



## Product overview





## Safe and reliable

### **Level and pressure instrumentation for the process industry**

Production processes are becoming even more complex. So it's important that the measurement technology used to control and monitor them is all the more understandable and intuitive. VEGA has set itself the goal of developing innovative measurement technology that is easy to install and operate while providing maximum safety and reliability. Leading the way in a worldwide trend towards "intelligent factories", the VEGA instrumentation concept "plics®" provides a modular instrument platform with a standardized adjustment concept that encompasses all measuring principles.

VEGA employs over 1,800 people worldwide, 825 of whom work at its headquarters in Schiltach in the Black Forest. This is where, for over 60 years now, solutions to demanding measuring tasks are being conceived and brought to realization: for chemical and pharmaceutical plants, the food industry, drinking water supply systems, sewage treatment works, landfills, mining operations, power generation, oil exploration and production, ships and airplanes.

VEGA is active in over 80 countries with its global network of subsidiaries and distributors. The company and its products have all the necessary certificates and approvals for worldwide application. This applies to the technical safety, as well as the quality of all products and services.

Trend-setting measurement technology orientates itself around the people who use it. Every plics® sensor is assembled according to the customer's specifications, fulfilling their application requirements perfectly.

VEGA has thought the “easy is better” principle through from start to finish. plics® is perfectly positioned to solve measuring tasks from the most demanding level and pressure challenges.

**The plics® modular principle**

The idea is simple: each instrument is assembled from prefabricated components after the order is received. This way VEGA customers get the optimal device to meet their requirements, made to measure and fast. This is where the plics® modular concept pays dividends, as these instruments are more cost efficient over their entire life cycle.

**The components**

Every plics® instrument consists of multiple components: First, the sensing element is combined with the process fitting required and a housing of plastic, aluminium or stainless steel. Then, the electronics module is inserted. On top of that comes the universal display and adjustment module PLICSCOM. The optional Bluetooth feature also allows any transmitter to be adjusted wirelessly from a distance of approximately 25 meters.

**VEGA makes measurement technology easy**

Handling measurement technology always means responsibility. Its good to know that VEGA is constantly working to make both instrument configuration and adjustment even more simple. That's because the simpler and easier something is to use, the more reliable it becomes: reducing the probability of mistakes and increasing functional reliability.





Malfunction

Maintenance required

Check function

Outside of specification

| Event memory                                                |          |                  |                          |  |
|-------------------------------------------------------------|----------|------------------|--------------------------|--|
| (List of the parameter changes and event in the instrument) |          |                  |                          |  |
| Graph                                                       |          | All              | Update                   |  |
| Date/Time                                                   | Status   | Event type       | Event description        |  |
| 21.06.2012 13:27:35                                         | Change   | By PC (directly) | Linearization type       |  |
| 21.06.2012 13:27:35                                         | Change   | By PC (directly) | Vessel height D          |  |
| 21.06.2012 13:27:35                                         | Change   | By PC (directly) | Socket correction h      |  |
| 21.06.2012 13:21:20                                         | Incoming | F105 (Failure)   | Measured value is determ |  |
| 21.06.2012 13:21:20                                         | Outgoing | F105 (Failure)   | Measured value is determ |  |
| 21.06.2012 13:21:15                                         | Outgoing | F105 (Failure)   | Measured value is determ |  |
| 21.06.2012 13:21:14                                         | Incoming | F105 (Failure)   | Measured value is determ |  |
| 21.06.2012 13:21:13                                         | Change   | By PC (directly) | False signal suppression |  |
| 21.06.2012 13:21:13                                         | Change   | By PC (directly) | False signal suppression |  |
| 21.06.2012 13:19:14                                         | Outgoing | F105 (Failure)   | Measured value is determ |  |



### Display and adjustment module



PLICSCOM



VEGA CONNECT



PLICSLED

### Electronics



4 ... 20 mA/  
HART



Profibus PA



Foundation  
Fieldbus



Level switch

### Housing



Plastic



Stainless steel



Aluminium



Plastic double  
chamber



Stainless steel  
double chamber



Aluminium  
double chamber

### Process fitting



Thread



Flange



Hygienic  
fitting



Customer-  
specific

### Sensor



Radar



Ultrasonic



Vibration



Process  
pressure



Differential  
pressure



Guided radar



Microwave  
barrier



Capacitive



Hydrostatic

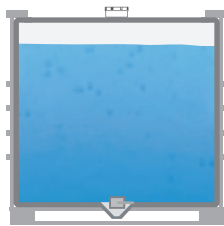
# Quickfinder

[illegible]





## IIoT | Level | VEGAPULS Air series



### Area of application

Radar sensors of the VEGAPULS Air series are used for non-contact level measurement of liquids and bulk solids. They operate completely independently and do not require any wiring for energy supply or transmission of measured values. Built-in batteries allow operation for up to 10 years. Integrated wireless interfaces transmit the data from the sensor directly or via router to VEGA Inventory System.



### Measuring principle

Via the antenna system integrated in the instrument housing, the measuring instrument transmits short radar signals in the direction of the medium. The product surface reflects the signal waves, which are then received by the antenna system. The instrument calculates the level from the received radar signals and the entered container height. The level, together with other instrument data, is sent to the Industrial Internet of Things (IIoT) via wireless interface.

### Advantages

The battery integrated in the sensor and the transmission of measured values via wireless network allow a fast, cost-effective installation for remote and mobile measuring points. The device parameters preset specifically for the application and the wireless parameterisation via app allow easy setup and commissioning. The non-contact, 80-GHz radar level measurement is especially characterised by its high accuracy and reliability. The measuring result is not influenced by changing temperatures, fluctuating pressures or changing products.

|                     | VEGAPULS Air 23                                                                                                                                                                                                                                                                                                                 | VEGAPULS Air 41                                                                   | VEGAPULS Air 42                                                                     |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                                                |  |  |
| Application         | Liquids and bulk solids in plastic tanks without process fitting                                                                                                                                                                                                                                                                | Liquids and bulk solids in simple process conditions                              | Liquids and bulk solids in simple process conditions                                |
| Measuring range     | 3 m                                                                                                                                                                                                                                                                                                                             | 15 m                                                                              | 30 m                                                                                |
| Antenna             | Integrated                                                                                                                                                                                                                                                                                                                      | Integrated                                                                        | Integrated                                                                          |
| Process fitting     | –                                                                                                                                                                                                                                                                                                                               | Threads: G1½, 1½ NPT, R1½                                                         | Compression flanges DN 80, 3" Adapter flanges from DN 100, 4"                       |
| Mounting connection | Adhesive adapter, tensioning strap, ceiling mounting                                                                                                                                                                                                                                                                            | Mounting strap                                                                    | –                                                                                   |
| Process temperature | -20 ... +60 °C                                                                                                                                                                                                                                                                                                                  | -20 ... +60 °C                                                                    | -20 ... +60 °C                                                                      |
| Process pressure    | –                                                                                                                                                                                                                                                                                                                               | -1 ... +2 bar (-100 ... +200 kPa)                                                 | -1 ... +2 bar (-100 ... +200 kPa)                                                   |
| Accuracy            | ±5 mm                                                                                                                                                                                                                                                                                                                           | ±2 mm                                                                             | ±2 mm                                                                               |
| Frequency range     | 80 GHz                                                                                                                                                                                                                                                                                                                          | 80 GHz                                                                            | 80 GHz                                                                              |
| Signal output       | NB-IoT (LTE-CAT-NB1), LTE-M (LTE-CAT-M1), LoRaWAN                                                                                                                                                                                                                                                                               | NB-IoT (LTE-CAT-NB1), LTE-M (LTE-CAT-M1), LoRaWAN, Bluetooth                      | NB-IoT (LTE-CAT-NB1), LTE-M (LTE-CAT-M1), LoRaWAN, Bluetooth                        |
| Display/adjustment  | VEGA Inventory System                                                                                                                                                                                                                                                                                                           | VEGA Tools app, PACTware, VEGA Inventory System                                   | VEGA Tools app, PACTware, VEGA Inventory System                                     |
| Voltage supply      | Integrated batteries 2x 3.6 V (lithium)                                                                                                                                                                                                                                                                                         | Integrated batteries 5x 3.6 V (lithium)                                           | Integrated batteries 5x 3.6 V (lithium)                                             |
| Approvals           | –                                                                                                                                                                                                                                                                                                                               | –                                                                                 | –                                                                                   |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Easy mounting “outside”, as it is optimised for measurement through the tank top</li> <li>▪ Minimal installation work thanks to self-sufficient supply and wireless interface</li> <li>▪ Exact measuring results regardless of the medium and the ambient conditions</li> </ul>        |                                                                                   |                                                                                     |
|                     | <ul style="list-style-type: none"> <li>▪ Minimal installation work thanks to self-sufficient supply and wireless interface</li> <li>▪ Exact measuring results regardless of the medium, the process and the ambient conditions</li> <li>▪ Easy extension of the operating time through use of exchangeable batteries</li> </ul> |                                                                                   |                                                                                     |

# IIoT | Level | VEGAPULS Air series

|                   | LoRa Gateway (indoor)                                                                                                                                                                                                                                                                                       | LoRa Gateway (outdoor)                                                              |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                                                                            |  |
| Application       | Gateway for connecting LoRaWAN sensors to VEGA Inventory System                                                                                                                                                                                                                                             | Gateway for connecting LoRaWAN sensors to VEGA Inventory System                     |
| Input             | LoRaWAN                                                                                                                                                                                                                                                                                                     | LoRaWAN                                                                             |
| Output            | GPRS/UMTS/LTE (2G, 3G, 4G)                                                                                                                                                                                                                                                                                  | GPRS/UMTS/LTE (2G, 3G, 4G)                                                          |
| Display           | LED                                                                                                                                                                                                                                                                                                         | LED                                                                                 |
| Mounting          | Wall mounting                                                                                                                                                                                                                                                                                               | Wall and tube mounting                                                              |
| Temperature range | -20 ... +55 °C                                                                                                                                                                                                                                                                                              | -40 ... +60 °C                                                                      |
| Voltage supply    | 100 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                                                                                  | 100 ... 230 V AC, 50/60 Hz, PoE adapter                                             |
| Benefit           | <ul style="list-style-type: none"> <li>• Easy setup and commissioning through preconfigured settings</li> <li>• Connection of multiple LoRaWAN sensors up to 15 km away</li> <li>• Intelligent solution in situations with missing or poor NB-IoT/LTE-M network coverage at the measuring points</li> </ul> |                                                                                     |

|                               | VEGA Inventory System                                                                                                                                                                                                                                                                                                                           |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                                                                                                                                                                                                                                |
| Application                   | System for inventory monitoring as well as remote enquiry and visualization of measurement and location data                                                                                                                                                                                                                                    |
| Recommended operating systems | <ul style="list-style-type: none"> <li>▪ VEGA Hosting Service: independent of operating system</li> <li>▪ Local server: MS Windows Server 2012 or higher as well as MS SQL Server 2012 or higher</li> </ul>                                                                                                                                     |
| Adjustment                    | With standard web browser                                                                                                                                                                                                                                                                                                                       |
| Versions                      | <ul style="list-style-type: none"> <li>▪ VEGA Hosting Service (VH)</li> </ul>                                                                                                                                                                                                                                                                   |
| Technology                    | Web-based                                                                                                                                                                                                                                                                                                                                       |
| Benefit                       | <ul style="list-style-type: none"> <li>▪ Simple centralized inventory monitoring and management</li> <li>▪ More transparency through connected assets and facilities</li> <li>▪ Avoidance of production stoppages through increased supply security</li> <li>▪ Reduction of transport costs through optimized replenishment planning</li> </ul> |



## Level I Radar



### Area of application

Radar sensors in the VEGAPULS series are used for non-contact level measurement of liquids and bulk solids. They measure all kinds of liquids, even under high pressure and extreme temperatures, in solvents as well as aggressive liquids, they are also suitable for use in applications with stringent hygiene requirements. VEGAPULS sensors can also measure the lightest to the heaviest of bulk solids with absolute reliability, even in the presence of dust and noise, without being affected by buildup or condensation.

### Measuring principle

The measuring instrument sends out short microwave signals toward the medium via the antenna system. The product surface reflects the signal waves, which are then received back by the antenna system. The instrument calculates the level from the running time of the microwave signals and the entered tank height.

### Advantages

Non-contact radar technology is characterized by a particularly high measurement accuracy. The measurement is not affected by changing medium properties or by changing process conditions such as temperature, pressure or intense dust generation. User-friendly adjustment without vessel filling and emptying saves time and the sensors are maintenance free.

|                     | VEGAPULS C 11                                                                                                                                                                                                                                                                   | VEGAPULS C 21/C 22                                                                                                                                                                                                                                                              | VEGAPULS C 23                                                                                                                                                                                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                |                                                                                                                                                                                                |                                                                                                                                                                                                                      |
| Application         | Liquids and bulk solids in simple process conditions                                                                                                                                                                                                                            | Liquids and bulk solids in simple process conditions                                                                                                                                                                                                                            | Liquids and bulk solids in simple process conditions                                                                                                                                                                                                                                                    |
| Measuring range     | 8 m                                                                                                                                                                                                                                                                             | 15 m                                                                                                                                                                                                                                                                            | 30 m                                                                                                                                                                                                                                                                                                    |
| Antenna             | Integrated plastic horn antenna made of PVDF                                                                                                                                                                                                                                    | Integrated plastic horn antenna made of PVDF                                                                                                                                                                                                                                    | Integrated plastic horn antenna made of PVDF                                                                                                                                                                                                                                                            |
| Process fitting     | Threads G1½, 1½ NPT                                                                                                                                                                                                                                                             | Threads G1½, 1½ NPT                                                                                                                                                                                                                                                             | –                                                                                                                                                                                                                                                                                                       |
| Mounting connection | Threads G1, 1 NPT                                                                                                                                                                                                                                                               | VEGAPULS C 21:<br>Threads G1, 1 NPT<br><br>VEGAPULS C 22:<br>Adapter for ceiling mounting                                                                                                                                                                                       | Threads G1, 1 NPT                                                                                                                                                                                                                                                                                       |
| Process temperature | -40 ... +60 °C                                                                                                                                                                                                                                                                  | -40 ... +80 °C                                                                                                                                                                                                                                                                  | -40 ... +80 °C                                                                                                                                                                                                                                                                                          |
| Process pressure    | -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                                                                                                                                                            | -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                                                                                                                                                            | -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                                                                                                                                                                                    |
| Accuracy            | ±5 mm                                                                                                                                                                                                                                                                           | ±2 mm                                                                                                                                                                                                                                                                           | ±2 mm                                                                                                                                                                                                                                                                                                   |
| Frequency range     | W-band, 80 GHz                                                                                                                                                                                                                                                                  | W-band, 80 GHz                                                                                                                                                                                                                                                                  | W-band, 80 GHz                                                                                                                                                                                                                                                                                          |
| Signal output       | 4 ... 20 mA                                                                                                                                                                                                                                                                     | 4 ... 20 mA/HART, SDI 12, Modbus                                                                                                                                                                                                                                                | 4 ... 20 mA/HART, SDI 12, Modbus                                                                                                                                                                                                                                                                        |
| Display/adjustment  | VEGA Tools app, PACTware                                                                                                                                                                                                                                                        | VEGA Tools app, PACTware                                                                                                                                                                                                                                                        | VEGA Tools app, PACTware                                                                                                                                                                                                                                                                                |
| Approvals           | –                                                                                                                                                                                                                                                                               | ATEX, IEC, cCSAus, cFMus, NEPSI, EAC, mcerts, INMETRO, KOSHA/KTL, CCOE, EG 1935/2004, FDA, NSF, KTW, WHG, VLAREM, Ship                                                                                                                                                          | ATEX, IEC, cCSAus, cFMus, NEPSI, EAC, INMETRO, KOSHA/KTL, CCOE, EG 1935/2004, FDA, NSF, KTW, WHG, VLAREM, Ship                                                                                                                                                                                          |
| Benefit             | <ul style="list-style-type: none"> <li>• Maintenance-free operation through non-contact 80 GHz radar technology</li> <li>• Low-cost sensor for simple measuring tasks</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with mobile devices or PC</li> </ul> | <ul style="list-style-type: none"> <li>• Maintenance-free operation through non-contact 80 GHz radar technology</li> <li>• Low-cost sensor for simple measuring tasks</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with mobile devices or PC</li> </ul> | <ul style="list-style-type: none"> <li>• Maintenance-free operation through non-contact 80 GHz radar technology</li> <li>• Unaffected by vessel internals thanks to very good signal focusing</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with mobile devices or PC</li> </ul> |

# Level I Radar

|                     | VEGAPULS 11                                                                                                                                                                                                                                                                     | VEGAPULS 21/31                                                                                                                              |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                |                                                          |
| Application         | Liquids and bulk solids in simple process conditions                                                                                                                                                                                                                            | Liquids and bulk solids in simple process conditions                                                                                        |
| Measuring range     | 8 m                                                                                                                                                                                                                                                                             | 15 m                                                                                                                                        |
| Antenna             | Integrated plastic horn antenna made of PVDF                                                                                                                                                                                                                                    | Integrated plastic horn antenna made of PVDF                                                                                                |
| Process fitting     | Threads G1½, 1½ NPT                                                                                                                                                                                                                                                             | Threads G1½, 1½ NPT                                                                                                                         |
| Process temperature | -40 ... +60 °C                                                                                                                                                                                                                                                                  | -40 ... +80 °C                                                                                                                              |
| Process pressure    | -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                                                                                                                                                            | -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                        |
| Accuracy            | ±5 mm                                                                                                                                                                                                                                                                           | ±2 mm                                                                                                                                       |
| Frequency range     | W-band, 80 GHz                                                                                                                                                                                                                                                                  | W-band, 80 GHz                                                                                                                              |
| Signal output       | 4 ... 20 mA                                                                                                                                                                                                                                                                     | 4 ... 20 mA/HART                                                                                                                            |
| Display/adjustment  | VEGA Tools app, PACTware                                                                                                                                                                                                                                                        | VEGAPULS 21:<br>VEGA Tools app, PACTware<br><br>VEGAPULS 31:<br>Integrated on-site display and 3-key operation,<br>VEGA Tools app, PACTware |
| Approvals           | –                                                                                                                                                                                                                                                                               | ATEX, IEC, cCSAus, cFMus, NEPSI, EAC,<br>mcerts, INMETRO, KOSHA/KTL, CCOE,<br>EG 1935/2004, FDA, NSF, KTW, WHG,<br>VLAREM, Ship             |
| Benefit             | <ul style="list-style-type: none"> <li>• Maintenance-free operation through non-contact 80 GHz radar technology</li> <li>• Low-cost sensor for simple measuring tasks</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with mobile devices or PC</li> </ul> |                                                                                                                                             |

| VEGAPULS 61                                                                                                                                                                             | VEGAPULS 62                                                                                                                                                                                                                   | VEGAPULS 63                                                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                        |                                                                                                                                              |                                                                                                                                         |
| Liquids under simple process conditions                                                                                                                                                 | Storage containers, reactors and process vessels with various process conditions                                                                                                                                              | Aggressive liquids or with hygienic requirements                                                                                                                                                                           |
| up to 35 m                                                                                                                                                                              | up to 35 m                                                                                                                                                                                                                    | up to 35 m                                                                                                                                                                                                                 |
| Plastic horn antenna of PP or encapsulated horn antenna of PVDF                                                                                                                         | Horn antenna, parabolic antenna or standpipe antenna ½" of 316L                                                                                                                                                               | Hygienically encapsulated horn antenna of PTFE or PFA                                                                                                                                                                      |
| Thread G1½, 1½ NPT<br>Mounting strap, compression flanges from DN 80, 3"<br>Adapter flanges from DN 100, 4"                                                                             | Thread from G1½, 1½ NPT<br>Flanges from DN 50, 2"                                                                                                                                                                             | Flanges from DN 50, 2"<br>Slotted nut<br>Hygienic fittings                                                                                                                                                                 |
| -40 ... +80 °C                                                                                                                                                                          | -196 ... +450 °C                                                                                                                                                                                                              | -196 ... +200 °C                                                                                                                                                                                                           |
| -1 ... +3 bar<br>(-100 ... +300 kPa)                                                                                                                                                    | -1 ... +160 bar<br>(-100 ... +16000 kPa)                                                                                                                                                                                      | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                                                                                                                                                                     |
| ±2 mm                                                                                                                                                                                   | ±2 mm                                                                                                                                                                                                                         | ±2 mm                                                                                                                                                                                                                      |
| K-band, 26 GHz                                                                                                                                                                          | K-band, 26 GHz                                                                                                                                                                                                                | K-band, 26 GHz                                                                                                                                                                                                             |
| 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                              | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                                    | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                                 |
| PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                              | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                    | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                 |
| ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2                                                                                                              | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2                                                                                                                                                    | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>▪ Economical solution through wide variety of mounting options</li> <li>▪ Maintenance-free operation with encapsulated antenna system</li> </ul> | <ul style="list-style-type: none"> <li>▪ Optimal solution for nearly all applications through different antenna versions</li> <li>▪ Simple planning and engineering thanks to large temperature and pressure range</li> </ul> | <ul style="list-style-type: none"> <li>▪ Continuous maintenance-free operation through high chemical resistance</li> <li>▪ Optimal cleaning to meet strict hygienic requirements thanks to front-flush mounting</li> </ul> |

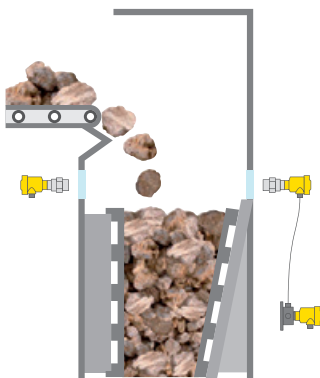
# Level I Radar

|                     | VEGAPULS 64                                                                                                                                                                                                             | VEGAPULS 66                                                                                          | VEGAPULS 67                                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                        |                    |                                                                                                      |
| Application         | Liquids under various process conditions or with hygienic requirements                                                                                                                                                  | Liquids under difficult process conditions                                                           | Bulk solids in vessels of average height                                                                                                                                                |
| Measuring range     | up to 30 m                                                                                                                                                                                                              | up to 35 m                                                                                           | up to 15 m                                                                                                                                                                              |
| Antenna             | Plastic horn antenna of PP, thread with integrated horn antenna, flange with encapsulated antenna system                                                                                                                | Horn antenna of 316L or enamel or standpipe 2" of 316L                                               | Completely encapsulated plastic horn antenna of PP                                                                                                                                      |
| Process fitting     | Mounting strap, thread from G $\frac{3}{4}$ , $\frac{3}{4}$ NPT, flanges from DN 50, 2", compression flanges from DN 80, 3", hygienic fittings                                                                          | Flanges from DN 50, 2"                                                                               | Mounting strap, compression flanges from DN 80, 3"<br>Adapter flanges from DN 100, 4"                                                                                                   |
| Process temperature | -196 ... +200 °C                                                                                                                                                                                                        | -60 ... +400 °C                                                                                      | -40 ... +80 °C                                                                                                                                                                          |
| Process pressure    | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                  | -1 ... +160 bar<br>(-100 ... +16000 kPa)                                                             | -1 ... +2 bar<br>(-100 ... +200 kPa)                                                                                                                                                    |
| Accuracy            | ±1 mm                                                                                                                                                                                                                   | ±8 mm                                                                                                | ±2 mm                                                                                                                                                                                   |
| Frequency range     | W-band, 80 GHz                                                                                                                                                                                                          | C-band, 6 GHz                                                                                        | K-band, 26 GHz                                                                                                                                                                          |
| Signal output       | 4 ... 20 mA/HART                                                                                                                                                                                                        | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                           | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                              |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                              | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                           | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                              |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship                                                                                                                                                    | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2                           | ATEX, IEC, FM, CSA, SIL2, EAC (GOST), UKR Sepro                                                                                                                                         |
| Benefit             | <ul style="list-style-type: none"> <li>• Ideal solution for very small and narrow vessels through extreme signal focusing</li> <li>• High plant availability, hence insensitive to buildup and contamination</li> </ul> | <ul style="list-style-type: none"> <li>• Universal use through different antenna versions</li> </ul> | <ul style="list-style-type: none"> <li>• Economical solution through wide variety of mounting options</li> <li>• Maintenance-free operation with encapsulated antenna system</li> </ul> |

|  | VEGAPULS 68 (SR 68)                                                                                                                                                                                                                    | VEGAPULS 69                                                                                                                                                                                                    |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                       |                                                                                                                              |
|  | Bulk solids for average to large vessels                                                                                                                                                                                               | Bulk solids for smaller or very large vessels                                                                                                                                                                  |
|  | up to 75 m, SR 68: up to 30 m                                                                                                                                                                                                          | up to 120 m                                                                                                                                                                                                    |
|  | Horn or parabolic antenna of 316L                                                                                                                                                                                                      | Plastic horn antenna of PP, metal jacketed lens antenna with rinsing air connection of PEEK, thread with integrated horn antenna                                                                               |
|  | Thread from G1½, 1½ NPT, flanges from DN 50, 2"                                                                                                                                                                                        | Mounting strap, compression flanges from DN 80, 3"; flanges from DN 80, 3", thread G1½, 1½ NPT                                                                                                                 |
|  | -196 ... +450 °C<br>SR 68: -40 ... +250 °C                                                                                                                                                                                             | -40 ... +200 °C                                                                                                                                                                                                |
|  | -1 ... +160 bar<br>(-100 ... +16000 kPa)<br>SR 68: -1 ... +100 bar<br>(-100 ... +10000 kPa)                                                                                                                                            | -1 ... +20 bar<br>(-100 ... +2000 kPa)                                                                                                                                                                         |
|  | ±2 mm                                                                                                                                                                                                                                  | ±5 mm                                                                                                                                                                                                          |
|  | K-band, 26 GHz                                                                                                                                                                                                                         | W-band, 80 GHz                                                                                                                                                                                                 |
|  | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                                             | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                     |
|  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                             | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                     |
|  | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, only VEGAPULS 68: Ship, SIL2                                                                                                                                                                | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro                                                                                                                                                                      |
|  | <ul style="list-style-type: none"> <li>Optimal solution for almost all applications due to different antenna versions and materials</li> <li>Simple planning and engineering thanks to large temperature and pressure range</li> </ul> | <ul style="list-style-type: none"> <li>Ideal solution for very narrow or very large containers through extreme signal focusing</li> <li>Maintenance-free operation with encapsulated antenna system</li> </ul> |



## Point level detection | Radar



### Area of application

The microwave barriers of the VEGAMIP series are suitable for non-contact point level detection of liquids and bulk solids of any kind. Even point level detection of high-purity liquids through the container wall is possible. When it comes to bulk solids, the microwave barrier lends itself well for heavy and dust-generating media or for blockage detection in conveying systems.

### Measuring principle

The microwave barrier works like a light barrier: if the microwave beam between transmitter and receiver is blocked by the rising medium, the measuring signal is damped. This change is detected by the receiver and converted into a switching signal.



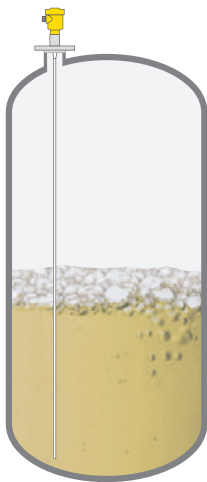
### Advantages

This method allows point level detection without direct contact with the medium. Dirt, buildup and abrasion on the sensor are eliminated, allowing a wear and maintenance-free operation.

|                     | VEGAMIP T61                                                                                                                                                                                                                                                 | VEGAMIP R61                                                                                                                                                     | VEGAMIP R62                                                                                                                                                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                            |                                                                                |                                                                                                                                                    |
| Application         | Bulk solids, liquids                                                                                                                                                                                                                                        | Bulk solids, liquids                                                                                                                                            | Bulk solids, liquids in dangerous mounting or hard-to-reach locations                                                                                                                                                                 |
| Version             | Emitter                                                                                                                                                                                                                                                     | Receiver                                                                                                                                                        | Receiver with separate version                                                                                                                                                                                                        |
| Measuring range     | up to 100 m                                                                                                                                                                                                                                                 | up to 100 m                                                                                                                                                     | up to 100 m                                                                                                                                                                                                                           |
| Antenna             | Inside horn antenna with PTFE cover, plastic horn antenna with PP cover                                                                                                                                                                                     | Inside horn antenna with PTFE cover, plastic horn antenna with PP cover                                                                                         | Inside horn antenna with PTFE cover, plastic horn antenna with PP cover                                                                                                                                                               |
| Process fitting     | Thread G1½, 1½ NPT, flanges, clamp, mounting strap                                                                                                                                                                                                          | Thread G1½, 1½ NPT, flanges, clamp, mounting strap                                                                                                              | Thread G1½, 1½ NPT, flanges, clamp, mounting strap                                                                                                                                                                                    |
| Process temperature | -40 ... +80 °C<br>+450 °C with mounting adapter                                                                                                                                                                                                             | -40 ... +80 °C<br>+450 °C with mounting adapter                                                                                                                 | -40 ... +80 °C<br>+450 °C with mounting adapter                                                                                                                                                                                       |
| Process pressure    | -1 ... +4 bar<br>(-100 ... +400 kPa)                                                                                                                                                                                                                        | -1 ... +4 bar<br>(-100 ... +400 kPa)                                                                                                                            | -1 ... +4 bar<br>(-100 ... +400 kPa)                                                                                                                                                                                                  |
| Frequency range     | K-band, 24 GHz                                                                                                                                                                                                                                              | K-band, 24 GHz                                                                                                                                                  | K-band, 24 GHz                                                                                                                                                                                                                        |
| Signal output       | –                                                                                                                                                                                                                                                           | Relay, transistor                                                                                                                                               | Relay, transistor                                                                                                                                                                                                                     |
| Approvals           | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), UKR Sepro                                                                                                                                                                                                            | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), UKR Sepro                                                                                                                | ATEX, IEC, NEPSI, CSA, EAC (GOST)                                                                                                                                                                                                     |
| Benefit             | <ul style="list-style-type: none"> <li>Simple installation and mounting, as transmitter requires no parameterization</li> <li>Universal transmitter for VEGAMIP R61 and VEGAMIP R62 saves time during planning and reduces costs of stockkeeping</li> </ul> | <ul style="list-style-type: none"> <li>Compact instrument saves time and money when installing and connecting, as no separate controller is required</li> </ul> | <ul style="list-style-type: none"> <li>Separate instrument version allows installation in hard-to-reach or dangerous locations</li> <li>Simple adjustment procedure saves time and money when setting up and commissioning</li> </ul> |



## Level I Guided Wave Radar



### Area of application

The GWR sensors of the VEGAFLEX series are suitable for level measurement in liquids and bulk solids. In liquids, they can also detect the interface between two media. They measure liquid levels very reliably, even under high pressure and extreme temperatures. They can be used in simple as well as in aggressive media and are also suitable for applications with stringent hygiene requirements. The sensors are able to measure light and heavy bulk solids with absolute reliability, even in the presence of dust and noise.

### Measuring principle

High-frequency microwave pulses are coupled onto a cable or rod and guided along the probe. The pulses are reflected by the surface of the medium. The instrument calculates the level from the running time of the radar pulses versus the programmed tank height.

### Advantages

GWR sensors operate independently of noise, pressure or temperature fluctuations and are also completely unaffected by changes in density, foaming, steam or dust. Buildup on the probe or on the container wall hardly affects the measurement. This allows simple, straightforward system design and engineering. The menu-driven adjustment routines enable simple, time-saving and confident setup.

|                     | VEGAFLEX 81                                                                                                                                                                                                                                                                                                   | VEGAFLEX 82                                                                                                              |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                              |                                       |
| Application         | All kind of liquids, applications with steam, buildup, foam generation, condensation as well as ammonia                                                                                                                                                                                                       | Light-weight and heavy-weight bulk solids of all kind, applications with strong dust generation, condensation or buildup |
| Measuring range     | Cable probe up to 75 m of 316 or Alloy C22<br>Rod probe up to 6 m of 316L, Alloy C22, Alloy C276, Duplex, 304L or Alloy 400<br>Coax probe up to 6 m of 316L, Alloy C22 or 304L                                                                                                                                | Cable probe up to 75 m of 316 or 316 PA coated<br>Rod probe up to 6 m of 316L or Alloy C22                               |
| Version             | Exchangeable cable (ø 2 mm, ø 4 mm)<br>Exchangeable rod (ø 8 mm, ø 12 mm)<br>Coax (ø 21.3 mm, ø 42.2 mm)                                                                                                                                                                                                      | Exchangeable cable (ø 4 mm, ø 6 mm, ø 11 mm)<br>Exchangeable rod (ø 16 mm)                                               |
| Process fitting     | Thread from G $\frac{3}{4}$ , $\frac{3}{4}$ NPT, flanges from DN 25, 1"                                                                                                                                                                                                                                       | Thread from G $\frac{3}{4}$ , $\frac{3}{4}$ NPT, flanges from DN 25, 1"                                                  |
| Process temperature | -60 ... +200 °C                                                                                                                                                                                                                                                                                               | -40 ... +200 °C                                                                                                          |
| Process pressure    | -1 ... +40 bar<br>(-100 ... +4000 kPa)                                                                                                                                                                                                                                                                        | -1 ... +40 bar<br>(-100 ... +4000 kPa)                                                                                   |
| Accuracy            | ±2 mm                                                                                                                                                                                                                                                                                                         | ±2 mm                                                                                                                    |
| Signal output       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                                                                                                                    | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                               |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                                                                                    | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                               |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, FDA, INMETRO, NEPSI, KOSHA, CCOE                                                                                                                                                                                                  | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, INMETRO, NEPSI, KOSHA, CCOE                  |
| Benefit             | <ul style="list-style-type: none"> <li>Comprehensive diagnostic options ensure low-maintenance operation and thus high plant availability</li> <li>Shortenable probes enable simple standardization and maximum flexibility in planning</li> <li>Factory calibration simplifies setup considerably</li> </ul> |                                                                                                                          |

# Level I Guided Wave Radar

|                     | VEGAFLEX 83                                                                                                                                                                                       | VEGAFLEX 86                                                                                                                                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                  |                                                                                                                                                                    |
| Application         | Aggressive liquids or liquid media with stringent hygienic requirements, applications with steam, buildup, foam generation or condensation                                                        | Virtually all liquids under extreme pressure and temperature conditions, applications with buildup, foam generation or condensation                                                                                                                   |
| Measuring range     | Cable probe up to 32 m of PFA<br>Rod probe up to 4 m of PFA or 1.4435 (BN)                                                                                                                        | Cable probe up to 75 m of 316 or Alloy C22<br>Rod probe up to 6 m of 316L or Alloy C22<br>Coax probe up to 6 m of 316L, Alloy C22, Duplex or Alloy C276                                                                                               |
| Version             | Cable (ø 4 mm)<br>Rod (ø 8 mm, ø 10 mm)                                                                                                                                                           | Exchangeable cable (ø 2 mm, ø 4 mm)<br>Exchangeable rod (ø 8 mm, ø 16 mm)<br>Coax (ø 21.3 mm, ø 42.2 mm)                                                                                                                                              |
| Process fitting     | Flanges from DN 25, 1", hygienic fittings, clamp, slotted nut                                                                                                                                     | Thread from G $\frac{3}{4}$ , $\frac{3}{4}$ NPT, flanges from DN 25, 1"                                                                                                                                                                               |
| Process temperature | -40 ... +150 °C                                                                                                                                                                                   | -196 ... +450 °C                                                                                                                                                                                                                                      |
| Process pressure    | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                                                                                                                                            | -1 ... +400 bar<br>(-100 ... +40000 kPa)                                                                                                                                                                                                              |
| Accuracy            | ±2 mm                                                                                                                                                                                             | ±2 mm                                                                                                                                                                                                                                                 |
| Signal output       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                        | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus, Modbus                                                                                                                                                                                            |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                        | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                            |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, EHEDG/3-A, FDA, INMETRO, NEPSI, KOSHA, CCOE                                                                           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, steam boiler, Overfill protection, Ship, SIL2, INMETRO, NEPSI, KOSHA, CCOE                                                                                                                                 |
| Benefit             | <ul style="list-style-type: none"> <li>Gap-free hygienic design ensures good cleanability with simple methods</li> <li>Maintenance-free operation increases profitability of the plant</li> </ul> | <ul style="list-style-type: none"> <li>Comprehensive diagnostic options guarantee low-maintenance operation and thus high plant availability</li> <li>Shortenable probes enable simple standardization and maximum flexibility in planning</li> </ul> |



# Level | Magnetic level gauge | Bypass

## Application range

VEGAMAG bypass level indicators are ideal for measuring and indicating the level of liquids without auxiliary energy. They can also determine where the interface between two different media is located. Due to the large selection of materials, VEGAMAG instruments can also be used for aggressive liquids.

## Measuring principle

The VEGAMAG visually communicates the contents of the level in the tank. It consists of an external vertical bypass float chamber with lateral process fittings into the tank. The float chamber contains a float with an integrated permanent magnet which, as the level moves up and down, causes the individual magnetised flags inside a level indicator scale mounted to the side of the chamber to rotate and change colour.

## Advantages

The level inside a tank can be displayed without auxiliary energy and is visible from a distance. The VEGAMAG level indicator can be completely decoupled from the tank by means of valves built into the process fittings. This allows maintenance to be performed without interrupting the process in the main tank. If required, a level switch can be retrofitted to the level indicator.

|                      | VEGAMAG 81                                                                                                                                                                                                  |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                                                                                          |
| Application          | Bypass vessel for liquid-holding tanks, for measuring and indicating levels without auxiliary energy (directly communicating vessel)                                                                        |
| Measuring range      | up to 4 m                                                                                                                                                                                                   |
| Version              | ASME B31.3<br>PED 2014/68/EU<br>EAC 032/2013                                                                                                                                                                |
| Process fitting tank | Flanges from 1/2"/DN15<br>Threaded connections from 1/2"<br>Welding sockets from 1/2"                                                                                                                       |
| Process temperature  | -196 °C ... +450 °C                                                                                                                                                                                         |
| Process pressure     | 0 ... +100 bar<br>(0 ... +10000 kPa)                                                                                                                                                                        |
| Measurement accuracy | ±5 mm                                                                                                                                                                                                       |
| Approvals            | ASME 31.3<br>PED 2014/68/EU<br>EAC 032/2013                                                                                                                                                                 |
| Benefits             | <ul style="list-style-type: none"> <li>• Measurement and on-site indication without auxiliary energy</li> <li>• Manufactured according to customer specifications</li> <li>• Minimal maintenance</li> </ul> |

## Application range

VEGAPASS is a bypass chamber mounted on the outside of a liquid tank, which is designed to hold a level, point level or interface measuring instrument. Due to the large selection of materials, VEGAPASS instruments can also be used for aggressive liquids.

## Measuring principle

VEGAPASS is an externally mounted standpipe with lateral process fittings that effectively communicates the level inside the tank to the outside world. By adding a suitable instrument into the chamber, an electronic measurement of level, point level or interface can be carried out. VEGAPASS and the additional measuring instrument form a measuring system, which is engineered and delivered pre-assembled on request.

## Advantages

VEGAPASS can be completely isolated from the tank by means of valves built into the process fittings. This allows maintenance to be performed without interrupting the process in the main tank. VEGAPASS and the additionally selected measuring instrument are optimally matched to each other and designed to suit customer requirements.

|                      | VEGAPASS 81                                                                                                                                                                                                                                               |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                                                                                                                                        |
| Application          | Bypass chamber for liquid tanks to accommodate level, point level or interface sensors (communicates the direct vessel level)                                                                                                                             |
| Measuring range      | up to 4 m                                                                                                                                                                                                                                                 |
| Version              | ASME B31.3<br>PED 2014/68/EU<br>EAC 032/2013                                                                                                                                                                                                              |
| Process fitting tank | Flanges from 1/2"/DN15<br>Threaded connections from 1/2"<br>Welding sockets from 1/2"                                                                                                                                                                     |
| Process temperature  | -196 °C ... +450 °C                                                                                                                                                                                                                                       |
| Process pressure     | 0 ... +205 bar<br>(0 ... +20500 kPa)<br>depends on the built-in sensor                                                                                                                                                                                    |
| Measurement accuracy | depends on the built-in sensor                                                                                                                                                                                                                            |
| Approvals            | ASME 31.3<br>PED 2014/68/EU<br>EAC 032/2013<br>depends on the built-in sensor                                                                                                                                                                             |
| Benefits             | <ul style="list-style-type: none"><li>• Complete solution comprising bypass vessel and measurement technology</li><li>• Designed and manufactured according to customer specifications</li><li>• Maintenance-free, as there are no moving parts</li></ul> |



## Level I Ultrasonic



### Area of application

The ultrasonic sensors of the VEGASON series are suitable for non-contact level measurement of liquids and bulk solids in simple applications with stable measuring conditions. Typical applications with liquids are storage tanks and open basins. Bulk solids applications usually involve level measurement in open containers and small vessels.

### Measuring principle

VEGASON sends pulses of ultrasonic sound waves in the direction of the medium to be measured. These pulses are reflected by the surface of the medium and then received back by the sensor. The instrument calculates the level from the running time of the sound waves versus the programmed tank height.

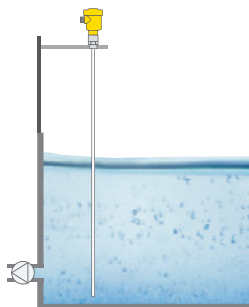
### Advantages

The compact design allows for easy installation of the sensor. Since the properties of the medium do not affect the level measurement, setup and commissioning can be carried out without medium. The low-cost, non-contact measuring method allows wear and maintenance-free operation.

|                     | VEGASON 61                                                                                                                                                                                                                                 | VEGASON 62                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                                                                                                                                                           |  |
| Application         | Liquids and bulk solids in small vessels                                                                                                                                                                                                   | Liquids and bulk solids in small vessels                                            |
| Measuring range     | Liquids: 0.25 ... 5 m<br>Bulk solids: 0.25 ... 2 m                                                                                                                                                                                         | Liquids: 0.4 ... 8 m<br>Bulk solids: 0.4 ... 3.5 m                                  |
| Transducer          | of PVDF                                                                                                                                                                                                                                    | of PVDF                                                                             |
| Process fitting     | Thread G1½, 1½ NPT                                                                                                                                                                                                                         | Thread G2, 2 NPT                                                                    |
| Process temperature | -40 ... +80 °C                                                                                                                                                                                                                             | -40 ... +80 °C                                                                      |
| Process pressure    | -0.2 ... +2 bar<br>(-20 ... +200 kPa)                                                                                                                                                                                                      | -0.2 ... +2 bar<br>(-20 ... +200 kPa)                                               |
| Accuracy            | ±10 mm                                                                                                                                                                                                                                     | ±10 mm                                                                              |
| Signal output       | 4 ... 20 mA/HART, Profibus PA,<br>Foundation Fieldbus                                                                                                                                                                                      | 4 ... 20 mA/HART, Profibus PA,<br>Foundation Fieldbus                               |
| Display/adjustment  | PLICSCOM, PACTware,<br>VEGADIS 81, VEGADIS 82                                                                                                                                                                                              | PLICSCOM, PACTware,<br>VEGADIS 81, VEGADIS 82                                       |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, Ship, SIL2                                                                                                                                                                                   | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, Ship, SIL2                            |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Maintenance-free operation through non-contact measuring method</li> <li>▪ Reliable measurement, independent of medium properties</li> <li>▪ Low-cost solution for simple applications</li> </ul> |                                                                                     |



## Level | Capacitive

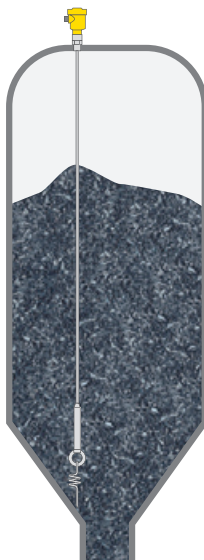


### Area of application

The robust level sensors of the VEGACAL series are used for level measurement in bulk solids and homogeneous liquids that have stable electrical properties. With the fully insulated instrument version, aggressive liquids as well as very adhesive products can be measured. The partly insulated version is preferably used for bulk solids.

### Measuring principle

In capacitive level measurement, sensor and vessel form the two electrodes of a capacitor. Any change in capacitance due to a level change is converted into a level signal.



### Advantages

This level measuring method is very economical and allows measurement over the entire sensor length without blocking distance. Thanks to shortenable cable and rod versions, the sensors can be adapted to any application and are very easy to install. Its robust mechanical design is the basis for reliable, trouble and maintenance-free operation and a long service life.

|                     | VEGACAL 62                                                                                                                                                                                       | VEGACAL 63                                                                               | VEGACAL 64                                                                               |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                     |                                                                                                                 |         |       |
| Application         | Bulk solids, non-conductive liquids                                                                                                                                                              | Liquids                                                                                  | Adhesive liquids                                                                         |
| Measuring range     | up to 6 m                                                                                                                                                                                        | up to 6 m                                                                                | up to 4 m                                                                                |
| Version             | Partly insulated rod of steel, 316L, Alloy, PTFE, PEEK                                                                                                                                           | Fully insulated rod of steel, 316L, Alloy, PTFE, PE                                      | Fully insulated rod of steel, 316L, Alloy, FEP                                           |
| Process fitting     | Thread from G½, ½ NPT, flanges from DN 25, 1"                                                                                                                                                    | Thread from G½, ½ NPT, flanges from DN 25, 1"                                            | Thread from G¾, ¾ NPT, flanges from DN 25, 1"                                            |
| Process temperature | -50 ... +200 °C                                                                                                                                                                                  | -50 ... +200 °C                                                                          | -50 ... +150 °C                                                                          |
| Process pressure    | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                                                                                                                           | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                   | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                   |
| Signal output       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                               | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                       |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                       | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                               | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                               |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI, KOSHA                                                                                                         | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI, KOSHA | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI, KOSHA |
| Benefit             | <ul style="list-style-type: none"> <li>Maximum container utilization, because entire probe length is used for measuring</li> <li>Cost savings thanks to simple installation and setup</li> </ul> |                                                                                          |                                                                                          |

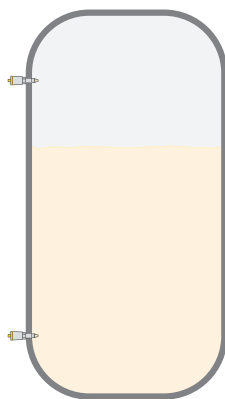
# Level I Capacitive

|                     | VEGACAL 65                                                                                                                                                                                           | VEGACAL 66                                                                               |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
|                     |                                                                                                                     |       |
| Application         | Bulk solids, non-conductive liquids                                                                                                                                                                  | Liquids and bulk solids, not abrasive                                                    |
| Measuring range     | up to 32 m                                                                                                                                                                                           | up to 32 m                                                                               |
| Version             | Partly insulated cable of steel, 316L, Alloy, PTFE, PEEK, PA                                                                                                                                         | Fully insulated cable of steel, 316L, PTFE                                               |
| Process fitting     | Thread from G1, 1 NPT, flanges from DN 50, 2"                                                                                                                                                        | Thread from G1, 1 NPT, flanges from DN 50, 2"                                            |
| Process temperature | -50 ... +200 °C                                                                                                                                                                                      | -50 ... +150 °C                                                                          |
| Process pressure    | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                                                                                                                               | -1 ... +40 bar<br>(-100 ... +4000 kPa)                                                   |
| Signal output       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                                   | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                       |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                           | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                               |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI, KOSHA                                                                                                             | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI, KOSHA |
| Benefit             | <ul style="list-style-type: none"> <li>• Maximum container utilization, because entire probe length is used for measuring</li> <li>• Cost savings thanks to simple installation and setup</li> </ul> |                                                                                          |

|  | VEGACAL 67                                                                                                                      | VEGACAL 69                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|  |                                                |                                 |
|  | Bulk solids with high process temperatures                                                                                      | Liquids in non-conductive vessels                                                                                |
|  | Rod up to 6 m; cable up to 40 m                                                                                                 | up to 4 m                                                                                                        |
|  | Rod or cable of steel, 316L, ceramic                                                                                            | Fully insulated double rod made of PTFE, PP, FEP                                                                 |
|  | Thread from G1½, 1½ NPT, flanges from DN 50, 2"                                                                                 | Flanges from DN 50, 2"                                                                                           |
|  | -50 ... +400 °C                                                                                                                 | -50 ... +100 °C                                                                                                  |
|  | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                                                                          | -1 ... +2 bar<br>(-100 ... +200 kPa)                                                                             |
|  | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                              | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                               |
|  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                      | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                       |
|  | –                                                                                                                               | ATEX, IEC, EAC (GOST), UKR Sepro                                                                                 |
|  | <ul style="list-style-type: none"> <li>Exact measuring results in almost all bulk solids and high temperature ranges</li> </ul> | <ul style="list-style-type: none"> <li>Simple, fast installation thanks to compact, double rod design</li> </ul> |



## Point level | Capacitive



### Area of application

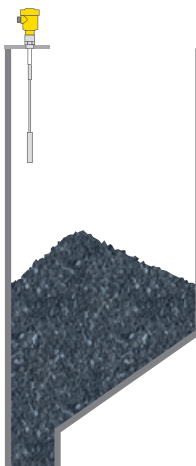
The point level sensors of the VEGAPOINT and VEGACAP series are used in homogeneous liquids and bulk solids in tanks and pipelines. They serve as overflow protection and dry run protection. They can also be used for foam detection and liquid media differentiation, e.g. oil-water detection.

### Measuring principle

In capacitive level measurement, sensor and vessel form the two electrodes of a capacitor. Any change in capacitance due to a level change is converted into a switching signal. The capacitive measuring principle places no special requirements on installation and mounting.

### Advantages

These low-cost point level sensors can be installed in tanks or pipes in any position. Thanks to shortenable cable and rod versions, VEGACAP sensors can be adapted to suit their application and are very easy to install. Their robust mechanical design is the basis for reliable, trouble-free and maintenance-free operation and a long service life. The excellent cleanability and hygienic design of VEGAPOINT sensors make them particularly suitable for use in the food and pharmaceutical industries.



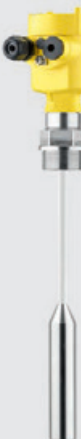
|                     | VEGAPOINT 11                                                                                                                                                                                                                                                        | VEGAPOINT 21/31                                                                                                                                                                                                                                                                                                                                          |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                    |                                                                                                                                                                                                                                                                       |
| Application         | Water-based liquids                                                                                                                                                                                                                                                 | VEGAPOINT 21: liquids<br>VEGAPOINT 31: bulk solids                                                                                                                                                                                                                                                                                                       |
| Version             | Compact version                                                                                                                                                                                                                                                     | Compact version                                                                                                                                                                                                                                                                                                                                          |
| Process fitting     | Threads from G½, ½ NPT,<br>universal connector for hygiene adapter                                                                                                                                                                                                  | Threads from G½, ½ NPT,<br>universal connector for hygiene adapter                                                                                                                                                                                                                                                                                       |
| Process temperature | -20 °C ... +100 °C/<br>1 h @ +135 °C                                                                                                                                                                                                                                | -40 °C ... +115 °C/<br>1 h @ +135 °C                                                                                                                                                                                                                                                                                                                     |
| Process pressure    | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                              | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                                                                                                                   |
| Signal output       | Three-wire: PNP/NPN, IO-Link                                                                                                                                                                                                                                        | Three-wire: PNP/NPN, IO-Link                                                                                                                                                                                                                                                                                                                             |
| Approvals           | EG 1935/2004, FDA, ADI                                                                                                                                                                                                                                              | ATEX, IEC, EG 1935/2004, FDA, 3-A, EHEDG,<br>ASME BPE, USP Class VI, ADI, China FDA,<br>WHG, VLAREM, SVTI, Ship                                                                                                                                                                                                                                          |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Low-cost level switch with extremely small installation dimensions</li> <li>▪ Adjustment-free for easy setup</li> <li>▪ Highly visible, adjustable full-colour multidirectional (360°) switching status display</li> </ul> | <ul style="list-style-type: none"> <li>▪ Low-cost level switch with extremely small installation dimensions</li> <li>▪ Adjustment-free for easy setup</li> <li>▪ Highly visible, adjustable full-colour multidirectional (360°) switching status display</li> <li>▪ User-friendly, wireless setup and diagnosis via Bluetooth with smartphone</li> </ul> |

# Point level | Capacitive

|                     | VEGAPOINT 23                                                                                                                                                                                                                                                                                                                                                        | VEGAPOINT 24                                                                                                                                                                                                                                                                                                                                        |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                  |
| Application         | Liquids and bulk solids                                                                                                                                                                                                                                                                                                                                             | Adhesive media or flush mounting                                                                                                                                                                                                                                                                                                                    |
| Version             | Compact version with tube extension up to 1 m                                                                                                                                                                                                                                                                                                                       | Compact version                                                                                                                                                                                                                                                                                                                                     |
| Process fitting     | Thread from G½, ½ NPT, universal connector for hygiene adapter                                                                                                                                                                                                                                                                                                      | Thread from G½, ½ NPT, universal connector for hygiene adapter                                                                                                                                                                                                                                                                                      |
| Process temperature | Tube extension ≤ 250 mm:<br>-40 °C ... +115 °C/1 h @ +135 °C<br><br>Tube extension > 250 mm:<br>-40 °C ... +80 °C/1 h @ +135 °C                                                                                                                                                                                                                                     | -40 °C ... +115 °C/1 h @ +135 °C                                                                                                                                                                                                                                                                                                                    |
| Process pressure    | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                                                                                                                              | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                                                                                                              |
| Signal output       | Three-wire: PNP/NPN, IO-Link                                                                                                                                                                                                                                                                                                                                        | Three-wire: PNP/NPN, IO-Link                                                                                                                                                                                                                                                                                                                        |
| Approvals           | ATEX, IEC, EG 1935/2004, FDA, 3-A, EHEDG, ASME BPE, USP Class VI, ADI, China FDA, WHG, VLAREM, SVTI, Ship                                                                                                                                                                                                                                                           | ATEX, EG 1935/2004, FDA, 3-A, EHEDG, USP Class VI, ADI, China FDA, WHG, VLAREM, SVTI                                                                                                                                                                                                                                                                |
| Benefit             | <ul style="list-style-type: none"> <li>• Low-cost level switch with selectable switching point position/tube extension</li> <li>• Adjustment-free for easy setup</li> <li>• Highly visible, adjustable full-colour multidirectional (360°) switching status display</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with smartphone</li> </ul> | <ul style="list-style-type: none"> <li>• Inexpensive level switch, optimised for adhesive media</li> <li>• Absolutely front-flush measuring cell</li> <li>• Highly visible, adjustable full-colour multidirectional (360°) switching status display</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with smartphone</li> </ul> |

|                     | VEGACAP 62                                                                                                                                    | VEGACAP 63                                                                        | VEGACAP 64                                                                          |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                                                              |  |  |
| Application         | Liquids and bulk solids                                                                                                                       | Liquids and bulk solids, not abrasive                                             | Adhesive liquids and light-weight bulk solids, not abrasive                         |
| Version             | Partly insulated rod of steel, 316L, PTFE up to 6 m                                                                                           | Fully insulated rod of steel, 316L, PE, PTFE, Alloy up to 6 m                     | Fully insulated rod of steel, 316L, PTFE up to 4 m                                  |
| Process fitting     | Thread from G½, ½ NPT, flanges from DN 25, 1"                                                                                                 | Thread from G½, ½ NPT, flanges from DN 25, 1"                                     | Thread from G¾, ¾ NPT, flanges from DN 25, 1"                                       |
| Process temperature | -50 ... +200 °C                                                                                                                               | -50 ... +200 °C                                                                   | -50 ... +200 °C                                                                     |
| Process pressure    | -1 ... +64 bar (-100 ... +6400 kPa)                                                                                                           | -1 ... +64 bar (-100 ... +6400 kPa)                                               | -1 ... +64 bar (-100 ... +6400 kPa)                                                 |
| Signal output       | Relay, transistor, two-wire output, contactless electronic switch                                                                             | Relay, transistor, two-wire output, contactless electronic switch                 | Relay, transistor, two-wire output, contactless electronic switch                   |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI                                                             | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI   |
| Benefit             | <ul style="list-style-type: none"> <li>• Rugged, resistant designs</li> <li>• Cost savings thanks to simple installation and setup</li> </ul> |                                                                                   |                                                                                     |

# Point level | Capacitive

|                     | VEGACAP 65                                                                                                                                                                                | VEGACAP 66                                                                        | VEGACAP 67                                                                                                        |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                          |  |                                |
| Application         | Liquids and bulk solids                                                                                                                                                                   | Liquids and bulk solids, not abrasive                                             | Bulk solids with high process temperatures                                                                        |
| Version             | Partly insulated steel cable, 316L, PTFE, PE up to 32 m                                                                                                                                   | Fully insulated steel cable, 316L, PTFE up to 32 m                                | Partly insulated steel rod or cable, 316L, ceramic up to 6 m (rod) up to 40 m (cable)                             |
| Process fitting     | Thread from G1, 1 NPT, flanges from DN 50, 2"                                                                                                                                             | Thread from G1, 1 NPT, flanges from DN 50, 2"                                     | Thread from G1½, 1½ NPT, flanges from DN 50, 2"                                                                   |
| Process temperature | -50 ... +200 °C                                                                                                                                                                           | -50 ... +150 °C                                                                   | -50 ... +400 °C                                                                                                   |
| Process pressure    | -1 ... +64 bar (-100 ... +6400 kPa)                                                                                                                                                       | -1 ... +40 bar (-100 ... +4000 kPa)                                               | -1 ... +16 bar (-100 ... +1600 kPa)                                                                               |
| Signal output       | Relay, transistor, two-wire output, contactless electronic switch                                                                                                                         | Relay, transistor, two-wire output, contactless electronic switch                 | Relay, transistor, two-wire output, contactless electronic switch                                                 |
| Approvals           | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI                                                                                                         | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, NEPSI | –                                                                                                                 |
| Benefit             | <ul style="list-style-type: none"> <li>• Rugged, resistant designs with capability to ignore buildup on sensor</li> <li>• Cost savings thanks to simple installation and setup</li> </ul> |                                                                                   | <ul style="list-style-type: none"> <li>• Universal use in bulk solids thanks to wide temperature range</li> </ul> |

|  | VEGACAP 69                                                                                                       | VEGACAP 27                                                                                                                                                                       | VEGACAP 35                                                                        | VEGACAP 98                                                                          |
|--|------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |                                 |                                                                                                 |  |  |
|  | Liquids, also in non-conductive vessels                                                                          | Adhesive, conductive liquids                                                                                                                                                     | Bulk solids                                                                       | Liquids, bulk solids                                                                |
|  | Fully insulated double rod of PTFE, PP, FEP up to 4 m                                                            | Fully insulated rod of steel, 316Ti, PTFE, PFA up to 4 m                                                                                                                         | Insulated cable of steel, 316Ti, PE, PA12 up to 20 m                              | Fully insulated rod of PP up to 2 m                                                 |
|  | Flanges from DN 50, 2"                                                                                           | Thread from G1, 1 NPT, Clamp 1½"                                                                                                                                                 | Thread from G1½, 1½ NPT                                                           | Thread from G1½, 1½ NPT                                                             |
|  | -50 ... +100 °C                                                                                                  | -50 ... +200 °C                                                                                                                                                                  | -40 ... +80 °C                                                                    | -40 ... +80 °C                                                                      |
|  | -1 ... +2 bar<br>(-100 ... +200 kPa)                                                                             | -1 ... +63 bar<br>(-100 ... +6300 kPa)                                                                                                                                           | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                            | Unpressurized operation                                                             |
|  | Relay, transistor, two-wire output, contactless electronic switch                                                | Relay output                                                                                                                                                                     | Relay output                                                                      | Relay output                                                                        |
|  | ATEX, EAC (GOST), UKR Sepro                                                                                      | Overfill protection                                                                                                                                                              | Overfill protection                                                               | Overfill protection                                                                 |
|  | <ul style="list-style-type: none"> <li>Simple, fast installation thanks to compact, double rod design</li> </ul> | <ul style="list-style-type: none"> <li>Minimal time and cost expenditure thanks to simple setup without medium</li> <li>Exact switching point even with heavy buildup</li> </ul> |                                                                                   |                                                                                     |



## Point level | Vibration | Liquids



### Area of application

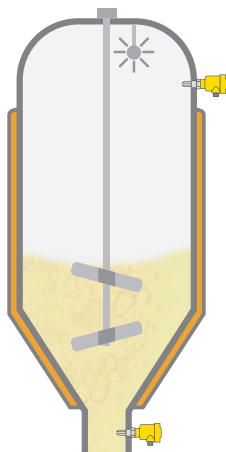
The point level sensors of the VEGASWING series are used as overfill and dry run protection in liquids. They are also suitable for safety-related applications up to SIL2. Special materials and coated versions also allow their use in aggressive media.

### Measuring principle

The tuning fork of VEGASWING is made to vibrate by a piezo drive. If the medium comes into contact with the tuning fork, the vibration frequency is reduced. The electronics responds by triggering a switching signal.

### Advantages

With a tuning fork only 40 mm long, VEGASWING works reliably in all liquids – regardless of the installation position. Pressure, temperature, foam and viscosity do not influence the switching accuracy. The low-cost point level sensors are easy to install and can be set up and commissioned without medium.



|                     | VEGASWING 51/53                                                                                                                                                                                                                                                   | VEGASWING 61/63                                                                                   | VEGASWING 66                                                                                                           |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                  |                  |                                     |
| Application         | Liquids                                                                                                                                                                                                                                                           | Liquids                                                                                           | Liquids under high and low temperatures                                                                                |
| Version             | VEGASWING 51:<br>Compact version<br><br>VEGASWING 53:<br>Tube extension up to 1 m                                                                                                                                                                                 | VEGASWING 61:<br>Compact version<br><br>VEGASWING 63:<br>Tube extension up to 6 m                 | Compact version or with tube extension up to 3 m                                                                       |
| Material            | 316L                                                                                                                                                                                                                                                              | 316L, ECTFE, PFA, enamel, Alloy 400, Duplex, Alloy C22                                            | Inconel 718 (tuning fork), 316L, Alloy C22                                                                             |
| Process fitting     | Thread from G½, ½ NPT, hygienic fittings                                                                                                                                                                                                                          | Thread from G¾, ¾ NPT, flanges from DN 25, 1", hygienic fittings                                  | Thread from G1, 1 NPT, flanges from DN 50, 2"                                                                          |
| Process temperature | -40 ... +150 °C                                                                                                                                                                                                                                                   | -50 ... +250 °C                                                                                   | -196 ... +450 °C                                                                                                       |
| Process pressure    | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                                                                                                                                                                                            | -1 ... +64 bar<br>(-100 ... +6400 kPa)                                                            | -1 ... +160 bar<br>(-100 ... +16000 kPa)                                                                               |
| Signal output       | Transistor output, contactless electronic switch, IO-Link                                                                                                                                                                                                         | Relay, transistor, two-wire, NAMUR output, contactless electronic switch                          | Relay, transistor, two-wire output                                                                                     |
| Approvals           | VEGASWING 51:<br>Overfill protection, Ship, CSA-OL, EHEDG, FDA, EG 1935/2004, EAC (GOST)<br><br>VEGASWING 53:<br>EHEDG, FDA, EG 1935/2004                                                                                                                         | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Overfill protection, Ship, SIL2, KOSHA, NEPSI, INMETRO | ATEX, IEC, CSA, EAC (GOST), UKR Sepro, Overfill protection, steam boiler, Ship, SIL2, KOSHA, NEPSI, INMETRO, VdTÜV 100 |
| Benefit             | <ul style="list-style-type: none"> <li>Minimal time and cost expenditure thanks to simple setup without medium</li> <li>Accurate and reliable function through medium-independent switching point</li> <li>Minimal costs for maintenance and servicing</li> </ul> |                                                                                                   |                                                                                                                        |

Controllers see page 64–69



## Point level | Vibration | Bulk solids



### Area of application

The point level sensors of the VEGAVIB series are used as overfill protection and as empty detector in silos and bunkers containing bulk solids. Typical applications include materials such as plastic granules, pellets and non-adhesive media. The sensors are also suitable for safety-related applications up to SIL2.

### Measuring principle

The rod element of VEGAVIB is made to vibrate by a piezo drive. If this vibrating rod comes in contact with the medium, the vibration amplitude is damped. The electronics responds by triggering a switching signal.



### Advantages

The sensors are easy to clean and therefore ideal for use in food and pharmaceutical products. Mounting position and grain size have no effect on their functional reliability. The sensors are easy to install and can be set up and commissioned without medium.

|                     | VEGA VIB S61                                                                                                                                                                                                                                         | VEGA VIB 61/63                                                                    | VEGA VIB 62                                                                         |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                     |  |  |
| Application         | Granuled and coarse-grained bulk solids                                                                                                                                                                                                              | Granuled and coarse-grained bulk solids                                           | Granuled and coarse-grained bulk solids (with suspension cable up to 80 m)          |
| Version             | Compact version or with tube extension up to 1.5 m                                                                                                                                                                                                   | VEGA VIB 61:<br>Compact version<br><br>VEGA VIB 63:<br>Tube extension up to 6 m   | Suspension cable up to 80 m                                                         |
| Measuring range     | Bulk solids from 100 g/l                                                                                                                                                                                                                             | Bulk solids from 20 g/l                                                           | Bulk solids from 20 g/l                                                             |
| Material            | 316L                                                                                                                                                                                                                                                 | 316L, Carbocer coating                                                            | 316L and PUR or FEP, Carbocer coating                                               |
| Process fitting     | Thread from G1, 1 NPT                                                                                                                                                                                                                                | Thread from G1, 1 NPT, flanges from DN 32, 1½", hygienic fittings                 | Thread from G1, 1 NPT, flanges from DN 32, 1½", hygienic fittings                   |
| Process temperature | -50 ... +250 °C                                                                                                                                                                                                                                      | -50 ... +250 °C                                                                   | -40 ... +150 °C                                                                     |
| Process pressure    | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                                                                                                                                                                                               | -1 ... +16 bar<br>(-100 ... +1600 kPa)                                            | -1 ... +6 bar<br>(-100 ... +600 kPa)                                                |
| Signal output       | Relay, transistor output                                                                                                                                                                                                                             | Relay, transistor, two-wire, NAMUR output, contactless electronic switch          | Relay, transistor, two-wire, NAMUR output, contactless electronic switch            |
| Approvals           | ATEX                                                                                                                                                                                                                                                 | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, SIL2, KOSHA, NEPSI, INMETRO            | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, SIL2, KOSHA, NEPSI, INMETRO              |
| Benefit             | <ul style="list-style-type: none"> <li>Minimal time and cost expenditure thanks to simple setup without medium</li> <li>Reliable function through medium-independent switching point</li> <li>Minimal costs for maintenance and servicing</li> </ul> |                                                                                   |                                                                                     |

Controllers see page 64–69



## Point level | Vibration | Powders



### Area of application

The point level sensors of the VEGAWAVE series are used as overfill protection and empty detection in silos and bunkers containing powdery bulk solids. Typical applications are silos containing powdery media such as flour, cement or sand as well as containers with fine-grained bulk materials such as plastic granules, fine gravel or styrofoam beads. The sensors are also suitable for safety-related applications up to SIL2.

### Measuring principle

The tuning fork of VEGAWAVE is made to vibrate by a piezo drive. When the medium covers the fork, the vibration amplitude is damped. The electronics responds by triggering a switching signal.



### Advantages

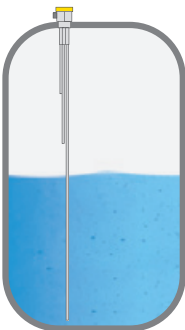
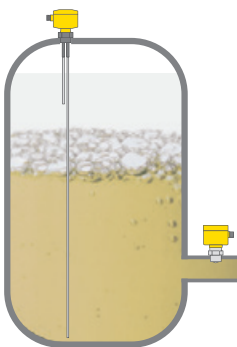
The sensors are robust and non-sensitive to buildup and function reliably in any position. They are easy to install and can be set up and commissioned without medium.

|                     | VEGAWAVE S61                                                                                                                                                                                                                                                                 | VEGAWAVE 61/63                                                                    | VEGAWAVE 62                                                                         |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                             |  |  |
| Application         | Powders and fine-grained bulk solids                                                                                                                                                                                                                                         | Powders and fine-grained bulk solids                                              | Powders and fine-grained bulk solids                                                |
| Version             | Compact version or with tube extension up to 1.5 m                                                                                                                                                                                                                           | VEGAWAVE 61:<br>Compact version<br><br>VEGAWAVE 63:<br>Tube extension up to 6 m   | Suspension cable up to 80 m                                                         |
| Measuring range     | Bulk solids from 8 g/l                                                                                                                                                                                                                                                       | Bulk solids from 8 g/l                                                            | Bulk solids from 8 g/l                                                              |
| Material            | 316L                                                                                                                                                                                                                                                                         | 316L, Carbocer coating                                                            | 316L and PUR or FEP, Carbocer coating                                               |
| Process fitting     | Thread G1½                                                                                                                                                                                                                                                                   | Thread G1½, 1½ NPT, flanges from DN 50, 2", hygienic fittings                     | Thread G1½, 1½ NPT, flanges from DN 50, 2", hygienic fittings                       |
| Process temperature | -50 ... +150 °C                                                                                                                                                                                                                                                              | -50 ... +250 °C                                                                   | -40 ... +150 °C                                                                     |
| Process pressure    | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                                       | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                            | -1 ... +6 bar<br>(-100 ... +600 kPa)                                                |
| Signal output       | Relay, transistor output                                                                                                                                                                                                                                                     | Relay, transistor, two-wire, NAMUR output, contactless electronic switch          | Relay, transistor, two-wire, NAMUR output, contactless electronic switch            |
| Approvals           | ATEX                                                                                                                                                                                                                                                                         | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, SIL2                                   | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, SIL2                                     |
| Benefit             | <ul style="list-style-type: none"> <li>Minimal time and cost expenditure thanks to simple setup without medium</li> <li>Reliable function through medium-independent switching point</li> <li>Minimal costs for maintenance and servicing thanks to robust design</li> </ul> |                                                                                   |                                                                                     |

Controllers see page 64–69



## Point level | Conductive



### Area of application

The conductive point level sensors of the VEGAKON series are used in conductive liquids as overfill protection, pump control or dry run protection in vessels and pipelines.

### Measuring principle

When the electrodes of the sensor come in contact with a conductive liquid, a small alternating current begins to flow. The electronics responds by triggering a switching command.

### Advantages

The simple, robust mechanical construction of the sensors ensures maintenance-free, cost-effective and reliable point level detection in all areas of industrial processes. The sensors, which can be installed in any position, provide a direct switching output. All measuring instruments offer the possibility of detecting at several switching points in a vessel. The VEGAKON sensors are designed as compact level switches, while the EL probes are designed to be used in combination with controllers of the VEGATOR series.

|                     | VEGAKON 61                                                                                                                                                                                                                                                                           | VEGAKON 66                                                                                                                                                                                                                     |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                     |                                                                                                                                             |
| Application         | Conductive liquids                                                                                                                                                                                                                                                                   | Conductive liquids                                                                                                                                                                                                             |
| Version             | Compact level switch with front-flush partly insulated electrode and one switching point                                                                                                                                                                                             | Compact level switch with partly insulated rod electrodes and max. two switching points                                                                                                                                        |
| Probe length        | –                                                                                                                                                                                                                                                                                    | 0.12 ... 4 m                                                                                                                                                                                                                   |
| Material            | 316L, PTFE                                                                                                                                                                                                                                                                           | 316Ti, PP                                                                                                                                                                                                                      |
| Process fitting     | Thread G1, cone DN 25, Varivent                                                                                                                                                                                                                                                      | Thread G1½                                                                                                                                                                                                                     |
| Process temperature | -40 ... +150 °C                                                                                                                                                                                                                                                                      | -40 ... +100 °C                                                                                                                                                                                                                |
| Process pressure    | -1 ... +25 bar<br>(-100 ... +2500 kPa)                                                                                                                                                                                                                                               | -1 ... +6 bar<br>(-100 ... +600 kPa)                                                                                                                                                                                           |
| Signal output       | Relay, transistor output                                                                                                                                                                                                                                                             | Relay, transistor output                                                                                                                                                                                                       |
| Approvals           | –                                                                                                                                                                                                                                                                                    | –                                                                                                                                                                                                                              |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Time and cost saving setup without adjustment with medium</li> <li>▪ Optimal cleanability thanks to front-flush mounting</li> <li>▪ Maintenance-free operation ensured by robust measuring probe that is not affected by buildup</li> </ul> | <ul style="list-style-type: none"> <li>▪ Reliable pump control through multiple-rod probe</li> <li>▪ Minimal stockkeeping through exchangeable rod probes</li> <li>▪ Simple and versatile with cut to length probes</li> </ul> |

# Point level | Conductive

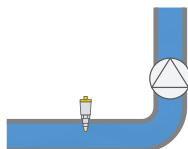
|                     | EL 1                                                                                                                                                                                                                                                       | EL 3                                                                                                                                                                                                                               | EL 4                                                                                                                                                                                                                                  |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                           |                                                                                                                                                   |                                                                                                                                                    |
| Application         | Conductive liquids                                                                                                                                                                                                                                         | Conductive liquids                                                                                                                                                                                                                 | Conductive liquids                                                                                                                                                                                                                    |
| Probe length        | up to 4 m                                                                                                                                                                                                                                                  | up to 6 m                                                                                                                                                                                                                          | up to 4 m                                                                                                                                                                                                                             |
| Version             | Partly insulated rod with one switching point                                                                                                                                                                                                              | Partly insulated rod with max. four switching points                                                                                                                                                                               | Partly insulated rod with max. four switching points                                                                                                                                                                                  |
| Material            | 316Ti, PTFE                                                                                                                                                                                                                                                | 316Ti, PTFE                                                                                                                                                                                                                        | 316Ti, PP                                                                                                                                                                                                                             |
| Process fitting     | Thread G1½                                                                                                                                                                                                                                                 | Thread G1½                                                                                                                                                                                                                         | Thread G1½                                                                                                                                                                                                                            |
| Process temperature | -50 ... +130 °C                                                                                                                                                                                                                                            | -50 ... +130 °C                                                                                                                                                                                                                    | -20 ... +100 °C                                                                                                                                                                                                                       |
| Process pressure    | -1 ... +63 bar<br>(-100 ... +6300 kPa)                                                                                                                                                                                                                     | -1 ... +63 bar<br>(-100 ... +6300 kPa)                                                                                                                                                                                             | -1 ... +6 bar<br>(-100 ... +600 kPa)                                                                                                                                                                                                  |
| Signal output       | VEGATOR 131, VEGATOR 132                                                                                                                                                                                                                                   | VEGATOR 131, VEGATOR 132                                                                                                                                                                                                           | VEGATOR 131, VEGATOR 132                                                                                                                                                                                                              |
| Approvals           | ATEX, Overfill protection                                                                                                                                                                                                                                  | ATEX, Overfill protection                                                                                                                                                                                                          | –                                                                                                                                                                                                                                     |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Easy installation in confined spaces through small sensor dimensions</li> <li>▪ Low costs for maintenance and repair thanks to robust design</li> <li>▪ Simple and versatile with cut to length probes</li> </ul> | <ul style="list-style-type: none"> <li>▪ Simple setup and commissioning with minimal time and costs</li> <li>▪ Maintenance-free thanks to robust construction</li> <li>▪ Simple and versatile with cut to length probes</li> </ul> | <ul style="list-style-type: none"> <li>▪ Reliable pump control through multiple-rod probe</li> <li>▪ Minimal stockkeeping through use of exchangeable rod probes</li> <li>▪ Simple and versatile with cut to length probes</li> </ul> |

Controllers see page 64–69

| EL 6                                                                                                                                                                                                                                            | EL 8                                                                                                                                                               |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                |                                                                                   |
| Conductive liquids                                                                                                                                                                                                                              | Conductive liquids                                                                                                                                                 |
| up to 50 m                                                                                                                                                                                                                                      | up to 3 m                                                                                                                                                          |
| Partly insulated cable<br>with max. four switching points                                                                                                                                                                                       | Partly insulated rod<br>with one switching point                                                                                                                   |
| 316Ti, PP/FEP                                                                                                                                                                                                                                   | 316Ti, PE                                                                                                                                                          |
| Thread G1½                                                                                                                                                                                                                                      | Thread G½                                                                                                                                                          |
| -20 ... +100 °C                                                                                                                                                                                                                                 | -10 ... +60 °C                                                                                                                                                     |
| -1 ... +6 bar<br>(-100 ... +600 kPa)                                                                                                                                                                                                            | -1 ... +6 bar<br>(-100 ... +600 kPa)                                                                                                                               |
| VEGATOR 131, VEGATOR 132                                                                                                                                                                                                                        | VEGATOR 131, VEGATOR 132                                                                                                                                           |
| –                                                                                                                                                                                                                                               | –                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>▪ Cost-effective pump control through multiple-cable probe</li> <li>▪ Minimal stockkeeping through use of exchangeable cable probes</li> <li>▪ Simple and versatile with cut to length probes</li> </ul> | <ul style="list-style-type: none"> <li>▪ Low-cost point level detection</li> <li>▪ Easy installation in confined spaces through small sensor dimensions</li> </ul> |



# Process pressure



## Area of application

The process pressure transmitters and pressure switches of the VEGABAR series can measure the pressures and levels of liquids, gases and vapours. As well as general applications, there are special designs for use in chemically aggressive liquids, and in hazardous or hygienic areas. The instruments are ideal for detecting relative or absolute pressure in applications with condensation or rapid temperature changes, and can also measure the temperature of the medium. Their versatility and precision enable use for submersible hydrostatic level measurement in liquids or slurries. All VEGABAR series 80 transmitters can be interconnected to create an electronic differential pressure system.

## Measuring principle

The pressure of the measured medium acts on a pressure measuring cell, which converts it into an electronic signal. There is a range of measuring cell technologies employed in the VEGABAR range: Ceramic-capacitive CERTEC® and MINI-CERTEC®, metallic METEC®, piezoelectric and strain gauge cells – to best meet individual application requirements.

## Advantages

These instruments cover a particularly large measuring range, from vacuum to extremely high pressures. Their integrated self-monitoring function guarantees high operational reliability. An especially high degree of safety and dependability is guaranteed by the process pressure transmitters that use dry, ceramic-capacitive measuring cells. They are characterized by their high overload resistance, long-term stability and thermal shock compensation.

|                                       | VEGABAR 18                                                                                                                                                                                                                                 | VEGABAR 19                                                                                                                                                                                                   |
|---------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                                                                                                                           |                                                                                                                           |
| Application                           | Liquids and gases                                                                                                                                                                                                                          | Liquids and gases, even at high pressure                                                                                                                                                                     |
| Deviation                             | 0.5 %                                                                                                                                                                                                                                      | 0.5 %                                                                                                                                                                                                        |
| Measuring cell<br>Measuring cell seal | Ceramic measuring cell<br>FKM                                                                                                                                                                                                              | Metallic measuring cell<br>–                                                                                                                                                                                 |
| Process fitting                       | ½" standard thread                                                                                                                                                                                                                         | ½" standard thread                                                                                                                                                                                           |
| Process temperature                   | -40 ... +100 °C                                                                                                                                                                                                                            | -40 ... +100 °C                                                                                                                                                                                              |
| Measuring range                       | Relative<br>0 ... +25 bar<br>(0 ... +2500 kPa)                                                                                                                                                                                             | Relative<br>0 ... +100 bar<br>(0 ... +10000 kPa)                                                                                                                                                             |
| Overload resistance                   | up to 150-fold measuring range                                                                                                                                                                                                             | up to 4-fold measuring range                                                                                                                                                                                 |
| Signal output                         | Two-wire: 4 ... 20 mA                                                                                                                                                                                                                      | Two-wire: 4 ... 20 mA                                                                                                                                                                                        |
| Approvals                             | –                                                                                                                                                                                                                                          | –                                                                                                                                                                                                            |
| Benefit                               | <ul style="list-style-type: none"> <li>▪ Low-cost version with extremely small installation dimensions</li> <li>▪ High plant availability due to the highly robust overload and vacuum resistance of the ceramic measuring cell</li> </ul> | <ul style="list-style-type: none"> <li>▪ Low-cost version with extremely small installation dimensions</li> <li>▪ Universally applicable due to fully welded metallic measuring cell construction</li> </ul> |

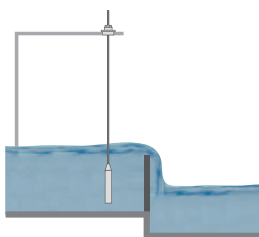
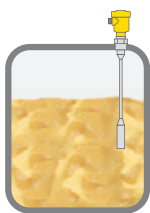
# Process pressure

|                     | VEGABAR 28                                                                                                                                                                                                                                                                                                                                                                                 | VEGABAR 29                                                                                                                                                                                                                                                                                                                                                                                 | VEGABAR 38                                                                                                                                                                                                                                                                                             |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                     |
| Application         | Liquids and gases                                                                                                                                                                                                                                                                                                                                                                          | Liquids and gases, even at high pressure                                                                                                                                                                                                                                                                                                                                                   | Liquids and gases                                                                                                                                                                                                                                                                                      |
| Deviation           | 0.3 %                                                                                                                                                                                                                                                                                                                                                                                      | 0.3 %                                                                                                                                                                                                                                                                                                                                                                                      | 0.3 %                                                                                                                                                                                                                                                                                                  |
| Measuring cell      | Ceramic measuring cell                                                                                                                                                                                                                                                                                                                                                                     | Metallic measuring cell                                                                                                                                                                                                                                                                                                                                                                    | Ceramic measuring cell                                                                                                                                                                                                                                                                                 |
| Measuring cell seal | FKM, EPDM, FFKM                                                                                                                                                                                                                                                                                                                                                                            | –                                                                                                                                                                                                                                                                                                                                                                                          | FKM, EPDM, FFKM                                                                                                                                                                                                                                                                                        |
| Process fitting     | Optional flush thread and hygienic fittings, universal connector for hygiene adapter                                                                                                                                                                                                                                                                                                       | Optional flush thread and hygienic fittings, universal connector for hygiene adapter                                                                                                                                                                                                                                                                                                       | Optional flush thread and hygienic fittings, universal connector for hygiene adapter                                                                                                                                                                                                                   |
| Process temperature | -40 ... +130 °C/<br>1 h @ +135 °C steam                                                                                                                                                                                                                                                                                                                                                    | -40 ... +130 °C/<br>1 h @ +135 °C steam                                                                                                                                                                                                                                                                                                                                                    | -40 ... +130 °C/<br>1 h @ +135 °C steam                                                                                                                                                                                                                                                                |
| Measuring range     | Absolute and relative<br>-1 ... +60 bar<br>(-100 ... +6000 kPa)                                                                                                                                                                                                                                                                                                                            | Absolute and relative<br>-1 ... +1000 bar<br>(-100 ... +100000 kPa)                                                                                                                                                                                                                                                                                                                        | Absolute and relative<br>-1 ... +60 bar<br>(-100 ... +6000 kPa)                                                                                                                                                                                                                                        |
| Overload resistance | up to 150-fold measuring range                                                                                                                                                                                                                                                                                                                                                             | up to 4-fold measuring range                                                                                                                                                                                                                                                                                                                                                               | up to 150-fold measuring range                                                                                                                                                                                                                                                                         |
| Signal output       | Two-wire: 4 ... 20 mA<br>Three-wire: PNP/NPN,<br>4 ... 20 mA, IO-Link                                                                                                                                                                                                                                                                                                                      | Two-wire: 4 ... 20 mA<br>Three-wire: PNP/NPN,<br>4 ... 20 mA, IO-Link                                                                                                                                                                                                                                                                                                                      | Two-wire: 4 ... 20 mA<br>Three-wire: PNP/NPN,<br>4 ... 20 mA, IO-Link                                                                                                                                                                                                                                  |
| Display/adjustment  | PACTware, VEGA Tools app, IODD                                                                                                                                                                                                                                                                                                                                                             | PACTware, VEGA Tools app, IODD                                                                                                                                                                                                                                                                                                                                                             | Integrated on-site display and 3-key operation, PACTware, VEGA Tools app, IODD                                                                                                                                                                                                                         |
| Approvals           | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, IA, CCOE, TIIS, KOSHA/KTL, SEPRO, EG 1935/2004, FDA, China FDA, Ship                                                                                                                                                                                                                                                                                | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, IA, CCOE, TIIS, KOSHA/KTL, SEPRO, EG 1935/2004, FDA, 3-A, EHEDG, China FDA, Ship                                                                                                                                                                                                                                                                    | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, IA, CCOE, TIIS, KOSHA/KTL, SEPRO, EG 1935/2004, FDA, China FDA, Ship                                                                                                                                                                                            |
| Benefit             | <ul style="list-style-type: none"> <li>• Simple inventory management thanks to configurable signal output</li> <li>• Highly visible, adjustable full-colour multidirectional (360°) switch status display</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with smartphone</li> <li>• Simple integration into control systems through IO-Link communication</li> </ul> | <ul style="list-style-type: none"> <li>• Simple inventory management thanks to configurable signal output</li> <li>• Highly visible, adjustable full-colour multidirectional (360°) switch status display</li> <li>• User-friendly, wireless setup and diagnosis via Bluetooth with smartphone</li> <li>• Simple integration into control systems through IO-Link communication</li> </ul> | <ul style="list-style-type: none"> <li>• Simple inventory management thanks to configurable signal output</li> <li>• Simple setup thanks to large on-site display with VDMA operation and additional texts</li> <li>• Simple integration into control systems through IO-Link communication</li> </ul> |

|  | VEGABAR 39                                                                                                                                                                                                                                                                                       | VEGABAR 81                                                                                                                                                                                                                                   | VEGABAR 82                                                                                                                                                                                                                                                                                                                       | VEGABAR 83                                                                                                                                                                                                                                          |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                                                                                 |                                                                                                                                                             |                                                                                                                                                                                                                                                 |                                                                                                                                                                  |
|  | Liquids and gases, even at high pressure                                                                                                                                                                                                                                                         | Liquids and gases with high temperatures                                                                                                                                                                                                     | Liquids and gases                                                                                                                                                                                                                                                                                                                | Liquids and gases also with high pressures                                                                                                                                                                                                          |
|  | 0.3 %                                                                                                                                                                                                                                                                                            | 0.2 %                                                                                                                                                                                                                                        | 0.2 %; 0.1 %; 0.05 %                                                                                                                                                                                                                                                                                                             | 0.2 %; 0.1 %; 0.075 %                                                                                                                                                                                                                               |
|  | Metallic measuring cell<br>–                                                                                                                                                                                                                                                                     | Chemical seal system<br>–                                                                                                                                                                                                                    | CERTEC®, MINI-CERTEC®<br>FKM, EPDM, FFKM                                                                                                                                                                                                                                                                                         | Piezoresistive/thin film strain gauge/METEC®<br>–                                                                                                                                                                                                   |
|  | Optional flush thread and hygienic fittings, universal connector for hygiene adapter                                                                                                                                                                                                             | Thread from G½, ½ NPT, flanges from DN 25, 1", hygienic fittings of 316L, Alloy 400, Tantalum, gold                                                                                                                                          | Thread from G½ of 316L, Duplex, PVDF, Alloy, flanges from DN 15, ½", hygienic fittings                                                                                                                                                                                                                                           | Thread from G½, ½ NPT, flanges from DN 25, 1", hygienic fittings of 316L, Alloy                                                                                                                                                                     |
|  | -40 ... +130 °C/<br>1 h @ +135 °C steam                                                                                                                                                                                                                                                          | -90 ... +400 °C                                                                                                                                                                                                                              | -40 ... +150 °C                                                                                                                                                                                                                                                                                                                  | -40 ... +200 °C                                                                                                                                                                                                                                     |
|  | Absolute and relative<br>-1 ... +1000 bar<br>(-100 ... +100000 kPa)                                                                                                                                                                                                                              | Absolute and relative<br>-1 ... +1000 bar<br>(-100 ... +100000 kPa)                                                                                                                                                                          | Absolute and relative<br>-1 ... +100 bar<br>(-100 ... +10000 kPa)                                                                                                                                                                                                                                                                | Absolute and relative<br>-1 ... +1000 bar<br>(-100 ... +100000 kPa)                                                                                                                                                                                 |
|  | up to 4-fold measuring range                                                                                                                                                                                                                                                                     | Depending on chemical seal system                                                                                                                                                                                                            | up to 200-times measuring range                                                                                                                                                                                                                                                                                                  | up to 150-times measuring range                                                                                                                                                                                                                     |
|  | Two-wire: 4 ... 20 mA<br>Three-wire: PNP/NPN,<br>4 ... 20 mA, IO-Link                                                                                                                                                                                                                            | 4 ... 20 mA, 4 ... 20 mA/HART,<br>Profibus PA, Foundation<br>Fieldbus, Modbus                                                                                                                                                                | 4 ... 20 mA, 4 ... 20 mA/HART,<br>Profibus PA, Foundation<br>Fieldbus, Modbus                                                                                                                                                                                                                                                    | 4 ... 20 mA, 4 ... 20 mA/HART,<br>Profibus PA, Foundation<br>Fieldbus, Modbus                                                                                                                                                                       |
|  | Integrated on-site display and 3-key operation, VEGA Tools app, IODD                                                                                                                                                                                                                             | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                   | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                                                                                                       | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                          |
|  | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, IA, CCOE, TIIS, KOSHA/KTL, SEPRO, EG 1935/2004, FDA, 3-A, EHEDG, China FDA, Ship                                                                                                                                                                          | ATEX, IEC, FM, CSA, EAC (GOST), Overfill protection, Ship, SIL2/3, EG 1935/2004, FDA                                                                                                                                                         | ATEX, IEC, FM, CSA, EAC (GOST), Overfill protection, Ship, SIL2/3, EG 1935/2004, FDA, 3-A                                                                                                                                                                                                                                        | ATEX, IEC, FM, CSA, EAC (GOST), Overfill protection, Ship, SIL2/3, EG 1935/2004, FDA, 3-A, EHEDG                                                                                                                                                    |
|  | <ul style="list-style-type: none"> <li>Simple inventory management thanks to configurable signal output</li> <li>Simple setup thanks to large on-site display with VDMA operation and additional texts</li> <li>Simple integration into control systems through IO-Link communication</li> </ul> | <ul style="list-style-type: none"> <li>Optimal process adaptation through selection of various product-contacting materials, media and temperature couplers</li> <li>Reliable measurement, even with extreme product temperatures</li> </ul> | <ul style="list-style-type: none"> <li>High resistance to abrasion and corrosion through use of high-quality Sapphire Ceramic®</li> <li>High plant availability through maximum overload resistance and absolute vacuum resistance</li> <li>Absolutely front-flush process fittings ensure maintenance-free operation</li> </ul> | <ul style="list-style-type: none"> <li>Universal application thanks to fully welded measuring cell</li> <li>Reliable measurement even at high pressures</li> <li>Excellent accuracy, even with strongly fluctuating process temperatures</li> </ul> |



# Hydrostatic



## Area of application

The hydrostatic pressure transmitters VEGAWELL and VEGABAR were specifically designed to measure levels in a wide range of liquids with widely different properties. They can also measure the temperature of the medium.

## Measuring principle

The hydrostatic pressure of the liquid column acts on a pressure measuring cell, which converts it into an electronic signal. Ceramic-capacitive and metallic pressure measuring cells are used for this purpose in the instruments.

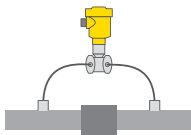
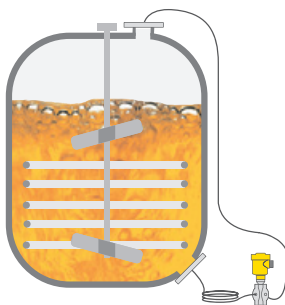
## Advantages

Level measurement by means of pressure technology is totally unaffected by foam or internal vessel installations. The hydrostatic pressure transmitters can be precisely adapted to the process by selecting an appropriate measuring cell and suitable housing materials.

|                                       | VEGAWELL 52                                                                                                                                                                                                                                                                                                           | VEGABAR 86                                                                                                                                                                                                                                                                                                        | VEGABAR 87                                                                                                                                                                                                                                                                                           |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                   |
| Application                           | Liquids                                                                                                                                                                                                                                                                                                               | Liquids                                                                                                                                                                                                                                                                                                           | Liquids                                                                                                                                                                                                                                                                                              |
| Sensor diameter                       | 22 mm or 32 mm                                                                                                                                                                                                                                                                                                        | 32 mm                                                                                                                                                                                                                                                                                                             | 40 mm                                                                                                                                                                                                                                                                                                |
| Deviation                             | 0.1 %; 0.2 %                                                                                                                                                                                                                                                                                                          | 0.1 %                                                                                                                                                                                                                                                                                                             | 0.1 %                                                                                                                                                                                                                                                                                                |
| Measuring cell<br>Measuring cell seal | CERTEC®/MINI-CERTEC®<br>FKM, EPDM, FFKM                                                                                                                                                                                                                                                                               | CERTEC®<br>FKM, EPDM, FFKM                                                                                                                                                                                                                                                                                        | METEC®<br>–                                                                                                                                                                                                                                                                                          |
| Process fitting                       | Straining clamp, thread,<br>suspension cable, threaded fitting<br>of 316L, PVDF, Duplex, Titanium                                                                                                                                                                                                                     | Straining clamp, suspension<br>cable, threaded fitting, thread from<br>G1½, 1½ NPT, flanges from<br>DN 40, 2" of 316L, PVDF                                                                                                                                                                                       | Straining clamp, suspension<br>cable, threaded fitting, thread<br>from G1½, 1½ NPT, flanges from<br>DN 50, 2" of 316L                                                                                                                                                                                |
| Process temperature                   | -20 ... +80 °C                                                                                                                                                                                                                                                                                                        | -20 ... +100 °C                                                                                                                                                                                                                                                                                                   | -12 ... +100 °C                                                                                                                                                                                                                                                                                      |
| Measuring range                       | Absolute and relative<br>0 ... +60 bar<br>(0 ... +6000 kPa)                                                                                                                                                                                                                                                           | Absolute and relative<br>0 ... +25 bar<br>(0 ... +2500 kPa)                                                                                                                                                                                                                                                       | Absolute and relative<br>0 ... +25 bar<br>(0 ... +2500 kPa)                                                                                                                                                                                                                                          |
| Overload resistance                   | up to 150-times measuring range                                                                                                                                                                                                                                                                                       | up to 200-times measuring range                                                                                                                                                                                                                                                                                   | up to 150-times measuring range                                                                                                                                                                                                                                                                      |
| Signal output                         | 4 ... 20 mA<br>4 ... 20 mA/HART + PT 100                                                                                                                                                                                                                                                                              | 4 ... 20 mA,<br>4 ... 20 mA/HART, Profibus PA,<br>Foundation Fieldbus, Modbus                                                                                                                                                                                                                                     | 4 ... 20 mA,<br>4 ... 20 mA/HART, Profibus PA,<br>Foundation Fieldbus, Modbus                                                                                                                                                                                                                        |
| Display/adjustment                    | PACTware, VEGADIS 82                                                                                                                                                                                                                                                                                                  | PLICSCOM, PACTware,<br>VEGADIS 81, VEGADIS 82,<br>VEGA Tools app                                                                                                                                                                                                                                                  | PLICSCOM, PACTware,<br>VEGADIS 81, VEGADIS 82,<br>VEGA Tools app                                                                                                                                                                                                                                     |
| Approvals                             | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, Overfill protection,<br>Ship                                                                                                                                                                                                                                            | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, Overfill protection,<br>Ship, SIL2/3                                                                                                                                                                                                                                | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, Overfill protection,<br>Ship, SIL2/3                                                                                                                                                                                                                   |
| Benefit                               | <ul style="list-style-type: none"> <li>▪ High measurement certainty through very high overload and vacuum resistance of the ceramic measuring cell</li> <li>▪ High plant availability through integrated overvoltage protection</li> <li>▪ Versatile application thanks to robust housing and cable design</li> </ul> | <ul style="list-style-type: none"> <li>▪ High plant availability through very high overload and vacuum resistance of the ceramic measuring cell</li> <li>▪ Self-cleaning effect through front-flush design</li> <li>▪ Low costs for maintenance and servicing through wear-free ceramic measuring cell</li> </ul> | <ul style="list-style-type: none"> <li>▪ High measurement certainty even with quickly changing process temperatures</li> <li>▪ High plant availability through vacuum-proof design</li> <li>▪ Very good cleanability and high chemical resistance through choice of appropriate materials</li> </ul> |



# Differential pressure



## Area of application

The differential pressure transmitter VEGADIF was specially developed for level measurement of liquids and gases in pressurized vessels. It is also suitable for pressure monitoring across filters and pumps as well as for flow measurement of gases, vapours and liquids in conjunction with a flow element. When used in conjunction with a CSB or CSS chemical seal assembly, VEGADIF can also be deployed for density and interface measurement.

## Measuring principle

Different pressures act on the two sides of an oil-filled differential pressure measuring cell. This converts the pressure differential into an electronic signal. A piezo measuring cell is used as the pressure measuring cell.

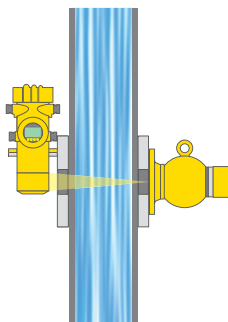
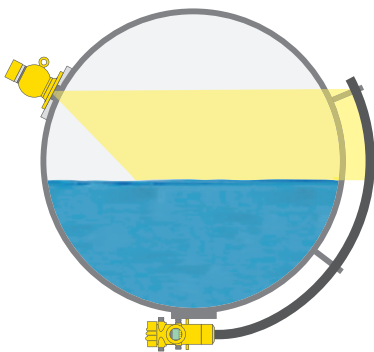
## Advantages

The differential pressure transmitter VEGADIF is characterized by its especially wide application spectrum. Even differential pressures of only a few mbar can be accurately measured. Media at extreme temperatures can be measured by adding a chemical seal assembly.

|                     | VEGADIF 85                                                                                                                                                                                                                                                                                                                                    | Chemical seal CSB/CSS                                                                                                                                                                                                                                    | Electronic differential pressure                                                                                                                                                                                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                                                                                                                              |                                                                                                                                                                        |                                                                                                                                                                                                                  |
| Application         | Liquids and gases                                                                                                                                                                                                                                                                                                                             | Liquids and gases                                                                                                                                                                                                                                        | Liquids and gases, even at high pressures and temperatures                                                                                                                                                                                                                                          |
| Deviation           | < ±0.065 %                                                                                                                                                                                                                                                                                                                                    | –                                                                                                                                                                                                                                                        | 0.2 %; 0.1 %; 0.05 %                                                                                                                                                                                                                                                                                |
| Measuring cell      | Metallic measuring cell                                                                                                                                                                                                                                                                                                                       | –                                                                                                                                                                                                                                                        | Depending on the sensor of VEGABAR series 80                                                                                                                                                                                                                                                        |
| Process fitting     | ¼-18 NPT, M10, optional with chemical seal assembly, metallic of 316L, Alloy                                                                                                                                                                                                                                                                  | Flanges from DN 40, 2" cells from DN 50, 2" of 316L, Alloy, Tantalum                                                                                                                                                                                     | Flanges from DN 25, 1", hygienic fittings, thread from G½ of 316L, Duplex, PVDF, Alloy                                                                                                                                                                                                              |
| Process temperature | -40 ... +120 °C                                                                                                                                                                                                                                                                                                                               | -40 ... +400 °C                                                                                                                                                                                                                                          | -40 ... +400 °C                                                                                                                                                                                                                                                                                     |
| Measuring range     | -16 ... +16 bar<br>(-1600 ... +1600 kPa)                                                                                                                                                                                                                                                                                                      | -16 ... +16 bar<br>(-1600 ... +1600 kPa)                                                                                                                                                                                                                 | ±0.025 ... ±1000 bar<br>(±2.5 ... ±100000 kPa)                                                                                                                                                                                                                                                      |
| Overload resistance | up to 400 bar                                                                                                                                                                                                                                                                                                                                 | up to 400 bar                                                                                                                                                                                                                                            | up to 200-times measuring range                                                                                                                                                                                                                                                                     |
| Signal output       | 4 ... 20 mA, 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                                                                                                                                                               | –                                                                                                                                                                                                                                                        | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                                                                                                                                  |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                                                                                                                    | –                                                                                                                                                                                                                                                        | PLICSCOM, PACTware, VEGADIS 82, VEGA Tools app                                                                                                                                                                                                                                                      |
| Approvals           | ATEX, IEC, CSA, EAC (GOST), Overfill protection, Ship, SIL2/3                                                                                                                                                                                                                                                                                 | In combination with VEGADIF 85                                                                                                                                                                                                                           | ATEX, IEC, FM, CSA, EAC (GOST), Overfill protection, Ship, SIL2/3                                                                                                                                                                                                                                   |
| Benefit             | <ul style="list-style-type: none"> <li>• Measurement of extremely low differential pressures through high-precision measurement data acquisition</li> <li>• High operational reliability through integrated overload diaphragm</li> <li>• Universally applicable thanks to wide selection of measuring ranges and process fittings</li> </ul> | <ul style="list-style-type: none"> <li>• High chemical resistance through choice of appropriate diaphragm materials</li> <li>• Versatile solutions through free configurability</li> <li>• Reliable measurement, even in extreme temperatures</li> </ul> | <ul style="list-style-type: none"> <li>• Exact differential pressure measurement without capillary lines</li> <li>• Cost savings through simultaneous output of absolute and differential pressure</li> <li>• Universal use through simple combination of sensors from VEGABAR series 80</li> </ul> |



## Radiation-based



### Area of application

The radiation-based sensors of the PROTRAC series enable precise measurement of liquids and bulk solids under extreme process conditions such as high temperatures and pressures or aggressive media. They can detect level, point level, interface, density or mass flow contactlessly and reliably without interfering with the process. Radiation-based measurement is the solution in applications where other measuring principles reach their limits.

### Measuring principle

A minimally radioactive isotope emits focused gamma rays. The sensor, which is mounted on the opposite side of the process, receives this radiation. Because gamma rays are attenuated when penetrating matter, the sensor can calculate the level, point level, density or mass flow from the intensity of the incoming radiation.

### Advantages

The radiation-based measuring principle offers maximum operational safety and reliability even under the toughest application conditions. Measurement is independent of pressure, temperature and the aggressiveness of the medium. The measuring system can be installed on the outside of process vessels during ongoing production, without disturbing the process in any way. This saves installation costs and time.

|                     | FIBERTRAC 31                                                                                                                                                                                                                            | FIBERTRAC 32                                                                                                                                                                                                                                        | SOLITRAC 31                                                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                                                        |                                                                                                                                                                    |                                                             |
| Application         | Level and interface measurement of liquids and bulk solids                                                                                                                                                                              | Level and interface measurement of liquids and bulk solids                                                                                                                                                                                          | Level and interface measurement of liquids and bulk solids                                                                                     |
| Measuring range     | up to 7 m                                                                                                                                                                                                                               | up to 7 m                                                                                                                                                                                                                                           | up to 3 m                                                                                                                                      |
| Version             | Sensor with flexible plastic detector ø 42 mm                                                                                                                                                                                           | Sensor with flexible plastic detector ø 60 mm                                                                                                                                                                                                       | Sensor with PVT rod detector ø 77 mm                                                                                                           |
| Process pressure    | any                                                                                                                                                                                                                                     | any                                                                                                                                                                                                                                                 | any                                                                                                                                            |
| Process temperature | any                                                                                                                                                                                                                                     | any                                                                                                                                                                                                                                                 | any                                                                                                                                            |
| Reproducibility     | ±0.5 %                                                                                                                                                                                                                                  | ±0.5 %                                                                                                                                                                                                                                              | ±0.5 %                                                                                                                                         |
| Mounting            | From outside on the vessel                                                                                                                                                                                                              | From outside on the vessel                                                                                                                                                                                                                          | From outside on the vessel                                                                                                                     |
| Signal output       | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                                                                      | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                                                                                                  | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                             |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                              | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                                                                                          | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                     |
| Approvals           | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS, KOSHA/KTL, Overfill protection, SIL2                                                                                                                                        | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS, KOSHA/KTL, SIL2                                                                                                                                                                         | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS, KOSHA/KTL, Overfill protection SIL2                                                |
| Benefit             | <ul style="list-style-type: none"> <li>Simple installation on round and conical vessels via flexible higher sensitivity detector</li> <li>Cost savings through the use of only one sensor for a measuring range of up to 7 m</li> </ul> | <ul style="list-style-type: none"> <li>Simple installation on round and conical vessels via flexible detector</li> <li>Cost savings through the use of only one sensor for a measuring range of up to 7 m and reduces source size needed</li> </ul> | <ul style="list-style-type: none"> <li>Maximum accuracy through PVT detector</li> <li>Simple installation with supplied accessories</li> </ul> |

# Radiation-based

|                     | POINTRAC 31                                                                                                                                                     | MINITRAC 31                                                                                                                                                                      | WEIGHTRAC 31                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
|                     |                                                                                |                                                                                                 |           |
| Application         | Level detection of liquids and bulk solids                                                                                                                      | Density measurement of liquids and bulk solids                                                                                                                                   | Mass flow determination of bulk solids on belts and in screw conveyors                       |
| Measuring range     | –                                                                                                                                                               | –                                                                                                                                                                                | up to 2800 mm (conveyor width)                                                               |
| Version             | Sensor with PVT rod detector                                                                                                                                    | Sensor with integrated NaI detector                                                                                                                                              | With PVT rod detector in protective tube of 316L                                             |
| Process pressure    | any                                                                                                                                                             | any                                                                                                                                                                              | any                                                                                          |
| Process temperature | any                                                                                                                                                             | any                                                                                                                                                                              | any                                                                                          |
| Reproducibility     | –                                                                                                                                                               | ±0.1 %                                                                                                                                                                           | ±1 % of measuring range final value                                                          |
| Mounting            | From outside on pipeline or on vessel                                                                                                                           | From outside on pipeline or on vessel                                                                                                                                            | Through supplied measuring frame                                                             |
| Signal output       | 8/16 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                  | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                                                                                                               | 4 ... 20 mA/HART, Profibus PA, Foundation Fieldbus                                           |
| Display/adjustment  | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                      | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                                                                                                       | PLICSCOM, PACTware, VEGADIS 81, VEGADIS 82, VEGA Tools app                                   |
| Approvals           | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS, Overfill protection, SIL2                                                                           | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS, KOSHA/KTL, Overfill protection                                                                                       | ATEX, IEC, NEPSI, FM, CSA, EAC (GOST), INMETRO, CCOE, TIIS                                   |
| Benefit             | <ul style="list-style-type: none"> <li>• High process reliability through buildup detection</li> <li>• Simple installation with supplied accessories</li> </ul> | <ul style="list-style-type: none"> <li>• Simple retrofitting during ongoing production processes</li> <li>• Exact measuring results independent of process conditions</li> </ul> | <ul style="list-style-type: none"> <li>• Wear-free due to non-contact measurement</li> </ul> |

|                     | VEGASOURCE 31                                                                                                                                                                     | VEGASOURCE 35                                                                                    | SHLD1                                                                                                                                                                                    |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                  |                |                                                                                                       |
| Application         | Source container for radioactive isotope                                                                                                                                          | Source container for radioactive isotope                                                         | Source container for radioactive isotope                                                                                                                                                 |
| Measuring range     | –                                                                                                                                                                                 | –                                                                                                | –                                                                                                                                                                                        |
| Version             | Cs-137: For activities up to 18.5 GBq (500 mCi)<br>Co-60: For activities up to 0.74 GBq (20 mCi)                                                                                  | Cs-137: For activities up to 111 GBq (3000 mCi)<br>Co-60: For activities up to 3.7 GBq (100 mCi) | Cs-137: For activities up to 3.7 GBq (100 mCi)                                                                                                                                           |
| Process pressure    | any                                                                                                                                                                               | any                                                                                              | any                                                                                                                                                                                      |
| Process temperature | any                                                                                                                                                                               | any                                                                                              | any                                                                                                                                                                                      |
| Reproducibility     | –                                                                                                                                                                                 | –                                                                                                | –                                                                                                                                                                                        |
| Mounting            | Flange DN 100 PN 16, 4" 150 lbs                                                                                                                                                   | Flange DN 100 PN 16, 4" 150 lbs                                                                  | Mounting plate or L profile 152 mm (6")                                                                                                                                                  |
| Signal output       | –                                                                                                                                                                                 | –                                                                                                | –                                                                                                                                                                                        |
| Display/adjustment  | –                                                                                                                                                                                 | –                                                                                                | –                                                                                                                                                                                        |
| Approvals           | –                                                                                                                                                                                 | –                                                                                                | –                                                                                                                                                                                        |
| Benefit             | <ul style="list-style-type: none"> <li>• Reliable shielding allows use without control areas</li> <li>• Operational safety through optional pneumatic ON/OFF switching</li> </ul> |                                                                                                  | <ul style="list-style-type: none"> <li>• Ideal for mass flow detection with an aperture angle of 45° and 60°</li> <li>• Simple mounting through compact design and low weight</li> </ul> |



## Software and display instruments



### Area of application

Calibration of sensors and visualization of measured values via on-site display units. The visualization and monitoring of measured values can also be carried out via the web-based VEGA Inventory System.

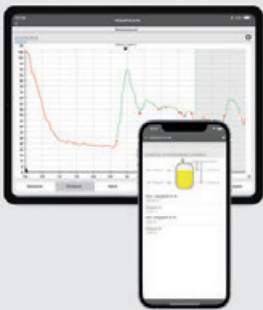
### Systems

Any sensor can be completely configured with the adjustment software PACTware or the VEGA Tools app. Alternatively, the adjustment module PLICSCOM can be used to configure a sensor directly on site. The web-based visualization software VEGA Inventory System collects readings from sensors connected anywhere in the world and displays them in a clear, well-organized layout.



### Advantages

Depending on the requirements, the user can set up the sensors either on site or comfortably via laptop, tablet or smartphone. Additional display units can be connected in the measurement loop to display the readings at other locations. It is also very easy to set up a visualization system that allows the readings to be displayed worldwide via a standard browser.

|                               | DTM Collection                                                                                                                                                                                                                                                                                                                                                                          | VEGA Inventory System                                                                                                                                                                                                                                                                                                                           | VEGA Tools app                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                         |
| Application                   | Adjustment software for configuration, parameter adjustment, documentation and diagnosis for field devices                                                                                                                                                                                                                                                                              | System for inventory monitoring as well as remote enquiry and visualization of measurement and location data                                                                                                                                                                                                                                    | App for wireless configuration, parameter adjustment and diagnosis of field devices                                                                                                                                                                                                                                                                                                        |
| Recommended operating systems | Windows 8 (32 or 64 Bit)<br>Windows 10 (32 or 64 Bit)                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>▪ VEGA Hosting Service: independent of operating system</li> <li>▪ Local server: MS Windows Server 2012 or higher as well as MS SQL Server 2012 or higher</li> </ul>                                                                                                                                     | from iOS 8<br>from Android 5.1                                                                                                                                                                                                                                                                                                                                                             |
| Adjustment                    | Via computer                                                                                                                                                                                                                                                                                                                                                                            | With standard web browser                                                                                                                                                                                                                                                                                                                       | With smartphone<br>With tablet                                                                                                                                                                                                                                                                                                                                                             |
| Versions                      | <ul style="list-style-type: none"> <li>▪ Standard version</li> <li>▪ Full version</li> </ul>                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>▪ VEGA Hosting Service (VH)</li> <li>▪ Local server (LS)</li> </ul>                                                                                                                                                                                                                                      | –                                                                                                                                                                                                                                                                                                                                                                                          |
| Technology                    | FDT/DTM                                                                                                                                                                                                                                                                                                                                                                                 | Web-based                                                                                                                                                                                                                                                                                                                                       | Bluetooth/App                                                                                                                                                                                                                                                                                                                                                                              |
| Benefit                       | <ul style="list-style-type: none"> <li>▪ User-friendly, standardized adjustment program for the PC</li> <li>▪ Extremely user friendly thanks to graphical user interface, project storage and documentation</li> <li>▪ Extended functional range as full version with additional features such as multiviewer, tank calculation, echo curve storage and advanced diagnostics</li> </ul> | <ul style="list-style-type: none"> <li>▪ Simple centralized inventory monitoring and management</li> <li>▪ More transparency through connected assets and facilities</li> <li>▪ Avoidance of production stoppages through increased supply security</li> <li>▪ Reduction of transport costs through optimized replenishment planning</li> </ul> | <ul style="list-style-type: none"> <li>▪ Simple, intuitive and unique adjustment for all plics® sensors as well as sensors with integrated Bluetooth</li> <li>▪ Can be used for instruments as from 2002 through retrofitting of PLICSCOM with Bluetooth, without software update of the sensor</li> <li>▪ Secure connection through authentication and encrypted communication</li> </ul> |

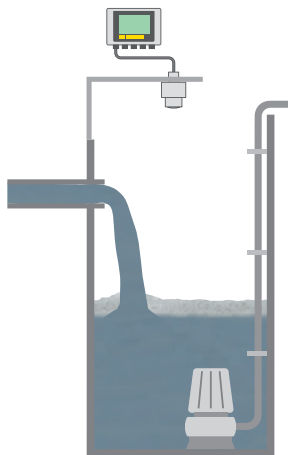
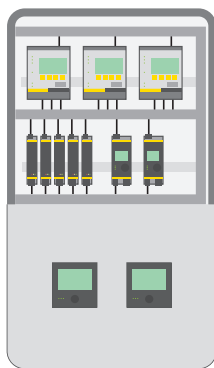
# Software and display instruments

|                     | VEGACONNECT                                                                                                                                                                                      | PLICSCOM                                                                                                                                                                                                                                                                                                                                                                  | PLICSLED                                                                                                                                                                                                                                                                                                           |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     |                                                                                                                 |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                 |
| Application         | Interface adapter between PC and VEGA instruments                                                                                                                                                | Measured value indication and adjustment on plics® sensors                                                                                                                                                                                                                                                                                                                | Switching status indication directly on the sensor                                                                                                                                                                                                                                                                 |
| Sensors             | All communication-capable VEGA sensors                                                                                                                                                           | All plics® sensors                                                                                                                                                                                                                                                                                                                                                        | All plics® sensors with relay output                                                                                                                                                                                                                                                                               |
| Mounting            | Directly in the sensor or in the junction box                                                                                                                                                    | Directly in the sensor or in VEGADIS 81, 82                                                                                                                                                                                                                                                                                                                               | Directly in the sensor                                                                                                                                                                                                                                                                                             |
| Ambient temperature | -20 ... +60 °C                                                                                                                                                                                   | -20 ... +70 °C                                                                                                                                                                                                                                                                                                                                                            | -40 ... +80 °C                                                                                                                                                                                                                                                                                                     |
| Signal              | Standard interface or HART on the VEGA instrument, USB interface on the PC, on Fieldbus and Modbus sensors                                                                                       | Standard interface on the sensor<br>Bluetooth (optional)<br>Magnetic pen adjustment (optional)                                                                                                                                                                                                                                                                            | –                                                                                                                                                                                                                                                                                                                  |
| Lighting            | –                                                                                                                                                                                                | Integrated                                                                                                                                                                                                                                                                                                                                                                | Red-green or yellow-green                                                                                                                                                                                                                                                                                          |
| Protection          | IP40                                                                                                                                                                                             | IP66/IP67 in the sensor                                                                                                                                                                                                                                                                                                                                                   | IP66/IP67 in the sensor                                                                                                                                                                                                                                                                                            |
| Voltage supply      | Via USB interface on the PC                                                                                                                                                                      | Via standard interface on the sensor                                                                                                                                                                                                                                                                                                                                      | 20 ... 253 V AC/DC, 50/60 Hz                                                                                                                                                                                                                                                                                       |
| Voltage loss        | –                                                                                                                                                                                                | –                                                                                                                                                                                                                                                                                                                                                                         | –                                                                                                                                                                                                                                                                                                                  |
| Approvals           | ATEX, EAC (GOST), UKR Sepro                                                                                                                                                                      | –                                                                                                                                                                                                                                                                                                                                                                         | –                                                                                                                                                                                                                                                                                                                  |
| Benefit             | <ul style="list-style-type: none"> <li>▪ Universally applicable, because compatible with all communication-capable VEGA instruments</li> <li>▪ Simple connection via supplied adapter</li> </ul> | <ul style="list-style-type: none"> <li>▪ Good readability through graphics-capable LCD display and built-in lighting</li> <li>▪ Simple and reliable handling via 4-button operation and intuitive menu structure with plain text display</li> <li>▪ Universally applicable, because compatible with all plics® sensors, independent of the measuring principle</li> </ul> | <ul style="list-style-type: none"> <li>▪ Clearly visible switching status display, even in bright daylight</li> <li>▪ Minimal installation time, as no external wiring is required</li> <li>▪ Universally applicable</li> <li>▪ High protection category via integrated module in plics® sensor housing</li> </ul> |

|  | VEGADIS 81                                                                                                                                                                                                                                                                                                                                                 | VEGADIS 82                                                                                                                                                                                                                                                                                                                                                                                           | VEGADIS 176                                                                                                                                                                                                                                                          |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                   |
|  | External measured value indication and adjustment of plics® sensors                                                                                                                                                                                                                                                                                        | External measured value indication and adjustment of 4 ... 20 mA/HART sensors                                                                                                                                                                                                                                                                                                                        | Switching cabinet measured value indication of 4 ... 20 mA/HART sensors                                                                                                                                                                                              |
|  | All plics® sensors                                                                                                                                                                                                                                                                                                                                         | 4 ... 20 mA/HART sensors                                                                                                                                                                                                                                                                                                                                                                             | 4 ... 20 mA/HART sensors                                                                                                                                                                                                                                             |
|  | Tube, wall mounting or carrier rail                                                                                                                                                                                                                                                                                                                        | Tube, panel, wall mounting or carrier rail                                                                                                                                                                                                                                                                                                                                                           | Panel mounting                                                                                                                                                                                                                                                       |
|  | -20 ... +70 °C                                                                                                                                                                                                                                                                                                                                             | -20 ... +70 °C                                                                                                                                                                                                                                                                                                                                                                                       | -10 ... +60 °C                                                                                                                                                                                                                                                       |
|  | Standard interface<br>Bluetooth<br>Magnetic pen adjustment                                                                                                                                                                                                                                                                                                 | 4 ... 20 mA<br>4 ... 20 mA/HART                                                                                                                                                                                                                                                                                                                                                                      | 4 ... 20 mA<br>4 ... 20 mA/HART                                                                                                                                                                                                                                      |
|  | Integrated                                                                                                                                                                                                                                                                                                                                                 | Integrated                                                                                                                                                                                                                                                                                                                                                                                           | Integrated                                                                                                                                                                                                                                                           |
|  | IP66/IP67                                                                                                                                                                                                                                                                                                                                                  | IP66/IP67                                                                                                                                                                                                                                                                                                                                                                                            | IP65 front, IP20 rear                                                                                                                                                                                                                                                |
|  | Via standard interface on sensor                                                                                                                                                                                                                                                                                                                           | Via 4 ... 20 mA current loop                                                                                                                                                                                                                                                                                                                                                                         | Via 4 ... 20 mA current loop                                                                                                                                                                                                                                         |
|  | –                                                                                                                                                                                                                                                                                                                                                          | Standard < 1.7 V,<br>with lighting < 3.2 V                                                                                                                                                                                                                                                                                                                                                           | Standard < 1 V,<br>with lighting < 2.9 V                                                                                                                                                                                                                             |
|  | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, NEPSI, INMETRO,<br>KOSHA                                                                                                                                                                                                                                                                                     | ATEX, IEC, FM, CSA, EAC (GOST),<br>UKR Sepro, NEPSI, INMETRO,<br>KOSHA                                                                                                                                                                                                                                                                                                                               | ATEX, IEC, FM, CSA                                                                                                                                                                                                                                                   |
|  | <ul style="list-style-type: none"> <li>Measured value display and sensor operation at easily accessible locations (up to 50 m away from the sensor)</li> <li>Good readability and simple adjustment via integrated PLICSCOM</li> <li>Universally applicable, because compatible with all plics® sensors, independent of the measuring principle</li> </ul> | <ul style="list-style-type: none"> <li>Measured value display and sensor operation at easily accessible locations (up to 1500 m away from the sensor)</li> <li>Good readability and simple adjustment via integrated PLICSCOM</li> <li>Universally applicable thanks to compatibility with all 4 ... 20 mA sensors and integrated adjustment functions for VEGAPULS WL 61 and VEGAWELL 52</li> </ul> | <ul style="list-style-type: none"> <li>Convenient measured value display in accessible places (up to 1500 m away from the sensor)</li> <li>Excellent visibility via large display</li> <li>Universally applicable thanks to freely scalable display range</li> </ul> |



# Controllers



## Area of application

Together with connected sensors, controllers enable a variety of measuring tasks, such as e.g. level, gauge, differential pressure, process pressure, distance, interface and temperature measurement.

## Principle of operation

Sensors detect physical values in a vessel and forward them to the controller. Through an adjustment in the controller, the readings can be adapted to the specific conditions of the measuring point. They appear on its display and can be retransmitted via the integrated current or digital outputs connected to field mounted indicators or higher-level control systems. In addition, point level signals can be programmed to control pumps or other actuators via integrated relays.

## Advantages

Versatile linearisation and scaling of outputs with differential control capability on dual-sensor variants. The large displays, easy, app-based setup or Ethernet and RS232 communication capability offers simple integration into higher-level systems. Quick and easy installation thanks to a wide range of variants and mounting options. Cost savings through integrated sensor power supply, multi-drop sensor connection, even in explosion protected areas.

|                   | VEGAMET 841/842                                                                                                                                                                                                                                                                                           | VEGAMET 861/862                                                                                                 |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                                                                          |                               |
| Application       | Measured value display, point level alarms, pump control, flow measurement in open channels                                                                                                                                                                                                               | Measured value display, point level alarms, pump control, flow measurement in open channels, data logger        |
| Input             | 1/2x 4 ... 20 mA sensor input                                                                                                                                                                                                                                                                             | 1/2x 4 ... 20 mA/HART sensor input<br>2/4x digital input                                                        |
| Output            | 1/2x 0/4 ... 20 mA current output<br>3x operating relay<br>1x fail safe relay (instead of an operating relay)                                                                                                                                                                                             | 1/3x 0/4 ... 20 mA current output<br>4/6x operating relay<br>1x fail safe relay (instead of an operating relay) |
| Operating voltage | 24 ... 65 V DC<br>100 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                                                              | 24 ... 65 V DC<br>100 ... 230 V AC, 50/60 Hz                                                                    |
| Mounting          | Wall/pipe mounting in the field                                                                                                                                                                                                                                                                           | Wall/pipe mounting in the field                                                                                 |
| Display           | LCD matrix display, black and white backlight with colour change according to status, relay or measured value                                                                                                                                                                                             | LCD matrix display, black and white backlight with colour change according to status, relay or measured value   |
| Adjustment        | On-site adjustment with 4 keys, smartphone/tablet/PC and PACTware or VEGA Tools app                                                                                                                                                                                                                       | On-site adjustment with 4 keys, smartphone/tablet/PC and PACTware or VEGA Tools app                             |
| Approvals         | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, TIIS, KOSHA/KTL, SEPRO, CCOE, IA, WHG                                                                                                                                                                                                                              | ATEX, IEC, cULus, NEPSI, EAC, INMETRO, TIIS, KOSHA/KTL, SEPRO, CCOE, IA, WHG, mcerts                            |
| Benefit           | <ul style="list-style-type: none"> <li>▪ Clear, easy-to-read (at distance), user-programmable display</li> <li>▪ Fast setup thanks to simple intuitive menu navigation and application wizards</li> <li>▪ Secure, user-friendly wireless operation via Bluetooth with smartphone, tablet or PC</li> </ul> |                                                                                                                 |

# Controllers

|                   | VEGAMET 341/342                                                                                                                                                                                                                                                                                           | VEGAMET 391                                                                                                                                                         |
|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                                                                          |                                                                                  |
| Application       | Measured value visualisation, limit value monitoring, pump control, flow measurement in open channels                                                                                                                                                                                                     | Measured value indication and simple control functions, remote enquiry of measured values, remote data retrieval, data transmission via Ethernet                    |
| Input             | 1/2x 4 ... 20 mA sensor input                                                                                                                                                                                                                                                                             | 1x 4 ... 20 mA/HART sensor input                                                                                                                                    |
| Output            | 1/2x 0/4 ... 20 mA current output<br>3x operating relay<br>1x fail safe relay (instead of operating relay)                                                                                                                                                                                                | 1x 0/4 ... 20 mA current output<br>6x operating relay<br>1x fail safe relay (instead of operating relay)<br><br>1x Ethernet (optional)<br>1x RS232 (optional)       |
| Operating voltage | 24 ... 65 V DC<br>100 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                                                              | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                                         |
| Mounting          | Panel mounting                                                                                                                                                                                                                                                                                            | Front panel or wall mounting<br>Carrier rail 35 x 7.5 acc. to EN 50022                                                                                              |
| Display           | LCD matrix display, black and white backlight with colour change according to status, relay or measured value                                                                                                                                                                                             | LCD matrix display, background lighting                                                                                                                             |
| Adjustment        | On-site adjustment with rotary knob/push-button, smartphone/tablet/PC and PACTware or VEGA Tools app                                                                                                                                                                                                      | On-site adjustment with 4 keys, PACTware/DTM                                                                                                                        |
| Approvals         | ATEX, IEC, cULus, WHG, Ship                                                                                                                                                                                                                                                                               | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, SIL2                                                                                                                     |
| Benefit           | <ul style="list-style-type: none"> <li>▪ Clear, easy-to-read (at distance), user-programmable display</li> <li>▪ Fast setup thanks to simple intuitive menu navigation and application wizards</li> <li>▪ Secure, user-friendly wireless operation via Bluetooth with smartphone, tablet or PC</li> </ul> | <ul style="list-style-type: none"> <li>▪ Simple connection of sensor thanks to integrated power supply</li> <li>▪ Excellent visibility via large display</li> </ul> |

|  | VEGAMET 141/142                                                                                                                                                                                                                                                                                 | VEGAMET 624                                                                                                                                                                                                                                                     | VEGAMET 625                                                                                                                                           | VEGASCAN 693                                                                                                              |
|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                                                                                |                                                                                                                                                                                |                                                                     |                                        |
|  | Measured value visualisation, limit value monitoring, pump control, flow measurement in open channels                                                                                                                                                                                           | Measured value indication, simple control functions as well as remote enquiry of measured values for one 4 ... 20 mA/HART sensor, data transmission via Ethernet                                                                                                | Measured value indication, simple control functions as well as remote enquiry of measured values for two HART sensors, data transmission via Ethernet | Measured value indication and remote enquiry of measured values for up to 15 HART sensors, data transmission via Ethernet |
|  | 1/2x 4 ... 20 mA sensor input                                                                                                                                                                                                                                                                   | 1x 4 ... 20 mA/HART sensor input                                                                                                                                                                                                                                | 2x HART sensor input                                                                                                                                  | 15x HART sensor input                                                                                                     |
|  | 1/2x 0/4 ... 20 mA current output<br>3x operating relay<br>1x fail safe relay (instead of operating relay)                                                                                                                                                                                      | 3x 0/4 ... 20 mA current output<br>3x operating relay<br>1x fail safe relay<br><br>1x Ethernet (optional)<br>1x RS232 (optional)                                                                                                                                | 3x 0/4 ... 20 mA current output<br>3x operating relay<br>1x fail safe relay<br><br>1x Ethernet (optional)<br>1x RS232 (optional)                      | 1x fail safe relay<br>1x Ethernet (optional)<br>or 1x RS232 (optional)                                                    |
|  | 24 ... 65 V DC<br>100 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                                                    | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                     | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                           | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                               |
|  | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                                                                                       | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                                                       | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                             | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                 |
|  | LCD matrix display, black and white backlight with colour change according to status, relay or measured value                                                                                                                                                                                   | LCD matrix display, background lighting                                                                                                                                                                                                                         | LCD matrix display, background lighting                                                                                                               | LCD matrix display, background lighting                                                                                   |
|  | On-site adjustment with rotary knob/push-button, smartphone/tablet/PC and PACTware or VEGA Tools app                                                                                                                                                                                            | On-site adjustment with 4 keys, PACTware/DTM                                                                                                                                                                                                                    | On-site adjustment with 4 keys, PACTware/DTM                                                                                                          | On-site adjustment with 4 keys, PACTware/DTM                                                                              |
|  | ATEX, IEC, cULus, WHG, Ship                                                                                                                                                                                                                                                                     | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Ship                                                                                                                                                                                                                 | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Ship                                                                                                       | ATEX, IEC, FM, CSA, EAC (GOST), UKR Sepro, Ship                                                                           |
|  | <ul style="list-style-type: none"> <li>• Compact design with display for on-site checking</li> <li>• Fast setup and commissioning via simple menu navigation and application wizards</li> <li>• Secure, user-friendly wireless operation via Bluetooth with smartphone, tablet or PC</li> </ul> | <ul style="list-style-type: none"> <li>• Simple connection of sensor thanks to integrated power supply</li> <li>• Versatile use through relay and current outputs as well as integrated web server</li> <li>• Excellent visibility via large display</li> </ul> |                                                                                                                                                       |                                                                                                                           |

# Controllers

|                   | VEGATOR 111/112                                                                                                                                                                                                                                        | VEGATOR 121/122                                                                                                                                   |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                       |                                                                |
| Application       | Transmission of NAMUR signals for level signalling                                                                                                                                                                                                     | Transmission of 8/16 mA signals for level signalling                                                                                              |
| Input             | VEGATOR 111: single channel<br>VEGATOR 112: double channel                                                                                                                                                                                             | VEGATOR 121: single channel<br>VEGATOR 122: double channel                                                                                        |
| Output            | VEGATOR 111:<br>1x operating relay (SPDT),<br>optional<br>1x fail safe relay (SPDT)<br><br>VEGATOR 112:<br>2x operating relay (SPDT)                                                                                                                   | VEGATOR 121:<br>1x operating relay (SPDT),<br>optional<br>1x fail safe or operating relay (SPDT)<br><br>VEGATOR 122:<br>2x operating relay (SPDT) |
| Operating voltage | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                            | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                       |
| Mounting          | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                                              | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                         |
| Display           | 1x LED voltage supply<br>1x LED switching signal per channel<br>1x LED false signal per channel                                                                                                                                                        | 1x LED voltage supply<br>1x LED switching signal per channel<br>1x LED false signal per channel                                                   |
| Approvals         | ATEX, IEC, EAC (GOST), Overfill protection,<br>Ship, SIL2, UL                                                                                                                                                                                          | ATEX, IEC, EAC (GOST), Overfill protection,<br>Ship, SIL2, UL                                                                                     |
| Benefit           | <ul style="list-style-type: none"> <li>• Rapid implementation of simple control and regulatory functions</li> <li>• Increased operational reliability through line monitoring and test button</li> <li>• Easy installation via carrier rail</li> </ul> |                                                                                                                                                   |

|                   | VEGATOR 131/132                                                                                                                                                                                                                        | VEGATOR 141/142                                                                                                                             |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                       |                                                          |
| Application       | Controller for conductive probes                                                                                                                                                                                                       | Controller for 4 ... 20 mA signals for level detection                                                                                      |
| Input             | VEGATOR 131: single channel<br>VEGATOR 132: double channel                                                                                                                                                                             | VEGATOR 141: single channel<br>VEGATOR 142: double channel                                                                                  |
| Output            | VEGATOR 131:<br>1x operating relay,<br>optional<br>1x fail safe relay output (SPDT)<br><br>VEGATOR 132:<br>2x operating relay (SPDT)                                                                                                   | VEGATOR 141:<br>1x operating relay (SPDT),<br>optional<br>1x fail safe relay output (SPDT)<br><br>VEGATOR 142:<br>2x operating relay (SPDT) |
| Operating voltage | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                                                                                                            | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                 |
| Mounting          | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                              | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                   |
| Display           | 1x LED voltage supply<br>1x LED switching signal per channel<br>1x LED false signal per channel                                                                                                                                        | 1x LED voltage supply<br>1x LED switching signal per channel<br>1x LED false signal per channel                                             |
| Approvals         | ATEX, IEC, EAC (GOST), Overfill protection                                                                                                                                                                                             | ATEX, IEC, EAC (GOST), Overfill protection,<br>Ship, SIL2, UL                                                                               |
| Benefit           | <ul style="list-style-type: none"> <li>▪ Rapid implementation of simple control and regulatory functions</li> <li>▪ Increased operational reliability through line monitoring</li> <li>▪ Easy installation via carrier rail</li> </ul> |                                                                                                                                             |



## Wireless communication

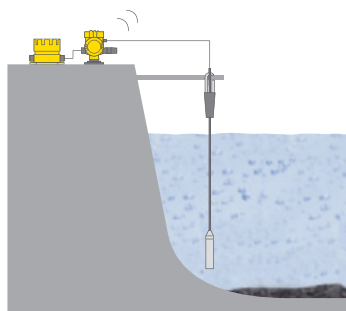


### Area of application

Wireless communication devices are used when measured values have to be transferred from remote monitoring stations or mobile tanks to data collection centres. This makes them ideal for use in conjunction with VEGA Inventory System, the software for automatic inventory monitoring. They also enable wireless remote diagnostics and maintenance of their connected sensors.

### Principle of operation

Only the transmitting unit is required for wireless communication. It is connected to the sensors via a serial bus cable or via the standard 4 ... 20 mA/HART signal cable. The transmitting unit provides the voltage supply for the sensors, reads out the measured values and transmits them to a data collection centre via the local mobile phone network.



### Advantages

Simple operation through the use of open and standardized frequency bands (multi-band technology). High flexibility for the user thanks to free choice of mobile network. Especially fast setup as well as maintenance-free operation when using the VEGA service package "Wireless Data Transmission".

|                    | PLICSMOBILE T81                                                                                                                                                                                                                                                                                                                                                                                                                            | PLICSMOBILE in the sensor                                                                                                                                                               | PLICSMOBILE B81                                                                                                                                                                                                                                                                 |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                        |                                                                                                                                                                                              |
| Application        | Remote data retrieval and remote parameterization for up to 15 HART sensors                                                                                                                                                                                                                                                                                                                                                                | Remote data retrieval and remote parameterization for one HART sensor                                                                                                                   | Battery and accumulator unit for PLICSMOBILE                                                                                                                                                                                                                                    |
| Input              | 1 to 15 HART sensors                                                                                                                                                                                                                                                                                                                                                                                                                       | 1x VEGAPULS 64/69                                                                                                                                                                       | 1x solar panel                                                                                                                                                                                                                                                                  |
| Output             | VEGA Inventory System, e-mail, SMS                                                                                                                                                                                                                                                                                                                                                                                                         | VEGA Inventory System, e-mail, SMS                                                                                                                                                      | Power supply of PLICSMOBILE and the connected sensors                                                                                                                                                                                                                           |
| Display/adjustment | PACTware and DTM/ VEGA Tools app                                                                                                                                                                                                                                                                                                                                                                                                           | PLICSCOM/PACTware and DTM/ VEGA Tools app                                                                                                                                               | –                                                                                                                                                                                                                                                                               |
| Technology         | GSM/GPRS/UMTS/GPS/LTE/ Bluetooth                                                                                                                                                                                                                                                                                                                                                                                                           | GSM/GPRS/UMTS/GPS/LTE/ Bluetooth                                                                                                                                                        | –                                                                                                                                                                                                                                                                               |
| Mounting           | Wall or tube mounting                                                                                                                                                                                                                                                                                                                                                                                                                      | Integrated in field device                                                                                                                                                              | Wall or tube mounting                                                                                                                                                                                                                                                           |
| Temperature range  | -20 ... +65 °C                                                                                                                                                                                                                                                                                                                                                                                                                             | -20 ... +65 °C                                                                                                                                                                          | Battery: -10 ... +50 °C,<br>-40 ... +80 °C (lithium)<br>Battery pack: -20 ... +50 °C                                                                                                                                                                                            |
| Voltage supply     | 9.6 ... 32 V DC                                                                                                                                                                                                                                                                                                                                                                                                                            | 9.6 ... 32 V DC                                                                                                                                                                         | Battery: 4x 1.5 V<br>4x 3.6 V (lithium)<br>Battery pack: 4x 1.2 V                                                                                                                                                                                                               |
| Approvals          | –                                                                                                                                                                                                                                                                                                                                                                                                                                          | –                                                                                                                                                                                       | –                                                                                                                                                                                                                                                                               |
| Benefit            | <ul style="list-style-type: none"> <li>▪ Autonomous solution for remote enquiry of measurement data and remote parameterization of 1–15 sensors</li> <li>▪ World-wide application through multi-band technology</li> <li>▪ High flexibility through free choice of mobile network operator</li> <li>▪ Increased operating time with battery or accumulator via integrated power management</li> <li>▪ Alarms via e-mail and SMS</li> </ul> | <ul style="list-style-type: none"> <li>▪ Autonomous solution for remote enquiry of measurement data and remote parameterization via radio module integrated in plics® sensor</li> </ul> | <ul style="list-style-type: none"> <li>▪ Cost-effective solution for autonomous operation of PLICSMOBILE with battery or accumulator supply</li> <li>▪ Increased operating time with accumulator via integrated charging circuit and connected external solar panels</li> </ul> |

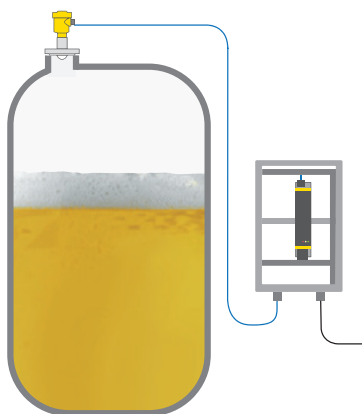
# Wireless communication

|                   | Wireless router                                                                                                                                                                                                                                   |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                   |                                                                                                                                                                  |
| Application       | For connecting to the Internet, for controllers with Ethernet interface                                                                                                                                                                           |
| Input             | Controllers with Ethernet interface                                                                                                                                                                                                               |
| Output            | VEGA Inventory System, e-mail                                                                                                                                                                                                                     |
| Display           | 6x LED status indicators                                                                                                                                                                                                                          |
| Technology        | GPRS/UMTS/LTE                                                                                                                                                                                                                                     |
| Mounting          | Wall mounting, carrier rail 35 x 7.5 according to EN 50022                                                                                                                                                                                        |
| Temperature range | -40 ... +75 °C                                                                                                                                                                                                                                    |
| Power supply      | 9 ... 36 V DC                                                                                                                                                                                                                                     |
| Approvals         | –                                                                                                                                                                                                                                                 |
| Benefit           | <ul style="list-style-type: none"> <li>• Cost-effective solution for remote enquiry of measurement data and remote parameterization of 1 - 15 sensors via connection to controllers</li> <li>• Worldwide use via multi-band technology</li> </ul> |





## Isolation and protection devices



### Area of application

Isolation devices are used in all applications where hazardous area regulations must be observed. In addition to powering the sensors in the field, they ensure electrical isolation from the connected PLC or process control system.

### Principle of operation

Isolation devices separate intrinsically safe circuits from non-intrinsically safe circuits. Distinguishing features are the type of power supply and the size of the Ex-specific characteristic values.

### Advantages

Reliable separation of intrinsically safe and non-intrinsically safe circuits. Simple installation, as no additional power supply is required. Simple installation via carrier rail mounting.



|                               | VEGATRENN 141/142                                                                                                                                                                                                                                                                                                                     | VEGATRENN 151/152                                                                                                                                                                                                                                                                                    |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               |                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                   |
| Application                   | Separator<br>for 4 ... 20 mA/HART sensors                                                                                                                                                                                                                                                                                             | Separator<br>for 4 ... 20 mA/HART sensors                                                                                                                                                                                                                                                            |
| Sensors                       | 4 ... 20 mA                                                                                                                                                                                                                                                                                                                           | 4 ... 20 mA                                                                                                                                                                                                                                                                                          |
| Input and sensor power supply | VEGATRENN 141: single channel<br>VEGATRENN 142: double channel                                                                                                                                                                                                                                                                        | VEGATRENN 151: single channel<br>VEGATRENN 152: double channel                                                                                                                                                                                                                                       |
| Output                        | VEGATRENN 141: single channel<br>VEGATRENN 142: double channel                                                                                                                                                                                                                                                                        | VEGATRENN 151: single channel<br>VEGATRENN 152: double channel                                                                                                                                                                                                                                       |
| Operating voltage             | 24 ... 65 V DC<br>24 ... 230 V AC, 50/60 Hz                                                                                                                                                                                                                                                                                           | Via 4 ... 20 mA current loop                                                                                                                                                                                                                                                                         |
| Mounting                      | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                                                                                                                             | Carrier rail 35 x 7.5<br>acc. to EN 50022                                                                                                                                                                                                                                                            |
| Voltage loss                  | –                                                                                                                                                                                                                                                                                                                                     | 4 mA < 3 V<br>20 mA < 5 V                                                                                                                                                                                                                                                                            |
| Approvals                     | ATEX, IEC, cULus, Ship, SIL2                                                                                                                                                                                                                                                                                                          | ATEX, IEC, cULus, Ship, SIL2                                                                                                                                                                                                                                                                         |
| Benefit                       | <ul style="list-style-type: none"> <li>▪ Secure power supply and reliable separation of intrinsically safe and non-intrinsically safe measuring circuits</li> <li>▪ Complete HART permeability allows unrestricted access to sensor settings</li> <li>▪ Easy installation via rail mounting and removable, coded terminals</li> </ul> | <ul style="list-style-type: none"> <li>▪ Reliable separation of intrinsically safe and non-intrinsically safe measuring circuits.</li> <li>▪ Simple installation, as no additional power supply is required</li> <li>▪ Easy installation via rail mounting and removable, coded terminals</li> </ul> |

# Isolation and protection devices

|                      | B53-19/B61-300/B61-300 FI                                                                                                                                                                                                      | B62-36G/B62-30W                                                                                                                                    |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                                                                                                               |                                                                 |
| Application          | <p>B53-19: Overvoltage arresters for conductive probes</p> <p>B61-300: Overvoltage arresters of supply and control cables</p> <p>B61-300FI: Overvoltage arresters of supply and control cables with FI protective circuits</p> | <p>B62-36G: Overvoltage arresters for two-wire circuits</p> <p>B62-30W: Overvoltage arresters for Profibus PA and Foundation Fieldbus circuits</p> |
| Mounting             | Carrier rail 35 x 7.5 acc. to EN 50022 or on carrier rail 32 mm acc. to EN 50035                                                                                                                                               | Carrier rail 35 x 7.5 acc. to EN 50022 or on carrier rail 32 mm acc. to EN 50035                                                                   |
| Operating voltage    | <p>B53-19: max. 19 V AC, 27 V DC</p> <p>B61-300/B61-300 FI: 110 ... 300 V AC/DC, max. 16 A</p>                                                                                                                                 | <p>B62-36G: 9.6 ... 36 V DC, max. 450 mA</p> <p>B62-30W: 12 ... 36 V DC, max. 450 mA</p>                                                           |
| Nominal leak current | < 10 kA                                                                                                                                                                                                                        | < 10 kA                                                                                                                                            |
| Protection           | IP20                                                                                                                                                                                                                           | IP20                                                                                                                                               |
| Temperature range    | -40 ... +60 °C                                                                                                                                                                                                                 | -40 ... +60 °C                                                                                                                                     |
| Approvals            | ATEX                                                                                                                                                                                                                           | ATEX                                                                                                                                               |
| Benefit              | <ul style="list-style-type: none"> <li>• High operational reliability even with impermissible voltage surges</li> <li>• Simple installation via carrier rail mounting</li> </ul>                                               |                                                                                                                                                    |

|  | B63-48/B63-32                                                                                                                                                                                                                                     | B81-35                                                                                                                                                                                                                                                                                           |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |                                                                                                                                                                  |                                                                                                                                                                                                                |
|  | <p>B63-48: Overvoltage arresters for two-wire circuits</p> <p>B63-32: Overvoltage arresters for Profibus PA and Foundation Fieldbus circuits</p>                                                                                                  | <p>Pluggable overvoltage arresters for supply and signal circuits</p>                                                                                                                                                                                                                            |
|  | Direct mounting in the cable entry of the field device                                                                                                                                                                                            | Pluggable to the plics® mains electronics of VEGAPULS series 60, VEGAFLEX series 80, VEGABAR series 80 and VEGADIS 82                                                                                                                                                                            |
|  | <p>B63-48: 12 ... 48 V DC</p> <p>B63-32: max. 32 V DC</p>                                                                                                                                                                                         | max. 35 V DC                                                                                                                                                                                                                                                                                     |
|  | < 10 kA                                                                                                                                                                                                                                           | < 10 kA                                                                                                                                                                                                                                                                                          |
|  | IP66                                                                                                                                                                                                                                              | -                                                                                                                                                                                                                                                                                                |
|  | -40 ... +85 °C                                                                                                                                                                                                                                    | -40 ... +85 °C                                                                                                                                                                                                                                                                                   |
|  | ATEX                                                                                                                                                                                                                                              | ATEX, IEC, EAC                                                                                                                                                                                                                                                                                   |
|  | <ul style="list-style-type: none"> <li>▪ High operational reliability even with impermissible voltage surges</li> <li>▪ Simple installation in the cable gland of the field device</li> <li>▪ No additional, separate on-site assembly</li> </ul> | <ul style="list-style-type: none"> <li>▪ High operational reliability of the measuring point through surge protection</li> <li>▪ Simple installation in the terminal compartment of the field device through compact design</li> <li>▪ Easy retrofitting in already installed sensors</li> </ul> |







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Looking Forward

**VEGA**

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