bernoulli the sum of energies remains constant.
Increases the velocity in the pipe line decreases the pressure in the restriction.
The pressure differential between the inlet pressure and the pressure in the restriction is measured expressing the flow velocity.
When the physical values of the fluid is known and the inner pipe diameter is established the electronics calculate the flow rate. The flow rate is expressed in an analogue signal 4 - 20 mA or signal for digital communication.



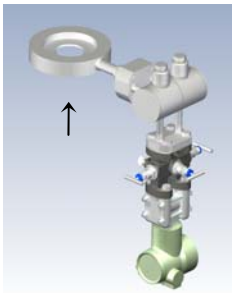
Horizontal -
Right hand side



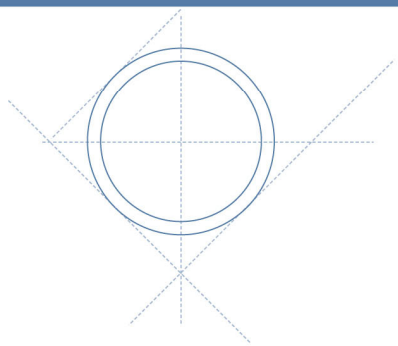
Horizontal -
Left hand side



Vertical -
Downwards

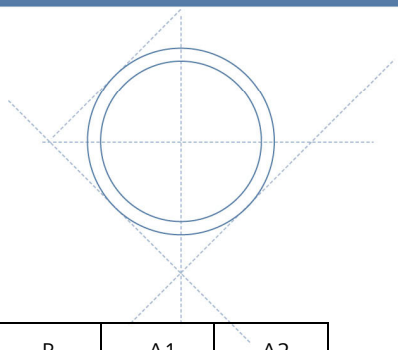


Vertical -
Upwards



Technical data

Sizes	:	DN 40 - DN 400, 1½" - 16", larger sizes on request
Pressure rating	:	up to PN 40, 300 lbs, higher pressure ratings on request
Temperature	:	Process : up to 400°C,
Mounting style	:	Between flanges according to DIN or ANSI standards
Flange facing	:	flat face (standard), raised face, DIN 2512 N, DIN 2513 R
Overall length	:	32 mm
Material	:	Stainless steel AISI 316, others on request
Design and calculation standards	:	ISO 5167, ASME MFC-3M.
Drain hole	:	On request
β (d/D)	:	0,5 and 0,6; other β on request.
Accuracy	:	+/- 1,2 %
Rangeability	:	8 : 1
Repeatability	:	better than 0,1 %
Pressure loss	:	typical 150 mbar (values are given at full flow)
Reynolds No	:	Re > 5000
Allowable differential Pressure	:	max 2,5 bar
Output signal	:	analogue 4 - 20 mA or Digital communication via protocol, HART, PROFIBUS, Foundation Fieldbus or others.
Local indicator (option)	:	LCD showing flowing units or %
Power supply	:	14 - 36 Vdc, typical 24 Vdc.
Max load (24 Vdc)	:	700 Ohm
Enclosure	:	IP 67
Ex protection	:	intrinsically safe EEx ia IIC T6 Explosion proof EEx d IIC T6
Temperature	:	Ambient : -40 - +80°C



Sizes

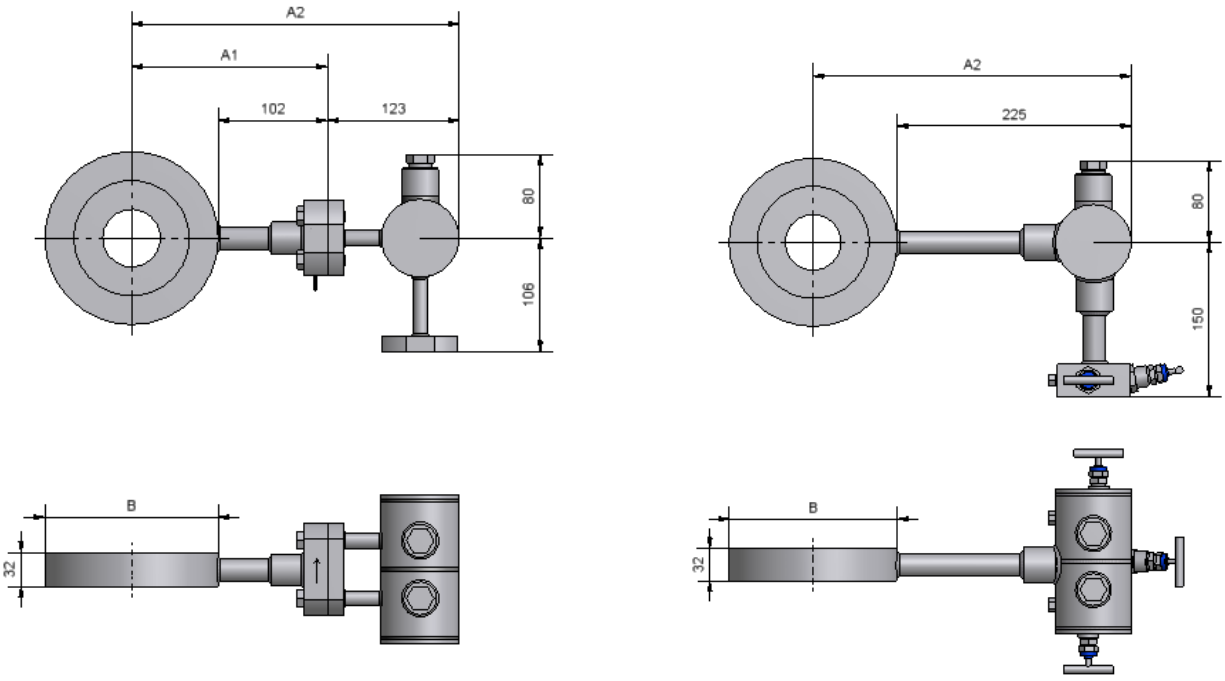
DIN flanges

Size	Pipe OD	Pressure rating	Inner pipe diameter	ß = 0,5 Bore	ß = 0,6 Bore	B	A1	A2
DN 40	48,3	PN 40	43,1	21,5	26,0	90	147	270
DN 50	60,3	PN 40	54,5	27,3	32,0	107	156	279
DN 65	76,1	PN 40	70,3	35,0	42,0	127	166	289
DN 80	88,9	PN 40	82,5	41,0	49,5	142	173	296
DN 100	114,3	PN 16	107,1	54,0	64,0	162	183	306
DN 100	114,3	PN 40	107,1	54,0	64,0	168	186	309
DN 125	139,7	PN 16	131,7	66,0	79,0	192	198	321
DN 125	139,7	PN 40	131,7	66,0	79,0	194	199	322
DN 150	168,3	PN 16	159,3	80,0	96,0	218	211	334
DN 150	168,3	PN 40	159,3	80,0	96,0	224	214	337
DN 200	219,1	PN 16	207,3	104,0	124,4	273	239	362
DN 200	219,1	PN 25	206,5	104,0	124,4	284	244	367
DN 200	219,1	PN 40	206,5	104,0	124,4	290	247	370
DN 250	273	PN 16	260,4	130,0	156,0	329	267	390
DN 250	273	PN 25	258,8	130,0	156,0	340	272	395
DN 250	273	PN 40	258,8	130,0	156,0	352	278	401
DN 300	323,9	PN 10	309,7	155,0	185,0	378	291	414
DN 300	323,9	PN 16	309,7	155,0	185,0	384	294	417
DN 300	323,9	PN 25	307,9	155,0	185,0	400	302	425
DN 300	323,9	PN 40	307,9	155,0	185,0	417	311	434
DN 350	355,6	PN 10	341,4	170,0	204,0	438	321	435
DN 350	355,6	PN 16	339,6	170,0	204,0	444	324	447
DN 350	355,6	PN 25	339,6	170,0	204,0	457	331	454
DN 350	355,6	PN 40	338,0	170,0	204,0	474	339	462
DN 400	406,4	PN 10	392,2	195,0	234,0	489	341	464
DN 400	406,4	PN 16	390,4	195,0	234,0	495	350	473
DN 400	406,4	PN 25	388,8	195,0	234,0	514	359	482
DN 400	406,4	PN 40	384,4	195,0	234,0	546	375	498

ANSI flanges

Size	Pipe OD	Pressure rating	Sch. 10S Inner pipe dia.	Sch. 40 Inner pipe dia.	Sch. 80 Inner pipe dia.	ß = 0,5 Bore	ß = 0,6 Bore	B	A1	A2
1½"	48,3	150 lbs	42,7	40,9	37,3	20,0	24,0	85,7	145	268
		300 lbs						95,3	150	273
2"	60,3	150 lbs	54,7	52,5	49,3	26,0	31,5	104,8	154	277
		300 lbs						111,1	158	281
3"	88,9	150 lbs	82,8	77,9	73,7	39,0	47,0	136,5	170	293
		300 lbs						149,1	177	300
4"	114,3	150 lbs	108,2	102,3	97,2	51,0	61,0	174,6	189	312
		300 lbs						181,1	193	316
6"	168,3	150 lbs	161,5	154,1	146,3	77,0	92,5	222,3	213	336
		300 lbs						250,7	227	350
8"	219,1	150 lbs	211,5	202,7	193,7	101,0	121,6	279,4	242	365
		300 lbs						308	256	379
10"	273	150 lbs	264,6	254,5	242,8	127,0	153,0	339,7	272	395
		300 lbs						362	283	406
12"	323,9	150 lbs	314,7	303,2	289,1	150,0	180,0	409,6	307	430
		300 lbs						422,3	313	436
14"	355,6	150 lbs	346	333,3	317,5	165,0	198,0	450,9	327	450
		300 lbs						485,8	345	468
16"	406,4	150 lbs	396,8	381	363,6	190,0	228,0	514,4	359	482
		300 lbs						539,8	372	495

Overall dimensions



Installation requirements

The STEEMCO flow meter can be mounted in a horizontal or vertical pipe. The condensing pot arrangement shall be mounted horizontally with the outlet pointing downwards.

To insure high accuracy of measurement, long straight pipe runs up-stream from the flow meter is necessary. The required straight pipe run depends on the disturbance upstream. To maintain the 1,2% accuracy the minimum straight pipe run upstream shall be 14 x inner pipe diameter and 6 x downstream
If an additional inaccuracy of ½ % is acceptable the required straight pipe runs are reduced to half of the above values.

Mass flow

Mass flow measurement of saturated steam is obtainable using STEEMCO with a multi variable differential pressure transmitter.

Mass flow measurement of super heated steam : ask for STEEMCO-MAS mass flow meter data sheet.

STEEMCO coding

1. Type

In AISI 316 with		
transmitter flange	code	ST1
integrated manifold	code	ST2
integrated cond. chamber	code	ST3

2. Size

DN 40, DIN standard	code	040
DN 50, DIN standard	code	050
DN 65, DIN standard	code	065
DN 80, DIN standard	code	080
DN 100, DIN standard	code	100
DN 125, DIN standard	code	125
DN 150, DIN standard	code	150
DN 200, DIN standard	code	200
DN 250, DIN standard	code	250
DN 300, DIN standard	code	300
DN 350, DIN standard	code	350
DN 400, DIN standard	code	400
1½", ANSI standard	code	01.5
2", ANSI standard	code	002
3", ANSI standard	code	003
4", ANSI standard	code	004
6", ANSI standard	code	006
8", ANSI standard	code	008
10", ANSI standard	code	010
12", ANSI standard	code	012
14", ANSI standard	code	014
16", ANSI standard	code	016

3. Pressure rating

PN 10, DIN standard	code	10
PN 16, DIN standard	code	16
PN 25, DIN standard	code	25
PN 40, DIN standard	code	40
150 lbs, ANSI standard	code	15
300 lbs, ANSI standard	code	30

4. Facing

DIN 2526 Form A	code	26
DIN 2513 Form R13	code	13
DIN 2512 Form N	code	12
Raised face RF, ANSI std.	code	RF
Flat face FF, ANSI std.	code	FF

5. Pipe schedule (only applicable for ANSI flanges)

DIN flanges	code	00
Schedule 10S	code	10
Schedule 40	code	40
Schedule 80	code	80

6. β value

β value 0,5	code	5
β value 0,6	code	6
β value free choice	code	9

7. Drain/vent hole Ø3 mm

Without drain/vent hole	code	0
With drain/vent hole	code	1

8. Manifold valve

ST1 - Without	code	0
ST1 - 3 valve manifold	code	1
ST2 - Integrated manifold	code	2
ST3 - Integrated condensing chamber without manifold	code	3
ST3 - Integrated condensing chamber with manifold	code	4

9. Mounting position

Horizontal pipe right hand	code	HR
Horizontal pipe left hand	code	HL
Vertical pipe down	code	VD
Vertical pipe up	code	VU

10. Differential pressure transmitter

Without	code	0
Included	code	Original transmitter type no.

Examples

DN 100 STEEMCO ST1 in stainless steel PN 40 with DIN 2526 facing, β value 0,6, with drain hole, for horizontal right hand mounting and 3 valve double flanged manifold valve type G3H and without transmitter has following code:

ST1-100-40-26-00-6-1-1-HR-0

8" STEEMCO ST2 in stainless steel 150 lbs with RF facing, β value 0,5, without drain hole, with Integrated manifold, for vertical mounting flow direction downwards has following code:

ST2-008-15-RF-40-5-0-2-VD-0