

Flow Measurement

SITRANS F US Inline

Flowmeter SONO 3100/FUS060

Overview



The combination of the SONO 3100 sensor and the FUS060 transmitter is ideal for applications where process shut-down is impossible during service and where there is a need for extreme high/low temperatures and pressures.

Transducers can easily be changed without interrupting operation. SONO 3100 can optionally be delivered as a 4-track solution for absolute best performance and accuracy.

Benefits

- Transducers can be replaced under pressure
- Measurement of all liquids less than 350 Cst, conductive or non-conductive
- No pressure drop
- Reliable and accurate flow measurements
- Long-time stability
- On request:
 - Special sensor material, e.g. Duplex
 - High/low temperature sensor version: +250 °C (+482 °F) / -200 °C (-328 °F) sensors
 - Pressure rating 430 bar (6235 psi)
 - 4-track sensor technology

Application

The main application for SONO 3100 in combination with FUS060 ultrasonic flowmeter is to measure volume flow within:

- Petrochemical industry
- Power engineering
- Water and waste water
- Oil and liquefied gases

SITRANS FUS060 holds ATEX for hazardous areas, HART and PROFIBUS PA. SONO 3100 holds ATEX Ex approval.

Design

The SONO 3100 in combination with FUS060 consists of a SONO 3100 sensor, transducers with O-rings or flanges depending on selection - and a FUS060 transmitter.

SONO 3100 is basically supplied in a 2-track solution with and without flanges in sizes from DN 100 to DN 1200.

4-track version is available on request.

SONO 3100 is as standard available in carbon/stainless steel from DN 100 to DN 1200.

FUS060 is designed for remote wall mounting only.

Technical specifications

The transmitter related to this system is the SITRANS FUS060. Technical specifications to the FUS060 see page 4/216.

2-track sensor fitted with four SONO 3200 transducers

Error in measurement

Error in measurement at reference conditions	$v > 0.5 \dots 10 \text{ m/s}$, $< \pm 0.5 \%$ of rate (v =flow velocity)
Max flow velocity	10 m/s (32 ft/s)
Nominal size	DN 100 ... 1200 (4" ... 48")
Media/surface temperature	<ul style="list-style-type: none"> • Standard: -10 °C ... +200 °C (14 ... 392 °F) • ATEX Ex d version: -20 ... +180 °C (-4 ... +356 °F) • ATEX Ex i version: -10 ... +190 °C (+14 ... +374 °F) • Specials: -200 °C (-328 °F) or up to 250 °C (482 °F)
Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)
Enclosure	IP67 (NEMA 6)/IP68 (NEMA 6X) and ATEX (see below)

Process connections

PN designated, EN 1092-1

Pipe material carbon steel

- DN 200 ... 1200 (8" ... 48"), PN 10
- DN 100 ... 1200 (4" ... 48"), PN 16
- DN 200 ... 1000 (8" ... 40"), PN 25
- DN 100 ... 500 (4" ... 20"), PN 40

Pipe material stainless steel

- DN 200 ... 300 (8" ... 12"), PN 10 and PN 25
- DN 100 ... 300 (4" ... 12"), PN 16 and PN 40

Class designated, EN 1759-1

Pipe material carbon steel

- DN 100 ... 600 (4" ... 24") Class 150
- DN 100 ... 300 (4" ... 12") Class 300

Pipe material stainless steel

- DN 100 ... 300 (4" ... 12") Class 150 and Class 300

Without flanges, (weld-in version) only in carbon steel

- DN 100 ... 1200 (4" ... 48"), PN 16
- DN 200 ... 1000 (8" ... 40"), PN 25
- DN 100 ... 500 (4" ... 20"), PN 40

Transducer SONO 3200

O-ring or flange versions

Materials

Pipe

Steel EN 1.0345-P235GH or stainless steel AISI 316L/1.4404

Flange

EN 10025-S235JRG2, 1E1 or stainless steel EN 10222-5-1.4404, 13E0

PN

Class

ASTM A105, 1, 1 or stainless steel ASTM F316L, 2, 3

Transducer body

Stainless steel AISI 316 or similar

Transducer terminal house

Stainless steel AISI 316 or plastic PA 6.6

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Certificates and approvals

System ATEX approval for SONO 3100 together with transmitter FUS060-Ex

ATEX II 2G Ex dem [ia/ib] IIC T6/T4/T3 or ATEX II 2G EEx d IIC T3-T6 with SONO 3200 Exd transducers (for standard FUS060 transmitter, installed outside of Ex zone)
For FUS060 Ex version the transducer cable length is restricted to 3 m (9.84 ft), in order to meet requirements for electrical immunity.

Conformity certificate

The devices are supplied as standard with a Siemens Certificate of Conformity on CD

Material certificate

Material certificate according to EN 10204-3.1 is optionally available

NDT examination report

Extended material certificate is optionally available

Pressure certificate

Pressure test according EN 1024-2.3 optionally available

Calibration report

A standard calibration report is shipped with each flowmeter.

Optionally available

Extended accredited ISO/IEC 17025 calibration certificates

Approvals

No custody transfer approvals

The sensor SONO 3100 with transmitter FUS060 conforms to Product Family Standard EN 61326/A3 appendix A (Title: Electrical Equipment for Measurement control and laboratory use – EMC requirements).

The sensors are approved according to EU directive 97/23/EC dated 29 May 1997 regarding fluid group 1, classified in category III. Design according to EN 13480 (PED Directive).

The SONO 3100 as weld-in version does not include the flanges. Thus, it can neither be tested nor approved according to PED. After the installation, all installation-related activities (welding, pressure test etc.) are the responsibility of the customer.

Selection and Ordering data

Order No. Order code

SITRANS F US SONO 3100 sensor 2-track

7ME3100-

Diameter Qn setting [m³/h]

DN 100 (4")	28	1 N
DN 100 (4")	100	1 P
DN 100 (4")	220	1 R
DN 125 (5")	44	1 S
DN 125 (5")	150	1 T
DN 125 (5")	350	1 V
DN 150 (6")	64	2 A
DN 150 (6")	220	2 B
DN 150 (6")	500	2 D
DN 200 (8")	110	2 E
DN 200 (8")	380	2 F
DN 200 (8")	900	2 H
DN 250 (10")	180	2 J
DN 250 (10")	600	2 K
DN 250 (10")	1300 ¹⁾	2 M
DN 300 (12")	250	2 N
DN 300 (12")	850	2 P
DN 300 (12")	2000 ¹⁾	2 R
DN 350 (14")	350	2 S
DN 350 (14")	1000	2 T
DN 350 (14")	2800 ¹⁾	2 V
DN 400 (16")	450	3 A
DN 400 (16")	1300 ¹⁾	3 B
DN 400 (16")	3600 ¹⁾	3 D
DN 500 (20")	1300 ¹⁾	3 J
DN 500 (20")	2200 ¹⁾	3 K
DN 500 (20")	4200 ¹⁾	3 M
DN 600 (24")	1300	3 S
DN 600 (24")	3200	3 T
DN 600 (24")	4200 ¹⁾	3 V
DN 700 (28")	2000	4 E
DN 700 (28")	4200	4 F
DN 800 (32")	4200	4 N
DN 800 (32")	5500 ¹⁾	4 P
DN 900 (36")	4200	5 A
DN 900 (36")	7500 ¹⁾	5 B
DN 1000 (40")	4200	5 J
DN 1000 (40")	9000 ¹⁾	5 K
DN 1200 (48")	4200	5 S
DN 1200 (48")	13200 ¹⁾	5 T

Flange norm and pressure rating

(All sizes are not available in all pressure ratings)

EN 1092-1

PN 10 (DN 200 ... DN 1200)

PN 16 (DN 100 ... DN 1200)

PN 25 (DN 200 ... DN 1000)

PN 40 (DN 100 ... DN 500)

ANSI B16.5

class 150 (DN 100 ... DN 600)

class 300 (DN 100 ... DN 300)

Pipe without flanges (weld-in version)

PN 10 (DN 200 ... DN 1200)

PN 16 (DN 100 ... DN 1200)

PN 25 (DN 200 ... DN 1200)

PN 40 (DN 100 ... DN 500)

B

C

D

E

H

J

P

Q

R

S

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Selection and Ordering data	Order No.	Order code	Selection and Ordering data	Order code
SITRANS F US SONO 3100 sensor 2-track	7ME3100-		Additional information	
Pipe and flange material			Please add „-Z“ to Order No. and specify Order code(s) and plain text.	
Carbon steel (DN 100 ... 1200)	1		<u>Calibration</u>	
Stainless steel (DN 100 ... 300)	2		Production calibration DN 100 ... DN 1200 (with certificate)	Included
Transducer type and approval			Theoretical calibration DN 500 ... DN 1200	D03
IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 50 mm, 100 °C (212 °F) (DN 100 ... 1200; SS and CS sensors)	1		Accredited Siemens ISO/IEC 17025 calibration for DN100 to DN500/600 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 1235/1300 m ³ /h).	D21
IP68 SS housing, PN 40, O-ring, 50 mm, 200 °C (392 °F) (DN 100 ... 1200; SS and CS sensors)	2		Accredited Siemens ISO/IEC 17025 calibration for DN300 to DN700 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 4200 m ³ /h).	D22
IP68 SS housing, PN 40, O-ring, 50 mm, 180 °C (356 °F), Ex i ATEX approval (only with standard FUS060) (DN 100 ... 1200; SS and CS sensors)	3		Accredited Siemens ISO/IEC 17025 calibration for DN800 to DN1200 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 4200 m ³ /h).	D23
IP67 (NEMA 4X/6) PA housing, PN 40, flange, 88 mm, 100 °C (212 °F) (DN 100 ... 300; SS sensors)	4		Accredited - Third Party ISO/IEC 17025 calibration for DN100 to DN600 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 1300 m ³ /h).	D31
IP68 SS housing, PN 40, flange, 88 mm, 200 °C (392 °F) (DN 100 ... 300; SS sensors)	5		Accredited - Third Party ISO/IEC 17025 calibration for DN300 to DN700 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 4200 m ³ /h).	D32
IP68 SS housing, PN 40, flange, 88 mm, 180 °C (356 °F), Ex i ATEX approval (only with standard FUS060) (DN 100 ... 300; SS sensors)	6		Accredited - Third Party ISO/IEC 17025 calibration for DN800 to DN1200 with Qn as selected in diameter. Verification certificate: 2 x 3 points in 10 %, 25 % and 100 % Qn (max. flow 7000 m ³ /h).	D33
IP67 SS housing, PN 40, O-ring, 50 mm, 190 °C (374 °F), Ex i ATEX approval (only with FUS060 Ex-version) (DN 100 ... 1200; SS and CS sensors)	7		<u>Material certificate</u>	
IP67 SS housing, PN 40, flange, 88 mm, 190 °C (374 °F), Ex i ATEX approval (only with FUS060 Ex-version) (DN 100 ... 300; SS sensors)	8		EN 10204-3.1	F10
Cable gland entries			EN 10204-3.1 and 100 % NDT on weldings, DN 100 ... DN 400	F11
Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5	1		EN 10204-3.1 and 100 % NDT on weldings, DN 500 ... DN 700	F12
Cable glands ½" NPT in transducers and in transmitter	2		EN 10204-3.1 and 100 % NDT on weldings, DN 800 ... DN 1200	F13
Transmitter SITRANS FUS060			<u>Pressure certificate</u>	F21
IP65 (NEMA 4), 120/230 V AC	N		EN 10204-2.3	
IP65 (NEMA 4), 24 V AC/DC	P		<u>Tag name plate</u>	
IP65 (NEMA 4), 24 V AC/DC ATEX Ex version	Q		Stainless steel tag name plate, text length depends on font size: 8 mm up to 10 characters, 4 mm up to 20 characters, or 3 mm up to 30 characters (add plain text)	Y17
Module			Please also see www.siemens.com/SITRANSForming for practical examples of ordering	
HART, 1 pulse output, 1 relay	B			
HART Ex, 1 pulse output, 1 relay	C			
PROFIBUS PA, 1 pulse/frequency	D			
PROFIBUS PA, Ex, 1 pulse/frequency	E			
Transducer coaxial cable				
4 x 3 m, max. 70 °C (158 °F), the only option for Ex i	0			
4 x 15 m, max. 70 °C (158 °F)	1			
4 x 30 m, high temp. max. 200 °C (392 °F)	2			
4 x 30 m, max. 70 °C (158 °F)	3			
4 x 60 m, max. 70 °C (158 °F)	4			
4 x 90 m, max. 70 °C (158 °F)	5			
4 x 120 m, max. 70 °C (158 °F)	6			
4 x 3 m, high temp. max. 200 °C (392 °F), the only option for Ex i	7			
4 x 15 m, high temp. max. 200 °C (392 °F)	8			

This device is shipped with a Quick Start guide and the SITRANS F manual CD containing the complete manual library. Printed Operating Instructions are available for purchase via PMD.

1) Reduced Q value during calibration (Qn setting unchanged)



Please use online Product selector to get latest updates. Product selector link:

www.pia-selector.automation.siemens.com

Flowmeter SONO 3100 with FUS060 operating instructions, accessories and spare parts

Operating instructions


Description	Order No.
SITRANS FUS060	
• English	A5E01204521
• German	A5E02123845
SITRANS F US SONO 3100	
• English	A5E00814513

This device is shipped with a Quick Start guide and a CD containing further SITRANS F US literature.


All literature is also available for free at:
<http://www.siemens.com/flowdocumentation>

Accessories

Description	Order No.
Submersible kit for transducers SONO 3200, IP68 10 m (32.81 ft) w.g. rating	FDK:085L2403




Description	Transducer length	Order No.
Extraction tool for replacement of SONO 3200 O-ring transducers under pressure (hot-tap)	50 mm (1.97")	FDK:085B5331



Cable connection boxes

(For the connection of individually transducer cables with the FUS060 transducer cables)

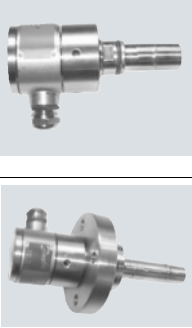
Description	Order No.
Junction box for coaxial cable	
• IP68 metal box for 4 coaxial cables	FDK:085B1361
• IP68 EEx e plastic box for 4 coaxial cables, no ATEX approval	FDK:085B1363



Spare parts

Transducer SONO 3200 spare parts, complete units

Type	Material	Gasket	Press. rating	Terminal housing	Approv.	Temp. range [°C (°F)]	Length mm (inch)	Order No.
O-ring	316 SS	O-ring	PN 40	Plastic, PA 6.6 M20		-20 ... +100 (-4 ... +212)	50 (1.97)	FDK:085B5453
O-ring	316 SS	O-ring	PN 40	316 SS M20		-20 ... +200 (-4 ... +392)	50 (1.97)	FDK:085B5450
O-ring	316 SS	O-ring	PN 40	316 SS M20	Ex d ¹⁾	-20 ... +180 (-4 ... +356)	50 (1.97)	FDK:085B5451
O-ring	316 SS	O-ring	PN 40	316 SS M20	Ex i ²⁾	-10 ... +190 (14 ... 374)	50 (1.97)	A5E00836448
O-ring	316 SS	O-ring	PN 40	Plastic, PA 6.6 ½" NPT		-20 ... +100 (-4 ... +212)	50 (1.97)	A5E00839472
O-ring	316 SS	O-ring	PN 40	316 SS ½" NPT		-20 ... +200 (-4 ... +392)	50 (1.97)	A5E00839431^{F)}
Flange	316 SS	Graphite	PN 40	Plastic, PA 6.6 M20		-20 ... +100 (-4 ... +212)	88 (3.47)	FDK:085B5461
Flange	316 SS	Graphite	PN 40	316 SS M20		-20 ... +200 (-4 ... +392)	88 (3.47)	FDK:085B5462
Flange	316 SS	Graphite	PN 40	316 SS M20	Ex d ¹⁾	-20 ... +180 (-4 ... +356)	88 (3.47)	FDK:085B5463
Flange	316 SS	Graphite	PN 40	316 SS M20	Ex i ²⁾	-10 ... +190 (14 ... 374)	88 (3.47)	A5E00836465
Flange	316 SS	Graphite	PN 40	Plastic, PA 6.6 ½" NPT		-20 ... +100 (-4 ... +212)	88 (3.47)	A5E00839479
Flange	316 SS	Graphite	PN 40	316 SS ½" NPT		-20 ... +200 (-4 ... +392)	88 (3.47)	A5E00839440^{F)}
Flange	316 SS	Copper ring	PN 40	316 SS PG13.5 (cryogenic version)		-200 ... +100 (-328 ... +212)	88 (3.47)	FDK:085B5416
Flange	316 SS	Copper ring	PN 40	316 SS M20 (cryogenic version)		-200 ... +100 (-328 ... +212)	88 (3.47)	FDK:085B5471
Flat flange	316 SS	Flat gasket	PN 40	316 SS M20 (cryogenic version)		-200 ... +100 (-328 ... +212)	88 (3.47)	A5E02593524



¹⁾ ATEX (Ex) IIC 2G EEx d IIC T3 ... T6

²⁾ For systems with FUS060 ATEX IIC 2G Ex dem [ia/ib] T6/T4/T3

Flow Measurement

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Flowmeter SONO 3100/FUS060

Terminal housing

Type	Pressure rating	Material	Temp. range [°C (°F)]	Order No.
Terminal housing (M20 cable gland)	N/A	PA 6.6	-20 ... +100 (-4 ... +212)	FDK:085B5501
Terminal housing (M20 cable gland)	N/A	ASTM 316	-20 ... +200 (-4 ... +392)	FDK:085B5504
Terminal housing (½" NPT cable gland)	N/A	PA 6.6	-20 ... +100 (-4 ... +212)	A5E00839460
Terminal housing (½" NPT cable gland)	N/A	ASTM 316	-20 ... +200 (-4 ... +392)	A5E00839427
Ex d ¹⁾ terminal housing (M20 cable gland)	N/A	ASTM 316	-20 ... +180 (-4 ... +356)	FDK:085B5505
Ex i ²⁾ terminal housing (M20 cable gland)	N/A	ASTM 316	-10 ... +190 (14 ... 374)	A5E00835255^{F)}

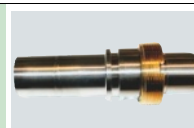


1) ATEX (Ex) IIC 2G EEx d IIC T3 ... T6

2) For systems with FUS060 ATEX IIC 2G Ex dem [ia/ib] T6/T4/T3

SONO 3200 spare parts, transducer body without terminal housing, including insert

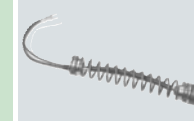
Type	Material	Gasket	Pressure rating	Temp. range [°C (°F)]	Length mm (inch)	Order No.
O-ring	316 SS	O-ring	PN 40	-20 ... +200 (-4 ... +392)	50 (1.97)	FDK:085B1405
Flange	316 SS	Graphite	PN 40	-20 ... +200 (-4 ... +392)	88 (3.47)	FDK:085B1464



F) Subject to export regulations AL: 91999, ECCN: N.

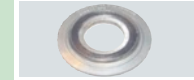
SONO 3200 spare parts, transducer insert

Type	Temp. range [°C (°F)]	Length mm (inch)	Order No.
Insert	-20 ... +200 (-4 ... +392)	50 (1.97)	FDK:085B1411
Insert	-20 ... +200 (-4 ... +392)	88 (3.47)	FDK:085B1459



Transducer SONO 3200 gaskets

Type	Pressure rating	Material	Temperature range [°C (°F)]	Order No.
Gasket O-ring (3 pcs. for o-ring transducers)	PN 40	FKM	-20 ... +200 (-4 ... +392)	FDK:085B1089
Gasket flange	PN 40/160	Graphite	-20 ... +200 (-4 ... +392)	FDK:085B1080
Gasket and 12 mm (0.47") bolts and nuts for flange transducers	PN 40	Flat ring type	-20 ... +200 (-4 ... +392)	FDK:085B1083
Gasket and 16 mm (0.63") bolts and nuts for flange transducers	PN 160	Graphite, 316 SS	-20 ... +200 (-4 ... +392)	FDK:085B1084
Gasket for cryogenics transducer with flat flange (2 pcs.)	PN 40	Graphite/metal	-200 ... +100 (-328 ... +212)	A5E02593522
Gasket cryogenics (2 pcs.)	PN 40	Copper, O-ring	-200 ... +100 (-328 ... +212)	A5E02593512



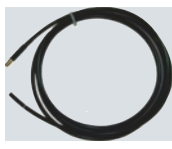
Flow Measurement SITRANS F US Inline

Flowmeter SONO 3100/FUS060

SONO 3200 cable glands

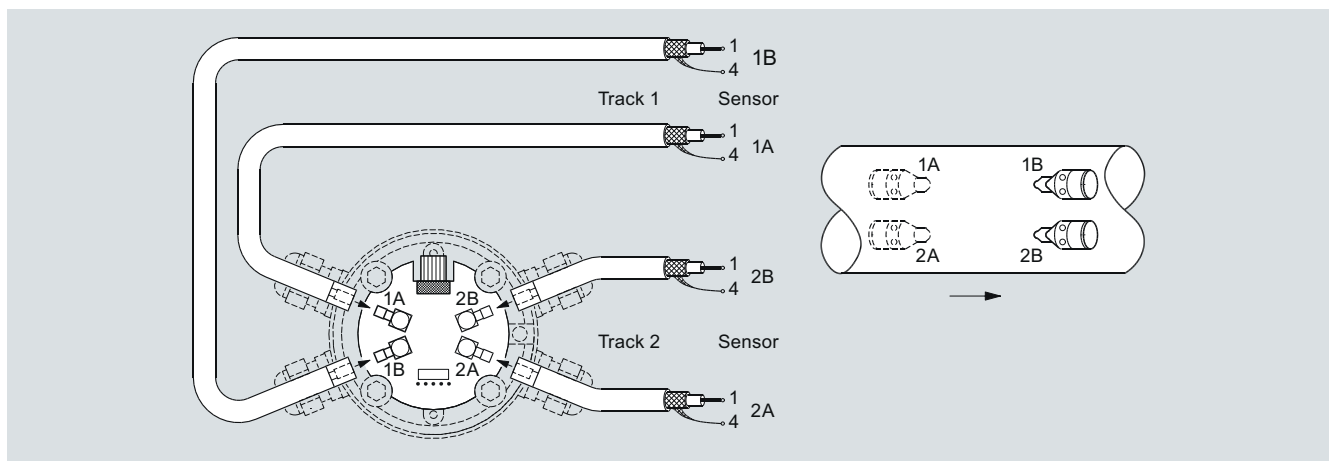
Type/description	Temperature range [°C (°F)]	Appr.	Order No.	
black PA plastic, cable Ø 5 ... 13 mm	-20 ... 100 (-4 ... +212)		A5E02246304	
½" NPT gray PA plastic, cable Ø 5 ... 9 mm	-20 ... 100 (-4 ... +212)		A5E02246309	
½" NPT chrome-plated brass, cable Ø 5 ... 9 mm	-40 ... 100 (-40 ... +212)		A5E02246258	
M20 stainless steel, cable Ø 4 ... 6 mm	-25 ... 200 (-13 ... +392)	Ex i	A5E02246194	
M20 Stainless steel, cable Ø 5 ... 8 mm	-60 ... 180 (-76 ... +356)	Ex d	A5E02246311	

Cables for SONO 3100 with FUS060

Description	Length m (ft)	Order No.	
Coaxial cable for FUS060, (75 Ω, max. 70 °C (158 °F), black PVC) (2 pcs.)	3 (9.84)	A5E00875101	
	15 (49.21)	A5E00861432	
	30 (98.43)	A5E01278662	
	60 (196.85)	A5E01278682	
	90 (295.28)	A5E01278687	
High temp. coaxial cable for FUS060; with 0.3 m brown PTFE high temp. transducer part, max. 200 °C (392 °F) and black PVC for remaining transmitter part with SMB plug, max. 70 °C (158 °F); (impedance 75 Ω) (2 pcs.)	120 (393.7)	A5E01278698	
	3 (9.84)	A5E00875105	
	15 (49.21)	A5E00861435	
Low temperature PTFE coaxial cable FUS060 and cryogenic sensors; PTFE, max. -200 ... +200 °C. (-328 ... +392 °F); (impedance 75 Ω) (2 pcs.)	30 (98.43)	A5E01196952	
	10 (32.84)	A5E02085593	
	40 (131.23)	A5E02085649	

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Schematics



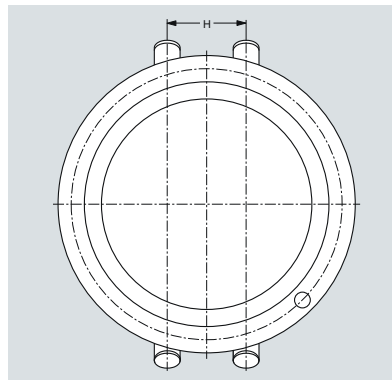
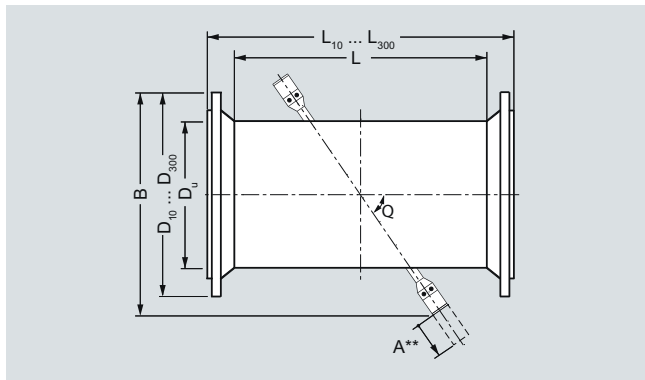
Electrical connection of SITRANS FUS060 and SONO 3100

Flow Measurement

SITRANS F US Inline

Flowmeter SONO 3100/FUS060

Dimensional drawings of sensor SONO 3100



Sensor SONO 3100 with EN norm

DN	DU [mm]	L ^{1) 4)} [mm]	B [mm]	θ [°]	H [mm]	PN 10			PN 16			PN 25			PN 40		
						W ₁₀ ²⁾ [mm]	D ₁₀ [mm]	L ₁₀ ¹⁾ [mm]	W ₁₆ ²⁾ [mm]	D ₁₆ [mm]	L ₁₆ ¹⁾ [mm]	W ₂₅ ²⁾ [mm]	D ₂₅ [mm]	L ₂₅ ¹⁾ [mm]	W ₄₀ ²⁾ [mm]	D ₄₀ [mm]	L ₄₀ ¹⁾ [mm]
100	114.3	860	305	45 ³⁾	42.8	-	-	-	3.6	220	960	-	-	-	3.6	235	990
125	139.7	862	325	45 ³⁾	64.5	-	-	-	4.0	250	970	-	-	-	4.0	270	990
150	168.3	862	350	45 ³⁾	78.1	-	-	-	4.5	285	970	-	-	-	4.5	300	1010
200	219.1	668	430	45 ³⁾	102.1	6.3	340	790	6.3	340	790	6.3	360	820	6.3	375	840
250	273.0	714	480	45 ³⁾	127.6	6.3	395	850	6.3	405	850	7.1	425	890	7.1	450	920
300	323.9	607	525	45 ³⁾	151.8	7.1	445	740	7.1	460	760	8.0	485	790	8.0	515	830
350	355.6	639	550	45 ³⁾	166.4	8.0	405	770	8.0	520	800	8.0	555	840	8.8	580	880
400	406.4	703	600	45 ³⁾	191.3	8.0	565	850	8.0	580	875	8.8	620	925	11.1	660	975
500	508.0	797	690	45 ³⁾	241.1	7.1	670	950	8.0	715	980	10.0	730	1050	14.2	755	1080
600	610.0	912	705	60	294.8	7.1	780	1075	8.8	840	1105	11.0	845	1165	-	-	-
700	711.0	937	895	60	340.6	8.0	895	1100	8.8	910	1140	12.5	960	1190	-	-	-
800	813.0	967	985	60	390.4	8.0	1015	1150	10.0	1025	1180	14.2	1085	1240	-	-	-
900	914.0	1007	1070	60	445.9	10.0	1115	1200	10.0	1125	1230	16.0	1185	1300	-	-	-
1000	1016.0	1060	1160	60	490.0	10.0	1230	1250	10.0	1255	1300	17.5	1320	1370	-	-	-
1200	1220.0	1100	1350	60	588.0	8.0	1340	1280	11.0	1455	1360	-	-	-	-	-	-

¹⁾ Length tolerance (mm): DN100 +2/-3, DN 125 ... 200 +3/-4, DN 250 ... 400 +4/-5, DN 500 ... 1200 +5/-6

²⁾ Wall thickness for pressure rates PN 6 ... 40

³⁾ For all sensors with flange transducers track angle are 60°

⁴⁾ L is the length of sensor versions without flanges (weld-in version)

A**) Space required for replacement of transducer min. 230 mm (9.1 inch).
For replacement with special tool (extraction tool) see more information on page 4/237.

SONO 3100, 2-track

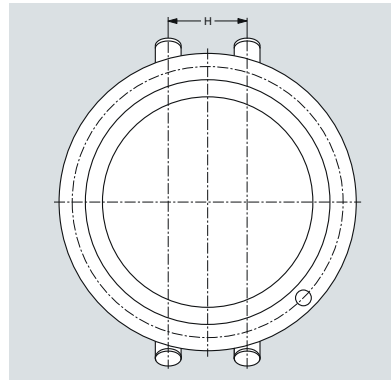
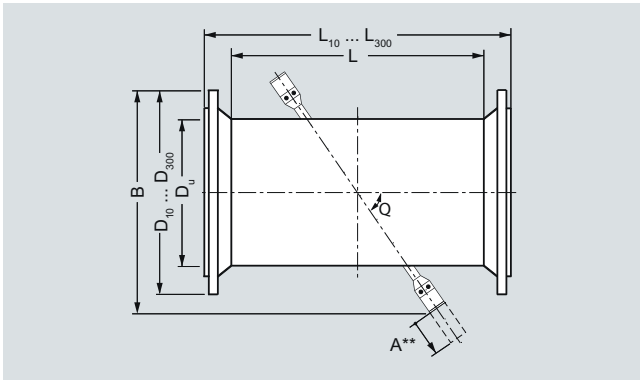
Nominal diam. DN	Flange type - Weight [kg (lbs)]			
	PN 10	PN 16	PN 25	PN 40
100 (4")	-	32 (70.5)	-	35 (77.2)
125 (5")	-	38 (83.8)	-	44 (97.0)
150 (6")	-	45 (99.2)	-	52 (114.6)
200 (8")	59 (130.0)	58 (127.9)	70 (154.3)	79 (174.2)
250 (10")	73 (161.0)	75 (163.3)	96 (211.6)	117 (257.9)
300 (12")	83 (183.0)	92 (202.8)	114 (251.3)	151 (332.9)
350 (14")	98 (216.0)	113 (249.1)	145 (322.9)	191 (421.1)
400 (16")	119 (262.4)	141 (310.9)	191 (421.1)	275 (606.3)
500 (20")	153 (337.3)	207 (456.4)	284 (626.0)	379 (836.0)
600 (24")	193 (425.5)	276 (608.5)	363 (800.3)	-
700 (28")	262 (577.6)	303 (668.0)	480 (1058)	-
800 (32")	329 (725.3)	400 (881.8)	650 (1433)	-
900 (36")	428 (943.6)	475 (1047)	835 (1841)	-
1000 (40")	500 (1102)	594 (1010)	1078 (2377)	-
1200 (48")	680 (1496)	860 (1892)	-	-

Weight of system incl. process flanges and standard O-ring transducers. For sensors with flange transducer please add approx. 10 kg (22.05 lbs).
For SS terminal housings instead of the standard PA housing add approx. 5 kg (11.03 lbs).

Flow Measurement

SITRANS F US Inline

Flowmeter SONO 3100/FUS060



Sensor SONO 3100 with ANSI norm

Size (DN)	D _U	L ^{1) 4)}	B	θ	H	Class 150			Class 300		
						W ₁₅₀ ²⁾	D ₁₅₀	L ₁₅₀ ¹⁾	W ₃₀₀ ²⁾	D ₃₀₀	L ₃₀₀ ¹⁾
inch (mm)	[inch]	[inch]	[inch]	[°]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]	[inch]
4" (100)	4.50	33.86	12.01	45 ³⁾	1.69	0.14	9.00	39.86	0.25	10.00	40.62
5" (125)	5.50	33.94	12.80	45 ³⁾	2.54	0.15	10.00	40.94	0.27	11.00	41.70
6" (150)	6.63	33.94	13.78	45 ³⁾	3.07	0.16	11.00	40.94	0.30	12.50	41.70
8" (200)	8.63	26.30	16.93	45 ³⁾	4.02	0.16	13.50	34.30	0.29	15.00	35.06
10" (250)	10.75	28.11	18.90	45 ³⁾	5.02	0.18	16.00	36.11	0.34	17.50	37.35
12" (300)	12.75	23.90	20.67	45 ³⁾	5.98	0.20	19.00	32.90	0.39	20.50	34.14
14" (350)	14.00	25.16	21.65	45 ³⁾	6.55	0.21	21.00	35.16	-	-	-
16" (400)	16.00	27.68	23.62	45 ³⁾	7.53	0.22	23.50	33.74	-	-	-
20" (500)	20.00	31.38	27.17	45 ³⁾	9.49	0.26	27.50	42.76	-	-	-
24" (600)	24.00	35.91	27.76	60	11.61	0.30	32.00	47.91	-	-	-

1) Length tolerance (mm): 4" +0.08"/-0.12" (+2/-3mm), 5" ... 8" +0.12"/-0.16" (+3/-4mm), 10" to 16" +0.16"/-0.20" (+4/-5mm), 20" ... 24" +0.20"/-0.24" (+5/-6mm)

2) Minimum wall thickness for pressure rates Class 150 or Class 300

3) For all sensors with flange transducers track angle are 60°

4) L is the length of sensor versions without flanges (weld-in version)

A**) Space required for replacement of transducer min. 230 mm (9.1 inch).
For replacement with special tool (extraction tool) see more information in „Sensor SONO 3100 accessories and spare parts“ on page 4/237.

Flow Measurement

SITRANS F US Inline

Flowmeter SONO 3100/FUS060

Approximate weights for SONO 3100 sensor with ANSI B16.5 flanges

Nominal diameter		Weight [kg (lbs)] ¹⁾			
DN	DN	CL150		CL300	
[inch]	[mm]	[kg]	[lbs]	[kg]	[lbs]
4"	100	32	70.5	35	77.2
5"	125	38	83.8	44	97.0
6"	150	45	99.2	52	114.6
8"	200	58	127.9	79	174.2
10"	250	75	165.3	117	257.9
12"	300	92	202.8	151	332.9
14"	350	113	249.1	-	-
16"	400	141	310.9	-	-
20"	500	207	456.4	-	-
24"	600	276	608.5	-	-

¹⁾ Weight of system incl. process flanges and standard O-ring transducers. For sensors with flange transducer please add approx. 10 kg (22.05 lbs). For SS terminal housings instead of the standard PA housing add approx. 5 kg (11.03 lbs).