

# Ultrasonic measurement Time-of-Flight Prosonic FDU90

Ultrasonic sensor for level and flow measurement for connection to FMU9x (measuring range up to 3m)



## Benefits:

- Integrated temperature sensor for Time-of-Flight correction. Accurate measurements are possible, even if temperature changes are present
- Hermetically welded PVDF sensor for highest chemical resistance
- Suited for rough ambient conditions thanks to separate installation from the transmitter (up to 300m)
- Reduced build-up formation because of the self-cleaning effect
- Integrated automatic sensor detection for transmitters FMU90 / FMU95 for simple commissioning
- Weather resistant and flood-proof (IP 68)
- Integrated heating against a build-up of ice at the sensor (optional) ensures reliable measurement

More information and current pricing:

[www.ch.endress.com/FDU90](http://www.ch.endress.com/FDU90)

## Specs at a glance

- **Process temperature** -40 °C ... 80 °C (-40 °F ... 176 °F)
- **Process pressure / max. overpressure limit** 0.7 bar ... 4 bar abs (10 psi ... 58 psi)
- **Max. measurement distance** Liquids: 3 m (9.8 ft), Solids: 1.2 m (3.9 ft)
- **Accuracy** +/- 2mm + 0.17% of measured distance
- **Main wetted parts** PVDF (IP68 / NEMA6P)

**Field of application:** The FDU90 ultrasonic sensor for continuous, non-contact and maintenance-free level measurement of fluids, pastes, sludges and powdery to coarse bulk materials. But also for flow measurement in open channels and measuring weirs. The measurement

is unaffected by dielectric constant, density or humidity and also unaffected by build-up due to the self-cleaning effect of sensors. Suited for explosion hazardous areas. Maximum measuring range in liquids 3m (9.8ft), solids 1.2m (3.9ft).

## Features and specifications

### Continuous / Liquids

**Measuring principle**

Ultrasonic

**Characteristic / Application**

Separated version with field housing or top hat rail housing for control cabinet instrumentation, 300m in-between sensor and transmitter

**Specialities**

Floating protection tube

**Supply / Communication**

4-wire (HART, Profibus DP)

**Accuracy**

+/- 2mm + 0.17% of measured distance

**Ambient temperature**

-40 °C ... 80 °C  
(-40 °F ... 176 °F)

**Process temperature**

-40 °C ... 80 °C  
(-40 °F ... 176 °F)

**Process pressure / max. overpressure limit**

0.7 bar ... 4 bar abs  
(10 psi ... 58 psi)

**Main wetted parts**

PVDF (IP68 / NEMA6P)

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## Continuous / Liquids

**Process connection**

Front side thread:

G / NPT 1 1/2"

Rear side thread:

G / NPT 1"

Ceiling mounting

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**Blocking distance**

0.07 m (0.23 ft)

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**Max. measurement distance**

Liquids: 3 m (9.8 ft),

Solids: 1.2 m (3.9 ft)

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**Communication**

Transmitter:

4 ... 20 mA HART

Profibus DP

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**Certificates / Approvals**

ATEX, FM, CSA, IEC Ex, INMETRO, NEPSI, EAC Ex

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**Options**

Second 4...20mA output

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**Components**

Transmitter:

FMU90, FMU95

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**Application limits**

Foam / high turbulence possible:

FDU92

Flange-flush assembly:

FDU91F

For tank farms scanner:

FMU95

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**Continuous / Solids****Measuring principle**Ultrasonic

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**Characteristic / Application**Separated version with field housing or top hat rail housing for control cabinet instrumentation, 300m in-between sensor and transmitter

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**Supply / Communication**4-wire (HART, PROFIBUS DP)

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**Accuracy**+/- 2mm + 0.17% of measured distance

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**Ambient temperature**-40 °C ... 80 °C  
(-40 °F ... 176 °F)

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**Process temperature**-40 °C ... 80 °C  
(-40 °F ... 176 °F)

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**Process pressure / max. overpressure limit**0.7 bar ... 4 bar abs  
(10 psi ... 58 psi)

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**Main wetted parts**PVDF (IP68 / NEMA6P)

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**Process connection**Front side thread:  
G / NPT 1 1/2"  
Rear side thread:  
G / NPT 1"  
Ceiling mounting

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**Blocking distance**0.07 m (0.23 ft)

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## Continuous / Solids

**Max. measurement distance**

Liquids: 3 m (9.8 ft),  
Solids: 1.2 m (3.9 ft)

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**Communication**

Transmitter:  
4 ... 20 mA HART  
Profibus DP

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**Certificates / Approvals**

ATEX, FM, CSA, IEC Ex, INMETRO, NEPSI, EAC Ex

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**Options**

Second 4...20mA output

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**Components**

Transmitter:  
FMU90

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## Liquids

**Measuring principle**

Ultrasonic

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**Product headline**

Version with separate transmitter in field housing or top hat rail housing  
Cost effective solution for open channel flow measurement in water /  
wastewater plants

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**Max. measurement error**

accuracy:  
distance measurement: +/- 2mm + 0.17%  
resolution:  
distance measurement: 1m

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**Measuring range**

max measuring distance up to 3 m / 9.8 ft

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## Liquids

**Max. process pressure**

atm.

**Medium temperature range**

-40 °C ... 80 °C

(-40 °F ... 176 °F)

**Degree of protection**

IP68

**Display/Operation**

Transmitter

**Outputs**

Transmitter:

4 ... 20 mA HART

PROFIBUS DP

**Inputs**

Transmitter

**Digital communication**

HART, PROFIBUS DP

**Hazardous area approvals**

ATEX, FM, CSA, IEC Ex, INMETRO, NEPSI, EAC Ex

More information [www.ch.endress.com/FDU90](http://www.ch.endress.com/FDU90)