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 and liquefied gases, hot water / cooling systems.

Design

The SONO 3300/FUS060 consists of a casted sensor (DN 50 to 150 (2” to 6”)), welded pipes (DN 200 to 300 (8” 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 4/214.

2-track sensor with flanges and integrated transducers	
Error in measurement	
Error in measurement at reference conditions; % of measured value	v > 0.5...10 m/s, < ± 0.5% of rate (v=flow speed)
	SONO 3300 DN 50 and DN 65: For Reynolds numbers $1000 < R_e < 5000$: ± 1.5%
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/surface temperature	Separate version: -10 … +160 °C (14 … 320 °F)
Ambient temperature (sensor)	Separate version: -20 ... +60 °C (-4 ... +140 °F)
	Storage: -40 … +85 °C (-40 … +185 °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	• 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	Integrated version welded into pipe
Materials	
Pipe	• DN 50 ... 150 (2” … 6”): Steel EN 1.113145-16Mn5
	• DN 200 ... 300 (8” … 12”): 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

Flowmeter SONO 3300/FUS060

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 optionally available
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 2G Ex dem [ia/ib] IIC T6/T4/T3) For Ex version the transducer cable length is restricted to 3 m (9.84 ft), in order to meet requirements for electrical immunity.

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).

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)

Selection and Ordering data		Order No.	Order code
Sensor SONO 3300 with transmitter FUS060		**7ME3300 -**	
		0 -	
Diameter	**Qn setting [m^3/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**	
Transmitter 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	Order No.	Order code
Sensor SONO 3300 with transmitter FUS060	**7ME3300 -**	
	0 -	
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**
PROFIBUS PA, Ex version, 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**

Please also see www.siemens.com/SITRANSFordering for practical examples of ordering

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Order No. and specify Order code(s) and plain text.	
Calibration	
Sensor prepared for older SONO 3000 transmitters	**A30**[1) 2)]
Production calibration DN 50 ... DN 300 (with certificate)	**Included**
Accredited Siemens ISO/IEC 17025 calibration for DN50 to DN150 with Qn as selected in Diameter. Verification certificate: 2 x 3 points in 10%, 25% and 100% Qn (max. flow 325 m^3/h).	**D20**
Accredited Siemens ISO/IEC 17025 calibration for DN125 to DN300 with Qn as selected in Diameter. Verification certificate: 2 x 3 points in 10%, 25% and 100% Qn (max. flow 1300 m^3/h).	**D21**
Material certificate	
EN 10204-3.1	**F10**
EN 10204-3.1 with 100% NDT on weldings	**F11**[2)]
Pressure certificate	
EN 10204-2.3	**F21**
Tag name plate	
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**

[1)] In preparation

[2)] On request

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Flowmeter SONO 3300/FUS060

Selection and Ordering data	Order code
Operating instructions	
for SITRANS FUS060 transmitter	
• English	**A5E01204521**
• German	**A5E02123845**
for SITRANS F US SONO 3300 sensor	
• English	**A5E01365400**
• German	**A5E02690975**
• Spanish	**A5E02690992**
• French	**A5E02690987**
• Italian	**A5E01365400**

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

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

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

www.pia-selector.automation.siemens.com

Sensor SONO 3300 accessories and spare parts

Potting kit

Description	Order No.	
Potting kit, IP68, 10 m (32.81 ft) w.g. rating	**FDK:085L2403**	

Cables for SONO 3300 with FUS060

(only as spare parts)

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**	
	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 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**	

Cable glands (for the SONO 3300 terminal box)

(only as spare parts)

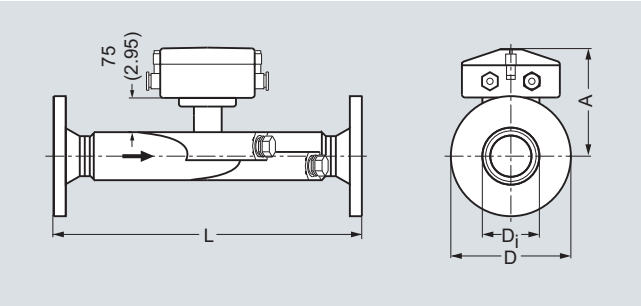
Type	Material	Temperature range [°C (°F)]	Order No.	
M20	Nickel-plated brass, 2x cables Ø 5 ... 6 mm (2 pcs.)	-25 ... +200 (-13 ... +392)	**A5E02246329**	

Description	Order No.	
SONO 3300 terminal box lid, in metal (1 pc.)	**A5E02593569**	
Gasket for SONO 3300 terminal lid (1 pc.)	**A5E02593567**	
SONO 3300 SS terminal box (1 pc.), incl. 2 x M20 cable glands, incl. lid and gasket	**A5E02593566**	

Description	Order No.	
Coax cable connecting plate (1 pc.) for the SONO 3300 terminal box and use with transmitter type FUS060	**A5E02593568**	

Flowmeter SONO 3300/FUS060

Dimensional drawings of sensor SONO 3300



Sensor SONO 3300

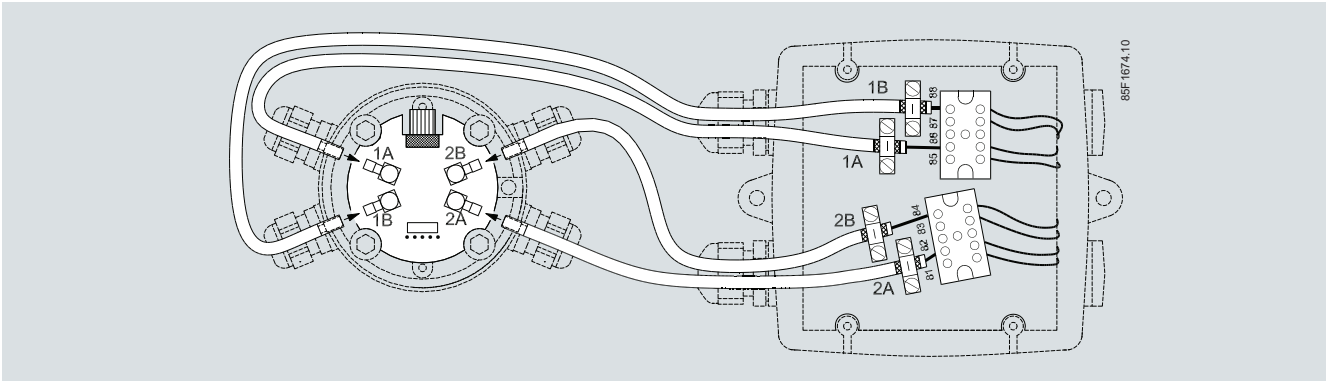
DN	EN 1092-1																	
	PN 10						PN 16						PN 40					
	$L^{1)}$		D		D_i		$L^{1)}$		D		D_i		$L^{1)}$		D		D_i	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
50													475	18.70	165	6.50	52.60	2.07
65													475	18.70	185	7.28	62.70	2.47
80							380	14.96	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 (PN 40)		ANSI CL 300	
	$L^{1)}$		D		D_i		$L^{1)}$		D		D_i		A					
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	kg	lbs	kg	lbs
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): DN50 ... DN100 +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

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