

Overview



SITRANS F X vortex flow meters provide accurate standard volumetric and mass flow measurement of steam, gases and liquids as an all in one solution with integrated temperature and pressure compensation.

Benefits

- All devices have 2-wire technology and HART communication
- Temperature compensation for saturated steam as standard feature
- Integrated temperature and pressure compensation enabling direct compensation of density.
- Pressure, temperature and flow can be read at a single point. No additional installation of pressure and temperature sensors.
- Direct measurement of energy
- Optimum process reliability thanks to Intelligent Signal Processing (ISP) - stable readings, free of external perturbations
- Fully welded stainless steel construction with high corrosion, pressure and temperature resistance
- Maintenance-free sensor design
- Ready to use due to plug & play feature. No additional cabling work
- Minimal pressure drop

Application

The SITRANS FX300 is a compact flow meter in a single or dual transmitter version, suitable for measuring industrial steam, gases, as well as conductive and non-conductive liquids. E.g. steam (saturated steam, superheated steam), industrial gases (compressed air, nitrogen, liquefied gases, flue gases), and conductive and non conductive liquids (demineralized water, boiler feed water, solvents, heat transfer oil)

The main applications of SITRANS FX300 can be found in the following sectors:

- Chemical
- Petrochemical
- Oil & Gas
- Power plants
 - Air
 - Heating
 - Cooling
 - Chilling
- Food & beverage
 - Pharmaceutical
 - Sugar refineries
 - Dairies
 - Breweries
 - Producers of soft drinks
- Refining
- Water & waste water

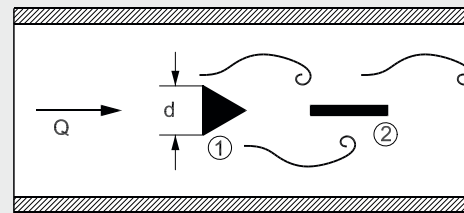
System Overview

Version	Single transmitter			Dual trans- mitter
Options	Vortex Volumetric Flow Meter	Vortex Mass Flow Meter	Vortex Mass Flow Meter with shut off valve	Vortex volumetric Flow Meter
Flange				
Sandwich				

Function

Operating Principle

SITRANS F X vortex flow meters measure flow rate by detecting the frequency at which alternating vortices are shed from a bluff body inserted into the flow stream. This principle of measurement is known as Von Karman's vortex street principle: alternating vortices form behind an object in a stream. The frequency of the alternating vortices is proportional to the flow rate. The Passage of a vortex causes a slight stress on a wing placed downstream of the bluff body. The stress is picked up and counted as pressure surges by a dual Piezo crystal placed inside the wing.



① = Bluff Body, ② = Wing

The flow meter calculates the flow velocity using the following equation:

$$Q = A \cdot V = A \cdot d / St \cdot f = 101,93 \cdot f / K \text{ [m}^3/\text{h]}$$

Where:

Q = flow rate [m^3/h]

f = vortex shedding frequency [Hz]

K = calibration constant [pulses/ ft^3]

d = diameter of the bluff body [m]

St = Strouhal Number

A = cross-section area [m^2]

V = flow velocity [m/s]

SITRANS F flowmeters

SITRANS F X

SITRANS FX300

Requirements

In order to generate the vortex streets, the medium must have a minimum of velocity:

- for steam and gases, the flow rate must be between 2 to 80 m/s (6.6 to 262 ft/s)
- for liquids the flow rate must be between 0.4 to 10 m/s (1.3 to 32.8 ft/s).

Design

SITRANS FX300 is available in the following configurations:

SITRANS FX300 single transmitter

The single converter is available in a flange or sandwich version volumetric flow meter (standard) and as a mass flow meter (optional):

- **Vortex volumetric flow meter**
Measurement with integrated temperature sensor for saturated steam compensation as standard feature
- **Vortex mass flow meter**
Measurement with integrated temperature and pressure sensors for compensation of gases, wet gases, gas mixtures or steam (for energy measurement).
The SITRANS FX300 mass flow meter is optionally available with:
 - Shut-off valves
Allowing the pressure sensor to be shut off for the purpose of pressure or leak testing of the pipeline or for being exchanged without interrupting the process. Using the built-in two-way valve, the pressure sensor can also be calibrated and tested at a later time.

SITRANS FX300 Dual transmitter

This is a genuine redundant system with two independent sensors and two converters providing twofold functional reliability and availability of the measurement. This variant is optimally suited for measurements in multi product pipelines, where different products are moved through one after the other. Here one converter can be programmed for one product, and the other converter for the other.

The dual converter is available as:

- **Vortex volumetric flow meter**
Measurement with temperature sensor for saturated steam compensation as standard feature

Technical specifications

Input	
Measuring range limits	See „Dimensional Drawings“
Media pressure	1 ... 100 bar (Higher pressures on request)
Output	
Current output	
• Measuring range	4 ... 20 mA
• Over range	20.8 mA $\pm$ 1 % (105 % $\pm$ 1 %)
• Load	Min. 100 Ω ; max. $R_{ges} = (U_B - 14 \text{ V}) / 22 \text{ mA}$
• Error signal	NAMUR NE 43
• Maximum output	22 mA (112.5 %)
• Multidrop mode	4 mA
Digital output	
• Communication	HART
• Physical layer	FSK
• Device category	Transmitter
Pulse Output	
• Pulse frequency	Max. 0.5 Hz

Power supply	
• Standard version	24 V DC as NAMUR or open < 1 mA, max. 36 V, closed 100 mA, $U < 2 \text{ V}$
• Ex version	24 V DC as NAMUR or open < 1 mA, max. 30 V, closed 100 mA, $U < 2 \text{ V}$
Accuracy	
Standard version	
• For liquids - $Re \geq 20\,000$	$\pm 0.75 \%$
• For steam and gases - $Re \geq 20\,000$	$\pm 1 \%$
• For steam, gases and liquids - $10\,000 < Re < 20\,000$	$\pm 2 \%$
Pressure and temperature compensated version	
• For liquids - $10\,000 < Re < 20\,000$ - $Re \geq 20\,000$	$\pm 2 \%$ $\pm 0.75 \%$
• For gases and steam - $10\,000 < Re < 20\,000$ - $Re \geq 20\,000$	$\pm 2.5 \%$ $\pm 1.5 \%$
Installation conditions	
• Inlet run	$\geq 20 \times DN$
• Outlet run	$\geq 5 \times DN$
Rated operation conditions	
Ambient temperature	
• Standard version	-40 ... +85 °C (-40 ... +185 °F)
• Ex version	-20 ... +65 °C (-4 ... +149 °F)
Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
Media temperature	-40 ... +240 °C (-40 ... +464 °F)
Density	Taken into consideration when rating
Viscosity	< 10 cP
Reynolds number	10 000 ... 2 300 000
Media pressure limit	Max. 100 bar (Higher pressure on request)
Design	
Material	
• Sensor	1.4404/316L Hastelloy C22 (on request)
• Housing	Aluminium Aluminium seawater resistant
• Sensor gasket	1.4435/316L/FPM Hastelloy C22/FFKM (on request)
Process connections	
• Flange version	EN or ASME flanges DN 15 ... 300 (½ ... 12")
• Sandwich version	DN 15 ... 100 (½ ... 4")
Degree of protection	IP66/IP67 (NEMA 6)
Dimensions and weights	See „Dimensional Drawings“
Display and operating interface	
Local display	2 lines, 10 characters per line
Languages	German, English, French
Power supply	
• Standard version	14 ... 36 V DC
• Ex version	14 ... 30 V DC
Certificates and approvals	
Explosion protection	
• ATEX	II 2G EEx d ia [ia] IIC T6
• FM	Class I, Div 1

Selection and Ordering data		Order No.	
SITRANS FX300 Flanged Single transmitter and T _{max} = 240 °C (464 °F)		7 ME 2 6 0 0 -	
Connection size	Sensor size		
DN 15 (½")	DN 15	1 A	
DN 25 (1")	DN 25	2 B	
DN 40 (1½")	DN 40	2 K	
DN 50 (2")	DN 50	2 R	
DN 80 (3")	DN 80	3 L	
DN 100 (4")	DN 100	3 S	
DN 150 (6")	DN 150	4 M	
DN 200 (8")	DN 200	4 T	
DN 250 (10")	DN 250	4 W	
DN 300 (12")	DN 300	5 E	
Flange norm and nominal pressure			
Form B1/B2	EN 1092-1		
PN 10	DN 200 ... 300	A	
PN 16	DN 50 ... 300	B	
PN 25	DN 200 ... 300	C	
PN 40	DN 15 ... 300	D	
PN 63	DN 50 ... 150	E	
PN 100	DN 15 ... 150	F	
RF	ASME B16.5		
150 lb	1½ ... 12"	J	
300 lb	1½ ... 12"	K	
600 lb	1½ ... 6"	L	
Sensor material/Gasket			
Stainless steel 1.4404 (316L)/1.4435 (316L)/FPM		1	
Hastelloy C22/C276/FPM		3	
Stainless steel 1.4404 (316L)/1.4435 (316L)/FFKM		5	
Hastelloy C22/C276/FFKM		7	
Transducer design and coax cable			
Compact, none cable		1	
Approval and cable gland			
Non Ex, M20x1,5		1	
ATEX EEx Zone 1 -Ex II 2G EEx d ia[ia] IIC T6, M20x1,5		4	
FM Class I DIV 1, M20x1.5		6	
FM Class I DIV 1, ½" NPT		7	
Transmitter, display and communication			
With display, HART		A	
Pressure sensor			
Without		A	
4 bar		B	
6 bar		D	
10 bar		E	
16 bar		G	
25 bar		H	
40 bar		K	
60 bar		L	
100 bar		N	

Selection and Ordering data		Order No.	
SITRANS FX300 Flanged Single transmitter and T _{max} = 240 °C (464 °F)		7 ME 2 6 0 0 -	
<u>With iso valve</u>			
4 bar			P
6 bar			Q
10 bar			R
16 bar			S
25 bar			U
40 bar			V
60 bar			W
100 bar			Y
Software			
Uncompensated			1
Density compensation for superheated steam (option only with pressure sensor)			4
Density compensation for gas-wet-mix (option only with pressure sensor)			7

Selection and Ordering data		Order code	
Additional information			
Please add "-Z" to Order No. and specify Order code(s) and plain text.			
Accredited Siemens calibration FX300			
Calibration certificate (5 point)		D11	
Material certificate			
Certificate of compliance EN 10204-2.1		F10	
Pressure test + 3.1 accordance EN 10204		F11	
Material certificate pressure parts + certificate 3.1		F12	
Material in accordance of NACE MR 0175-01		F13	
PMI of pressure bearing metal parts + certificate 3.1		F14	
Material certificate pressure parts + PMI/certificate 3.1		F15	
Hardness test			
Hardness test on pressure bearing parts + 3.1		H30	
Cleaning			
Class 2		K40	
Class 2 and 3.1 (EN 10204)		K42	
Class 1		K46	
Class 1 and 3.1 (EN 10204)		K48	
Certificates			
Option			
1 = General Arrangement Drawings		M50	
2 = Opt. 1 + Inspection and Test plan ITP		M52	
3 = Opt. 2 + Welding procedure, -plan, welder-qualification		M54	
4 = Opt. 3 + X-ray test on pressurized weldings		M56	
5 = Opt. 4 + Dye penetration test on pressure bearing weldings		M58	
6 = Opt. 5 + Stress calculation		M59	
Tag name plate			
Stainless steel tag with 3 mm characters, max. 2 x 8 characters (40 x 20 mm, add plain text)		Y 17	
Stainless steel tag with 2,5 mm characters, max. 8 x 40 characters (120 x 46 mm, add plain text)		Y18	
Converter housing material			
Aluminium seawater resistant		Y40	

SITRANS F flowmeters

SITRANS F X

SITRANS FX300

Selection and Ordering data		Order No.	
SITRANS FX300 Sandwich Single transmitter and T _{max} = 240 °C (464 °F)		7 ME 2 7 0 0 -	
Connection size	Sensor size		
DN 15 (½")	DN 15	1 A	
DN 25 (1")	DN 25	2 B	
DN 40 (1½")	DN 40	2 K	
DN 50 (2")	DN 50	2 R	
DN 80 (3")	DN 80	3 L	
DN 100 (4")	DN 100	3 S	
Nominal pressure			
EN			
PN 100	DN 40 ... 100	R	
ASME			
150 lb	1½ ... 4"	S	
300 lb	1½ ... 4"	T	
600 lb	1½ ... 4"	U	
Sensor material/Gasket			
Stainless steel 1.4404 (316L)/1.4435 (316L)/FPM		1	
Hastelloy C22/C276/FPM		3	
Stainless steel 1.4404 (316L)/1.4435 (316L)/FFKM		5	
Hastelloy C22/C276/FFKM		7	
Transducer design and coax cable			
Compact, none cable		1	
Approval and cable gland			
Non Ex, M20x1,5		1	
ATEX EEx Zone 1 -Ex II 2G EEx d ia[ia] IIC T6, M20x1,5		4	
FM Class I DIV 1, M20x1.5		6	
FM Class I DIV 1, ½" NPT		7	
Transmitter, display and communication			
With display, HART		A	
Pressure sensor			
Without		A	
4 bar		B	
6 bar		D	
10 bar		E	
16 bar		G	
25 bar		H	
40 bar		K	
60 bar		L	
100 bar		N	

Selection and Ordering data		Order No.	
SITRANS FX300 Sandwich Single transmitter and T _{max} = 240 °C (464 °F)		7 ME 2 7 0 0 -	
<u>With iso valve</u>			
4 bar			P
6 bar			Q
10 bar			R
16 bar			S
25 bar			U
40 bar			V
60 bar			W
100 bar			Y
Software			
Uncompensated			1
Density compensation for superheated steam (option only with pressure sensor)			4
Density compensation for gas-wet-mix (option only with pressure sensor)			7

Selection and Ordering data		Order code	
Additional information			
Please add "-Z" to Order No. and specify Order code(s) and plain text.			
Accredited Siemens calibration FX300			
Calibration certificate (5 point)		D11	
Material certificate			
Certificate of compliance EN 10204-2.1		F10	
Pressure test + 3.1 accordance EN 10204		F11	
Material certificate pressure parts + certificate 3.1		F12	
Material in accordance of NACE MR 0175-01		F13	
PMI of pressure bearing metal parts + certificate 3.1		F14	
Material certificate pressure parts + PMI/certificate 3.1		F15	
Hardness test			
Hardness test on pressure bearing parts + 3.1		H30	
Cleaning			
Class 2		K40	
Class 2 and 3.1 (EN 10204)		K42	
Class 1		K46	
Class 1 and 3.1 (EN 10204)		K48	
Certificates			
Option			
1 = General Arrangement Drawings		M50	
2 = Opt. 1 + Inspection and Test plan ITP		M52	
3 = Opt. 2 + Welding procedure, -plan, welder-qualification		M54	
4 = Opt. 3 + X-ray test on pressurized weldings		M56	
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Tag name plate			
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Stainless steel tag with 2,5 mm characters, max. 8 x 40 characters (120 x 46 mm, add plain text)		Y18	
Converter housing material			
Aluminium seawater resistant		Y40	

Selection and Ordering data		Order No.
SITRANS FX300 Flanged Dual transmitter and T_{max} = 240 °C (464 °F)		7 ME 2 8 0 0 -
Connection size	Sensor size	
DN 40 (1½")	DN 40	2 K
DN 50 (2")	DN 50	2 R
DN 80 (3")	DN 80	3 L
DN 100 (4")	DN 100	3 S
DN 150 (6")	DN 150	4 M
DN 200 (8")	DN 200	4 T
DN 250 (10")	DN 250	4 W
DN 300 (12")	DN 300	5 E
Flange norm and nominal pressure		
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PN 100	DN 40 ... 150	F
RF	ASME B16.5	
150 lb	1½ ... 12"	J
300 lb	1½ ... 12"	K
600 lb	1½ ... 6"	L
Sensor material/Gasket		
Stainless steel 1.4404 (316L)/1.4435 (316L)/FPM		1
Hastelloy C22/C276/FPM		3
Stainless steel 1.4404 (316L)/1.4435 (316L)/FFKM		5
Hastelloy C22/C276/FFKM		7
Transducer design and coax cable		
Compact, none cable		1
Approval and cable gland		
Non Ex, M20x1,5		1
ATEX EEx Zone 1 -Ex II 2G EEx d ia[ia] IIC T6, M20x1,5		4
FM Class I DIV 1, M20x1,5		6
FM Class I DIV 1, ½" NPT		7
Transmitter, display and communication		
With display, HART		A
Pressure sensor		
Without		A
Software		
Uncompensated		1

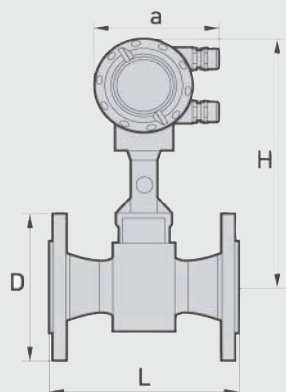
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Calibration certificate (5 point)	D11
Material certificate	
Certificate of compliance EN 10204-2.1	F10
Pressure test + 3.1 accordance EN 10204	F11
Material certificate pressure parts + certificate 3.1	F12
Material in accordance of NACE MR 0175-01	F13
PMI of pressure bearing metal parts + certificate 3.1	F14
Material certificate pressure parts + PMI/certificate 3.1	F15
Hardness test	
Hardness test on pressure bearing parts + 3.1	H30
Cleaning	
Class 2	K40
Class 2 and 3.1 (EN 10204)	K42
Class 1	K46
Class 1 and 3.1 (EN 10204)	K48
Certificates	
Option	
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6 = Opt. 5 + Stress calculation	M59
Tag name plate	
Stainless steel tag with 3 mm characters, max. 2 x 8 characters (40 x 20 mm, add plain text)	Y 17
Stainless steel tag with 2,5 mm characters, max. 8 x 40 characters (120 x 46 mm, add plain text)	Y18
Converter housing material	
Aluminium seawater resistant	Y40

SITRANS F flowmeters

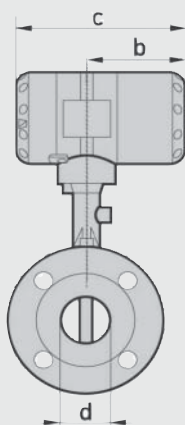
SITRANS F X

SITRANS FX300

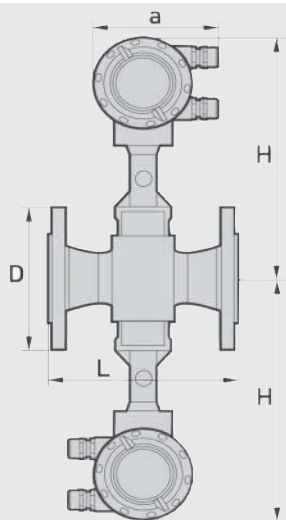
Dimensional drawings



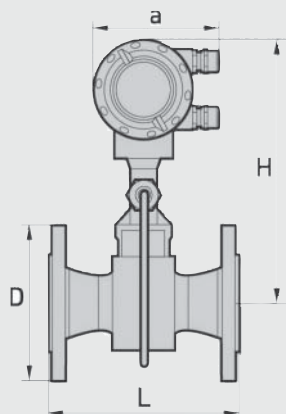
Flange version, frontal view, a = 133 mm (5.24 inches)



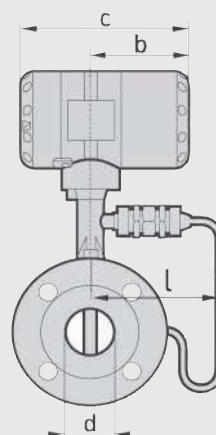
Flange version, side view, b = 105 mm (4.13 inches),
c = 179 mm (7.05 inches)



Flange version, dual converter, specified weight + 2.80 kg (6.17 lb)



Flange version, frontal view, a = 133 mm (5.24 inches)



Flange version, side view, b = 105 mm (4.13 inches),
c = 179 mm (7.05 inches)

Flange version EN1092-1

Size	Pressure rating	Dimensions [mm (inches)]					Weight [kg (lb)]	
DN	PN	d	D	L	H	I	Mass meter (with pressure sensor)	Volumetric meter (without pressure sensor)
15	40	17.3 (0.68)	95 (3.74)	200 (7.87)	265 (10.43)	144 (5.67)	6.1 (13.45)	5.5 (12.13)
15	100	17.3 (0.68)	105 (4.13)	200 (7.87)	265 (10.43)	144 (5.67)	7.1 (15.65)	6.5 (14.33)
25	40	28.5 (1.12)	115 (4.53)	200 (7.87)	265 (10.43)	144 (5.67)	7.9 (17.42)	7.3 (16.09)
25	100	28.5 (1.12)	140 (5.51)	200 (7.87)	265 (10.43)	144 (5.67)	9.9 (21.83)	9.3 (20.50)
40	40	43.1 (1.70)	150 (5.91)	200 (7.87)	270 (10.63)	144 (5.67)	10.8 (23.81)	10.2 (22.49)
40	100	42.5 (1.67)	170 (6.69)	200 (7.87)	270 (10.63)	144 (5.67)	14.8 (32.63)	14.2 (31.31)
50	16	54.5 (2.15)	165 (6.50)	200 (7.87)	275 (10.83)	144 (5.67)	12.7 (28.00)	12.1 (26.68)
50	40	54.5 (2.15)	165 (6.50)	200 (7.87)	275 (10.83)	144 (5.67)	12.9 (28.44)	12.3 (27.12)
50	63	54.5 (2.15)	180 (7.09)	200 (7.87)	275 (10.83)	144 (5.67)	16.9 (37.26)	16.3 (35.94)
50	100	53.9 (2.12)	195 (7.68)	200 (7.87)	275 (10.83)	144 (5.67)	18.4 (40.57)	17.8 (39.24)
80	16	82.5 (3.25)	200 (7.87)	200 (7.87)	290 (11.42)	154 (6.06)	17.4 (38.36)	16.8 (37.04)
80	40	82.5 (3.25)	200 (7.87)	200 (7.87)	290 (11.42)	154 (6.06)	19.4 (42.77)	18.8 (41.45)
80	63	81.7 (3.22)	215 (8.46)	200 (7.87)	290 (11.42)	154 (6.06)	23.4 (51.59)	22.8 (50.27)
80	100	80.9 (3.19)	230 (9.06)	200 (7.87)	290 (11.42)	154 (6.06)	27.4 (60.41)	26.8 (59.08)
100	16	107.1 (4.22)	220 (8.66)	250 (9.84)	310 (12.20)	164 (6.46)	22 (48.50)	21.4 (47.18)
100	40	107.1 (4.22)	235 (9.25)	250 (9.84)	310 (12.20)	164 (6.46)	25 (55.12)	24.4 (53.79)
100	63	106.3 (4.19)	250 (9.84)	250 (9.84)	310 (12.20)	164 (6.46)	30 (66.14)	29.4 (64.82)
100	100	104.3 (4.11)	265 (10.43)	250 (9.84)	310 (12.20)	164 (6.46)	36 (79.37)	35.4 (78.04)
150	16	159.3 (6.27)	285 (11.22)	300 (11.81)	325 (12.80)	174 (6.85)	35.8 (78.93)	35.2 (77.60)
150	40	159.3 (6.27)	300 (11.81)	300 (11.81)	325 (12.80)	174 (6.85)	41.8 (92.15)	41.2 (90.83)
150	63	157.1 (6.19)	345 (13.58)	300 (11.81)	325 (12.80)	174 (6.85)	59.8 (131.84)	59.2 (130.51)
150	100	154.1 (6.07)	355 (13.98)	300 (11.81)	325 (12.80)	174 (6.85)	67.8 (149.47)	67.2 (148.15)
200	10	206.5 (8.13)	340 (13.39)	300 (11.81)	350 (13.78)	194 (7.64)	38.4 (84.66)	37.8 (83.33)
200	16	206.5 (8.13)	340 (13.39)	300 (11.81)	350 (13.78)	194 (7.64)	38.4 (84.66)	37.8 (83.33)
200	25	206.5 (8.13)	360 (14.17)	300 (11.81)	350 (13.78)	194 (7.64)	47.4 (104.50)	46.8 (103.18)
200	40	206.5 (8.13)	375 (14.76)	300 (11.81)	350 (13.78)	194 (7.64)	55.4 (122.14)	54.8 (120.81)
250	10	260.4 (10.25)	395 (15.55)	380 (14.96)	370 (14.57)	224 (8.82)	58.0 (127.87)	57.4 (126.55)
250	16	260.4 (10.25)	405 (15.94)	380 (14.96)	370 (14.57)	224 (8.82)	59.0 (130.07)	58.4 (128.75)
250	25	258.8 (10.19)	425 (16.73)	380 (14.96)	370 (14.57)	224 (8.82)	75.0 (165.35)	74.4 (164.02)
250	40	258.8 (10.19)	450 (17.72)	380 (14.96)	370 (14.57)	224 (8.82)	93.0 (205.03)	92.4 (203.71)
300	10	309.7 (12.19)	445 (17.52)	450 (17.72)	395 (15.55)	244 (9.61)	76.3 (168.21)	75.7 (166.89)
300	16	309.7 (12.19)	460 (18.11)	450 (17.72)	395 (15.55)	244 (9.61)	82.8 (182.54)	82.2 (181.22)
300	25	307.9 (12.12)	485 (19.09)	450 (17.72)	395 (15.55)	244 (9.61)	99.3 (218.92)	98.7 (217.60)
300	40	307.9 (12.12)	515 (20.28)	450 (17.72)	395 (15.55)	244 (9.61)	128.1 (282.41)	127.5 (281.09)

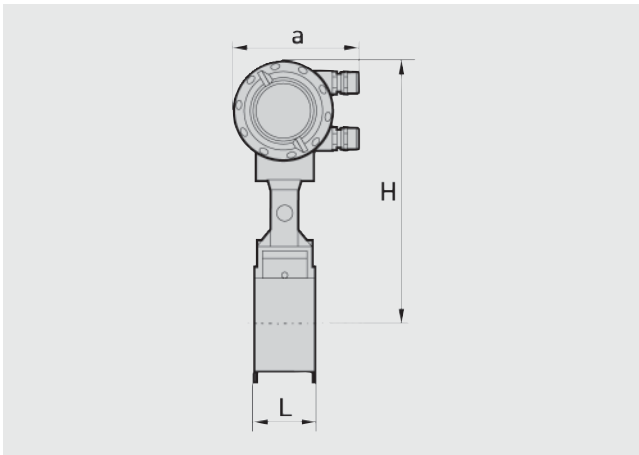
SITRANS F flowmeters

SITRANS F X

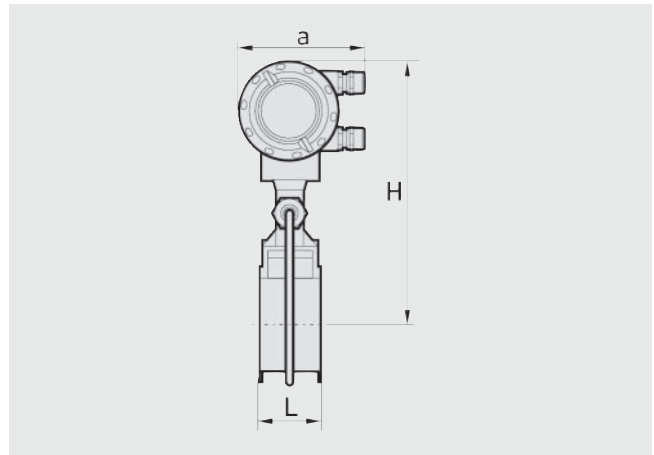
SITRANS FX300

Flange version ASME B16.5

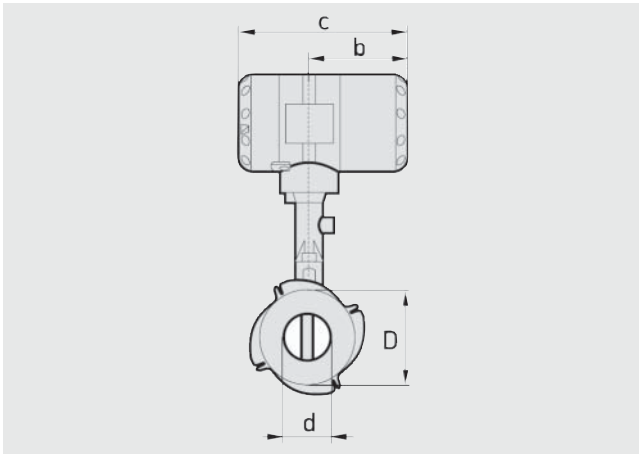
Size	Pressure rating	Dimensions [mm (inches)]					Weight [kg (lb)]	
DN	class	d	D	L	H	I	Mass meter (with pressure sensor)	Volumetric meter (without pressure sensor)
½	150	15.8 (0.62)	90 (3.54)	200 (7.87)	265 (10.43)	144 (5.67)	5.1 (11.24)	4.5 (9.92)
½	300	15.8 (0.62)	95 (3.74)	200 (7.87)	265 (10.43)	144 (5.67)	5.5 (12.13)	4.9 (10.80)
½	600	13.9 (0.55)	95 (3.74)	200 (7.87)	265 (10.43)	144 (5.67)	5.7 (12.57)	5.1 (11.24)
1	150	26.6 (1.05)	110 (4.33)	200 (7.87)	265 (10.43)	144 (5.67)	6.8 (14.99)	6.2 (13.67)
1	300	26.6 (1.05)	125 (4.92)	200 (7.87)	265 (10.43)	144 (5.67)	7.8 (17.20)	7.2 (15.87)
1	600	24.3 (0.96)	125 (4.92)	200 (7.87)	265 (10.43)	144 (5.67)	8.1 (17.86)	7.5 (16.53)
1½	150	40.9 (1.61)	125 (4.92)	200 (7.87)	270 (10.63)	144 (5.67)	8.9 (19.62)	8.3 (18.30)
1½	300	40.9 (1.61)	155 (6.10)	200 (7.87)	270 (10.63)	144 (5.67)	11 (24.25)	10.4 (22.93)
1½	600	38.1 (1.50)	155 (6.10)	200 (7.87)	270 (10.63)	144 (5.67)	12 (26.46)	11.4 (25.13)
2	150	52.6 (2.07)	150 (5.91)	200 (7.87)	275 (10.83)	144 (5.67)	11.6 (25.57)	11 (24.25)
2	300	52.6 (2.07)	165 (6.50)	200 (7.87)	275 (10.83)	144 (5.67)	13 (28.66)	12.4 (27.34)
2	600	49.3 (1.94)	165 (6.50)	200 (7.87)	275 (10.83)	144 (5.67)	14.5 (31.97)	13.9 (30.64)
3	150	78 (3.07)	190 (7.48)	200 (7.87)	290 (11.42)	154 (6.06)	20.4 (44.97)	19.8 (43.65)
3	300	78 (3.07)	210 (8.27)	200 (7.87)	290 (11.42)	154 (6.06)	23.4 (51.59)	22.8 (50.27)
3	600	73.7 (2.90)	210 (8.27)	200 (7.87)	290 (11.42)	154 (6.06)	24.4 (53.79)	23.8 (52.47)
4	150	102.4 (4.03)	230 (9.06)	250 (9.84)	310 (12.20)	164 (6.46)	24 (52.91)	23.4 (51.59)
4	300	102.4 (4.03)	255 (10.04)	250 (9.84)	310 (12.20)	164 (6.46)	32 (70.55)	31.4 (69.23)
4	600	97.2 (3.83)	275 (10.83)	250 (9.84)	310 (12.20)	164 (6.46)	41 (90.39)	40.4 (89.07)
6	150	154.2 (6.07)	280 (11.02)	300 (11.81)	325 (12.80)	174 (6.85)	36.8 (81.13)	36.2 (79.81)
6	300	154.2 (6.07)	320 (12.60)	300 (11.81)	325 (12.80)	174 (6.85)	51.8 (114.20)	51.2 (112.88)
6	600	146.3 (5.76)	355 (13.98)	300 (11.81)	325 (12.80)	174 (6.85)	76.8 (169.31)	46.2 (101.85)
8	150	202.7 (7.98)	345 (13.58)	300 (11.81)	350 (13.78)	194 (7.64)	50.6 (111.55)	50.0 (110.23)
8	300	202.7 (7.98)	380 (14.96)	300 (11.81)	350 (13.78)	194 (7.64)	75.4 (166.23)	74.8 (164.91)
10	150	254.5 (10.02)	405 (15.94)	380 (14.96)	370 (14.57)	224 (8.82)	75.0 (165.35)	74.4 (164.02)
10	300	254.5 (10.02)	455 (17.91)	380 (14.96)	370 (14.57)	224 (8.82)	107.0 (235.89)	106.4 (234.57)
12	150	304.8 (12.00)	485 (19.09)	450 (17.72)	395 (15.55)	244 (9.61)	106.9 (235.67)	106.3 (234.35)
12	300	304.8 (12.00)	520 (20.47)	450 (17.72)	395 (15.55)	244 (9.61)	151.9 (334.88)	151.3 (333.56)



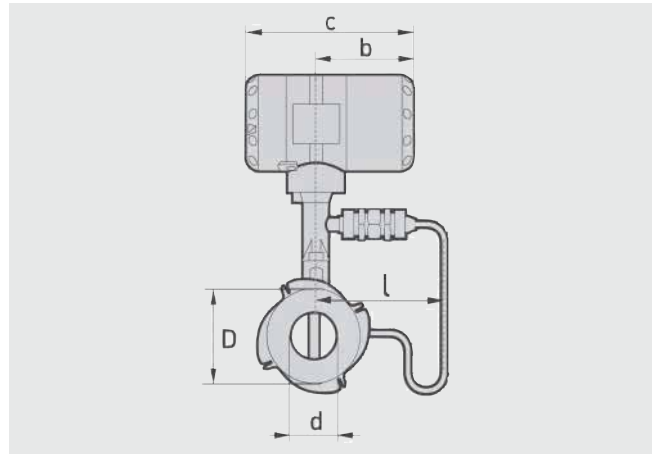
Sandwich version, front view, $a = 133 \text{ mm}$ (5.24 inches)



Sandwich version, front view, $a = 133 \text{ mm}$ (5.25 inches)



Sandwich version, side view, $b = 105 \text{ mm}$ (4.13 inches), $c = 179 \text{ mm}$ (7.05 inches)



Sandwich version, side view, $b = 105 \text{ mm}$ (4.13 inches), $c = 179 \text{ mm}$ (7.05 inches)

SITRANS F flowmeters

SITRANS F X

SITRANS FX300

Sandwich version EN

Size	Pressure rating	Dimensions [mm (inches)]					Weight [kg (lb)]	
DN	PN	d	D	L	H	I	Mass meter (with pressure sensor)	Volumetric meter (without pressure sensor)
15	100	16 (0.63)	45 (1.77)	65 (2.56)	265 (10.43)	144 (5.67)	4.1 (9.04)	3.5 (7.72)
25	100	24 (0.94)	65 (2.56)	65 (2.56)	265 (10.43)	144 (5.67)	4.9 (10.80)	4.3 (9.48)
40	100	38 (1.50)	82 (3.23)	65 (2.56)	270 (10.63)	144 (5.67)	5.5 (12.13)	4.9 (10.80)
50	100	50 (1.97)	102 (4.02)	65 (2.56)	275 (10.83)	144 (5.67)	6.6 (14.55)	6 (13.23)
80	100	74 (2.91)	135 (5.31)	65 (2.56)	290 (11.42)	155 (6.10)	8.8 (19.40)	8.2 (18.08)
100	100	97 (3.82)	158 (6.22)	65 (2.56)	310 (12.20)	164 (6.46)	10.1 (22.27)	9.5 (20.94)

Sandwich version ASME

Size	Pressure rating	Dimensions [mm (inches)]					Weight [kg (lb)]	
DN	class	d	D	L	H	I	Mass meter (with pressure sensor)	Volumetric meter (without pressure sensor)
1/2"	150, 300	0.63	1.77	2.56	10.43	5.67	9.04	7.72
1/2"	600	0.55	1.77	2.56	10.43	5.67	9.04	7.72
1"	150, 300, 600	0.94	2.56	2.56	10.43	5.67	10.08	9.48
1 1/2"	150, 300, 600	1.5	3.23	2.56	10.43	5.67	12.13	10.8
2"	150, 300, 600	1.97	4.02	2.56	10.43	5.67	14.55	13.23
3"	150, 300, 600	2.91	5.31	2.56	10.43	6.1	19.4	18.08
4"	150, 300, 600	3.82	6.22	2.56	10.43	6.46	22.27	20.94

Flow tables

Measuring Range Limits

Size		Q _{min}	Q _{max}	Q _{min}	Q _{max}
DN to EN 1092-1	DN to ASME B16.5	EN 1092-1 [m ³ /h]	EN 1092-1 [m ³ /h]	ASME B16.5 [m ³ /h]	ASME B16.5 [m ³ /h]
Water					
15	½"	0.45	5.07	0.44	4.94
25	1"	0.81	11.40	0.81	11.40
40	1½"	2.04	28.58	2.04	28.58
50	2"	3.53	49.48	3.53	49.48
80	3"	7.74	108.37	7.74	108.37
100	4"	13.30	186.22	13.30	186.21
150	6"	30.13	421.86	30.13	421.86
200	8"	52.66	737.18	52.66	737.18
250	10"	81.43	1 140.02	81.43	1 140.02
300	12"	114.83	1 607.61	114.83	1 607.61

Values based on water at 20 °C (68 °F)

Air

15	½"	6.72	57.91	6.72	56.46
25	1"	10.20	130.29	10.20	130.29
40	1½"	25.35	326.63	25.35	326.63
50	2"	43.89	565.49	43.89	565.49
80	3"	96.14	1 238.64	96.14	1 238.60
100	4"	165.14	2 128.27	165.19	2 128.27
150	6"	374.23	4 821.60	374.23	4 821.60
200	8"	653.95	8 425.53	633.95	8 425.50
250	10"	977.16	13 028.81	977.16	13 028.14
300	12"	1 377.95	18 372.66	1 377.95	18 372.66

Values based on air at 20 °C (68 °F) and 1.013 bar_{abs} (14.7 psi_{abs})

Flow rate limits

Product	Nominal diameters		Minimum flow rates	Maximum flow rates
	to EN	to ASME	[m/s]	[m/s]
Liquids	DN 15 ... DN 300	DN ½"...DN 12"	$0.5 \times (998/\rho)^{0.5 \ 1)}$	$7 \times (998/\rho)^{0.47 \ 1)}$
Gas, vapor	DN 15 ... DN 300	DN ½"...DN 12"	$6 \times (1.29/\rho)^{0.5 \ 2)}$	$7 \times (998/\rho)^{0.47 \ 3)}$

ρ = operating density [kg/m³]

¹⁾ Minimum flow rates 0.4 m/s (1.3 ft/s), maximum flow rates 10 m/s (32.8 ft/s)

²⁾ Minimum flow rates 2 m/s (6.6 ft/s), maximum flow rates 80 m/s (262 ft/s)

³⁾ Minimum flow rates 2 m/s (6.6 ft/s), maximum flow rates 80 m/s (262 ft/s); DN 15: 45 m/s (148 ft/s) and DN 25: 70 m/s (230 ft/s)

SITRANS F flowmeters

SITRANS F X

SITRANS FX300

Measuring range saturated steam: 1 to 7 bar

Overpressure [bar]		1		3.5		5.2		7	
Density [kg/m³]		1.13498		2.4258		3.27653		4.16732	
Temperature [°C]		120.6		148.2		160.4		170.6	
Flow [kg/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ASME B16.5								
15	½"	5.25	65.72	7.68	140.47	8.93	189.73	10.06	241.31
25	1"	11.82	147.87	17.28	316.05	20.09	426.89	22.66	542.95
40	1½"	29.64	370.71	43.33	792.33	50.63	1 070.2	56.8	1 361.2
50	2"	51.31	641.82	75.02	1 371.8	87.19	1 852.8	98.33	2 356.6
80	3"	112.41	1 405.8	164.33	3 004.7	191	4 058.4	215.39	5 161.8
100	4"	193.14	2 415.5	282.36	5 162.7	328.16	6 973.3	370.09	8 869.2
150	6"	437.56	5 472.4	639.69	11 696	743.45	15 798	838.44	20 093
200	8"	764.62	9 562.8	1 117.8	20 439	1 299.2	27 606	1 465.1	35 112
250	10"	1 177.07	14 655.07	1 716.4	31 161.66	1 993.6	42 039.68	2 247.44	53 426.86
300	12"	1 659.85	20 665.94	2 420.39	43 942.81	2 811.29	58 282.52	3 169.24	75 340.22

Measuring range saturated steam: 10.5 to 20 bar

Overpressure [bar]		10.5		14		17.5		20	
Density [kg/m³]		5.88803		7.60297		9.31702		10.5442	
Temperature [°C]		186.2		198.5		208.5		215	
Flow [kg/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ASME B16.5								
15	½"	12.78	332.97	16.51	381.28	20.23	424.66	22.89	453.44
25	1"	26.93	749.18	30.6	857.88	33.87	955.48	36.04	1 020.2
40	1½"	67.51	1 878.2	76.72	2 150.7	84.93	2 395.3	90.35	2 557.7
50	2"	116.89	3 251.7	132.82	3 723.4	147.03	4 147	156.42	4 428.1
80	3"	256.03	7 122.4	290.93	8 155.8	322.06	9 083.7	342.62	9 699.3
100	4"	439.91	12 238	499.9	14 013	553.38	15 608	588.69	16 666
150	6"	996.62	27 725	1 132.5	31 747	1 253.7	35 359	1 333.7	37 756
200	8"	1 741.6	48 449	1 979	55 478	2 190.7	61 789	2 330.6	65 977
250	10"	2 670.28	66 065.16	3 033.45	75 626.77	3 357.4	84 214.04	3 571	89 910.45
300	12"	3 765.52	93 162.2	4 277.65	106 645.56	4 737.45	118 754	5 036.01	126 787.78

Measuring range saturated steam: 15 to 100 psig

Overpressure [psig]		15		50		75		100	
Density [lbs/ft³]		0.0719		0.1497		0.2036		0.2569	
Temperature [°F]		249.98		297.86		320.36		338.184	
Flow [lbs/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ASME B16.5								
15	½"	11.6	147.08	16.83	306	19.62	416.04	22.04	524.86
25	1"	26.25	330.92	37.86	688.48	44.15	936.09	49.59	1 180.9
40	1½"	65.81	829.61	94.92	1 726	110.68	2 346.7	124.32	2 960.5
50	2"	113.94	1 436.3	164.34	2 988	191.63	4 062.9	215.23	5 125.6
80	3"	249.57	3 146.1	360	6 545.3	419.74	8 899.4	471.45	11 227
100	4"	428.81	5 405.7	618.51	11 246	721.21	15 291	810.06	19 291
150	6"	971.47	12 246	1 401.2	25 478	1 633.9	34 642	1 835.2	43 703
200	8"	1 697.6	21 400	2 448.6	44 523	2 855.2	60 536	3 206.9	76 369
250	10"	2 562.72	32 308.86	3 777.85	68 699.63	4 371.7	92 681.52	4 946.03	117 785.23
300	12"	3 613.84	45 560.54	5 327.61	96 877.61	6 164.78	130 695.42	6 974.68	166 096.57

Measuring range saturated steam: 150 to 300 psig

Overpressure [psig]		150		200		250		300	
Density [lbs/ft³]		0.3627		0.4681		0.5735		0.6792	
Temperature [°F]		366.08		388.04		406.22		422.06	
Flow [lbs/h]		min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ASME B16.5								
15	½"	27.79	728.25	35.86	833.73	43.94	928.44	52.04	1 015.5
25	1"	58.93	1 638.6	66.94	1 875.9	74.1	2 089	80.63	2 284.9
40	1½"	147.72	4 107.2	167.83	4 702.8	185.76	5 237	202.15	5 728
50	2"	255.75	7 111.9	290.56	8 141.9	321.6	9 066.8	350	9 917
80	3"	560.19	15 578	636.44	17 834	704.43	19 860	766.6	21 722
100	4"	962.54	26 766	1 093.5	30 643	1 210.4	34 124	1 317.2	37 324
150	6"	2 180.6	60 639)	2 477.4	69 421	2 742.1	77 307	2 984	84 556
200	8"	3 810.6	105 960.54	4 329.2	121 310	4 791.7	135 090	5 214.5	147 760
250	10"	5 876.29	145 648.57	6 674.55	166 728.29	7 386.91	185 659.96	7 680.16	198 218.37
300	12"	8 286.49	205 387.25	9 412.15	235 112.94	10 416.7	261 809.55	10 830.22	279 518.87