

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 4000 (8" to 160") 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 is available on request

Technical specifications

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

Technical specifications to the FUS060 see page 3/234 and to FUS080 see page 3/240.

Accuracy

Typical, depending on accuracy of measurements of installation

- 2-path: $\pm (0.5 \dots 1.5 \%)$
- 1-path: $\pm (1 \dots 3 \%)$

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 4000 (4" ... 160")
FUS080:
DN 100 ... DN 1200 (4" ... 48")
max. 40 bar (580 psi)

Line pressure

Media temperature

- Standard
-10 ... +200 °C (14 ... 392 °F)
- ATEX Ex d version
-20 ... +200 °C (-4 ... +392 °F)
- ATEX Ex i version
-10 ... +200 °C (+14 ... +392 °F)
- Specials
-200 °C (-328 °F) or
up to 250 °C (482 °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 2G Ex dem [ia/lb] IIC T6/T4/T3 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)

Flow Measurement

SITRANS F US Inline

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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 \geq 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 CD

Material certificate

Material certificate for the transducer parts according to EN 10204-3.1 is optionally available

Approvals

No custody transfer approvals

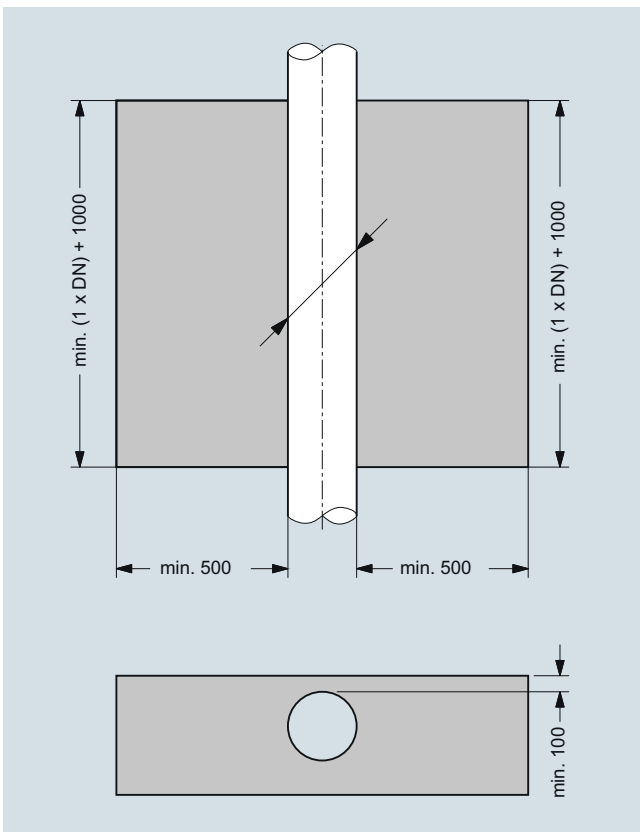
Information on PED approval:

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.

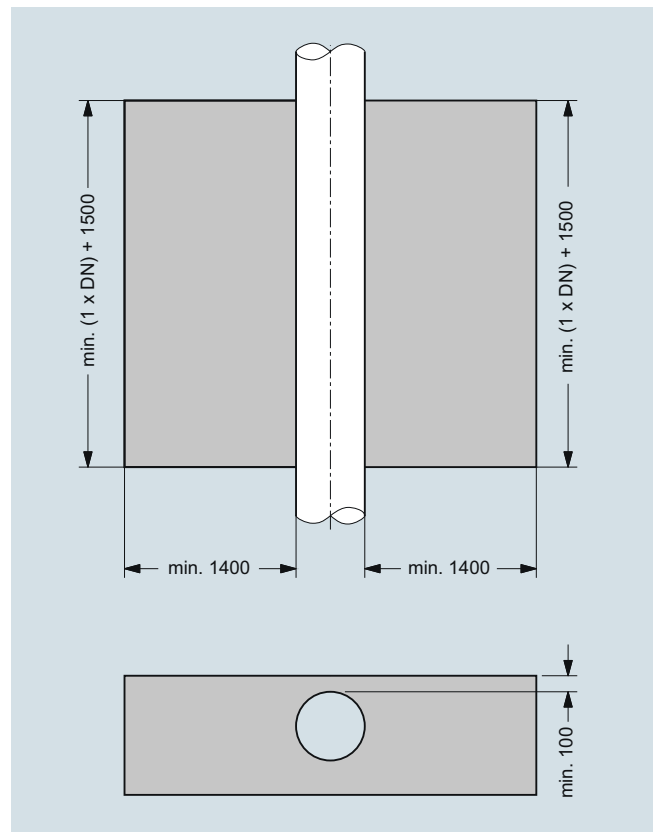
¹⁾ Mounting plates are only included for empty pipe installation types (refer to selection "A"). For tapping-band types holder and mounting plates are not included (refer to selection "C").

Installation requirements

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



Empty pipe installation



Hot-tap installation

Flow Measurement SITRANS F US Inline

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3

Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT 1-path sensor		7ME3210-	
Diameter	Qn setting [m³/h]		
DN 100 (4")	100	1 P	
DN 125 (5")	150	1 T	
DN 150 (6")	220	2 B	
DN 200 (8")	380	2 F	
DN 250 (10")	600	2 K	
DN 300 (12")	850	2 P	
DN 350 (14")	1000	2 T	
DN 400 (16")	1300	3 B	
DN 450 (18")	1700	3 F	
DN 500 (20")	2200	3 K	
DN 550 (22")	2600	3 P	
DN 600 (24")	3200	3 T	
DN 650 (26")	3600	4 B	
DN 700 (28")	4200	4 F	
DN 750 (30")	4800	4 K	
DN 800 (32")	5500	4 P	
DN 900 (36")	7500	5 B	
DN 1000 (40")	9000	5 K	
DN 1100 (44")	10000	5 P	
DN 1200 (48")	13200	5 T	
<u>Only for FUS060</u>			
DN 1300 (52")	14000	6 A	
DN 1400 (56")	16800	6 C	
DN 1500 (60")	19000	6 E	
DN 1600 (64")	22800	6 G	
DN 1700 (68")	25000	6 J	
DN 1800 (72")	27600	6 L	
DN 1900 (76")	31000	6 N	
DN 2000 (80")	36000	6 Q	
DN 2100 (84")	37000	6 S	
DN 2200 (88")	42000	6 U	
DN 2300 (92")	45000	6 W	
DN 2400 (96")	51000	7 A	
Installation method³⁾			
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	
SONOKIT for tapping band (DN 200 ... DN 1800) (transducer holder and mounting plates not incl., tapping band to be ordered separately) ¹⁾		C	
Transducer holder			
None (for tapping band)		0	
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	

Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT 1-path sensor		7ME3210-	
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-adaptor, 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			
<u>Transmitter SITRANS FUS080:</u>			
Pulse and/or alarm output (standard for FUS080).			A
<u>Transmitter SITRANS FUS060:</u>			
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 R 0 A
No transducer cable, cable length 2 x 15 m			9 R 0 B
No transducer cable, cable length 2 x 30 m			9 R 0 C
No transducer cable, cable length 2 x 60 m			9 R 0 D
No transducer cable, cable length 2 x 90 m			9 R 0 E
No transducer cable, cable length 2 x 120 m			9 R 0 F

¹⁾ Tapping band via special request

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."

³⁾ Mounting tools must be ordered separately as "-Z"-options.

Flow Measurement

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Selection and Ordering data

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

Accessories

Alignment rods-set for DN 100 ... 650 (4" ... 26")
Ø = 25 mm, L = 500 mm, 3 pcs.

S10

Alignment rods-set for DN 700 ... 1900 (28" ... 76")
Ø = 25 mm, L = 500 mm, 6 pcs.

S11

Alignment rods-set for DN 2000 ... 2400 (80" ... 96")
Ø = 25 mm, L = 500 mm, 8 pcs.

S12

Spanner key for transducer 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
• Spanish	A5E31628493
• French	A5E31628438
SITRANS F US SONOKIT 1-path	
• English	A5E00814557
• German	A5E02610428
• Spanish	A5E02608231
• French	A5E02610419

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>



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

www.pia-selector.automation.siemens.com

Flow Measurement

SITRANS F US Inline

Flowmeter SONOKIT (with FUS060 or FUS080)

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT		7ME3220-		SITRANS F US SONOKIT		7ME3220-	
2-path sensor				2-path sensor			
Diameter	Qn setting [m³/h]			Transducer holder			
DN 200 (8")	380	2 F		None (for tapping band)	0		
DN 250 (10")	600	2 K		Carbon steel, length = 160 mm, mounting plates in carbon steel	1		
DN 300 (12")	850	2 P		Stainless steel, length = 160 mm, mounting plates in stainless steel	2		
DN 350 (14")	1000	2 T		Stainless steel, length = 230 mm, for concrete pipe (DN 600 ... DN 4000)	3		
DN 400 (16")	1300	3 B		Transducer type and approval			
DN 450 (18")	1700	3 F		IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 100 °C (212 °F), no approval	1		
DN 500 (20")	2200	3 K		IP68 SS housing, PN 40, O-ring, 180 °C (356 °F), EEx d, ATEX approval (only with standard FUS060)	2		
DN 550 (22")	2600	3 P		IP68 PA housing, Sylgard potting kit, PN 40, SS, O-ring, 100 °C (212 °F), no approval	3		
DN 600 (24")	3200	3 T		IP68 SS housing, Sylgard potting kit, PN 40, SS, O-ring, 200 °C (392 °F), no approval	4		
DN 650 (26")	3600	4 B		IP67 SS housing, PN 40, O-ring, 190 °C (374 °F), Ex i, ATEX approval (only with FUS060 Ex)	5		
DN 700 (28")	4200	4 F		Cable gland entires			
DN 750 (30")	4800	4 K		Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5 (FUS080 only M20)	1		
DN 800 (32")	5500	4 P		Cable glands ½" NPT in transducers and in transmitter (only with FUS060)	2		
DN 900 (36")	7500	5 B		Transmitter version of SITRANS FUS060			
DN 1000 (40")	9000	5 K		(only DN 200 ... 4000 (8" ... 160"))			
DN 1100 (44")	10 000	5 P		IP65 (NEMA 4), 120/230 V AC	N		
DN 1200 (48")	13 200	5 T		IP65 (NEMA 4), 24 V AC/DC	P		
<u>Only for FUS060</u>				IP65 (NEMA 4), 24 V AC/DC Ex version	Q		
DN 1300 (52")	14 000	6 A		Transmitter version of SITRANS FUS080			
DN 1400 (56")	16 800	6 C		(only DN 200 ... 1200 (8" ... 48"))			
DN 1500 (60")	19 000	6 E		PDM software tool and IrDA-adapter, which are needed for settings update, to be ordered separately, see FUS080 accessories			
DN 1600 (64")	22 800	6 G		IP67/NEMA 4X/6 115 ... 230 V AC	U		
DN 1700 (68")	25 000	6 J		IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack	V		
DN 1800 (72")	27 600	6 L		IP67/NEMA 4X/6 115 ... 230 V AC, incl. 3.6 V single battery backup	W		
DN 1900 (76")	31 000	6 N		IP67/NEMA 4X/6 3.6 V battery version (no battery pack included) ⁴⁾	X		
DN 2000 (80")	36 000	6 Q		Transmitter output module			
DN 2100 (84")	37 000	6 S		<u>Transmitter SITRANS FUS080:</u>			
DN 2200 (88")	42 000	6 U		Pulse and/or alarm output (standard for FUS080).	A		
DN 2300 (92")	45 000	6 W		<u>Transmitter SITRANS FUS060:</u>			
DN 2400 (96")	51 000	7 A		HART, 1 pulse output, 1 relay	B		
DN 2500 (100")	53 000	7 C		HART Ex version, 1 pulse output, 1 relay	C		
DN 2600 (104")	60 000	7 E		PROFIBUS PA, 1 pulse/frequency	D		
DN 2700 (108")	62 000	7 G					
DN 2800 (112")	72 000	7 J					
DN 2900 (116")	71 000	7 L					
DN 3000 (120")	78 000	7 N					
DN 3100 (124")	82 000	7 Q					
DN 3200 (128")	85 000	7 S					
DN 3300 (132")	92 000	7 U					
DN 3400 (136")	100 000	7 W					
DN 3500 (140")	100 000	8 A					
DN 3600 (144")	110 000	8 C					
DN 3700 (148")	120 000	8 E					
DN 3800 (152")	130 000	8 G					
DN 3900 (156")	130 000	8 J					
DN 4000 (160")	144 000	8 L					
Installation method²⁾							
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					
SONOKIT for tapping band (DN 200 ... DN 1800) (transducer holder and mounting plates not incl., tapping band to be ordered separately) ¹⁾		C					

¹⁾ Tapping band via special request

²⁾ Mounting tools must be ordered separately as "-Z" options

Flow Measurement

SITRANS F US Inline

Flowmeter SONOKIT (with FUS060 or FUS080)

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 R 0 A
No transducer cable, cable length 4 x 15 m		9 R 0 B
No transducer cable, cable length 4 x 30 m		9 R 0 C
No transducer cable, cable length 4 x 60 m (up to DN 3000)		9 R 0 D
No transducer cable, cable length 4 x 90 m (up to DN 3000)		9 R 0 E
No transducer cable, cable length 4 x 120 m (up to DN 3000)		9 R 0 F

Selection and Ordering data

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**

Accessories

Alignment rods-set for DN 100 ... 750 (4" ... 30")
Ø = 25 mm, L = 500 mm, 3 pcs. **S10**
Alignment rods-set for DN 800 ... 2100 (32" ... 84")
Ø = 25 mm, L = 500 mm, 6 pcs. **S11**
Alignment rods-set for DN 2200 ... 4000 (88" ... 160")
Ø = 25 mm, L = 500 mm, 8 or 10 pcs. **S12**
Spanner key for transducer 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
• Spanish	A5E31628493
• French	A5E31628438
SITRANS F US SONOKIT 2-path	
• English	A5E02445496
• German	A5E02554972
• Spanish	A5E02555037
• French	A5E02555044
• Czech	A5E02814192

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

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www.pia-selector.automation.siemens.com



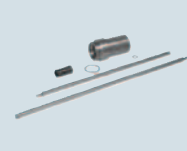
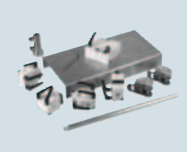
Flowmeter SONOKIT accessories and spare parts



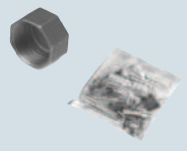
Accessories

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:	FDK:085B5333	
<ul style="list-style-type: none"> • Up to 160 mm (6.3") • 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"), Ø = 25 mm, L = 500 mm, 3 pcs.	A5E02609214	
Alignment rods-set for DN 700 ... 1900 (28" ... 76"), Ø = 25 mm, L = 500 mm, 6 pcs.	A5E02609215	
Alignment rods-set for DN 2000 ... 4000 (80" ... 160"), Ø = 25 mm, L = 500 mm, 10 pcs.	A5E02609216	
Spanner key for transducer mounting type SONO 3200 O-ring type	A5E02609218	
Tool set with various mounting/spare parts for SONOKIT installation	A5E02609219	

Flow Measurement

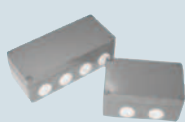
SITRANS F US Inline

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Cable connection boxes

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

Description	Article No.
Junction box for coaxial cable	
<ul style="list-style-type: none"> IP68 metal box for 2 coaxial cables 	FDK:085B1360
<ul style="list-style-type: none"> IP68 metal box for 4 coaxial cables 	FDK:085B1361
<ul style="list-style-type: none"> IP68 EEx e plastic box for 2 coaxial cables, no ATEX approval 	FDK:085B1362
<ul style="list-style-type: none"> IP68 EEx e plastic box for 4 coaxial cables, no ATEX approval 	FDK:085B1363



Spare parts

Transducer SONO 3200 spare parts, complete transducer with 1/2"-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 ... +200 (-4 ... +392)	160 (6.3)	FDK:085B5452
O-ring	316 SS	O-ring	PN 40	316 SS	Ex i ³⁾	-10 ... +200 (14 ... 392)	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 [ja/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 ... +200 °C (-4 ... +392 °F)	FDK:085B5505
Material: AISI 316, Ex i ²⁾ , Temperature range: -10 ... +200 °C (14 ... 392 °F)	A5E00835255

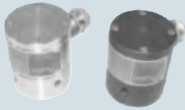
¹⁾ ATEX (Ex) IIC 2G Ex d IIC T3-T6 Gb

²⁾ For systems with FUS060 ATEX IIC 2G Ex dem [ja/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	

Flow Measurement

SITRANS F US Inline

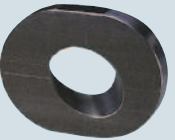
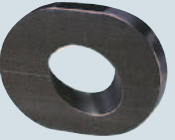
Flowmeter SONOKIT (with FUS060 or FUS080)

Transducer holder for SONOKIT SONO 3200 transducers

Description	Article No.	
1-path (each incl. 1 pc.)		
<ul style="list-style-type: none"> 160 mm (6.3") stainless steel 45°, DN 100 ... DN 150 (4" ... 6") 	FDK:085L1103	
<ul style="list-style-type: none"> 160 mm (6.3") carbon steel 45°, DN 100 ... DN 150 (4" ... 6") 	FDK:085L1102	
<ul style="list-style-type: none"> 230 mm (9.1") for concrete pipe 60°, DN 600 ... DN 2400 (24" ... 96") 	FDK:085L1107	
<ul style="list-style-type: none"> 160 mm (6.3") stainless steel 60°, DN 200 ... DN 2400 (8" ... 96") 	FDK:085L1105	
<ul style="list-style-type: none"> 160 mm (6.3") carbon steel 60°, DN 200 ... DN 2400 (8" ... 96") 	FDK:085L1104	
2-path (each incl. 1 pc.)		
<ul style="list-style-type: none"> 230 mm (9.1") for concrete pipe 60°, DN 600 ... DN 4000 (24" ... 160") 	FDK:085L1111	
<ul style="list-style-type: none"> 160 mm (6.3") stainless steel 60°, DN 200 ... DN 4000 (8" ... 160") 	FDK:085L1109	
<ul style="list-style-type: none"> 160 mm (6.3") carbon steel 60°, DN 200 ... DN 4000 (8" ... 160") 	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

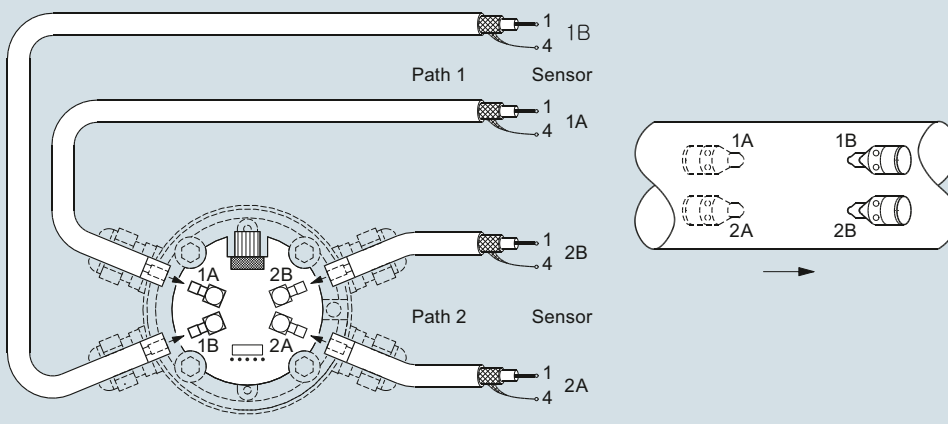
Description	Article No.	
1-path (each incl. 1 pc.)		
<ul style="list-style-type: none"> Stainless steel plate, 45°, DN 100 ... DN 150 (4" ... 6") 	FDK:085L1113	
<ul style="list-style-type: none"> Carbon steel plate, 45°, DN 100 ... DN 150 (4" ... 6") 	FDK:085L1112	
<ul style="list-style-type: none"> Stainless steel plate, 60°, DN 200 ... DN 2400 (8" ... 96") 	FDK:085L1115	
<ul style="list-style-type: none"> Carbon steel plate, 60°, DN 200 ... DN 2400 (8" ... 96") 	FDK:085L1114	
2-path (each incl. 1 pc.)		
<ul style="list-style-type: none"> Stainless steel plate, 60°, DN 200 ... DN 4000 (8" ... 160") 	FDK:085L1119	
<ul style="list-style-type: none"> Carbon steel plate, 60°, DN 200 ... DN 4000 (8" ... 160") 	FDK:085L1118	

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

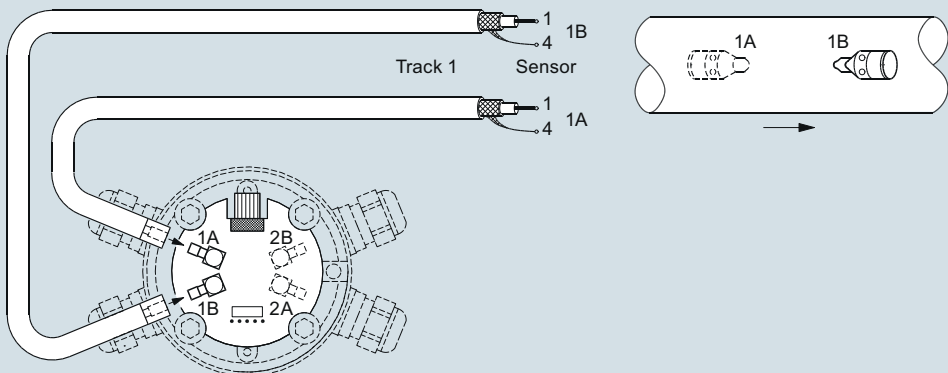
SONO 3200 cable glands

Type/description	Temperature range [°C (°F)]	Appr	Article No.	
black PA plastic, cable Ø 5 ... 13 mm	-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	

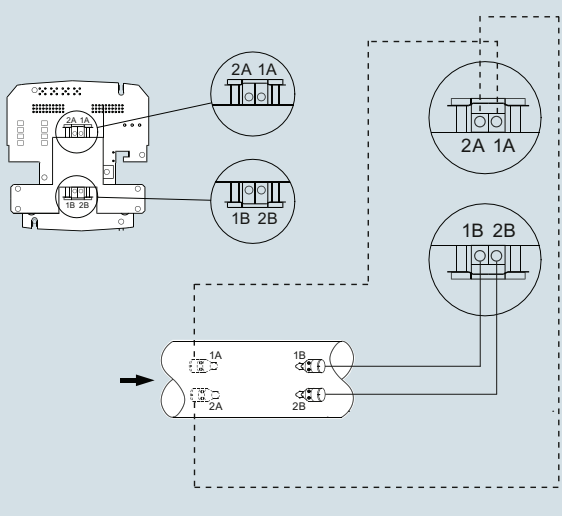
Schematics



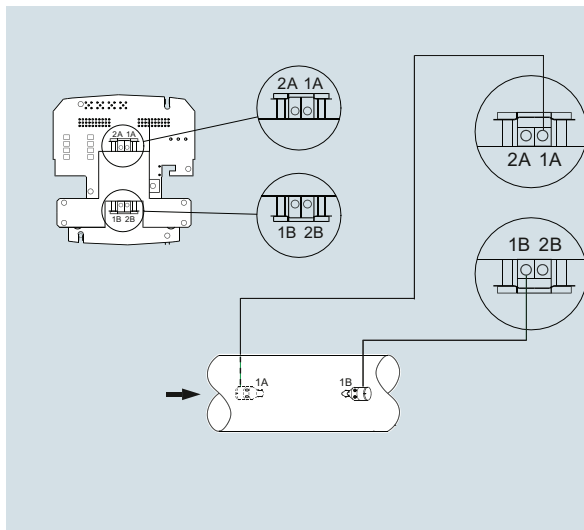
Electrical connection of SITRANS FUS060 and SONOKIT 2-path. Max. 30 m transducer cable length for sizes \geq DN 3000.



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