



# **munisense**

## Pore pressure meters

**The Munisense pore pressure meters (PP meters) measure the pore pressure in underground layers. Our PP meters send the measurement data via the mobile LTE-M network 24/7 to the Munisense INSIGHTNOW™ platform.**

### **Reliability sensor**

The pore pressure sensors have a PVC or stainless steel housing that is equipped with an AR conical internal thread for the probing rod. The long shaft of the housing provides space for the ceramic pressure sensor, permeable filters and a possible disinfection pill. The European quality of the sensor provides maximum guarantee of long-term stable pore pressure measurements.

### **Future-proof and energy efficient**

The PP meter can operate for many months or years on the existing battery, depending on the number of measurements and the update frequency with the INSIGHTNOW™ platform. The LTE-M technology ensures lower energy consumption and a reliable data connection thanks to roaming. The measurement data from the PP series is available at any time via a smartphone, tablet or web browser in the powerful INSIGHTNOW™ platform.

### **Our smart probing tool**

During probing, the sensor pressure must be prevented from exceeding the maximum pressure to prevent damage to the ceramic measuring

cell. We have developed the pressure checker probing tool for this purpose. By connecting this to the sensor cable during probing, the pressure in the sensor is continuously monitored during pressing. The pressure checker probing tool is optionally available.

### **Remote management**

After installation, the measurement and reporting intervals in the INSIGHTNOW™ platform can be adjusted remotely per meter. The water pressure meters can be managed and updated completely remotely. In addition to alarms for level changes, any malfunctions in the meter, e.g. battery or data transmission, are also reported in the INSIGHTNOW™ platform for quick follow-up.

**Years of operation on single battery**

**Sample interval from 5 sec. to 1 day**

**Adjustable Water Level Alarms**

**Option: pressure checker probing tool**



## Specifications pore pressure meter **PP8**

### Type measurement specifications

Water pressure	
• Range	4, 10, 20, 30 en 60 m H <sub>2</sub> O (abs.)
• Resolution	0.01 % FS
• Precision	± 0.1 % FS (typ.)
• Long term stability	± 0.02 % FS *
• Maximum pressure	3 x range
Water temperature sensor	
• Range	-20 - 50 °C
• Resolution	0.4 °C
• Precision	± 0.4 °C (max.)
Atmospheric pressure (PP-meter; requires optional valve)	
• Range	300 - 1100 hPa
• Resolution	0,01 hPa
• Precision	±0,4 hPa
• Accuracy, calibrated	±0,4 hPa
Timestamp accuracy	< 0.5 sec/day
Sampling, measurement interval	5 sec. - 24 hours
Logging capacity	25.000 measurements
Management information	
• Battery voltage	yes
• Radio quality (RSSI) in dBm	yes

### Specifications PP-pore pressure sensor (Huba 713)

Cable:	
• Length	5, 10, 20 m
• Diameter connector	< 10 mm
• Cable material	PU / PE-HD
Pore Pressure Sensor	
• Housing	pvc or stainless steel 316L
• Length and diameter housing	22 cm and 3,6 cm
• Housing sensor	stainless steel 316L
• Sensor	Ceramics AL <sub>2</sub> O <sub>3</sub>
• Identification sensor	unique, lasermarked stainless steel
• Ingress protection	IP68

### Specifications PP-meter (measurement & communication electronics)

<b>Environmental conditions</b>	
Temperature	-20 - 60 °C
Relative humidity	0 - 99 %
Ingress protection housing	IP68 **

### Energy

Battery (non rechargeable)	Li/SOCI2
Capacity	19 Ah
Battery replaceable	yes
Voltage	3,6 V
Operating time, depending on the quality of the connection, the selected measurement and reporting interval, approx.	5-7 jaar

### Communication

LTE-M and NB-IoT	both integrated
Antenna	integrated
OTA (Over The Air) upgrades	yes

### Afmetingen en gewicht

Diameter housing and cap	Ø 50 mm and Ø 62 mm
Length housing incl. cap	180 mm
Weight housing incl. cap	400 grams

### Options for model PP8

- Pressure checker probing tool
- External puckantenna, required for a metal well

### Not included at delivery of model PP8

Medium (oil, etc.), permeable filters, filling and/or friction rings, wire paste for sensor mounting, condoms, optional disinfection pills, separation membranes, probing rod, adapters and cable labels. O-rings are included.

\* After 30 days, over remainder whole lifespan - see EC EN 60770-1.

\*\* More than 6 weeks under max. 60 cm of water, with the seal intact.

### Recycling e-waste

Of course you can deliver or send us your old Munisense devices. We then ensure that they are included in our recycling process.

## At a glance

The portal allows to view pore pressure in mNAP on the GIS map. At the same time as changes over time and the way in which the measuring point is set up.



### PP water pressure meter

Available with a sensor housing made of PVC or stainless steel.

Photo inset: our pressure checker probing tool to continuously monitor the pressure during pressing.

## About Munisense

Munisense develops, produces, supplies and manages innovative measurement solutions for businesses and governments. Solutions that give stakeholders direct online insight into noise, water quality, water levels and air quality. The information is online available at any time for visualization, analysis or periodic reports. This way managers and policymakers can measure in real time; remotely, reliable and smarter.

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