

Flow Measurement

SITRANS F US Inline

Flowmeter SONO 3300/FUS060

Overview



The combination of SONO 3300 sensor and FUS060 transmitter is ideal for applications within the general industry. Measurements are independent of liquid temperature, density, pressure and conductivity. Transducers cannot be replaced.

Benefits

- Robust remote transmitter FUS060
- Robust design for industrial applications
- Measures all liquids less than 350 cSt, conductive or non-conductive
- No pressure drop
- Reliable and accurate flow measurements
- Long-time stability
- ATEX approval

Application

The main application for SONO 3300/FUS060 ultrasonic flowmeter is measurement of volume.

SONO 3300/FUS060 can be used for water and treated waste water, oil, hot water/cooling systems.

Design

The SONO 3300/FUS060 consists of a casted sensor (DN 50 to 80 (2" to 3")), welded pipes (DN 100 to 300 (4" to 12")) and a transmitter FUS060.

The transmitter can only be mounted separately.

The internal signal cables from transducers to sensor connection box are protected from an aggressive environment by stainless steel pipes.

Sensor installation

See system information.

Technical specifications

The transmitter related to this system is the SITRANS FUS060. Technical specifications to the FUS060 see page 3/247.

2-path sensor with flanges and inline transducers

Error in measurement

Error in measurement at reference conditions $v > 0.5 \dots 10 \text{ m/s}$, $< \pm 0.5 \%$ of rate ($v = \text{flow speed}$)

Max. flow velocity 10 m/s (32 ft/s)

Nominal size

DN 50, DN 65, DN 80, DN 100, DN 125, DN 150, DN 200, DN 250, DN 300 (2" ... 12")

Media temperature

Separate version: $-10 \dots +160 \text{ }^\circ\text{C}$ (14 ... 320 $^\circ\text{F}$)

Ambient temperature (sensor)

Separate version: $-20 \dots +60 \text{ }^\circ\text{C}$ (-4 ... +140 $^\circ\text{F}$)

Storage: $-40 \dots +85 \text{ }^\circ\text{C}$ (-40 ... +185 $^\circ\text{F}$)

Enclosure

Standard version: IP67 (NEMA 4X/NEMA 6)

ATEX version: As standard, but with ATEX approval (see below)

Process connections

PN designated EN 1092-1, type 11 (B)

• DN 50 ... 300 (2" ... 12"), PN 40

• DN 100 ... 300 (4" ... 12"), PN 16

• DN 200 ... 300 (8" ... 12"), PN 10

Class designated EN 1759-1

• DN 50 ... 300 (2" ... 12"), class 150

• DN 50 ... 300 (2" ... 12"), class 300

Transducer

Inline version welded into pipe

Materials

Pipe

• DN 50 ... 80 (2" ... 3"): Cast steel EN 1.1131-GS-15Mn5

• DN 100 ... 300 (4" ... 12"): Carbon steel EN 1.0345-P235GH

Flange

• DN 50 ... 300 (2" ... 12"): EN 1.0025-S235JRG2

Class

ASTM A105

Transducer

Stainless steel AISI 316 or similar

Certificates and approvals

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 available on special request (PVR)
Calibration report	A standard calibration report is shipped with each flowmeter.
Extended accredited ISO/IEC 17025 calibration certificates	Optionally available
Approvals	No custody transfer approvals
Ex approval	System ATEX approval for SONO 3300 with remote transmitter FUS060-Ex (ATEX II 2 G Ex dem [ia/ib] IIC T6/T4/T3 Gb) For Ex version the transducer cable length is restricted to 3 m (9.84 ft), in order to meet requirements.

The sensors are approved according to EU directive 2014/68/EU dated 27 June 2014 regarding fluid group 1, classified in category III. Design according to EN 13480 (PED Directive).

Coaxial cable between sensor SONO 3300 and transmitter FUS060

Standard Coaxial cable (75 Ω)	Coaxial cable with SMB straight plug on one end for the FUS060 connector
Outside diameter	Ø 5.8 mm
Length	3, 15, 30, 60, 90, 120 m (9.84, 49.21, 98.43, 196.85, 295.28, 393.70 ft) between sensor and transmitter
Material (outside jacket)	black PE
Ambient temperature	-10 ... +70 °C (14 ... 158 °F)
High temperature Coaxial cable (75 Ω)	Coaxial cable with SMB straight plug on one end for the FUS060 connector
Outside diameter	Ø 5.13 mm (first 0.3 m (0.98 ft) part to the transducer), Ø 5.8 mm (for remaining cable to the transmitter - with SMB plug at the end) and between these is a black hot melt junction Ø 16 mm (length 70 mm)
Length	3, 15, 30, 60, 90, 120 m (9.84, 49.21, 98.43, 196.85, 295.28, 393.70 ft) between sensor and transmitter (max. 3 m (9.84 ft)) transducer cable length for Ex area mounted transmitters)
Material (outside jacket)	Brown PTFE (0.3 m (0.98 ft) part) and black PE (for remaining cable)
Ambient temperature	-200 ... +200 °C (-328 ... +392 °F) (brown PTFE transducer part) and -10 ... +70 °C (14 ... 158 °F) (black PE for remaining transmitter cable part)



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Selection and Ordering data Article No. Order code

Sensor SONO 3300 with transmitter FUS060 7ME3300 -

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Diameter	Qn setting [m³/h]	
DN 50 (2")	10	1 A
DN 50 (2")	26	1 B
DN 50 (2")	60	1 D
DN 65 (2½")	15	1 E
DN 65 (2½")	42	1 F
DN 65 (2½")	100	1 H
DN 80 (3")	20	1 J
DN 80 (3")	60	1 K
DN 80 (3")	150	1 M
DN 100 (4")	36	1 N
DN 100 (4")	100	1 P
DN 100 (4")	230	1 R
DN 125 (5")	50	1 S
DN 125 (5")	150	1 T
DN 125 (5")	360	1 V
DN 150 (6")	80	2 A
DN 150 (6")	220	2 B
DN 150 (6")	500	2 D
DN 200 (8")	120	2 E
DN 200 (8")	380	2 F
DN 200 (8")	900	2 H
DN 250 (10")	200	2 J
DN 250 (10")	600	2 K
DN 250 (10")	1400	2 M
DN 300 (12")	300	2 N
DN 300 (12")	850	2 P
DN 300 (12")	2200	2 R

Flange norm and pressure rating
(All sizes are not available in all pressure ratings)

EN 1092-1	
PN 10 (DN 200 ... 300 (8" ... 12"))	B
PN 16 (DN 80 ... 300 (3" ... 12"))	C
PN 40 (DN 50 ... 300 (2" ... 12"))	E
ANSI B16.5	
class 150 (DN 50 ... 300 (2" ... 12"))	H
class 300 (DN 50 ... 300 (2" ... 12"))	J

Sensor type (approval) and transmitter mounting

IP67 standard, remote transmitter	1
IP67 Ex-version (ATEX), remote transmitter (Ex-version)	3

Cable gland entries in FUS060 and SONO 3300

Cable glands M20 in sensor and in transmitter M25/20/16 x 1.5	1
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Transmitter version of SITRANS FUS060

IP65 (NEMA 4), 120/230 V AC	N
IP65 (NEMA 4), 24 V AC/DC	P
IP65 (NEMA 4), 24 V AC/DC, Ex-version (ATEX)	Q

Selection and Ordering data Article No. Order code

Sensor SONO 3300 with transmitter FUS060 7ME3300 -

FUS060 output module

HART, 4 ... 20 mA, 1 pulse output, 1 relay	B
HART, Ex version, 4 ... 20 mA, 1 pulse output, 1 relay	C
PROFIBUS PA, 1 pulse/frequency	D

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

Selection and Ordering data Order code

Additional information

Please add „-Z“ to Article No. and specify Order code(s) and plain text.	
<u>Calibration</u>	
Production calibration DN 50 ... DN 300 (with certificate, 2 x 3 points in 10 %, 25 % and 100 % Qn)	Included
Accredited Siemens ISO/IEC 17025 calibration for DN 50 to DN 200 with Qn as selected in Diameter. Calibration certificate: 2 x 5 points in 5%, 10 %, 25 %, 50% and 100 % Qn (max. flow 630 m³/h).	D20
Accredited Siemens ISO/IEC 17025 calibration for DN 200 to DN 300 with Qn as selected in Diameter. Calibration certificate: 2 x 5 points in 5 %, 10 %, 25 %, 50 % and 100 % Qn (max. flow 2000 m³/h).	D21
<u>Material certificate</u>	
EN 10204-3.1	F10
<u>Tag name plate</u>	
Stainless steel TAG plate (1 x 24 x 80 mm), wire fixed. Font size depends on text length: 8 mm for 1 ... 10 characters, 4 mm for 11 ... 20 characters (specify in plain text).	Y17



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

www.pia-portal.automation.siemens.com

Flowmeter SONO 3300 with FUS060 operating instructions, accessories and spare parts**Operating instructions**


Description	Article No.
SITRANS FUS060	
• English	A5E01204521
• German	A5E02123845
SITRANS F US SONO 3300	
• English	A5E01365400
• German	A5E02690975

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

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


Accessories**Potting kit**

Description	Article No.
Potting kit for terminal box of SONO 3200 transducers for IP68/NEMA 6P (not for Ex sensors)	FDK:085L2403



Cable connection boxes

(Optional for the connection of individually transducer cables with the FUS060 transducer cables)


Description	Article No.
Junction box for coaxial cable	
• IP65 metal box for 4 coaxial cables	FDK:085B1361


Spare parts**Cables for SONO 3300 with FUS060 (only as spare parts)**

Description	Length m (ft)	Article 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
	120 (393.70)	A5E01278698
High temp. coaxial cable for FUS060; with 0.3 m brown PTFE high temp. transducer part (max. 200 °C (392 °F)) and black PVC transmitter part with SMB plug (max. 70 °C (158 °F)); impedance 75 Ω (2 pcs.)	3 (9.84)	A5E00875105
	15 (49.21)	A5E00861435
	30 (98.43)	A5E01196952


Cable glands (for the SONO 3300 terminal box) (only as spare parts)

Type	Material	Temperature range [°C (°F)]	Article No.
M20	Nickel-plated brass, 2x cables Ø 5 ... 6 mm (2 pcs.)	-25 ... +200 (-13 ... +392)	A5E02246329



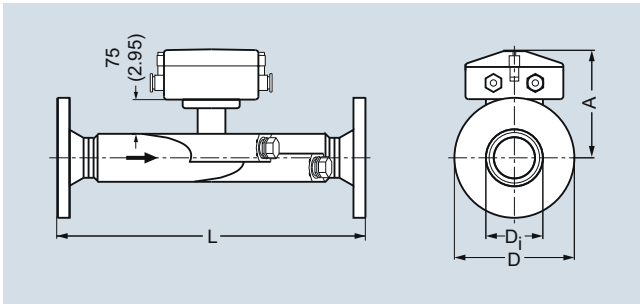
Flow Measurement

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Description	Article No.	Description	Article No.
SONO 3300 terminal box lid, in stainless steel painted black (1 pc.)	FDK-085U1505	SONO 3300 stainless steel terminal box (1 pc.), M20 cable gland version, incl. lid in stainless steel (painted black) and gasket in EPDM	A5E00836867
Gasket for SONO 3300 terminal lid in EPDM (1 pc.)	FDK-085U1820	Coax cable connecting plate (1 pc.) for SONO 3300 terminal box and use with transmitter type FUS060	A5E02593568

Dimensional drawings



Sensor SONO 3300, dimensions in mm (inch)

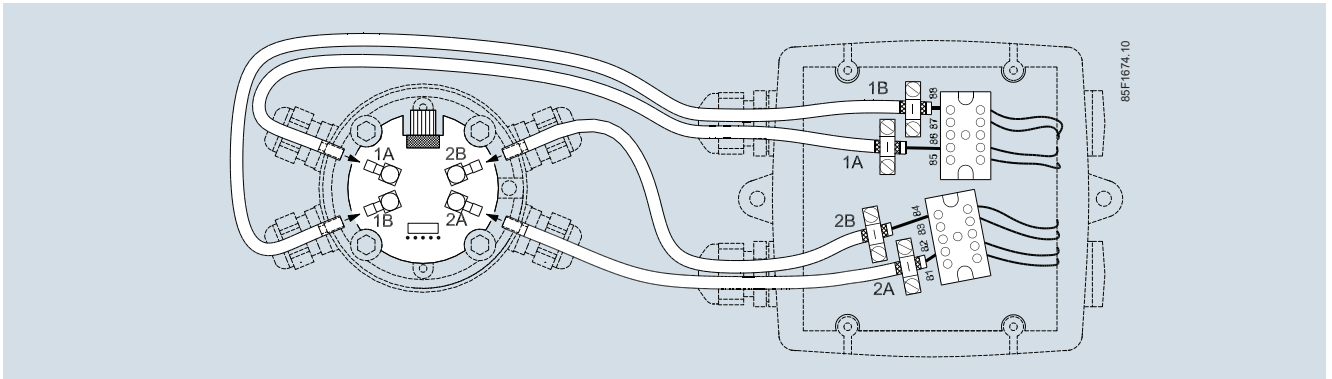
DN	EN 1092-1																	
	PN 10						PN 16						PN 40					
	L ¹⁾		D		Di		L ¹⁾		D		Di		L ¹⁾		D		Di	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
50													475	18.70	165	6.50	52.60	2.07
65													475	18.70	185	7.28	62.70	2.47
80							380	14.96	200	7.87	78.00	3.07	400	15.75	200	7.87	78.00	3.07
100							375	14.76	220	8.66	102.40	4.00	400	15.75	235	9.25	102.40	4.00
125							375	14.76	250	9.84	128.30	5.05	400	15.75	270	10.63	128.30	5.05
150							360	14.17	285	11.22	154.20	6.07	400	15.75	300	11.81	154.20	6.07
200	400	15.75	340	13.39	207.30	8.16	400	15.75	340	13.39	207.30	8.16	450	17.72	375	14.76	206.50	8.13
250	400	15.75	395	15.55	260.40	10.25	400	15.75	405	15.94	260.40	10.25	500	19.69	450	17.72	258.80	10.19
300	400	15.75	445	17.52	309.70	12.19	420	16.54	460	18.11	309.70	12.19	500	19.69	515	20.28	307.90	12.12

DN	ANSI												Weight ²⁾					
	150 lb						300 lb						EN and ANSI		EN		ANSI	
	L ¹⁾		D		Di		L ¹⁾		D		Di		A		kg	lb	kg	lb
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch				
50 mm/2"	510	20.08	152	5.98	52.6	2.07	520	20.47	165	6.50	52.6	2.07	180	7.09	14	30.9	17	37.5
65 mm/2½"	510	20.08	178	7.01	62.7	2.47	520	20.47	190	7.48	62.7	2.47	186	7.32	16	35.3	20	44
80 mm/3"	420	16.54	191	7.52	78.0	3.07	440	17.32	210	8.27	78.0	3.07	193	7.60	19	42	23	51
100 mm/4"	420	16.54	229	9.01	102.4	4.03	440	17.32	254	10	102.4	4.03	205	8.07	25	55	35	78
125 mm/5"	440	17.32	254	10.00	128.3	5.05	460	18.11	279	10.98	128.3	5.05	218	8.58	29	64	40	89
150 mm/6"	430	16.93	279	10.98	154.2	6.07	450	17.71	318	12.52	154.2	6.07	232	9.13	35	78	50	111
200 mm/8"	480	18.90	343	13.50	202.7	7.98	500	19.69	381	15	202.7	7.98	256	10.08	54	119	72	160
250 mm/10"	490	19.29	406	15.98	254.5	10.02	520	20.47	444	17.48	254.5	10.03	283	11.14	85	189	98	217
300 mm/12"	550	21.65	483	19.02	306.3	12.06	580	22.83	521	20.51	306.3	12.06	309	12.17	115	256	142	322

¹⁾ Length tolerance (mm): DN 50 ... 100 +2/-3, DN 125 ... 200 +3/-4, DN 250 ... 300 +4/-5

²⁾ Approximate weights without transmitter FUS060 - weight of FUS060 is 4.4 kg (9.7 lb)

Schematics



Electrical connection of SITRANS FUS060 and SONO 3300