



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Proline Prosonic Flow 93C

Ultrasonic flow measuring system

Volume flow measurement for standard applications
with drinking water, wastewater and process water



Applications

The Prosonic Flow C sensor is perfectly suited for the non-intrusive flow measurement of process water, saltwater, drinking water and wastewater applications.

- Suitable for pipe diameters from DN 300 to 2000 (12 to 80")
- Available with drinking water approvals
- Interface for easy integration into all common distributed control systems:
 - HART
 - PROFIBUS DP/PA
 - FOUNDATION Fieldbus

Features and benefits

The Prosonic Flow C Inline is a dual path system and has two pairs of insertion sensors. The flow measurement is bidirectional and causes no pressure loss.

In addition, the system provides:

- High accuracy
- Traceable calibration
- Short inlet run requirements
- Removal and replacement of sensor elements without process shutdown
- IP 68 rating
- Remote configuration using Endress+Hauser's FieldCare Software

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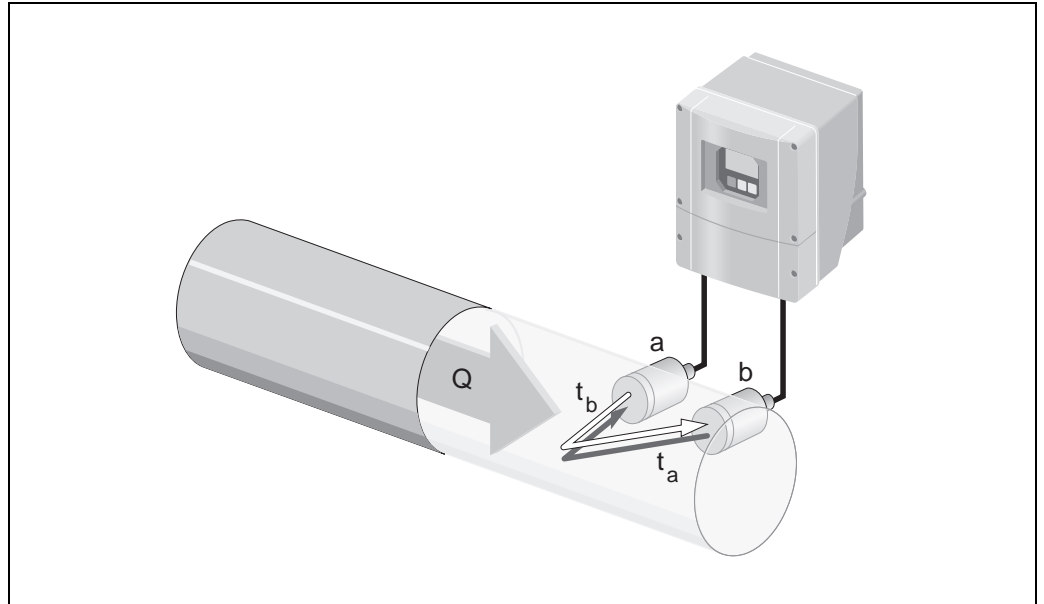
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Function and system design

Measuring principle

The measuring system operates on the principle of transit time difference. In this measurement method, acoustic (ultrasonic) signals are transmitted between two sensors. The signals are sent in both directions, i.e. the sensor in question works as both a sound transmitter and a sound receiver.

As the propagation velocity of the waves is less when the waves travel against the direction of flow than along the direction of flow, a transit time difference occurs. This transit time difference is directly proportional to the flow velocity.



Principle of the transit time difference measurement method

$$Q = v \cdot A$$

a Sensor

b Sensor

Q Volume flow

v Flow velocity ($v \sim \Delta t$)

Δt Transit time difference ($\Delta t = t_a - t_b$)

A Pipe cross-sectional area

The measuring system calculates the volume flow of the fluid from the measured transit time difference and the pipe cross-sectional area. In addition to measuring the transit time difference, the system simultaneously measures the sound velocity of the fluid. This additional measured variable can be used to distinguish different fluids or as a measure of product quality.

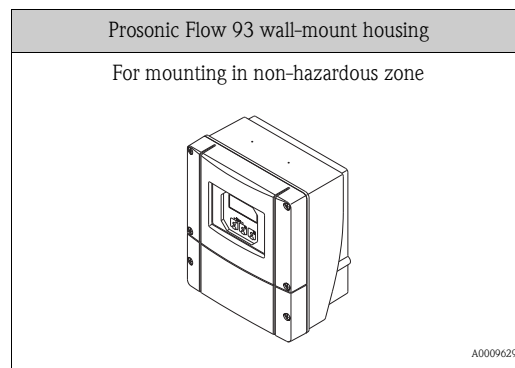
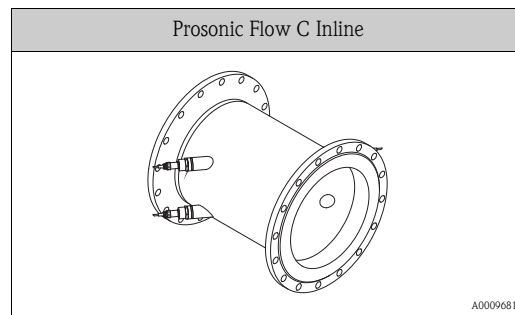
The measuring device can be configured onsite to suit the specific application using Quick Setup menus.

Measuring system

The measuring system consists of one transmitter and four sensors.

The transmitter is used both to control the sensors and to prepare, process and evaluate the measuring signals, and to convert the signals to a desired output variable.

The sensors work as sound transmitters and sound receivers.

Transmitter**Sensor**

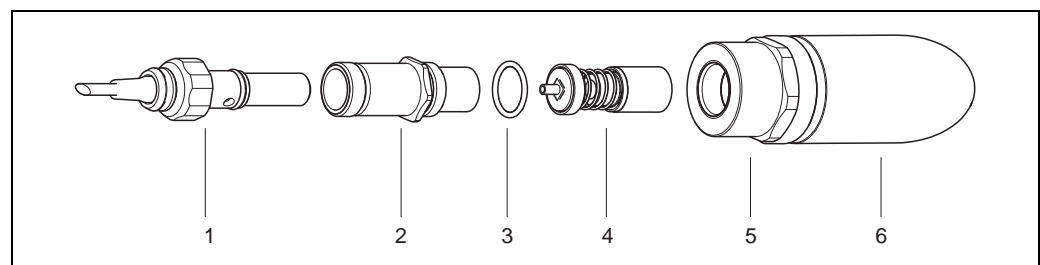
The Prosonic Flow C Inline sensor consists of a measuring pipe which is integrated into the pipe system of the application by means of process flanges.

The Prosonic Flow C Inline is a dual path system and has two pairs of insertion sensors.

The Prosonic Flow C Inline sensor is available with two different internal coatings depending on the application:

- for drinking water: epoxy coating with approval for drinking water
- for wastewater: epoxy coating for wastewater

The active part of the sensor can be replaced without interrupting the process.



- 1 *Sensor connector*
- 2 *Sensor neck*
- 3 *O-ring*
- 4 *Sensor element*
- 5 *Sensor holer*
- 6 *Sensor support in measuring pipe Prosonic Flow C*

Input

Measured variable	Flow velocity (transit time difference proportional to flow velocity)
Measuring range	Typically $v = 0$ to 10 m/s (0 to 33 ft/s)
Operable flow range	Over 150 : 1
Input signal	<p>Status input (auxiliary input)</p> <p>$U = 3$ to 30 V DC, $R_i = 5$ kΩ, galvanically isolated</p> <p>Configurable for: totalizer(s) reset, measured-value suppression, error-message reset</p>

Output

Output signal	<p>Current output</p> <ul style="list-style-type: none"> ■ Galvanically isolated ■ Active/passive selectable <ul style="list-style-type: none"> – Active: 0/4 to 20 mA, $R_L < 700$ Ω (for HART: $R_L \geq 250$ Ω) – Passive: 4 to 20 mA, max. 30 V DC, $R_i \leq 150$ Ω ■ Time constant selectable (0.01 to 100 s) ■ Full scale value adjustable ■ Temperature coefficient: typ. 0.005 % o.r./$^{\circ}\text{C}$ (o.r. = of reading) ■ Resolution: 0.5 μA <p>Pulse/frequency output</p> <ul style="list-style-type: none"> ■ Galvanically isolated ■ Active/passive selectable <ul style="list-style-type: none"> – Active: 24 V DC, 25 mA (max. 250 mA during 20 ms), $R_L > 100$ Ω – Passive: open collector, 30 V DC, 250 mA ■ Time constant selectable (0.05 to 100 s) ■ Frequency output <ul style="list-style-type: none"> – End frequency: 2 to 10000 Hz ($f_{\text{max}} = 12500$ Hz) – End frequency for EEx ia 2 to 5000 Hz – On/off ratio 1:1, pulse width max. 10 s ■ Pulse output <ul style="list-style-type: none"> – Pulse value and pulse polarity selectable – Max. pulse width adjustable (0.05 to 2000 ms) – As of a frequency of $1 / (2 \times \text{pulse width})$, the on/off ratio is 1:1 <p>PROFIBUS DP interface</p> <ul style="list-style-type: none"> ■ PROFIBUS DP in accordance with EN 50170 Volume 2 ■ Profile version 3.0 ■ Data transmission rate: 9.6 kBaud to 12 MBaud ■ Automatic data transmission rate recognition ■ Signal encoding = NRZ Code ■ Function blocks: 8 \times Analog input (AI), 3 \times Totalizer ■ Output data: volume flow channel 1 or channel 2, sound velocity channel 1 or channel 2, flow velocity channel 1 or channel 2, average volume flow, average sound velocity, average flow velocity, volume flow sum, volume flow difference, totalizer 1 to 3 ■ Input data: positive zero return (ON/OFF), zero point adjustment, measuring mode, totalizer control ■ Bus address adjustable via miniature switches or local display (optional) at the measuring device
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PROFIBUS PA interface

- PROFIBUS PA in accordance with EN 50170 Volume 2, IEC 61158-2 (MBP)
- Galvanically isolated
- Data transmission rate, supported baudrate: 31.25 kBit/s
- Current consumption = 11 mA
- Error current FDE (fault disconnection electronic) = 0 mA
- Signal encoding = Manchester II
- Function blocks: 8 × Analog Input (AI), 3 × Totalizer
- Output data: volume flow channel 1 or channel 2, sound velocity channel 1 or channel 2, flow velocity channel 1 or channel 2, average volume flow, average sound velocity, average flow velocity, volume flow sum, volume flow difference, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), operation control, totalizer control, zero point adjustment control, display value
- Bus address can be set via DIP switch on device

FOUNDATION Fieldbus interface

- FOUNDATION Fieldbus H1, IEC 61158-2
- Galvanically isolated
- Data transmission rate, supported baudrate: 31.25 kBit/s
- Current consumption = 12 mA
- Error current FDE (fault disconnection electronic) = 0 mA
- Signal encoding = Manchester II
- Function blocks: 8 × Analog Input (AI), 1 × Discrete Output, 1 × PID
- Output data: volume flow channel 1 or channel 2, sound velocity channel 1 or channel 2, flow velocity channel 1 or channel 2, signal strength channel 1 or 2, average volume flow, average sound velocity, average flow velocity, volume flow sum, difference, volume flow, totalizer 1 to 3
- Input data: positive zero return (ON/OFF), reset totalizer, zero point adjustment control
- Link master function (LAS) is supported

Signal on alarm

- Current output → failsafe mode selectable
- Pulse/frequency output → failsafe mode selectable
- Relay output → "deenergized" in the event of a fault or if the power supply fails

Load

See "Output signal"

Switching output**Relay output**

- NC or NO contact available
Factory setting: relay 1 = NO contact, relay 2 = NC contact
- Max. 30 V / 0.5 A AC; 60 V / 0.1 A DC
- Galvanically isolated
- Configurable for: error messages, flow direction, limit values

Low flow cutoff

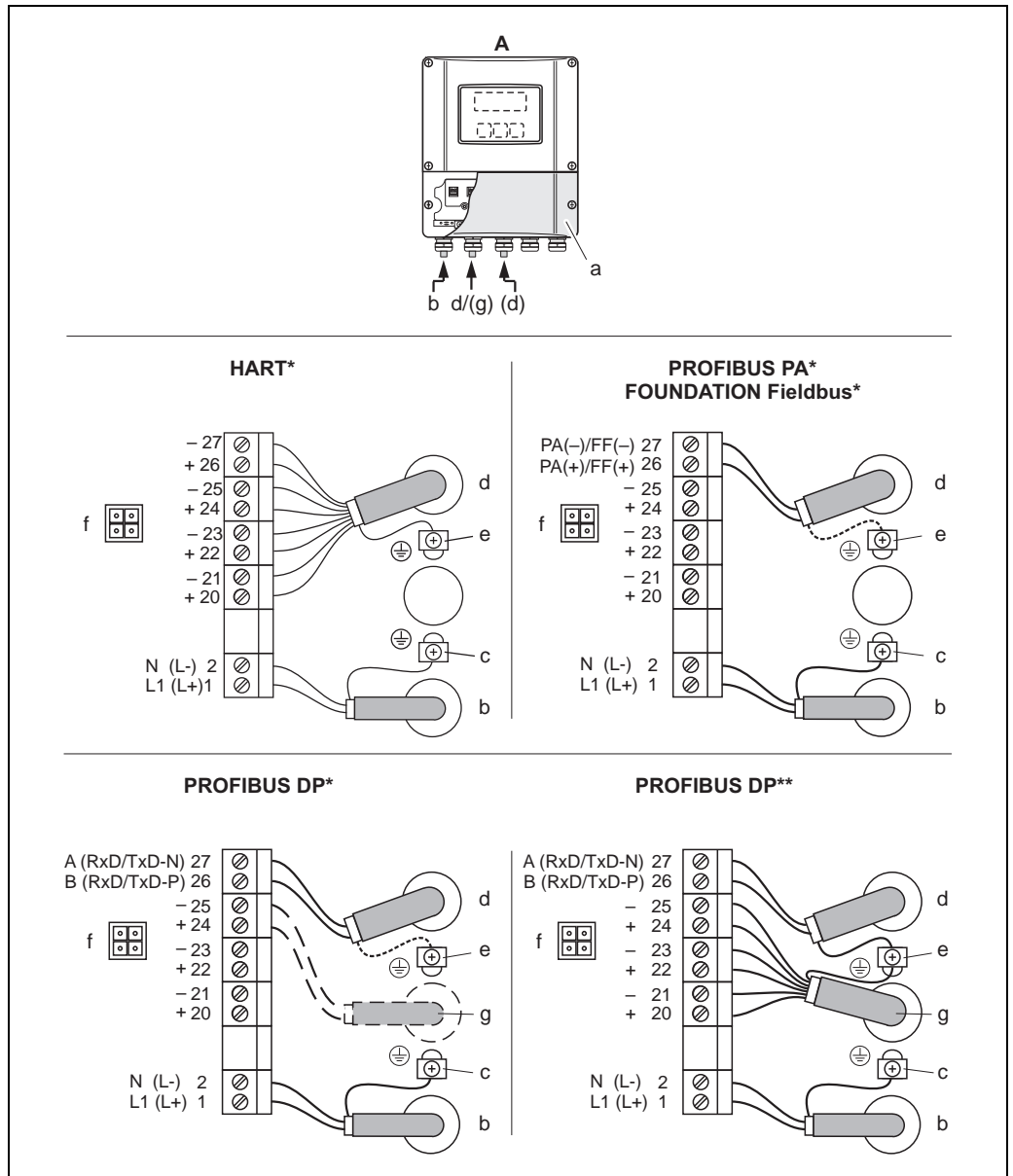
Switch points for low flow are selectable

Galvanic isolation

All circuits for inputs, outputs, and power supply are galvanically isolated from each other.

Power supply

Electrical connection,
measuring unit



Connecting the transmitter, cable cross-section max. 2.5 mm² (14 AWG)

A View A (wall-mount housing)

*) fixed communication boards

**) flexible communication boards

a Connection compartment cover

b Cable for power supply: 85 to 260 V AC / 20 to 55 V AC / 16 to 62 V DC

- Terminal No. 1: L1 for AC, L+ for DC

- Terminal No. 2: N for AC, L- for DC

c Ground terminal for protective conductor

d Signal cable: see terminal assignment → 8

Fieldbus cable:

- Terminal No. 26: DP (B) / PA (+) / FF (+) with polarity protection

- Terminal No. 27: DP (A) / PA (-) / FF (-) with polarity protection

e Ground terminal for signal cable shield / Fieldbus cable

f Service adapter for connecting service interface FXA193 (Fieldcheck, FieldCare)

g Signal cable: see terminal assignment → 8

Cable for external termination (only for PROFIBUS DP with fixed assignment communication board):

- Terminal No. 24: +5 V

- Terminal No. 25: DGND

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Electrical connection, terminal assignment

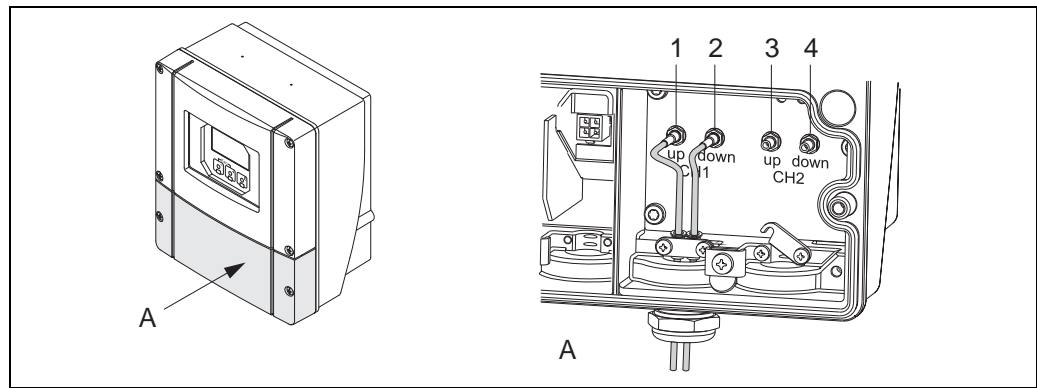
The inputs and outputs on the communication board can be either permanently assigned or variable, depending on the version ordered (see table). Replacements for modules which are defective or which have to be replaced can be ordered as accessories.

Order variant	Terminal No. (inputs/outputs)			
	20 (+) / 21 (-)	22 (+) / 23 (-)	24 (+) / 25 (-)	26 (+) / 27 (-)
<i>Fixed communication boards (fixed assignment)</i>				
93***_*****A	–	–	Frequency output	Current output HART
93***_*****B	Relay output 2	Relay output 1	Frequency output	Current output HART
93***_*****H	–	–	–	PROFIBUS PA
93***_*****J	–	–	–	PROFIBUS DP
93***_*****K	–	–	–	FOUNDATION Fieldbus
<i>Flexible communication boards</i>				
93***_*****C	Relay output 2	Relay output 1	Frequency output	Current output HART
93***_*****D	Status input	Relay output	Frequency output	Current output HART
93***_*****L	Status input	Relay output 2	Relay output 1	Current output HART
93***_*****M	Status input	Frequency output	Frequency output	Current output HART
93***_*****P	Current output	Frequency output	Status input	PROFIBUS DP
93***_*****V	Relay output 2	Relay output 1	Status input	PROFIBUS DP
93***_*****W	Relay output	Current output	Current output	Current output HART
93***_*****2	Relay output	Current output	Frequency output	Current output HART

Ground terminal → 7

Connecting the connecting cable

Connecting the wall-mount housing



Connecting the connecting cable, wall-mount housing

- 1 Channel 1 upstream
- 2 Channel 1 downstream
- 3 Channel 2 upstream (only available when ordered)
- 4 Channel 2 downstream (only available when ordered)

Supply voltage

Transmitter

HART

- 85 to 260 V AC, 45 to 65 Hz
- 20 to 55 V AC, 45 to 65 Hz
- 16 to 62 V DC

PROFIBUS DP/PA

- 9 to 32 V DC

FOUNDATION Fieldbus

- 9 to 32 V DC

Sensor

Powered by the transmitter

Cable entry

Power supply and signal cables (inputs/outputs)

- Cable gland M20 × 1.5
 - Cable gland for cables 8 to 12 mm (0.3 to 0.5")
 - Cable gland for cables 6 to 12 mm (0.2 to 0.5")
- Thread for cable entry ½" NPT, G ½"

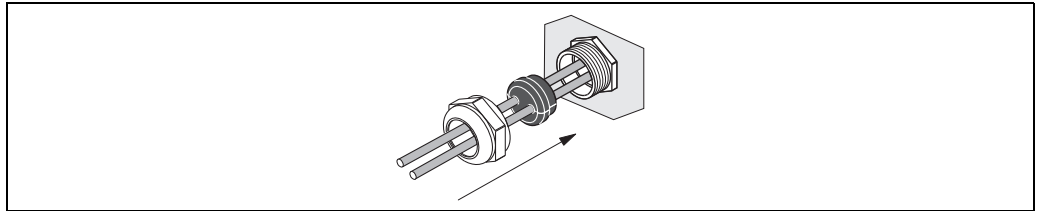
Connecting cable (sensor/transmitter)

Cable gland for one connecting cable per cable entry, 1 × Ø 8 mm (0.31")

- Cable gland M20 × 1.5
- Thread for cable entry ½" NPT, G ½"

Cable gland for two connecting cables per cable entry, 2 × Ø 4 mm (0.16")

- Cable gland M20 × 1.5
- Thread for cable entry ½" NPT, G ½"



Cable gland for two connecting cables per cable entry

Connecting cable (sensor/transmitter)

Only use the connecting cables supplied by Endress+Hauser.

Different versions of the connecting cables are available → 20.

- Cable material made of PVC (standard)
- Cable length: 5 to 30 m (16.4 to 98.4 ft)



Note!

To ensure correct measuring results, route the connecting cable well clear of electrical machines and switching elements.

Power consumption

AC: < 18 VA (incl. sensor)

DC: < 10 W (incl. sensor)

Switch-on current

- max. 13.5 A (< 50 ms) at 24 V DC
- max. 3 A (< 5 ms) at 260 V AC

Power supply failure

Lasting min. 1 power cycle

HistoROM/T-DAT save measuring system data if the power supply fails

Potential equalization

For potential equalization, no special measures are necessary.

Performance characteristics

Reference operating conditions

- Fluid temperature: +20 to +30 °C
- Ambient temperature: +22 °C ± 2 K
- Warm-up period: 30 minutes
- Sensors and transmitter are grounded.
- The measuring sensors are correctly installed.

Maximum measured error

For flow velocities of > 0.3m/s (1 ft/s) and a Reynolds number of > 10000, the system accuracy is:

Nominal diameter	Guaranteed error limits of the device	Report
DN 300 to 2000 (12 to 80")	±0.5 % o.r. ± 3 mm/s	Factory measurement report

o.r. = of reading



Note!

The Prosonic Flow 93 C Inline sensor is also available without factory flow calibration.

The error limits without calibration are ±1.5 % o.r. ± 3 mm/s

Repeatability

±0.3 % for flow velocities > 0.3 m/s (1 ft/s)

Operating conditions: installation

Installation instructions



Mounting location

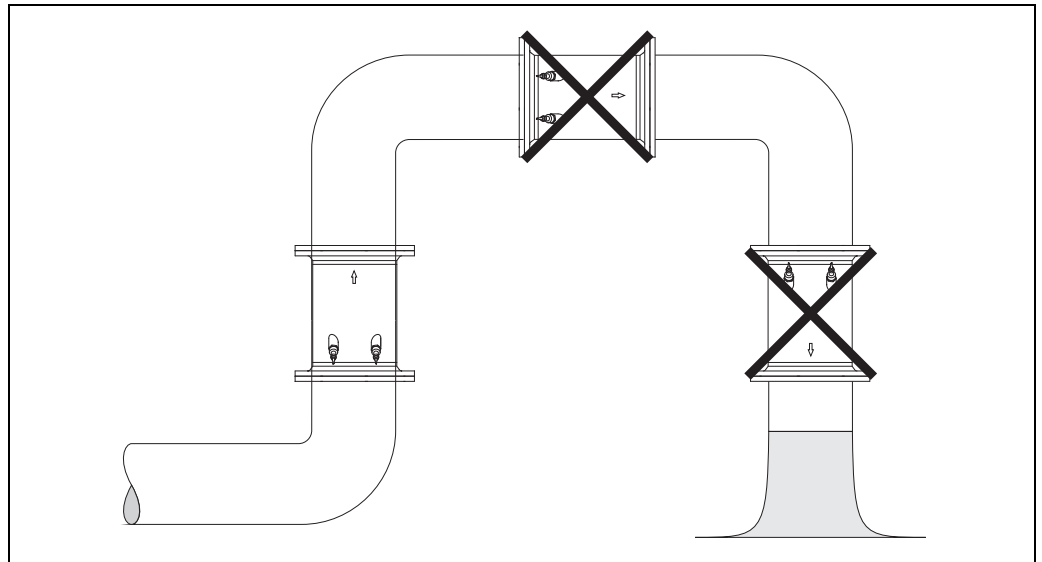
Correct flow measurement is possible only if the pipe is full. It is preferable to install the sensors in a riser.

Note!

Entrained air or gas bubbles in the measuring tube can result in an increase in measuring errors.

For this reason, **avoid** the following mounting locations:

- Highest point of a pipeline. Risk of air accumulating.
- Directly upstream of a free pipe outlet in a vertical pipe. Risk of partial pipe filling.



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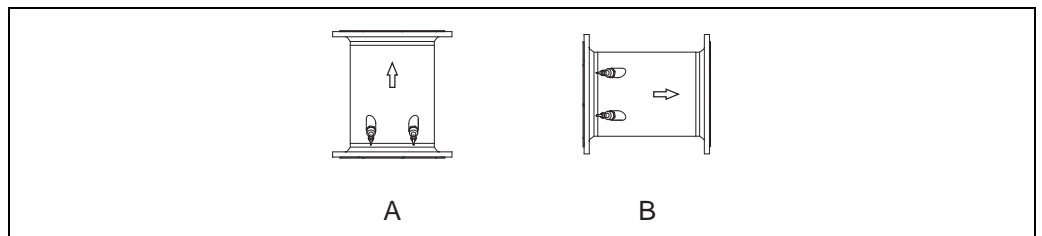
Orientation

Vertical

Recommended orientation with upward direction of flow (View A). With this orientation, entrained solids will sink and gases will rise away from the sensor when the fluid is stagnant. The piping can be completely drained and protected against solids buildup.

Horizontal

In the recommended installation range in a horizontal installation position (View B), gas and air collections at the pipe cover and problematic deposits at the bottom of the pipe have a smaller influence on measurement.



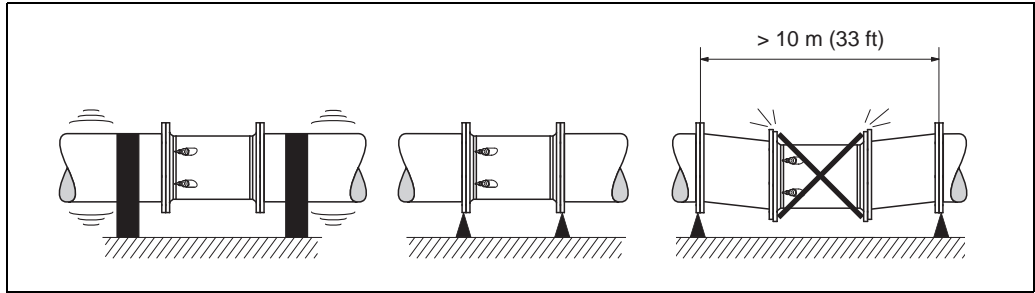
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A Recommended orientation with upward direction of flow

B Recommended installation range with horizontal orientation

Vibrations

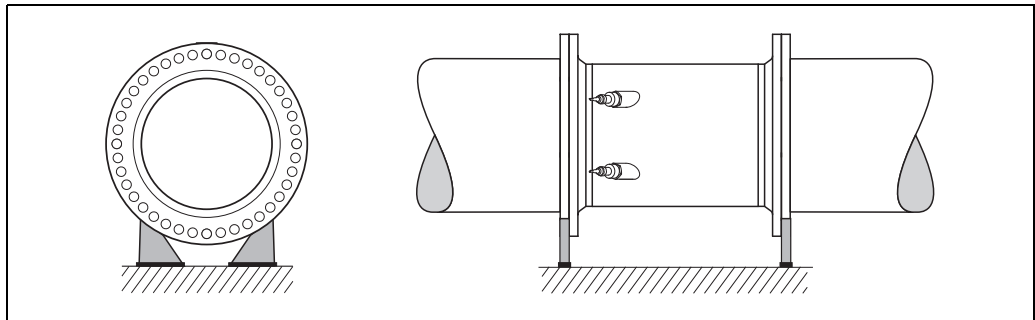
Secure the piping and the Prosonic Flow C Inline sensor if vibration is severe.
 Information on resistance to vibration and shock → 13.



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Foundations, supports

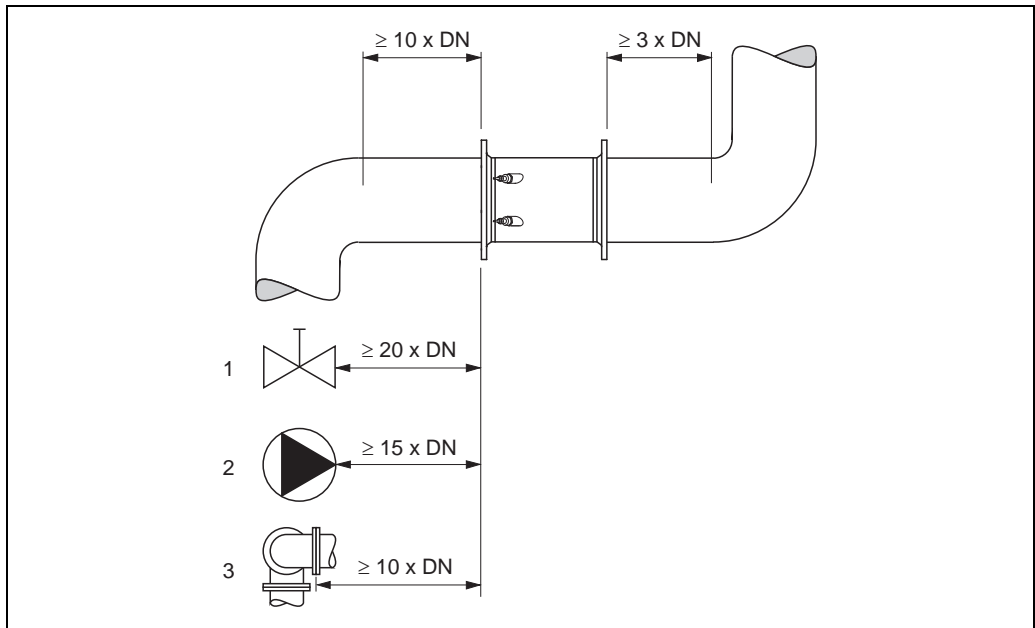
For all nominal diameter mount the sensor on a foundation of adequate load-bearing strength. The foundation/supports must work on the pipe flanges and not on the measuring pipe flanges of Prosonic Flow C.



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Inlet and outlet runs

If possible, install the sensor well clear of fittings such as valves, T-pieces, elbows, etc. Compliance with the following inlet and outlet runs is required in order to ensure measuring accuracy.




A0014016

Inlet und outlet runs

- 1 Valve (2/3 open)
- 2 Pump
- 3 Two pipe bends in different directions

Operating conditions: environment

Ambient temperature range	Transmitter -20 to +60 °C (-4 to +140 °F)
	Sensor Prosonic Flow 93C ■ -20 to +80 °C (-4 to +176 °F)
	Connecting cable (sensor/transmitter) ■ Standard (PVC): -20 to +70 °C (-4 to +158 °F)
	 Note! ■ Mount the transmitter in a shady location and avoid direct sunlight, particularly in warm climatic regions.
Storage temperature	The storage temperature corresponds to the ambient temperature range.
Degree of protection	Transmitter IP 67 (NEMA 4X)
	Sensor IP 68 (NEMA 6P)
Shock and vibration resistance	According to IEC 68-2-6
Electromagnetic compatibility (EMC)	Electromagnetic compatibility (EMC requirements) according to IEC/EN 61326 "Emission to class A requirements" and NAMUR Recommendation NE 21/43.

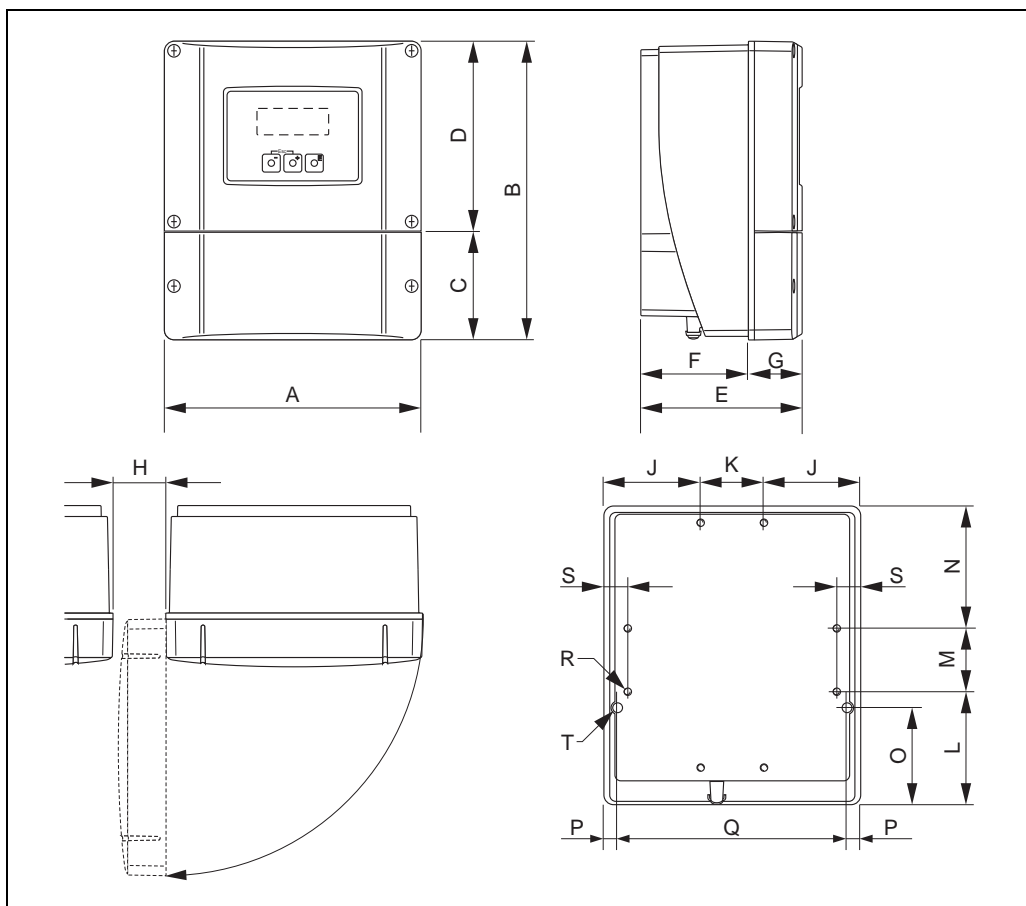
Operating conditions: process

Medium temperature range	Prosonic Flow 93C sensor -10 to +80 °C (+14 to +176 °F)
	■ Drinking Water Approval: 0 to +60 °C (+32 to +140 °F)
Medium pressure range (nominal pressure)	The maximum nominal pressure is PN 16 (16 bar / 232 psi).
Pressure loss	There is no pressure loss.

Mechanical construction

Design, dimensions

Transmitter wall-mount housing



A0001150

Dimensions (SI units)

A	B	C	D	E	F	G	H	J	K
215	250	90.5	159.5	135	90	45	> 50	81	53
L	M	N	O	P	Q	R	S	T ¹⁾	
95	53	102	81.5	11.5	192	8 × M5	20	2 × Ø 6.5	

¹⁾ Securing screw for wall mounting: M6 (screw head max. 10.5 mm)

All dimensions in [mm]

Dimensions (US units)

A	B	C	D	E	F	G	H	J	K
8.46	9.84	3.56	6.27	5.31	3.54	1.77	> 1.97	3.18	2.08
L	M	N	O	P	Q	R	S	T ¹⁾	
3.74	2.08	4.01	3.20	0.45	7.55	8 × M5	0.79	2 × Ø 0.26	

¹⁾ Securing screw for wall mounting: M6 (screw head max. 0.41")

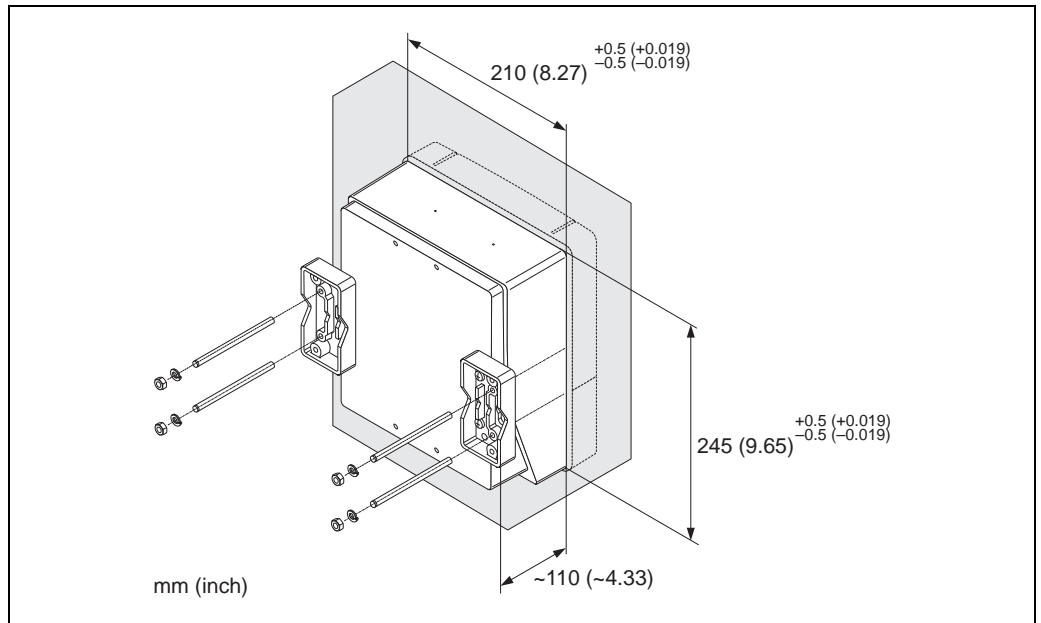
All dimensions in [inch]

Panel mounting



Note!

To aid mounting, mounting kits are available as accessories → 20.



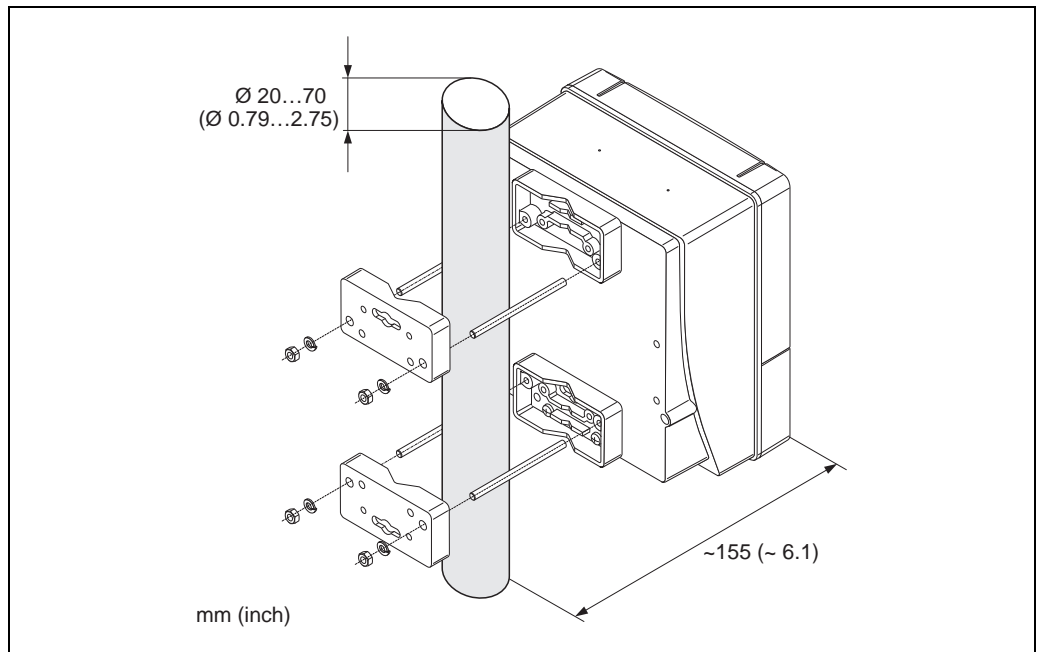
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Pipe mounting



Note!

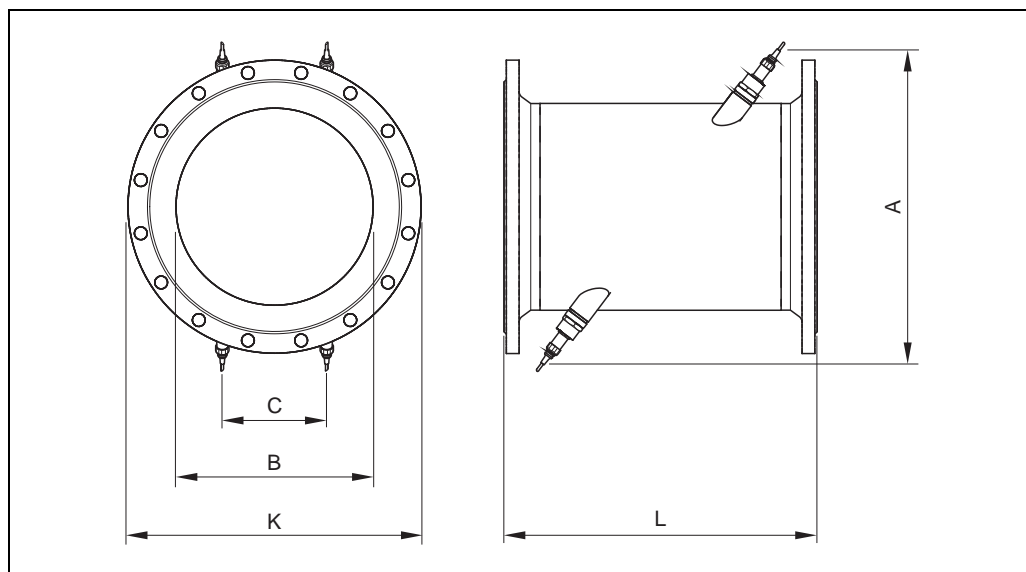
To aid mounting, mounting kits are available as accessories → 20.



A0001132

Prosonic Flow C Inline

Calibrated measuring pipe with flowrate measuring sensors C



A0009677

DN				A	B	C	L	K
EN (DIN) PN 6 [mm]	EN (DIN) PN 10 [mm]	EN (DIN) PN 16 [mm]	ANSI/AWWA [inch]	[mm]	[mm]	[mm]	[mm]	[mm]
-	300	-	-	520	317.5	165.1	500	445
-	-	300	-	517	313.9	163.2	500	460
-	-	-	12"	517	313.9	163.2	500	482.6
-	350	-	-	548	350	182	550	505
-	-	350	-	546	348	181	550	520
-	-	-	14"	544	346	179.9	550	533.4
-	400	-	-	590	400	208	600	565
-	-	400	-	589	398	207	600	580
-	-	-	16"	587	396	205.9	600	596.9
-	-	-	18"	629	445	231.4	650	635
-	500	-	-	676	500	260	650	670
-	-	500	-	674	498	259	650	715
-	-	-	20"	672	496	257.9	650	699
-	600	-	-	763	602	313	780	780
-	-	600	-	760	598	311	780	840
-	-	-	24"	756	594	308.9	780	813
-	700	-	-	848	701	364.5	910	895
-	-	700	-	842	695	361.4	910	910
-	-	-	28"	846	699	363.5	910	927.1
-	-	-	30"	889	750	390	975	984.25
-	800	-	-	935	803	417.6	1040	1015
-	-	800	-	930	797	414.4	1040	1025
-	-	-	32"	933	801	416.5	1040	1060.45
-	900	-	-	1019	902	469	1170	1115
-	-	900	-	1012	894	464.9	1170	1125
-	-	-	36"	1016	898	467	1170	1168.4
-	1000	-	-	1106	1004	522.1	1300	1230
-	-	1000	-	1100	996	517.9	1300	1255
-	-	-	40"	1103	1000	520	1300	1289.05
-	-	-	42"	1147	1051	546.5	1365	1346.2

DN				A	B	C	L	K
EN (DIN) PN 6 [mm]	EN (DIN) PN 10 [mm]	EN (DIN) PN 16 [mm]	ANSI/AWWA [inch]	[mm]	[mm]	[mm]	[mm]	[mm]
1200	-	-	-	1282	1210	629.2	1560	1405
-	1200	-	-	1277	1204	626.1	1560	1455
-	-	1200	-	1270	1196	621.9	1560	1485
-	-	-	48"	1274	1200	624	1560	1511.3
-	-	-	54"	1399	1347	700.4	1755	1682.75
1400	-	-	-	1453	1410	733.2	1820	1630
-	1400	-	-	1448	1404	730.1	1820	1675
-	-	1400	-	1441	1396	725.9	1820	1685
-	-	-	60"	1530	1500	780	1950	1854.2
1600	-	-	-	1622	1608	836.2	2080	1830
-	1600	-	-	1615	1600	832	2080	1915
-	-	1600	-	1607	1590	826.8	2080	1930
-	-	-	66"	1655	1646	855.9	2145	2032
1800	-	-	-	1793	1808	940.2	2340	2045
-	1800	-	-	1786	1800	936	2340	2115
-	-	1800	-	1776	1788	929.8	2340	2130
-	-	-	72"	1778	1790	930.8	2340	2197.1
2000	-	-	-	1961	2004	1042.1	2600	2265
-	2000	-	-	1954	1996	1037.9	2600	2325
-	-	2000	-	1943	1984	1031.7	2600	2345
-	-	-	80"	1949	1990	1034.8	2600	2362.2

The fitting length (L) is always the same per nominal diameter, regardless of the pressure rating selected.

Weight

Transmitter

- Wall mount housing: 6.0 kg (13.2 lbs)

Measuring pipe incl. sensors

Prosonic Flow C (Inline)						
Nominal diameter		Measuring pipe incl. sensors in [kg]*				
[mm]	[inch]	EN (DIN), PN 6	EN (DIN), PN 10	EN (DIN), PN 16	ANSI, Class 150	AWWA, Class D
300	12"	-	41.8	59.6	77.2	-
350	14"	-	54.7	70.1	111.2	-
400	16"	-	66.4	90.3	139.6	-
-	18"	-	-	-	162.7	-
500	20"	-	96.8	145.9	197.8	-
600	24"	-	120.4	196.6	287.9	-
700	28"	-	183.6	251.3	-	229.9
-	30"	-	-	-	-	265.1
800	32"	-	245.0	327.0	-	323.9
900	36"	-	313.7	456.3	-	455.6
1000	40"	-	379.0	587.3	-	552.6
-	42"	-	-	-	-	626.1
1200	48"	434.6	678.6	941.7	-	894.7
-	54"	-	-	-	-	1280.2
1400	-	569.2	907.6	1267.6	-	-
-	60"	-	-	-	-	1584.5
1600	-	818.7	1381.4	2012.0	-	-
-	66"	-	-	-	-	2268.0
1800	72"	993.5	1726.7	2608.2	-	2707.0
2000	80"	1508.2	2393.6	3601.3	-	3073.9

* Weight data valid for standard pressure ratings and without packaging material

Materials**Transmitter Prosonic Flow 93**

- Wall-mounted housing: powder-coated die-cast aluminum

Sensor Prosonic Flow C Inline

- Sensor housing: 1.4404/DN 17440 (316L/AISI)
- Weld-in parts: 1.4404/DN 17440 (316L/AISI)
- Measuring pipe: ST 37.2 (carbon steel)

Standard sensor cable

- Cable sheath: PVC
- Cable connector: nickled brass 2.0401

Human interface**Display elements**

- Liquid crystal display: illuminated, four lines each with 16 characters
- Custom configuration for presenting different measured values and status variables
- 3 totalizers

Operating elements

- Local operation with three optical keys
- Application specific Quick Setup menus for straightforward commissioning

Language group

Language groups available for operation in different countries:

- Western Europe and America (WEA):
English, German, Spanish, Italian, French, Dutch and Portuguese
- Eastern Europe/Scandinavia (EES):
English, Russian, Polish, Norwegian, Finnish, Swedish and Czech
- South and Eastern Asia (SEA):
English, Japanese, Indonesian
- China (CN):
English, Chinese

You can change the language group via the FieldCare operating program.

Remote operation

Operation via HART, PROFIBUS DP/PA, FOUNDATION Fieldbus

Certificates and approvals

CE mark	The measuring system is in conformity with the statutory requirements of the EC Directives. Endress+Hauser confirms successful testing of the device by affixing to it the CE mark.
C-Tick mark	The measuring system is in conformity with the EMC requirements of the "Australian Communications and Media Authority" (ACMA).
PROFIBUS DP/PA certification	<p>The flowmeter has successfully passed all the test procedures carried out and is certified and registered by the PNO (PROFIBUS/DP User Organization). The device thus meets all the requirements of the following specifications:</p> <ul style="list-style-type: none"> ■ Certified to PROFIBUS DP/PA, profile version 3.0 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers (interoperability)
FOUNDATION Fieldbus certification	<p>The flowmeter has successfully passed all the test procedures carried out and is certified and registered by the Fieldbus Foundation. The device thus meets all the requirements of the following specifications:</p> <ul style="list-style-type: none"> ■ Certified to FOUNDATION Fieldbus Specification ■ The device meets all the specifications of the FOUNDATION Fieldbus H1. ■ Interoperability Test Kit (ITK), revision status 5.01 (device certification number: on request) ■ The device can also be operated with certified devices of other manufacturers ■ Physical Layer Conformance Test of the Fieldbus Foundation
Other standards and guidelines	<ul style="list-style-type: none"> ■ EN 60529 Degrees of protection provided by enclosures (IP code) ■ EN 61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use ■ IEC/EN 61326 "Emission in accordance with Class A requirements". Electromagnetic compatibility (EMC requirements). ■ ANSI/ISA-S82.01 Safety Standard for Electrical and Electronic Test, Measuring, Controlling and Related Equipment - General Requirements. Pollution Degree 2, Installation Category II. ■ CAN/CSA-C22.2 No. 1010.1-92 Safety Requirements for Electrical Equipment for Measurement and Control and Laboratory Use. Pollution degree 2, Installation Category II ■ NAMUR NE 21 Electromagnetic compatibility (EMC) of industrial process and laboratory control equipment. ■ NAMUR NE 43 Standardization of the signal level for the breakdown information of digital transmitters with analog output signal. ■ NAMUR NE 53 Software of field devices and signal-processing devices with digital electronics.

Ordering information

The Endress+Hauser sales and service organization can provide detailed ordering information and information on the order codes on request.

Accessories

Various accessories, which can be ordered separately from Endress+Hauser, are available for the transmitter and the sensor. The Endress+Hauser service organization can provide detailed information on the order codes on request.

Device-specific accessories

Accessory	Description	Order code
Wall-mount housing, transmitter Prosonic Flow 93	Transmitter for replacement or for stock. Use the order code to define the following specifications: <ul style="list-style-type: none"> ■ Approvals ■ Degree of protection/version ■ Cable entry ■ Display / power supply / operation ■ Software ■ Outputs / inputs 	Two-channel version: 93XXX - XX2XX*****
Conversion kit, inputs/outputs	Conversion kit with appropriate plug-in point modules for converting the current input/output configuration to a new version.	DK9UI - **

Measuring principle-specific accessories

Accessory	Description	Order code
Mounting kit for aluminum field housing	Mounting kit for wall-mount housing. Suitable for: <ul style="list-style-type: none"> ■ Wall mounting ■ Pipe mounting ■ Panel mounting 	DK9WM - A
93C Flow sensor set	Type C Sensors <ul style="list-style-type: none"> ■ (DN 300 to 2000 (11.8 to 78.7")) ■ -10 to 60 °C (14 to 140 °F) ■ NEMA IP68 	DK9WS - L*
Conduit adapter for connecting cable	Prosonic Flow 93C (DN 50 to 4000 / 2 to 160") <ul style="list-style-type: none"> ■ Conduit adapter incl. cable entry M20 × 1.5 ■ Conduit adapter incl. cable entry ½" NPT ■ Conduit adapter incl. cable entry G ½" 	DK9CB - BD1 DK9CB - BD2 DK9CB - BD3
Connecting cable	5 m sensor cable, PVC, -20 to +70 °C (-4 to +158 °F) 10 m sensor cable, PVC, -20 to +70 °C (-4 to +158 °F) 15 m sensor cable, PVC, -20 to +70 °C (-4 to +158 °F) 30 m sensor cable, PVC, -20 to +70 °C (-4 to +158 °F)	DK9SS - BDA DK9SS - BDB DK9SS - BDC DK9SS - BDD

Communication-specific accessories

Accessory	Description	Order code
HART handheld terminal DXR375	Handheld terminal for remote configuration and for obtaining measured values via the HART current output (4 to 20 mA) and FOUNDATION Fieldbus. Contact your Endress+Hauser representative for more information.	DXR375 - *****
Fieldgate FXA320	Gateway for remote interrogation of HART sensors and actuators via Web browser: <ul style="list-style-type: none"> ■ 2-channel analog input (4 to 20 mA) ■ 4 binary inputs with event counter function and frequency measurement ■ Communication via modem, Ethernet or GSM ■ Visualization via Internet/Intranet in the Web browser and/or WAP cellular phone ■ Limit value monitoring with alarm signaling via e-mail or SMS ■ Synchronized time stamping of all measured values. 	FXA320 - *****
Fieldgate FXA520	Gateway for remote interrogation of HART sensors and actuators via Web browser: <ul style="list-style-type: none"> ■ Web server for remote monitoring of up to 30 measuring points ■ Intrinsically safe version [Ex ia] IIC for applications in hazardous areas ■ Communication via modem, Ethernet or GSM ■ Visualization via Internet/Intranet in the Web browser and/or WAP cellular phone ■ Limit value monitoring with alarm signaling via e-mail or SMS ■ Synchronized time stamping of all measured values ■ Remote diagnosis and remote configuration of connected HART devices 	FXA520 - *****

Service-specific accessories

Accessory	Description	Order code
Applicator	Software for selecting and planning flowmeters. The Applicator can be downloaded from the Internet or ordered on CD-ROM for installation on a local PC. Contact your Endress+Hauser representative for more information.	DXA80 - *
Fieldcheck	Tester/simulator for testing flowmeters in the field. When used in conjunction with the "FieldCare" software package, test results can be imported into a database, printed out and used for official certification. Contact your Endress+Hauser representative for more information.	50098801
FieldCare	FieldCare is Endress+Hauser's FDT-based plant asset management tool. It can configure all intelligent field units in your system and helps you manage them. By using the status information, it is also a simple but effective way of checking their status and condition.	See the product page on the Endress+Hauser Web site: www.endress.com
FXA193	Service interface from the measuring device to the PC for operation via FieldCare.	FXA193 - *
Communication cable	Communication cable for connecting the Prosonic Flow 93C transmitter to the FXA193 service interface.	DK9ZT - A

Documentation

- Flow measurement (FA005D)
- Operating Instructions for Prosonic Flow 93 (BA070D and BA071D)
- Operating Instructions for Prosonic Flow 93 PROFIBUS DP/PA (BA076D and BA077D)
- Operating Instructions for Prosonic Flow 93 FOUNDATION Fieldbus (BA078D and BA079D)
- Supplementary documentation on Ex-ratings: ATEX, FM, CSA, IECEx, NEPSI

Registered trademarks

HART®

Registered trademark of HART Communication Foundation, Austin, USA

PROFIBUS®

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