Product information

Signal conditioning instruments and communication

Controllers in field housing for continuously measuring level sensors

VEGAMET 841
VEGAMET 842
VEGAMET 861
VEGAMET 862

Document ID: 62826

Contents

Take note of safety instructions for Ex applications

Please note the Ex specific safety information which you can find on our homepage www.vega.com/downloads under "*Approvals*" and which comes with every instrument. In hazardous areas you should take note of the corresponding regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

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1 Product description

Functional principle

In continuous measurement, the level in a vessel is detected by a sensor and then transferred to the controller for further processing. By means of an adjustment in the controller, the measured value can be adapted to the individual circumstances. The requested measurement parameter is indicated in the display via a scaling/linearisation. The measured value can be transmitted to an external display or a connected control system via the current output.

Several operating relays are additionally integrated in each VEGAMET for level detection. These can be used to control pumps or other actuators.

Application

In conjunction with the appropriate sensors, the controllers can be used in a variety of applications:

- Level measurement
- Gauge measurement
- Differential measurement/Differential pressure measurement
- Process pressure measurement
- Distance measurement
- Interface measurement

Each instrument also serves as (Ex) power supply unit for the connected sensors. Power is supplied via the same two-wire cable. As an option, an input without sensor power supply (passive input) is available, enabling the connection of transmitters with their own voltage supply (sensors in four-wire version). Depending on the instrument type, one or two independent sensors can be connected and their measured values processed.

Safety

The integrated fault monitoring detects faults in the controller as well as in the connected sensors. If such a fault is detected, the integrated fail safe relay de-energises and a fault signal is displayed via the LEDs on the front panel. In addition, the current output of each VEGAMET jumps to an adjustable fault current.

The instrument has the following approvals:

- Ex approval as auxiliary, intrinsically safe instrument
- WHG as part of an overfill protection system

Adjustment

All devices can be operated on site via the integrated display and adjustment unit. Wireless operation via Bluetooth using the following adjustment tools is also possible:

- Smartphone/tablet (iOS or Android operating system)
- PC/notebook with Bluetooth LE or Bluetooth USB adapter (Windows operating system)

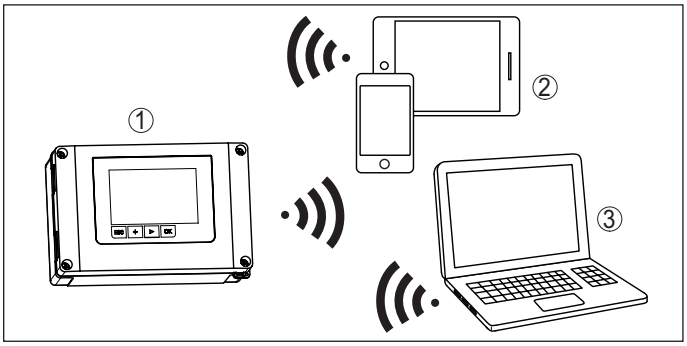

Fig. 1: Wireless connection to smartphone/table/notebook

1 VEGAMET
2 Smartphone/Tablet
3 PC/Notebook

2 Type overview

	VEGAMET 841	VEGAMET 842
		
Application	● Universal level measurement ● Pumping station ● Sewage screw pump lifting station ● Gauge measurement ● Process pressure measurement ● Flow measurement	● Universal level measurement ● Pumping station ● Sewage screw pump lifting station ● Gauge measurement ● Process pressure measurement ● Flow measurement ● Weir control ● Differential measurement
Measurement loops	1 Measurement loop	2 measuring points, 1 differential measuring point
Sensor inputs	1 x 4 … 20 mA	2 x 4 … 20 mA
Digital inputs	-	-
Outputs	● 3 x operating relay, one can be configured as fail safe relay ● 1 x current output	● 3 x operating relay, one can be configured as fail safe relay ● 2 x current outputs
Display on the instrument	● Graphic-capable LC display, with lighting ● LEDs for operation, relay, fault signal	● Graphic-capable LC display, with lighting ● LEDs for operation, relay, fault signal
Measured value memory	-	-
Interfaces	Bluetooth LE	Bluetooth LE
Ambient temperature	-40 … +60 °C (-40 … +140 °F)	-40 … +60 °C (-40 … +140 °F)

	VEGAMET 861	VEGAMET 862
		
Application	● Universal level measurement ● Pumping station ● Sewage screw pump lifting station ● Gauge measurement ● Process pressure measurement ● Flow measurement	● Universal level measurement ● Pumping station ● Sewage screw pump lifting station ● Gauge measurement ● Process pressure measurement ● Flow measurement ● Weir control ● Differential measurement
Measurement loops	1 Measurement loop	2 measuring points, 1 differential measuring point
Sensor inputs	1 x 4 … 20 mA/HART	2 x 4 … 20 mA/HART
Digital inputs	2 Digital inputs	4 Digital inputs
Outputs	● 4 x operating relay, one can be configured as fail safe relay ● 1 x current output	● 6 x operating relay, one can be configured as fail safe relay ● 3 x current output
Display on the instrument	● Graphic-capable LC display, with lighting ● LEDs for operation, relay, fault signal	● Graphic-capable LC display, with lighting ● LEDs for operation, relay, fault signal
Measured value memory	Internal memory or SD card	Internal memory or SD card
Interfaces	Bluetooth LE	Bluetooth LE
Ambient temperature	-40 … +60 °C (-40 … +140 °F)	-40 … +60 °C (-40 … +140 °F)

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3 Instrument selection

All series 800 controllers are equally suitable for outdoor or indoor installation due to their degree of protection IP66/IP67 and Type 4X. The standard version is designed for wall mounting. A mounting adapter for pipe mounting is available as an option.

The devices are specialized in the processing and reproduction of process states. A generous display for data visualization is already integrated in the compact housing designed for harsh field conditions. During operation, the devices feed the connected analogue 4 … 20 mA/HART sensors.

With all series 800 device, the limited values can be safely monitored and relays, such as an overfill protection according to WHG, can be switched. The equipment includes functions for adjustment and pump control, which allow a wide range of individual adaptations. The devices are suitable for all industrial sectors, including chemicals, building materials, water and waste water.

VEGAMET 841
The single channel instrument has an input for analogue 4 … 20 mA sensors.

VEGAMET 841 is suitable for measured value visualisation, limit value monitoring for storage tanks and pumping stations, flow measurement in open channels and weirs.

In the field of water and waste water, the device convinces with functions such as pump changeover, flow measurement in open channels, trend function and totalizer.

VEGAMET 842
The two-channel instrument has two independent inputs for analogue 4 … 20 mA sensors.

VEGAMET 842 is suitable for measured value visualisation, limit value monitoring for storage tanks and pumping stations, flow measurement in open channels and weirs. Differential measurements such as weir control are also possible.

In the field of water and waste water, the device convinces with functions such as pump changeover, flow measurement in open channels, trend function and totalizer.

VEGAMET 861
The single channel instrument has an input for a digital or an analogue 4 … 20 mA/HART sensor.

VEGAMET 841 is suitable for measured value visualisation, limit value monitoring for storage tanks and pumping stations, flow measurement at open channels and weirs, storm water overflow basin.

In the field of water and waste water, the device convinces with functions such as pump changeover, flow measurement in open channels, trend function, totalizer and data logger.

VEGAMET 862
The two-channel instrument has two independent inputs for two digital or analogue 4 … 20 mA/HART sensors.

VEGAMET 862 is suitable for measured value visualisation, limit value monitoring for storage tanks and pumping stations, flow measurement at open channels and weirs, differential calculation, storm water overflow basin.

In the field of water and waste water, the device convinces with functions such as pump changeover, flow measurement in open channels, trend function, totalizer and data logger.

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4 Selection criteria

The following charts provide an overview of the standard applications and functions of VEGAMET 800 series controllers. They give also information about whether the respective function can be activated and adjusted via the integrated indicating and adjustment unit (OP) or via DTM/app.[1)]

Applications (adjustable with DTM/app)	VEGAMET				Adjustment	
	841	842	861	862	OP	DTM/App
Universal	•	•	•	•	•	•
Level storage tank	•	•	•	•		•
Calculation difference		•		•		•
Flow measurement flume/Weir	•	•	•	•		•
Pumping station	•	•	•	•		•
Weir control		•		•		•
Sewage screw pump lifting station	•	•	•	•		•

Additional application examples	VEGAMET				Adjustment	
	841	842	861	862	OP	DTM/App
Level measurement	•	•	•	•		•
Gauge measurement	•	•	•	•		•
Process pressure measurement	•	•	•	•		•

Functions	VEGAMET				Adjustment	
	841	842	861	862	OP	DTM/App
Application wizard	•	•	•	•		•
Indication measured values	•	•	•	•	•	•
Automatic display change	•	•	•	•	•	•
Display multilingual	•	•	•	•	•	•
Sensor input 4 … 20 mA	•	•	•	•	•	•
Sensor input HART			•	•	•	•
Damping	•	•	•	•	•	•
Linearization - Preset curves	•	•	•	•	•	•
Linearization - Dimensions ISO standard	•	•	•	•		•
Linearization - Flow formula	•	•	•	•		•
Linearization - Manufacturer definition	•	•	•	•		•
Linearization - Calculation wizard	•	•	•	•		•
Linearization - Bearing table	•	•	•	•		•
Linearization - Gauging by litres	•	•	•	•		•
Import linearization curves	•	•	•	•		•
Adjustment of the measuring point	•	•	•	•	•	•
Scaling	•	•	•	•	•	•
Totalizer 1/2	•	•	•	•		•
Totalizer 3/4		•		•		•
Relay mode - Overfill protection	•	•	•	•	•	•
Relay mode - Dry run protection	•	•	•	•	•	•
Relay mode - Switching window ON	•	•	•	•		•
Relay mode - Switching window OFF	•	•	•	•		•
Relay mode - Flow rate pulse	•	•	•	•		•
Relay mode - Sampling pulse	•	•	•	•		•
Relay mode - Rising tendency	•	•	•	•		•
Relay mode - Falling tendency	•	•	•	•		•
Relay mode - Pump control 1 (same running time)	•	•	•	•		•
Relay mode - Pump control 2 (same running time)	•	•	•	•		•
Relay mode - Pump control 3 (fixed sequence)	•	•	•	•		•
Relay mode - Pump control 4 (fixed sequence)	•	•	•	•		•
Mode pump control - Sequenced operation	•	•	•	•		•

[1)] OP: Operating Panel (integrated display and adjustment unit)

Functions	VEGAMET				Adjustment	
	841	842	861	862	OP	DTM/App
Mode pump control - Alternating pump operation	•	•	•	•		•
Dry weather pump	•	•	•	•		•
Pump monitoring			•	•		•
Forced pump changeover	•	•	•	•		•
Relay - Switch on and off delay	•	•	•	•		•
Bandwidth for switching points	•	•	•	•		•
Fail safe relay	•	•	•	•	•	•
Current output 0/4 … 20 mA, 20 … 4 mA	•	•	•	•	•	•
Current output - Flow rate pulse	•	•	•	•		•
Current output - Sampling pulse	•	•	•	•		•
Diagnosis - Status	•	•	•	•	•	•
Diagnosis - Measured values	•	•	•	•	•	•
Simulation sensor value, %, lin% value, scaled values	•	•	•	•	•	•
Simulation - current output	•	•	•	•		•
Simulation - relay output	•	•	•	•		•
Simulation - digital input			•	•		•
Date/Time			•	•	•	•
Internal device memory/SD card			•	•		•
Protection of the parameterization	•	•	•	•	•	•
Bluetooth access code	•	•	•	•	•	•

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5 Mounting

Mounting options

The field housing of the VEGAMET is equally suitable for outdoor or indoor installation due to its degree of protection IP66/IP67 and Type 4X. The standard version is designed for wall mounting. A mounting adapter for pipe mounting is available as an option.

Wall mounting

Fix the mounting plate to the wall using the screws and dowels supplied as shown in the figure below. Make sure that the arrows on the mounting plate point upwards.

Loosen the four screws in the housing cover and open it to the left. Fasten the device to the mounting plate using the screws (M5) supplied.

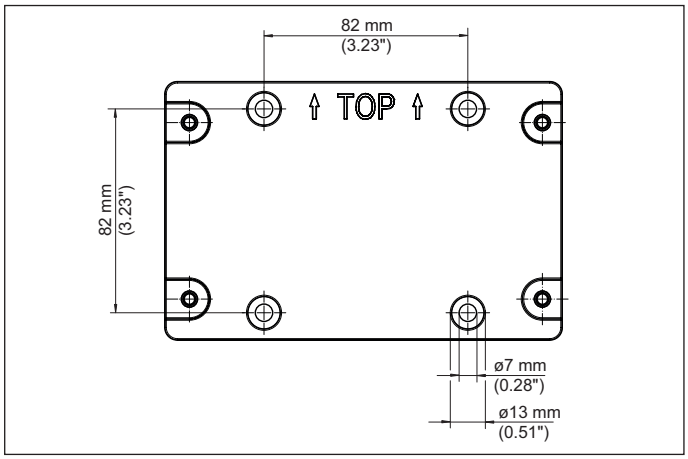

Fig. 2: Mounting plate for wall mounting (VEGAMET 841, 842)

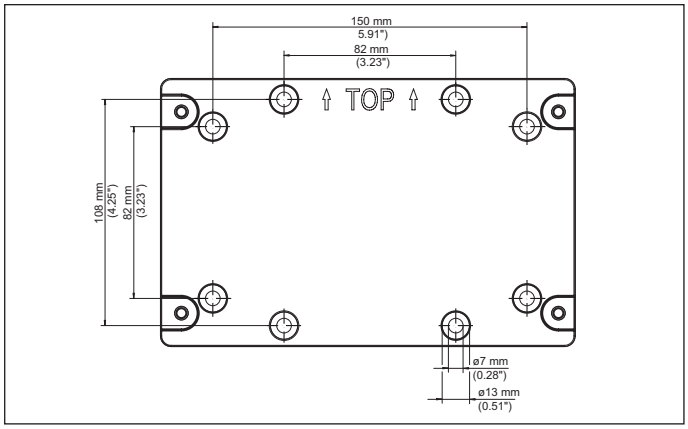

Fig. 3: Mounting plate for wall mounting (VEGAMET 861, 862)

Tube mounting

The optionally available mounting accessories are required for tube mounting. The kit consists of two pairs of mounting brackets and four mounting screws M6 x 100.

The mounting brackets are screwed to the mounting plate and the tube as shown in the following illustration.

Loosen the four screws in the housing cover and open it to the left. Fasten the device to the mounting plate using the screws (M5) supplied.

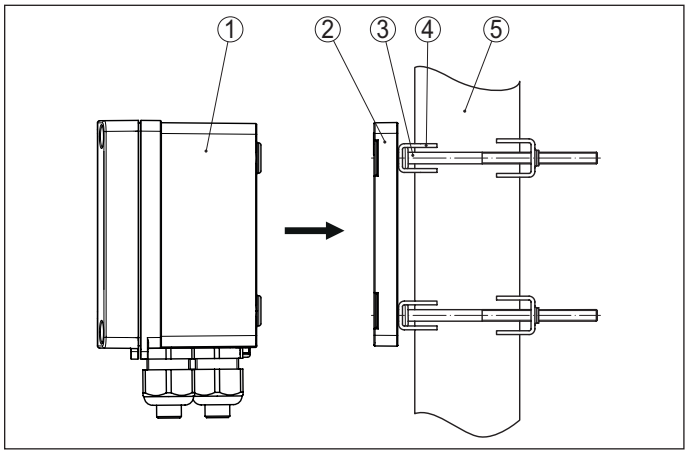

Fig. 4: Tube mounting

1 VEGAMET
2 Mounting plate
3 4 screws M6 x 100
4 Mounting brackets
5 Pipe for diameter 29 … 60 mm (1.14" to 2.36")

Mounting sun shade

The optional sun protection can be used to protect against direct sunlight. The sunshade is simply mounted between the mounting plate and the controller, this is possible for both wall and pipe mounting.

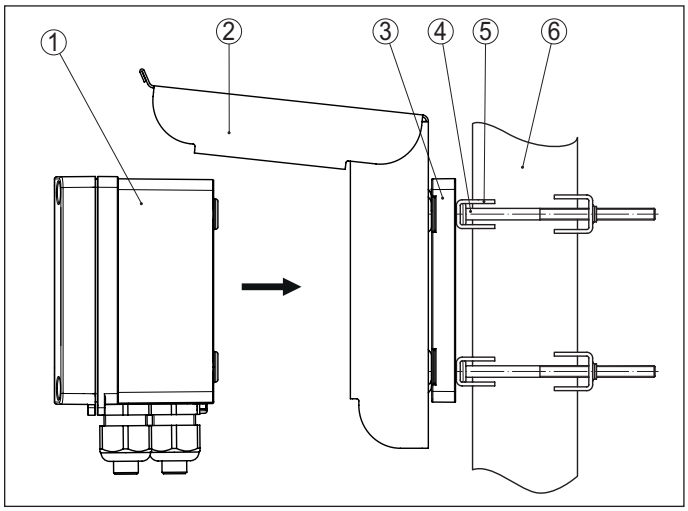

Fig. 5: Mounting sun protection with pipe mounting

1 VEGAMET
2 Sun shade
3 Mounting plate
4 4 screws M6 x 100
5 Mounting brackets
6 Pipe for diameter 29 … 60 mm (1.14" to 2.36")

6 Electrical connection

6.1 Preparing the connection

Safety instructions
Always keep in mind the following safety instructions:

- The electrical connection must only be carried out by trained, qualified personnel authorised by the plant operator.
- If overvoltage surges are expected, overvoltage arresters should be installed.

Warning:
Only connect or disconnect in de-energized state.

Voltage supply
The data for power supply are specified in chapter "*Technical data*".

The instrument belongs to protection class I, hence connection of an earth conductor is required.

Connection cable
Use cable with round cross section. The cable diameter must be suitable for the cable gland used to ensure the seal effect of the cable gland (IP protection).

The voltage supply is connected with standard cable according to the national installation standards.

Standard two-wire cable can be used to connect the sensors.

Cable screening and grounding
When connecting VEGAMET 861/862 to HART sensors, the supplied ground terminal must be attached to the outside of the housing. To do this, carefully remove the pre-embossed opening (ø 6 mm) on the lower side of the device with a suitable tool and screw in the ground terminal.

Connect the cable screening on both ends to ground potential. In the sensor/VEGAMET, the shielding must be connected directly to the internal ground terminal. The ground terminal on the outside of the sensor housing/VEGAMET must be connected to the potential equalisation (low impedance).

If potential equalisation currents are expected, the screen connection on the side of VEGAMET must be made via a ceramic capacitor (e. g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

6.2 Connection VEGAMET 841

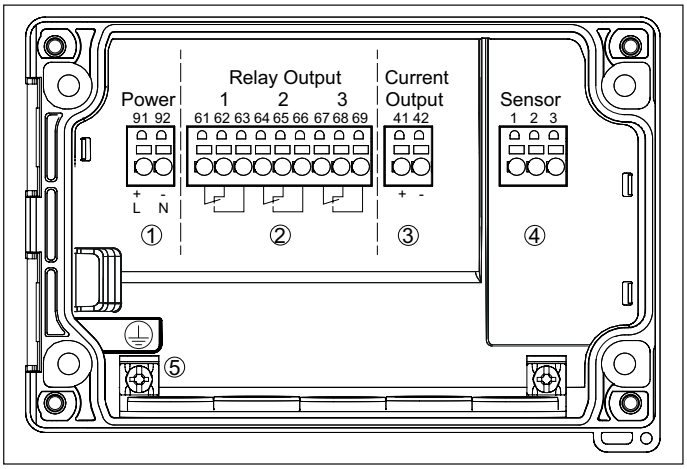

Fig. 6: Wiring plan VEGAMET

1 Voltage supply of the controller
2 Relay outputs 1 … 3
3 Current output
4 Sensor input (active/passive)
5 Ground terminal for protective conductor

Details on the electrical connection can be found in the operating instructions of the device in the download area on our homepage.

6.3 Connection VEGAMET 842

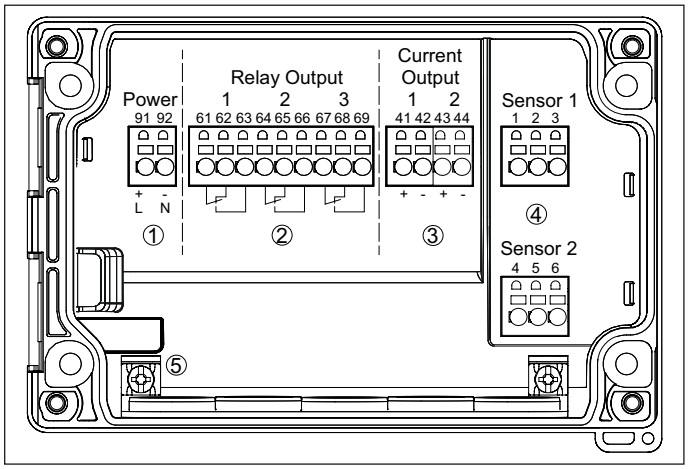

Fig. 7: Wiring plan VEGAMET

1 Voltage supply of the controller
2 Relay outputs 1 … 3
3 Current outputs 1/2
4 Sensor inputs 1/2 (active/passive)
5 Ground terminal for protective conductor

Details on the electrical connection can be found in the operating instructions of the device in the download area on our homepage.

6.4 Connection VEGAMET 861

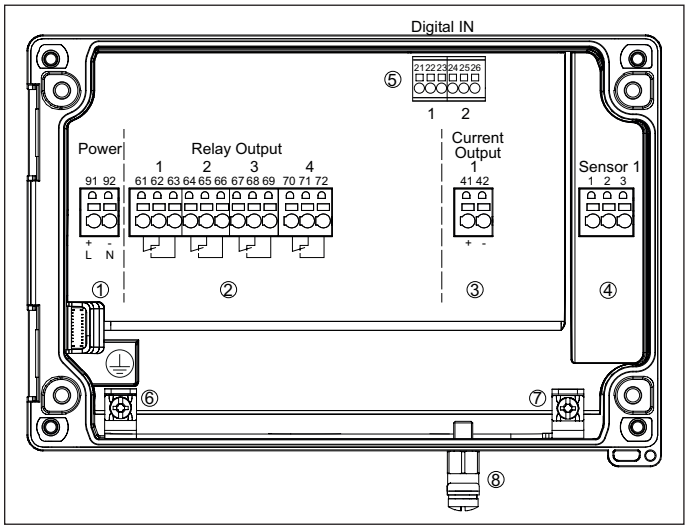

Fig. 8: Wiring plan VEGAMET

1 Voltage supply of the controller
2 Relay outputs 1 … 4
3 Current output
4 Sensor input (active/passive)
5 Digital inputs 1/2
6 Ground terminal for protective conductor
7 Ground terminal for cable screening sensor cable
8 Ground terminal for potential equalization

6.5 Connection VEGAMET 862

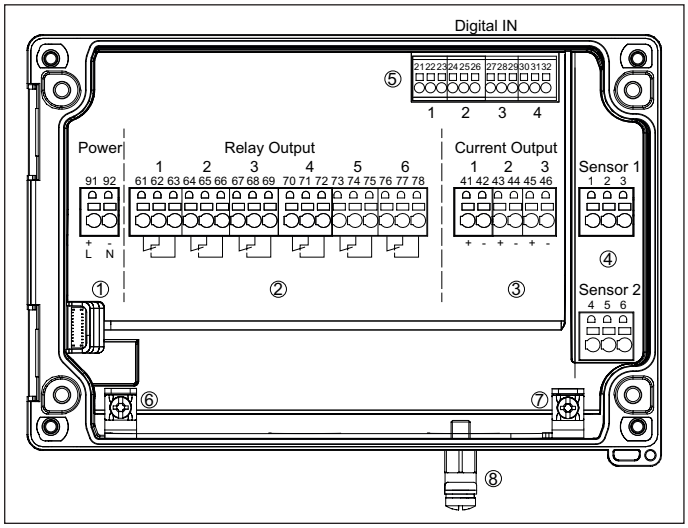

Fig. 9: Wiring plan VEGAMET

1 *Voltage supply of the controller*
2 *Relay outputs 1 … 6*
3 *Current outputs 1 … 3*
4 *Sensor inputs 1/2 (active/passive)*
5 *Digital inputs 1 … 4*
6 *Ground terminal for protective conductor*
7 *Ground terminal for cable screening*
8 *Ground terminal for potential equalization*

7 Adjustment

7.1 Adjustment options and access protection

All VEGAMET 800 series controllers have an integrated display and adjustment unit. In addition, the instruments can be parameterised via Bluetooth and corresponding adjustment tools.

Adjustment via the display and adjustment unit

The adjustment is carried out menu-driven via four front keys and a clearly arranged, graphic-capable display with background lighting.

Wireless adjustment via Bluetooth

The integrated Bluetooth module enables wireless connection to smartphones/tablets (iOS/Android) or Windows PCs.

Operation is via a free app from the "*Apple App Store*", the "*Google Play Store*" or the "*Baidu Store*". Alternatively, adjustment can also be carried out via PACTware/DTM and a Windows PC.

Fig. 10: Wireless connection to smartphone/table/notebook

Information:
Certain setting options are not possible or only possible to a limited extent with the integrated display and adjustment unit, for example the settings for flow measurement or pump control. For these applications, the use of PACTware/DTM or the VEGA Tools app is recommended. An overview of the available applications and functions as well as their adjustment options can be found in chapter "*Selection criteria*".

Access protection

Devices with a Bluetooth radio interface are protected against unwanted access from outside. This means that only authorized persons can receive measured and status values and change device settings via this interface.

Protection of the parameterization

The settings (parameters) of the device can be protected against unwanted changes. The device is not locked on delivery, all settings can be made.

8 Dimensions

VEGAMET 841, 842

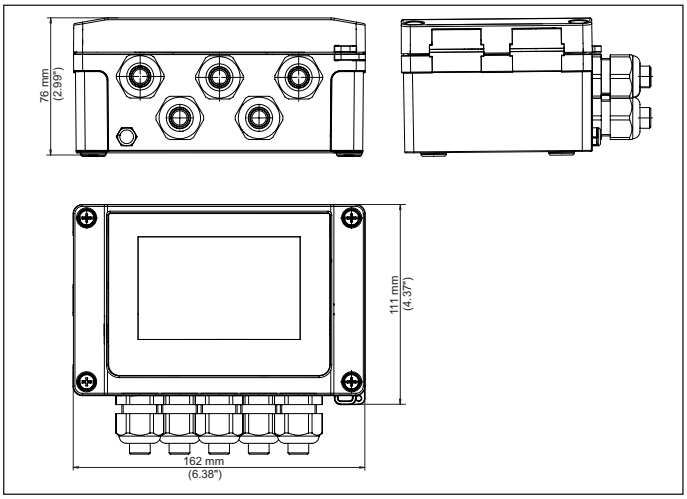

Fig. 11: Dimensions VEGAMET 841, 842

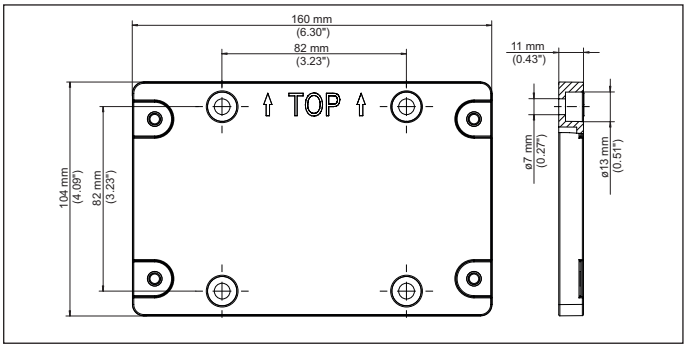

Fig. 12: Dimensions Wall mounting VEGAMET 841, 842

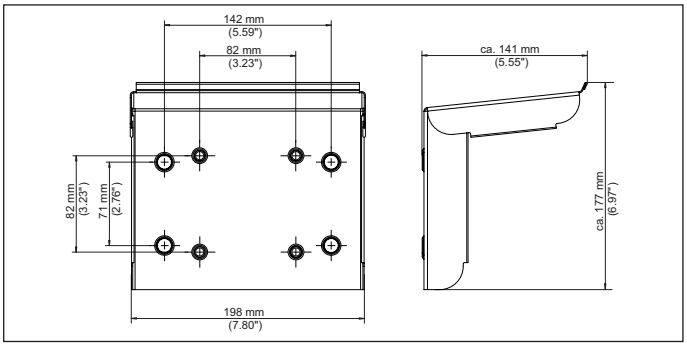

Fig. 13: Dimensions Sun shade VEGAMET 841, 842

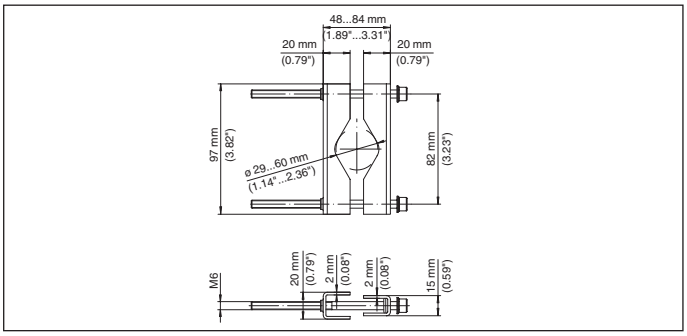

Fig. 14: Dimensions Brackets for tube mounting VEGAMET 841, 842

VEGAMET 861, 862

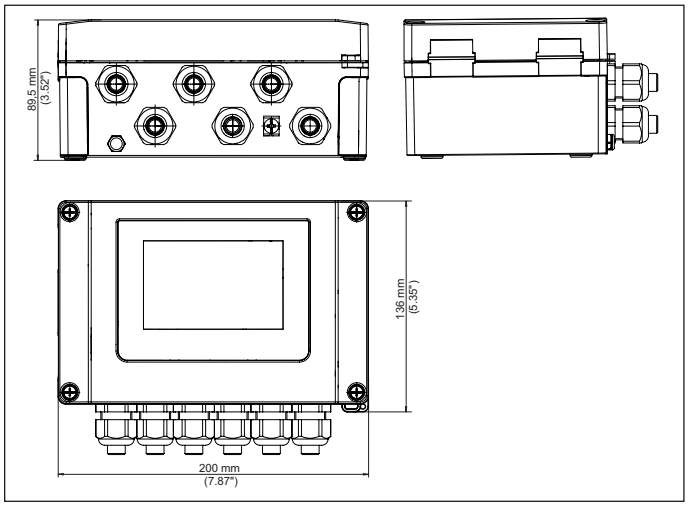

Fig. 15: Dimensions VEGAMET 861, 862

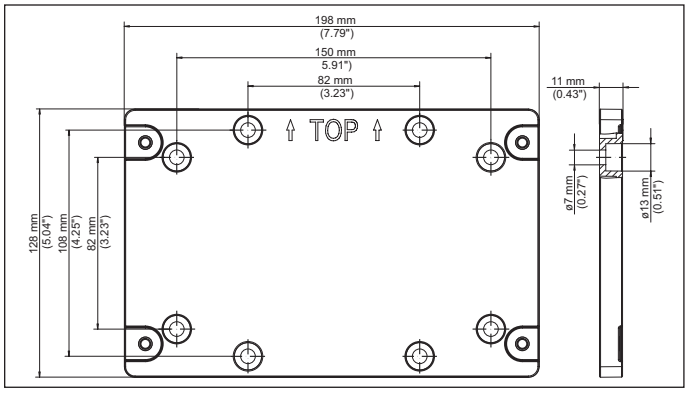

Fig. 16: Dimensions Wall mounting VEGAMET 861, 862

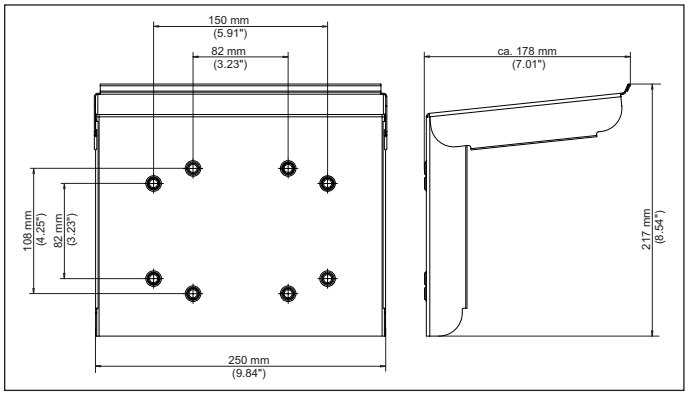

Fig. 17: Dimensions Sun shade VEGAMET 861, 862

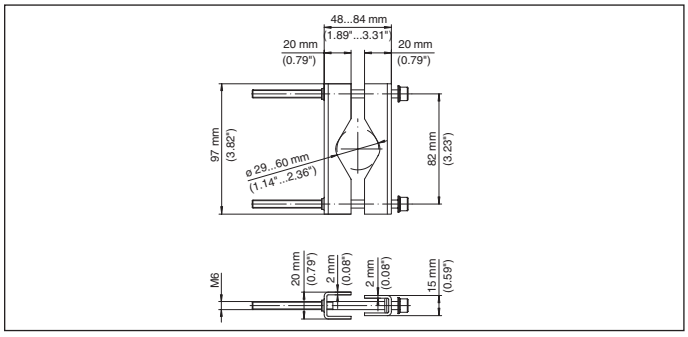

Fig. 18: Dimensions Brackets for tube mounting VEGAMET 861, 862

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