

## Technical Information

# Prosonic S FMU95

Transmitter in housing for field or top-hat rail mounting  
for up to 10 ultrasonic sensors FDU90/91/91F/92/93/95/96



### Application

- Continuous, non-contact level measurement of fluids, pastes, sludge and powdery to coarse bulk materials with up to 5 or 10 ultrasonic sensors
- Measuring range up to 70 m (230 ft) (depending on sensor and material measured)
- Calculation of average values or sums

### Your benefits

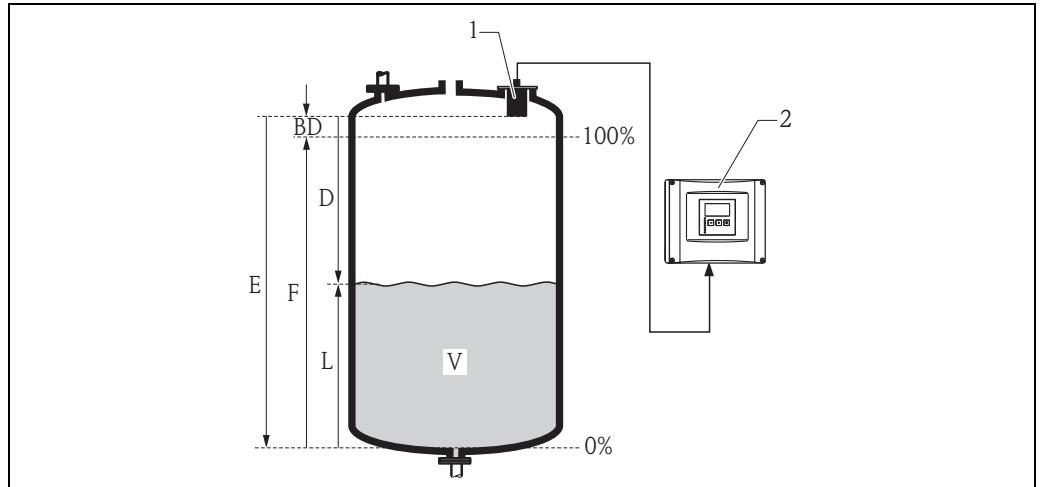
- Simple, menu-guided operation with 6-line plain text display; 15 languages selectable
- Envelope curves on the display for quick and simple diagnosis
- Easy operation, diagnosis and measuring point documentation with the supplied operating program "FieldCare".
- Temperature dependent time-of-flight correction via the integrated temperature measurement in the sensors
- Linearization (up to 32 points, freely configurable)
- System integration via PROFIBUS DP with up to 20 measured values
- Automatic detection of the sensors FDU90/91(F)/92/93/95/96
- The sensors of the series FDU8x can be connected (for certificates see note → 5)
- adjustable to the individual requirements via product structure

# Table of Contents

|   |           |  |           |
|---|-----------|--|-----------|
| <b>Function and system design</b> .....                       | <b>3</b>  | Operating menu .....                         | 17        |
| Measuring principle .....                                     | 3         | Basic setup .....                            | 17        |
| Blocking distance .....                                       | 3         | Locking of the instrument.....               | 17        |
| Time-of-flight correction .....                               | 3         | <b>Certificates and Approvals</b> .....      | <b>18</b> |
| Interference echo suppression .....                           | 3         | CE mark .....                                | 18        |
| Linearization .....   | 3         | Ex approval .....                            | 18        |
| Datalog functions .....                                       | 4         | External standards and guidelines .....      | 18        |
| Application examples .....                                    | 4         | <b>Ordering information</b> .....            | <b>19</b> |
| System integration PROFIBUS DP .....                          | 5         | Product structure .....                      | 19        |
| <b>Input</b> .....  | <b>5</b>  | Scope of delivery .....                      | 19        |
| Sensor inputs .....   | 5         | <b>Accessories</b> .....                     | <b>20</b> |
| <b>Output</b> .....   | <b>6</b>  | Commubox FXA291 .....                        | 20        |
| PROFIBUS DP interface .....                                   | 6         | Protection cover for the field housing ..... | 20        |
| <b>Power supply</b> .....                                     | <b>6</b>  | Mounting plate for the field housing .....   | 20        |
| Supply voltage / Power consumption /Current consumption ..... | 6         | Mounting bracket .....                       | 21        |
| Galvanic isolation .....                                      | 6         | Adaption plate for remote display .....      | 21        |
| Fuse .....  | 6         | Overvoltage protection HAW562 .....          | 22        |
| <b>Electrical connection</b> .....                            | <b>7</b>  | <b>Documentation</b> .....                   | <b>23</b> |
| Terminal compartment of the field housing .....               | 7         | Technical Information .....                  | 23        |
| Cable entries of the field housing .....                      | 7         | Operating Instructions .....                 | 23        |
| Terminal compartment of the DIN-rail housing .....            | 7         | Safety Instructions .....                    | 23        |
| Terminals .....   | 9         |  |           |
| Terminal assignment .....                                     | 9         |  |           |
| Connection of the sensors FDU9x .....                         | 11        |  |           |
| Synchronization line .....                                    | 12        |  |           |
| Connection of the separate display and operating module ..... | 12        |  |           |
| <b>Performance characteristics</b> .....                      | <b>13</b> |  |           |
| Reference operating conditions .....                          | 13        |  |           |
| Maximum measuring error .....                                 | 13        |  |           |
| Typical measuring error .....                                 | 13        |  |           |
| Measured value resolution .....                               | 13        |  |           |
| Measuring frequency .....                                     | 13        |  |           |
| <b>Operating conditions: Environment</b> .....                | <b>13</b> |  |           |
| Ambient temperature .....                                     | 13        |  |           |
| Storage temperature .....                                     | 13        |  |           |
| Climate class .....   | 13        |  |           |
| Vibration resistance .....                                    | 13        |  |           |
| Ingress protection .....                                      | 13        |  |           |
| Electromagnetic compatibility (EMC) .....                     | 13        |  |           |
| <b>Mechanical construction</b> .....                          | <b>14</b> |  |           |
| Housing versions .....  | 14        |  |           |
| Dimensions of the field housing .....                         | 14        |  |           |
| Dimensions of the DIN-rail housing .....                      | 15        |  |           |
| Dimensions of the separate display and operating module ..... | 15        |  |           |
| Weight .....  | 15        |  |           |
| Materials .....   | 16        |  |           |
| <b>Human interface</b> .....                                  | <b>17</b> |  |           |
| Display and operating module .....                            | 17        |  |           |

## Function and system design

### Measuring principle



**BD:** Blocking distance, **D:** Distance from sensor membrane to fluid surface, **E:** Empty distance **F:** Span (full distance), **L:** Level, **V:** Volume (or mass)

The sensor transmits ultrasonic pulses in the direction of the product surface. There, they are reflected back and received by the sensor. The transmitter Prosonic S measures the time  $t$  between pulse transmission and reception. From  $t$  (and the velocity of sound  $c$ ) it calculates the distance  $D$  from the sensor membrane to the product surface:

$$D = c \cdot t / 2$$

From  $D$  results the desired measuring value:

- Level  $L$
- Volume  $V$

### Blocking distance

The span  $F$  may not extend into the blocking distance  $BD$ . Level echos from the blocking distance can not be evaluated due to the transient characteristics of the sensor. The blocking distances of the individual sensors are given in the following documents:

- TI00396F for the sensors FDU90/91/91F/92/93/95/96
- TI00189F for the sensors FDU80/80F/81/81F/82/83/84/85/86

### Time-of-flight correction

In order to compensate for temperature dependent time-of-flight changes, a temperature sensor (NTC) is integrated in the ultrasonic sensors.

### Interference echo suppression

The interference echo suppression feature of the Prosonic S ensures that interference echos (e.g. from edges, welded joints and installations) are not interpreted as a level echo.

### Linearization

#### Pre-programmed linearization curves for specific types of vessels

- horizontal, cylindrical tank
- spherical tank
- tank with pyramidal bottom
- tank with conical bottom
- tank with flat, inclined bottom

The pre-programmed linearization curves are calculated on-line.

#### Linearization table

consisting of up to 32 linearization points; to be entered manually or half-automatically.

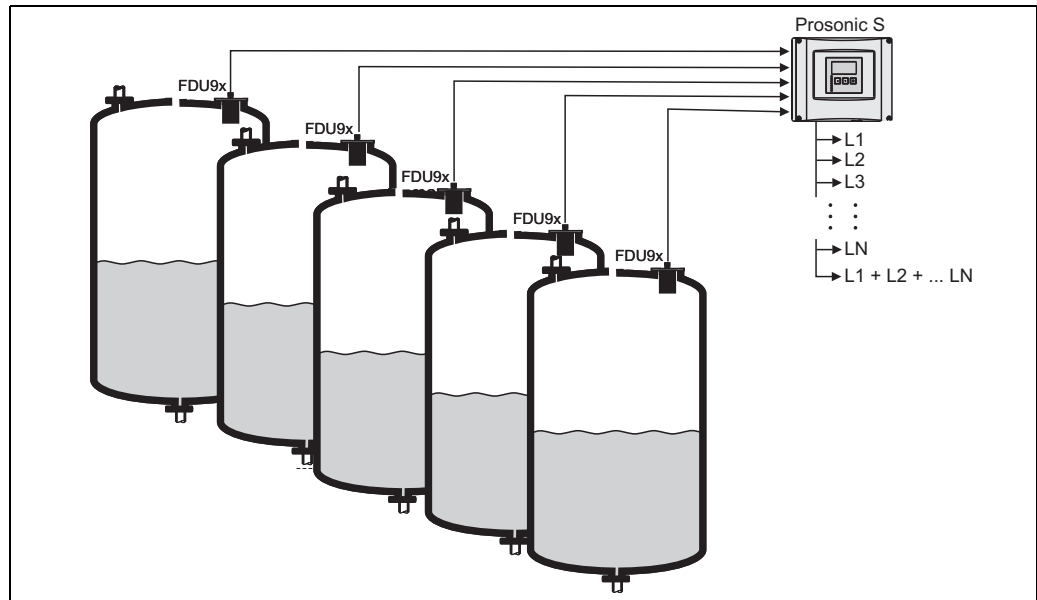
**Datalog functions**

**Basic version**

- Peak hold indicator of the min./max. levels and the min./max. temperatures at the sensors
- Recording of the last 10 alarms
- Indication of the operating status
- Indication of the operating hours

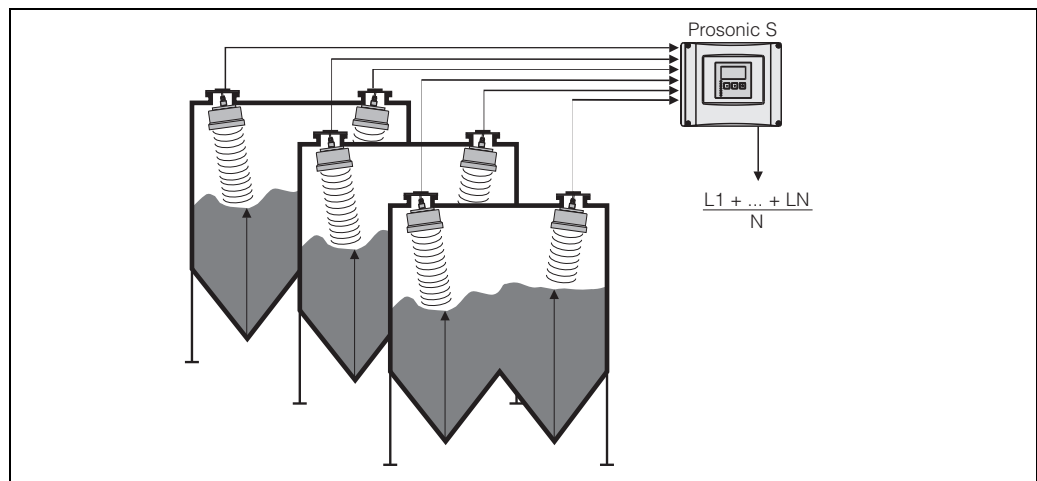
**Application examples**

**Multi-channel level measurement with sum calculation**



100-FMU95xxx-15-00-00-xx-010

**Multi-channel level measurement with average calculation**

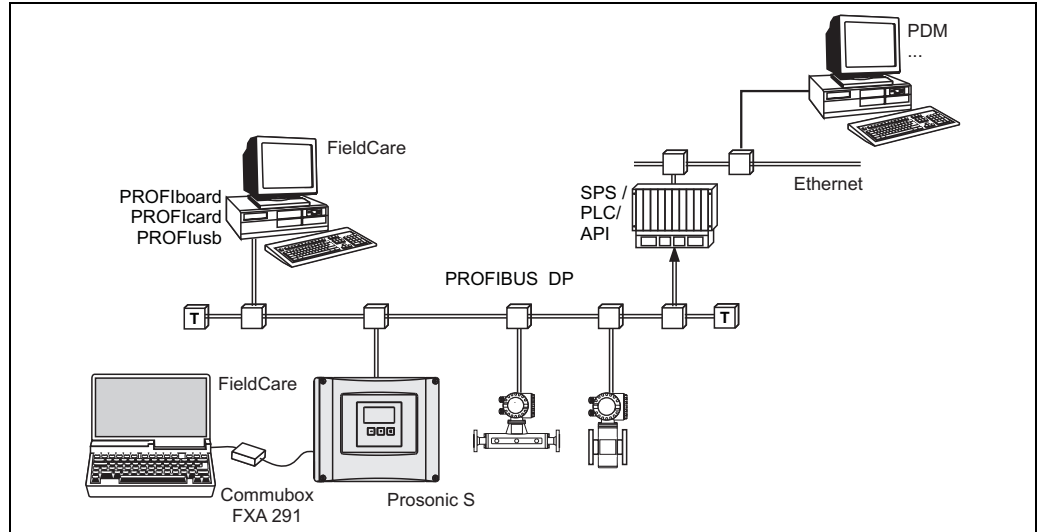


100-FMU95xxx-15-00-00-xx-003

**System integration  
PROFIBUS DP**

**Operating options**

- via the display and operating module at the Prosonic S
- via the service interface with the Commubox FXA291 and the operating program FieldCare
- via PROFIBUS DP with PROFiBoard, PROFiCard or PROFiLusB and the operating program FieldCare



L00-FMU90xxx-14-00-00-xx-021

**Input**

**Sensor inputs**

Depending on the instrument version, up to 5 or up to 10 of the sensors FDU90, FDU91, FDU91F, FDU92, FDU93, FDU95 and FDU96 can be connected. The Prosonic S identifies these sensors automatically.

| Sensor                              | FDU90     | FDU91<br>FDU91F | FDU92   | FDU93   | FDU95    | FDU96    |
|-------------------------------------|-----------|-----------------|---------|---------|----------|----------|
| max. range <sup>1)</sup> in liquids | 3 (9.8)   | 10 (33)         | 20 (66) | 25 (82) | -        | -        |
| max. range <sup>1)</sup> in solids  | 1.2 (3.9) | 5 (16)          | 10 (33) | 15 (49) | 45 (148) | 70 (230) |

m (ft)

1) This table gives the maximum range. The range depends on the measuring conditions. For an estimation see Technical Information TI00396F, chapter "Input".

In order to support existing installations, the sensors of the series FDU8x can be connected as well. The type of sensor must be entered manually.

| Sensor                              | FDU80<br>FDU80F | FDU81<br>FDU81F | FDU82   | FDU83   | FDU84   | FDU85    | FDU86    |
|-------------------------------------|-----------------|-----------------|---------|---------|---------|----------|----------|
| max. range <sup>1)</sup> in liquids | 5 (16)          | 10 (33)         | 20 (66) | 25 (82) | -       | -        | -        |
| max. range <sup>1)</sup> in solids  | 2 (6.6)         | 5 (16)          | 10 (33) | 15 (49) | 25 (82) | 45 (148) | 70 (230) |

m (ft)

1) This table gives the maximum range. The range depends on the measuring conditions. For an estimation see Technical Information TI00189F, chapter "Planning Recommendations".

**Warning!**

The sensors FDU83, FDU84, FDU85 and FDU86 with an ATEX, FM or CSA certificate are not certified for connection to the transmitter FMU95.

## Output

### PROFIBUS DP interface

|                              |  |
|------------------------------|--|
| Profile                      | 3.0  |
| Transmittable values         | <ul style="list-style-type: none"> <li>■ main value (level 1 to level 10)</li> <li>■ distances</li> <li>■ temperatures</li> <li>■ averages/sums</li> </ul>   |
| Function blocks              | <ul style="list-style-type: none"> <li>■ 20 Analog Input Blocks (AI)</li> </ul>  |
| Supported baud rates         | <ul style="list-style-type: none"> <li>■ 9.6 kbaud</li> <li>■ 19.2 kbaud</li> <li>■ 45,45 kbaud</li> <li>■ 93,75 kbaud</li> <li>■ 187.5 kbaud</li> <li>■ 500 kbaud</li> <li>■ 1.5 Mbaud</li> <li>■ 3 Mbaud</li> <li>■ 6 Mbaud</li> <li>■ 12 Mbaud</li> </ul> |
| Service Access Points (SAPs) | 2  |
| ID number                    | 154E (hex) = 5454 (dec)  |
| GSD file                     | EH3x154E.gsd   |
| Addressing                   | via dip switches at the instrument or via software (e.g. FieldCare)<br>Default address: 126 per software   |
| Termination                  | can be activated/deactivated in the instrument   |
| Locking                      | The device can be locked by hardware or software.  |

## Power supply

### Supply voltage / Power consumption / Current consumption

| Instrument version                | Supply voltage                       | Power consumption         | Current consumption                |
|-----------------------------------|--------------------------------------|---------------------------|------------------------------------|
| AC voltage<br>(FMU95 - ****A****) | 90 to 253 V <sub>AC</sub> (50/60 Hz) | max. 23 VA                | max. 100 mA at 230 V <sub>AC</sub> |
| DC voltage<br>(FMU95 - ****B****) | 10,5 to 32 V <sub>DC</sub>           | max. 14 W (typically 8 W) | max. 580 mA at 24 V <sub>DC</sub>  |

### Galvanic isolation

The following terminals are galvanically isolated from each other:

- auxiliary energy
- sensor inputs
- bus connection (PROFIBUS DP)

### Fuse

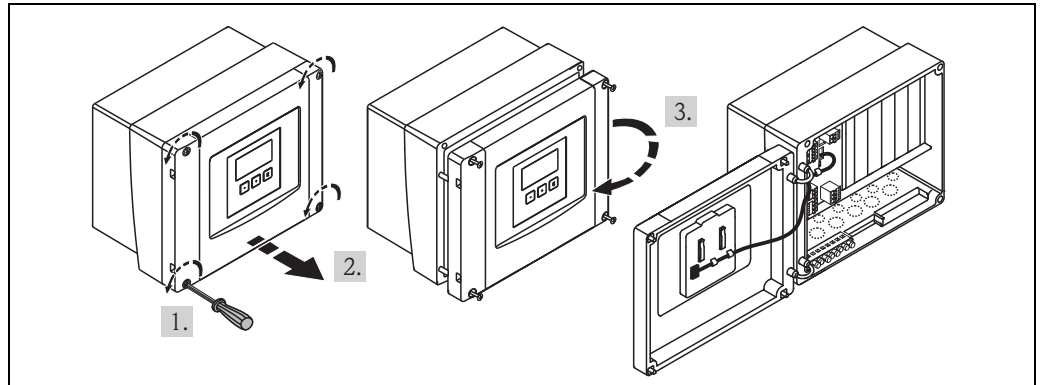
- 2 A T /DC
- 400 mA T /AC

accessible in the terminal compartment

## Electrical connection

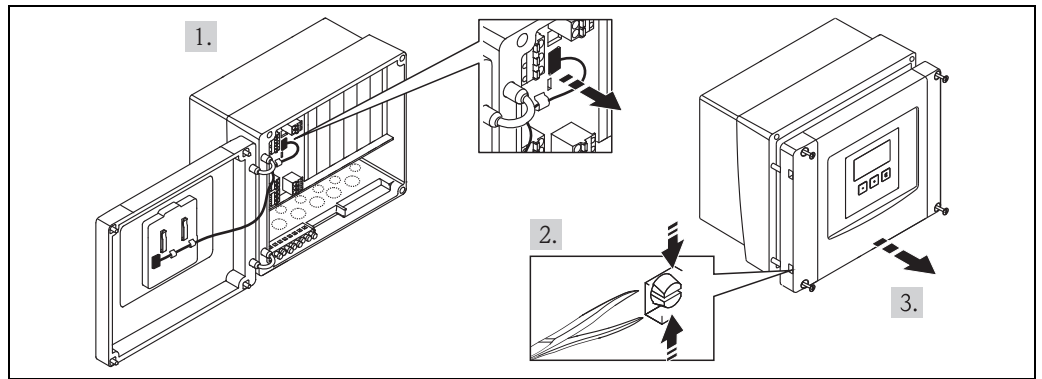
### Terminal compartment of the field housing

The field housing has a separate terminal compartment. It can be opened after loosening the four screws of the lid.



L00-FMU90xxx-04-00-00-xx-002

For easier wiring, the lid can be completely removed by unplugging the display plug and loosening the hinges:



L00-FMU90Kxx-04-00-00-xx-009

### Cable entries of the field housing

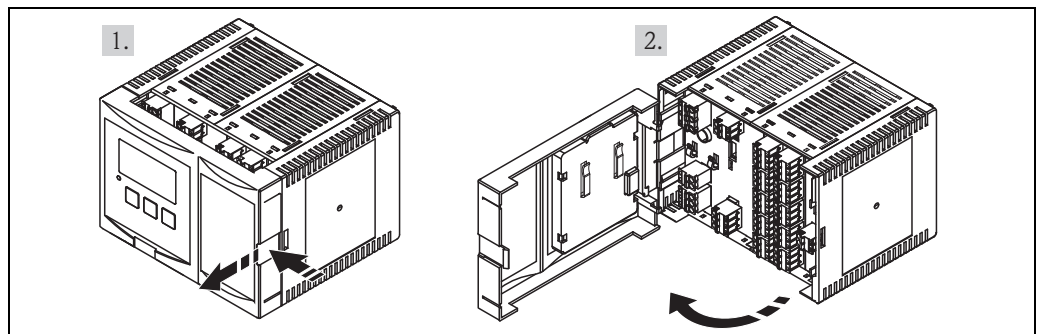
On the bottom of the housing the following openings for cable entries are prestamped:

- M20x1.5 (10 openings)
- M16x1.5 (5 openings)
- M25x1.5 (1 opening)

A suitable cutting device must be used for cutting out the openings.

### Terminal compartment of the DIN-rail housing

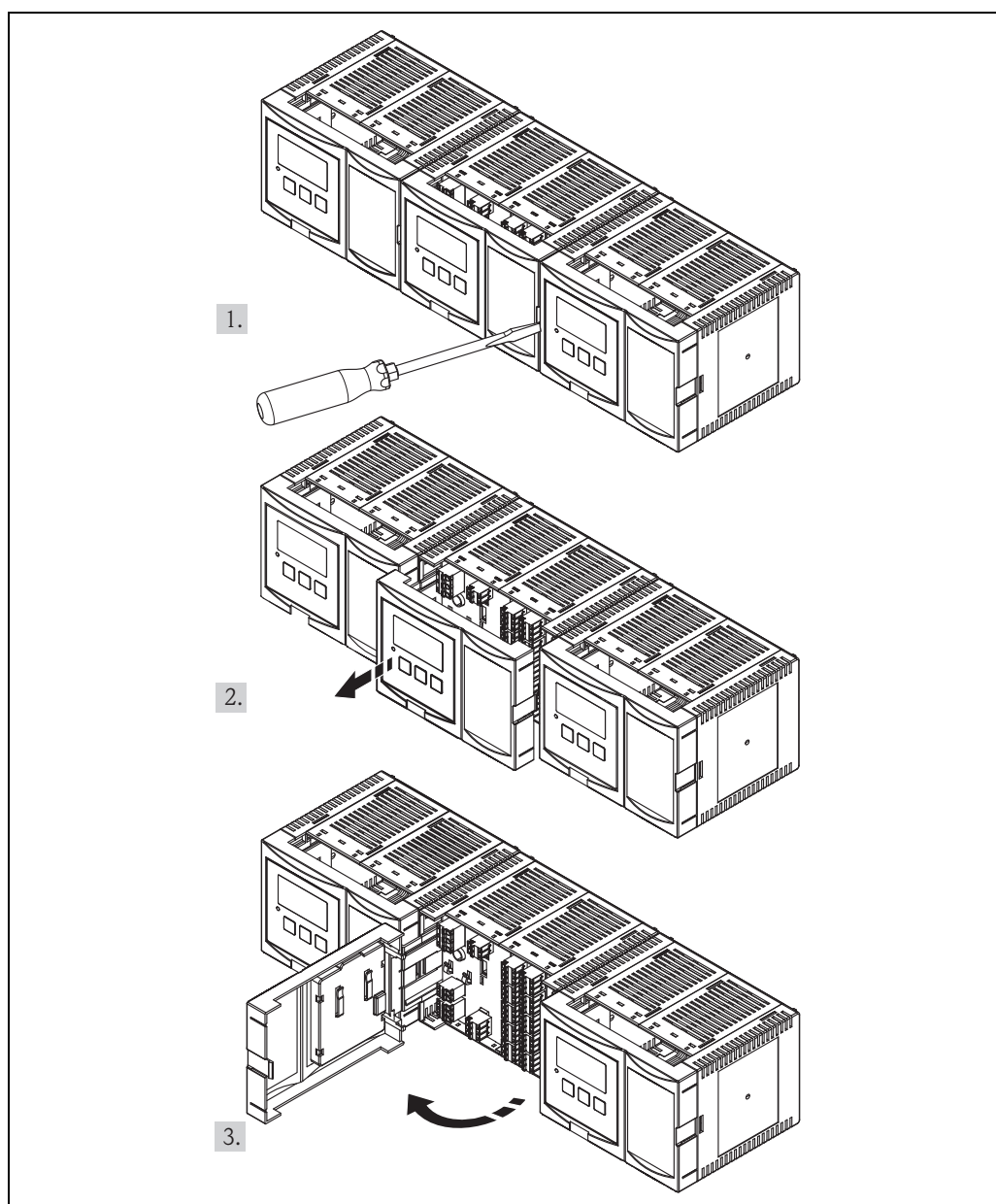
#### Single instrument



L00-FMU95xxx-04-00-00-xx-005

The catch can be unlocked by slightly pressing onto the clip. Then, the cover of the terminal compartment can be opened.

## Several instruments mounted side by side



L00-FMU95KAx-04-00-00-xx-005

1. Open the catch of the cover (e.g. by a screwdriver).
2. Pull the cover out by approx. 20 mm (0.79 in).
3. The cover can now be opened.

## Note!

- The cables can be inserted into the housing from above or from below.
- If the instruments are mounted next to each other and if the sensor cables run in parallel, the synchronization terminals (39 and 40) must be interconnected (see sections "Terminal assignment" and "Synchronization line").

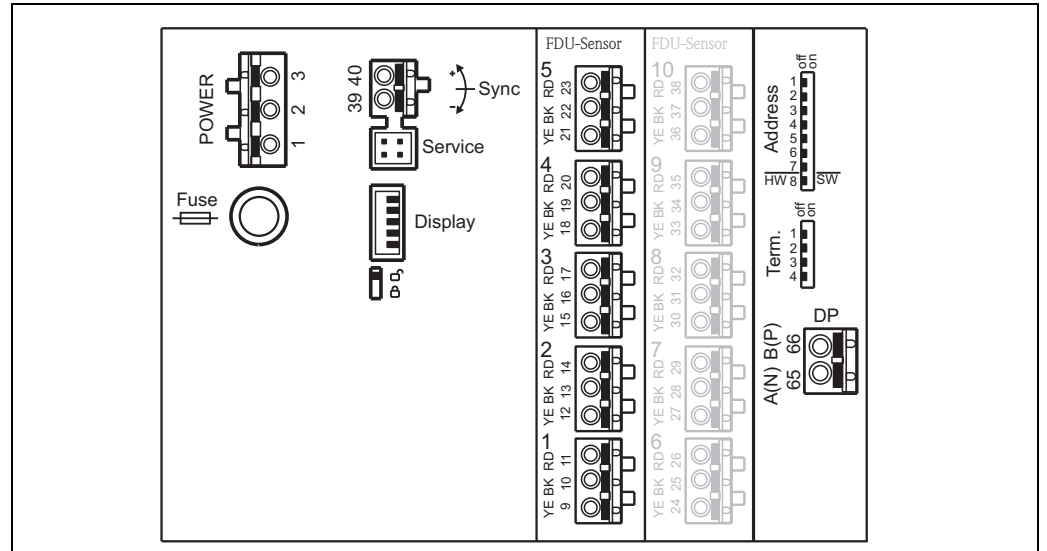


**Terminals**

Pluggable spring-force terminals for connection of the cables are supplied in the terminal compartment. Rigid conductors or flexible conductors with cable and sleeve can directly be inserted and are contacted automatically.

|                                |  |
|--------------------------------|--|
| Conductor cross section        | 0,2 mm <sup>2</sup> to 2,5 mm <sup>2</sup> (26 to 14 AWG)  |
| Cable and sleeve cross section | 0,25 mm <sup>2</sup> to 2,5 mm <sup>2</sup> (24 to 14 AWG) |
| min. stripping length          | 10 mm (0.39 in)  |

**Terminal assignment**



L00-FMU90:xxxx-04-00-00-xx-001

Terminals of the Prosonic S FMU95; the terminals depicted in grey are not present in every instrument version.

| Terminals                | Meaning   | Remarks   |
|--------------------------|---|---|
| <b>Auxiliary energy</b>  |   |   |
| 1                        | <ul style="list-style-type: none"> <li>L (for AC version)</li> <li>L+ (for DC version)</li> </ul> | depending on instrument version:<br><ul style="list-style-type: none"> <li>90 to 253 V<sub>AC</sub></li> <li>10,5 to 32 V<sub>DC</sub></li> </ul> |
| 2                        | <ul style="list-style-type: none"> <li>N (for AC version)</li> <li>L- (for DC version)</li> </ul> |   |
| 3                        | Potential equalization  |   |
| Fuse                     |   | depending on instrument version:<br><ul style="list-style-type: none"> <li>400 mA T (for AC)</li> <li>2 A T (for DC)</li> </ul>                   |
| <b>Bus communication</b> |   |   |
| 65                       | PROFIBUS A (RxT/TxD - N)  |   |
| 66                       | PROFIBUS B (RxT/TxD - P)  |   |
| <b>Synchronization</b>   |   |   |
| 39, 40                   | Synchronization   | see section "Synchronization line"  |
| <b>Level inputs</b>      |   |   |
| 09,10,11                 | Sensor 1 (FDU8x/9x)   | YE: yellow strand<br>BK: black strand<br>RD: red strand   |
| 12, 13, 14               | Sensor 2 (FDU8x/9x)   |   |
| 15, 16, 17               | Sensor 3 (FDU8x/9x)   |   |
| 18, 19, 20               | Sensor 4 (FDU8x/9x)   |   |
| 21, 22, 23               | Sensor 5 (FDU8x/9x)   |   |

| Terminals  | Meaning              | Remarks   |
|------------|----------------------|---|
| 24, 25, 26 | Sensor 6 (FDU8x/9x)  | only available for the version with 10 sensor inputs<br><br>YE: yellow strand<br>BK: black strand<br>RD: red strand |
| 27, 28, 29 | Sensor 7 (FDU8x/9x)  |   |
| 30, 31, 32 | Sensor 8 (FDU8x/9x)  |   |
| 33, 34, 35 | Sensor 9 (FDU8x/9x)  |   |
| 36, 37, 38 | Sensor 10 (FDU8x/9x) |   |


**Warning!**

When using the public supply mains, an easily accessible power switch must be installed in the proximity of the device. The power switch must be marked as a disconnecter for the device (IEC/EN 61010).

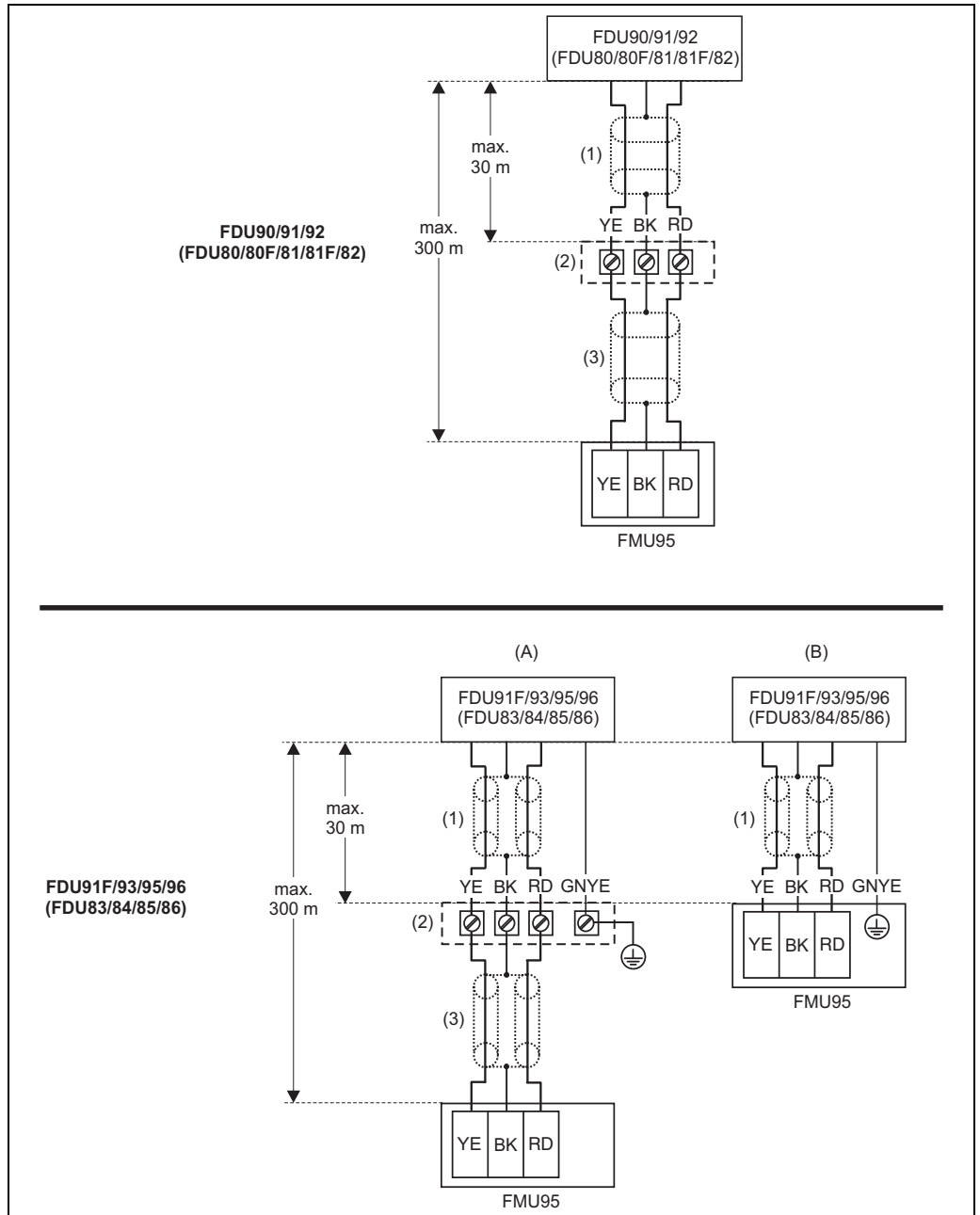
**Note!**

- In order to avoid interference signals, the sensor cables should not be laid parallel to high voltage or electric power lines.
- The cables may not be laid in the proximity to frequency converters.

**Additional elements on the terminal areas**

| Designation   | Meaning/Remarks   |
|---|---|
| Fuse  | Fuse: 2 A T /DC or 400 mA T/AC  |
| Display   | Connection of the display or the remote display and operating module  |
| Service   | Service interface for connection of a PC/Notebook via Commubox FXA291 |
|  | Locking switch  |
| Term.   | Bus termination   |
| Address   | Bus address   |

**Connection of the sensors  
FDU9x**



L00-FMU95xxxx-04-00-00-xx-004

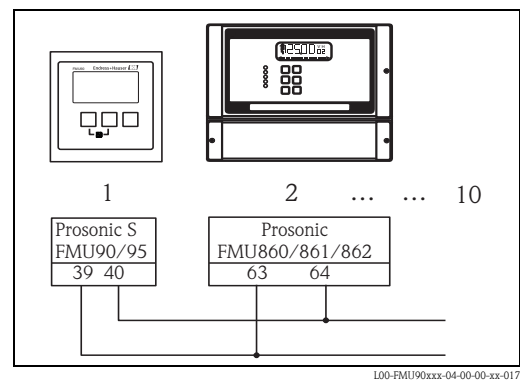
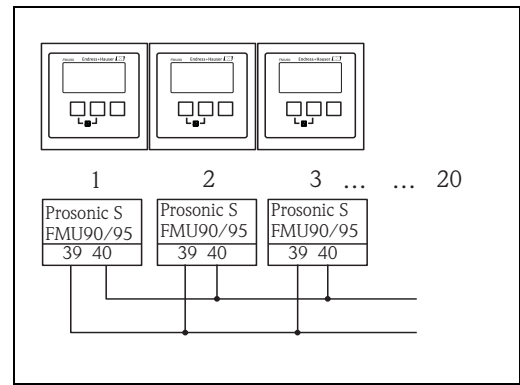
- (A):** grounding at the terminal box,
- (B):** grounding at the transmitter FMU95,
- (1):** screen of the sensor cable,
- (2):** terminal box,
- (3):** screen of the extension cable

Colours of the strands: YE = yellow; BK = black; RD = red; BU = blue; BN = brown; GNYE = green-yellow

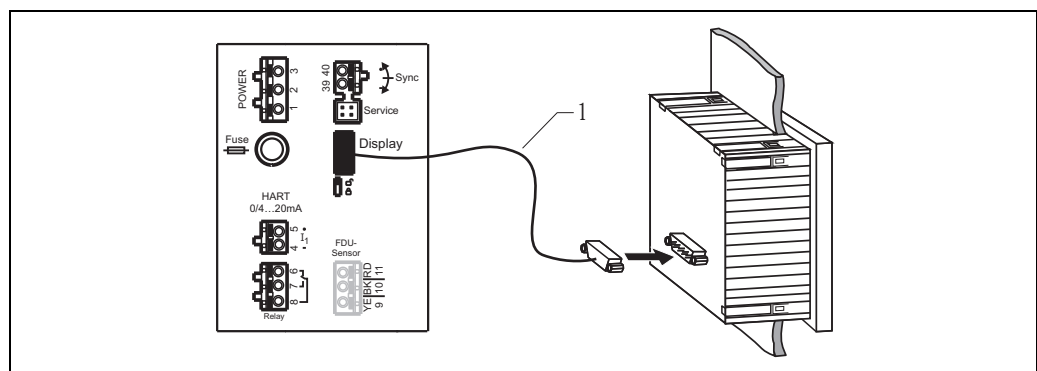
For details on the sensor connection refer to Technical Information TI00396F/00/DE (FDU9x) or TI00189F/00/EN (FDU8x).

**Synchronization line**

- If wiring several Prosonic S (FMU90/FMU95) which are mounted in a common cabinet and if the sensor cables run in parallel, the synchronization terminals (39 and 40) must be interconnected.
- Up to 20 instruments can be synchronized in this way.
- The synchronization prevents an evaluation unit from receiving a signal while a different evaluation unit is emitting a signal. This prevents pulses in the sensor cable of one sensor from influencing the received signal on the cable of a different sensor.
- If there are more than 20 instruments, groups must be formed, each containing a maximum of 20 instruments. For the instruments within each group, the sensor cables may run in parallel. The sensor cables of different groups must be separated from each other.
- Usual commercial screened cable can be used for synchronization
  - max. length: 10 m (33 ft) between the individual instruments
  - cross section: 2 x (0.75 to 2.5 mm<sup>2</sup> (20 to 14 AWG))
  - for lengths up to 1 m (3.3 ft), an unscreened cable can be used; for lengths exceeding 1 m (3.3 ft), screening is required. The screen must be connected to ground
- Instruments of the Prosonic FMU86x family can be connected to the synchronization line as well. In this case a maximum of 10 instruments can be connected to each synchronisation line.



**Connection of the separate display and operating module**



1 Connection of the display plug with the cable (3 m (9.8 ft))


For the version of the Prosonic S with a separate display for panel mounting, a pre-assembled connecting cable (3 m (9.8 ft)) is supplied. The cable must be connected to the display plug of the Prosonic S.

Note!  
Minimum diameter for cable bushing: 20 mm (0.79 in)

## Performance characteristics

|  |   |
|--|---|
| <b>Reference operating conditions</b>          | <ul style="list-style-type: none"> <li>■ Temperature = 24±5 °C (75±9 °F)</li> <li>■ Pressure = 960±100 mbar (14±1.45 psi)</li> <li>■ Relative humidity = 60±15 %</li> <li>■ Ideally reflecting surface, sensor vertically aligned (e.g. calm, plane liquid surface of 1 m<sup>2</sup> (10.76 ft<sup>2</sup>))</li> <li>■ No interference echoes within the signal beam</li> <li>■ Settings of the application parameters: <ul style="list-style-type: none"> <li>– tank shape = flat ceiling; medium property = liquid; process condition = calm surface</li> </ul> </li> </ul> |
| <b>Maximum measuring error<sup>1) 2)</sup></b> | ±0,2 % of the maximum span of the sensor  |
| <b>Typical measuring error<sup>2)</sup></b>    | Include linearity, repeatability and hysteresis<br>Better than ±2 mm (0.08 in) + 0.17 % of the measured distance  |
| <b>Measured value resolution</b>               | 1 mm (0.04 in) with FDU90/FDU91   |
| <b>Measuring frequency</b>                     | <ul style="list-style-type: none"> <li>■ 0.2 Hz (with 5 sensors)</li> <li>■ 0.1 Hz (with 10 sensors)</li> </ul> <p>The exact value depends on the settings of the application parameters and the instrument version (5 sensors or 10 sensors).</p> <p>Note!<br/>If unused sensor inputs are switched off (in the "sensor management" menu), the measuring frequency increases. The Prosonic S measures with one sensor per second.</p>  |

## Operating conditions: Environment

|  |   |
|--|---|
| <b>Ambient temperature</b>                 | <p>–40 to +60 °C (–40 to +140 °F)</p> <p>The functionality of the LC display becomes restricted at <math>T_U &lt; -20</math> °C (<math>T_U &lt; -4</math> °F).<br/>If the device is operated outdoors in strong sunlight, a protective cover should be used (→  20).</p> |
| <b>Storage temperature</b>                 | –40 to +60 °C (–40 to +140 °F)  |
| <b>Climate class</b>                       | <ul style="list-style-type: none"> <li>■ <b>Field housing:</b> according to DIN EN 60721-3 4K2/4K5/4K6/4Z2/4Z5/4C3/4S4/4M2 (DIN 60721-3 4K2 corresponds to DIN 60654-1 D1)</li> <li>■ <b>Housing for DIN rail mounting:</b> according to DIN EN 60721-3 3K3/3Z2/3Z5/3B1/3C2/3S3/3M1 (DIN 60721-3 3K3 corresponds to DIN 60654-1 B2)</li> </ul>                |
| <b>Vibration resistance</b>                | <ul style="list-style-type: none"> <li>■ Housing for DIN rail: DIN EN 60068-2-64 / IEC 68-2-64; 20 to 2000 Hz; 0.5 (m/s<sup>2</sup>)<sup>2</sup>/Hz</li> <li>■ Field housing: DIN EN 60068-2-64 / IEC 68-2-64; 20 to 2000 Hz; 1.0 (m/s<sup>2</sup>)<sup>2</sup>/Hz</li> </ul>   |
| <b>Ingress protection</b>                  | <ul style="list-style-type: none"> <li>■ Field housing: IP66 / NEMA 4x</li> <li>■ Housing for DIN rail: IP20</li> <li>■ separate display: <ul style="list-style-type: none"> <li>– IP65 / NEMA 4 (front panel, if mounted in cabinet door)</li> <li>– IP20 (rear panel, if mounted in cabinet door)</li> </ul> </li> </ul>                                    |
| <b>Electromagnetic compatibility (EMC)</b> | <p>Electromagnetic compatibility according to all relevant requirements of the EN 61326- series and NAMUR recommendation EMC (NE21). For details see declaration of conformity.</p> <p>With respect to interference emission the devices meet the requirements of class A and are only provided for use in an "industrial environment"!</p>                   |

1) according to EN 61298-2

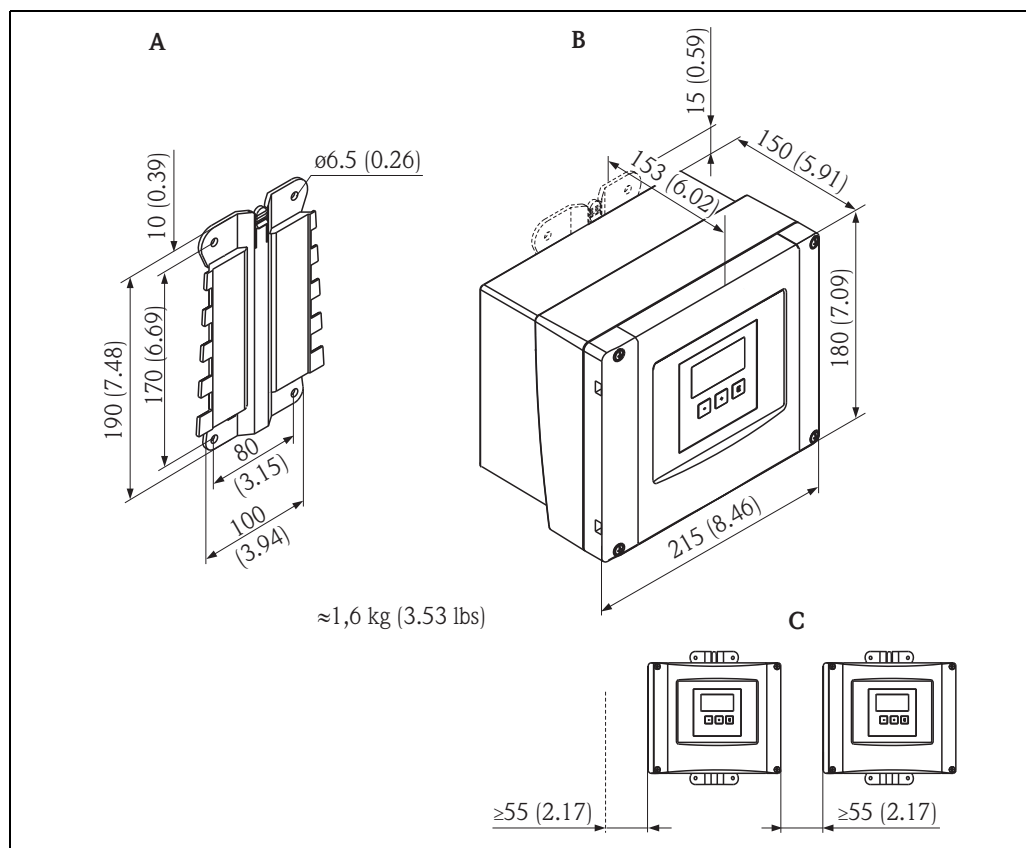
2) with reference operating conditions

## Mechanical construction

### Housing versions

- Field housing; optionally with integrated display and operating module
- Housing for top-hat rail mounting; optionally with intergrated display and operating module
- Housing for top-hat rail mounting with separated display and operating module for cabinet door mounting

### Dimensions of the field housing



Dimensions in mm (in)

**A** Mounting help (supplied); can also be used as drilling template

**B** Field housing

**C** Minimum mounting distance

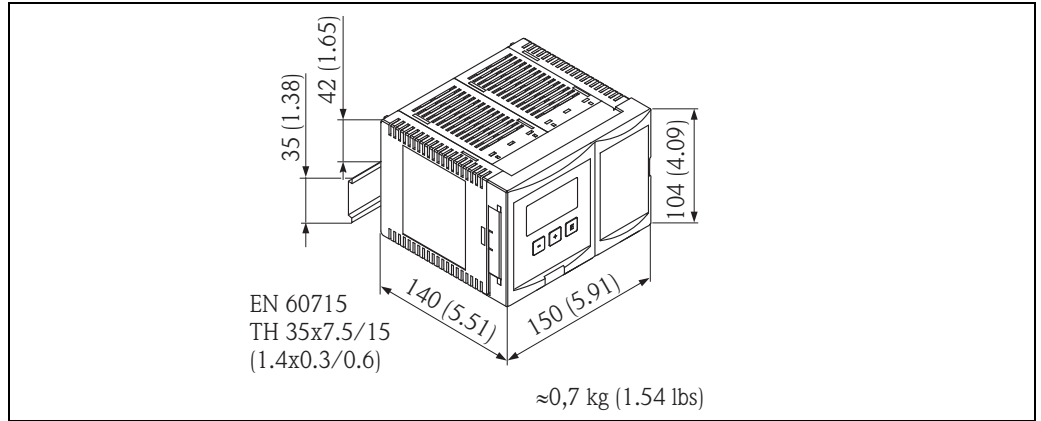
The dimensions of the field housing are the same for all instrument versions.

To open the housing, a minimum mounting distance of 55 mm (2.17 in) is required on the left.

Note!

The mounting help must be mounted on a plane surface and must not become bent. Otherwise the mounting of the field housing may be difficult or impossible.

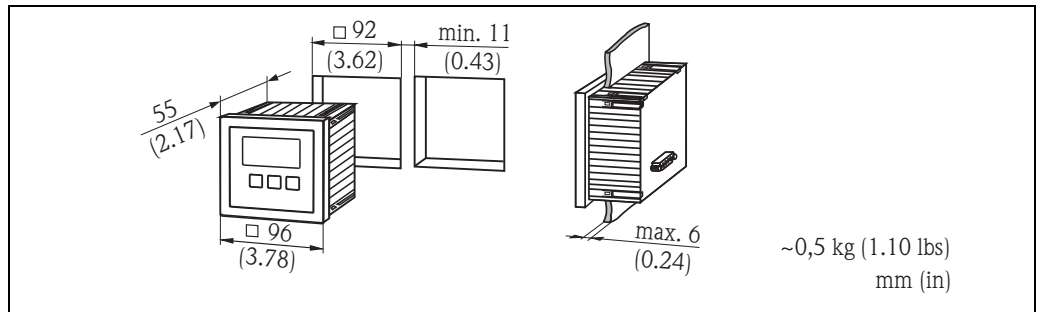
**Dimensions of the DIN-rail housing**



L00-FMU190xxx-06-00-00-xx-005

Dimensions in mm (in)

**Dimensions of the separate display and operating module**

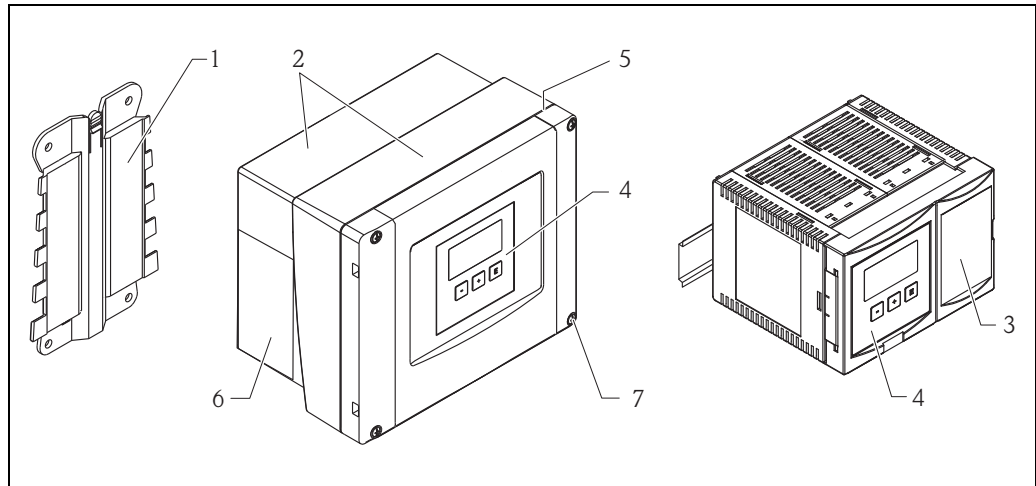


L00-FMU190xxx-06-00-00-xx-004

**Weight**

| Housing version                       | Weight  |
|---------------------------------------|---|
| Field housing                         | approx. 1.6 to 1.8 kg (3.53 to 3.97 lbs); depending on instrument version |
| Housing for DIN rail                  | approx. 0.7 kg (1.54 lbs)   |
| separate display and operating module | approx. 0.5 kg (1.10 lbs)   |

## Materials



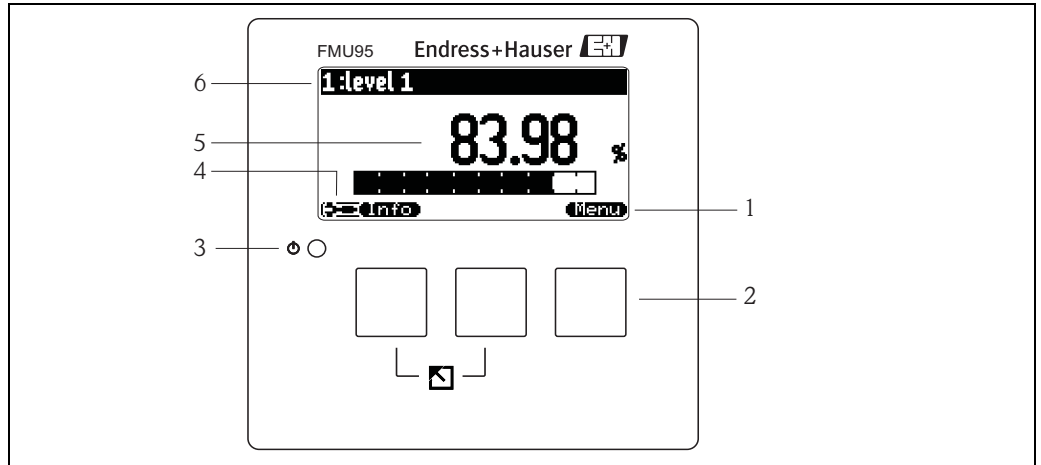
L00-FMU9xxx-16-00-00-xx-000

| Pos. | Part                                  | Material    |
|------|---------------------------------------|-------------|
| 1    | Housing bracket                       | PC-FR       |
| 2    | Field housing                         | PC-FR       |
| 3    | Housing for DIN rail                  | PBT-GF      |
| 4    | Separate display and operating module | PC          |
| 5    | Sealing                               | PUR foam    |
| 6    | Nameplate                             | Polyester   |
| 7    | Screws                                | A4 (1.4578) |



## Human interface

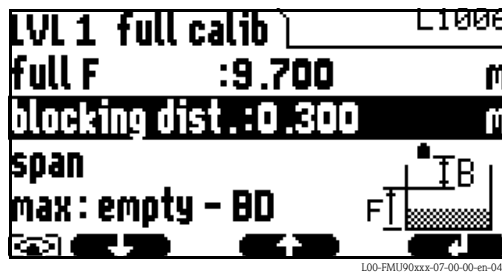
### Display and operating module



L00-FMU95xxxx-07-00-00-xx-001

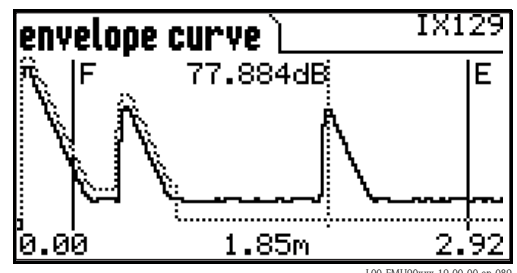
- 1 Softkey symbol
- 2 Key
- 3 LED indicating the operating state
- 4 Display symbols
- 5 Value of the parameter, including unit
- 6 Name of the parameter

### Display (Examples)



L00-FMU90xxxx-07-00-00-en-041

Display of a function including help text and descriptive graphic



L00-FMU190xxxx-19-00-00-en-089

Display of the envelope curve including the mapping. The level echo and the empty distance are marked.

### Keys (softkey operation)

The function of the keys depends on the current position within the operating menu (softkey functionality). The key functions are indicated by softkey symbols in the bottom line of the display.

### LED

The LED (a) indicates the operating state ("normal operation", "alarm" or "warning")

### Display

An illuminated display is available as an option (s. feature 40 of the product structure → 19)

### Operating menu

The Prosonic S has got a dynamical operating menu. Only those functions are visible which are relevant for the instrument version and installation environment at hand.

### Basic setup

The operating menu contains a basic setup for easy commissioning of the connected sensors. The basic setup guides the user through the complete commissioning procedure.

### Locking of the instrument

The instrument can be locked against parameter changes in the following ways:

- Locking switch in the terminal compartment
- Key combination at the operating module
- Input of a locking code via software (e.g. "FieldCare")

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## Certificates and Approvals

---

|  |   |
|--|---|
| <b>CE mark</b>                           | The measuring system meets the legal requirements of the EC-guidelines. Endress+Hauser confirms the instrument passing the required tests by attaching the CE-mark.   |
| <b>Ex approval</b>                       | <p>The available certificates are listed in the ordering information. Note the associated safety instructions (XA) and control or installation drawings (ZD).</p> <p>Warning!</p> <ul style="list-style-type: none"> <li>■ Measuring systems for use in hazardous environments are accompanied by separate "Ex documentation", which is an integral part of this Operating Manual. Strict compliance with the installation instructions and ratings as stated in this supplementary documentation is mandatory. <ul style="list-style-type: none"> <li>– Ensure that all personnel are suitably qualified.</li> <li>– Observe the specifications in the certificate as well as national and local standards and regulations.</li> </ul> </li> <li>■ The transmitter may only be installed in suitable areas.</li> <li>■ Sensors with a certificate for hazardous areas may be connected to a transmitter without a certificate.</li> <li>■ For FM approvals: <ul style="list-style-type: none"> <li>Unauthorized substitution of components may impair the suitability for Division 1 or Division 2.</li> </ul> </li> <li>■ Do not disconnect equipment unless the area is known to be non-hazardous.</li> </ul> <p>Note!</p> <ul style="list-style-type: none"> <li>■ The sensor must be installed and used in a way that eliminates any danger. Possible installation positions: in tanks, vessels, silos, over stockpiles, open channels, weirs or other bins.</li> <li>■ Sensors FDU9x with Ex-approval can be connected to the transmitter FMU95 without Ex-approval.</li> </ul> |
| <b>External standards and guidelines</b> | <p><b>EN 60529</b><br/>Protection class of housing (IP code)</p> <p><b>EN 61326 series</b><br/>EMC product family standard for electrical equipment for measurement, control and laboratory use</p> <p><b>NAMUR</b><br/>User association for automation technology in process industries</p> <p><b>US Standard UL 61010-1</b><br/>CSA General Purpose Units FMU9x-N***** are tested according to US standard UL 61010-1, 2nd edition</p>  |

## Ordering information

### Product structure

|            |                          |   |
|------------|--------------------------|---|
| <b>010</b> | <b>Approval</b>          |   |
|            | R                        | Non-hazarous area   |
|            | J                        | ATEX II 3D  |
|            | N                        | CSA General Purpose   |
| <b>020</b> | <b>Application</b>       |   |
|            | 1                        | Level   |
| <b>030</b> | <b>Housing, material</b> |   |
|            | 1                        | Field mounting PC, IP66 NEMA 4x   |
|            | 2                        | DIN rail mounting PBT, IP20   |
| <b>040</b> | <b>Operation</b>         |   |
|            | C                        | Illuminated display + keypad  |
|            | E                        | Illuminated display + keypad, 96x96, panel mounting, front IP65                         |
|            | K                        | w/o display, via communication  |
| <b>050</b> | <b>Power supply</b>      |   |
|            | A                        | 90-253 VAC  |
|            | B                        | 10.5-32 VDC   |
| <b>060</b> | <b>Level input</b>       |   |
|            | A                        | 5x sensor FDU9x/8x  |
|            | B                        | 10x sensor FDU9x/8x   |
| <b>080</b> | <b>Output</b>            |   |
|            | 3                        | PROFIBUS DP   |
| <b>110</b> | <b>Language (*)</b>      |   |
|            | 1                        | de, en, nl, fr, es, it, pt  |
|            | 2                        | de, en, ru, pl, cs  |
|            | 3                        | en, zh, ja, ko, th, id  |
| <b>120</b> | <b>Additional option</b> |   |
|            | A                        | Basic version   |
|            | L                        | 5-point linearity protocol only to order with FDU9x sensor + 5-point linearity protocol |
| <b>995</b> | <b>Marking</b>           |   |
|            | 1                        | Tagging (TAG)   |
|            | 2                        | Bus address   |
| FMU95 -    |                          | complete product designation  |

(\*): meaning of the language code:

cs: Czech; de: German; en: English; es: Spanish; fr: French; id: Bahasa (Indonesia, Malaysia); it: Italian; ja: Japanese; ko: korean; nl: Dutch; pl: Polish; pt: Portuguese; ru: Russian; th: Thai; zh: Chinese

### Scope of delivery

- Instrument according to the version ordered
- Operating program: FieldCare
- Operating Instructions (depending on communication version (→ 23, "Documentation"))
- for certified instrument versions: Safety Instructions (XAs) or Control Drawings (ZDs) → 23, "Documentation"

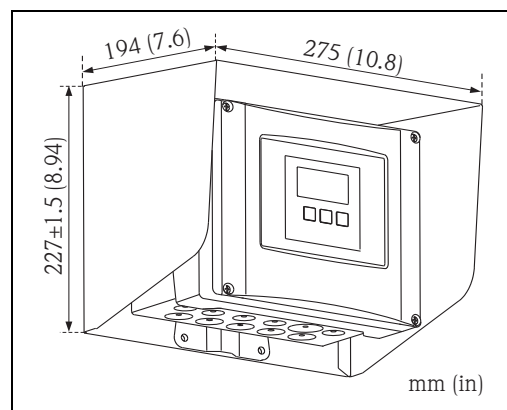
## Accessories

### Commubox FXA291

The Commubox FXA291 connects Endress+Hauser field instruments via service interface to the USB interface of a personal computer or a notebook. For details refer to TI00405C/07/EN.

### Protection cover for the field housing

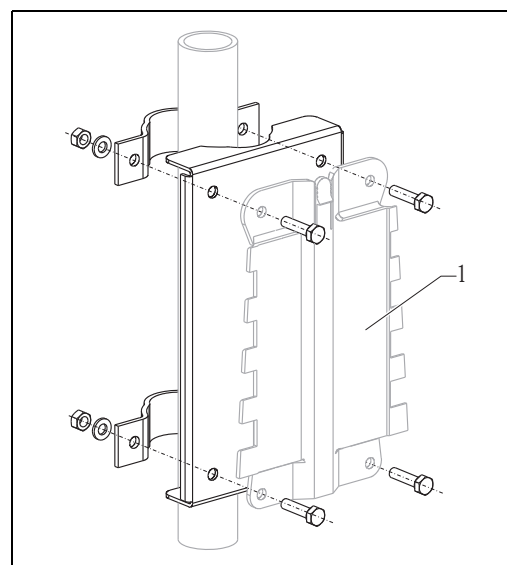
- Material: 316Ti (1.4571)
- is mounted by the mounting help of the Prosonic S
- Order-Code: 52024477



L00-FMU90xxx-06-00-00-xx-003

### Mounting plate for the field housing

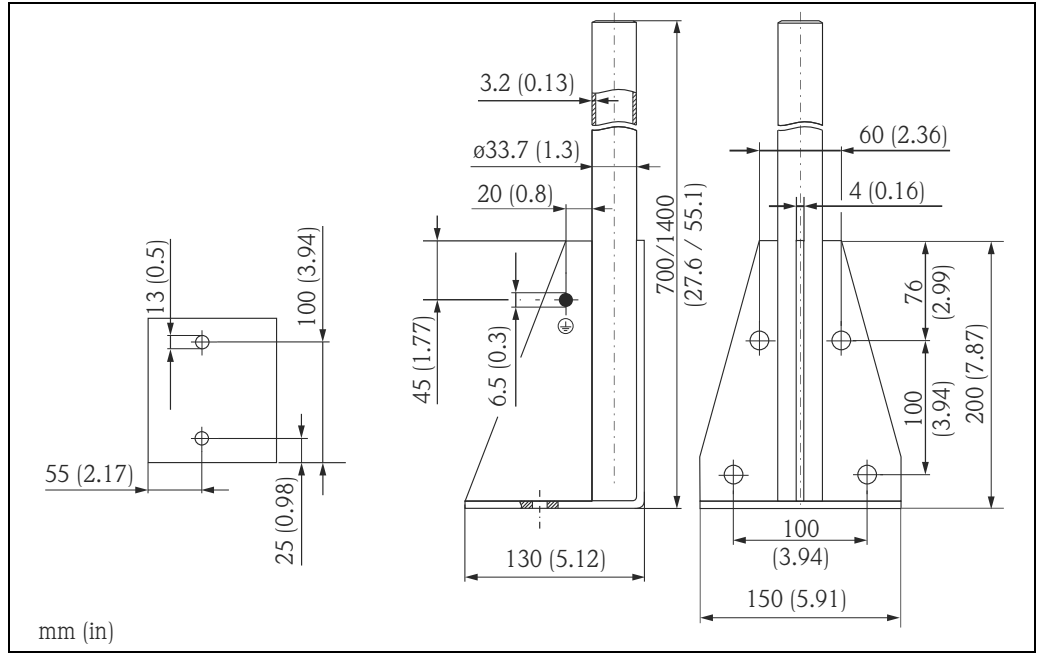
- suited for the mounting help of the Prosonic S
- for 1" - 2" tubes
- Dimensions: 210 mm x 110 mm (8.27 x 4.33 in)
- Material: 316Ti (1.4571)
- fixing clips, screws and nuts are supplied
- Order code: 52024478



L00-FMU90xxx-00-00-00-xx-001

1 Mounting help of the field housing

**Mounting bracket**



| Height      | Material       | Weight             | Order Code  |
|-------------|----------------|--------------------|-------------|
| 700 (27.6)  | galv. steel    | 3.2 kg (7.06 lbs)  | 919791-0000 |
| 700 (27.6)  | 316Ti (1.4571) |                    | 919791-0001 |
| 1400 (55.1) | galv. steel    | 4.9 kg (10,08 lbs) | 919791-0002 |
| 1400 (55.1) | 316Ti (1.4571) |                    | 919791-0003 |

mm (in)

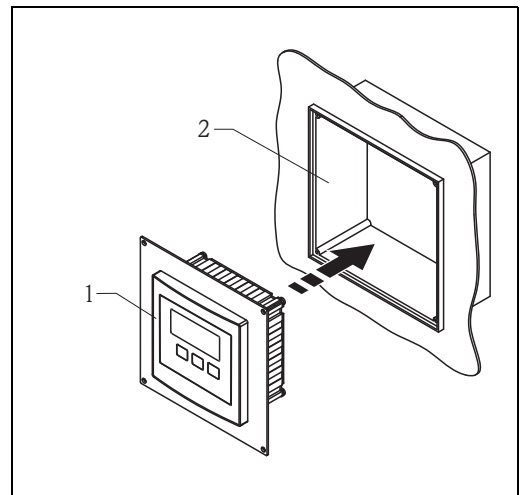
**Adaption plate for remote display**

Used to mount the remote display into the opening (138 x 138 mm (5.43 x 5.43 in)) of the remote display module of the Prosonic FMU860/861/862 (Display size: 144 x 144 mm (5.67 x 5.67 in)).

Order-Code: 52027441

**Note!**

The adapter plate will be mounted directly in the old remote display of the FMU86x series. The housing of the remote display of FMU860/861/862 is the holder for the adapter plate and the new remote display of the FMU90/95 in the format 96 x 96 mm (3.78 x 3.78 in).



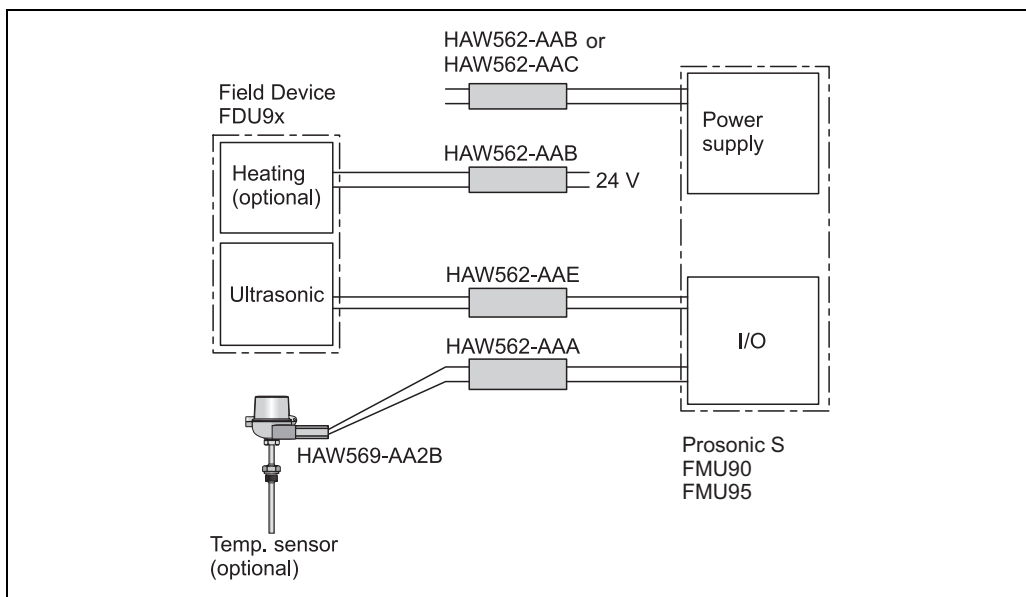
1 Remote display of the Prosonic S with adaption plate  
2 Opening of the remote display FMU860/861/862

**Option:**

- Adaption plate 160 x 160 mm (6.3 x 6.3 in), thickness 3 mm (0.12 in), aluminum, opening 92 x 92 mm (3.62 x 3.62 in) for remote display of the FMU90 (size of the display: 96 x 96 mm (3.78 x 3.78 in)).
- Can be used to replace the FMU86x remote display or DMU2160/2260.
- Order Code: TSPFU 0390
- Please contact your Endress+Hauser representative.

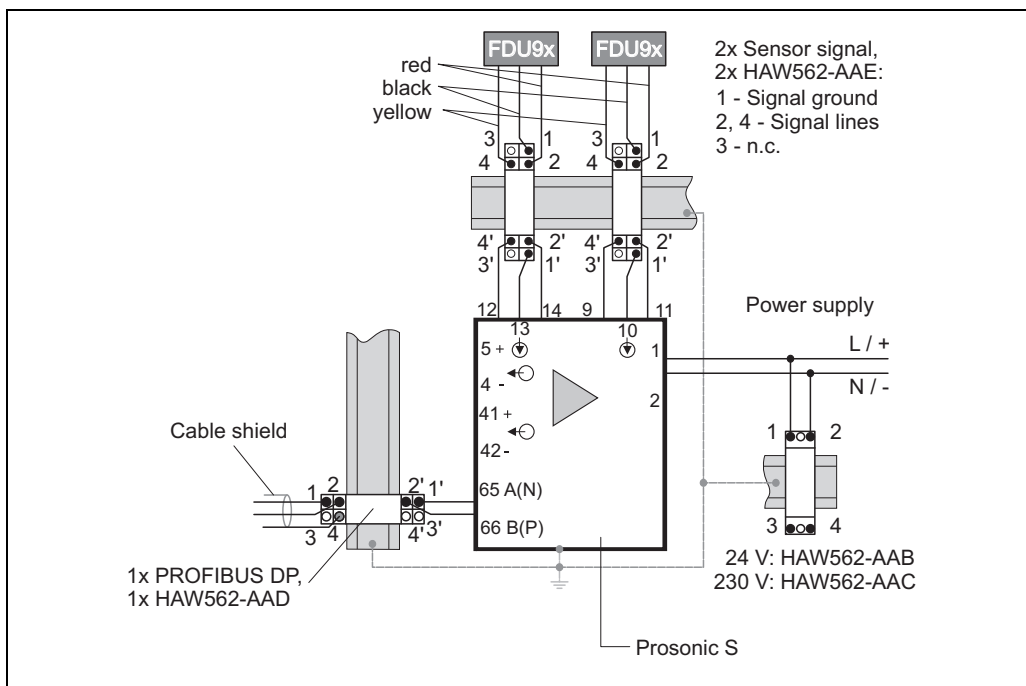
Overvoltage protection  
HAW562

System principle



L00-FMU9x-15-00-00-es-001

Application examples



C09-HAW562xx-04-10-01-es-004

Level measurement with 2 Prosonic FDU9x level sensors and version PROFIBUS DP

**Ordering information**

Surge Arrester HAW562, compact device for DINrail installation in signal and power supply lines and communication lines protecting field devices and systems against overvoltage and magnetic induction.

| Approval                        |   |
|---------------------------------|---|
| AA                              | Non-hazardous area                      |
| 8D                              | ATEX II 2 (1)G Ex ia IIC T6             |
| Application                     |   |
| A                               | Measuring signal 0/4-20 mA, PFM, PA, FF |
| B                               | Supply voltage 10-55 V (+/-20%)         |
| C                               | Supply voltage 90-230 V (+/-10%)        |
| D                               | Communication RS485/MOD-Bus/PROFIBUS DP |
| E                               | Protection module Prosonic FMU90        |
| + Additional selection (option) |   |
|                                 |   |
| Additional approvals            |   |
| LA                              | SIL                                     |
| Accessory enclosed              |   |
| PA                              | Screen grounding terminal               |
| PB                              | Field housing                           |
| PC                              | Mounting bracket, wall/pipe             |
| Marking                         |   |
| Z1                              | Tagging (TAG), metal                    |
| Z3                              | Commissioning label, paper              |
| Z6                              | Tagging (TAG), by customer              |
| HAW562 -                        | + complete product designation          |

For details see Technical Informations TI01012K und TI01013K and the Operating Instruction BA00306K.

**Documentation**

|                               |  |
|-------------------------------|--|
| <b>Technical Information</b>  | <b>TI00396F</b><br>Technical Information for the ultrasonic sensors FDU90/FDU91/FDU91F/FDU92/FDU93/FDU95/FDU96   |
| <b>Operating Instructions</b> | <b>BA00344F</b><br>Operating Instructions for Prosonic S FMU95<br>This document describes the installation and commissioning of the Prosonic S. It contains those functions from the operating menu which are required fo a standard measuring task. Additional functions are contained in the "Description of Instrument Funcitons", BA00345F.<br><br><b>BA00345F</b><br>Description of Instrument Functions for Prosonc S FMU95<br><br><b>BA00346F</b><br>Slot-Index tables for the PROFIBS-DP interface of Prosonic S FMU95 |
| <b>Safety Instructions</b>    | <b>XA00326F</b><br>Safety Instructions for ATEX II 3D  |

