

SITRANS F flowmeters

SITRANS F US

Flowmeter SONOKIT (with FUS060)

Overview



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

The kit includes all necessary parts and special tools to make the installation as 1- or 2-track 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 in-line 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-track DN 100 to DN 2400 (4" to 96") – without process shut-down or flow interruption
- 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
- In-line transducers assure superior accuracy and performance
- Automatic calculation of the calibration factor when pipe geometry data are entered in the transmitter
- Transmitter versions with HART or PROFIBUS PA

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 a ultrasonic flowmeter on existing pipes depending on choices at ordering:

- Papers to wrap around pipes for alignment of sensors
- Transducer alignment tools
- Mounting plates and, transducer holders and SONO 3200 transducers
- Transducer cables
- SITRANS FUS060 transmitter for wall mounting
- 4 track version is available on request

Technical specifications

Transmitter specifications to the type SITRANS FUS060 see page 4/176 ff.

Accuracy

Typical, depending on accuracy of measurements of installation

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

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 transmitter.

Requirements for pipes

Requirements for pipes

Size	DN 100 ... DN 4000 (4" ... 160")
Line pressure	max. 40 bar (580 psi)
Media/surface temperature	<ul style="list-style-type: none"> • Standard version: -20 ... +200 °C (-4 ... +392 °F) • ATEX Ex-d version: -20 ... +180 °C (-4 ... +356 °F) • ATEX Ex-i version: -10 ... +190 °C (14 ... 374 °F)
Ambient temperature	-20 ... +60 °C (-4 ... +140 °F)

Transducer enclosure/approvals/certificates

Standard version	IP67 (NEMA 6) / IP68 (NEMA 6X)
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 EEx d T3-T6 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)

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Materials of existing pipeline

Steel	Transducer holder: EN 10273 or EN 10216 (P235GH) Mounting plates: EN 10273 or EN 10216 (P235GH)
Concrete	Transducer holder: Stainless steel AISI 316 or similar Mounting plates: (not included)
Stainless steel	Transducer holder: Stainless steel AISI 316 or similar Mounting plates: Stainless steel AISI 316 or similar

Pipe wall thickness

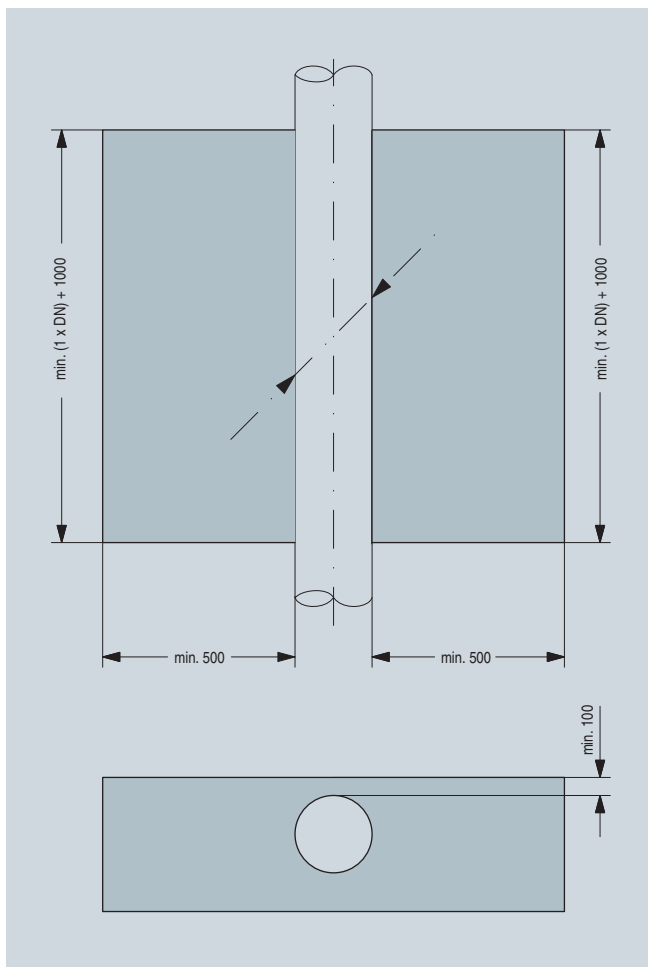
Steel pipe (AISI 316 and St. 37.2 or corresponding material)	Transducer and holder available in length L = 160, allowing a pipe wall thickness up to 20 mm (0.79")
Concrete pipe	Transducer and holder available in length L = 230, allowing a pipe wall thickness up to 200 mm (7.9")

Dimension of the package box

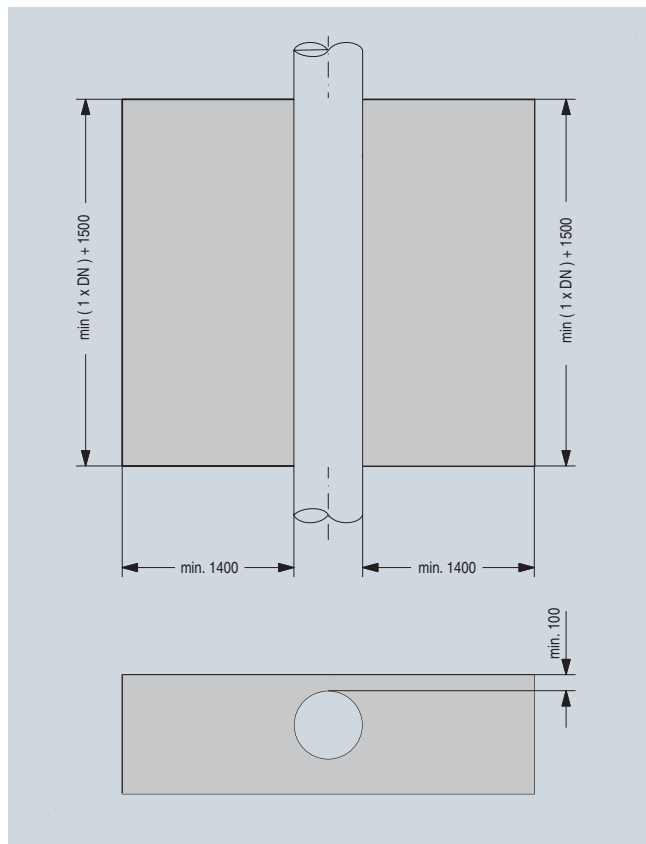
(L x W x H) 820 x 420 x 360 mm (32.3" x 16.6" x 14.2")

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		Order No.
SITRANS F US SONOKIT 1-track 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
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 method		
Empty pipe		A
Hot tap, mounting under pressure		B
SONOKIT for tapping band (Tapping band to be ordered separately) ¹⁾		C
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		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
IP68 SS housing, PN 40, SS, O-ring, 190 °C (374 °F), Ex i type, ATEX approval (only with FUS060 Ex)		5

¹⁾ Tapping band via special request

Selection and Ordering data		Order No.
SITRANS F US SONOKIT 1-track sensor		7ME3210 -
Cable gland entires		
Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5		1
Cable glands ½" NPT in transducers and in transmitter		2
Transmitter SITRANS FUS060		
IP65 (NEMA 4), 120/230 V AC		N
IP65 (NEMA 4), 24 V AC/DC		P
IP65 (NEMA 4), 24 V AC/DC Ex version		Q
Module		
HART, 1 pulse output, 1 relay		B
HART Ex version, 1 pulse output, 1 relay		C
PROFIBUS PA, 1 pulse/frequency		D
PROFIBUS PA, Ex version, 1 pulse/frequency		E
Transducer coax cable		
4 x 3 m, max. 70 °C (158 °F)		0
4 x 15 m, max. 70 °C (158 °F)		1
4 x 30 m, high temp. max. 200 °C (392 °F)		2
4 x 30 m, max. 70 °C (158 °F)		3
4 x 60 m, max. 70 °C (158 °F)		4
4 x 90 m, max. 70 °C (158 °F)		5
4 x 120 m, max. 70 °C (158 °F)		6
4 x 3 m, high temp. max. 200 °C (392 °F)		7
4 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		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

Selection and Ordering data		Order code
Additional information		
Please add „-Z“ to Order 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 with 12 mm characters (max. 15 characters) (add plain text)		Y17
Self-adhesive plastic tag with 8 mm characters (max. 15 characters) (add plain text)		Y18

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



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www.pia-selector.automation.siemens.com

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Selection and Ordering data		Order No.	Selection and Ordering data		Order No.
SITRANS F US SONOKIT 2-track sensor		7 ME 3 2 2 0 -	SITRANS F US SONOKIT 2-track sensor		7 ME 3 2 2 0 -
Diameter	Qn setting [m³/h]		Transducer type and approval		
DN 200 (8")	380	2 F	IP67 (NEMA 4X/6) PA housing, PN 40, O-ring, 100 °C (212 °F), no approval	1	
DN 250 (10")	600	2 K	IP68 SS housing, PN 40, O-ring, 180 °C (356 °F), EEx-d, ATEX approval (only with standard FUS060)	2	
DN 300 (12")	850	2 P	IP68 PA housing, Sylgard potting kit, PN 40, SS, O-ring, 100 °C (212 °F), no approval	3	
DN 350 (14")	1000	2 T	IP68 SS housing, Sylgard potting kit, PN 40, SS, O-ring, 200 °C (392 °F), no approval	4	
DN 400 (16")	1300	3 B	IP68 SS housing, PN 40, O-ring, 190 °C (374 °F), EEx-i, ATEX approval (only with FUS060 Ex)	5	
DN 450 (18")	1700	3 F	Cable gland entires		
DN 500 (20")	2200	3 K	Cable glands M20 in transducers and in transmitter M25/20/16 x 1.5	1	
DN 550 (22")	2600	3 P	Cable glands ½" NPT in transducers and in transmitter	2	
DN 600 (24")	3200	3 T	Transmitter SITRANS FUS060		
DN 650 (26")	3600	4 B	IP65 (NEMA 4), 120/230 V AC	N	
DN 700 (28")	4200	4 F	IP65 (NEMA 4), 24 V AC/DC	P	
DN 750 (30")	4800	4 K	IP65 (NEMA 4), 24 V AC/DC Ex version	Q	
DN 800 (32")	5500	4 P	Module		
DN 900 (36")	7500	5 B	HART, 1 pulse output, 1 relay	B	
DN 1000 (40")	9000	5 K	HART Ex version, 1 pulse output, 1 relay	C	
DN 1100 (44")	10000	5 P	PROFIBUS PA, 1 pulse/frequency	D	
DN 1200 (48")	13200	5 T	PROFIBUS PA, Ex version, 1 pulse/frequency	E	
DN 1300 (52")	14000	6 A	Transducer coax cable		
DN 1400 (56")	16800	6 C	4 x 3 m, max. 70 °C (158 °F)	0	
DN 1500 (60")	19000	6 E	4 x 15 m, max. 70 °C (158 °F)	1	
DN 1600 (64")	22800	6 G	4 x 30 m, high temp. max. 200 °C (392 °F)	2	
DN 1700 (68")	25000	6 J	4 x 30 m, max. 70 °C (158 °F)	3	
DN 1800 (72")	27600	6 L	4 x 60 m, max. 70 °C (158 °F)	4	
DN 1900 (76")	31000	6 N	4 x 90 m, max. 70 °C (158 °F)	5	
DN 2000 (80")	36000	6 Q	4 x 120 m, max. 70 °C (158 °F)	6	
DN 2100 (84")	37000	6 S	4 x 3 m, high temp. max. 200 °C (392 °F)	7	
DN 2200 (88")	42000	6 U	4 x 15 m, high temp. max. 200 °C (392 °F)	8	
DN 2300 (92")	45000	6 W	Special version (add order code):		
DN 2400 (96")	51000	7 A	No transducer cable, cable length 4 x 3 m	9 R 0 A	
DN 2500 (100")	53000	7 C	No transducer cable, cable length 4 x 15 m	9 R 0 B	
DN 2600 (104")	60000	7 E	No transducer cable, cable length 4 x 30 m	9 R 0 C	
DN 2700 (108")	62000	7 G	No transducer cable, cable length 4 x 60 m	9 R 0 D	
DN 2800 (112")	72000	7 J	No transducer cable, cable length 4 x 90 m	9 R 0 E	
DN 2900 (116")	71000	7 L	No transducer cable, cable length 4 x 120 m	9 R 0 F	
DN 3000 (120")	78000	7 N			
DN 3100 (124")	82000	7 Q			
DN 3200 (128")	85000	7 S			
DN 3300 (132")	92000	7 U			
DN 3400 (136")	100000	7 W			
DN 3500 (140")	100000	8 A			
DN 3600 (144")	110000	8 C			
DN 3700 (148")	120000	8 E			
DN 3800 (152")	130000	8 G			
DN 3900 (156")	130000	8 J			
DN 4000 (160")	144000	8 L			
Installation method					
Empty pipe		A			
Hot tap, mounting under pressure		B			
SONOKIT for tapping band (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		3			

¹⁾ Tapping band via special request

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Selection and Ordering data	Order code
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Additional information

Please add „-Z“ to Order 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 with 12 mm characters (max. 15 characters) (add plain text)	Y17
Self-adhesive plastic tag with 8 mm characters (max. 15 characters) (add plain text)	Y18

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