

## Technical Information

# Prosonic S FMU90

Transmitter in housing for field or top-hat rail mounting  
for the ultrasonic sensors FDU91/91F/92/93/95/96



### Application for level measurement

- Continuous, non-contact level measurement of fluids, pastes, sludge and powdery to coarse bulk materials with 1 or 2 ultrasonic sensors
- Measuring range up to 70 m (depending on sensor and material measured)
- Level limit detection (up to 6 relays)
- Pump control (alternating)
- Screen and rake control
- Calculations: average, difference, sum

### Application for flow measurement

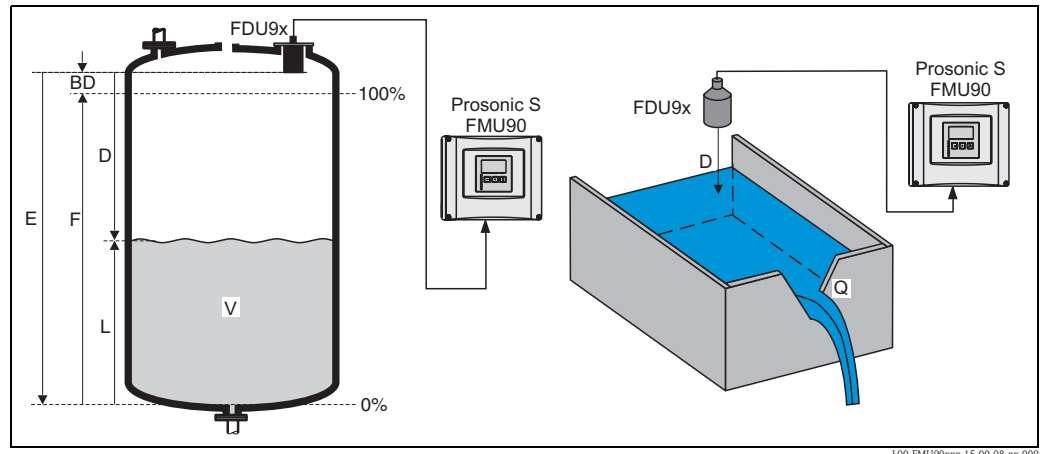
- Flow measurement in open channels and measuring weirs with 1 or 2 ultrasonic sensors
- Simultaneous measurement of level and flow in a stormwater overflow basin with only 1 sensor
- Flow measurement with back water detection (2 sensors) or sludge detection
- Up to 3 (non-resettable) totalizers and 3 (resettable) counters configurable
- Counting or time pulse output for control of external units

### Your benefits

- Simple, menu-guided operation with 6-line plain text display
- Envelope curves on the display for quick and simple diagnosis
- Easy operation, diagnosis and measuring point documentation with the supplied "ToF-Tool - FieldTool Package" operating program.
- Temperature dependent time-of-flight correction via the integrated temperature measurement in the sensors
- Linearisation (up to 32 points, freely configurable)
- Linearisation tables for the most common flumes and weirs pre-programmed and selectable
- Online calculation of the flume-/weir-flows via integrated flow curves
- System integration via HART or PROFIBUS DP
- Automatic detection of the sensors FDU91/91F/92/93/95/96
- The sensors of the former series FDU8x can be connected (for certificates see note on page 8)
- adjustable to the individual requirements via product structure

## 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); **Q:** flow

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  $V$
- flow  $Q$  across measuring weirs or open channels

### 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:

- TI 396F for the sensors FDU 91/91F/92/93/95/96
- TI 189F for the sensors FDU 80/80F/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 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.

### Pump control

individually configurable for each pump:

- pump switching delay, e.g. to prevent overload of the power supply system
- backlash time and backlash interval, e.g. for complete draining of shafts or channels
- crust reduction at pump shaft walls by fine adjustment of the switch point

## Ordering information

**Product structure**

<b>10</b>	<b>Approval</b>										
	R	Non-hazarous area									
	J	ATEX II 3D									
	N	CSA General Purpose									
<b>20</b>	<b>Application</b>										
	1	Level + pump control, alternating									
	2	Flow + totalizer + level + sample control + preprogrammed OCM flow curves									
<b>30</b>	<b>Housing, material</b>										
	1	Field mounting PC, IP66 NEMA 4x									
	2	DIN rail mounting PBT, IP20									
<b>40</b>	<b>Operation</b>										
	C	Illuminated display + keypad									
	E	Illuminated display + keypad, 96x96, panel mounting, front IP65									
	K	w/o display, via communication									
<b>50</b>	<b>Power supply</b>										
	A	90-253 VAC									
	B	10,5-32 VDC									
<b>60</b>	<b>Level input</b>										
	1	1x sensor FDU9x/8x									
	2	2x sensor FDU9x/8x									
<b>70</b>	<b>Switch output</b>										
	1	1x relay, SPDT									
	3	3x relay, SPDT									
	6	6x relay, SPDT									
<b>80</b>	<b>Output</b>										
	1	1x 0/4-20mA HART									
	2	2x 0/4-20mA HART									
	3	PROFIBUS DP									
<b>90</b>	<b>Additional input</b>										
	A	w/o additional input									
	B	4x limit switch + 1x temperature PT100/FMT131 (in preparation)									
<b>100</b>	<b>Datalog function</b>										
	A	Basic version									
<b>110</b>	<b>Languages</b>										
	1	de, en, nl, fr, es, it									
	3	en, zh, ja (in preparation)									
<b>120</b>	<b>Additional option</b>										
	A	Basic version									
FMU90 -											complete product designation

**Scope of delivery**

- Instrument according to the version ordered
- Operating program: ToF Tool - FieldTool Package
- Operating Instructions (depending on communication version, see chapter "Supplementary documentation")
- for certified instrument versions: Safety Instructions (XAs) or Control Drawings (ZDs) (s. chapter "Supplementary documentation")
- field housing units for flow measurement FMU90-\*21\*\*\*\*\* are delivered with 2 screws for plumbing the device

## 广州晋合水处理设备有限公司



地 址：广东省广州市海珠区工业大道333号华新园区7幢218

电 话：020-88191905

传 真：020-61139917

邮 编：510300

邮 箱：jinhewater@jinhewater.com

网 址：<http://www.jinhewater.com>

**Endress+Hauser**   
People for Process Automation