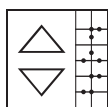
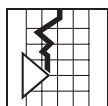
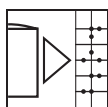
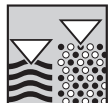


# Ultrasonic Measurement

## *Prosonic FMU 860 to 862*

**Level and flow measurements with ultrasonics**  
**Simple to start up, easy to use, flexible**  
**Field mounted ultrasonic transmitters**



### Applications

Prosonic FMU 860, 861 and 862 ultrasonic transmitters are for use with the Prosonic FDU 80 to 86 family of sensors.

The transmitter determines levels in silos and tanks and calculates the volume of solids and liquids they contain.

With the Prosonic transmitter, sensors can be operated which are mounted in explosion hazardous areas according to FM, CSA or ATEX.

When used for applications in fresh and wastewater, the Prosonic measures:

- flow rates in flumes and weirs
- water levels
- differential level/screen control
- wet well level/pump sequencing

The Prosonic transmitter is also used in applications for:

- storage tank level
- process vessel level
- solids hopper level
- solids silo level

### Features and benefits

A universal transmitter that covers a wide range of measurement and control applications with sensors to provide liquid and solids level measurement from two inches to over 230 feet.

Choice of transmitters

- designed for field or control room
- single or two-channel versions with three to five relays and optional totalizer
- optional HART® interface for remote configuration
- optional PROFIBUS-DP and RS 485 interface

Intelligent commissioning, enhanced reliability, enhanced safety, plus simple to install and program.

- instrument parameters arranged in a simple matrix
- various linearization functions, totalizers, and all common Q/h curves included in the software
- quick commissioning and stable measurement due to signal pattern recognition by fuzzy logic and the application parameter

# Endress+Hauser

The Power of Know How



## Measuring system

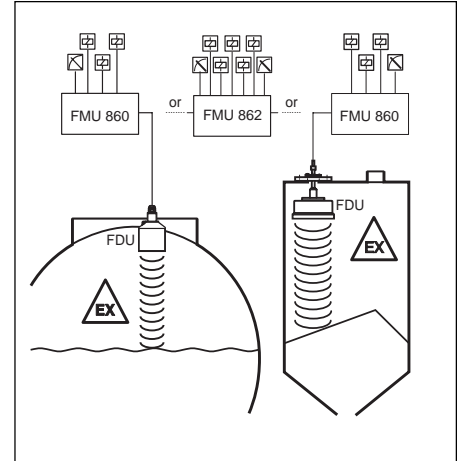
### Measuring system

The measuring system consists of the Prosonic transmitter with a Prosonic sensor chosen according to the required application. The two-channel version is for differential measurement or for controlling two measuring points. The certified sensor ensures that the measuring system can be used in explosion hazardous areas.

Other units can be connected to the Prosonic transmitter for special applications:

- separate temperature sensor, e.g. if the ultrasonic sensor is heated
- separate external limit detector.

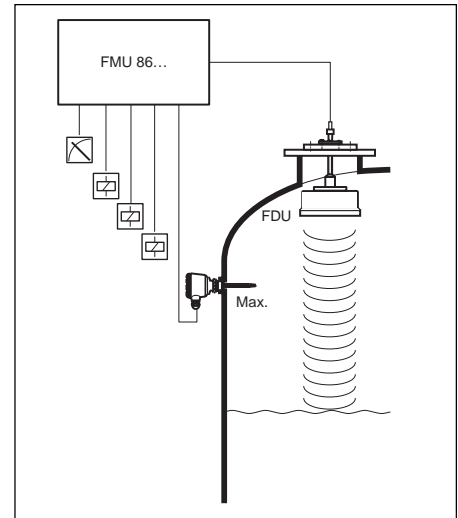
The Prosonic transmitter can be integrated into automation systems using the RS 485 or PROFIBUS-DP interface.



### Overspill protection

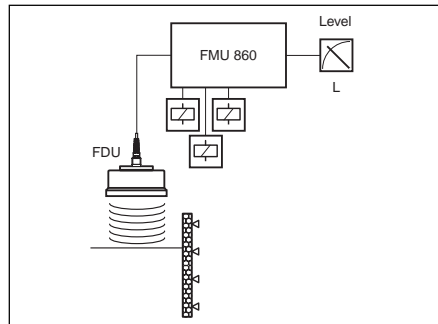
Double protection against overflow:

- all Prosonic transmitters have an additional connection for an external limit detector
- even when the level moves within the blocking distance of the sensor, this error is indicated promptly on the display, the signal output and relays.

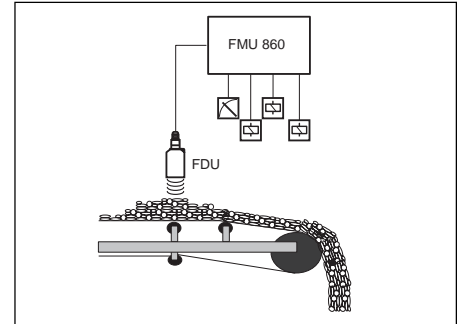


## Applications

### Prosonic FMU 860



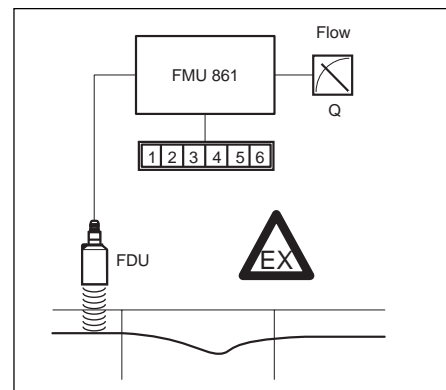
- continuous level and volumetric measurement of liquids and solids in tanks and silos
- pump control in up to 5 steps
- alternating pump control
- adjustable switch delay



- conveyor belts, rapid changes in load height are easily dealt with by the Prosonic FMU 860

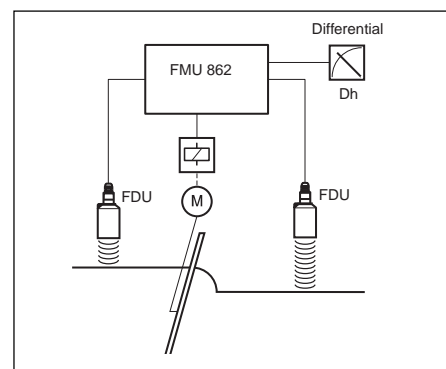
**Prosonic FMU 861**

- Flow rate measurement in flumes or weirs
- millimeter accuracy for the flow level
- the linearization curves of all common standard flumes and weirs are preset and can be called up as required
- for the NEMA 4X (IP 66) housing, the summation of liquid flowing through is displayed by the totalizer
- low-flow cut-off
- separate display of floodwater on external counters
- sample control using a quantity or time function

**Prosonic FMU 862**

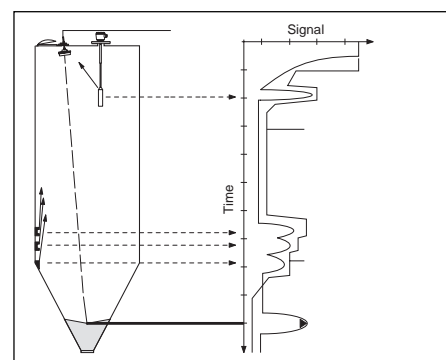
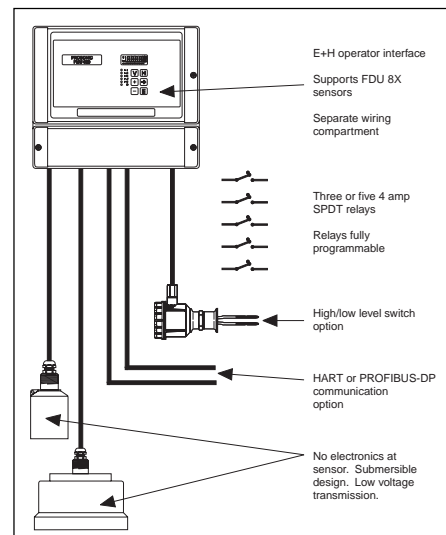
Two channel version

- Flow or level measurement in channel 1, level measurement in channel 2
- differential and average value measurement (FMU 862 for distance measurement with two sensors)
- controlling the screen cleaning process as a function of clogging
- superimposed interval time
- trend indication
- back water alarm (back water in weirs is detected, signalled and the flow rate automatically adjusted)

**System operation**

Prosonic brings many reliable level measurement and operating capabilities closer to the user. A new generation of ultrasonic sensors provides high sensitivity, rugged construction, and resistance to corrosive coatings. A fuzzy logic implementation manager in the transmitter smoothly combines many sophisticated signal processing techniques through the Endress+Hauser operator interface. The user can set up a Prosonic application by entering a few parameters describing individual measurement needs. As conditions change, Prosonic adapts to provide reliable level information. Prosonic also provides HART® or PROFIBUS-DP communication allowing an operator to remotely interface with the measurement system anywhere on its 4 to 20 mA loop with a handheld communicator or laptop computer.

Tank mapping is a patented technique that digitizes and eliminates unwanted echoes from fixed reflective surfaces inside a silo or vessel. As the material level moves up or down past the source of unwanted echoes, the true level echo is tracked rather than the unwanted echoes.



## Operation and signal processing

### Principle of operation

An ultrasonic pulse emitted from the sensor is reflected back by the surface of the material or liquid and is received by the same sensor as an echo signal. The product height or water level is then calculated from the run time of the ultrasonic signal (echo level determination).

### Simple start-up

The time required for start-up is minimized by using preset operating parameter values. Selecting just one parameter automatically sets the measuring line to one of five typical applications:

- liquid
- vessels with rapid changes of liquid
- fine-grained bulk solids
- coarse-grained bulk solids
- conveyor belts

### Intelligent software with fuzzy logic elements

The Prosonic transmitter is based on state-of-the-art evaluation methods including fuzzy logic elements for intelligent echo analysis. No other special procedures are required as this method enables the true level echo to be clearly distinguished from:

- sporadic reflections (e.g. from agitator blades)
- interference echoes and noise (e.g. from filling)
- multiple reflections (e.g. with closed tanks)

Even with almost unfavorable mounting points, the advantages of continuous, non-contact ultrasonic measurement can be used by activating a special fixed target suppression mode or filtering factor (tank mapping).

### Complete functionality

#### For level measurement

The characteristic curve is already programmed for volumetric measurement in a horizontal cylindrical tank. The linearization curve of any vessel can be easily entered (maximum of 32 points).

The Prosonic FMU 862 also has the following mode:

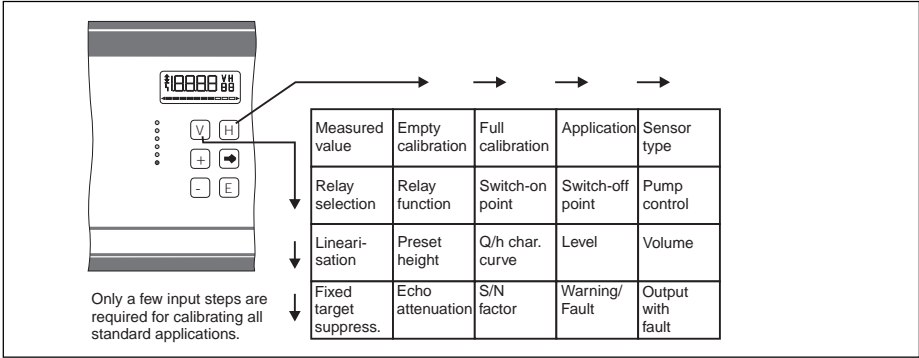
- Differential measurement: Value 1 - Value 2
- Average value measurement: Value 1 + Value 2 / 2

#### For flow measurement

All common Q/h characteristic curves for measuring flow rates with flumes and weirs are stored in the Prosonic. Other Q/h curves can be entered (up to maximum of 32 points). Three different programmable counting pulses for totalizing can be sent to the relay outputs for controlling external counters. The transmitter itself has a resettable software counter; a non-resettable totalizer is available as an option.

## On-site operation

### Front cover keys and display

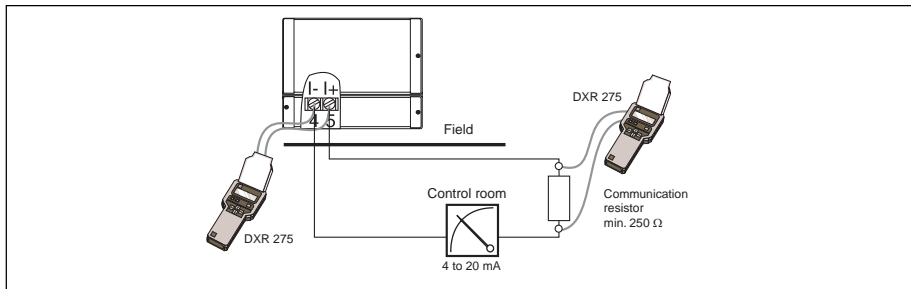


The keypad on the front panel is used to configure the transmitter and call up parameters, which are shown on a 4-1/2 character display.

The input dialogue is based on the standard Endress+Hauser operating matrix in which every input field is quickly and easily selected using the "V" (vertical) and "H" (horizontal) keys. Parameters are simply entered using the three keys (-, +, →) and are registered and stored once the "E" key has been pressed.

## HART® communication protocol

### DXR 275 handheld terminal



#### Operation

For devices with HART® interface, all values can be entered using a handheld terminal (DXR 275). The user has comprehensive and detailed information on inputs both on-site and in the control room. The measurement remains totally unaffected during the interactive input.

#### Electrical connection

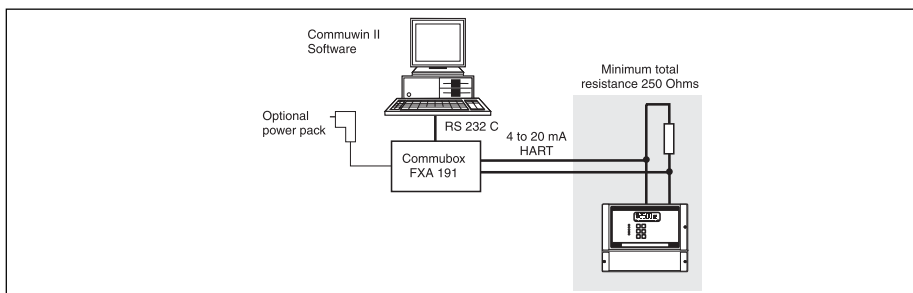
The handheld terminal is connected either

- directly to current output 1 of the transmitter, or
- to a communications resistor

In general, the handheld terminal can be connected anywhere in the signal circuit as long as there is a resistance between its terminals which is larger than the minimum communications resistor (250 Ω).

Shielded cable is recommended, maximum capacitance 100 nF.

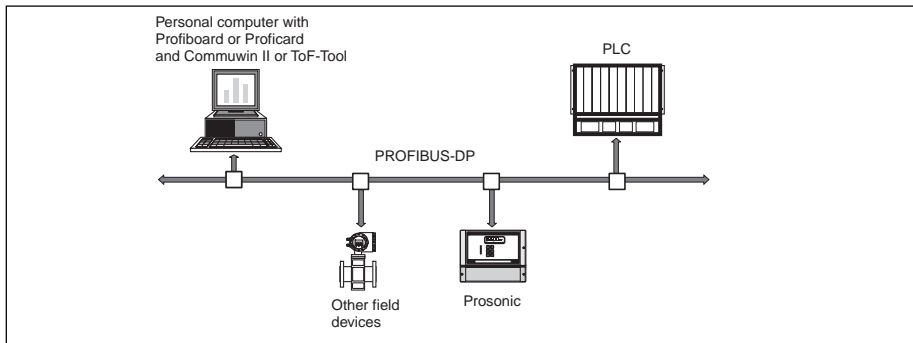
### Operation via Commuwin II software



The Commubox FXA 191 connects HART® transmitters to the RS 232 C serial interface of a personal computer. This enables the transmitter to be remotely operated with the Endress+Hauser Commuwin II operating program.

## PROFIBUS-DP interface

### System integration



The Prosonic version with PROFIBUS-DP interface can be integrated as a slave into a PROFIBUS-DP segment. In order to connect a personal computer to the bus, PROFIBOARD or PROFICARD can be used.

The following operation programs are available:

- Commuwin II
- ToF Tool (limited functionality)

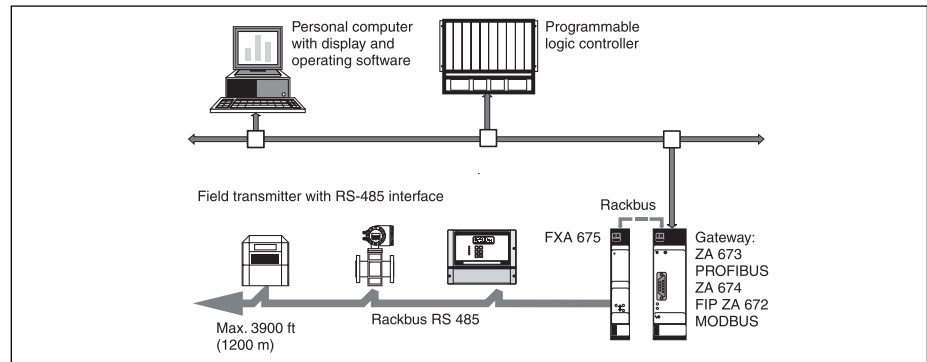
## RS-485 interface

### Connecting a PC

Instruments with RS-485 interface can be connected to a Personal Computer in one of the following ways:

- RS 485 card for PC (for the Fieldmanager and Commugraph programs)
- Adapter RS 232 C/ RS 485 (for the Fieldmanager and Commugraph programs)
- Commubox FXA 192 (for the graphical program Commuwin II)
- FXA 675 with a Gateway ZA 67x with serial interface

### Connecting to process control systems



The Prosonic FMU 86x can be easily linked to existing process control systems via the RS-485 interface.

The FXA 675 interface card (or the Monorack II RS-485) connects two individual Rackbus RS-485 networks with up to 25 transmitters via the Rackbus. A second card (Gateway) serves as the bus connection for standard networks such as PROFIBUS, FIP or MODBUS.

The Prosonic P level measurement system also enables a number of widely distributed ultrasonic measuring points to be controlled by a personal computer.

### Operating programs

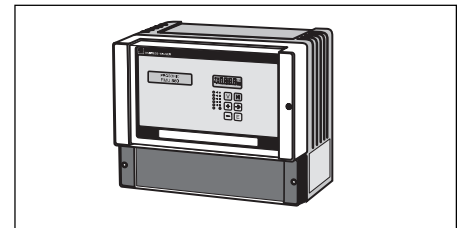
- Operating program "Fieldmanager" (MS-DOS)
- Visualization program "Commugraph" (MS-DOS)
- Graphical operating program "Commuwin II" (Windows 3.1, 95, 98, NT, ME and XP)

## Housing versions

### Field housing

The field housing version houses the electronics in a NEMA 4X (IP 66) housing. The transmitter is operated with a key board and display or by using an additional serial interface, with a handheld terminal.

An external totalizer can also be connected to the FMU 861 version.

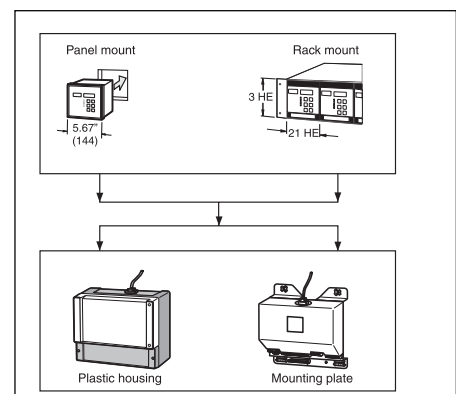


### Separate transmitter electronics (control room operation)

With this version, the operating unit is separated from the transmitter electronics. The operating unit is available for mounting in a control panel 5.67" x 5.67" (144 mm x 144 mm) or for mounting in an assembly rack (21 HP). The transmitter electronics are mounted in a separate housing or on a mounting plate in the control cabinet.

#### NOTE:

The versions with separate electronics are NOT available with digital interfaces RS-485 or PROFIBUS-DP.

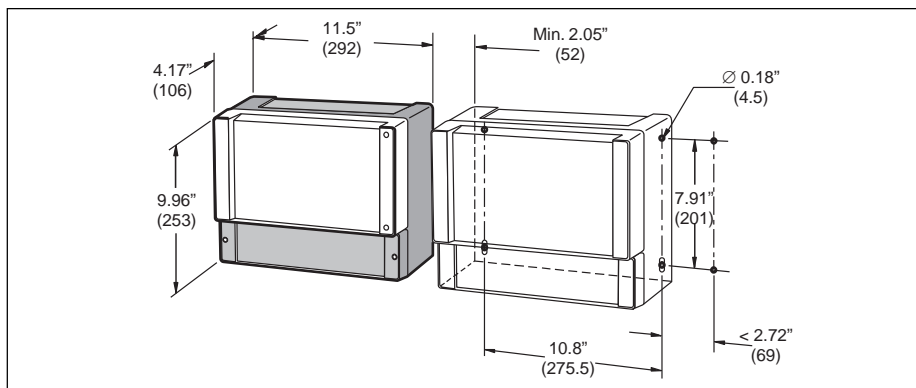


### Hazardous areas

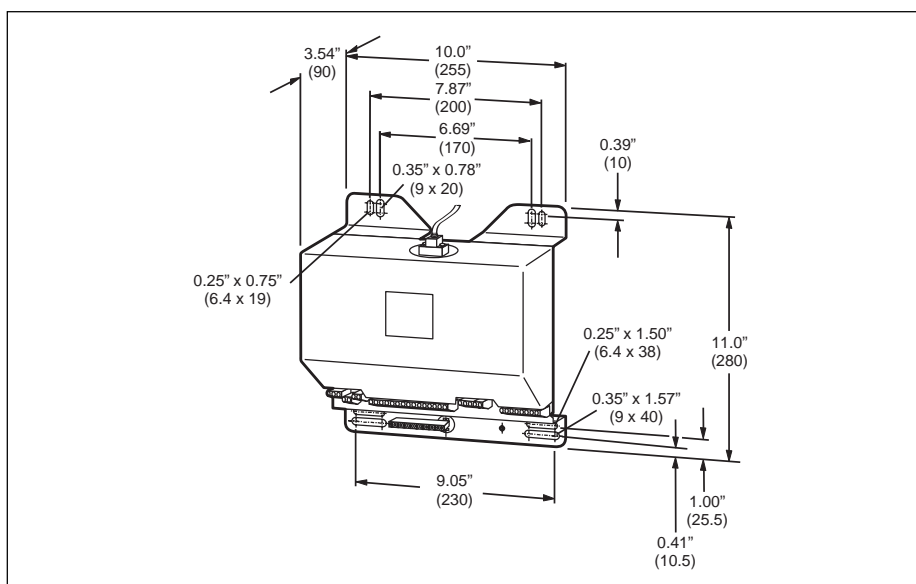
For certified systems, only the sensor can be installed in the hazardous area. The transmitter must always be installed in a safe area.

## Dimensions and mounting details

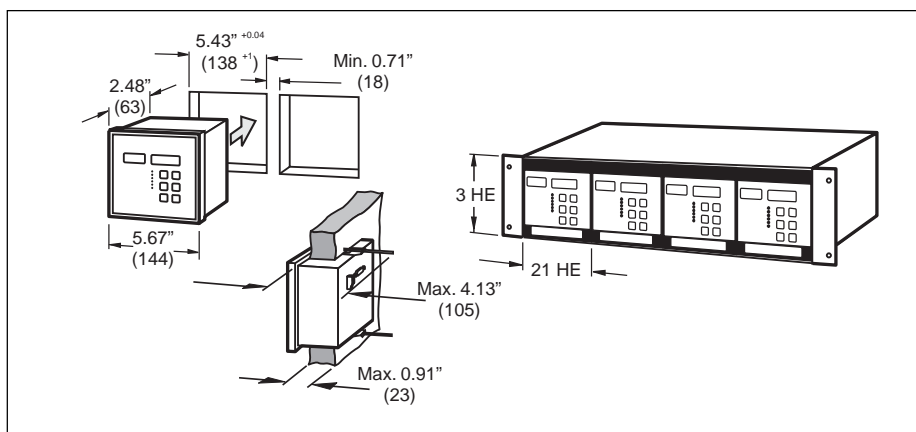
### NEMA 4X housing and separate electronics housing



### Mounting plate

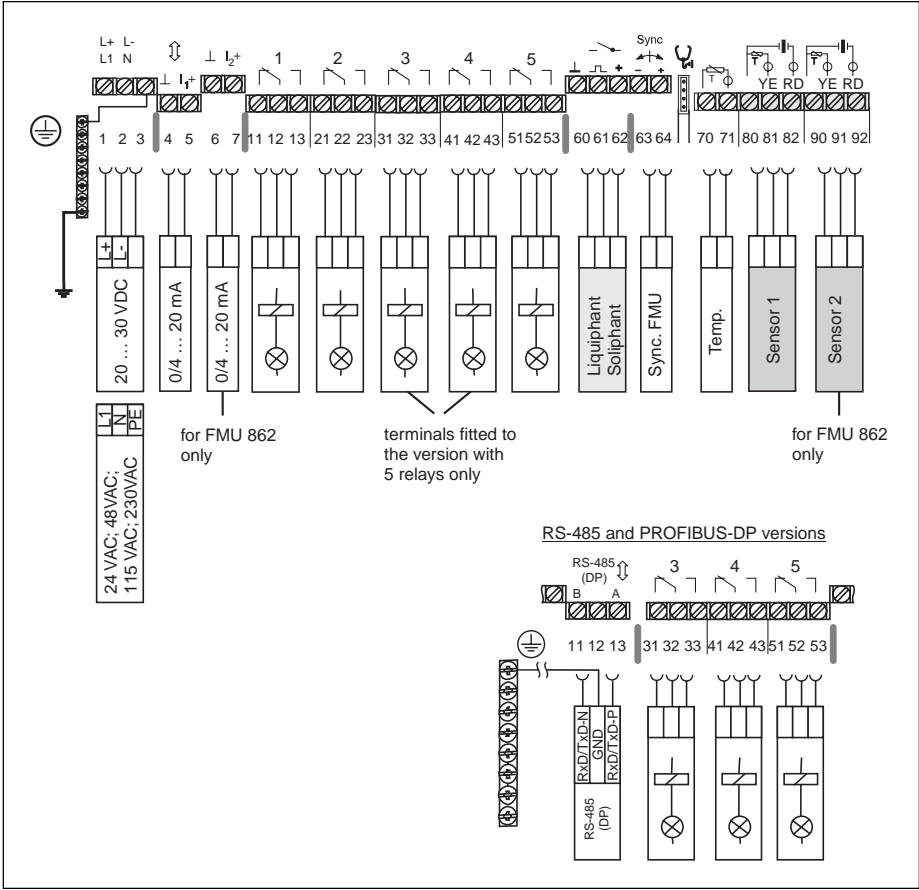


### Seperate operating unit



Electrical connection

Wiring terminals



The terminal strip for cable diameters up to 16 AWG is in a separate connection chamber. The cable entries are prestamped for easy removal. Bottom of the enclosure has 5 x Pg 16 and 4 x Pg 13.5. The rear of the enclosure has 5 x Pg 16. Electrically isolated areas are designated by the thick lines in the figure above.

Sensor cable

Connection is with the cable supplied or by using an extension via a terminal box with commercial two-wire shielded cabling (available from Endress+Hauser). Maximum values: up to 6 Ω per wire, maximum 60 nF.

Wire gage	20 AWG	18 AWG	17 AWG
Max. length	490 ft	820 ft	980 ft

Electrical isolation

Current output, relay outputs, power connection and sensor input are all electrically isolated from each other. With the FMU 862 version, the two current outputs are electrically connected to each other as are the two sensor inputs.

Power supply

The FMU 86x is available in the following power supply voltages:

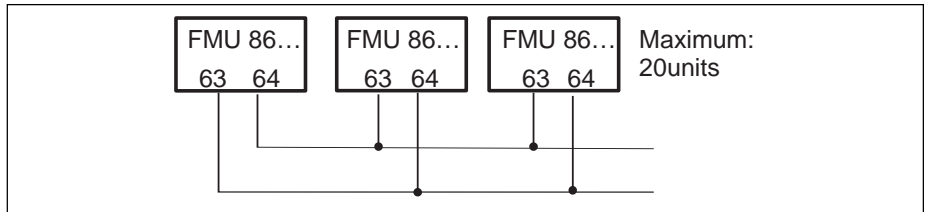
- 180 to 253 VAC, +10% / -15%, 50/60 Hz
- 90 to 132 VAC, +10% / -15%, 50/60 Hz
- 38 to 55 VAC, +10% / -15%, 50/60 Hz
- 19 to 28 VAC, +10% / -15%, 50/60 Hz

Power consumption: maximum 15 VA  
Current consumption: maximum 65 mA at 230 VAC  
20 to 30 VDC (residual ripple within tolerance), integrated reverse polarity protection  
Power consumption: maximum 12 W (typically 8 W), maximum 500 mA at 24 VDC.

## Synchronization line

In order to avoid cross-talk between parallel routed sensor lines, connect the transmitters (maximum 20) to a synchronization line. The sensors are then scanned in sequence. If more devices are present, groups of 20 transmitters should be used.

The cables within one group can be in parallel. The cables of different groups must be separated. Common shielded cable can be used.



## Technical data

### General information

Ultrasonic transmitter, Prosonic FMU 860, 861, and 862 for non-contact continuous level measurement in liquids or solids. Used for determining flowrates in open channels and weirs, water levels or for controlling screens and pumps.

### Function

Measuring principle: ultrasonic echo, time-of-flight measurement

- FMU 860: one signal input for level measurement
- FMU 861: one signal input for flow measurement
- FMU 862: two signal inputs for differential level measurement

### System design, transmitter

- NEMA 4X (IP 66) field housing, post or wall mounted
- Separate operating unit (keyboard and display) for control room mounting (panel or rack), 10 ft (3 m) cable included
- NEMA 3 (IP 40) plastic housing with electronics for connection to separate operating unit
- NEMA 1 (IP 10) mounting plate for connecting a separate operating unit

## Input

### Measured variable

Time of flight measurement of the ultrasonic pulse using FDU series ultrasonic sensors

### Measuring range

6 to 230 feet (2 to 70 m), depending on ultrasonic sensor selected (refer to TI 189F)

### Measuring sensors

FDU 80, 80F, 81, 81F, 82, 83, 84, 85, 86

### Separate switch input

External passive limit switch (NO or NC relay contact) or PNP switch, 24 V, maximum short circuit current 20 mA

### Separate temperature sensor

To compensate for temperature errors on time of flight in open channels, NTC version

## Analog output

<b>Output signal</b>	<ul style="list-style-type: none"> <li>4 to 20 mA, switchable to 0 to 20 mA (can be inverted), superimposed digital communications signal HART®</li> <li>FMU 862: same values for second signal output, simultaneous switchover of channel 1 to 0 to 20 mA</li> <li>With plug-in module and also serial interface</li> <li>4 mA level for coupling</li> </ul>
<b>Output on error</b>	<ul style="list-style-type: none"> <li>0 to 20 mA: -10% (-2 mA), +110% (22 mA), HOLD (last current value is held)</li> <li>4 to 20 mA: -10% (2.4 mA), +110% (21.6 mA), HOLD (last current value is held)</li> </ul>
<b>Current limit</b>	<ul style="list-style-type: none"> <li>24 mA</li> </ul>
<b>Integration time</b>	0 to 300 seconds
<b>Load</b>	Maximum 600 $\Omega$
<b>Effect of load</b>	Negligible

## Relay output

<b>Relays</b>	Three or five SPDT independent relays (4 A at 250 VAC) each with one potential free change over contact
<b>Functions</b>	Limit value, alarm relay, trend Time pulses (FMU 861 and 862 only), maximum counting frequency 2 Hz, pulse width 200 ms Time pulses (FMU 861 only) Back-up (FMU 862 only)
<b>Switching power</b>	AC: 4 A, 250 V, 1000 VA at $\cos \varphi = 0.7$ DC: 4 A, 35 V and 100 W

## Accuracy

<b>Measured error</b>	Measured error is the sum of linearity, hysteresis and reproducibility and is typically 0.2% for maximum measured span with a smooth material surface
<b>Maximum resolution</b>	0.04" (1 mm) for FDU 80 sensor
<b>Effect of load</b>	Negligible within permissible range

## Ambient conditions

<b>Ambient temperature</b>	-4° to +140°F (-20 to +60°C)
<b>Storage temperature</b>	-40° to +176°F (-40° to +80°C)
<b>Shock resistance</b>	2 g (10 to 55 Hz) and 15 g for 11 ms (DIN 40040, Type W)
<b>Climatic class</b>	DIN 40040 Type R, relative air humidity 95% in yearly average, condensation is permissible
<b>Ingress protection</b>	DIN 40050: <ul style="list-style-type: none"> <li>Field housing, NEMA 4X (IP 66) with closed housing and cable entry of identical protection</li> <li>Plastic electronics housing, NEMA 3 (IP 40) with cable entry of identical protection</li> <li>Mounting plate in cabinet, NEMA 1 (IP 10)</li> <li>Separate operating unit in control cabinet, NEMA 3 (IP 40)</li> </ul>

**Electromagnetic compatibility (EMC)**

AC power supply:

- Interference emission to EN 61326, electrical equipment Class B
- Interference immunity to EN 61326, Annex A (Industrial)

DC power supply:

- Interference emission to EN 61326, electrical equipment Class A
- Interference immunity to EN 61326, Annex A (Industrial)

PROFIBUS-DP instruments

- Interference emission to EN 61326, electrical equipment Class A
- Interference immunity to EN 61326

**Materials and weight**

Field housing body, PC/ABS with PC transparent cover, includes front plate with tag area.

Weight: 5 lbs (2.6 kg)

Plastic electronics housing, PC/ABS

Weight: 2 lbs (1 kg)

Mounting plate, Al/PS

Weight: 1.7 lbs (0.8 kg)

Separate operating unit, PC/ ABS

Weight: 0.7 lbs (0.3 kg)

**Display and operating interface****Display**

LCD, 4-1/2 character display, optional lighting

Segment display of current in 10% increments

Display elements: error, signal overflow or underflow, communication

**LEDs**

One yellow LED each for indicating the switching status of a relay (ON = relay energized)

One yellow LED error indicator (ON = error free operation)

One green LED indicates error free indication (ON = error free operation, flashing = warning)

**Counter**

Six- character non-resettable; FMU 861 standard only, FMU 862 optional

Software counter; FMU 861 standard only, FMU 862 optional

**Communication interface****HART®**

On-site operation via HART® handheld DXR 275

Connection to PC via Commubox FXA 191

Remote operation via Commuwin II software

**RS 485**

Via interface card FXA 675 connection to Rackbus-RS 485 network, operation via Fieldmanager, visualization via Commugraph

Via Commubox FXA 192 connection to serial interface RS 232C or a PC, operation via Commuwin II software

**PROFIBUS-DP**

Profile version 3.0

Supported Baudrates: 19.2 kBaud, 45.45 kBaud, 93.75 kBaud, 187.5 kBaud, 500 kBaud, and 1.5 MBaud

Via PROFIBOARD or PROFICARD connection to PC

Operation via Commuwin II or ToF Tool

**Synchronizing connection**

Parallel link for up to 20 instruments if several sensor cables are laid together over long distances.

Power supply

Input power	<ul style="list-style-type: none"><li>• 180 to 253 VAC, 90 to 132 VAC, 38 to 55 VAC, or 19 to 28 VAC (all 50/60 Hz)</li><li>• 20 to 30 VDC (residual ripple within tolerances)</li></ul> DC power consumption, max. 12 W (typical 8 W), max. 500 mA at 24 VDC
Ripple with Smart transmitters	HART® max. ripple (measured to 500 Ω) 47 to 125 Hz, $U_{ss} = 200\text{ mV}$ Maximum noise (measured to 500 Ω) 500 Hz to 10kHz, $U_{eff} = 2.2\text{ mV}$
Reliable galvanic isolation	Between current output, relay outputs, interfaces, power supply and sensor inputs
Power supply cable	Common two-wire shielded cable. Max. 6 Ω per wire, max. 60 nF

Certificates and approvals

Ignition protection	CSA general purpose
CE mark	By attaching the CE Mark, Endress+Hauser confirms that the instrument fulfills all the requirements of the relevant EC directives
Supplemental documentation	Prosonic ultrasonic sensors, FDU 80 to FDU 86 - Technical Information TI 189F Operation instructions, FMU 860 to 862 - BA 100F

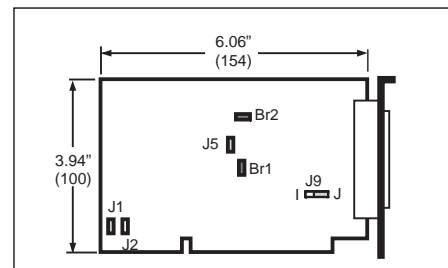
Accessories

Field housing accessories	<p>All-weather cover</p> <ul style="list-style-type: none"><li>• Aluminum, blue lacquered Order No: 919567-0000</li><li>• 304 SS Order No: 919567-0001</li><li>• Weight, approximately 2 lbs (1 kg)</li><li>• Mounting screws supplied</li></ul> <p>Post mounting</p> <ul style="list-style-type: none"><li>• Galvanized steel 2" post, Order No: 919566-0000 1" post, Order No: 919566-1000</li><li>• 304 SS 2" post, Order No: 919566-0001 1" post, Order No: 919566-1001</li><li>• Weight, approximately 2 lbs (1 kg)</li><li>• Mounting screws and nuts supplied</li></ul>	
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Converter: RS 232C/RS 485 interface	<ul style="list-style-type: none"><li>• 230 VAC, Order No: 016398-0000</li><li>• 115 VAC, Order No: 016398-0050</li><li>• Connector for PC, 25 pin Min-D plug</li><li>• For bus, 9-pin Min-D plug, plug supplied with screw terminals</li><li>• Baud rate: 19,200 Bits/s</li><li>• RS 485 output electrically isolated</li><li>• Power supply, 15 VDC (for 230V or 115 V)</li><li>• RS 232C interface, can be configured as DCE/DTE</li></ul>	
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**RS 485 PC interface card**

- Order No: 016399-0000
- Connector, 25-pin Min-D plug, supplied with screw terminals
- Baud rate, 19,200 Bits/s
- Configuration, supplied configured to COM 3, address 3E8H, with protective ground at Pin 1 or connector, Slot; 8 or 16 bit
- RS 485 output electrically isolated

**DXR 275 HART® communicator**

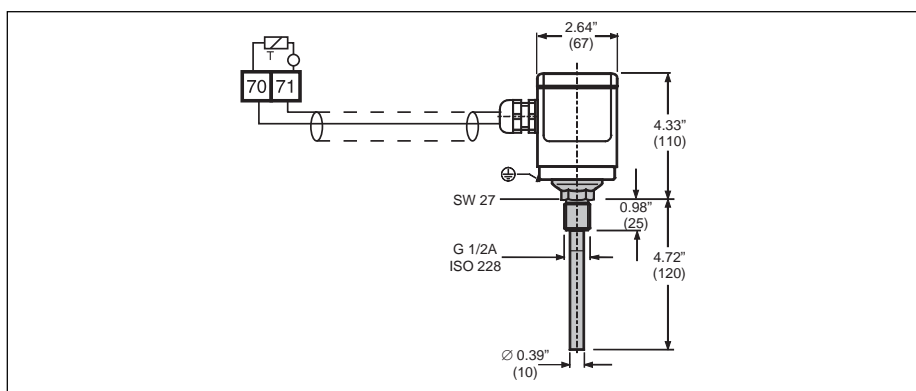
Handheld for instruments with HART® interface (refer to operating instructions 139F/00/en)

**PROFIBUS-DP PC interface**

- PROFICARD (PCMCIA card)  
Order No: 016570-5200
- PROFIBOARD (PCI-Board)  
Order No: 52005721

**Temperature sensor**

An external temperature sensor can be connected in applications where the FDU sensor requires heating.

**Spare sensor cable**

- Connection from the Prosonic transmitter to the sensors:
- FDU 80, 80F, 81, 81F, and 82: Order No. 938278-0120
  - FDU 83, 84, and 85: Order No. 938278-1021
  - FDU 86: Order No. 52000261

**Overvoltage protection**

- Overvoltage protection unit for power supply, for field housing (NEMA 4X):
- Order No. 215095-0001

**Power supply for sensor heating with overvoltage protection**

- Power supply unit (24 VDC) for sensor heating of up to 2 sensors with integrated overvoltage protection for power supply (for NEMA 4X field housing):
- Order No. 215095-0000
  - Power supply, 230 VAC (+15%/-20%)

**Power supply for sensor heating without overvoltage protection**

- Power supply unit (24 VDC) for sensor heating of up to 2 sensors (for NEMA 4X field housing):
- Order No. 215095-0002
  - Power supply, 230 VAC (+15%/-20%)

## Ordering information

Prosonic FMU 860 - ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> ☐ <sup>6</sup>

- 1 Certificates
  - R Standard (non-certified transmitter, also used for all certified FDU sensors)
  - U CSA general purpose
- 2 Housing for electronics
  - 1 NEMA 4X (IP 66) field mounted housing
  - 2 Plastic housing, NEMA 3 (IP 40) for remote operation
  - 7 Mounting base plate, NEMA 1 (IP 10) for control room mounting, remote electronics
- 3 Keypad and display
  - A Keypad and display in housing
  - C Keypad and display in 21 PU 19" rack
  - D Keypad and display, panel mount, 5.67" x 5.67" (144 x 144 mm)
  - E Keypad, illuminated display in housing
  - G Keypad, illuminated display in 21 PU 19" rack
  - H Keypad, illuminated display, panel mount, 5.67" x 5.67" (144 x 144 mm)
  - K Without keypad, without display, without counter, for remote operation via HART®, RS 485, PROFIBUS-DP
- 4 Relay output
  - 1 3 SPDT relays
  - 2 5 SPDT relays
- 5 Power supply
  - A 180 to 253 VAC, 50/60 Hz
  - B 90 to 132 VAC, 50/60 Hz
  - C 38 to 55 VAC, 50/60 Hz
  - D 19 to 28 VAC, 50/60 Hz
  - E 20 to 30 VDC
- 6 Communication
  - 1 No communication selected
  - 3 HART® protocol
  - 4 Rackbus RS 485
  - 5 PROFIBUS-DP protocol
  - 8 Prepared for HART®, without module

Prosonic FMU 861 - ☐ ☐ ☐ ☐ ☐ ☐

- 1 Certificates
  - R Standard (non-certified transmitter, also used for all certified FDU sensors)
  - U CSA general purpose
- 2 Housing for electronics
  - 1 NEMA 4X (IP 66) field mounted housing
  - 2 Plastic housing, NEMA 3 (IP 40) for remote operation
  - 7 Mounting base plate, NEMA 1 (IP 10) for control room mounting, remote electronics
- 3 Keypad and display
  - B Keypad, display and totalizer
  - C Keypad and display in 21 PU 19" rack
  - D Keypad and display, panel mount, 5.67" x 5.67" (144 x 144 mm)
  - F Keypad, illuminated display and totalizer
  - G Keypad, illuminated display in 21 PU 19" rack
  - H Keypad, illuminated display, panel mount, 5.67" x 5.67" (144 x 144 mm)
  - K Without keypad, without display, without counter, for remote operation via HART®, RS 485, PROFIBUS-DP
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  - 8 Prepared for HART®, without module

Prosonic FMU 862 - ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6

- 1 Certificates
  - R Standard (non-certified transmitter, also used for all certified FDU sensors)
  - U CSA general purpose
- 2 Housing for electronics
  - 1 NEMA 4X (IP 66) field mounted housing
  - 2 Plastic housing, NEMA 3 (IP 40) for remote operation
  - 7 Mounting base plate, NEMA 1 (IP 10) for control room mounting, remote electronics
- 3 Keypad and display
  - A Keypad and display in housing
  - B Keypad, display and totalizer
  - C Keypad and display in 21 PU 19" rack
  - D Keypad and display, panel mount, 5.67" x 5.67" (144 x 144 mm)
  - E Keypad, illuminated display in housing
  - F Keypad, illuminated display and totalizer
  - G Keypad, illuminated display in 21 PU 19" rack
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  - C 38 to 55 VAC, 50/60 Hz
  - D 19 to 28 VAC, 50/60 Hz
  - E 20 to 30 VDC
- 6 Communication
  - 1 No communication selected
  - 3 HART® protocol
  - 4 Rackbus RS 485
  - 5 PROFIBUS-DP protocol
  - 8 Prepared for HART®, without module

For application and selection assistance,  
in the U.S. call 888-ENDRESS

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a day, in the U.S. call 800-642-8737

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