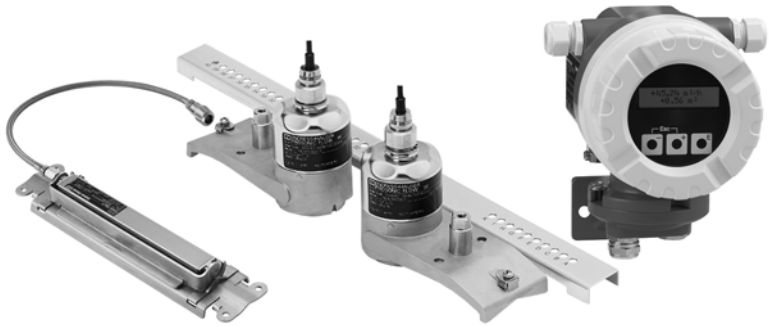
Technical Information
Proline Prosonic Flow 91W
Ultrasonic Flow Measuring System



Flowrate measurement for standard applications with drinking water and process water

Applications
The sensors are perfectly suited for the non-contact measurement of pure or slightly contaminated liquids, regardless of the pressure or electrical conductivity.

- Suitable for pipe diameters in the range DN 15 to 2000 (½" to 80")
- Can be used with all metal and plastic pipes lined or unlined
- Ideal solution for applications with water, e.g. drinking water, industrial water, saltwater, deionized water, cooling water and heating water
- Perfectly suitable for
  - subsequent mounting
  - flow monitoring
  - improving measuring points

Features and benefits
The Prosonic Flow ultrasonic clamp-on system allows accurate and cost-effective flow measurement from outside the pipe and without the need to interrupt the process. The flow measurement is bidirectional and causes no pressure loss.

- Easy, safe and menu-guided sensor mounting ensures precise measuring results
- Long-term system integrity thanks to robust sensor and industrial mounting kit design
- Automatic frequency scan for optimized installation and maximum measuring performance
- IP 68 for pipes under water
- Remote configuration using Endress+Hauser's FieldCare software

Endress+Hauser
People for Process Automation

Table of contents

Function and system design 3
Measuring principle 3
Measuring 4
Sensor selection and arrangement 5

Input 6
Measured variable 6
Measuring range 6
Operable flow range 6

Output 6
Output signal 6
Signal on alarm 6
Load 6
Low flow cutoff 6
Galvanic isolation 6

Power supply 7
Measuring unit electrical connection 7
Connecting the connecting cable 8
Supply voltage 8
Cable entry 8
Cable-specification 9
power consumption 9
Power supply failure 9
Potential equalization 9

Performance characteristics 10
Reference operating conditions 10
Maximum measured error 10
Repeatability 11

Operating conditions: installation 12
Installation instructions 12
Inlet and outlet runs 13
Connection cable 13

Operating conditions: environment 13
Ambient temperature range 13
Storage temperature 13
Degree of protection 14
Shock and vibration resistance 14

Operating conditions: process 14
Medium temperature range 14
Medium pressure range (nominal pressure) 14
Pressure loss 14
Energy Measurement 14

Mechanical construction 15
Design, dimensions 15
Weight 19
Materials 19

Human interface 19
Display elements 19
Operating elements 19
Remote operation 19
Language group 19

Certificates and approvals 20
CE mark 20
C-Tick mark 20
Ex approval 20
Other standards and guidelines 20

Ordering information 20

Accessories 21
Device-specific accessories 21
Device-specific accessories 21
Communication-specific accessories 22
Service-specific accessories 23

Documentation 23

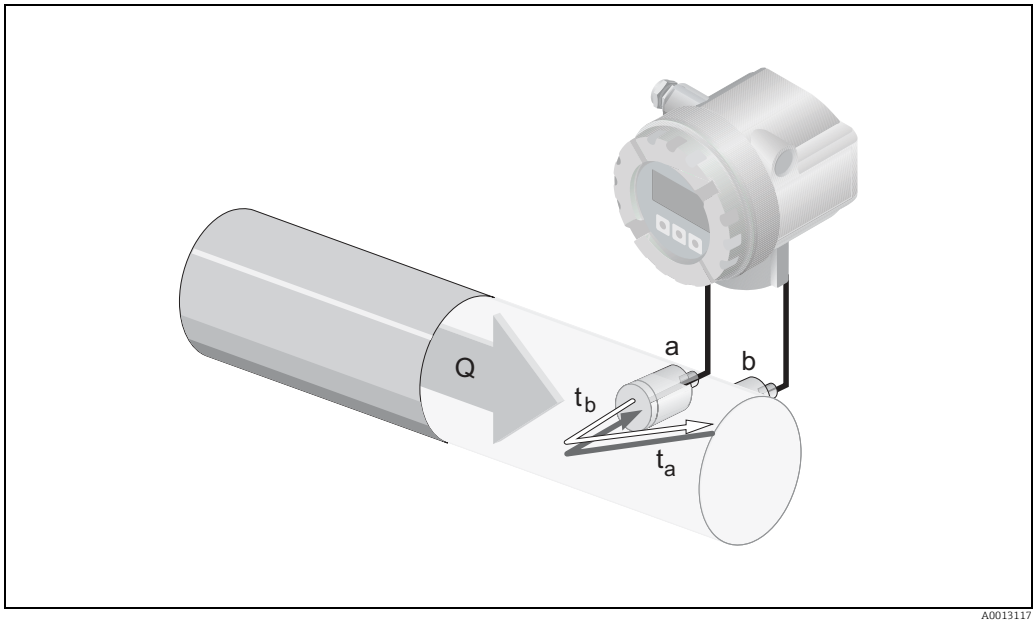
Registered trademarks 23

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.



A0013117

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.

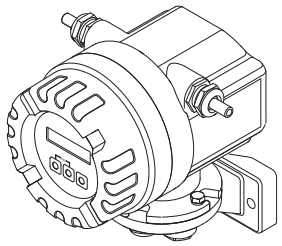
Measuring

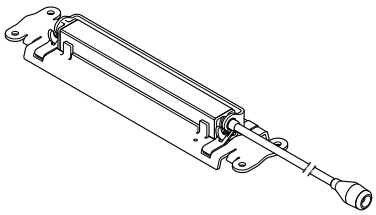
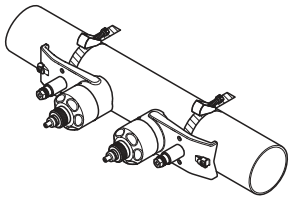
The measuring system consists of one transmitter and two sensors. Different versions are available depending on the specific requirements.

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. Depending on the application and version, the sensors can be arranged for measurement via one or two traverses → 🖹 5.

Transmitter

Prosonic Flow 91 W Field Housing
 A0006022

Prosonic Flow W	Prosonic Flow W
DN 15 to 65 (½" to 2½")	DN 50 to 4000 (2" to 160")
 A0011484	 A0013475

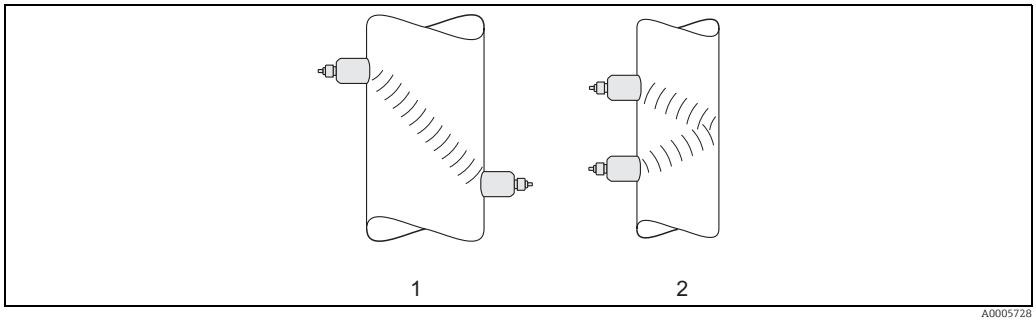
Mounting accessories

The requisite mounting distances must be determined for the sensors. Information on the fluid, the pipe material used and the exact pipe dimensions is needed to determine these values. The values for the sound velocity of the following fluids, pipe materials and lining materials are stored in the transmitter:

Fluid		Pipe material		Lining
▪ Water ▪ Sea water ▪ Distilled water ▪ Ammonia ▪ Alcohol ▪ Benzene ▪ Bromide ▪ Ethanol	▪ Glycol ▪ Kerosene ▪ Milk ▪ Methanol ▪ Toluene ▪ Lube oil ▪ Fuel Oil ▪ Petrol	▪ Carbon steel ▪ Ductile Iron ▪ Stainless steel ▪ Alloy C ▪ PVC ▪ PE ▪ LDPE ▪ HDPE	▪ PVDF ▪ PA ▪ PP ▪ PTFE ▪ Glass pyrex	▪ Mortar ▪ Rubber ▪ Tar Epoxy

Sensor selection and arrangement

The sensors can be arranged in two ways:
- Mounting arrangement for measurement via one traverse: the sensors are located on opposite sides of the pipe.
- Mounting arrangement for measurement via two traverses: the sensors are located on the same side of the pipe.



Sensor mounting arrangement (top view)

1 Mounting arrangement for measurement via one traverse
2 Mounting arrangement for measurement via two traverses

Recommendations
The number of traverses required depends on the sensor type, the nominal diameter and the thickness of the pipe wall. We recommend the following types of mounting:

Sensor Type	Nominal Diameter	Sensor Frequency	Sensor ID	Type of Mounting [1]
Prosonic Flow W	DN 15 to 65 (½" to 2 ½")	6 MHz	W-CL-6F	2 traverses [3]
	DN 80 (3")	2 MHz	W-CL-2F	2 traverses
	DN 100 to 300 (4" to 12")	2 MHz (or 1 MHz)	W-CL-2F W-CL-1F	2 traverses [2]
	DN 300 to 600 (12" to 24")	1 MHz (or 2 MHz)	W-CL-1F W-CL-2F	2 traverses [2]
	DN 650 to 2000 (26" to 80")	1 MHz (or 0.5 MHz)	W-CL-1F W-CL-05F	1 traverse [2]

[1] The installation of clamp-on sensors is principally recommended in the 2 traverse type installation. This type of installation allows the easiest and most comfortable type of mounting. However, in certain applications a 1 traverse installation may be preferred:

- Certain plastic pipes with wall thickness > 4 mm (0.16 in)
- Lined pipes
- Applications with fluids with high acoustic damping

[2] 0.5 MHz sensors are also recommended for applications with composite material pipes such as GRP and may be recommended for certain lined pipes, pipes with wall thickness >10 mm (0.4 in), or applications with media with high acoustic damping. In addition, for these applications we principally recommend mounting the W sensors in a 1 traverse configuration.

[3] 6 MHz sensors are recommended for applications where flow velocity is < 10 m/s (32.8 ft/s)

Input

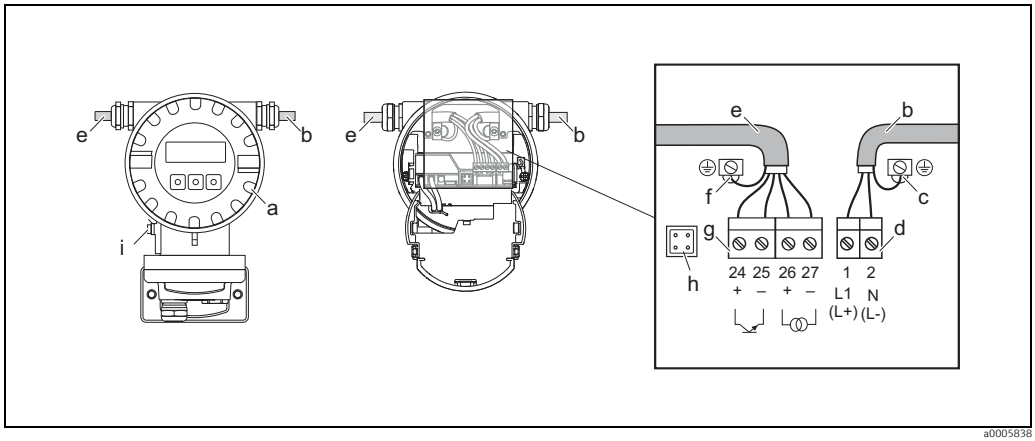
Measured variable	Flow velocity (differential delay proportional to flow velocity)
Measuring range	Typically v = 0 to 15 m/s (0 to 50 ft/s) at the specified measuring accuracy
Operable flow range	Over 150 : 1

Output

Output signal	**Current output**: ▪ Galvanically isolated ▪ Full scale value adjustable ▪ Temperature coefficient: typ. 2 µA/°C, resolution: 1.5 µA ▪ Active: 4 to 20 mA, R_L < 700 Ω (for HART: RL ≥ 250 Ω) **Pulse/status output:** ▪ Galvanically isolated ▪ Open collector ▪ 30 V DC / 250 mA ▪ Passive ▪ Can be configured as: – **Pulse output**: pulse value and pulse polarity can be selected, max. pulse width adjustable (5 to 2000 ms), pulse frequency max. 100 Hz – **Status output**: for example, can be configured for error messages, empty pipe detection, flow recognition, limit value
Signal on alarm	▪ Current output → failsafe mode selectable. ▪ Pulse/frequency output → failsafe mode selectable
Load	See “Output signal”
Low flow cutoff	Switching point for the low flow freely selectable.
Galvanic isolation	All circuits for inputs, outputs, and power supply are galvanically isolated from each other.

Power supply

Measuring unit electrical connection



Connecting the transmitter (Aluminium-Fieldhousing).
cable cross-section: max. 2.5 mm² (AWG 13)

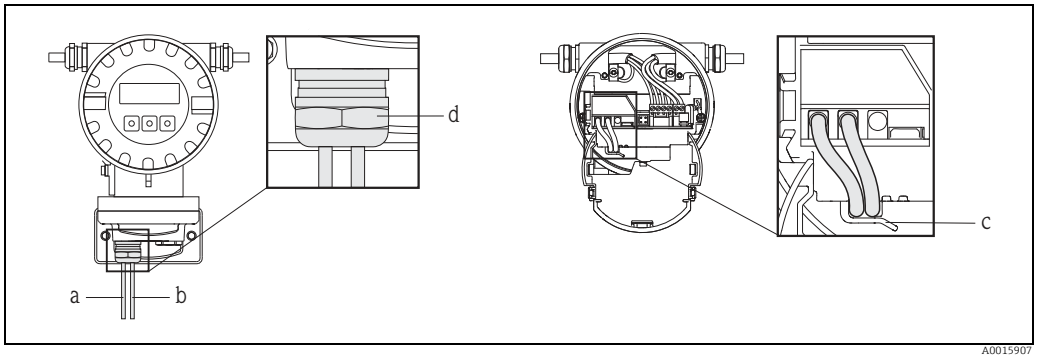
a *Cover*
b *Cable for power supply: 85 to 260 V AC, 20 to 55 V AC, 16 to 62 V DC*
c *Terminal for power supply:*
d *Terminal for power supply:* ***Nr. 1–2*** *(terminal assignment)*
e *Signal cable*
f *Ground terminal für signal cable*
g *Terminal connector for signal cable:* ***Nr. 24–27*** *(terminal assignment)*
h *Service connector*
i *Ground terminal for potential matching*

Terminal assignment Prosonic Flow 91W

Order variant	Terminal No. (inputs/outputs)		
	24 (+)/25 (–)	26 (+)/27 (–)	1 (L1/L+) /2 (N/L–)
Fixed communication boards (fixed assignment)			
91***-********** A	Pulse output	HART current output	Power supply
Functional values	see "Output signal"		see "supply voltage"

Connecting the connecting cable

Connection sensor cable in the electronics compartment



A0015907

a, b *Sensor connection cable*
c *Cable gland holder*
d *Cable gland*

Supply voltage

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

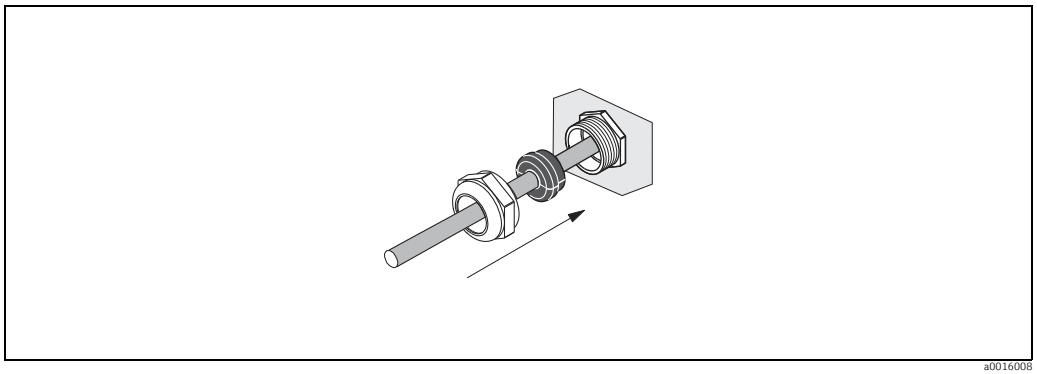
Sensor
Powered by the transmitter

Cable entry

Power supply and signal cables (inputs/outputs)
- Cable entry M20 × 1.5 (8 to 12 mm; 0.31 to 0.47 in)
- Cable gland for cables, 6 to 12 mm (0.24" to 0.47")
- Thread for cable entries ½" NPT, G ½"

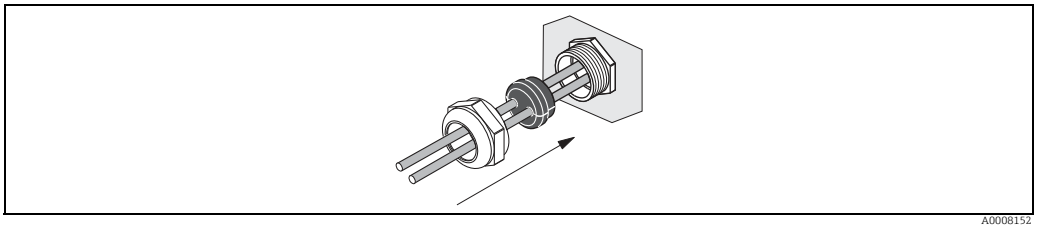
Connection cable (sensor/transmitter)
Cable glands for one multicore connection cable (1 × ∅ 8 mm) per cable entry
- Cable gland M20 × 1.5
- Thread for cable entries ½" NPT, G ½"

Connection cable (sensor/transmitter)
Cable glands for two single core connection cable (2 × ∅ 4 mm) per cable entry
- Cable gland M20 × 1.5
- Thread for cable entries ½" NPT, G ½"
  The Prosonic Flow W DN 15 to 65 (½ to 2½") is grounded via the cable gland.



a0016008

Cable gland for one multicore connection cable (1 × ∅ 8 mm /0.31 in) per cable entry



Cable gland for two connection cables (2 × ∅ 4 mm/0.16 in) per cable entry

Cable-specification

Only use the connection cable supplied by Endress+Hauser. Different versions of the connecting cables are available → 22.
Prosonic Flow
- Cable material:
  – Prosonic Flow 91W (DN 50 to 4000 / 2" to 160") PVC (standard) or optional PTFE
  – Prosonic Flow 91W (DN 15 to 65 / ½" to 2½") TPE-V
- Cable length:
  – For use in a non hazardous zone: 5 to 60 m (16.4 to 196.8 ft)

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

power consumption

85 to 250 V AC: <12 VA (incl. measuring sensor)
20 to 28 V AC: <7 VA (incl. measuring sensor)
11 to 40 V DC: <5 W (incl. measuring sensor)

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

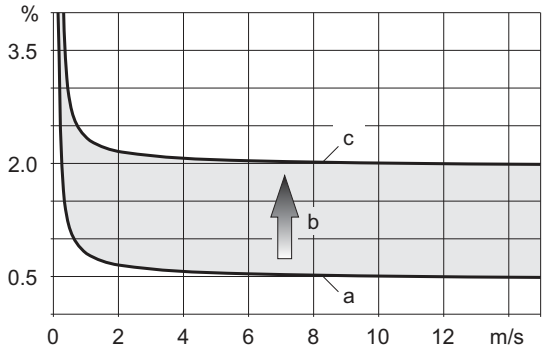
- Fluid temperature: +28 °C ± 2 K
- Ambient temperature: +22 °C ± 2 K
- Warm-up period: 30 minutes

Installation:
- Sensor and transmitter grounded.
- The measuring sensors are mounted correctly.

Maximum measured error

Measured error

The measured error depends on a number of factors. A distinction is made between the measured error of the device (Prosonic Flow 91 = 0.5 % of the measured value) and an additional installation-specific measured error (typically 1.5 % of the measured value) that is independent of the device.
The installation-specific measured error depends on the installation conditions on site, such as the nominal diameter, wall thickness, real pipe geometry, fluid etc. The sum of the two measured errors is the measured error at the measuring point.



A0011347

Example of the measured error in a pipe with a nominal diameter DN > 200 (8")

a Measured error of the device (0.5 % o.r. ± 3 mm/s
b Measured error due to installation conditions (typically 1.5 % o.r.)
c Measured error at the measuring point: 0.5 % o.r. ± 3 mm/s + 1.5 % o.r. = 2 % o.r. ± 3 mm/s.

Measured error at the measuring point

The measured error at the measuring point is made up of the measured error of the device (0.5 % o.r.) and the measured error resulting from the installation conditions on site.
Given a flow velocity > 0.3 m/s (1 ft/s) and a Reynolds number > 10000, the following are typical error limits:

Nominal diameter	Device error limits	+	Installation-specific error limits (typical)	→	Error limits at the measuring point (typical)
DN 15 (½")	±0.5 % o.r. ± 5 mm/s	+	±2.5 % o.r.	→	±3 % o.r. ± 5 mm/s
DN 25 to 200	±0.5 % o.r. ± 7.5 mm/s	+	±1.5 % o.r.	→	±2 % o.r. ±7.5 mm/s
> DN 200	±0.5 % o.r. ± 3 mm/s	+	±1.5 % o.r.	→	±2 % o.r. ± 3 mm/s

o.r. = of reading

Measurement Report

If required, the device can be supplied with a measurement report. To certify the performance of the device, a measurement is performed under reference conditions. Here, the sensors are mounted on a pipe with a nominal diameter of DN 100 (4").

The measurement report guarantees the following error limits of the device (at a flow velocity > 0.3 m/s (1 ft/s) and a Reynolds number > 10000):

Sensor	Nominal diameter	Guaranteed error limits of the device
Prosonic Flow W	DN 15 (½"), DN 25 (1"), DN 40 (1½"), DN 50 (2")	±0.5 % o.r. ± 5 mm/s
Prosonic Flow W	DN 100 (4")	±0.5 % o.r. ± 7.5 mm/s

o.r. = of reading

Repeatability

Max. ± 0.3 % for flow velocity > 0.3 m/s (1 ft/s)

Operating conditions: installation

Installation instructions

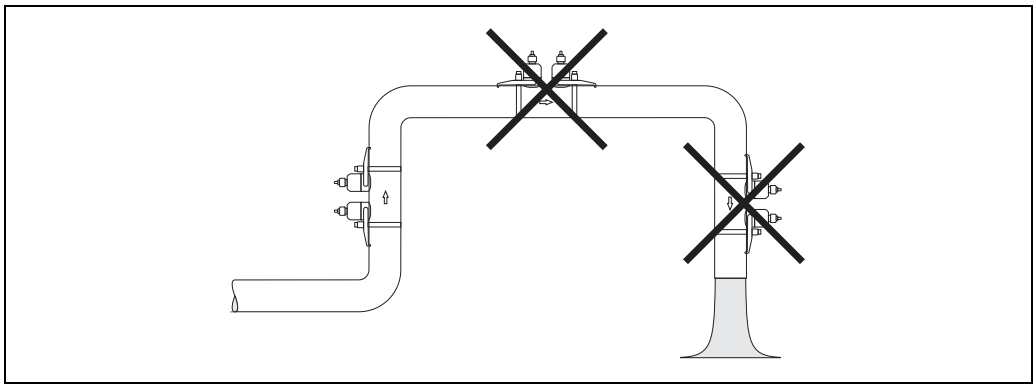
Mounting location

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.



A0001103

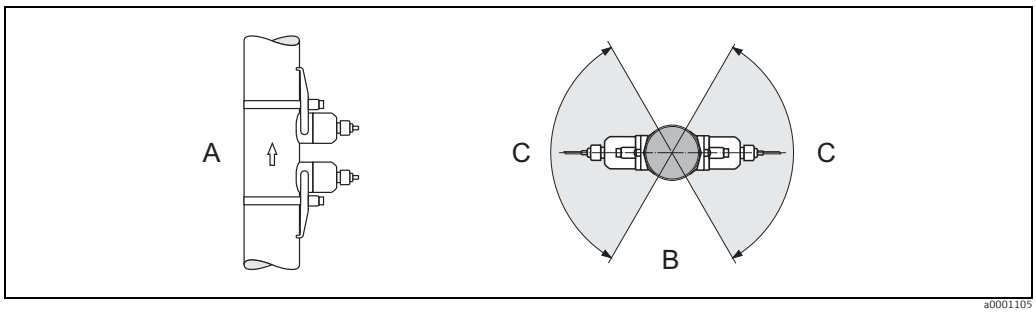
Orientation

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.

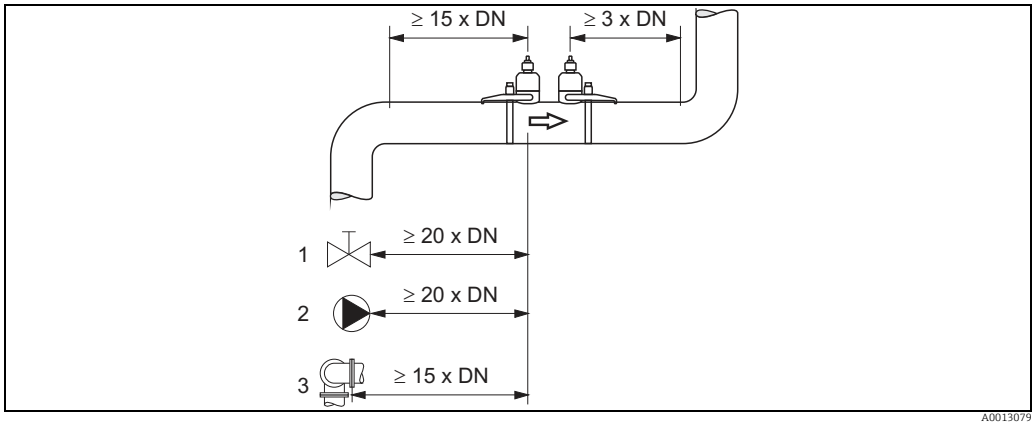


a0001105

A Vertical
B Horizontal
C Recommended installation range max. 120°

Inlet and outlet runs

If possible, install the sensor well clear of assemblies such as valves, T-pieces, elbows, etc. If several flow obstructions are installed, the longest inlet or outlet run must be considered. Compliance with the following requirements for the inlet and outlet runs is recommended to ensure measuring accuracy.



Inlet and outlet runs (top view)

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

Connection cable

Route the cable well clear of electrical machines and switching elements
Cable specification → 🖹 8

Operating conditions: environment

Ambient temperature range

Transmitter

−25 to +60 °C (−13 to +140 °F)

At ambient temperatures below −20 °C (−4 °F) the readability of the display may be impaired.
Install the transmitter at a shady location. Avoid direct sunlight, particularly in warm climatic regions.

Sensor Prosonic Flow W

−20 to +80 °C (−4 to +176 °F)
Optional: 0 to +130 °C (−32 to +265 °F)

It is permitted to insulate the sensors mounted on the pipe.

Connecting cable (sensor/transmitter)

- Standard (TPE-V): −20 to +80 °C (−4 to 175 °F) (multi core, sensor DN 15 to 65 / ½" to 2½") [1)]
- Standard (PVC): −20 to +70 °C (−4 to 158 °F) (single core, sensor DN 50 to 4000 / 2" to 160")
- Optional (PTFE): −40 to +170 °C (−40 to 338 °F) (single core, sensor DN 50 to 4000 / 2" to 160")
- It is permitted to insulate the sensors mounted on the pipes.
- Mount the transmitter in a shady location and avoid direct sunlight, particularly in warm climatic regions.

Note!
[1)] Can be used with the version for 0...130 °C (-32...256 °F).

Storage temperature

The storage temperature corresponds to the operating temperature range of the measuring transmitter and the appropriate measuring sensors and the corresponding sensor cable (see above).

Degree of protection

Transmitter

IP 67 (NEMA 4X)

Sensors

IP 67 (NEMA 4X)
Optional: IP 68 (NEMA 6P)

Shock and vibration resistance

according to IEC 68-2-6

Operating conditions: process

Medium temperature range

−20 to +80 °C (−4 to +176 °F)
Optional: 0 to +130 °C (32 to +265 °F)

Medium pressure range (nominal pressure)

Perfect measurement requires that the static fluid pressure is higher than vapor pressure, to avoid outgasing.

Pressure loss

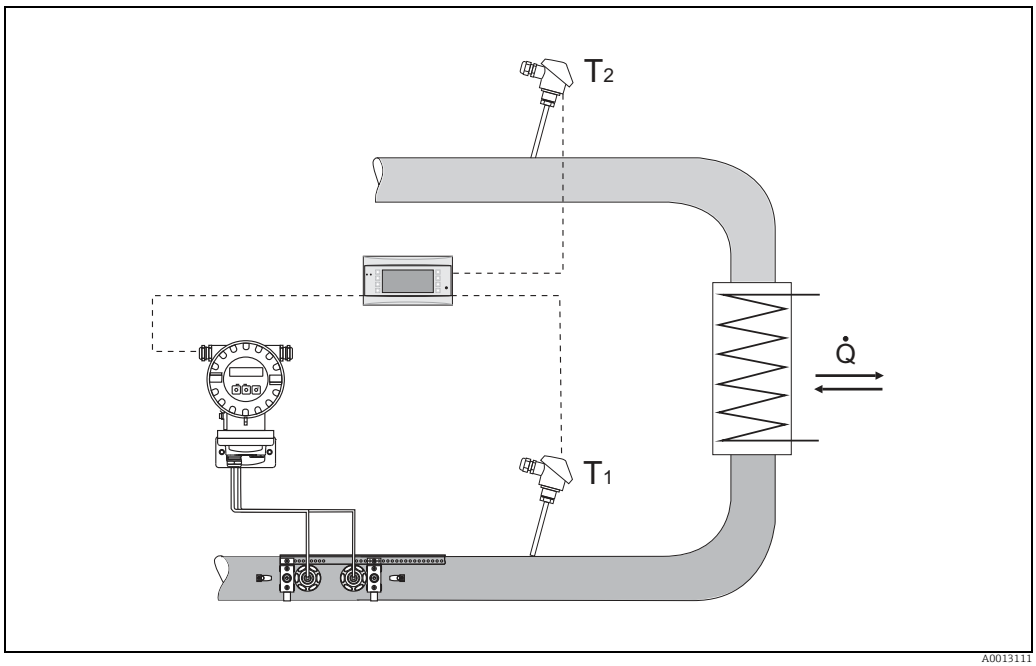
There is no pressure loss.

Energy Measurement

The Prosonic Flow 91W Ultrasonic is well suited for making or retrofitting energy measurement for hot or chilled water systems - often used in conjunction with Endress+Hauser Flow and Energy Manager RMC621/RMS621.
The quantity of heat is calculated from the process variable for flow and the differential from the feed and return temperature. Energy Manager can also determine the quantity of heat in water flow from process variable flow and a single temperature measurement.

Installation of delta heat measurement

- Temperature measurement takes place via two separate sensors which are directly connected to the Endress+Hauser Energy Manager. (Temperature sensors and Energy Manager supplied separately).
- The Prosonic Flow 91W can be installed on either the hot or cold side of the heat exchanger.

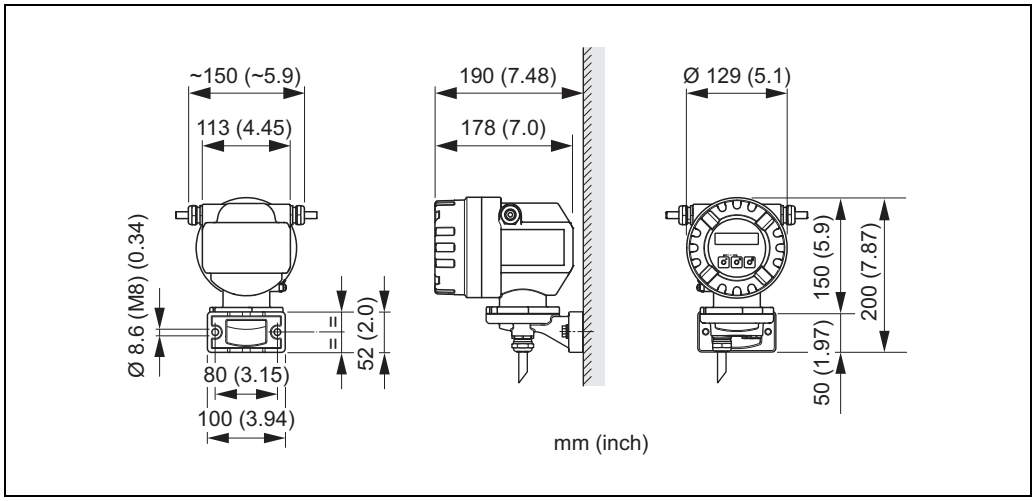


Layout for delta heat measurement of hot or chilled water system

Mechanical construction

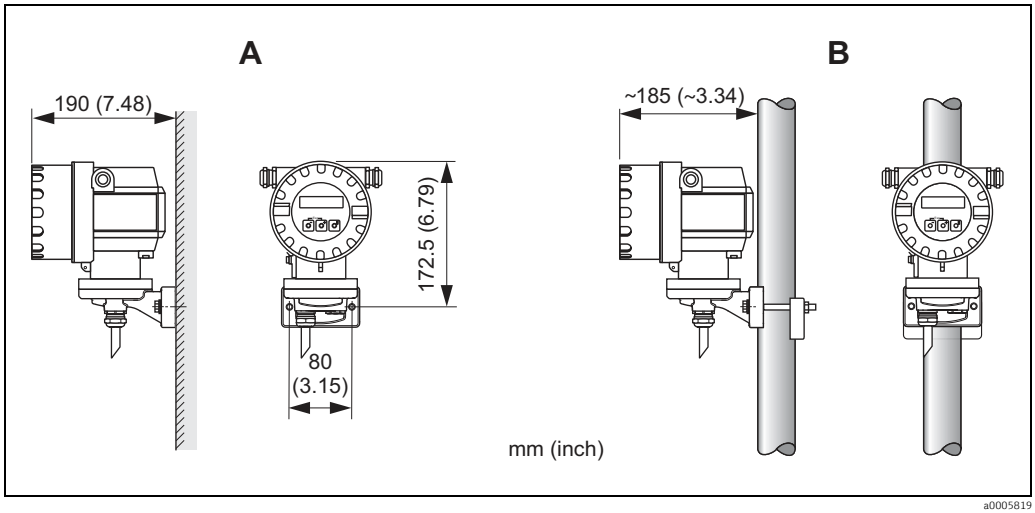
Design, dimensions

Dimensions field housing



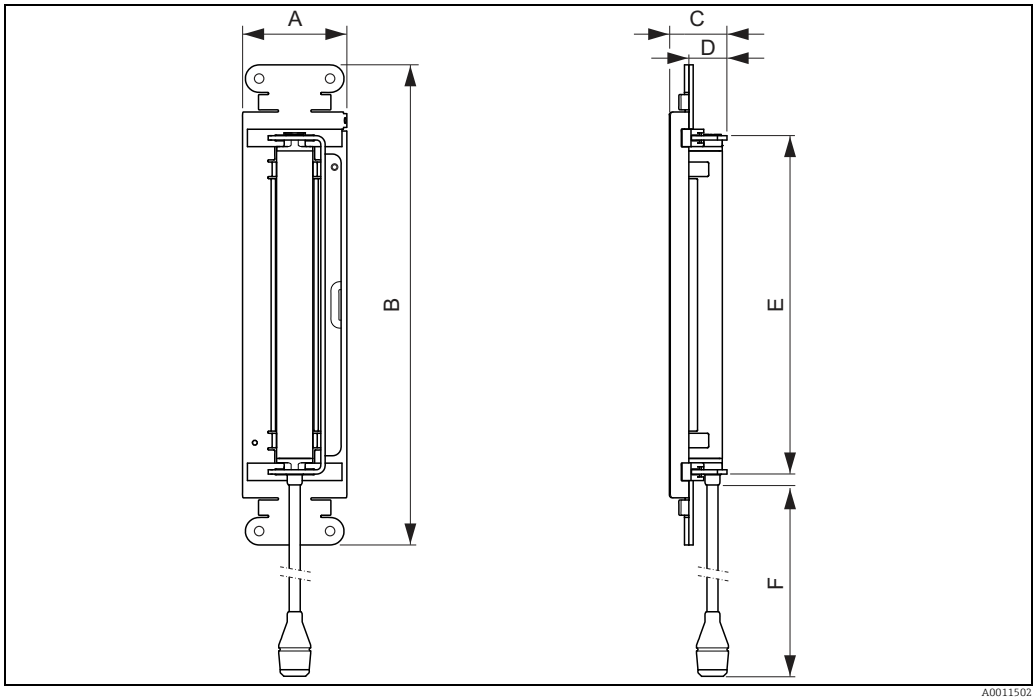
A0006063-ae

Dimensions pipe mounting



a0005819

Prosonic Flow W sensor (DN 15 to 65 / ½" to 2½")



Mounting arrangement for measurement via two traverses

Dimensions in SI units

A	B	C	D	E	F
72	331	39	28	233	450

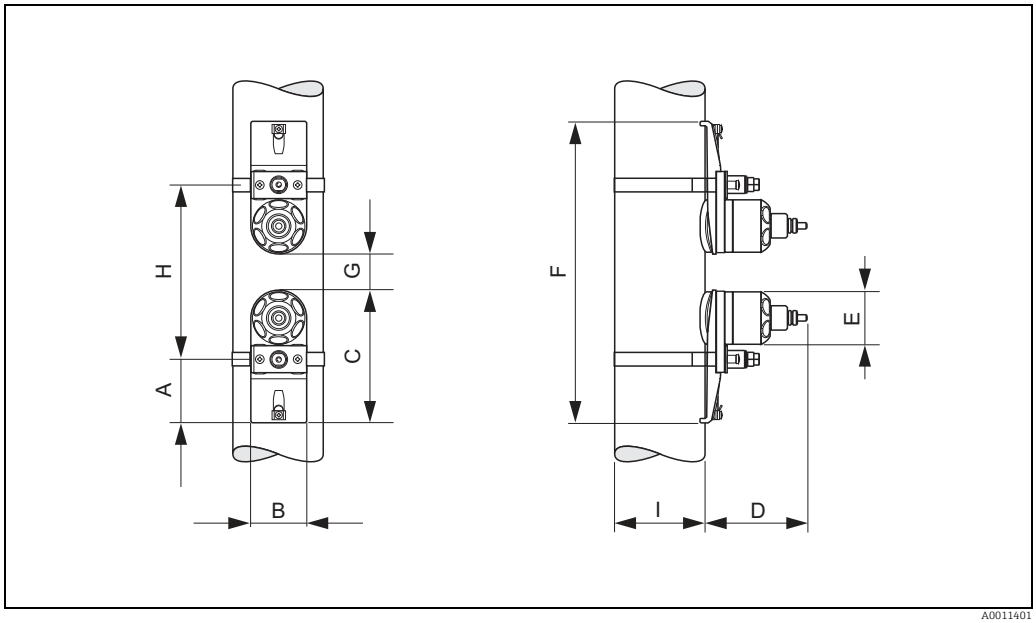
All dimensions in [mm]

Dimensions in US units

A	B	C	D	E	F
2.83	13.03	1.54	1.10	9.17	17.72

All dimensions in [inch]

Prosonic Flow W sensor (DN50 to 2000 / 2" to 80")



Mounting arrangement for measurement via two traverse

Dimensions in SI units

A	B	C	D	E	F
56	62	145	111	∅ 58	Max. 872
G				H	
Depends on the measuring point conditions (pipe, fluid etc.). Dimension "H" can be determined: ▪ by the transmitter prior to the mounting (Quick Setup or FieldCare) ▪ when specifying the flowmeter (online (Applicator))				Pipe outer diameter	

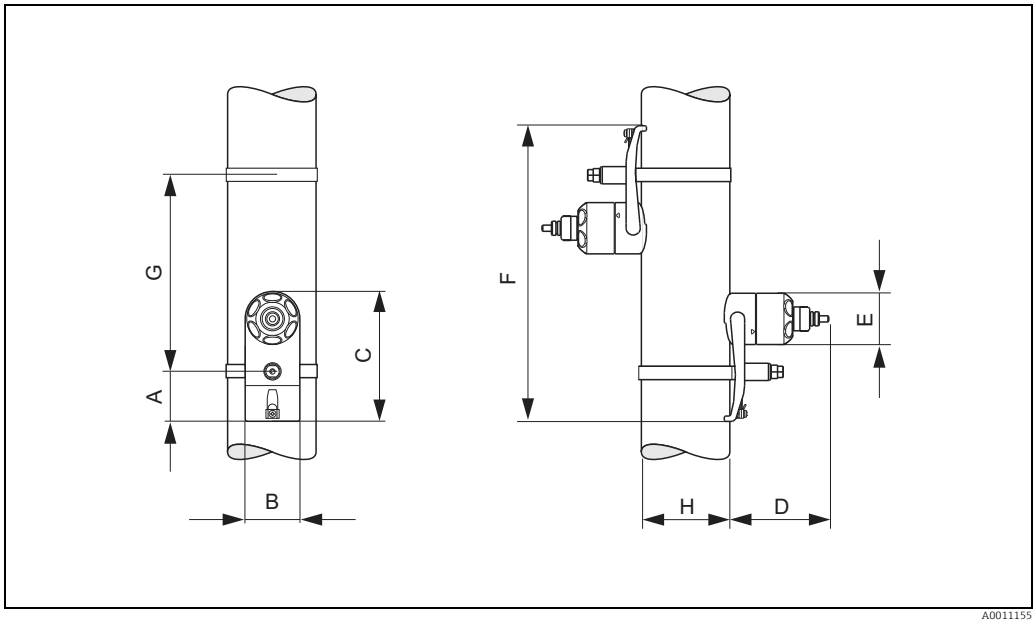
All dimensions in [mm]

Dimensions in US units

A	B	C	D	E	F
2.20	2.44	5.71	4.37	∅ 2.28	Max. 34.3
G				H	
Depends on the measuring point conditions (pipe, fluid etc.). Dimension "H" can be determined: ▪ by the transmitter prior to the mounting (Quick Setup or FieldCare) ▪ when specifying the flowmeter (online (Applicator))				Pipe outer diameter	

All dimensions in [inch]

Prosonic Flow W sensor (DN50 to 2000 / 2" to 80")



Mounting arrangement for measurement via one traverse

Dimensions in SI units

A	B	C	D	E	F
56	62	145	111	∅ 58	Max. 872
G				H	
Depends on the measuring point conditions (pipe, fluid etc.). Dimension "H" can be determined: ▪ by the transmitter prior to the mounting (Quick Setup or FieldCare) ▪ when specifying the flowmeter (online (Applicator))				Pipe outer diameter	

All dimensions in [mm]

Dimensions in US units

A	B	C	D	E	F
2.20	2.44	5.71	4.37	∅ 2.28	Max. 34.3
G				H	
Depends on the measuring point conditions (pipe, fluid etc.). Dimension "H" can be determined: ▪ by the transmitter prior to the mounting (Quick Setup or FieldCare) ▪ when specifying the flowmeter (online (Applicator))				Pipe outer diameter	

All dimensions in [inch]

Weight

- Transmitter housing: 2.4 kg (5.2 lb)
- Flowrate measuring sensors W (clamp-on) incl. mounting rail and tensioning bands: 2.8 kg (6.2 lb)

Materials

Transmitter

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

Sensor

- Sensor holder: stainless steel 1.4308/CF-8
- Sensor housing: stainless steel 1.4301/304
- Strapping bands/bracket: stainless steel 1.4301/304
- Sensor contact surfaces: chemically stable plastic

Connecting cable (sensor/transmitter)

- PVC/TPE-V connecting cable
  - Cable sheath: PVC/TPE-V
  - Cable connector: nickeled brass 2.0401/C38500

Human interface

Display elements

- Liquid crystal display: illuminated, two lines each with 16 characters
- Custom configuration for presenting different measured values and status variables
- 1 totalizer

Operating elements

Local operation via three operating keys (−, +, E)

Remote operation

Operation via HART protocol and FieldCare

Language group

English, German, Spanish, Italian, French

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).

Ex approval

Information about currently available Ex versions (FM, CSA) can be supplied by your Endress+Hauser Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.

Other standards and guidelines

- 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
- 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 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
Sensor W (DN 15 to 65, (½" to 2½") Clamp-on version	DN 15 to 65, −20 to +80 °C (½" to 2 ½", −4 to +176 °F), 5.0 MHz ▪ IP 67 / NEMA 4X ▪ IP 68 / NEMA 6P DN 15 to 65, 0 to +130 °C (½" to 2 ½", +32 to +266 °F), 5.0 MHz ▪ IP 67 / NEMA 4X ▪ IP 68 / NEMA 6P	 DK9WS - 1* DK9WS - 3* DK9WS - 2* DK9WS - 4*
Sensor W (DN 50 to 4000, (2" to 157") Clamp-on version	DN 50 to 300, −20 to +80 °C (2" to 12", −4 to +176 °F), 2.0 MHz ▪ IP 67 / NEMA 4X ▪ IP 68 / NEMA 6P DN 100 to 4000, −20 to +80 °C (4" to 160", −4 to +176 °F), 1.0 MHz ▪ IP 67 / NEMA 4X ▪ IP 68 / NEMA 6P DN 100 to 4000, 0 to +130 °C (4" to 160", +32 to +266 °F), 1.0 MHz ▪ IP 67 / NEMA 4X DN 50 to 300, 0 to +130 °C (2" to 12", +32 to +266 °F), 2.0 MHz ▪ IP 67 / NEMA 4X DN 100 to 4000, −20 to +80 °C (4" to 160", −4 to +176 °F), 0.5 MHz ▪ IP 67 / NEMA 4X ▪ IP 68 / NEMA 6P	 DK9WS - B* DK9WS - N* DK9WS - A* DK9WS - M* DK9WS - P* DK9WS - S* DK9WS - R* DK9WS - T*

Device-specific accessories

Accessory	Description	Order code
Mounting kit for aluminum field housing	Mounting kit for wall-mount housing.	DK9WM - C
Sensor holder set	Prosonic Flow W (DN 15 to 65, ½" to 2½") ▪ Sensor holder, clamp-on version Prosonic Flow W (DN 50 to 4000, 2" to 160") ▪ Sensor holder, fixed retaining nut, clamp-on version ▪ Sensor holder, detachable retaining nut, clamp on version	 DK9SH - 1 DK9SH - A DK9SH - B
Clamp-on installation set	Sensor fastening for Prosonic Flow W (DN 15 to 65, ½" to 2 ½") ▪ U-Bolt DN15-32 (½ to 1 ¼") ▪ Strapping bands DN 40 to 65 (1 ½ to 2 ½") (DN 50 to 4000, 2" to 160") ▪ Without sensor fastening ▪ Strapping bands DN 200 to 600 (8" to 24") ▪ Strapping bands DN 600 to 2000 (24" to 80") ▪ Strapping bands DN 2000 to 4000 (80" to 160") ▪ Without mounting tools ▪ Spacing ruler DN 50 to 200 (2" to 8") ▪ Spacing ruler DN 200 to 600 (8" to 24") ▪ Fastener, 1 Traverse DN 50 to 4000 (2" to 160")	 DK9IC - 11* DK9IC - 21* DK9IC - A* DK9IC - C* DK9IC - D* DK9IC - E* DK9IC - *1 DK9IC - *2 DK9IC - *3 DK9IC - *6

Accessory	Description	Order code
Conduit adapter for connecting cable	Prosonic Flow W (DN 15 to 65, ½" to 2 ½") ▪ Conduit adapter incl. cable entry M20 × 1,5 ▪ Conduit adapter incl. cable entry ½" NPT ▪ Conduit adapter incl. cable entry G ½" Prosonic Flow W (DN 50 to 4000, 2" to 160") ▪ Conduit adapter incl. cable entry M20 × 1,5 ▪ Conduit adapter incl. cable entry ½" NPT ▪ Conduit adapter incl. cable entry G ½"	 DK9CB - AA1 DK9CB - AA2 DK9CB - AA3 DK9CB - AB1 DK9CB - AB2 DK9CB - AB3
Connecting cable	For sensor DN 15 to 65, ½" to 2 ½" 5 m (16 ft) sensor cable, TPE-V, −20 to +70 °C (−4 to 158 °F) 10 m (33 ft) sensor cable, TPE-V, −20 to +70 °C (−4 to 158 °F) 15 m (49 ft) sensor cable, TPE-V, −20 to +70 °C (−4 to 158 °F) 30 m (98 ft) sensor cable, TPE-V, −20 to +70 °C (−4 to 158 °F) For sensor DN 50 to 4000, 2" to 160" 5 m (16 ft) sensor cable, PVC, −20 to +70 °C (−4 to 158 °F) 10 m (33 ft) sensor cable, PVC, −20 to +70 °C (−4 to 158 °F) 15 m (49 ft) sensor cable, PVC, −20 to +70 °C (−4 to 158 °F) 30 m (98 ft) sensor cable, PVC, −20 to +70 °C (−4 to 158 °F) 60 m (197 ft) sensor cable, PVC, −20 to +70 °C (−4 to 158 °F)	 DK9SS - AAA DK9SS - AAB DK9SS - AAC DK9SS - AAD DK9SS - ABA DK9SS - ABB DK9SS - ABC DK9SS - ABD DK9SS - ABJ
Acoustic coupling fluid	▪ Coupling fluid 0 to 170 °C (+32 to 338 °F), Standard ▪ Adhesive coupling fluid −40 to +80 °C (−40 to 176 °F) ▪ Water-soluble coupling fluid −20 to +80 °C (−4 to 176 °F) ▪ Coupling fluid DDU 19, −20 to +60 °C (−4 to 140 °F) ▪ Coupling fluid −40 to +100 °C (−40 to 212 °F), Standard, type MBG2000	DK9CM - 2 DK9CM - 3 DK9CM - 4 DK9CM - 6 DK9CM - 7

Communication-specific accessories

Accessory	Description	Order code
HART Communicator Field Xpert SFX 100	Handheld terminal for remote configuration and for obtaining measured values via the HART current output (4 to 20 mA). Contact your Endress+Hauser representative for more information.	SFX100 – *******
Fieldgate FXA320	Gateway for remote interrogation of HART sensors and actuators via Web browser: ▪ 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: ▪ Web server for remote monitoring of up to 30 measuring points ▪ Intrinsically safe version [EEx 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 - ****
FXA195	The Commubox FXA195 connects intrinsically safe Smart transmitters with HART protocol to the USB port of a personal computer. This makes the remote operation of the transmitters possible with the aid of configuration programs (e.g. FieldCare). Power is supplied to the Commubox by means of the USB port	FXA195 – *

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
FXA291	Service interface from the measuring device to the PC for operation via FieldCare.	FXA291 – *
Memograph M graphic display recorder	The Memograph M graphic display recorder provides information on all the relevant process variables. Measured values are recorded correctly, limit values are monitored and measuring points analyzed. The data are stored in the 256 MB internal memory and also on a SD card or USB stick. Memograph M boasts a modular design, intuitive operation and a comprehensive security concept. The ReadWin® 2000 PC software is part of the standard package and is used for configuring, visualizing and archiving the data captured. The mathematics channels which are optionally available enable continuous monitoring of specific power consumption, boiler efficiency and other parameters which are important for efficient energy management.	RSG40-**********

Documentation

- Flow measurement (FA005D/06)
- Operating Instructions for Prosonic Flow 91 (BA100D/06)
- Supplementary documentation on Ex-ratings: FM, CSA

Registered trademarks

HART®
Registered trademark of HART Communication Foundation, Austin, USA

HistoROM™, T-DAT™, FieldCare®, Field Xpert™, Fieldcheck®
Registered or registration-pending trademarks of Endress+Hauser Flowtec AG, Reinach, CH



www.addresses.endress.com

Endress+Hauser

People for Process Automation