

Ultrasonic measurement Time-of-Flight Prosonic FDU91

Ultrasonic sensor for level and flow measurement for connection to FMU9x (measuring range up to 10m)



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.be.endress.com/FDU91

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: 10 m (33 ft), Solids: 5 m (16 ft)
- **Accuracy** +/- 2mm + 0.17% of measured distance
- **Main wetted parts** PVDF (fully welded IP68 / NEMA 6P)

Field of application: The FDU91 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 10m (33ft), solids 5m (16ft).

Features and specifications

Continuous / Liquids

Measuring principle

Ultrasonic

Characteristic / Application

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

Supply / Communication

4-wire (HART, Profibus DP)

Accuracy

+/- 2 mm + 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 (fully welded IP68 / NEMA6P)

Process connection

G / NPT 1"

Continuous / Liquids**Blocking distance**0.3 m (1 ft)

Max. measurement distance

Liquids: 10 m (33 ft),

Solids: 5 m (16 ft)

Communication

Transmitter:

4 ... 20 mA HART

Profibus DP

Certificates / ApprovalsATEX, FM, CSA, IEC Ex, INMETRO, NEPSI, EAC Ex

OptionsSecond 4...20 mA output

Components

Transmitter:

FMU90, FMU95

Application limits

Foam / high turbulence possible:

FDU92

Flange-flush assembly:

FDU91F

For tank farms scanner:

FMU95

Continuous / Solids**Measuring principle**Ultrasonic

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

Continuous / Solids**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 limit0.7 bar ... 4 bar abs
(10 psi ... 58 psi)

Main wetted partsPVDF (fully welded IP68 / NEMA 6P)

Process connectionG / NPT 1"

Blocking distance0.3 m (1 ft)

Max. measurement distanceLiquids: 10 m (33 ft),
Solids: 5 m (16 ft)

CommunicationTransmitter:
4 ... 20 mA HART
Profibus DP

Certificates / ApprovalsATEX, FM, CSA, IEC Ex, JPN Ex, INMETRO, NEPSI, EAC Ex

Continuous / Solids**Options**

Second 4...20mA output

ComponentsTransmitter:
FMU90

Liquids**Measuring principle**Ultrasonic

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

Max. measurement error

accuracy:

distance measurement: +/- 2mm + 0.17%

resolution:

distance measurement: 1mm

Measuring rangemax measuring distance up to 10m / 32ft

Max. process pressureatm.

Medium temperature range

-40...80°C

(-40...176°F)

Degree of protectionIP68

Display/OperationTransmitter

Liquids

Outputs

Transmitter:

4...20mA HART

Option: second 4...20mA output

Inputs

Transmitter

Digital communication

HART, PROFIBUS DP

Hazardous area approvals

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

More information www.be.endress.com/FDU91