

Flow Measurement

SITRANS FS (ultrasonic)

Inline ultrasonic flowmeters

SONOKIT flowmeter (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.
- FST030 transmitter, modified for inline HART or Modbus
- 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
- For pipes bigger DN500 (20") please order FST030 transmitter separately (FDK-085X6329)

Technical specifications

The transmitter related to this system is the SITRANS FUS080 or FST030.

Technical specifications on pages 3/260 and 3/331.

Accuracy

Typical, depending on accuracy of measurements of installation

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

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	
• Standard version	-10 ... +200 °C (14 ... 392 °F)
• ATEX Ex d version (FUS060)	-20 ... +180 °C (-4 ... +356 °F)
• ATEX Ex i version (FUS060)	-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 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)

Technical specifications (continued)

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.

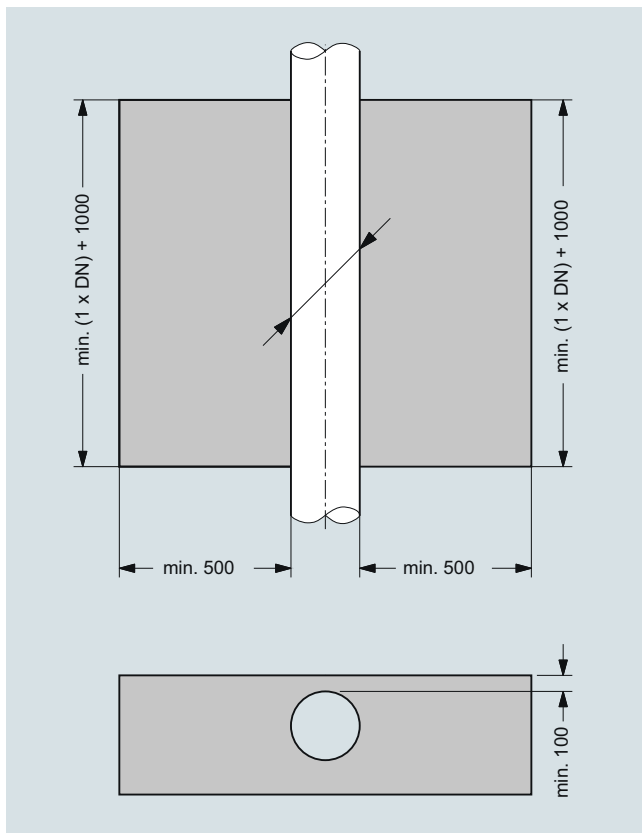
Dimension of the package box (L x W x H)	856 x 390 x 344 mm (33.7" x 15.4" x 13.5")
Weight example of a package (standard 2-path with FUS060)	approx. 53 kg (116.8 lb)
Certificates and approvals	
Conformity certificate	The devices are supplied as standard with a Siemens Certificate of Conformity on a 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.

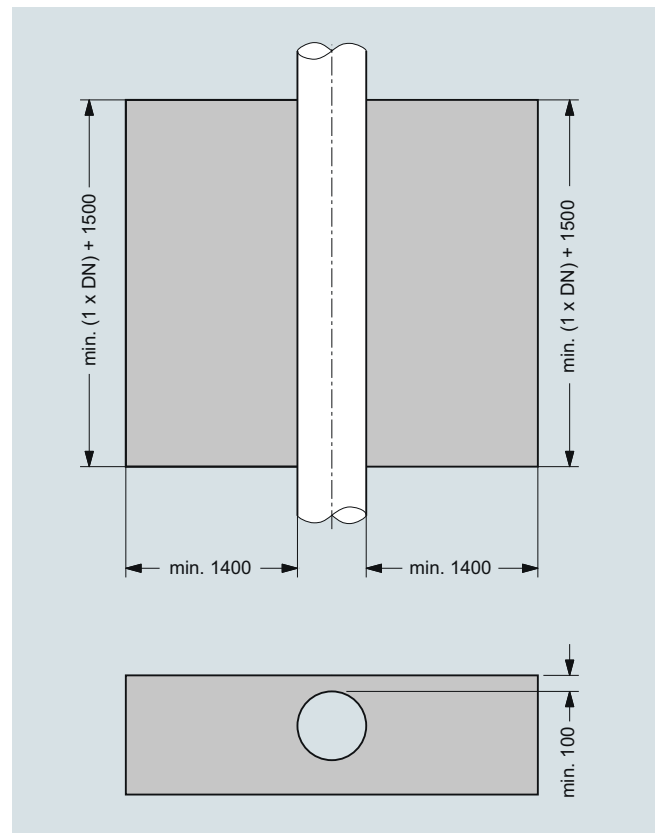
¹⁾ Mounting plates are only included for empty pipe installation types (refer to selection "A"). For hot tap mounting the mounting plates are not included (refer to selection "B").

Installation requirements

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

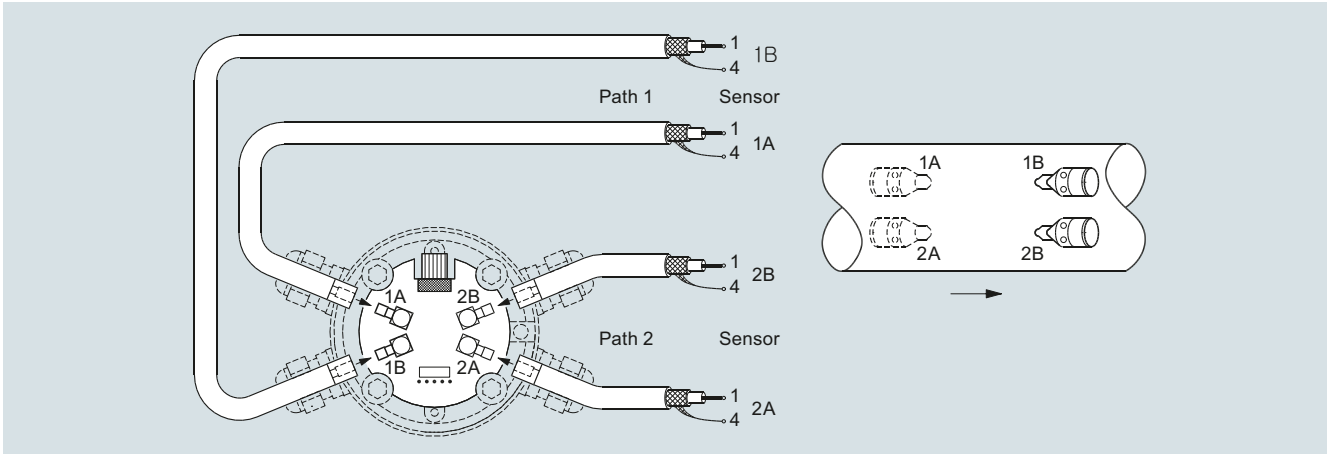


Empty pipe installation

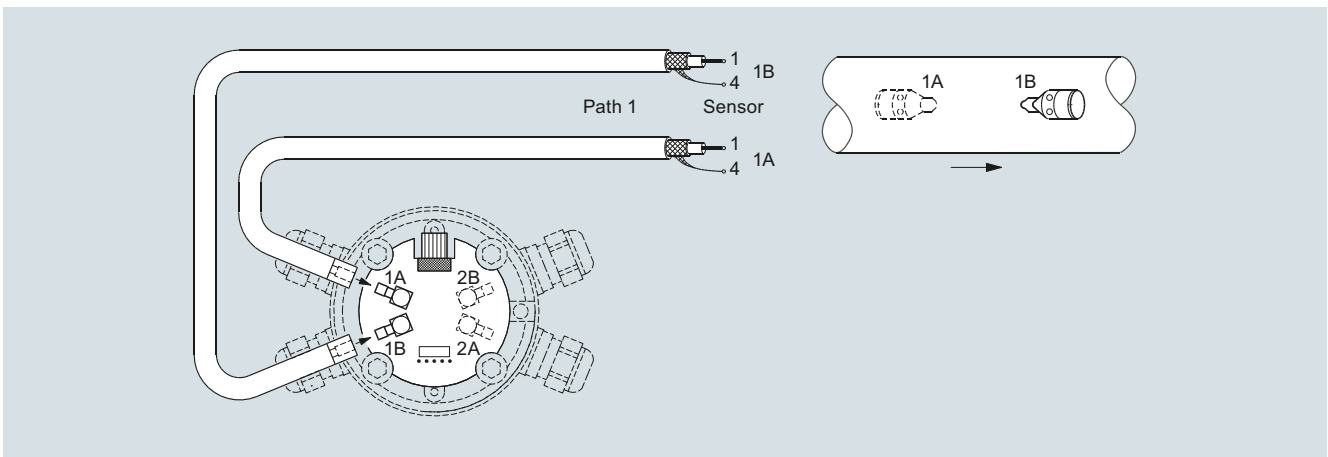


Hot-tap installation

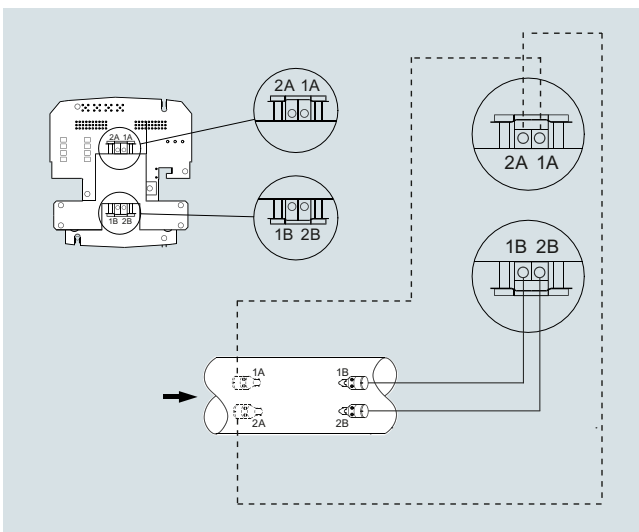
Circuit diagrams



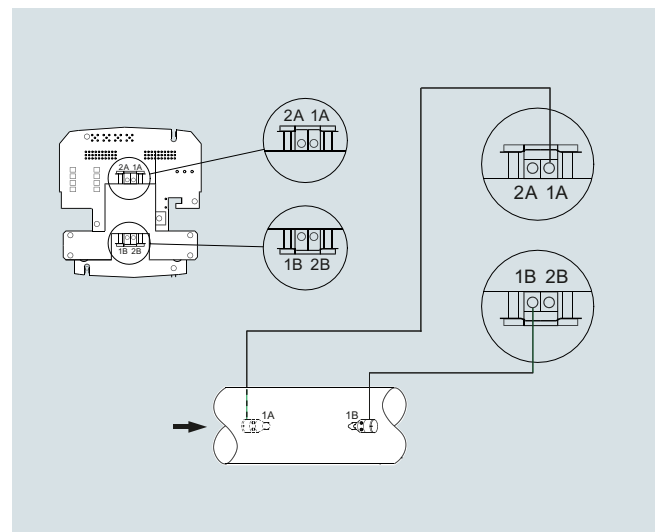
Electrical connection of SITRANS FUS060 and SONOKIT 2-path



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