Flowmeter SITRANS FUS880 (retrofit kit)

Overview

The SITRANS FUS880 is a battery-powered irrigation flowmeter, designed for pipes measuring from DN 200 up to DN 1200 (8" up to 48") in diameter. The SITRANS FUS880 gives you the ability to install the flowmeter underground retrofitting onto existing pipelines. This ultrasonic transient time irrigation flowmeter is used for full pipe flow measurements. Pipe material may be PVC or concrete and pipe construction may be single wall or double wall, smooth or corrugated.

The flowmeter produces a signal proportional to the velocity of the flow (flow rate) as the liquid flows past the ultrasonic sensors.

SITRANS FUS880 has transducers in the flow (inline) which assures superior aides in accuracy and superior performance when compared to doppler or many other types of flow measurement systems.

Benefits

- Cost-effective solution - contains all the necessary components for retrofitting onto existing pipe
- Battery-operated - Maintenance-free up to 6 years
- SITRANS FUS880 is easy to install in pipeline sizes from DN 200 up to DN 1200 (8" up to 48") in diameter
- The transmitter display shows both accumulated volume and instantaneous flow rate.
- The flowmeter provides a digital signal that can be sent directly to a PLC/RTU/DCS
- Solid construction with no moving parts for a 100% maintenance and obstruction-free flowmeter
- The SITRANS FUS880 transmitter comes within an IP67 enclosure.
- Sensor can easily be buried and withstand constant flooding.
- Automatic calculation of the calibration factor when pipe geometry data are entered in the signal transmitter.
- Pipe material may be polyvinylchloride (PVC) or concrete
- Pipe construction may be single wall or double wall, smooth or corrugated

Application

- Irrigation systems
- Irrigation distribution systems
- Pumping stations
- Canal laterals
- On-farm outlets
- Water well production
- Drip and sprinkler irrigation
- Center pivot systems
- Potable water

Design

The SITRANS FUS880 set contains all necessary parts to build up an ultrasonic flowmeter on existing pipes depending on choices at ordering:

- Templates to wrap around pipes for alignment of sensors
- Transducer threading tool
- Thread adapters
- Transducer alignment tools
- Mounting plugs or saddles as well as FUS880 transmitter dependant upon the specifics at time of ordering and required mounting hardware
- Cables

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Technical specifications

Accuracy

Typical ≤ ± 2.0%, dependant upon the accuracy of measurements of tube diameter and during installation

Note:

Flow system measurement performance depends on the accuracy of the measurements taken at time of installation. This means that inaccurate measurements of angles, distance between transducers, wall thickness and pipe diameter have a direct effect on the accuracy as these values measured are entered into the memory of the FUS880 transmitter and used in part of the calculation of flow rate.

Requirements for pipes	
Size	DN 200 ... DN 1200 (8" ... 48")
Transmitter Enclosure	
Rating	IP67 rated enclosure
Material	Fibre glass reinforced polyamide
Terminal box	PA 6.6, 100 °C (212 °F)
Transducer element	AISI 316 Stainless Steel 200 °C (392 °F)
2000 Corrugated PVC	Transducer holder: Polyvinyl chloride Mounting saddle: Polyvinyl chloride
• Line pressure max.	Pressure rating per spec. ASTM D-1784 (5.5 bar (80 psi))
• Liquid temperature max.	Temperature rating per spec. ASTM D-1784 (60 °C (140 °F))
Pro21 Corrugated PVC	Transducer holder: Polyvinyl chloride Mounting saddle: Polyvinyl chloride
• Line pressure max.	Pressure rating per spec. ASTM D-1784 (5.5 bar (80 psi))
• Liquid temperature max.	Temperature rating per spec. ASTM D-1784 (60 °C (140 °F))
PVC Solid PIP 80	Transducer holder: Polyvinyl chloride Mounting saddle: Polyvinyl chloride
• Line pressure max.	Pressure rating per spec. ASTM D-1784 (5.5 bar (80 psi))
• Liquid temperature max.	Temperature rating per spec. ASTM D-1784 (60 °C (140 °F))
Concrete	Transducer holder: Polyvinyl chloride Mounting saddle: Polyvinyl chloride
• Line pressure max.	Pressure rating per spec. ASTM D-1784 (5.5 bar (80 psi))
• Liquid temperature max.	Temperature rating per spec. ASTM D-1784 (60 °C (140 °F))
	Structural Epoxy joint meets spec. ASTM D1002 (118 bar or 1710 psi)
Pipe wall thickness	
A2000 Corrugated PVC	25 ... 50 mm (1" ... 2")
Pro21 Corrugated PVC	25 ... 50 mm (1" ... 2")
PVC Solid PIP 80	Less than 25 mm (1")
Concrete	• 51 ... 57 mm (2“ ... 2.25“) • 57 ... 64 mm (2.25“ ... 2.5“) • 70 ... 76 mm (2.75“ ... 3“) • 76 ... 83 mm (3“ ... 3.25“) • 89 ... 95 mm (3.5“ ... 3.75“) • 95 ... 100 mm (3.75“ ... 4“) • 108 ... 114 mm (4.25“ ... 4.50“)

More information

Installation requirement

The space requirements around the pipe for retrofitting an ultrasonic flowmeter type SITRANS FUS880 are given below:

It is important to prepare excavation site for a safe and efficient installation. An underground pipe needs to be exposed so that there is a minimum of 1.52 m (5 ft) or more of working space on either side of the pipe. The length of the trench should exceed the template length by 1.83 m (6 ft) or more.

Pipe support:

Ensure that an unearthed pipe has sufficient support beneath it to prevent deformation or breakage.

Cave-in:

Always brace trench walls. Follow all applicable (e.g. municipal, company, customer, site, union) construction guidelines.

Epoxy:

Follow all safety recommendations listed by the epoxy manufacturer. Use proper protection equipment, such as gloves, safety glasses, clothing, etc. Read the labels on the epoxy cans before mixing. Note all safety related statements and temperature recommendations in particular. For additional information, see the epoxy manufacturer's internet site.

Pipe template:

Templates are printed on a durable material, such as Mylar, and are resistant to normal contaminants. Do not expose the template to excessive moisture or excessive periods of sunlight, heat and cold temperatures. Always roll and store the template in its' shipping tube. Do not stretch or fold as this could permanently damage the template.

Installation overview:

Installation steps

Installation of the SITRANS FUS880 is accomplished with the following steps.

1. Expose and clean the pipe.
2. Mark a centerline on the pipe.
3. Place the template on the pipe and tape it securely to the pipe.
4. Mark the locations of the sensor mounting holes on the pipe.
5. Drill the sensor mounting holes in the pipe.
6. Clean and de-burr the sensor mounting area.
7. Measure up the pipe circumference C, the wall thickness WT and calculate OD and ID.
8. Epoxy and screw the saddle sensor holder to the pipe.
9. Assemble and install the sensors-holders.
10. Measure up the actual sensor-location to see if re-calibration is needed.
11. Assemble and install the sensors.
12. Install sensor wiring and conduit.
13. Install the transmitter and connect the sensor wiring.
14. Check the transmitter configuration.
15. Test the installation thoroughly and run a flow test.
16. Fill in the "Site Acceptance Form".
17. Cover the pipe.

For detailed instruction in installation please refer to User Manual Order no.: FDK:521HAP0553.

Flowmeter SITRANS FUS880 (retrofit kit)

Selection and Ordering data	Order No.
SITRANS F US **Ultrasonic flowmeters** **SITRANS FUS880 PVC (Solid) (PIP80)** **SONOKIT** **Battery-powered**	**7ME3440-**
Pipe diameter	
DN 200 (8")	**2F**
DN 250 (10")	**2K**
DN 300 (12")	**2P**
DN 380 (15")	**2M**
DN 450 (18")	**3F**
DN 530 (21")	**3M**
DN 600 (24")	**3T**
DN 680 (27")	**4D**
Wall thickness	
Less than 25 mm (1“)	**B**
Pipe material	
PVC (Solid) (PIP80)	**1**
Track configuration	
1-track	**1**
2-track X-configuration	**3**
Region version	
EU, US	**2**
Transmitters	
SITRANS FUS080, IP67, Battery-powered	**D**
Template	
Standard	**A**
Cable length	
20 m (65.6 ft) with gland	**4**

Selection and Ordering data	Order code
Further designs	
Please add „**-Z**“ to Order No. and specify Order code(s).	
Add on units of measure	
Flow unit GPM	**L01**
Flow unit CFS	**L02**
Flow unit m^3/h	**L03**
Flow unit MGD	**L05**
Volume unit US Gal	**L42**
Volume unit m^3/h	**L44**
Volume unit US Gal x 100	**L46**
Volume unit US Gal x 1000	**L49**
Volume unit US Mgal	**L48**
Volume unit AcF (Acre Feet)	**L43**
Volume unit AcI (Acre Inch)	**L51**

Selection and Ordering data	Order No.
SITRANS F US **Ultrasonic flowmeters** **SITRANS FUS880 A2000 Corrugated PVC** **SONOKIT 1-track** **Battery-powered**	**7ME3440-**
Pipe diameter	
DN 380 (15")	**2V**
DN 450 (18")	**3F**
DN 530 (21")	**3M**
DN 600 (24")	**3T**
DN 750 (30")	**4K**
DN 900 (36")	**5B**
Wall thickness	
25 ... 50 mm (1“ ... 2“)	**C**
Pipe material	
PVC Corrugated A2000	**3**
Track configuration	
1-track	**1**
Region version	
EU, US	**2**
Transmitter	
SITRANS FUS080, IP67, Battery-powered	**D**
Template	
Standard	**A**
Cable length	
20 m (65.6 ft) with gland	**4**

Selection and Ordering data	Order code
Further designs	
Please add „**-Z**“ to Order No. and specify Order code(s).	
Add on units of measure	
Flow unit GPM	**L01**
Flow unit CFS	**L02**
Flow unit m^3/h	**L03**
Flow unit MGD	**L05**
Volume unit US Gal	**L42**
Volume unit m^3/h	**L44**
Volume unit US Gal x 100	**L46**
Volume unit US Gal x 1000	**L49**
Volume unit US Mgal	**L48**
Volume unit AcF (Acre Feet)	**L43**
Volume unit AcI (Acre Inch)	**L51**

Flowmeter SITRANS FUS880 (retrofit kit)

Selection and Ordering data	Order No.
SITRANS F US Ultrasonic flowmeters	**7 M E 3 4 4 0 -**
SITRANS FUS880 Pro21 Corrugated PVC SONOKIT 1-track Battery-powered	■■■■■ - ■■■■
Pipe diameter	
DN 750 (30")	**4 K**
DN 840 (33")	**4 P**
DN 900 (36")	**5 B**
DN 1050 (42")	**5 M**
DN 1200 (48")	**5 T**
Wall thickness	
25 ... 50 mm (1“ ... 2“)	**C**
Pipe material	
PVC Pro21 Corrugated	**2**
Track configuration	
1-track	**1**
Region version	
EU, US	**2**
Transmitter	
SITRANS FUS080, IP67, battery-powered	**D**
Template	
Standard	**A**
Cable length	
20 m (65.6 ft) with gland	**4**

Selection and Ordering data	Order code
Further designs	
Please add „**-Z**“ to Order No. and specify Order code(s).	
Add on units of measure	
Flow unit GPM	**L01**
Flow unit CFS	**L02**
Flow unit m^3/h	**L03**
Flow unit MGD	**L05**
Volume unit US Gal	**L42**
Volume unit m^3/h	**L44**
Volume unit US Gal x 100	**L46**
Volume unit US Gal x 1000	**L49**
Volume unit US Mgal	**L48**
Volume unit AcF (Acre Feet)	**L43**
Volume unit AcI (Acre Inch)	**L51**

Selection and Ordering data	Order No.
SITRANS F US Ultrasonic flowmeters	**7 M E 3 4 4 0 -**
SITRANS FUS880 Concrete SONOKIT 1-track Battery-powered	■■■■■ - ■■■■
Pipe diameter	
DN 300 (12")	**2 P**
DN 380 (15")	**2 V**
DN 450 (18")	**3 F**
DN 530 (21")	**3 M**
DN 600 (24")	**3 T**
DN 680 (27")	**4 D**
DN 750 (30")	**4 K**
DN 900 (36")	**5 B**
DN 1050 (42")	**5 M**
Wall thickness	
51 ... 57 mm (2“ ... 2.25“)	**D**
57 ... 64 mm (2.25“ ... 2.5“)	**E**
70 ... 76 mm (2.75“ ... 3“)	**F**
76 ... 83 mm (3“ ... 3.25“)	**G**
89 ... 95 mm (3.5“ ... 3.75“)	**H**
95 ... 100 mm (3.75“ ... 4“)	**J**
108 ... 114 mm (4.25“ ... 4.5“)	**K**
Pipe material	
Concrete	**4**
Track configuration	
1-track	**1**
Region version	
EU, US	**2**
Transmitter	
SITRANS FUS080, IP67, battery-powered	**D**
Template	
Standard	**A**
Cable length	
20 m (65.6 ft) with gland	**4**

Selection and Ordering data	Order code
Further designs	
Please add „**-Z**“ to Order No. and specify Order code(s).	
Add on units of measure	
Flow unit GPM	**L01**
Flow unit CFS	**L02**
Flow unit m^3/h	**L03**
Flow unit MGD	**L05**
Volume unit US Gal	**L42**
Volume unit m^3/h	**L44**
Volume unit US Gal x 100	**L46**
Volume unit US Gal x 1000	**L49**
Volume unit US Mgal	**L48**
Volume unit AcF (Acre Feet)	**L43**
Volume unit AcI (Acre Inch)	**L51**

Selection and Ordering data	Order No.
Accessories and Spare parts	
SITRANS F US Ultrasonic flowmeters	
FUS880 transmitter includes 2 transducers and 20 m (65.6 ft) of cable	**7ME3440-0AA01-2DA4**
FUS880 Installation pipe template	
Template, PVC PIP 80	
DN 250 (10“)	**TGX:16347-80**
DN 300 (12“)	**TGX:16347-81**
DN 380 (15“)	**TGX:16347-82**
DN 450 (18“)	**TGX:16347-83**
DN 530 (21“)	**TGX:16347-84**
DN 600 (24“)	**TGX:16347-85**
DN 680 (27“)	**TGX:16347-86**
Template, Concrete	
DN 300 (12“)	**TGX:16347-90**
DN 380 (15“)	**TGX:16347-91**
DN 400 (16“)	**TGX:16347-89**
DN 450 (18“)	**TGX:16347-92**
DN 530 (21“)	**TGX:16347-93**
DN 600 (24“)	**TGX:16347-94**
DN 680 (27“)	**TGX:16347-95**
DN 750 (30“)	**TGX:16347-96**
DN 900 (36“)	**TGX:16347-97**
DN 1050 (42“)	**TGX:16347-98**
Template, pipe DN 900 (36“) PVC, A2000 corrugated	**TGX:16347-100**
Template, pipe DN 1050 (42“) Pro21 corrugated	**TGX:16347-101**
FUS880 Installation spare kit	
Concrete kit, Sensor mounting	
51 ... 57 mm (2“ ... 2.25“)	**TGX:16347-213K**
57 ... 64 mm (2.25“ ... 2.5“)	**TGX:16347-214K**
70 ... 76 mm (2.75“ ... 3“)	**TGX:16347-215K**
76 ... 83 mm (3“ ... 3.25“)	**TGX:16347-216K**
89 ... 95 mm (3.5“ ... 3.75“)	**TGX:16347-217K**
95 ... 100 mm (3.75“ ... 4“)	**TGX:16347-218K**
108 ... 114 mm (4.25“ ... 4.5“)	**TGX:16347-212K**
PVC kit, Sensor Mounting	
DN 300 (12“)	**TGX:16347-219K**
DN 380 (15“)	**TGX:16347-220K**
DN 450 (18“)	**TGX:16347-221K**
DN 530 (21“)	**TGX:16347-222K**
DN 600 (24“)	**TGX:16347-223K**
DN 680 (27“)	**TGX:16347-224K**
Corrugated PVC kit, DN 900 (36“) A2000	**TGX:16347-225K**
Corrugated PVC kit, DN 1050 (42“') Pro21	**TGX:16347-226K**
FUS880 spares	
Holder - Saddle	
DN 250 (10“) PIP 80 PVC Saddle	**TGX:16347-165**
DN 300 (12“) PIP 80 PVC Saddle	**TGX:16347-166**
DN 380 (15“) PIP 80 PVC Saddle	**TGX:16347-168**
DN 450 (18“) PIP 80 PVC Saddle	**TGX:16347-170**
DN 530 (21“) PIP 80 PVC Saddle	**TGX:16347-174**
DN 600 (24“) PIP 80 PVC Saddle	**TGX:16347-175**
DN 680 (27“) PIP 80 PVC Saddle	**TGX:16347-177**

Selection and Ordering data	Order No.
Holder - Plug	
51 ... 57 mm (2“ ... 2.25“) Cement sensor holder, PVC	**TGX:16347-120**
57 ... 64 mm (2.25“ ... 2.5“) Cement sensor holder, PVC	**TGX:16347-121**
70 ... 76 mm (2.75“ ... 3“) Cement sensor holder, PVC	**TGX:16347-122**
76 ... 83 mm (3“ ... 3.25“) Cement sensor holder, PVC	**TGX:16347-123**
89 ... 95 mm (3.5“ ... 3.75“) Cement sensor holder, PVC	**TGX:16347-124**
102 ... 108 (4“ ... 4.25“) Cement sensor holder, PVC	**TGX:16347-125**
108 ... 114 mm (4.25“ ... 4.5“) Cement sensor holder, PVC	**TGX:16347-127**
A2000 - DN 900 (36“) ID	**TGX:16347-134**
PRO-21 - DN 1050 (42“) ID	**TGX:16347-135**
Straps -Kits	
Strap kit for -134 & -135 plugs	**TGX:16347-235**
Strap kit for -120, -121, -122, -123 plugs	**TGX:16347-236**
Strap kit for -124 & -125 plugs	**TGX:16347-237**
Strap kit for -127 plug	**TGX:16347-238**
Adhesive	
1 lb epoxy	**A6X30004048**
Adapter	
Conduit adapter	**A6X30003981**
Tools	
Sensor Wrench	**TGX:16347-111**
Alignment Tool	**TGX:16347-137**
Documentation	
Manual	**FDK:521HAP0553**
Converter	
FUS880 converter kit for 2 track SYS	**7ME3440-0AA03-2DA4**

Note:
Installation spares kit include:

Concrete kit:
2 transducer mounting plugs, 2 straps, mounting hardware, epoxy, conduit adapter, installation guide

PVC kit:
2 transducer mounting saddles, mounting hardware, epoxy, conduit adapter, installation guide

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