

Level and pressure instrumentation in the food industry



Application examples and products



Measurement technology for the food industry

This brochure presents examples of applied level and pressure measurement technology. Here, you'll learn which sensors fit which measuring tasks.

■ Chocolate storage tank	Level measurement and point level detection	■ Storage silo for sugar and flour	Level and pressure measurement
■ Raw milk tank	Level, point level and pressure measurement	■ Small silos for baking ingredients	Level measurement and point level detection
■ Stirring and batching tank for yoghurt	Level measurement and point level detection	■ Jam cooking kettle	Level measurement
■ Storage tanks for alcohol	Level measurement and point level detection	■ Evaporator	Density and pressure measurement
■ Beer tank	Level measurement	■ Meat pellets conveyor	Monitoring of conveyor belt
■ Thickener for sugar beet juice	Level measurement	■ Batch filler vessel	Level measurement




More applications can be found at

www.vega.com/food-industry







■ Grain silo	Level measurement and point level detection	■ Aroma vessel	Level measurement
■ Flour silo	Level measurement	■ Mash tank	Level measurement
■ Animal feed silo	Level measurement	■ Ice cream "Premix" mixer	Level and pressure measurement
■ Conveyor belt for sugar beet	Level measurement	■ Mixing tank for soft cheese production	Level measurement
■ Sugar dissolver vessel	Level measurement	■ Reaction vessel with agitator	Level measurement
■ Storage tank for liquid foodstuffs	Level measurement	■ Reaction vessel for creatine production	Level measurement

All sensors at a glance



Continuous level measurement

Instrument type	Measuring range	Process fitting	Process temperature	Process pressure
VEGAPULS 64 Radar sensor for continuous level measurement of liquids 	up to 30 m	Thread from G¾, ¾ NPT, flanges from DN 50, 2", mounting strap	-40 ... +200 °C	-1 ... +20 bar (-100 ... +2000 kPa)
VEGAPULS 67 Radar sensor for continuous level measurement of bulk solids 	up to 15 m	Mounting strap, compression flanges from DN 80, 3"	-40 ... +80 °C	-1 ... +2 bar (-100 ... +200 kPa)
VEGAPULS 69 Radar sensor for continuous level measurement of bulk solids 	up to 120 m	Mounting strap, compression flange from DN 80, 3", flanges from DN 80, 3", adapter flanges from DN 100, 4"	-40 ... +200 °C	-1 ... +3 bar (-100 ... +300 kPa)

Point level detection

Instrument type	Measuring range	Process fitting	Process temperature	Process pressure
VEGACAP 63 Capacitive rod electrode for level detection 	up to 6 m	Thread from G½, ½ NPT, flanges from DN 25, 1"	-50 ... +200 °C	-1 ... +64 bar (-100 ... +6400 kPa)
VEGAMIP 61 Microwave barrier for level detection in bulk solids and liquids 	up to 100 m	Thread G1½, 1½ NPT, flanges, clamp, mounting strap	-40 ... +80 °C +450 °C with mounting adapter	-1 ... +4 bar (-100 ... +400 kPa)
VEGASWING 61 Vibrating level switch for liquids 	up to 6 m	Thread from G¾, ¾ NPT, flanges from DN 25, 1", hygienic fittings	-50 ... +250 °C	-1 ... +64 bar (-100 ... +6400 kPa)
VEGASWING 63 Vibrating level switch with tube extension for liquids 	up to 6 m	Thread from G¾, ¾ NPT, flanges from DN 25, 1", hygienic fittings	-50 ... +250 °C	-1 ... +64 bar (-100 ... +6400 kPa)
VEGAVIB 61 Vibrating level switch for granular bulk solids 	Bulk solids from 20 g/l	Thread from G1, 1 NPT, flanges from DN 32, 1½", hygienic fittings	-50 ... +250 °C	-1 ... +16 bar (-100 ... +1600 kPa)
MINITRAC 31 Radiation-based sensor for density measurement 	Density measurement	Mounting from outside on pipelines or on vessel	any (with optional cooling)	any

Pressure measurement

Instrument type	Deviation	Process fitting	Process temperature	Measuring range
VEGABAR 82 Pressure transmitter with ceramic measuring cell 	0.2 % 0.1 % 0.05 %	Thread G½, ½ NPT, flanges from DN 15, 1½", hygienic fittings	-40 ... +150 °C	-1 ... +100 bar (-100 ... +10000 kPa)
VEGABAR 83 Pressure transmitter with metallic measuring cell 	0.2 % 0.1 % 0.075 %	Thread from G½, ½ NPT, flanges from DN 25, 1", hygienic fittings	-40 ... +200 °C	-1 ... +1000 bar (-100 ... +100000 kPa)



Food industry



Modern, service-proven instrumentation

VEGA has decades of experience as a supplier of measuring instruments for the food industry. When it comes to sensors for hygienic processes, VEGA instruments measure level and pressure in tanks, containers and pipes with exceptional accuracy and very good reliability. They are also very easy to install, set up and put into operation.



Great value for money

VEGA sensors are oriented to the special requirements of the food industry and optimized for hygienic applications. Gapless designs, certified materials and process fittings, as well as shock-resistant, dry ceramic sensors allow long-term use.

Certificates

VEGA sensors are certified according to all current standards such as FDA, EC 1935/2004, EHEDG and 3A. Corresponding documents and certificates are supplied with the sensors and are also available online 24/7.



Food and Drug
Administration



EG 1935/2004



European Hygienic
Engineering & Design Group



3-A



plics® – easy is better

Instrument platform plics®

The plics® idea is simple: Each instrument is assembled from prefabricated components once the order is received. This modular design allows full flexibility when selecting the required sensor features. You receive your customised, user-friendly instrument within an amazingly short time. The best part: these instruments are more cost-effective and advantageous in every way – throughout their entire life cycle.

Display and adjustment

The display and adjustment module PLICSCOM is used for measured value indication, adjustment and diagnosis directly on the sensor. Its simple menu structure enables quick setup. Status messages are displayed in plain text. The optional Bluetooth feature allows wireless operation.

Connection

The VEGACONNECT connects your instrument to a PC via the USB interface. PLICSCOM with Bluetooth enables data transfer with wireless technology. The instruments are configured with the tried and trusted adjustment software PACTware and the appropriate DTM or with an app on a smartphone or tablet PC. For EDD-based systems we also offer graphics-driven EDDs.

Asset management and maintenance

The integrated self-monitoring function of plics® instruments permanently informs the user on the status of the instruments. Status messages allow proactive and cost-effective maintenance. All diagnostic data can be called up easily and quickly in plain text via the built-in memory functions.





Chocolate storage tank

Reliable

Certified materials according to FDA and EC 1935/2004 regulations

Cost effective

Easy to adjust and maintenance-free

User friendly

Exact measurement data despite rapidly changing liquid level

Level measurement and point level detection in chocolate storage tanks with agitator

After the “conching” process the liquid chocolate is kept in large tanks for further processing. An agitator stirs the chocolate “mass” to maintain a uniform consistency and temperature in the vessel. A reliable level measurement is required in both the chocolate tank and the downstream filler hoppers to control the production process.



VEGABAR 82

Pressure transmitter for level measurement

- Absolutely front-flush hard wearing ceramic diaphragm prevents sticking and abrasion damage
- High, long-term stability thanks to ceramic CERTEC® measuring cell
- Reliable measurement, unaffected by agitator



VEGACAP 63

Capacitive level switch as overflow protection

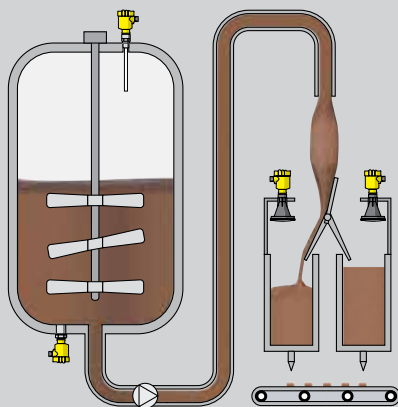
- Insensitive to heavy buildup or consistency and temperature of the liquid chocolate
- Uncomplicated installation, easy setup and commissioning
- Reliable detection through product-independent switching point



VEGAPULS 64

Radar sensor for level control

- Non-contact measurement, immune to abrasion and buildup
- Small compact design simplifies mounting
- Small blocking distance (dead band) enables reliable measurement in small containers





Raw milk tank

Reliable

Certified materials according to FDA and EC 1935/2004 regulations

Cost effective

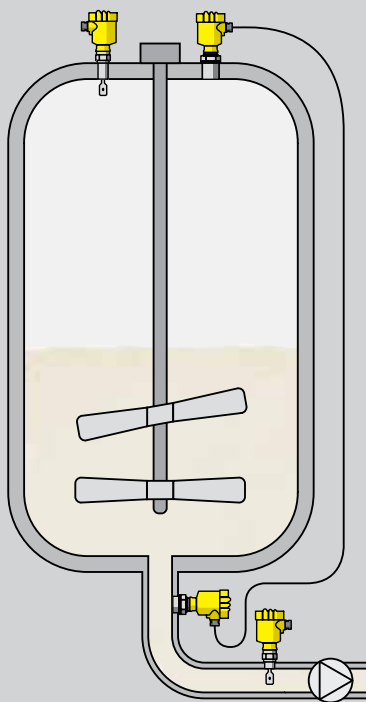
Short delivery time and standardized operation thanks to plics® concept

User friendly

Simple installation, differential pressure capillary lines unnecessary with electronic differential pressure method

Level, pressure measurement and point level detection in the raw milk tank

The incoming raw milk is stored at a temperature of about 4 °C and stirred gently at all times to ensure it is kept until it is forwarded for further processing. As well as measuring the level in the vessel, the milk is protected against contamination with an overpressure. Point level detection prevents any overfilling of the raw milk tank.



VEGABAR 83

Electronic differential pressure method for pressure and level measurement in the raw milk tank

- Suitable for CIP and SIP cleaning processes at temperatures up to 150 °C
- METEC® measuring cell with stainless steel or alloy diaphragm is resistant to aggressive cleaning agents
- Simple installation, since differential pressure lines are unnecessary



VEGASWING 61

Vibrating level switch for detection of the upper and lower point level in the raw milk stirring tank

- Safe and reliable operation under all process conditions
- Tuning fork easy to clean, as it is welded gap-free to process fitting
- Simple setup without adjustment



Stirring and batching tank for yoghurt

Reliable

Certified materials according to FDA and EC 1935/2004 regulations

Cost effective

plics® concept ensures short delivery times

User friendly

Standardised operation of all instruments thanks to plics® concept

Level measurement and point level detection in stirred batching tank for fruit yoghurt

The milk lactose is converted to lactic acid under controlled heating in stirring and batching tanks. This process thickens the milk to yoghurt and gives it its sourish taste. The resulting product is then cooled down. In further processing into a fruit based yoghurt, berries, nuts or grains are added and stirred in. The level and point level detection must be reliably detected to enable optimal filling of the vessel.



VEGAPULS 64

Level measurement with radar in yoghurt stirring and batching tank

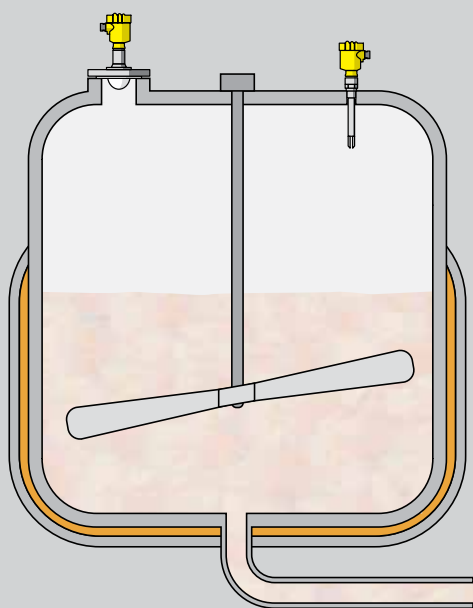
- Non-contact tight focused measurement, unaffected by agitators
- Flange with encapsulated antenna system allows optimal CIP and SIP cleaning
- Reliable volume measurement, independent of changing medium density



VEGASWING 63

Vibrating level switch as overflow protection in stirring and batching tank

- Product-independent switching point enables accurate and reliable control
- Stainless steel tuning fork unaffected by cleaning processes, abrasion and buildup





Storage tanks for alcohol

Reliable

Approvals for hazardous areas

Cost effective

Process instrumentation secures ongoing plant operation

User friendly

Standardised operation of all sensors

Level measurement and point level detection in the storage tank

Alcohol storage tanks are considered potentially explosive and are therefore kept in special rooms. When the alcohol is needed, it is pumped directly to the appropriate production vessel through a “ring main” supply system. Reliable measuring instruments are required for dependable measurement of the level in the tank and for monitoring the feed pressure in the pipeline.



VEGABAR 82

Pressure transmitter for level measurement in the alcohol tank and for monitoring pressure in the supply main

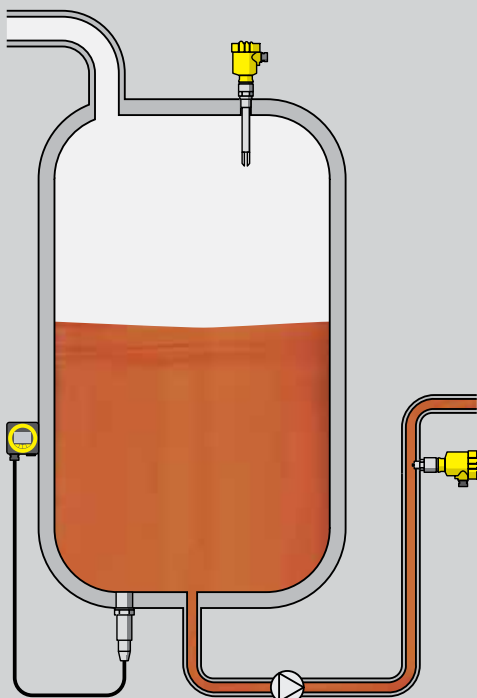
- External housing allows easy reading of measured values in hazardous areas
- Small process fittings on the pipeline
- Resistant to dynamic CIP and SIP cleaning



VEGASWING 63

Vibrating level switch in the alcohol tank for overfill protection

- Maintenance-free tuning fork reliably detects switch-off point regardless of the consistency of the alcohols
- Simple setup without adjustment
- Maximum reliability and safety in hazardous areas





Beer tank

Reliable

Certified materials according to FDA and EC 1935/2004 regulations

Cost effective

plics® concept: short delivery time and standardized operation

User friendly

One measuring system, three measured values: level, pressure, temperature

Level measurement in the beer tank

During the brewing process, a thick layer of foam is always present in the beer tanks. Therefore usually two pressure transmitters are used for level measurement. One transmitter measures the head pressure, while the other at the bottom measures the total pressure. The level is precisely calculated from the differential between these two pressures. Hygienic process fittings are absolutely necessary for these sensors.



VEGABAR 82

Electronic differential pressure measurement for determining the level in the beer tank

- Temperature resistant, CIP capable, linear, overload proof and hysteresis-free
- Reliable level measurement, independent of foaming
- CERTEC® measuring cell of sapphire-ceramic® with gap-free surface meets the highest hygienic standards





Thickener for sugar beet juice

Reliable

Accurate, reliable measurement, even under adverse vacuum and condensation conditions

Cost effective

Reliable measured values allow efficient control of the evaporation process

User friendly

Narrow beam angle allows easier installation in vessel top

Level measurement in a thickener

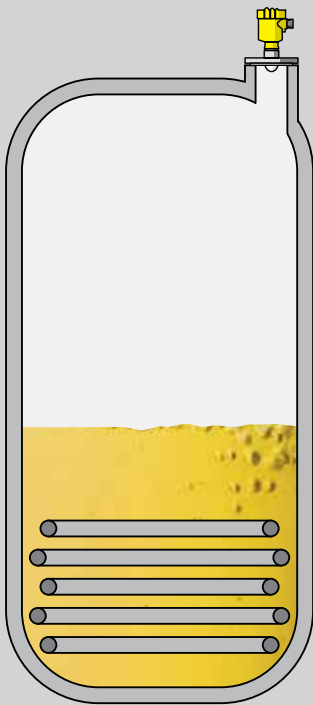
The thin juice extracted from sugar beet is thickened by the reduction of excess water in multiple stages at the evaporator station. This evaporation process is carried out under vacuum and heat. The liquid in the evaporator boils so violently that great amounts of vapour are formed. A level sensor is needed to monitor and control the thickening process.



VEGAPULS 64

Non-contact radar sensor for level measurement in thickener

- Encapsulated antenna system is unaffected by buildup
- Dynamic pressure and vacuum shock resistant
- Precise measuring results, independent of the density of the medium
- Internal structures are not detected due to the small beam angle





Storage silo for sugar and flour

Reliable

Reliable measurement, even in abrasive media

Cost effective

Standard sensors for all applications

User friendly

Simple setup and low maintenance

Level and pressure measurement in storage silos

Flour and sugar are the basic ingredients for many food products and stored in silos up to 20 m high. The filling and emptying is often performed by pneumatic systems that transport the media from the large external silos and deposit them in smaller holding vessels for further processing. The filling and emptying processes are controlled by reliable level measurement. Pressure monitoring is also needed in the pneumatic conveying pipelines.



VEGAPULS 69

Radar sensor for level measurement in the flour and sugar silos

- Precise focusing of the measurement signal, which means convenient installation almost anywhere on the silo roof is possible
- Accurate, reliable measurement data despite dust and noise
- Measurement even during filling, thereby ensuring continuous monitoring of the filling process via a control system



VEGABAR 82

Pressure transmitter for monitoring pressure in the conveyor pipeline

- Wear-resistant CERTEC® ceramic measuring cell, insensitive to abrasion
- Maintenance-free through front-flush mounting
- Robust measuring cell for long service life





Small silos for baking ingredients

Reliable

Reliable measurement of light bulk solids

Cost effective

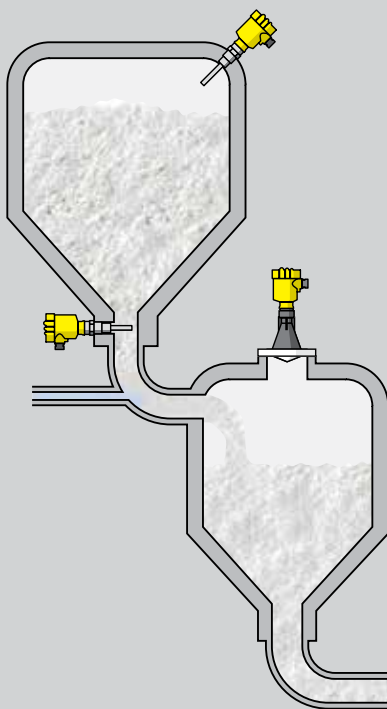
Precise measuring results enable cost-effective, usage and adequate stocks

User friendly

Simple installation and setup

Level measurement and point level detection in small storage containers

Small vessels and hoppers are used as intermediate storage containers in which ingredients such as flour, yeast and salt are there, ready for manufacture into baked goods. Level measurement and point level detection ensure that the ingredients required have high levels of availability and replenish when needed to meet production demand.



VEGA VIB 61

Vibrating level switch for detecting minimum and maximum levels in small silos

- No adjustment required, switching point independent of medium density
- Simple installation near the filling or discharge opening
- Rod design avoids sticking or jamming of bulk solids and is easy to clean



VEGA PULS 67

Radar sensor for continuous level measurement in small silos

- Non-contact measuring method is unaffected by dust and changing media
- Simple installation and commissioning saves time and money
- High equipment availability, because wear and maintenance-free



Jam cooking kettle

Reliable

Certified materials according to FDA and EC 1935/2004 regulations

Cost effective

plics® concept: short delivery time, standardised operation

User friendly

One measurement, three measured values: level, pressure, temperature

Level measurement in a vacuum vessel

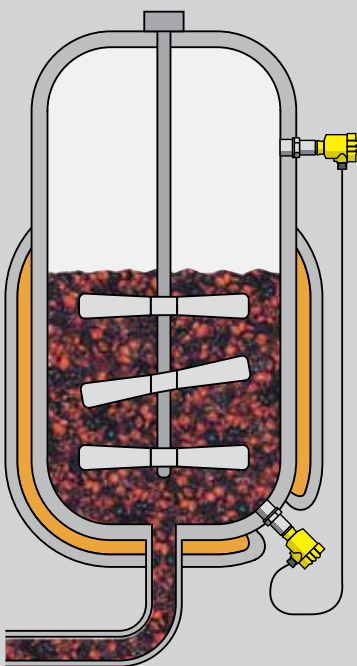
Deseeded fruits and other ingredients for the production of jam are weighed and placed in a cooking vessel and gently heated. The cooking process takes place in a closed vacuum boiler at a temperature of 65 °C to 85 °C, in order to maintain the product quality and preserve the fruits' flavours and colours. Pressure transmitters are deployed to closely monitor the vessel pressure and jam cooking process to ensure the setting point for the conserve is reached. One transmitter measures the head pressure, the other at the bottom of the tank measures the total pressure. The difference between the two is used to calculate the level with great precision.



VEGABAR 83

Electronic differential pressure measurement for determining the level in the vacuum vessel

- Absolutely vacuum resistant, stable temperature properties
- METEC® measuring cell with patented, self-compensating action
- Accurate measured values, even during the heating phase





Evaporator

Reliable

Reliable measurement independent of process conditions

Cost effective

plics® concept: short delivery time and standardized operation

User friendly

Simple installation and commissioning

Density and pressure measurement during spice slurry thickening

In the production of spices, the spices are first mixed with water and oil to form a slurry. This is fed into an evaporator, where water is removed to turn it into a kind of syrup. The thickened spice syrup must have exactly the right density – so that it can be spread thinly onto metal sheets for oven drying, ready to be ground into powder. To ensure the optimal density of the spice syrup, it requires a continuous measurement during manufacture. The pressure in the feed pipe leading to the evaporator also requires careful monitoring to ensure a smooth-running production process.



MINITRAC 31

Radiation-based sensor for density measurement in the evaporator

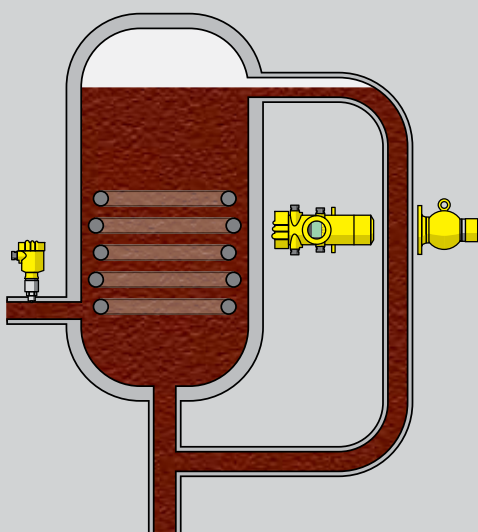
- External non-contact measurement through the pipeline regardless of process conditions and product properties
- Small, compact design enables space-saving installation
- PLICSCOM display and adjustment module for quick setup and on-site display of measured values



VEGABAR 82

Pressure transmitter for monitoring pressure in the evaporator feed pipe

- Wear-resistant CERTEC® ceramic measuring cell is non-sensitive to abrasion
- Absolutely front-flush ceramic diaphragm avoids sticking and abrasion damage
- Long service life thanks to the robust measuring cell





Meat pellets conveyor

Reliable

Fast reaction time guarantees a timely shutdown

Cost effective

Optimum performance through non-contact measurement

User friendly

Simple setup and commissioning

Monitoring of the conveyor belt

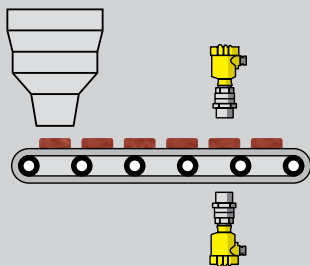
The finished meat pellets and kibbles are fed onto a conveyor belt ready for packaging to be sold as pet foods. In order to ensure a continuous supply of meatballs, the conveyor belt requires careful monitoring.



VEGAMIP 61

Microwave sensor for non-contact monitoring on a conveyor belt

- Fast switching ensures safe shutdown
- Simple setup and commissioning with control keys
- Simple installation, measurement right through conveyor belt and viewing window





Batch filler vessel

Reliable

Measurement independent of density and viscosity

Cost effective

Accurate level measurement optimises use of jars and medium

User friendly

Simple setup

Level measurement in the batch filler vessel

The small batch filler vessels around 1 m high and 60 cm diameter alongside the production facility supply the filler heads of the tank. The products vary from conserve to peanut butter to chocolate spread, with varying viscosity and temperatures. The product density is also changing from each batch. The level system is required to enable an optimal filling of jars.



VEGAPULS 64

Non-contact level measurement with radar in the batch filler vessel

- Reliable measurement, unaffected by condensation thanks to tight focussing
- Small process fitting allows installation even in small vessels
- Very good cleanability (CIP) thanks to flange with encapsulated antenna system





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Looking Forward **VEGA**