

Flow Measurement

SITRANS F US Inline

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 3/246 and to FUS080 see page 3/252.

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

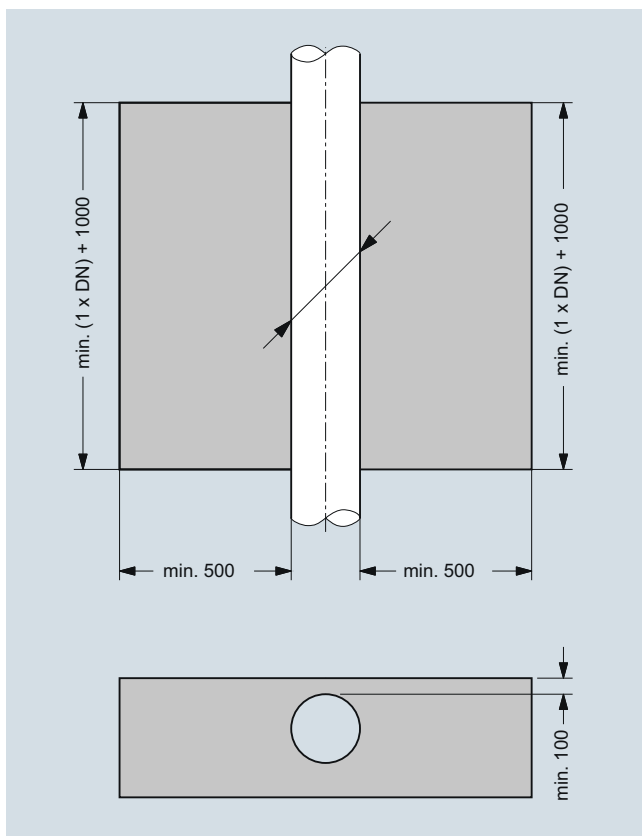
Size	FUS060: DN 100 ... DN 3000 (4" ... 120") FUS080: DN 100 ... DN 1200 (4" ... 48")
Line pressure	max. 40 bar (580 psi)
Media temperature	<ul style="list-style-type: none"> • Standard -10 ... +200 °C (14 ... 392 °F) • ATEX Ex d version -20 ... +180 °C (-4 ... +356 °F) • ATEX Ex i version -10 ... +190 °C (14 ... 374 °F)
Ambient temperature (sensor)	<ul style="list-style-type: none"> • Standard and Ex-i version -20 ... +60 °C (-4 ... +140 °F) • Ex d version -20 ... +180 °C (-4 ... +356 °F)
Transducer enclosure/ approvals/certificates	IP67 (NEMA 6)/IP68 (NEMA 6P) 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)
Standard version	
Ex approval	
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)

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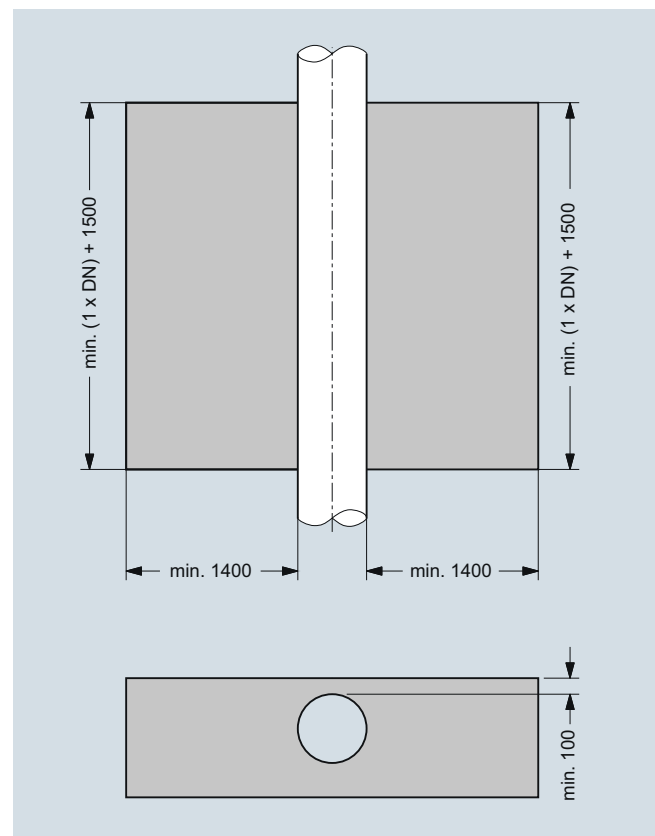
Materials of existing pipeline		Dimension of the package box (L x W x H, approx.)	856 x 390 x 344 mm (33.7" x 15.4" x 13.5")
Steel	Transducer holder: EN 10273 or EN 10216 (P235GH) Mounting plates ¹⁾ : EN 10273 or EN 10216 (P235GH)	Weight example of a package (standard 2-path with FUS060)	approx. 53 kg (116.8 lb)
Concrete	Transducer holder: Stainless steel AISI 316 or similar Mounting plates ¹⁾ : (not included)	Certificates and approvals	
Stainless steel	Transducer holder: Stainless steel AISI 316 or similar Mounting plates ¹⁾ : Stainless steel AISI 316 or similar	Conformity certificate	The devices are supplied as standard with a Siemens Certificate of Conformity on a DVD
Pipe wall thickness		Material certificate	Material certificate for the transducer parts according to EN 10204-3.1 is optionally available
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")	Approvals	No custody transfer approvals
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	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:



Empty pipe installation



Hot-tap installation

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Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Article No.	Ord. code
SITRANS F US SONOKIT		7ME3210-		SITRANS F US SONOKIT		7ME3210-	
1-path sensor				1-path sensor			
<p>➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>				<p>IP68 SS housing, Sylgard potting kit, PN 40, O-ring, 200 °C (392 °F), no approval</p>		4	
Diameter	Qn setting [m³/h]			<p>IP67 SS housing, PN 40, O-ring, 190 °C (374 °F), Ex i type, ATEX approval (only with FUS060 Ex)</p>		5	
DN 100 (4")	100	1 P		Cable gland entries			
DN 125 (5")	150	1 T		Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5 (FUS080 only M20)		1	
DN 150 (6")	220	2 B		Cable glands ½" NPT in transducers and in transmitter (only with FUS060)		2	
DN 200 (8")	380	2 F		Transmitter version of SITRANS FUS060			
DN 250 (10")	600	2 K		(only DN 100 ... 2400 (4" ... 96"))			
DN 300 (12")	850	2 P		IP65 (NEMA 4), 120/230 V AC		N	
DN 350 (14")	1000	2 T		IP65 (NEMA 4), 24 V AC/DC		P	
DN 400 (16")	1300	3 B		IP65 (NEMA 4), 24 V AC/DC Ex version		Q	
DN 450 (18")	1700	3 F		Transmitter version of SITRANS FUS080			
DN 500 (20")	2200	3 K		(only DN 100 ... 1200 (4" ... 48"))			
DN 550 (22")	2600	3 P		PDM software tool and IrDA-adaptor, which are needed for settings update, to be ordered separately, see FUS080 accessories			
DN 600 (24")	3200	3 T		IP67/NEMA 4X/6 115 ... 230 V AC		U	
DN 650 (26")	3600	4 B		IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack		V	
DN 700 (28")	4200	4 F		IP67/NEMA 4X/6 115 ... 230 V AC, incl. 3.6 V single battery backup		W	
DN 750 (30")	4800	4 K		IP67/NEMA 4X/6 3.6 V battery version (no battery pack included) ²⁾		X	
DN 800 (32")	5500	4 P		Transmitter output module			
DN 900 (36")	7500	5 B		Transmitter SITRANS FUS080:			
DN 1000 (40")	9000	5 K		Pulse and/or alarm output (standard for FUS080).		A	
DN 1100 (44")	10000	5 P		Transmitter SITRANS FUS060:			
DN 1200 (48")	13200	5 T		HART, 1 pulse output, 1 relay		B	
<u>Only for FUS060</u>				HART Ex version, 1 pulse output, 1 relay		C	
DN 1300 (52")	14000	6 A		PROFIBUS PA, 1 pulse/frequency		D	
DN 1400 (56")	16800	6 C		Transducer coaxial cables			
DN 1500 (60")	19000	6 E		(with FUS080 only, 15 and 30 m, 70°C (158 °F) cable types)			
DN 1600 (64")	22800	6 G		2 x 3 m, max. 70 °C (158 °F), the only option for Ex i		0	
DN 1700 (68")	25000	6 J		2 x 15 m, max. 70 °C (158 °F)		1	
DN 1800 (72")	27600	6 L		2 x 30 m, high temp. max. 200 °C (392 °F)		2	
DN 1900 (76")	31000	6 N		2 x 30 m, max. 70 °C (158 °F)		3	
DN 2000 (80")	36000	6 Q		2 x 60 m, max. 70 °C (158 °F)		4	
DN 2100 (84")	37000	6 S		2 x 90 m, max. 70 °C (158 °F)		5	
DN 2200 (88")	42000	6 U		2 x 120 m, max. 70 °C (158 °F)		6	
DN 2300 (92")	45000	6 W		2 x 3 m, high temp. max. 200 °C (392 °F), the only option for Ex i		7	
DN 2400 (96")	51000	7 A		2 x 15 m, high temp. max. 200 °C (392 °F)		8	
Installation method¹⁾				Special version (add Order code):			
Empty pipe (incl. transducer holder and mounting plates). Alignment rods and tools must be ordered as accessories.		A		No transducer cable, cable length 2 x 3 m, the only option for Ex i		9 R O A	
Hot tap, mounting under pressure (mounting plates not incl.). Special mounting tools to be ordered separately.		B		No transducer cable, cable length 2 x 15 m		9 R O B	
Transducer holder				No transducer cable, cable length 2 x 30 m		9 R O C	
Carbon steel, length = 160 mm, mounting plates in carbon steel		1		No transducer cable, cable length 2 x 60 m		9 R O D	
Stainless steel, length = 160 mm, mounting plates in stainless steel		2		No transducer cable, cable length 2 x 90 m		9 R O E	
Stainless steel, length = 230 mm, for concrete pipe (DN 600 ... DN 2400)		3		No transducer cable, cable length 2 x 120 m		9 R O F	
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					

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.	
<u>Material certificate</u>	
EN 10204-3.1, transducer body material	F30
EN 10204-3.1, transducer holder material	F31
EN 10204-3.1, mounting plate material	F32
<u>Regional specific approval</u>	
KCC marking for Korea	W28
<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
<u>Accessories</u>	
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
SITRANS F US SONOKIT 1-path	
• English	A5E00814557
• German	A5E02610428

This device is shipped with Safety Notes and a DVD 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



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

www.pia-portal.automation.siemens.com

Flow Measurement

SITRANS F US Inline

Flowmeter SONOKIT (with FUS060 or FUS080)

Selection and Ordering data

SITRANS F US SONOKIT
2-path sensor

Article No. Ord. code

7ME3220 -

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

Diameter	Qn setting [m ³ /h]	
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")	10 000	5 P
DN 1200 (48")	13 200	5 T

Only for FUS060

DN 1300 (52")	14 000	6 A
DN 1400 (56")	16 800	6 C
DN 1500 (60")	19 000	6 E
DN 1600 (64")	22 800	6 G
DN 1700 (68")	25 000	6 J
DN 1800 (72")	27 600	6 L
DN 1900 (76")	31 000	6 N
DN 2000 (80")	36 000	6 Q
DN 2100 (84")	37 000	6 S
DN 2200 (88")	42 000	6 U
DN 2300 (92")	45 000	6 W
DN 2400 (96")	51 000	7 A
DN 2500 (100")	53 000	7 C
DN 2600 (104")	60 000	7 E
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

Installation method¹⁾

Empty pipe (incl. transducer holder and mounting plates). Alignment rods and tools must be ordered as accessories.

Hot tap, mounting under pressure (mounting plates **not** incl.). Special mounting tools to be ordered separately.

¹⁾ Mounting tools must be ordered separately as "-Z" options

Selection and Ordering data

SITRANS F US SONOKIT
2-path sensor

Article No. Ord. code

7ME3220 -

Transducer holder

Carbon steel, length = 160 mm, mounting plates in carbon steel

Stainless steel, length = 160 mm, mounting plates in stainless steel

Stainless steel, length = 230 mm, for concrete pipe (DN 600 ... DN 3000)

Transducer type and approval

IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 100 °C (212 °F), no approval

IP68 SS housing, PN 40, O-ring, 180 °C (356 °F), EEx d, ATEX approval (only with standard FUS060)

IP68 PA housing, Sylgard potting kit, PN 40, SS, O-ring, 100 °C (212 °F), no approval

IP68 SS housing, Sylgard potting kit, PN 40, SS, O-ring, 200 °C (392 °F), no approval

IP67 SS housing, PN 40, O-ring, 190 °C (374 °F), Ex i, ATEX approval (only with FUS060 Ex)

Cable gland entires

Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5 (FUS080 only M20)

Cable glands ½" NPT in transducers and in transmitter (only with FUS060)

Transmitter version of SITRANS FUS060

(only DN 200 ... 4000 (8" ... 160"))

IP65 (NEMA 4), 120/230 V AC

IP65 (NEMA 4), 24 V AC/DC

IP65 (NEMA 4), 24 V AC/DC Ex version

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

IP67/NEMA 4X/6 3.6 V battery version, incl. dual battery pack

IP67/NEMA 4X/6 115 ... 230 V AC, incl. 3.6 V single battery backup

IP67/NEMA 4X/6 3.6 V battery version (no battery pack included)⁴⁾

Transmitter output module

Transmitter SITRANS FUS080:

Pulse and/or alarm output (standard for FUS080).

Transmitter SITRANS FUS060:

HART, 1 pulse output, 1 relay

HART Ex version, 1 pulse output, 1 relay

PROFIBUS PA, 1 pulse/frequency

Selection and Ordering data	Article No.	Ord. code	Selection and Ordering data	Order code
SITRANS F US SONOKIT 2-path sensor	7ME3220-		Additional information	
Transducer coaxial cables (with FUS080 only, 15 and 30 m, 70°C (158 °F) cable types)			Please add „-Z“ to Article No. and specify Order code(s) and plain text.	
4 x 3 m, max. 70 °C (158 °F), the only option for Ex i		0	<u>Material certificate</u>	
4 x 15 m, max. 70 °C (158 °F)		1	EN 10204-3.1, transducer body material	F30
4 x 30 m, high temp. max. 200 °C (392 °F)		2	EN 10204-3.1, transducer holder material	F31
4 x 30 m, max. 70 °C (158 °F)		3	EN 10204-3.1, mounting plate material	F32
4 x 60 m, max. 70 °C (158 °F) (up to DN 3000)		4	<u>Tag name plate</u>	
4 x 90 m, max. 70 °C (158 °F) (up to DN 3000)		5	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
4 x 120 m, max. 70 °C (158 °F) (up to DN 3000)		6	<u>Regional specific approval</u>	
4 x 3 m, high temp. max. 200 °C (392 °F), the only option for Ex i		7	KCC marking for Korea	W28
4 x 15 m, high temp. max. 200 °C (392 °F)		8	<u>Accessories</u>	
Special version (add Order code):			Alignment rods-set for DN 100 ... 750 (4" ... 30") Ø = 25 mm, L = 500 mm, 3 pcs.	S10
No transducer cable, cable length 4 x 3 m, the only option for Ex i		9 R0A	Alignment rods-set for DN 800 ... 2100 (32" ... 84") Ø = 25 mm, L = 500 mm, 6 pcs.	S11
No transducer cable, cable length 4 x 15 m		9 R0B	Alignment rods-set for DN 2200 ... 3000 (88" ... 120") Ø = 25 mm, L = 500 mm, 8 or 10 pcs.	S12
No transducer cable, cable length 4 x 30 m		9 R0C	Spanner key for transducer mounting type SONO 3200 O-ring type	T11
No transducer cable, cable length 4 x 60 m (up to DN 3000)		9 R0D	Tool set with various mounting/spare parts for SONOKIT installation	T12
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		

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

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



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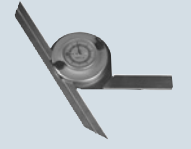
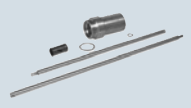
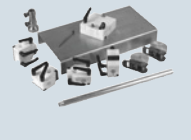
Flowmeter SONOKIT accessories and spare parts



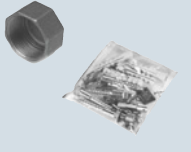
Accessories

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"), 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 ... 3000 (80" ... 120"), 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	

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 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 ... +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 Gb³⁾ 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 Gb²⁾ For systems with FUS060 ATEX IIC 2G Ex dem [ia/ib] T6/T4/T3

Flow Measurement


SITRANS F US Inline

Flowmeter SONOKIT (with FUS060 or FUS080)

Transducer SONO 3200 spare parts, transducer terminal housing with 1/2"-NPT cable glands

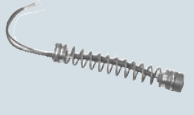
Type	Article No.	
Material: PA 6.6, Temperature range: -20 ... +100 °C (-4 ... +212 °F)	A5E00839460	
Material: AISI 316, Temperature range: -20 ... +200 °C (-4 ... +392 °F)	A5E00839427	

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

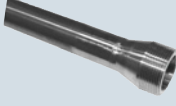
Description	Length [m (ft)]	Article No.	
Coaxial cable for FUS060, (75 Ω, max. 70 °C (158 °F), black PVC) (2 pcs.)	3 (9.84)	A5E00875101	
	15 (49.21)	A5E00861432	
	30 (98.43)	A5E01278662	
	60 (196.85)	A5E01278682	
	90 (295.28)	A5E01278687	
	120 (393.70)	A5E01278698	
High temp. coaxial cable for FUS060; 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	

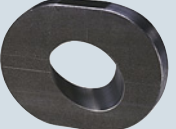
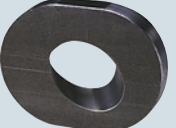
Flowmeter SONOKIT (with FUS060 or FUS080)

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 3000 (24" ... 120") 	FDK:085L1111	
<ul style="list-style-type: none"> 160 mm (6.3") stainless steel 60°, DN 200 ... DN 3000 (8" ... 120") 	FDK:085L1109	
<ul style="list-style-type: none"> 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.)		
<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 3000 (8" ... 120") 	FDK:085L1119	
<ul style="list-style-type: none"> 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 chrome-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 steel, cable Ø 5 ... 8 mm (1 pc.)	-60 ... 180 (-76 ... +356)	Ex d	A5E02246311	

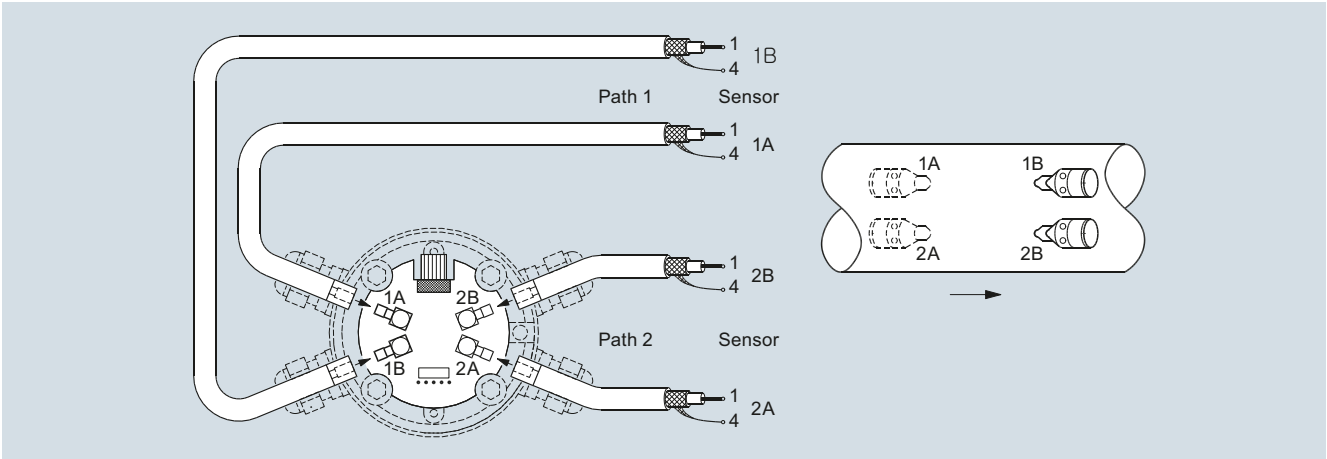
Flow Measurement

SITRANS F US Inline

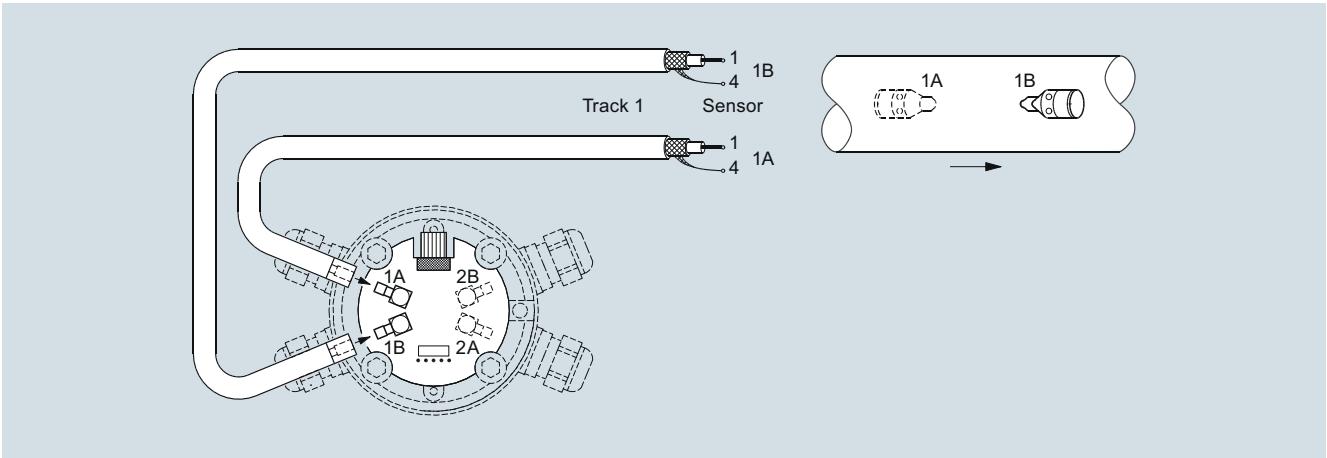
Flowmeter SONOKIT (with FUS060 or FUS080)

Schematics

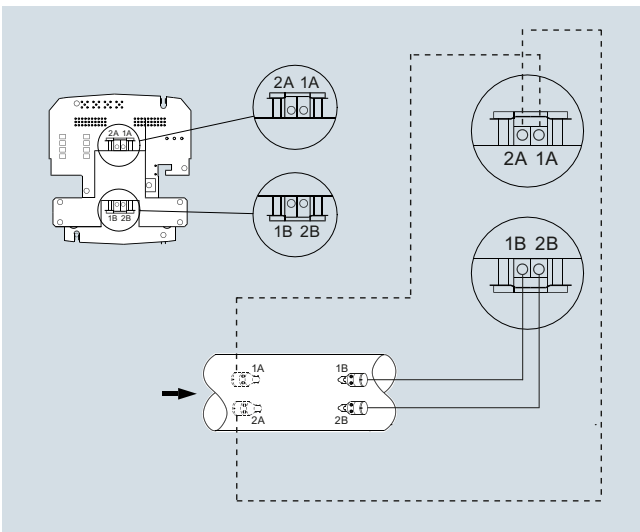
3



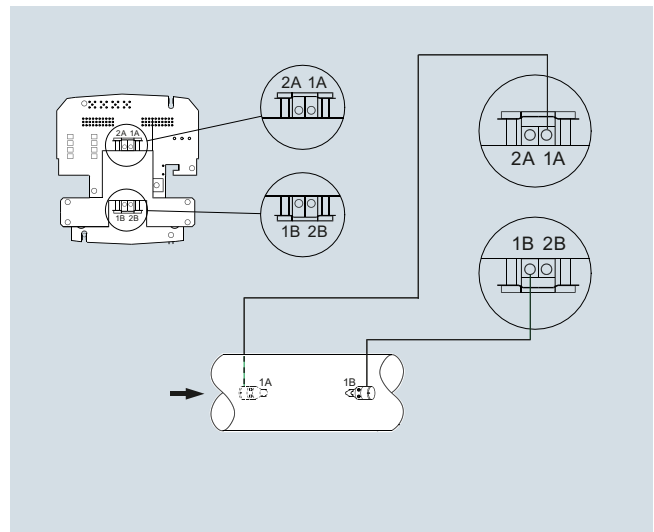
Electrical connection of SITRANS FUS060 and SONOKIT 2-path. Max. 30 m transducer cable length for sizes \geq DN 3000.



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