

Overview



SITRANS FX Vortex flowmeter are designed for use in industrial applications and optimally suited to the demands in auxiliary supply systems.

The proven principle of vortex flowmeters is suitable for measurement of liquids, gases and vapors unaffected by conductivity, viscosity, temperature and pressure.

Benefits

- Integrated pressure and temperature compensation
- Temperature compensation for saturated steam included as standard
- High measuring accuracy
- Maintenance-free sensor
- Non-wearing, fully welded stainless steel construction with high resistance to corrosion, pressure and temperature
- SIL2 certified according to IEC 61508 Edition 2
- Use in hazardous areas
- Integrated reduction of nominal diameter for space-saving and economic installation and large measuring ranges
- Redundant data management: Easy exchange of electronics without loss of calibration and configuration data
- FAD (Free Air Delivery) functionality
- Gross and net heat calculation to support advanced energy management
- Remote version with cable length up to 50 m (164 ft)

Even the basic version of the vortex flowmeter SITRANS FX330 is equipped with temperature compensation for saturated steam applications. With the optional pressure sensor the SITRANS FX330 has integrated density compensation for calculation of corrected volume and mass (online density compensation). The density compensation for calculation of corrected volume and mass is based on the standards of NIST for gases and IAPWS for steam.

Higher measuring accuracy with the use of compact measuring systems

With the classic installation of a vortex flowmeter and separate pressure and temperature sensor as well as flow calculator, all errors occurring in the measuring chain must be taken into account when determining system accuracy. This can result in a measuring error between ± 3 to 5 %.

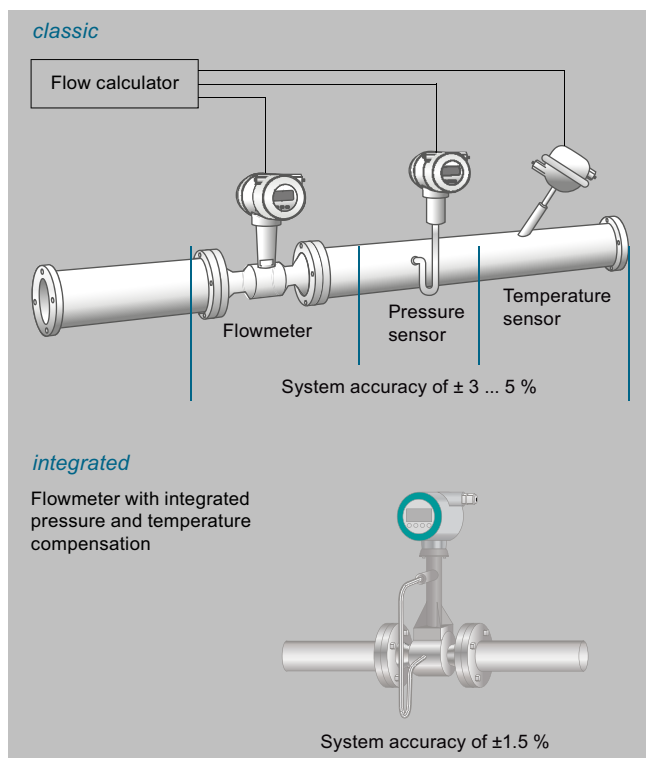
Using a vortex flowmeter with integrated pressure and temperature compensation such as the SITRANS FX330 allows you not only to lower installation costs but also increase the measuring accuracy of the measuring point. In this case the accuracy is ± 1.5 % of the measured value.

Flow Measurement

SITRANS FX (Vortex)

SITRANS FX330

Benefits (continued)



The SITRANS FX330 in flange design is available with integrated reduction of nominal diameter for space-saving installations and large measuring spans. About 90% of all vortex flowmeters are ordered one size smaller than the line diameter in order to increase the flow speed and to get a wider measuring range. Here, the line has to be reduced before and widened after the sensor, typically including 20x DN inlet and 5x DN outlet run. With the reduction and widening of nominal diameter included in the sensor, it is no longer necessary. To compensate the non-existent straight inlet run between reduction and the vortex bluff body, these devices are specially calibrated and linearized.

A new feature of the SITRANS FX330 is the advanced signal processing and filtering called AVFD (Advanced Vortex Frequency Detection): Interferences and disturbances in the measuring signal are suppressed, signals outside from the relevant frequency band are filtered out.

Redundant data management prevents loss of calibration and configuration data when changing electronics or display.

By default, all SITRANS FX330 meters are factory-calibrated (traceable to international standards) and pre-set according to customer specifications. The SITRANS FX330 also comes with an installation wizard to ease installation; e.g. in a steam application it will only show related settings.

Developed according to the standard IEC 61508 edition 2, the SITRANS FX330 can be used in safety-related application with classification SIL2 for continuous volume flow measurement.

Application

- Measurement of saturated steam and superheated steam
- Steam boiler monitoring
- Heat metering of steam and hot water
- Measurement of consumption of industrial gases
- Measurement of consumption in compressed air systems
- Monitoring of compressor output
- Evaluation of Free Air Delivery (FAD)
- SIP and CIP processes in the food, beverage and pharmaceutical industries
- Measuring of conductive and non-conductive liquids
- Safety-related measurement in SIL applications (SIL2)

Gross and net heat quantity calculation

The SITRANS FX330 was designed for applications in auxiliary and supply service lines, such as internal monitoring of energy flows for saturated and superheated steam or hot water. Equipped with temperature sensor as standard, the device can be installed as heat meter in the feed line directly connected with an external temperature sensor in the return line. The gross and net heat calculation can be fed into a DCS to support advanced energy management.

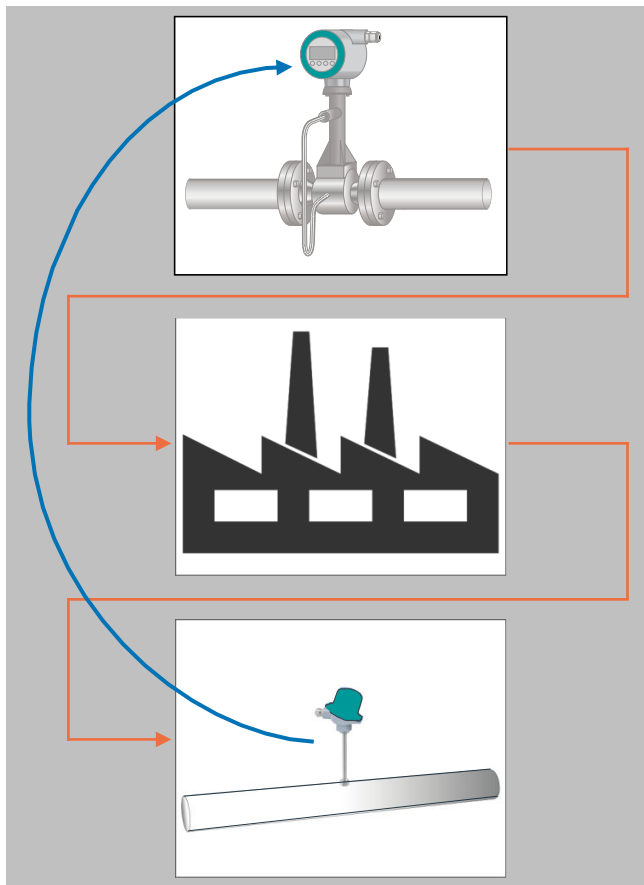
When it comes to energy, the most accurate measurement of consumption is essential. By combining flow, temperature and pressure measurements in one device, SITRANS FX330 provides the basis for a precise mass flow calculation.

In steam applications, the software even determines the enthalpy - the heat content - of the steam. Therefore, SITRANS FX330 is able to calculate the gross heat quantity.

In case net heat quantity consumption of process is asked for, a single temperature sensor can be added to the return line. SITRANS FX330 uses the readings to calculate the amount of heat consumed.

The SITRANS FX330 thereby proves itself to be a reliable partner.

Application (continued)



Design

SITRANS FX330 Flange



Flange version with integrated temperature compensation as standard for saturated steam and optional pressure compensation for superheated steam, gases and wet gases

Integrated reduction of nominal diameter for space-saving and economic installations plus large measuring ranges

Also in remote design with field housing and connection cable up to 50 m (164 ft)

With shut off valve allowing

- exchange and calibration of pressure sensor
- pressure and leak testing of pipeline without interrupting the process

SITRANS FX330 Sandwich



All advantages of the flange version in a space-saving sandwich design; centering rings guarantee an easy installation without any offset

Integrated reduction of nominal diameter not available

Also in remote design with field housing and connection cable up to 50 m (164 ft)

With shut off valve allowing

- exchange and calibration of pressure sensor
- pressure and leak testing of pipeline without interrupting the process

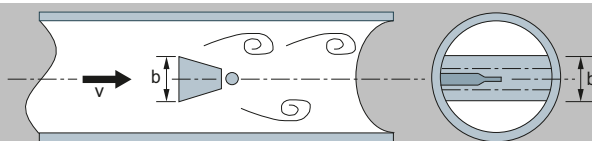
Function

Vortex flowmeters are used to measure the flow of gases, vapors and liquids in completely filled pipes. The measuring principle is based on the principle of the Karman vortex street. Inside the measuring sensor vortices are shed from a bluff body and are detected by a sensor located behind. The frequency f of the vortex shedding is proportional to the flow velocity v .

The nondimensional Strouhal number S describes the relationship between vortex frequency f , width b of the bluff body and the mean flow velocity v :

$$f = (S \cdot v) / b$$

The vortex frequency is recorded at the sensor and evaluated at the converter.



Functional principle

Flow Measurement

SITRANS FX (Vortex)

SITRANS FX330

Configuration

Available combinations of sensors and connection size for SITRANS FX330 in flanged design

SITRANS FX330 Flanged (7ME2610-...)										
Sensor size	Connection size	EN 1092-1, Form B1/B-2, PN 10	EN 1092-1, Form B1/B-2, PN 16	EN 1092-1, Form B1/B-2, PN 25	EN 1092-1, Form B1/B-2, PN 40	EN 1092-1, Form B1/B-2, PN 63	EN 1092-1, Form B1/B-2, PN 100	ANSI B16.5, class 150	ANSI B16.5, class 300	ANSI B16.5, class 600
DN 15	DN 15	-	-	-	X	-	X	X	X	X
	DN 25	-	-	-	X	-	X	X	X	X
	DN 40	-	-	-	X	-	X	X	X	X
DN 25	DN 25	-	-	-	X	-	X	X	X	X
	DN 40	-	-	-	X	-	X	X	X	X
	DN 50	-	X	-	X	X	X	X	X	X
DN 40	DN 40	-	-	-	X	-	X	X	X	X
	DN 50	-	X	-	X	X	X	X	X	X
	DN 80	-	X	-	X	X	X	X	X	X
DN 50	DN 50	-	X	-	X	X	X	X	X	X
	DN 80	-	X	-	X	X	X	X	X	X
	DN 100	-	X	-	X	X	X	X	X	X
DN 80	DN 80	-	X	-	X	X	X	X	X	X
	DN 100	-	X	-	X	X	X	X	X	X
	DN 150	-	X	-	X	X	X	X	X	X
DN 100	DN 100	-	X	-	X	X	X	X	X	X
	DN 150	-	X	-	X	X	X	X	X	X
	DN 200	X	X	X	X	-	-	X	X	-
DN 150	DN 150	-	X	-	X	X	X	X	X	X
	DN 200	X	X	X	X	-	-	X	X	-
	DN 250	X	X	X	X	-	-	X	X	-
DN 200	DN 200	X	X	X	X	-	-	X	X	-
	DN 250	X	X	X	X	-	-	X	X	-
	DN 300	X	X	X	X	-	-	X	X	-
DN 250	DN 250	X	X	X	X	-	-	X	X	-
	DN 300	X	X	X	X	-	-	X	X	-
DN 300	DN 300	X	X	X	X	-	-	X	X	-

X = available

- = not available

Selection and ordering data

		Article No.											
SITRANS FX330 Flanged		7ME2610-											
Not approved for SIL2 safety applications		7ME2611-											
Approved for SIL2 safety applications		● ● ● ● ● - ● ● ● ●											
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.													
Sensor size		Connection size											
DN 15 (½")	DN 15 (½")	1	A										
	DN 25 (1")	1	B										
	DN 40 (1½")	1	C										
DN 25 (1")	DN 25 (1")	2	B										
	DN 40 (1½")	2	C										
	DN 50 (2")	2	D										
DN 40 (1½")	DN 40 (1½")	2	K										
	DN 50 (2")	2	L										
	DN 80 (3")	2	M										
DN 50 (2")	DN 50 (2")	2	R										
	DN 80 (3")	2	S										
	DN 100 (4")	2	T										
DN 80 (3")	DN 80 (3")	3	L										
	DN 100 (4")	3	M										
	DN 150 (6")	3	R										
DN 100 (4")	DN 100 (4")	3	S										
	DN 150 (6")	3	T										
	DN 200 (8")	3	Q										
DN 150 (6")	DN 150 (6")	4	M										
	DN 200 (8")	4	P										
	DN 250 (10")	4	Q										
DN 200 (8")	DN 200 (8")	4	T										
	DN 250 (10")	4	U										
	DN 300 (12")	4	V										
DN 250 (10")	DN 250 (10")	4	W										
	DN 300 (12")	4	Y										
	DN 300 (12")	5	E										
Process connection and pressure rate													
EN 1092-1 type B1													
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										
ANSI B16.5 RF													
Class 150	½ ... 12"		J										
Class 300	½ ... 12"		K										
Class 600	½ ... 6"		L										
System design													
Compact version	No cable					0							
Remote version	Cable length with order code L..					1							
Transmitter housing													
Aluminum						0							
Aluminum, silicon free						1							
Stainless steel						2							
Stainless steel (remote version)						3							
Dual version, aluminum						6							
Dual version, aluminum, silicon free						7							
Communication													
HART									0				
PROFIBUS PA									1				
FOUNDATION Fieldbus									2				

Flow Measurement

SITRANS FX (Vortex)

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Selection and ordering data (continued)

SITRANS FX330 Flanged Not approved for SIL2 safety applications Approved for SIL2 safety applications	Article No.									
	7ME2610-	7ME2611-								
Ex approval	●	●	●	●	●	-	●	●	●	●
Without Ex approval								A		
ATEX II2 G Ex ia								B		
ATEX II2 G Ex d								C		
ATEX II3 G Ex nA								D		
ATEX II2 D Ex tb								E		
QPS IS Class I Div.1								F		
QPS XP Class I Div.1								G		
QPS NI Class I Div. 2								H		
QPS DIP Class I, III Div. 1								J		
IECEX II2 G Ex ia								K		
IECEX II2 G Ex d								L		
IECEX II3 G Ex nA								M		
IECEX II2 D Ex tb								N		
EAC Ex i (On Hold)								R		
EAC Ex d (On Hold)								S		
EAC Ex nA (On Hold)								T		
EAC Ex t (On Hold)								U		
Pressure sensor and gasket material										
Without pressure sensor								A		
With pressure sensor and gasket material FPM (Viton), Range:										
1 bar (14.5 psi)								B		
2 bar (29 psi)								C		
4 bar (58 psi)								D		
6 bar (87 psi)								E		
10 bar (145 psi)								F		
16 bar (232 psi)								G		
25 bar (363 psi)								H		
40 bar (580 psi)								J		
60 bar (870 psi)								K		
100 bar (1450 psi)								L		
With pressure sensor and gasket material FFKM (Kalrez), Range:										
1 bar (14.5 psi)								M		
2 bar (29 psi)								N		
4 bar (58 psi)								P		
6 bar (87 psi)								Q		
10 bar (145 psi)								R		
16 bar (232 psi)								S		
25 bar (363 psi)								T		
40 bar (580 psi)								U		
60 bar (870 psi)								V		
100 bar (1450 psi)								W		
Software version										
Standard - Uncompensated for gases, steam and liquids including temperature compensation for saturated steam										0
Standard + Heat meter for saturated steam and water										1
Density compensation for steam + Heat meter for saturated and superheated steam										2
Density compensation for gases, wet gases and mixed gases + FAD										3

Selection and ordering data (continued)

SITRANS FX330 Sandwich			Article No.									
Not approved for SIL2 safety applications			7ME2710-									
Approved for SIL2 safety applications			7ME2711-									
			●	●	●		●	-	●	●	●	●
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.												
Sensor size												
DN 15 (½")			1	A								
DN 25 (1")			2	B								
DN 40 (1½")			2	K								
DN 50 (2")			2	R								
DN 80 (3")			3	L								
DN 100 (4")			3	S								
Pressure rating												
EN 1092-1												
PN 16	DN 15 ... 100			B								
PN 25	DN 15 ... 100			C								
PN 40	DN 15 ... 100			D								
PN 63	DN 15 ... 100			E								
PN 100	DN 15 ... 100			F								
ANSI B16.5												
Class 150	½ ... 4"			J								
Class 300	½ ... 4"			K								
Class 600	½ ... 4"			L								
System design												
Compact version	No cable				0							
Remote version	Cable length with Order code L...				1							
Transmitter housing												
Aluminum					0							
Aluminum, silicon free					1							
Communication												
HART						0						
PROFIBUS PA						1						
FOUNDATION Fieldbus						2						
Ex approval												
Without Ex approval										A		
ATEX II2 G Ex ia										B		
ATEX II2 G Ex d										C		
ATEX II3 G Ex nA										D		
ATEX II2 D Ex tb										E		
QPS IS Class I Div.1										F		
QPS XP Class I Div.1										G		
QPS NI Class I Div. 2										H		
QPS DIP Class I, III Div. 1										J		
IECEX II2 G Ex ia										K		
IECEX II2 G Ex d										L		
IECEX II3 G Ex nA										M		
IECEX II2 D Ex tb										N		
EAC Ex i (On Hold)										R		
EAC Ex d (On Hold)										S		
EAC Ex nA (On Hold)										T		
EAC Ex t (On Hold)										U		
Pressure sensor and gasket material												
Without pressure sensor											A	
With pressure sensor and gasket material FPM (Viton), Range:												
1 bar (14.5 psi)											B	
2 bar (29 psi)											C	
4 bar (58 psi)											D	
6 bar (87 psi)											E	
10 bar (145 psi)											F	
16 bar (232 psi)											G	

Flow Measurement

SITRANS FX (Vortex)

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Selection and ordering data (continued)

SITRANS FX330 Sandwich						Article No.			
Not approved for SIL2 safety applications						7ME2710-			
Approved for SIL2 safety applications						7ME2711-			
						●	●	●	●
25 bar (363 psi)									H
40 bar (580 psi)									J
60 bar (870 psi)									K
100 bar (1450 psi)									L
With pressure sensor and gasket material FFKM (Kalrez), Range:									
1 bar (14.5 psi)									M
2 bar (29 psi)									N
4 bar (58 psi)									P
6 bar (87 psi)									Q
10 bar (145 psi)									R
16 bar (232 psi)									S
25 bar (363 psi)									T
40 bar (580 psi)									U
60 bar (870 psi)									V
100 bar (1450 psi)									W
Software version									
Standard - Uncompensated for gases, steam and liquids including temperature compensation for saturated steam									0
Standard + Heat meter for saturated steam and water									1
Density compensation for steam + Heat meter for saturated and superheated steam									2
Density compensation for gases, wet gases and mixed gases + FAD									3

Order code	
Additional information	
Please add "Z" to Article No. and specify as minimum Order code Y40, Y41, Y42, Y43, Y44 and Y45 in plain text.	
Application data	
Medium: Specify medium (liquid, gas, steam or customer-specific)	Y40
Temperature: Specify operating temperature with unit	Y41
Pressure: Specify operating pressure with unit	Y42
Density: Specify density with unit	Y43
Viscosity: Specify viscosity with unit	Y44
Flow rate: Specify max. flow rate with unit	Y45

Operating instruction

All literature is available to download for free, in a range of languages, at www.siemens.com/processinstrumentation/documentation

Order code	
Further designs	
Please add "Z" to Article No. and specify Order code.	
Cable connection	
Without cable glands	A01
M20 × 1.5 cable glands (3 cable entries) in plastic, grey	A02
M20 × 1.5 cable glands (3 cable entries) in plastic, blue	A03
M20 × 1.5 cable glands (3 cable entries) made of brass, Ex-d/t/nA	A04
M20 × 1.5 cable glands (3 cable entries) made of stainless steel, Ex-d/t/nA	A06

Order code	
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included)	A07
M20 × 1.5 cable glands (2 cable entries - 1 plugged) in plastic, grey	A12
M20 × 1.5 cable glands (2 cable entries - 1 plugged) in plastic, blue	A13
M20 × 1.5 cable glands (2 cable entries - 1 plugged) made of brass, Ex-d/t/nA	A14
M20 × 1.5 cable glands (2 cable entries - 1 plugged) made of stainless steel, Ex-d/t/nA	A16
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included)	A17
M20 × 1.5 cable glands (1 cable entry - 2 plugged) in plastic, grey	A22
M20 × 1.5 cable glands (1 cable entry - 2 plugged) in plastic, blue	A23
M20 × 1.5 cable glands (1 cable entry - 2 plugged) made of brass, Ex-d/t/nA	A24
M20 × 1.5 cable glands (1 cable entry - 2 plugged) made of stainless steel, Ex-d/t/nA	A26
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included)	A27
M20x1.5 cable glands (3 cable entries) made of brass, Ex-d/t/nA approved for Dual Version	A34
M20x1.5 cable glands (3 cable entries) made of Stainless steel, Ex-d/t approved for Dual Version	A36
1/2" NPT conduit connection in stainless steel (3 cable entries, cable glands not included) for Dual Version	A37
M20x1.5 cable glands (2 cable entries - 1 plugged) made of brass, Ex-d/t/nA approved for Dual Version	A44

Selection and ordering data (continued)

	Order code
M20x1.5 cable glands (2 cable entries - 1 plugged) made of Stainless steel, Ex-d/t approved for Dual Version	A46
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included) for Dual Version	A47
1/2" NPT conduit connection in stainless steel (2 cable entries - 1 plugged, cable glands not included) for Dual Version	A54
M20x1.5 cable glands (1 cable entry - 2 plugged) made of brass, Ex-d/t/nA approved for Dual Version	A56
1/2" NPT conduit connection in stainless steel (1 cable entry - 2 plugged, cable glands not included) for Dual Version	A57
Isolation valve	
With isolation valve	B10
Language	
English	B11
Chinese	B12
Russian	B13
Certificates	
Certificate of compliance according to EN 10204-2.1	C10
Pressure test + Inspection certificate according to EN 10204-3.1	C11
Material certification of pressure bearing metal parts according to EN 10204-3.1	C12
Material in accordance with NACE MR0175/ISO 15156	C13
PMI of pressure bearing metal parts + Inspection certificate according to EN 10204-3.1	C14
Material certificate of pressure bearing metal parts according to EN 10204-3.1 + PMI	C15
Dye penetration test of wetted welds	C16
X-ray test on pressurized weld DN 15 – 80 acc. to EN	C17
X-ray test on pressurized weld DN 100 – 300 acc. to EN	C18
Dye pen test on pressurized welds acc. to ASME	C19
X-ray test on press. welds DN 15 – 80 acc. to ASME	C20
X-ray test on press. welds DN 100 - 300 acc. to ASME	C21
Calibration	
5-point calibration with certificate	D11
General approval	
World (CE) except: EAC, KCC, UKCA, CRN	E00
EAC (On Hold)	E07
UKCA (In Preparation)	E13
KC	E20
CRN	E70
Cleaning	
Final cleaning for standard applications incl. certificate 2.1	K50
Final cleaning for standard applications incl. certificate 3.1	K51
Final oil & grease free cleaning for oxygen applications incl. certificate 2.1	K52
Final oil & grease free cleaning for oxygen applications incl. certificate 3.1	K53
Cable length for remote design	
5 m (16 ft)	L01
10 m (32 ft)	L02

	Order code
15 m (49 ft)	L03
20 m (65 ft)	L04
25 m (82 ft)	L05
30 m (98 ft)	L06
35 m (114 ft)	L07
40 m (131 ft)	L08
45 m (147 ft)	L09
50 m (164 ft)	L10
5 m (16 ft) UV resistant	L31
10 m (32 ft) UV resistant	L32
15 m (49 ft) UV resistant	L33
20 m (65 ft) UV resistant	L34
25 m (82 ft) UV resistant	L35
30 m (98 ft) UV resistant	L36
35 m (114 ft) UV resistant	L37
40 m (131 ft) UV resistant	L38
45 m (147 ft) UV resistant	L39
50 m (164 ft) UV resistant	L40
Tag name plate	
TAG name plate in stainless steel 40 × 20 mm (Add plain text)	Y17
TAG name plate in stainless steel tag 120 × 46 mm (Add plain text)	Y18

SITRANS FX330 spare parts

Description	Article No.
Transmitter electronic for SITRANS FX330	
• FXT030 in compact design with HART (non-Ex/Ex-i)	KRH-16000100
• FXT030 in compact design with HART (Ex-d)	A5E38663398
Display with HMI and data memory	A5E38663613
Seal disc 21.8 × 12 × 0.1	KRH-17000700
O-ring pickup	KRH-17001400
O-ring for pressure screw 17.13 × 2.62, FPM 70	KRH-17001200
Cover gasket O-ring	KRH-16000300
Front Cover (non Ex)	KRH-16002000
Front Cover (Ex)	KRH-16002500
Back Cover	KRH-16003000
Converter housing gasket, 59,35,5-2-N	KRH-16000400
O-ring	
• 20 × 1, FPM (DIN 3771)	KRH-17001100
• 10 × 2, NBR	KRH-17001000
DUBOX plug 5 pole, linear, RM2	KRH-17000800
Cable feed through 10 pole (non Ex)	KRH-16000500
Shut-off valve	KRH-17004000
Centering rings for Sandwich-Version	
• DN 15	KRH-17006000
• DN 25	KRH-17006001
• DN 40	KRH-17006002
• DN 50	KRH-17006003
• DN 50 (300 lbs, 600 lbs)	KRH-17006004

Selection and ordering data (continued)

Order code	
Cleaning	
Free of oil and grease (wetted parts)	K46
Free of oil and grease (wetted parts) + Inspection certificate according to EN 10204-3.1	K48

Technical specifications

SITRANS FX330		
Range of application	Flow measurement of liquids, gases and vapors	
Mode of operation		
Measuring principle	Karman vortex street	
Primary measured value	- Volume flow - Mass flow - Corrected volume flow - Density - Temperature - Pressure - Heat energy	
Design		
Transmitter		
• Compact and remote version	Cable length up to 50 m (164 ft)	
Sensor	Flange version	Sandwich version
• Integrated temperature measurement	Yes	Yes
• Reduction of nominal diameter	Yes	No
• Pressure and temperature compensation	Yes	Yes
• Isolation valve	Yes	Yes
• Dual measuring device	Yes	No
Display	4-line graphical display (backlit) with control keys	
Operation	- Via local display (languages: German, English, French, Italian, Spanish, Swedish, Danish, Czech, Polish, Russian, Chinese, Turkish, Slovenian) - Via SIMATIC PDM	
Accuracy		
Volume flow		
• Liquids		
- $Re \geq 20\,000$	$\pm 0.75\%$ of measured value	
- $10\,000 < Re < 20\,000$	$\pm 2.0\%$ of measured value	
• Gases and vapors		
- $Re \geq 20\,000$	$\pm 1.0\%$ of measured value	
- $10\,000 < Re < 20\,000$	$\pm 2.0\%$ of measured value	
Mass flow/Corrected volume flow		
• Gases and vapors		
- $Re \geq 20\,000$	$\pm 1.5\%$ of measured value	
- $10\,000 < Re < 20\,000$	$\pm 2.5\%$ of measured value	
Mass flow		
• Liquid/water		
- $Re \geq 20\,000$	$\pm 1.5\%$ of measured value	
- $10\,000 < Re < 20\,000$	$\pm 2.5\%$ of measured value	
Repeatability (Volume flow)	$\pm 0.1\%$ of measured value	

Technical specifications (continued)

SITRANS FX330	
Operating conditions	
Temperature ratings	
• Medium	-40 ... +240 °C (-40 ... +465 °F)
• Ambient	
- Non-Ex	-40 ... +85 °C (-40 ... +185 °F)
- Ex	-40 ... +65 °C (-40 ... +140 °F)
• Storage	-40 ... +85 °C (-40 ... +185 °F)
Pressure ratings	
Max. 100 bar (1450 psi), higher pressure rates on request	
Max. allowable test pressure	
• With integrated pressure sensor and isolation valve (closed)	1.5 x PN
• With integrated pressure sensor and without isolation valve	2 times the measuring range of pressure sensor
Process medium	
• Density	Taken into consideration when sizing
• Viscosity	< 10 cP
• Reynold's number	> 10000
Recommended flow velocities	
• Liquids	0.3 ... 7 m/s (0.98 ... 23 ft/s)
• Gases and vapors	2.0 ... 80 m/s (6.6 ... 262.5 ft/s)
- DN 15	3.0 ... 45 m/s (9.8 ... 148 ft/s)
- DN 25	2.0 ... 70 m/s (6.6 ... 230 ft/s)
For detailed information see operating instructions "Intended use"	
Installation conditions	
Inlet run	
• For undisturbed flow profile, after pipe section with reducer, after 1 x 90° pipe bend	≥ 15 x DN
• After 2 x 90° pipe bend	≥ 30 x DN
• After 2 x 90° three-dimensional pipe bend	≥ 40 x DN
• After control valves	≥ 50 x DN
• Before flow conditioner	≥ 2 x DN
• After flow conditioner	≥ 8 x DN
Outlet run	
≥ 5 x DN	
Material	
Sensor and process connections	
• Standard	1.4404/316L
• Option	Hastelloy C22 on request
Transmitter housing	
• Standard	Aluminum
	Aluminum die-cast, two-layer coating (epoxy/polyester)
• Option	Die-cast aluminum with finish for advanced requirements / 1.4409 / 316L / A 351-CF3M
Pressure sensor gasket	
• Standard	FPM

Flow Measurement

SITRANS FX (Vortex)

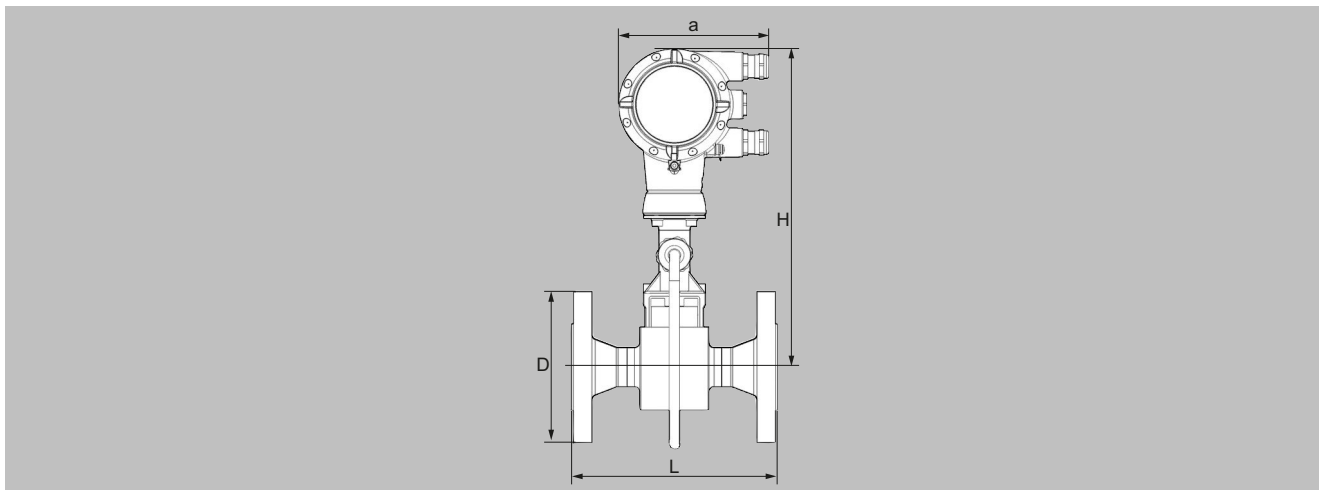
SITRANS FX330

Technical specifications (continued)

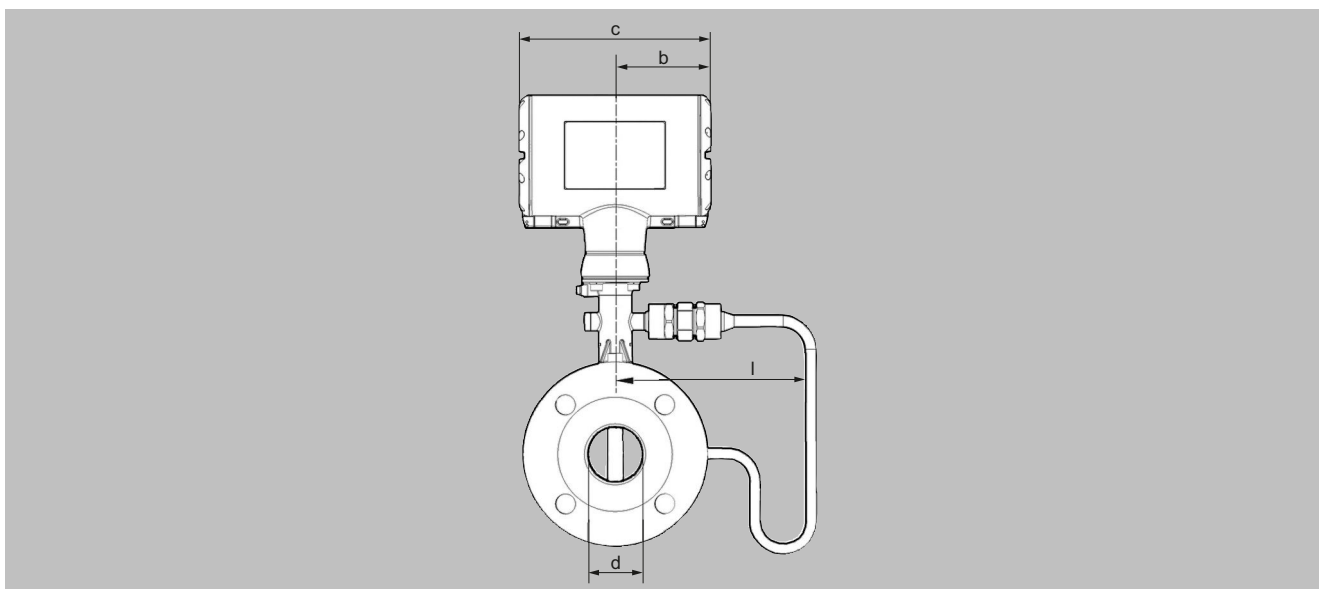
SITRANS FX330	
• Option	FFKM
Sensor gasket (Pick-up)	
• Standard	1.4535/316L
• Option	Hastelloy C276
Process connections	
DIN EN 1092-1	DN 15 ... 300 / PN 16 ... 100
ANSI B16.5	½" ... 12"/150 ... 600 lb
	For valid combinations of connection size and pressure rating see table in section "Configuration"
Enclosure rating	
Standard	Compact and remote version: IP66/IP67
Option	Remote version: IP66/IP68 for sensor
Power supply	
Non-Ex version	14 ... 36 V DC
Ex version	14 ... 30 V DC
Inputs/Outputs	
Current output	4 ... 20 mA, HART
Binary output	Pulse/Frequency/Status/Limit switch
Current input	4 ... 20 mA, passive
Communication	
	HART 7 PROFIBUS PA FOUNDATION Fieldbus
Calibration	
Standard calibration	3-point calibration: 3 x 15 %, 3 x 50 %, 3 x 80 %
Special calibration	5-point calibration: 3 x 15 %, 3 x 30 %, 3 x 50 %, 3 x 60 %, 3 x 80 %
Certificates and approvals	
Ex approvals	ATEX, QPS, IECEx
CE declaration of conformity	PED 2014/68/EU EMC 2014/30/EU
Safety integration level (SIL)	SIL2 according to IEC 61508

Dimensional drawings

Compact version



SITRANS FX330 (Vortex), Flanged version with pressure sensor, front view



SITRANS FX330 (Vortex), Flanged version with pressure sensor, side view

Flange version EN 1092-1

Size DN	Pressure rating PN	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)					H	I	Weight [kg (lb)]	
		d	d FR ¹⁾	d FR ²⁾	D	L			Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
15	40	17.3 (0.68)	-	-	95 (3.74)	200 (7.87)	358.8 (14.2)	169.3 (6.67)	5.5 (12.13)	6.1 (13.45)
15	100	17.3 (0.68)	-	-	105 (4.13)	200 (7.87)	358.8 (14.2)	169.3 (6.67)	6.5 (14.33)	7.1 (15.65)
25	40	28.5 (1.12)	17.3 (0.68)	-	115 (4.53)	200 (7.87)	358.4 (14.1)	169.3 (6.67)	7.3 (16.09)	7.9 (17.42)
25	100	28.5 (1.12)	17.3 (0.68)	-	140 (5.51)	200 (7.87)	358.4 (14.1)	169.3 (6.67)	9.3 (20.50)	9.9 (21.83)
40	40	43.1 (1.70)	28.5 (1.12)	17.3 (0.68)	150 (5.91)	200 (7.87)	362.3 (14.3)	169.5 (6.67)	10.2 (22.49)	10.8 (23.81)
40	100	42.5 (1.67)	28.5 (1.12)	17.3 (0.68)	170 (6.69)	200 (7.87)	362.3 (14.3)	169.5 (6.67)	14.2 (31.31)	14.8 (32.63)

Flow Measurement

SITRANS FX (Vortex)

SITRANS FX330

Dimensional drawings (continued)

Size	Pressure rating	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)							Weight [kg (lb)]	
DN	PN	d	d FR ¹⁾	d FR ²⁾	D	L	H	I	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
50	16	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	165 (6.50)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	12.1 (26.68)	12.7 (28.00)
50	40	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	165 (6.50)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	12.3 (27.12)	12.9 (28.44)
50	63	54.5 (2.15)	42.5 (1.67)	28.5 (1.12)	180 (7.09)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	16.3 (35.94)	16.9 (37.26)
50	100	53.9 (2.12)	42.5 (1.67)	28.5 (1.12)	195 (7.68)	200 (7.87)	368.3 (14.5)	169.3 (6.67)	17.8 (39.24)	18.4 (40.57)
80	16	82.5 (3.25)	54.5 (2.15)	42.5 (1.67)	200 (7.87)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	16.8 (37.04)	17.4 (38.36)
80	40	82.5 (3.25)	54.5 (2.15)	42.5 (1.67)	200 (7.87)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	18.8 (41.45)	19.4 (42.77)
80	63	81.7 (3.22)	54.5 (2.15)	42.5 (1.67)	215 (8.46)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	22.8 (50.27)	23.4 (51.59)
80	100	80.9 (3.19)	54.5 (2.15)	42.5 (1.67)	230 (9.06)	200 (7.87)	380.3 (15.0)	169.3 (6.67)	26.8 (59.08)	27.4 (60.41)
100	16	107 (4.21)	80.9 (3.19)	54.5 (2.15)	220 (8.66)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	21.4 (47.18)	22 (48.50)
100	40	107 (4.21)	80.9 (3.19)	54.5 (2.15)	235 (9.25)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	24.4 (53.79)	25 (55.12)
100	63	106 (4.17)	80.9 (3.19)	54.5 (2.15)	250 (9.84)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	29.4 (64.82)	30 (66.14)
100	100	104 (4.09)	80.9 (3.19)	54.5 (2.15)	265 (10.43)	250 (9.84)	396.8 (15.7)	171.5 (6.75)	35.4 (78.04)	36 (79.37)
150	16	159 (6.26)	107 (4.21)	80.9 (3.19)	285 (11.22)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	35.2 (77.60)	35.8 (78.93)
150	40	159 (6.26)	107 (4.21)	80.9 (3.19)	300 (11.81)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	41.2 (90.83)	41.8 (92.15)
150	63	157 (6.18)	107 (4.21)	80.9 (3.19)	345 (13.58)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	59.2 (130.51)	59.8 (131.84)
150	100	154 (6.06)	107 (4.21)	80.9 (3.19)	355 (13.98)	300 (11.81)	416.3 (16.4)	191.5 (7.54)	67.2 (148.15)	67.8 (149.47)
200	10	207 (8.15)	159 (6.26)	107 (4.21)	340 (13.39)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	37.8 (83.33)	38.4 (84.66)
200	16	207 (8.15)	159 (6.26)	107 (4.21)	340 (13.39)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	37.8 (83.33)	38.4 (84.66)
200	25	207 (8.15)	159 (6.26)	107 (4.21)	360 (14.17)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	46.8 (103.18)	47.4 (104.50)
200	40	207 (8.15)	159 (6.26)	107 (4.21)	375 (14.76)	300 (11.81)	442.1 (17.4)	202.8 (7.98)	54.8 (120.81)	55.4 (122.14)
250	10	260 (10.24)	207 (8.15)	159.3 (6.27)	395 (15.55)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	57.4 (126.55)	58.0 (127.87)
250	16	260 (10.24)	207 (8.15)	159.3 (6.27)	405 (15.94)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	58.4 (128.75)	59.0 (130.07)
250	25	259 (10.20)	207 (8.15)	159.3 (6.27)	425 (16.73)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	74.4 (164.02)	75.0 (165.35)
250	40	259 (10.20)	207 (8.15)	159.3 (6.27)	450 (17.72)	380 (14.96)	468.8 (18.5)	229.5 (9.04)	92.4 (203.71)	93.0 (205.03)
300	10	310 (12.20)	260 (10.24)	207 (8.15)	445 (17.52)	450 (17.72)	492.8 (19.4)	255 (10.04)	75.7 (166.89)	76.3 (168.21)
300	16	310 (12.20)	260 (10.24)	207 (8.15)	460 (18.11)	450 (17.72)	492.8 (19.4)	255 (10.04)	82.2 (181.22)	82.8 (182.54)
300	25	308 (12.13)	260 (10.24)	207 (8.15)	485 (19.09)	450 (17.72)	492.8 (19.4)	255 (10.04)	98.7 (217.60)	99.3 (218.92)
300	40	308 (12.13)	260 (10.24)	207 (8.15)	515 (20.28)	450 (17.72)	492.8 (19.4)	255 (10.04)	127.5 (281.09)	128.1 (282.41)

1) FR - single reduction

2) F2R - double reduction

Flange version ANSI B16.5

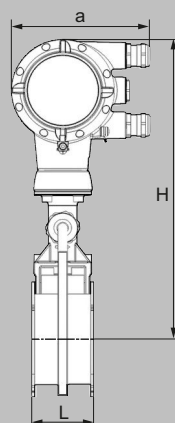
Size	Pressure rating	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)							Weight [kg (lb)]	
DN	Class	d	d FR ¹⁾	d FR ²⁾	D	L	H	I	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
½	150	16 (0.63)	-	-	90 (3.5)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	4.5 (9.92)	5.1 (11.24)
½	300	16 (0.63)	-	-	95 (3.7)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	4.9 (10.80)	5.5 (12.13)
½	600	14 (0.55)	-	-	95 (3.7)	200 (7.9)	358.8 (14.2)	169.3 (6.67)	5.1 (11.24)	5.7 (12.57)
1	150	27 (1.1)	15.8 (0.62)	-	110 (4.3)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	6.2 (13.67)	6.8 (14.99)
1	300	27 (1.1)	15.8 (0.62)	-	125 (4.9)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	7.2 (15.87)	7.8 (17.20)
1	600	24 (1.0)	15.8 (0.62)	-	125 (4.9)	200 (7.9)	358.4 (14.1)	169.3 (6.67)	7.5 (16.53)	8.1 (17.86)
1½	150	41 (1.6)	26.6 (1.1)	15.8 (0.6)	125 (4.9)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	8.3 (18.30)	8.9 (19.62)
1½	300	41 (1.6)	26.6 (1.1)	15.8 (0.6)	155 (6.1)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	10.4 (22.93)	11 (24.25)
1½	600	38 (1.5)	26.6 (1.1)	15.8 (0.6)	155 (6.1)	200 (7.9)	362.3 (14.3)	169.5 (6.67)	11.4 (25.13)	12 (26.46)
2	150	53 (2.1)	40.9 (1.6)	26.6 (1.1)	150 (5.9)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	11 (24.25)	11.6 (25.57)
2	300	53 (2.1)	40.9 (1.6)	26.6 (1.1)	165 (6.5)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	12.4 (27.34)	13 (28.66)
2	600	49 (1.9)	40.9 (1.6)	26.6 (1.1)	165 (6.5)	200 (7.9)	368.3 (14.5)	169.5 (6.67)	13.9 (30.64)	14.5 (31.97)
3	150	78 (3.1)	52.6 (2.1)	40.9 (1.6)	190 (7.5)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	19.8 (43.65)	20.4 (44.97)
3	300	78 (3.1)	52.6 (2.1)	40.9 (1.6)	210 (8.3)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	22.8 (50.27)	23.4 (51.59)
3	600	74 (2.9)	52.6 (2.1)	40.9 (1.6)	210 (8.3)	200 (7.9)	380.3 (15.0)	169.3 (6.67)	23.8 (52.47)	24.4 (53.79)
4	150	102 (4.0)	78 (3.1)	52.6 (2.1)	230 (9.1)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	23.4 (51.59)	24 (52.91)
4	300	102 (4.0)	78 (3.1)	52.6 (2.1)	255 (10)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	31.4 (69.23)	32 (70.55)
4	600	97 (3.8)	78 (3.1)	52.6 (2.1)	275 (11)	250 (9.8)	396.8 (15.7)	171.5 (6.76)	40.4 (89.07)	41 (90.39)

Dimensional drawings (continued)

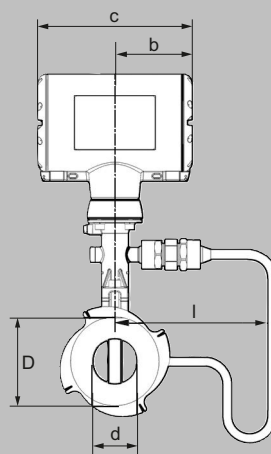
Size DN	Pressure rating Class	Dimensions [mm (inch)] a = 148.5 (5.85), b = 85.8 (3.38), c = 171.5 (6.76)							Weight [kg (lb)]	
		d	d FR ¹⁾	d FR ²⁾	D	L	H	I	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
6	150	154 (6.1)	102 (4.0)	78.0 (3.1)	280 (11)	300 (12)	416.3 (16.4)	191.5 (7.54)	36.2 (79.81)	36.8 (81.13)
6	300	154 (6.1)	102 (4.0)	78.0 (3.1)	320 (13)	300 (12)	416.3 (16.4)	191.5 (7.54)	51.2 (112.88)	51.8 (114.20)
6	600	146 (5.8)	102 (4.0)	78.0 (3.1)	355 (14)	300 (12)	416.3 (16.4)	191.5 (7.54)	76.2 (167.99)	76.8 (169.31)
8	150	203 (8.0)	154 (6.1)	102 (4.0)	345 (14)	300 (12)	442.1 (17.4)	202.8 (8.0)	50.0 (110.23)	50.6 (111.55)
8	300	203 (8.0)	154 (6.1)	102 (4.0)	380 (15)	300 (12)	442.1 (17.4)	202.8 (8.0)	74.8 (164.91)	75.4 (166.23)
10	150	255 (10.0)	203 (8.0)	154 (6.1)	405 (16)	380 (15)	468.8 (18.5)	229.5 (9.04)	74.4 (164.02)	75.0 (165.35)
10	300	255 (10.0)	203 (8.0)	154 (6.1)	455 (18)	380 (15)	468.8 (18.5)	229.5 (9.04)	106.4 (234.57)	107.0 (235.89)
12	150	305 (12.0)	255 (10.0)	203 (8.0)	485 (19)	450 (18)	492.8 (19.4)	255 (10.0)	106.4 (234.35)	107.0 (235.67)
12	300	305 (12.0)	255 (10.0)	203 (8.0)	520 (21)	450 (18)	492.8 (19.4)	255 (10.0)	151.4 (333.56)	152.0 (334.88)

1) FR - single reduction

2) F2R - double reduction



SITRANS FX330 (Vortex), Sandwich version with pressure sensor, front view



SITRANS FX330 (Vortex), Sandwich version with pressure sensor, side view

Flow Measurement

SITRANS FX (Vortex)

SITRANS FX330

Dimensional drawings (continued)

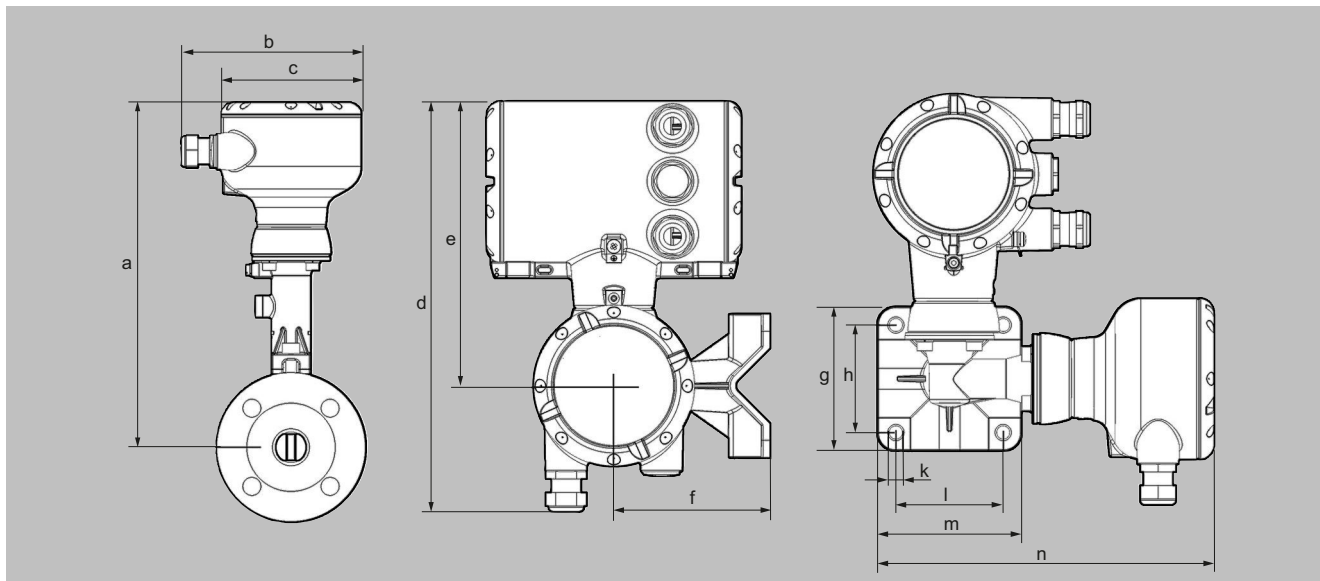
Sandwich version EN

Size DN	Pressure rating PN	Dimensions [mm (inch)]								Weight [kg (lb)]	
		a	b	c	d	D	L	H	I	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
15	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	16 (0.63)	45 (1.77)	65 (2.56)	265 (10.43)	174.25 (6.86)	3.5 (7.72)	4.1 (9.04)
25	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	24 (0.94)	65 (2.56)	65 (2.56)	265 (10.43)	174.25 (6.86)	4.3 (9.48)	4.9 (10.80)
40	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	38 (1.50)	82 (3.23)	65 (2.56)	270 (10.63)	174.5 (6.87)	4.9 (10.80)	5.5 (12.13)
50	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	50 (1.97)	102 (4.02)	65 (2.56)	275 (10.83)	174.5 (6.87)	6 (13.23)	6.6 (14.55)
80	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	74 (2.91)	135 (5.31)	65 (2.56)	290 (11.42)	174.25 (6.86)	8.2 (18.08)	8.8 (19.40)
100	16 ... 100	133 (5.24)	105 (4.13)	179 (7.05)	97 (3.82)	158 (6.22)	65 (2.56)	310 (12.20)	176.5 (6.95)	9.5 (20.94)	10.1 (22.27)

Sandwich version ANSI

Size DN	Pressure rating Class	Dimensions [inch]								Weight [lb]	
		a	b	c	d	D	L	H	I	Flowmeter (without pressure sensor)	Flowmeter (with pressure sensor)
½"	150, 300	5.32	4.26	7.25	0.63	1.77	2.56	10.43	6.82	7.72	9.04
½"	600	5.32	4.26	7.25	0.55	1.77	2.56	10.43	6.82	7.72	9.04
1"	150, 300, 600	5.32	4.26	7.25	0.94	2.56	2.56	10.43	6.82	9.48	10.80
1½"	150, 300, 600	5.32	4.26	7.25	1.50	3.23	2.56	10.63	6.82	10.80	12.13
2"	150, 300, 600	5.32	4.26	7.25	1.97	4.02	2.56	10.83	6.82	13.23	14.55
3"	150, 300, 600	5.32	4.26	7.25	2.91	5.31	2.56	11.42	6.82	18.08	19.40
4"	150, 300, 600	5.32	4.26	7.25	3.82	6.22	2.56	12.20	6.82	20.94	22.27

Remote version



SITRANS FX330 (Vortex), Remote version

Dimension a

DN	Flanged and Sandwich version						Flanged version			
	15 (½")	25 (1")	40 (1½")	50 (2")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
[mm]	265.7	265.2	269.2	275.2	287.2	303.7	323.2	348.9	375.7	399.7
[inch]	10.5	10.4	10.6	10.8	11.3	12.0	12.7	13.7	14.8	15.7

Dimensional drawings (continued)

Dimension a F1/2R

Flanged version										
DN	15 (½")	25 (1")	40 (1½")	50 (2")	80 (3")	100 (4")	150 (6")	200 (8")	250 (10")	300 (12")
F1R ¹⁾ [mm]	-	315.7	315.2	319.2	325.2	337.2	353.7	373.2	398.9	425.7
F1R ¹⁾ [inch]	-	12.4	12.4	12.6	12.8	13.3	13.9	14.7	15.7	16.8
F2R ²⁾ [mm]	-	-	315.7	315.2	319.2	325.2	337.2	353.7	373.2	398.9
F2R ²⁾ [inch]	-	-	12.4	12.4	12.6	12.8	13.3	13.9	14.7	15.7

Dimension b ... n

	b	c	d	e	f	g	h	j	k	l	m	n
[mm]	139	108	276	191	105	97	72	108	9	72	97	226
[inch]	5.46	4.25	10.9	7.53	4.14	3.82	2.84	4.25	0.35	2.84	3.82	8.90

Flow tables

Measuring range limits

Size		Q _{min}	Q _{max}	Q _{min}	Q _{max}
DN to EN 1092-1	DN to NSI B16.5	EN 1092-1 [m³/h]	EN 1092-1 [m³/h]	ANSI B16.5 [m³/h]	ANSI B16.5 [m³/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"	56.60	792.42	56.60	792.42
250	10"	90.48	1 266.8	90.48	1 266.8
300	12"	131.41	1 839.8	131.41	1 839.8

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

Size		Q _{min}	Q _{max}	Q _{min}	Q _{max}
DN to EN 1092-1	DN to NSI B16.5	EN 1092-1 [m³/h]	EN 1092-1 [m³/h]	ANSI B16.5 [m³/h]	ANSI B16.5 [m³/h]
Air					
15	½"	6.80	25.33	6.72	24.70
25	1"	10.20	81.43	10.20	81.43
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	1 238.6
100	4"	165.19	2 128.27	165.19	2 128.27
150	6"	374.23	4 821.60	374.23	4 821.6
200	8"	702.95	9 056.8	702.95	9 056.8
250	10"	1 123.7	14 478.0	1 123.7	14 478.0
300	12"	1 632.1	21 028.0	1 632.1	21 028.0

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

Flow rate limits

Product	Nominal sizes to EN	to ANSI	Minimum flow rates [m/s]	Maximum flow rates [m/s]
Liquids	DN 15 ... DN 300	DN ½" ... DN 12"	0.5 x (998/ρ) ^{0.51)}	7 x (998/ρ) ^{0.47 1)}
Gas, steam/vapor	DN 15 ... DN 300	DN ½" ... DN 12"	6 x (1.29/ρ) ^{0.52)}	7 x (998/ρ) ^{0.47 3)}

ρ = operating density [kg/m³]

³⁾ Maximum flow rate 80 m/s (262 ft/s); DN 15: 45 m/s (148 ft/s) and DN 25: 70 m/s (230 ft/s)¹⁾ Minimum flow rate 0.3 m/s (0.984 ft/s) - maximum flow rate 7 m/s (23 ft/s)²⁾ Minimum flow rate 2 m/s (6.6 ft/s)

Flow Measurement

SITRANS FX (Vortex)

SITRANS FX330

Dimensional drawings (continued)

Measuring range saturated steam: 1 ... 7 bar

Overpressure [bar]	1		3.5		5.2		7	
Density [kg/m³]	1.13498	1.13498	2.4258	2.4258	3.27653	3.27653	4.16732	4.16732
Temperature [°C]	120.6	120.6	148.2	148.2	160.4	160.4	170.6	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"	5.87	28.75	7.68	61.46	8.93	83.01	105.57
25	1"	11.82	92.42	17.28	197.53	20.09	266.81	339.35
40	1½"	29.64	370.71	43.33	792.33	50.63	1 070.2	1 361.2
50	2"	51.31	641.82	75.02	1 371.8	87.19	1 852.8	2 356.6
80	3"	112.41	1 405.8	164.33	3 004.7	191.00	4 058.4	5 161.8
100	4"	193.14	2 415.5	282.36	5 162.7	328.16	6 973.3	8 869.2
150	6"	437.56	5 472.4	639.69	11 696.0	743.45	15 798.0	20 093.0
200	8"	821.9	10 279.0	1 201.6	21 970.0	1 396.5	29 675.0	37 743.0
250	10"	1 313.9	16 433.0	1 920.9	35 122.0	2 232.5	47 439.0	60 337.0
300	12"	1 908.3	23 866.0	2 789.8	51 010.0	3 242.4	68 899.0	87 630.0

Measuring range saturated steam: 10.5 ... 20 bar

Overpressure [bar]	10.5		14.0		17.5		20.0	
Density [kg/m³]	5.88803	5.88803	7.60297	7.60297	9.31702	9.31702	10.5442	10.5442
Temperature [°C]	186.2	186.2	198.5	198.5	208.7	208.7	215.0	215.0
Flow [kg/h]	min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ANSI							
	B16.5							
15	½"	12.78	149.17	16.51	192.61	20.23	236.04	267.12
25	1"	26.93	479.46	30.60	619.11	33.87	758.69	858.62
40	1½"	67.51	1 878.2	76.72	2 150.7	84.93	2 395.3	2 557.7
50	2"	116.89	3 251.7	132.82	3 723.4	147.03	4 147.0	4 428.1
80	3"	256.03	7 122.4	290.93	8 155.8	322.06	9 083.7	9 699.3
100	4"	439.91	12 238	499.90	14 013.0	553.38	15 608.0	16 666.0
150	6"	996.62	27 725.0	1 132.5	31 747.0	1 253.7	35 359.0	37 756.0
200	8"	1 872.1	52 079.0	2 127.3	59 634.0	2 354.9	66 419.0	70 921.0
250	10"	2 992.7	83 254.0	3 400.7	95 333.0	3 764.6	106 180.0	113 380.0
300	12"	4 346.5	120 920.0	4 939.1	138 460.0	5 467.5	154 210.0	164 660.0

Measuring range saturated steam: 15 ... 100 psig

Overpressure [psig]	15		50		75		100	
Density [lbs/ft³]	0.0719	0.0719	0.1497	0.1497	0.2036	0.2036	0.2569	0.2569
Temperature [°F]	249.98	249.98	297.86	297.86	320.36	320.36	338.184	338.184
Flow [lbs/h]	min.	max.	min.	max.	min.	max.	min.	max.
DN to EN 1092-1	DN to ANSI							
	B16.5							
15	½"	12.95	64.35	16.83	133.87	19.62	182.02	229.63
25	1"	26.25	206.83	37.86	430.30	44.15	585.06	738.09
40	1½"	65.81	829.61	94.92	1 726	110.68	2 346.7	2 960.5
50	2"	113.94	1 436.3	164.34	2 988	191.63	4 062.9	5 125.6
80	3"	249.57	3 146.1	360.00	6 545.3	419.74	8 899.4	11 227
100	4"	428.81	5 405.7	618.51	11 246	721.21	15 291	19 291
150	6"	971.47	12 246	1 401.2	25 478	1 633.9	34 642	43 703
200	8"	1 824.8	23 004	2 632.1	47 859	3 069.1	65 072	82 092
250	10"	2 917.2	36 774	4 207.7	76 508	4 906.4	104 030	131 230
300	12"	4 236.8	53 410	6 111.1	111 120	7 125.8	151 080	190 600

Measuring range saturated steam: 150 ... 300 psig

Overpressure [psig]	150		200		250		300	
Density [lbs/ft³]	0.3627	0.3627	0.4681	0.4681	0.5735	0.5735	0.6792	0.6792
Temperature [°F]	366.08	366.08	388.04	388.04	406.22	406.22	422.06	422.06
Flow [lbs/h]	min.	max.	min.	max.	min.	max.	min.	max.

Dimensional drawings (continued)

Overpressure [psig]		150		200		250		300	
DN to EN 1092-1	DN to ANSI B16.5								
15	½"	27.79	324.21	35.86	418.47	43.94	512.66	52.04	607.12
25	1"	58.93	1 042.1	66.94	1 345.1	74.10	1 647.8	80.63	1 951.5
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	321.60	9 066.8	350.00	9 917
80	3"	560.19	15 578	636.44	17 834	704.43	19 860	766.60	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"	4 096.1	113 900	4 653.6	130 400	5 150.7	145 210	5 605.2	158 830
250	10"	6 548.1	182 090	7 439.3	208 460	8 234.1	232 140	8 960.6	253 910
300	12"	9 510.2	264 460	10 805	302 760	11 959	337 150	13 014	368 770