



Application examples and products

# Level and pressure instrumentation for ships

**VEGA**



#### Reliable

Stable ship positioning through precise level measurement

#### Cost effective

Universal sensor for a variety of level measuring tasks on board

#### User friendly

Simple installation and maintenance-free operation

## Ship position and draught

### Level measurements for the control of draught, trim and list

Among the most important measurements on board ships are those for determining draught, trim and list. In general, one measuring point is placed on the bow and another is used in the aft. On larger ships, two additional measuring points are installed on both the port and on the starboard. Accurate level measurements are required to determine the exact values of ship position and draught.

#### More details

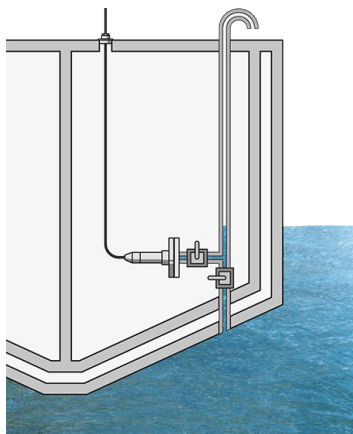


### VEGAWELL 52

Hydrostatic level measurement for reliable and precise measurement of draught, trim and list

- Encapsulated housing with fixed cable outlet, protects electronics and measuring cell reliably even in case of flooding
- Rugged CERTEC® measuring cell can withstand pressure shocks in rough seas
- High resistance to corrosive seawater with duplex or titanium housing

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### Reliable

Precise measurement regardless of the medium

### Cost effective

Multi-sensor flange reduces costs in planning and commissioning

### User friendly

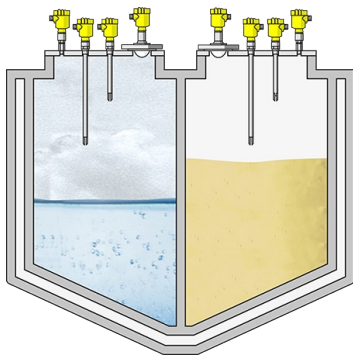
Simple installation of the radar, pressure and high level alarm sensors in one multi-sensor flange

## Cargo tank

### Measurement of level, point level and pressure in the cargo tanks on board

The levels in storage tanks, especially those on board chemical tankers must be continuously measured. This is especially important to monitor during loading and unloading operations, because of strict safety and environmental requirements. Any overfilling or product discharge on deck or into the sea could have devastating consequences for human life as well as the wider environment. Also, to prevent damage to the tanks caused via external temperature fluctuations, or overpressure and underpressure created by charging and discharging procedures, the internal tank pressures require continuous monitoring.

#### More details



### VEGAPULS 6X

Radar sensor for continuous level measurement in cargo tanks

- Independent of medium properties, temperature, pressure or gas overlay
- PTFE-protected, front-flush antenna: optimal chemical resistance even in aggressive media
- Measurement all the way to the tank bottom, also in media with low dielectric constant
- Strong focusing of the radar beam allows accurate measurement even in tanks with heating coils

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### VEGABAR 82

Pressure transmitter for monitoring gas pressure in the cargo tank

- Precise measurement of the internal tank pressure by capacitive CERTEC® ceramic measuring cell
- Capacitive ceramic CERTEC® measuring cell offers excellent chemical resistance even in aggressive media

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### VEGASWING 63

Vibrating level switch for high alarm (95 %) and high-high alarm (98 %)

- Robust sensor in alloy or stainless steel, resistant to aggressive media
- Test key on instrument allows fast and secure verification of function
- Exact switch point even with changing media optimises tank capacity

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#### Reliable

Exact level measurement in abrasive and aggressive seawater

#### Cost effective

Low installation and integration costs

#### User friendly

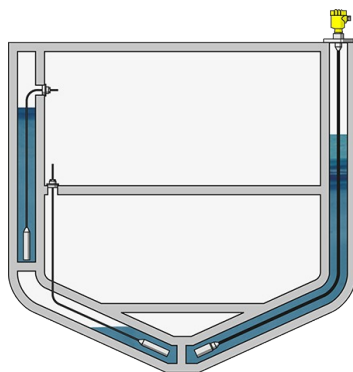
Maintenance-free operation due to seawater resistant materials

## Ballast water tanks

### Level measurement in the forepeak, wing and double bottom tanks with ballast water

The ballast water measurements in the wing and double bottom tanks go directly into the control system for the ship trim, draught and list. Since these measuring points are virtually inaccessible during operation on board, reliability and stability are an absolute must. Pressure shocks, abrasive sand particles and seawater place additional heavy demands on the instrumentation.

[More details](#)



#### VEGAWELL 52

Hydrostatic submersible pressure transmitter for level measurement in the ballast water tank

- Reliable, durable and robust, seawater-resistant sensors
- Ceramic measuring cell for exact and long-term stable measurement, even with pressure shocks and abrasion
- Simple installation from above or the side

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#### VEGABAR 86

Hydrostatic level measurement of ballast water in the double bottom tank

- Stainless steel housing protection to class IP 69K and ceramic measuring cell, offer the perfect sensor for the conditions in a double bottom tank
- Climate compensated electronics provide complete protection against high humidity
- On-site installation and ventilation of the electronics possible

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#### Reliable

Maximum safety for humans and the environment

#### Cost effective

Precise measurement in all the settling and service tanks

#### User friendly

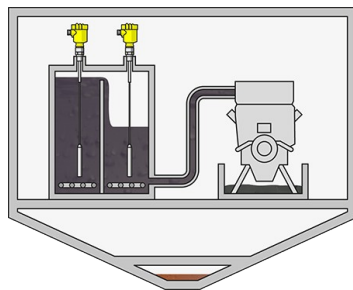
Maintenance-free and reliable operation

## HFO settling and service tank

### Level measurement in the settling and service tank in the engine room

To ensure fuel feed to the main engine, heavy fuel oil (HFO) is separated through first being pumped into a settling (buffer) tank. The following service tank or day tank, which is filled via a continuous overflow from the settling tank, directly supplies fuel into the main engine. Heating coils in both of these tanks maintain an even temperature between +75° C and +90° C. A reliable level measurement in these tanks guarantees continuous manoeuvrability of the ships.

#### [More details](#)



### VEGAFLEX 81

Level measurement with guided radar in the settling and service tanks

- Space saving mounting from the top
- Maintenance-free, continuous operation, as only stainless steel cable comes into contact with the hot, aggressive medium
- Reliable measurement in adhesive media

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#### Reliable

Maximum safety for humans and the environment

#### Cost effective

Simple installation

#### User friendly

Maintenance-free and reliable operation

## Bilges

### Point level detection for bilge and leakage monitoring

Every ship has 'bilges' – this is space at the lowest point of the vessel between the floor of the engine room and the bottom of the ship. A water/oil mixture collects in this bilge area, where the mixture is pumped out and recovered and separated into water and oil by an on-board skimmer and demulsifying unit. The bilge de-oiling equipment is normally controlled by level switches. The oil sumps of the main engine and any auxiliary systems must also be monitored continuously for safety and environmental reasons.

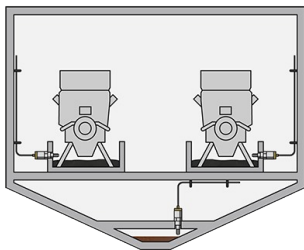
[More details](#)

### VEGASWING 51

Vibrating level switch for point level detection in bilge and oil pan

- Compact design allows installation in almost any position
- Maintenance-free operation, as the vibrating level switch has no mechanical moving parts
- Foam, bubble formation and viscosity do not influence switching accuracy

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### Reliable

Maximum safety for humans and the environment

### Cost effective

Reliable measurement of the amount of water in all tanks

### User friendly

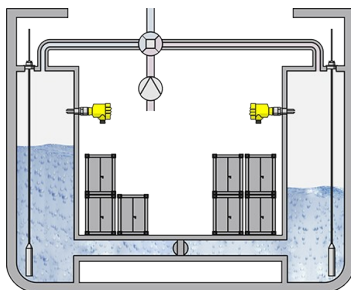
Simple installation and maintenance-free operation

## Anti-heeling system

### Level measurement and point level detection in the ballast water tanks

Ship heeling caused by high winds, uneven cargo loading or the forces of sharp turns is counteracted by anti-heeling systems. To counter these conditions, ballast tanks are connected to each other by means of pipe systems. Depending on the attitude of the ship, the tanks are either blown out or flooded by means of compressed air blowers or pumps. Reliable level measurement is needed to control this system.

#### More details



### VEGASWING 61

Vibrating level switch as overfill and pump dry run protection in the ballast tanks

- Wear and maintenance-free, as no mechanical moving parts involved
- Reliable detection of the limit level without adjustment
- Durable device with seawater resistant materials

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### VEGAWELL 52

Hydrostatic level measurement in the wing tank

- Precise level measurement and control of the anti-heeling system
- Fast response and excellent long-term stability with oil-free, ceramic-capacitive CERTEC® measuring cell
- Reliable measurement even under extreme pressure shocks thanks to overload resistant ceramic CERTEC® measuring cell

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### Reliable

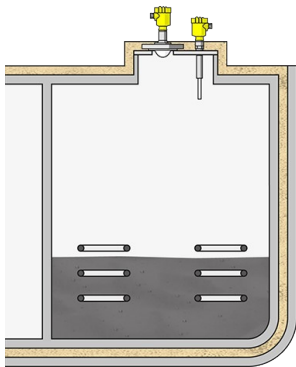
Reliable measurement solution for adhesive media

### Cost effective

Accurate measurement of the tank contents, regardless of medium and degree of contamination

### User friendly

Maintenance-free and reliable operation



## Cargo tank in a bitumen tanker

### Level measurement and point level detection in the cargo tanks of a bitumen tanker

Bitumen is transported at temperatures of around 170 °C to 190 °C. The heating is supplied via an array of multi-layered heating tubes mounted on the floor and sides of the tanks. To ensure efficient utilisation of the tanks as well as a safe ship attitude, the levels in the bitumen tanks require accurate monitoring, particularly during loading and unloading.

#### More details



#### VEGACAP 64

Capacitive point level detection for overflow protection in the bitumen tank

- Proven, robust measuring principle, unaffected by high temperatures and buildup
- Reliable switch point allows optimum utilization of the tank volume

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#### VEGAPULS 6X

Radar sensor for non-contact level measurement in the bitumen tank

- Ideal for hot and adhesive media thanks to contactless measuring principle
- Front-flush antenna delivers precise measurement data even with heavy buildup
- High accuracy in all measuring situations
- Reliable measurement down to the bottom, even in difficult installation conditions thanks to the good focusing of 80 GHz technology

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**Reliable**

Reliable and safe measurement in all media

**Cost effective**

Full utilization of the tank volume

**User friendly**

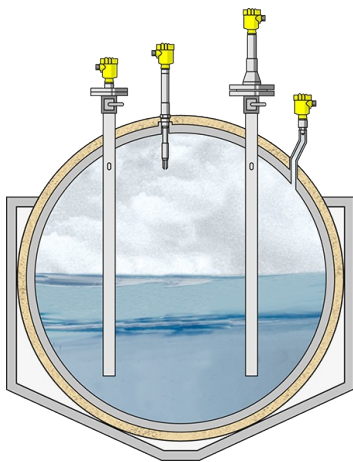
Simple planning and commissioning

## Cargo tanks on LNG carriers

### Pressure, level and point level detection in Liquefied Natural Gas (LNG) applications

Liquefied gas is transported in insulated cargo tanks on LNG carriers at temperatures of  $-162\text{ }^{\circ}\text{C}$ . The instrumentation used must be specially designed for these extreme temperatures. Pressure, level and point level of LNG in the cargo tanks must be reliably measured for the transport.

[More details](#)



#### VEGAPULS 6X

Radar sensor for non-contact level measurement in LNG tanks

- Front-flush PTFE antenna means no additional sealing material is required
- Reliable measurement even at very low temperatures down to  $-200\text{ }^{\circ}\text{C}$
- Exact measurement data despite low relative permittivity of the liquefied gas

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#### VEGABAR 82

Pressure transmitter for monitoring the pressure in the liquid gas tank

- High plant availability through maximum overload resistance of the ceramic measuring cell
- A special seal material and the dry measuring cell enable measurement at temperatures down to  $-50\text{ }^{\circ}\text{C}$

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#### VEGASWING 66

Vibrating level switch for point level detection in liquid gas tank

- Sensor for applications down to a temperature of  $-196\text{ }^{\circ}\text{C}$
- Switching point independent of changing media
- Reliable even with adhesive buildup

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#### Reliable

Accurate and reliable level measurement in all ballast tanks

#### Cost effective

Maximised operational time via maintenance-free measurement technology

#### User friendly

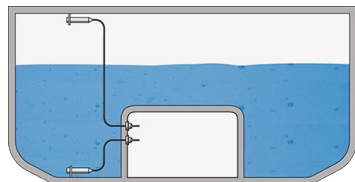
Simple installation in a service tunnel

## Heavy lifter

### Pressure and level measurement in the ballast water tanks of heavy lifters (Flo-Flo ship)

Flo-Flo (Float On/Float Off) ships are characterised by their large number of ballast water tanks. These make it possible to lower the ship until the main deck is below the waterline. This allows large floating loads to be loaded. The cargo is lifted out of the water and balanced by pumping out or blowing out the ballast water tanks. To avoid damage to the ballast water tanks from overpressure or underpressure, the internal tank pressures and levels require continuous monitoring.

[More details](#)



#### VEGAWELL 52

Pressure transmitter for measuring the internal pressure and the level in the ballast water tanks

- Ceramic-capacitive measuring cell is immune to pressure shocks, abrasion and particles suspended in the ballast water
- Long-term, high operational reliability through robust sensor with high protection class IP 68
- Sensor with fixed cable outlet allows easy planning and installation

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#### Reliable

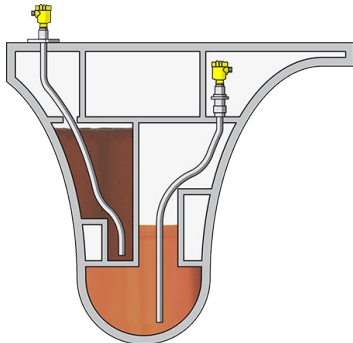
Reliable and accurate measurement, independent of the medium properties

#### Cost effective

Common sensor type for all applications reduces spare parts stocking

#### User friendly

Simple, easily accessible mounting from top



## Cavity tanks

### Level measurement in cavity service tanks on navy and research vessels

To extend the duration of stay at sea, every cubic centimetre of space on navy and research vessels is utilised. All available spaces and any inaccessible places on the ship are used as additional tanks for drinking water, diesel or aviation fuel. The tank shape and dimensions are completely different from familiar standard tanks. Depending on the type and size of the ship, they can also extend over several decks. A reliable level measurement is indispensable for the operation of these ships.

#### More details



#### VEGAPULS 66

Non-contact level measurement with radar in cavity tanks

- Sensor couples its signal directly into the sounding pipe
- Special fitting enables to perform manual sounding
- Costs for a second monitoring well are saved

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#### VEGAPULS 63

Radar sensor for level measurement in cavity tanks

- An existing monitoring well can be used for reliable non-contact measurement of the level
- Measurement is independent of internal fixtures and constrictions
- Accurate measurement, regardless of the medium

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### Reliable

Reliable and accurate measurement of the level

### Cost effective

Maximising the loading capacity of the tanks

### User friendly

Standard sensors for all tanks allow simple planning

## Crude oil storage tank

### Level measurement and point level detection in FPSO crude oil tanks

Crude oil is pumped directly into the cargo tanks on board in order to separate gas, oil and water from each other using gravity. To ensure profitable utilisation of the loading capacities as well as effective control of the pumps, the level is measured continuously and the point levels are monitored.

#### More details



### VEGAPULS 6X

Radar sensor for continuous level measurement in the FPSO crude oil tank

- Tight focusing of the radar beam thanks to 80 GHz technology, enables reliable measurement down to the tank bottom, even with narrow rib spacing
- High accuracy independent of oil consistency
- Simple installation due to small process fittings

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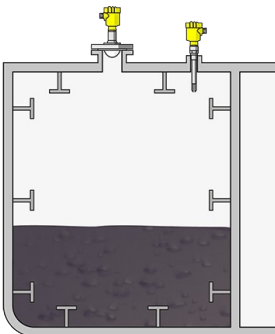


### VEGASWING 63

Vibrating level switch as overfill protection in the crude oil tank

- Millimetre-exact detection of the switching point, independent of oil consistency
- Adjustment-free sensor allows simple installation
- Simple function test with optional test button on the sensor

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#### Reliable

Maximum safety for humans and the environment

#### Cost effective

Low installation costs with simple setup

#### User friendly

Maintenance-free, robust measurement technology

## Manifold

### Pressure measurement on the line interface during loading and unloading

Hose connecting stations, also known as manifolds, connect the pipes and hoses that are required for cargo loading and offloading on tankers. To ensure the safety of facilities on shore and on board, and to control the pumps, the pipeline pressures need to be closely monitored on the manifold. Reliable pressure transmitters are required to ensure safe loading or unloading operations.

[More details](#)

#### VEGABAR 82

Pressure transmitter for monitoring manifold and pipeline pressure

- Resistant to abrasive and aggressive media thanks to ceramic-capacitive CERTEC® measuring cell
- Optimal cleaning due to front-flush measuring cell
- Display and adjustment module PLICSCOM displays the pressure readings on site

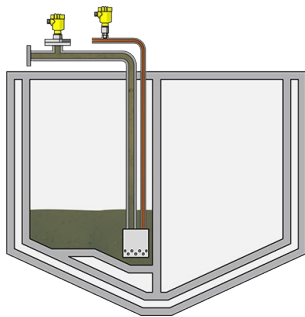
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#### VEGABAR 83

Pressure transmitter for controlling feed pump output

- Robust strain gauge measuring cell for hydraulic pressures up to 1000 bar
- Reliable measurement, even with overpressure or underpressure
- Display and adjustment module PLICSCOM shows the pressure readings locally

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### Reliable

Reliable water volume measurement

### Cost effective

Robust measuring technology ensures long, maintenance-free operation

### User friendly

Simple installation and setup

## Service tanks drinking water

### Level measurement in tanks with drinking water

Drinking water is an essential commodity on a ship. It is stored separately in dedicated tanks. Depending on the type and size of the ship, different amounts of fresh water are required for drinking, personal hygiene and cleaning. Direct electrical measuring principles are mandatory for level measurement.

#### [More details](#)

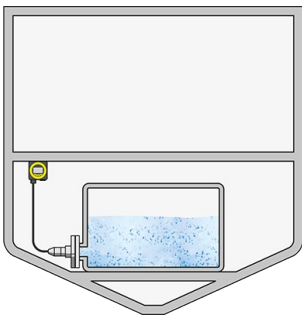


### VEGABAR 82

Hydrostatic pressure transmitter for level measurement in drinking water tanks

- Drinking water compatible materials and a flush diaphragm for hygienic measurement
- Robust diaphragm of sapphire-ceramic® withstands any chemical and mechanical cleaning required
- Remote electronics can be mounted at an easily accessible location

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#### Reliable

Reliable measurement of the waste volume

#### Cost effective

Robust measuring technology ensures long, maintenance-free operation

#### User friendly

Simple installation and setup

## Service tanks with grey and black water

### Level measurement in tanks with grey or black water

Waste water, known as grey/black water on ships, is treated on board larger vessels using ship-board clarification plants or it may be stored in special grey/black water tanks to await final disposal. Direct electrical measuring principles are mandatory for level measurement.

#### [More details](#)

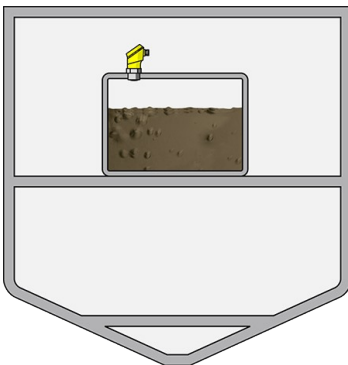


### VEGAPULS 21

Radar level measurement in grey or black water tank

- Reliable measurement via non-contact measuring method, even in liquids containing solids
- Simple installation from above through small process fitting

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#### Reliable

Reliable measurement unaffected by medium

#### Cost effective

Continuous operation of the power equipment is assured

#### User friendly

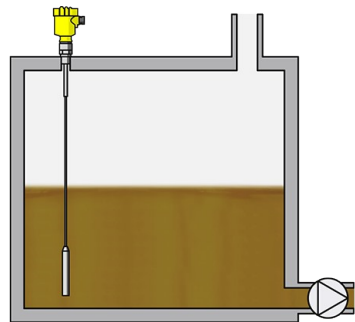
Simple installation

## Hydraulic oil reservoir tank

### Level measurement in the reservoir tank for hydraulic oil

The hydraulic oil used to transmit power circulates in a closed system. However, it is gradually lost due to lubrication points and leakages in the power equipment. To ensure optimum operation of the power equipment, the level in every hydraulic oil reservoir tank must be monitored for replenishment.

#### [More details](#)



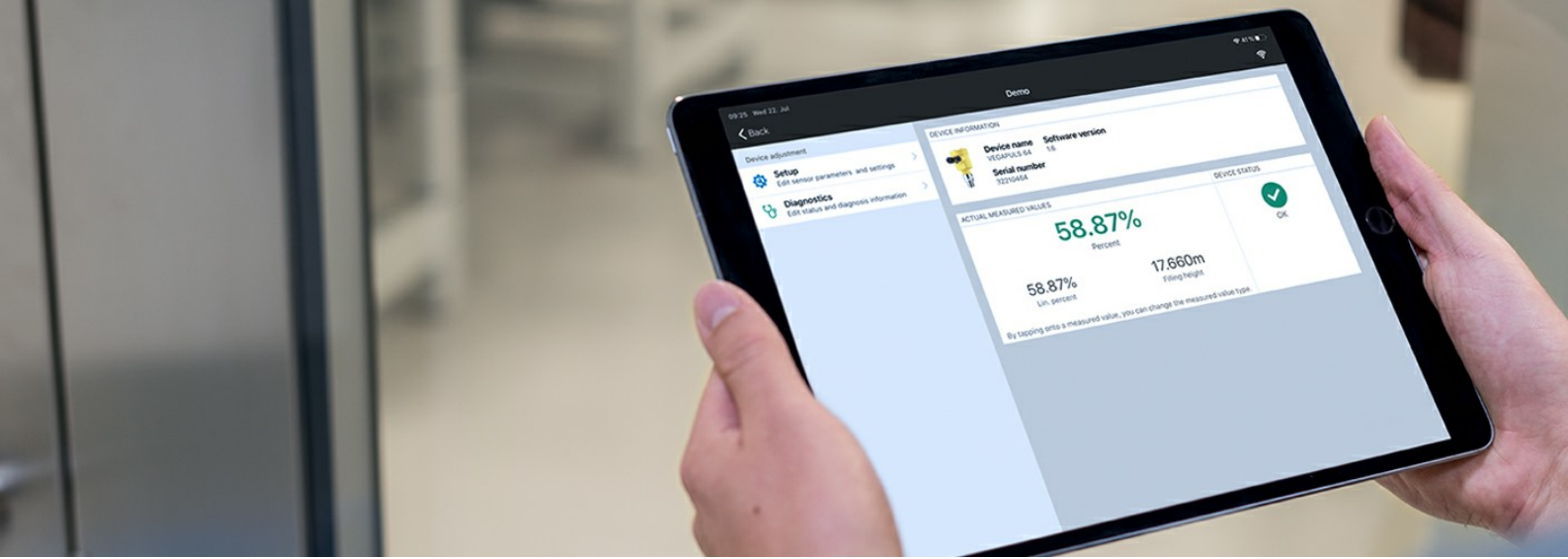
### VEGAFLEX 81

Level measurement with guided radar in the hydraulic oil reservoir tank

- Precise measurement, independent of media properties
- High measurement reliability even with buildup
- Simple setup and commissioning saves time

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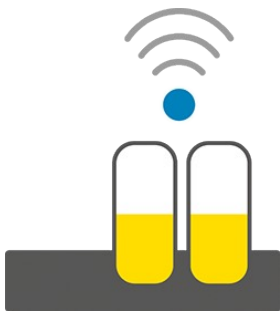
## Interconnected solutions



### Wireless operation

With Bluetooth, VEGA is looking far into the future. Wireless communication provides better accessibility: In harsh industrial environments, in hazardous areas, and in clean rooms. It allows setup, display and diagnostics from a distance of up to 50 metres, thus saving time and avoiding hazardous situations. Simply via VEGA Tools app – on any available smartphone or tablet.

### Wireless operation



### VEGA Inventory System

Simple but powerful visualization software coupled with high performance sensors provides a complete solution for remote monitoring of fish feed inventories.

- Access to live data anywhere on the internet via a web browser
- Gain detailed insights into your stock levels and consumption
- Optimize replenishment planning
- Never miss events with alerts and notifications
- Secure and reliable data

### VEGA Inventory System

### myVEGA

With myVEGA as your personal information platform you have access to many useful online functions relating to VEGA products.

- Configurator for the entire VEGA product range
- 2D/3D drawings of configured instruments
- Access to product data, operating instructions, certificates and software
- Manage offers and order data, and also track shipments
- Save, manage and synchronize access codes for VEGA sensors

### myVEGA

