Flowmeter SONOKIT (with FUS060 or FUS080)

Overview

SONOKIT is a transit time based ultrasonic flowmeter for retrofitting on existing pipelines.

The kit offers all necessary parts and special tools to make the installation as 1-path or 2-path flowmeter.

The set is made for installation on empty pipes or pipes under pressure without process shut-down (hot-tap).

Please contact Siemens for further information on hot-tap tools and instructions.

SONOKIT has inline transducers (in contact with media) which assure superior accuracy and performance.

Benefits

- Cost-effective solution – contains all the necessary components for retrofitting
- SONOKIT is easy to install in pipeline sizes DN 200 to DN 3000 (8" to 120") 1-path DN 100 to DN 2400 (4" to 96").
- No bypass installation necessary – withstands pressures up to 40 bar (580 psi) and media temperatures between -20 °C and +200 °C (-4 °F and +392 °F)
- High accuracy – the bigger the pipe, the more accurate the result
- Solid construction and no moving parts for a 100 % maintenance and obstruction-free flowmeter
- The SONOKIT comes with transducers in IP68 enclosure
- Available in a robust version that can be buried and withstands constant flooding
- Inline transducers assure superior accuracy and performance
- Automatic calculation of the calibration factor when pipe geometry data are entered in the transmitter
- FUS060 transmitter versions with HART or PROFIBUS PA
- FUS080 transmitter, battery or mains-powered

Application

- Raw water intake for water treatment plants
- Water distribution systems
- Irrigation systems
- Power generation (energy and water)
- District heating plants
- Cooling water plants within the industry and in power stations
- Systems within the oil and refinery business
- Sewage treatment plants
- Plants transporting non-conductive liquids

Design

The SONOKIT package box contains all necessary parts to build an ultrasonic flowmeter on existing pipes depending on choices at ordering:

- Papers to wrap around pipes for alignment of sensors
- Transducer alignment tools
- Mounting plates, transducer holders and SONO 3200 transducers
- Transducer cables
- SITRANS FUS060 or FUS080 transmitter for wall mounting
- 4-path version (up to DN 1500 (60")) is available on special request (PVR)

Technical specifications

The transmitter related to this system is the SITRANS FUS080 or FUS060.

Technical specifications to the FUS060 see page 3/256 and to FUS080 see page 3/262.

Accuracy	
Typical, depending on accuracy of measurements of installation	• 2-path: ≤ ± (0.5 … 1.5 %) • 1-path: ≤ ± (1 … 3 %)

Note:
Accuracy depends on the accuracy of the measurements taken at location. This means that inaccurate measurements of angles, distance between transducers, wall thickness and pipe diameter have a direct effect on the accuracy. Values measured are entered into the memory of the FUS060 or FUS080 transmitter.

Requirements for pipes

Size	FUS060: DN 100 … DN 3000 (4" … 120") FUS080: DN 100 … DN 1200 (4" … 48")
Line pressure	max. 40 bar (580 psi)
Media temperature	
• Standard	-10 ... +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)
Ambient temperature (sensor)	
• Standard and Ex-i version	-20 ... +60 °C (-4 ... +140 °F)
• Ex d version	-20 ... +180 °C (-4 ... +356 °F)
Transducer enclosure/ approvals/certificates	
Standard version	IP67 (NEMA 6)/IP68 (NEMA 6P)
Ex approval	System ATEX approval for SONO 3200 Ex i transducers together with transmitter FUS060-Ex: ATEX II 2 G Ex dem [ia/ib] IIC T6/T4/T3 Gb or ATEX II 2G Ex d IIC T3-T6 Gb with SONO 3200 Ex d transducers (for standard FUS060 transmitter, installed outside of Ex zone)
Material certificates	EN 10204-3.1 material certificate on transducer mounting parts
Transducer materials	
Terminal housing	Standard version: PA 6.6, 100 °C (212 °F) or stainless steel AISI 316, 200 °C (392 °F)
Transducer body	Standard version: Stainless steel AISI 316, 200 °C (392 °F)

Materials of existing pipeline	
Steel	Transducer holder: EN 10273 or EN 10216 (P235GH) Mounting plates[1]: EN 10273 or EN 10216 (P235GH)
Concrete	Transducer holder: Stainless steel AISI 316 or similar Mounting plates[1]: (not included)
Stainless steel	Transducer holder: Stainless steel AISI 316 or similar Mounting plates[1]: Stainless steel AISI 316 or similar
Pipe wall thickness	
Steel pipe (AISI 316 and St. 37.2 or corresponding material)	Transducer and holder available in length L = 160, allowing a pipe wall thickness up to 20 mm (0.79")
Concrete pipe	Transducer and holder available in length L = 230, allowing a pipe wall thickness up to 200 mm (7.9") and pipe sizes ≥ DN 600

Dimension of the package box (L x W x H, approx.)	856 x 390 x 344 mm (33.7" x 15.4" x 13.5")
Weight example of a package (standard 2-path with FUS060)	approx. 53 kg (116.8 lb)
Certificates and approvals	
Conformity certificate	The devices are supplied as standard with a Siemens Certificate of Conformity on a DVD
Material certificate	Material certificate for the transducer parts according to EN 10204-3.1 is optionally available
Approvals	No custody transfer approvals

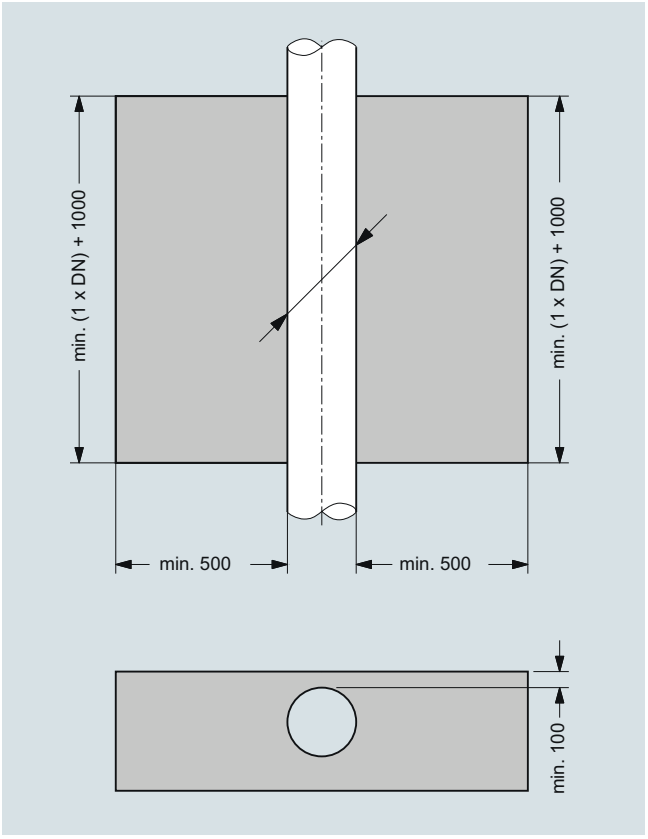
Information on PED approval:

The SONOKIT includes the pipe mounting parts only and therefore it cannot be PED-approved. After the installation, all installation-related activities (welding, pressure test etc.) are the responsibility of the customer.

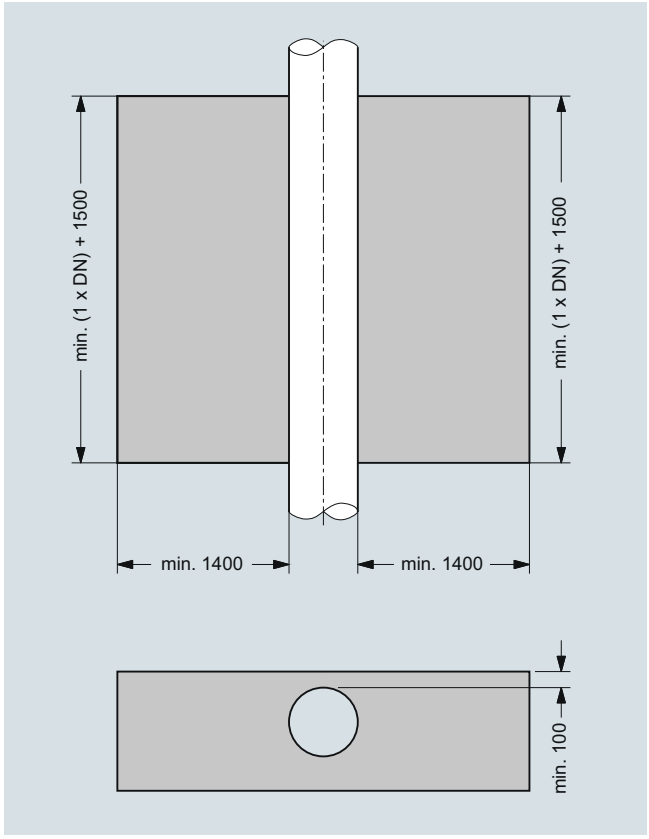
[1] Mounting plates are only included for empty pipe installation types (refer to selection "A"). For hot tap mounting the mounting plates are not included (refer to selection "B").

Installation requirements

The space requirements (in mm) around the pipe for retrofitting a SITRANS F US ultrasonic flowmeter type SONOKIT are given below in mm:



Empty pipe installation



Hot-tap installation

Flowmeter SONOKIT (with FUS060 or FUS080)

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Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT 1-path sensor		7ME3210-	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Diameter	**Qn setting [m^3/h]**		
DN 100 (4")	100	1P	
DN 125 (5")	150	1T	
DN 150 (6")	220	2B	
DN 200 (8")	380	2F	
DN 250 (10")	600	2K	
DN 300 (12")	850	2P	
DN 350 (14")	1000	2T	
DN 400 (16")	1300	3B	
DN 450 (18")	1700	3F	
DN 500 (20")	2200	3K	
DN 550 (22")	2600	3P	
DN 600 (24")	3200	3T	
DN 650 (26")	3600	4B	
DN 700 (28")	4200	4F	
DN 750 (30")	4800	4K	
DN 800 (32")	5500	4P	
DN 900 (36")	7500	5B	
DN 1000 (40")	9000	5K	
DN 1100 (44")	10000	5P	
DN 1200 (48")	13200	5T	
Only for FUS060			
DN 1300 (52")	14000	6A	
DN 1400 (56")	16800	6C	
DN 1500 (60")	19000	6E	
DN 1600 (64")	22800	6G	
DN 1700 (68")	25000	6J	
DN 1800 (72")	27600	6L	
DN 1900 (76")	31000	6N	
DN 2000 (80")	36000	6Q	
DN 2100 (84")	37000	6S	
DN 2200 (88")	42000	6U	
DN 2300 (92")	45000	6W	
DN 2400 (96")	51000	7A	
Installation method[1]			
Empty pipe (incl. transducer holder and mounting plates). Alignment rods and tools must be ordered as accessories.		A	
Hot tap, mounting under pressure (mounting plates **not** incl.). Special mounting tools to be ordered separately.		B	
Transducer holder			
Carbon steel, length = 160 mm, mounting plates in carbon steel		1	
Stainless steel, length = 160 mm, mounting plates in stainless steel		2	
Stainless steel, length = 230 mm, for concrete pipe (DN 600 ... DN 2400)		3	
Transducer type and approval			
IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 100 °C (212 °F), no approval		1	
IP68 SS housing, PN 40, O-ring, 180 °C (356 °F), Ex d, ATEX approval (only with standard FUS060)		2	
IP68 PA housing, Sylgard potting kit, PN 40, O-ring, 100 °C (212 °F), no approval		3	
IP68 SS housing, Sylgard potting kit, PN 40, O-ring, 200 °C (392 °F), no approval		4	
IP67 SS housing, PN 40, O-ring, 190 °C (374 °F), Ex i type, ATEX approval (only with FUS060 Ex)		5	
Cable gland entries			
Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5 (FUS080 only M20)		1	
Cable glands ½" NPT in transducers and in transmitter (only with FUS060)		2	
Transmitter version of SITRANS FUS060 (only DN 100 ... 2400 (4" ... 96")			
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		Q	
Transmitter version of SITRANS FUS080 (only DN 100 ... 1200 (4" ... 48"))			
PDM software tool and IrDA-adapter, which are needed for settings update, to be ordered separately, see FUS080 accessories			
IP67/NEMA 4X/6 115 ... 230 V AC		U	
IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack		V	
IP67/NEMA 4X/6 115 ... 230 V AC, incl. 3.6 V single battery backup		W	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[2]		X	
Transmitter output module			
Transmitter SITRANS FUS080:			
Pulse and/or alarm output (standard for FUS080).		A	
Transmitter SITRANS FUS060:			
HART, 1 pulse output, 1 relay		B	
HART Ex version, 1 pulse output, 1 relay		C	
PROFIBUS PA, 1 pulse/frequency		D	
Transducer coaxial cables (with FUS080 only, 15 and 30 m, 70°C (158 °F) cable types)			
2 x 3 m, max. 70 °C (158 °F), the only option for Ex i		0	
2 x 15 m, max. 70 °C (158 °F)		1	
2 x 30 m, high temp. max. 200 °C (392 °F)		2	
2 x 30 m, max. 70 °C (158 °F)		3	
2 x 60 m, max. 70 °C (158 °F)		4	
2 x 90 m, max. 70 °C (158 °F)		5	
2 x 120 m, max. 70 °C (158 °F)		6	
2 x 3 m, high temp. max. 200 °C (392 °F), the only option for Ex i		7	
2 x 15 m, high temp. max. 200 °C (392 °F)		8	
Special version (add Order code):			
No transducer cable, cable length 2 x 3 m, the only option for Ex i		9	R0A
No transducer cable, cable length 2 x 15 m		9	R0B
No transducer cable, cable length 2 x 30 m		9	R0C
No transducer cable, cable length 2 x 60 m		9	R0D
No transducer cable, cable length 2 x 90 m		9	R0E
No transducer cable, cable length 2 x 120 m		9	R0F

[1] Mounting tools must be ordered separately as "-Z"-options.

[2] Lithium batteries are subject to special transportation regulations according to United Nations "Regulation of Dangerous Goods, UN 3090 and UN 3091". Special transport documentation is required to observe these regulations. This may influence both transport time and costs."

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Article No. and specify Order code(s) and plain text.	
Material certificate	
EN 10204-3.1, transducer body material	**F30**
EN 10204-3.1, transducer holder material	**F31**
EN 10204-3.1, mounting plate material	**F32**
Regional specific approval	
KCC marking for Korea	**W28**
Tag name plate	
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**
Accessories	
Alignment rods-set for DN 100 ... 650 (4" ... 26") ∅ = 25 mm, L = 500 mm, 3 pcs.	**S10**
Alignment rods-set for DN 700 ... 1900 (28" ... 76") ∅ = 25 mm, L = 500 mm, 6 pcs.	**S11**
Alignment rods-set for DN 2000 ... 2400 (80" ... 96") ∅ = 25 mm, L = 500 mm, 8 pcs.	**S12**
Spanner key for tranducer mounting type SONO 3200 O-ring type	**T11**
Tool set with various mounting/spare parts for SONOKIT installation	**T12**

Operating instructions

Description	Article No.
SITRANS FUS060	
• English	**A5E01204521**
• German	**A5E02123845**
SITRANS FUS080	
• English	**A5E03059912**
• German	**A5E31628428**
SITRANS F US SONOKIT 1-path	
• English	**A5E00814557**
• German	**A5E02610428**

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Flowmeter SONOKIT (with FUS060 or FUS080)

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Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT 2-path sensor		↗ 7ME3220-	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Diameter	**Qn setting [m³/h]**		
DN 200 (8")	380	2F	
DN 250 (10")	600	2K	
DN 300 (12")	850	2P	
DN 350 (14")	1000	2T	
DN 400 (16")	1300	3B	
DN 450 (18")	1700	3F	
DN 500 (20")	2200	3K	
DN 550 (22")	2600	3P	
DN 600 (24")	3200	3T	
DN 650 (26")	3600	4B	
DN 700 (28")	4200	4F	
DN 750 (30")	4800	4K	
DN 800 (32")	5500	4P	
DN 900 (36")	7500	5B	
DN 1000 (40")	9000	5K	
DN 1100 (44")	10 000	5P	
DN 1200 (48")	13 200	5T	
Only for FUS060			
DN 1300 (52")	14 000	6A	
DN 1400 (56")	16 800	6C	
DN 1500 (60")	19 000	6E	
DN 1600 (64")	22 800	6G	
DN 1700 (68")	25 000	6J	
DN 1800 (72")	27 600	6L	
DN 1900 (76")	31 000	6N	
DN 2000 (80")	36 000	6Q	
DN 2100 (84")	37 000	6S	
DN 2200 (88")	42 000	6U	
DN 2300 (92")	45 000	6W	
DN 2400 (96")	51 000	7A	
DN 2500 (100")	53 000	7C	
DN 2600 (104")	60 000	7E	
DN 2700 (108")	62 000	7G	
DN 2800 (112")	72 000	7J	
DN 2900 (116")	71 000	7L	
DN 3000 (120")	78 000	7N	
Installation method[1]			
Empty pipe (incl. transducer holder and mounting plates). Alignment rods and tools must be ordered as accessories.		A	
Hot tap, mounting under pressure (mounting plates **not** incl.). Special mounting tools to be ordered separately.		B	

[1] Mounting tools must be orderd separately as "-Z" options

Selection and Ordering data	Article No.	Ord. code
SITRANS F US SONOKIT 2-path sensor	7ME3220-	
Transducer holder		
Carbon steel, length = 160 mm, mounting plates in carbon steel	1	
Stainless steel, length = 160 mm, mounting plates in stainless steel	2	
Stainless steel, length = 230 mm, for concrete pipe (DN 600 ... DN 3000)	3	
Transducer type and approval		
IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 100 °C (212 °F), no approval	1	
IP68 SS housing, PN 40, O-ring, 180 °C (356 °F), EEx d, ATEX approval (only with standard FUS060)	2	
IP68 PA housing, Sylgard potting kit, PN 40, SS, O-ring, 100 °C (212 °F), no approval	3	
IP68 SS housing, Sylgard potting kit, PN 40, SS, O-ring, 200 °C (392 °F), no approval	4	
IP67 SS housing, PN 40, O-ring, 190 °C (374 °F), Ex i, ATEX approval (only with FUS060 Ex)	5	
Cable gland entires		
Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5 (FUS080 only M20)	1	
Cable glands ½" NPT in transducers and in transmitter (only with FUS060)	2	
Transmitter version of SITRANS FUS060 (only DN 200 ... 4000 (8" ... 160"))		
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	Q	
Transmitter version of SITRANS FUS080 (only DN 200 ... 1200 (8" ... 48"))		
PDM software tool and IrDA-adapter, which are needed for settings update, to be ordered separately, see FUS080 accessories		
IP67/NEMA 4X/6 115 ... 230 V AC	U	
IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack	V	
IP67/NEMA 4X/6 115 ... 230 V AC, incl. 3.6 V single battery backup	W	
IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)[4]	X	
Transmitter output module		
Transmitter SITRANS FUS080:		
Pulse and/or alarm output (standard for FUS080).	A	
Transmitter SITRANS FUS060:		
HART, 1 pulse output, 1 relay	B	
HART Ex version, 1 pulse output, 1 relay	C	
PROFIBUS PA, 1 pulse/frequency	D	

Selection and Ordering data	Article No.	Ord. code	
SITRANS F US SONOKIT 2-path sensor	**7ME3220 -** ■■■■■ - ■■■■	■■■	
Transducer coaxial cables (with FUS080 only, 15 and 30 m, 70°C (158 °F) cable types)			
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) (up to DN 3000)		**4**	
4 x 90 m, max. 70 °C (158 °F) (up to DN 3000)		**5**	
4 x 120 m, max. 70 °C (158 °F) (up to DN 3000)		**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**	
Special version (add Order code):			
No transducer cable, cable length 4 x 3 m, the only option for Ex i		**9**	**R0A**
No transducer cable, cable length 4 x 15 m		**9**	**R0B**
No transducer cable, cable length 4 x 30 m		**9**	**R0C**
No transducer cable, cable length 4 x 60 m (up to DN 3000)		**9**	**R0D**
No transducer cable, cable length 4 x 90 m (up to DN 3000)		**9**	**R0E**
No transducer cable, cable length 4 x 120 m (up to DN 3000)		**9**	**R0F**

Selection and Ordering data	Order code
Additional information	
Please add „**-Z**" to Article No. and specify Order code(s) and plain text.	
Material certificate	
EN 10204-3.1, transducer body material	**F30**
EN 10204-3.1, transducer holder material	**F31**
EN 10204-3.1, mounting plate material	**F32**
Tag name plate	
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**
Regional specific approval	
KCC marking for Korea	**W28**
Accessories	
Alignment rods-set for DN 100 ... 750 (4" ... 30") ∅ = 25 mm, L = 500 mm, 3 pcs.	**S10**
Alignment rods-set for DN 800 ... 2100 (32" ... 84") ∅ = 25 mm, L = 500 mm, 6 pcs.	**S11**
Alignment rods-set for DN 2200 ... 3000 (88" ... 120") ∅ = 25 mm, L = 500 mm, 8 or 10 pcs.	**S12**
Spanner key for tranducer mounting type SONO 3200 O-ring type	**T11**
Tool set with various mounting/spare parts for SONOKIT installation	**T12**

Operating instructions

Description	Article No.
SITRANS FUS060	
• English	**A5E01204521**
• German	**A5E02123845**
SITRANS FUS080	
• English	**A5E03059912**
• German	**A5E31628428**
SITRANS F US SONOKIT 2-path	
• English	**A5E02445496**
• German	**A5E02554972**

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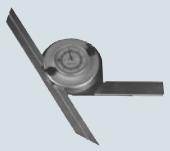
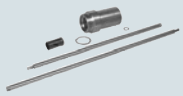
Flowmeter SONOKIT accessories and spare parts

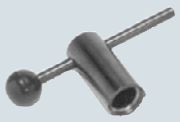
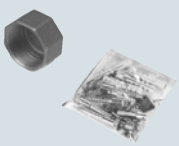
Accessories

Potting kit for SONO 3200 terminal housing

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

Tools for SONO 3200 transducers and SONOKIT

Description	Article No.	
Extraction tool for replacement of SONO 3200 O-ring transducers under pressure and for hot-tapping (working conditions: typically water, max. 40 bar and max. 60 °C (max. 580 psi and max. 140 °F)) For transducer length:		
• Up to 160 mm (6.3")	**FDK:085B5333**	
• Up to 230 mm (9.1")	**FDK:085B5335**	
Angle measurement tool for SONOKIT	**FDK:085B5330**	
Hot-tap drilling tool for SONOKIT, the extraction tool is required, max. pressure 40 bar (580 psi)	**FDK:085B5392**	
Alignment tool for SONOKIT (typically for hot-tapping) For use on pipe sizes in the range DN 300 to DN 1200.	**FDK:085B5393**	

Description	Article No.	
Alignment rods-set for DN 100 ... 650 (4" ... 26"), ∅ = 25 mm, L = 500 mm, 3 pcs.	**A5E02609214**	
Alignment rods-set for DN 700 ... 1900 (28" ... 76"), ∅ = 25 mm, L = 500 mm, 6 pcs.	**A5E02609215**	
Alignment rods-set for DN 2000 ... 3000 (80" ... 120"), ∅ = 25 mm, L = 500 mm, 10 pcs.	**A5E02609216**	
Spanner key for tranducer mounting type SONO 3200 O-ring type	**A5E02609218**	
Tool set with various mounting/spare parts for SONOKIT installation	**A5E02609219**	

Cable connection boxes
(For the connection of individual transducer cables with the FUS060 transducer cables)

Description	Article No.	
Junction box for coaxial cable		
• IP65 metal box for 2 coaxial cables	**FDK:085B1360**	
• IP65 metal box for 4 coaxial cables	**FDK:085B1361**	
• IP65 EEx e plastic box for 2 coaxial cables, no ATEX approval	**FDK:085B1362**	
• IP65 EEx e plastic box for 4 coaxial cables, no ATEX approval	**FDK:085B1363**	

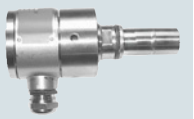
Spare parts

Transducer SONO 3200 spare parts, complete transducer with ½"-NPT cable glands

Transducer type	Material	Gasket	Pressure rating	Terminal housing	Approval	Temperature range [°C (°F)]	Length [mm (inch)]	Article No.	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 … +100 (-4 ... +212)	160 (6.3)	**A5E00839476**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 … +200[1] (-4 ... +392)	160 (6.3)	**A5E00839435**	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 … +100 (-4 ... +212)	230 (9.41)	**A5E00839477**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 … +200[1] (-4 ... +392)	230 (9.41)	**A5E00839437**	

[1] 316 SS housing for -20 ... +200 °C (-4 ... +392 °F) media temp. but cable glands only for -20 ... +100 °C (-4 ... +212 °F) ambient temp.

Transducer SONO 3200 spare parts, complete transducer with M20 cable glands

Transducer type	Material	Gasket	Pressure rating	Terminal housing	Approval	Temperature range [°C (°F)]	Length [mm (inch)]	Article No.	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 … +100 (-4 ... +212)	160 (6.3)	**FDK:085B5454**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 … +200[1] (-4 ... +392)	160 (6.3)	**FDK:085B5455**	
O-ring	316 SS	O-ring	PN 40	Plastic PA 6.6		-20 … +100 (-4 ... +212)	230 (9.41)	**FDK:085B5458**	
O-ring	316 SS	O-ring	PN 40	316 SS	Ex d[2]	-20 … +180 (-4 ... +356)	160 (6.3)	**FDK:085B5452**	
O-ring	316 SS	O-ring	PN 40	316 SS	Ex i[3]	-10 … +190 (14 ... 374)	160 (6.3)	**A5E00836462**	
O-ring	316 SS	O-ring	PN 40	316 SS		-20 … +200[2] (-4 ... +392)	230 (9.41)	**FDK:085B5459**	

[1] 316 SS housing for -20 ... +200 °C (-4 ... +392 °F) media temp. but cable glands only for -20 ... +100 °C (-4 ... +212 °F) ambient temp.

[2] ATEX (Ex) IIC 2G Ex d IIC T3-T6 Gb

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

Transducer SONO 3200 spare parts, transducer terminal housing with M20 cable glands

Type	Article No.	
Material: PA 6.6, Temperature range: -20 … +100 °C (-4 ... +212 °F)	**FDK:085B5501**	
Material: AISI 316, Temperature range: -20 … +200 °C (-4 ... +392 °F)	**FDK:085B5504**	
Material: AISI 316, Ex d[1], Temperature range: -20 … +180 °C (-4 ... +356 °F)	**FDK:085B5505**	
Material: AISI 316, Ex i[2], Temperature range: -10 … +190 °C (14 ... 374 °F)	**A5E00835255**	

[1] ATEX (Ex) IIC 2G Ex d IIC T3-T6 Gb

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

Flowmeter SONOKIT (with FUS060 or FUS080)

Transducer SONO 3200 spare parts, transducer terminal housing with ½"-NPT cable glands

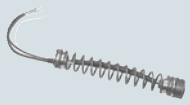
Type	Article No.
Material: PA 6.6, Temperature range: -20 … +100 °C (-4 ... +212 °F)	**A5E00839460**
Material: AISI 316, Temperature range: -20 … +200 °C (-4 ... +392 °F)	**A5E00839427**

Transducer SONO 3200 spare parts transducer body with insert as well as insert only

Temperature range [°C (°F)]	Gasket	Length [mm (inch)]	Article No.
-20 … +200 (-4 ... +392)	O-ring (FFKM O-ring material)[1]	160 (6.3)	**FDK:085B1406**
-20 … +200 (-4 ... +392)	O-ring (FKM 602 O-ring material)[2]	160 (6.3)	**FDK:085B5510**
-20 … +200 (-4 ... +392)	O-ring	230 (9.41)	**FDK:085B5511**

[1] Chemical resistant O-ring material. Body specially for Ex-approved transducers.
[2] Body specially for standard transducers.

Temperature range [°C (°F)]	Length [mm (inch)]	Article No.
-20 … +200 (-4 ... +392)	160 (6.3)	**FDK:085B1419**
-20 … +200 (-4 ... +392)	230 (9.41)	**FDK:085B1420**



Transducer SONO 3200 gasket

Type	Pressure rating	Material	Temperature range [°C (°F)]	Article No.
Gasket O-ring (3 pcs. for O-ring transducers)	PN 40	FKM	-20 … +200 (-4 ... +392)	**FDK:085B1089**

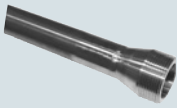
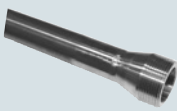
Cables for SONOKIT SONO 3200 transducers with FUS060

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**

Cables for SONOKIT SONO 3200 transducers with FUS080

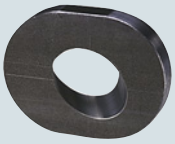
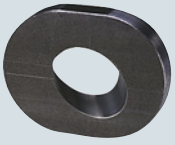
Description	Length [m (ft)]	Article No.
Coaxial cable for FUS080, (75 Ω, max. 70 °C (158 °F), black PVC) (2 pcs.)	15 (49.21)	**A5E02478541**
	30 (98.43)	**A5E02478751**

Transducer holder for SONOKIT SONO 3200 transducers

Description	Article No.	
1-path (each incl. 1 pc.)		
• 160 mm (6.3") stainless steel 45°, DN 100 … DN 150 (4" ... 6")	**FDK:085L1103**	
• 160 mm (6.3") carbon steel 45°, DN 100 … DN 150 (4" ... 6")	**FDK:085L1102**	
• 230 mm (9.1") for concrete pipe 60°, DN 600 … DN 2400 (24" ... 96")	**FDK:085L1107**	
• 160 mm (6.3") stainless steel 60°, DN 200 … DN 2400 (8" ... 96")	**FDK:085L1105**	
• 160 mm (6.3") carbon steel 60°, DN 200 … DN 2400 (8" ... 96")	**FDK:085L1104**	
2-path (each incl. 1 pc.)		
• 230 mm (9.1") for concrete pipe 60°, DN 600 … DN 3000 (24" ... 120")	**FDK:085L1111**	
• 160 mm (6.3") stainless steel 60°, DN 200 … DN 3000 (8" ... 120")	**FDK:085L1109**	
• 160 mm (6.3") carbon steel 60°, DN 200 … DN 3000 (8" ... 120")	**FDK:085L1108**	

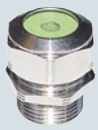
The other transducer holder parts are either completely in stainless steel for the concrete and stainless steel pipes (AISI 316L/1.4404 or similar). For carbon pipes the part welded onto the pipe is in carbon steel (St.37 or similar). Thread part is stainless steel (AISI 316L/1.4404 or similar).

Mounting plate for SONOKIT SONO 3200 transducers

Description	Article No.	
1-path (each incl. 1 pc.)		
• Stainless steel plate, 45°, DN 100 … DN 150 (4" ... 6")	**FDK:085L1113**	
• Carbon steel plate, 45°, DN 100 … DN 150 (4" ... 6")	**FDK:085L1112**	
• Stainless steel plate, 60°, DN 200 … DN 2400 (8" ... 96")	**FDK:085L1115**	
• Carbon steel plate, 60°, DN 200 … DN 2400 (8" ... 96")	**FDK:085L1114**	
2-path (each incl. 1 pc.)		
• Stainless steel plate, 60°, DN 200 … DN 3000 (8" ... 120")	**FDK:085L1119**	
• Carbon steel plate, 60°, DN 200 … DN 3000 (8" ... 120")	**FDK:085L1118**	

The mounting plates are either in stainless steel (AISI 316L/1.4404 or similar) or carbon steel (St.37 or similar).

SONO 3200 cable glands

Type/ description	Temperature range [°C (°F)]	Appr	Article No.	
black PA plastic, cable Ø 5 ... 13 mm (1 pc.)	-20 ... 100 (-4 ... +212)		**A5E02246304**	
½" NPT gray PA plastic, cable Ø 5 ... 9 mm (1 pc.)	-20 ... 100 (-4 ... +212)		**A5E02246309**	
½" NPT crome-plated brass, cable Ø 5 ... 9 mm (1 pc.)	-40 ... 100 (-40 ... +212)		**A5E02246258**	
M20 stainless steel, cable Ø 4 ... 6 mm (1 pc.)	-25 ... 200 (-13 ... +392)	Ex i	**A5E02246194**	
M20 stainless s teel, cable Ø 5 ... 8 mm (1 pc.)	-60 ... 180 (-76 ... +356)	Ex d	**A5E02246311**	

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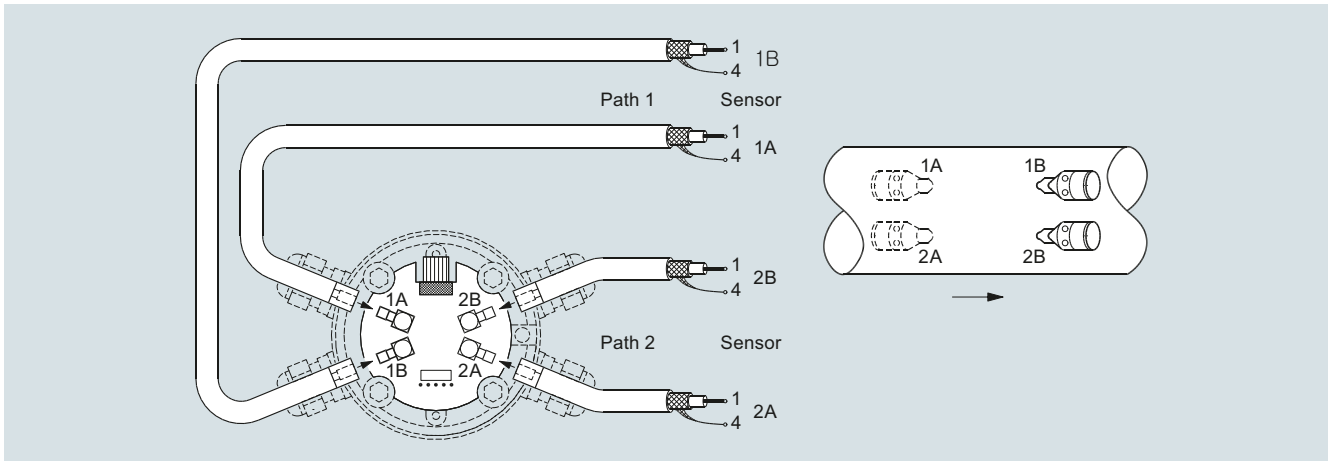
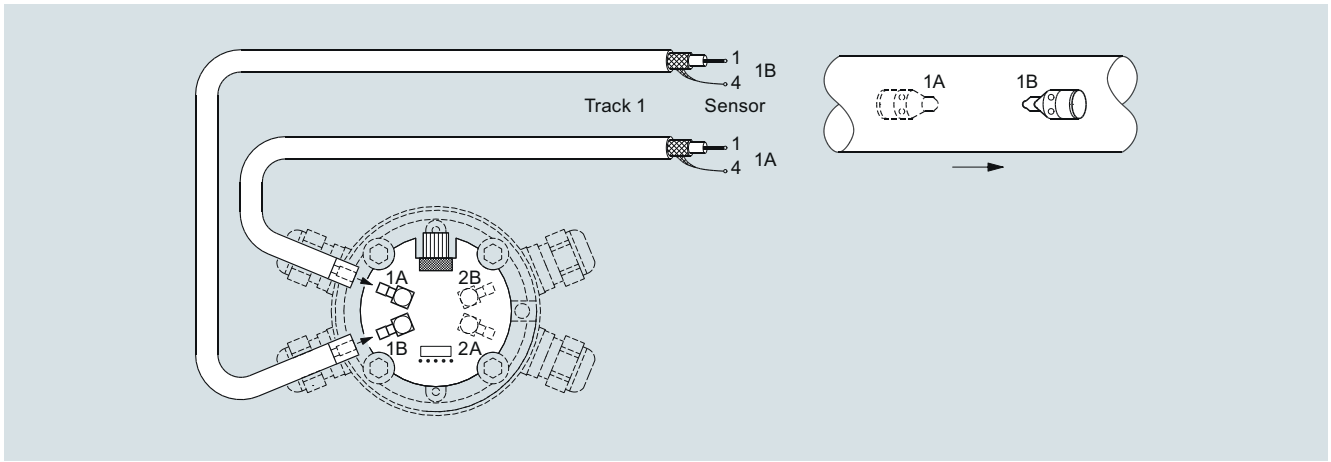
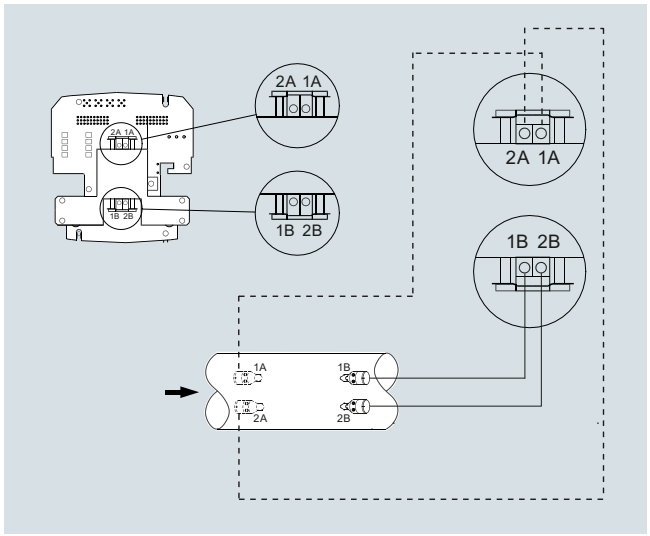
Schematics



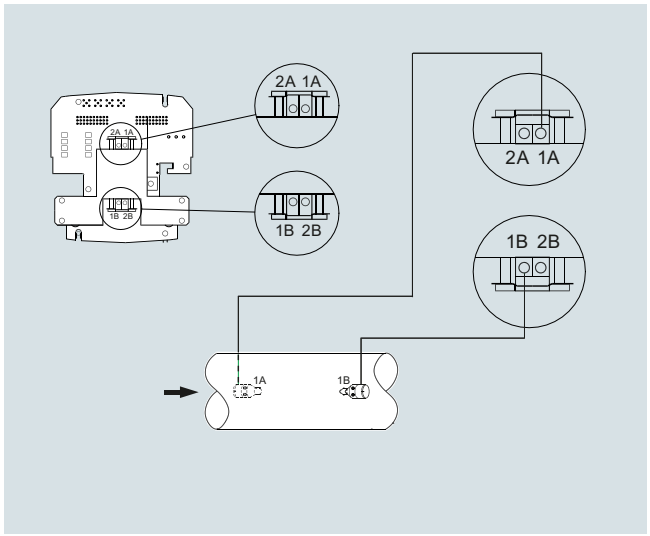
Electrical connection of SITRANS FUS060 and SONOKIT 2-path. Max. 30 m transducer cable length for sizes ≥ DN 3000.



Electrical connection of SITRANS FUS060 and SONOKIT 1-path



Electrical connection of SITRANS FUS080 and SONOKIT 2-path



Electrical connection of SITRANS FUS080 and SONOKIT 1-path