Level and pressure instrumentation for the environment and recycling industry

Application examples and products

Looking Forward VEGA

Measurement technology for the environment and recycling industry

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

■ **Dewatering wells in open cast mining**	Level measurement	■ **Incinerator**	Pressure and level measurement
■ **Dewatering column**	Level measurement	■ **Flue gas scrubber**	Level measurement
■ **Silo for crushed glass**	Level measurement and point level detection	■ **Pyrolysis chamber and ash container**	Level measurement
■ **Waste storage bunker**	Level measurement	■ **Receiving tank for hazardous waste**	Level measurement and point level detection

More applications can be found at

www.vega.com/environment-recycling

■ **Incinerator feed chute**	Point level detection	■ **Tsunami warning system in the harbour**	Gauge measurement
■ **Wet deslagger**	Level measurement	■ **Reactor**	Level measurement
■ **Leachate well**	Level measurement	■ **Plastic granule silo**	Level measurement
■ **Gauge station**	Level measurement	■ **Intermediate hazardous waste storage tank**	Level measurement and point level detection
■ **Stripping column for landfill leachate**	Level measurement		

All sensors at a glance

Continuous level measurement

Instrument type		Measuring range	Process fitting	Process temperature	Process pressure
VEGAFLEX 81 TDR sensor for continuous level and interface measurement of liquids		up to 75 m	Thread from G¾, ¾ NPT, flanges from DN 25, 1"	-60 … +200 °C	-1 … +40 bar (-100 … +4000 kPa)
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 68 Radar sensor for continuous level measurement of bulk solids		up to 75 m	Thread from G1½, 1½ NPT, flanges from DN 50, 2"	-196 … +450 °C	-1 … +160 bar (-100 … +16000 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 63 Vibrating level switch with tube extension for liquids		up to 6 m	Thread from G¾, ¾ NPT, flanges from DN 25, 1"	-50 … +250 °C	-1 … +64 bar (-100 … +6400 kPa)

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"	-40 … +150 °C	-1 … +100 bar (-100 … +10000 kPa)
VEGADIF 65 Differential pressure transmitter with metal measuring cell		0.15 % 0.075 %	¼-18 NPT, RC ¼, optional with chemical seal assembly, metallic of 316L, Alloy	-40 … +120 °C	from -10 … +10 mbar (-1 … +1 kPa) up to -40 … +40 bar (-4000 … +4000 kPa)
VEGAWELL 52 Pressure transmitter with ceramic measuring cell		0.1 % 0.2 %	Straining clamp, thread, suspension cable, threaded fitting of 316L, PVDF, Duplex, Titanium	-20 … +80 °C	0 … +60 bar (0 … +6000 kPa)

Environment and recycling

Leading the way in environmental technology

VEGA measurement technology is proving successful even under the demanding conditions of today's environmental industry applications. Since the 1990s VEGA has been a technology leader in level measurement with radar. Additional measuring principles like ultrasonic, guided wave radar, radiometric and capacitive round out the company's offerings in the area of level and switching instrumentation for the environmental industries.

Reliable under harsh conditions

Environmental applications demand a lot from transmitters. No problem for VEGA, because all components such as housing, electronics and sensor can be adapted to the expected operating conditions. The rugged housings provide high mechanical protections. The actual measuring sensors withstand temperatures up to +450 °C and are resistant to acids and alkalis.

Solutions for environmental technology

VEGA delivers the exact solutions the industry needs. Whether in waste incineration, flue gas scrubbing, pyrolysis or waste oil recycling – thanks to the wide range of physical measuring principles, virtually any measurement challenge can be solved.

More information

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.

Dewatering wells in open cast mining

Reliable
Maximum measurement reliability

Cost effective
Long-term availability of the measuring sensor

User friendly
Maintenance-free, thanks to self-cleaning effect of the flush-mounted diaphragm

Level measurement in groundwater control in dewatering wells

In open cast mining, the groundwater levels must be continuously reduced to protect the mining area from flooding and the excavation walls from instability due to water pressure. A large number of dewatering wells with submersible pumps are kept in operation for this purpose. A continuous water flow prevents the pump shaft from blocking due to the effects of hardening clay/iron oxide deposits. To regulate the pump output, precise level measurement is required in each of the up to 750 m deep wells.

VEGAWELL 52

Level measurement via submersible pressure transmitter for regulation of pump output

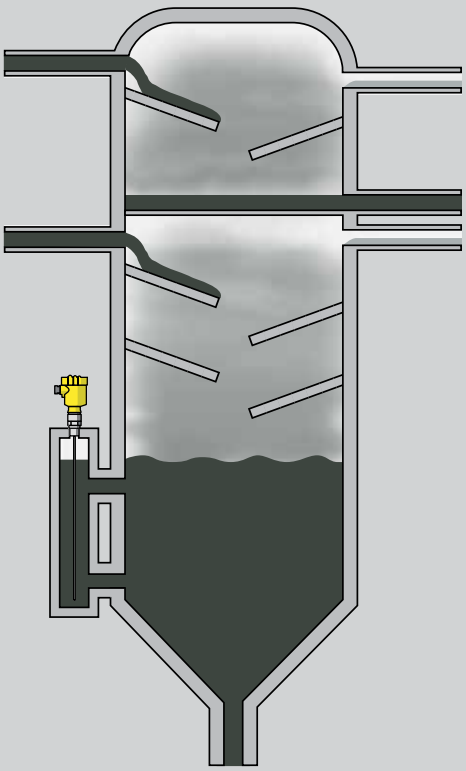
- Reliable, maintenance-free measurement
- Measurement reduces pump operating costs through output control
- Abrasion resistant CERTEC® ceramic measuring cell

Dewatering column

Reliable
Reliable measurement enables dependable operation of the column

Cost effective
Optimal dewatering performance through defined level

User friendly
Measurement independent of medium properties



Level measurement in the dewatering column

The waste oil is heated to a temperature of 105 °C in the lower section of the column. Here, the water evaporates and is pumped away after it condenses. After reaching the appropriate temperature, the oil is transported through pipes to the upper part of the column, where the remaining water vaporises. For optimal dewatering, a defined level is required in the column. As the oil surface is very turbulent due to the action of pumps and heating, making level measurement directly inside the column practically impossible. For that reason it is done in a bypass tube.

VEGAFLEX 81

Level measurement with guided wave radar in the dewatering column

- Dependable measurement in the bypass tube, completely independent of process conditions
- Easy setup and commissioning without full and empty adjustment

Silo for crushed glass

Reliable
Reliable measurement enables a continuous supply of material to the furnace

Cost effective
Non-contact measurement,
long service life

User friendly
Blockage detection makes additional monitoring superfluous

Level measurement and point level detection in the crushed glass, or cullet, silo

Glass is made of quartz sand, lime and soda, which are melted together at extremely high temperatures up to 1600 °C. This melting process is very energy intensive and for that reason, more easily melted waste glass is also often added into the mix. After delivery, the waste glass is first crushed and freed from impurities. The material, known as cullet, is then transported and filled into a silo, where it is fed to the melting process. To ensure a continuous supply of material to the furnace, a reliable level measurement in the cullet silo is required.

VEGAPULS 69

Level measurement with radar in the cullet silo

- Reliable measurement, even under difficult conditions
- No mechanical wear thanks to non-contact measurement
- Easy mounting and setup thanks to installation from above

VEGAMIP 61

Backup detection with microwave barrier in filling pipe

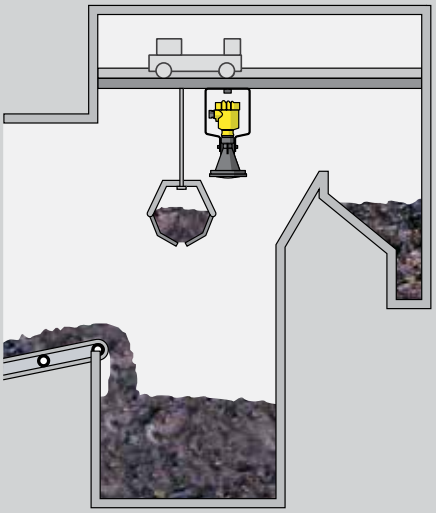
- Ceramic adapter ensures long service life of instrument
- Simple measurement outside the container
- Simple adjustment without external setup tools

Waste storage bunker

Reliable
Protection against flue gas blowback through uniform filling of the feed chute

Cost effective
Optimal utilization of the bunker capacity by ensuring steady, even filling

User friendly
Constantly updated measurement data allows easy control of the grab crane



Level measurement in the waste storage bunker

The waste storage bunker in the reception hall is an important part of the EFW incineration plant. Its purpose is to provide a place to store, buffer and uniformly mix the delivered waste and ensure a continuous supply of waste to the incinerator. A grab crane transports the waste to the feed chute of the furnace. To ensure efficient operation of the plant, a reliable and accurate level measuring system is required in the waste storage bunker. In addition, the level in the feed chute must be monitored to protect against a blowback of flue gas.

VEGAPULS 69

Non-contact level measurement with radar in a waste storage bunker

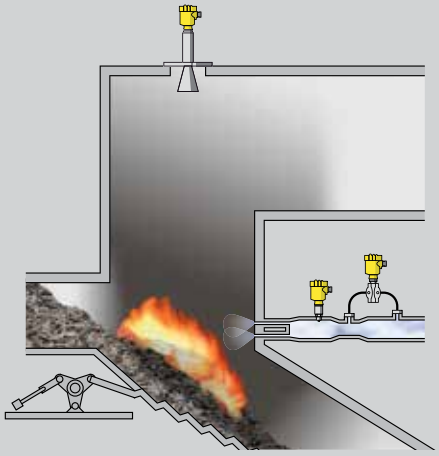
- Reliable even under difficult process conditions
- Non-contact, maintenance-free measurement
- High reliability ensured through immunity to noise

Incinerator

Reliable
Reliable measurement of the layer thickness and air flow, even at high combustion temperatures

Cost effective
Continuous operation and uniform combustion

User friendly
Maintenance-free measurement



Measurement of waste layer thickness and air flow in the incinerator

To ensure that the waste burns completely, temperatures up to 1000 °C must be maintained. For this purpose, large amounts of primary air from below and secondary air from above are blown in. Air quantity and air pressure must be precisely measured. Also an optimum waste layer thickness on the combustion grate is required for uniform combustion.

VEGAPULS 68

Non-contact level measurement with radar in the incinerator

- Accurate measurement and precise feed control
- High plant availability thanks to wear and maintenance-free instrumentation
- Unaffected by smoke, dust and noise

VEGADIF 65

Measurement of flow rate and pressure of the combustion air using differential pressure transmitter

- Exact measurement, even with very small pressure differential
- High overpressure and vibration resistance thanks to integrated overload diaphragm
- Universally applicable, with a wide selection of measuring ranges and process fittings

VEGABAR 82

Pressure transmitter for measurement of the combustion air

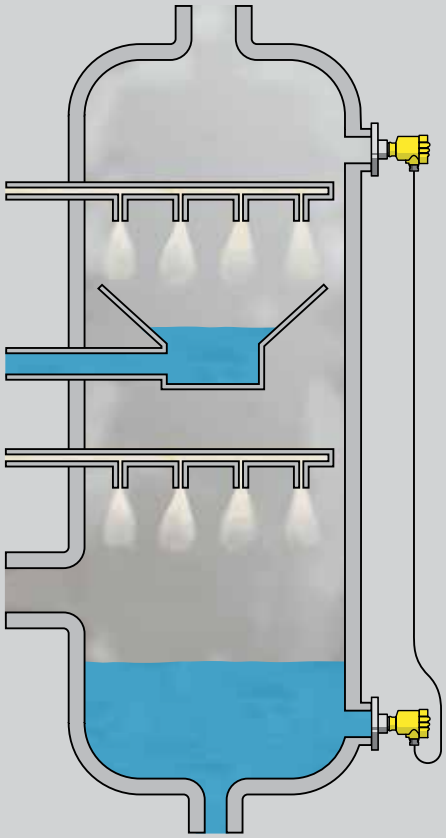
- High overload and vacuum resistance
- Long-term stability via dry measuring cell
- High measurement accuracy, even with very small measuring ranges

Flue gas scrubber

Reliable
Reliable function, even with a turbulent product surface

Cost effective
Economical solution without capillary tubes

User friendly
Front-flush mounting avoids buildup and enables a maintenance-free measurement



Level measurement in the flue gas scrubber

Flue gas from waste incineration must be cleaned before it is released into the environment. Flue gas scrubbers do this by removing acidic gas components such as sulphur dioxide. Lime water is used as the washing solution and it is sprayed in against the flow of the gas. The lime deposits filtered out of the washing water are used as gypsum, e.g. for the production of plasterboard. To ensure a continuous scrubbing process, a constant level in the scrubbing tower is required.

VEGABAR 82

Level measurement via electronic differential pressure in the scrubbing tower

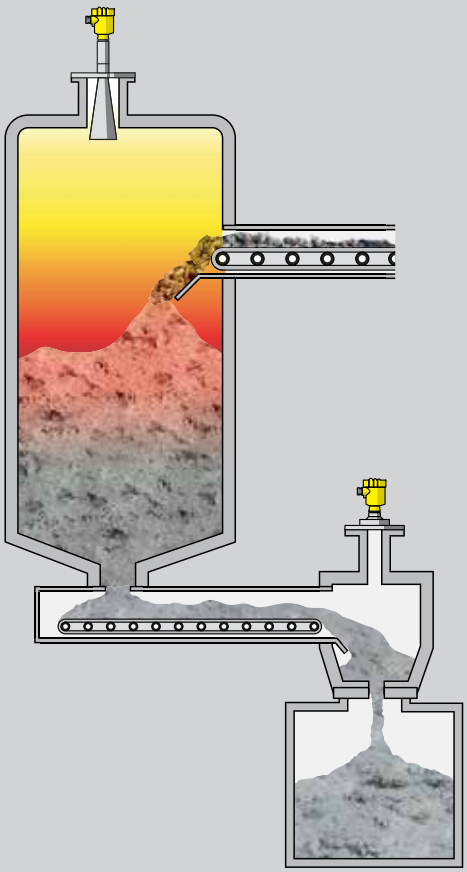
- Reliable function under difficult process conditions
- Measurement ensures continuous operation
- Easy installation with no capillary lines

Pyrolysis chamber and ash container

Reliable
Reliable backup detection in the chute

Cost effective
Optimal utilization of the ash container volume

User friendly
Low maintenance requirements thanks to non-contact measurement



Level measurement in the pyrolysis chamber and in the ash discharger

Waste incineration converts domestic and commercial waste into combustible gases and ash. Pyrolysis is carried out in the absence of air at temperatures up to 500 °C. The intermediate product, charcoal, is then further burned by adding air. Ash and synthesis gas with high thermal content are the end products. For continuous operation, the vessel must be loaded and emptied automatically. To this end, the level of material in the pyrolysis chamber and in the ash pan has to be measured.

VEGAPULS 69

Non-contact level measurement with radar in the ash container

- Precise measurement through narrow chute thanks to small beam angle
- Reliable measurement, even with poorly reflecting medium
- Integrated rinsing connection as the basis for automated cleaning

VEGAPULS 68

Level measurement with radar in the pyrolysis chamber

- Reliable measurement despite high temperatures
- Unaffected by dust, smoke and other harsh environmental conditions
- Maintenance-free thanks to non-contact measurement

Receiving tank for hazardous waste

Reliable
Reliable measurement despite changing process conditions

Cost effective
Optimum utilization of the vessel volume

User friendly
Complete, safe and automated operation of the facility

Level measurement and point level detection in a receiving tank

Hazardous waste can include lacquers, paints and thinners, as well as acids, alkalis and mixtures. At hazardous waste treatment facilities, environmentally harmful substances are converted into environmentally safe ones. Before treatment, the liquid hazardous waste is collected in receiving tanks. Level measuring systems ensure the automated, monitored operation of the facility, thereby protecting human health and the environment.

VEGAPULS 64

Level measurement with radar in the receiving tank

- Maintenance-free thanks to non-contact measurement of all media
- Small minimum distance, no mounting socket required
- Encapsulated antenna system ensures continuous availability

VEGACAP 63

Capacitive point level detection in the receiving tank

- Maintenance-free overfill protection of the receiving tanks
- Exact and reliable function through product-independent switching point

VEGASWING 63

Vibrating level switch for leakage detection in the receiving tank

- Reliable detection of leaks in the wall of the receiving tank
- Fast and reliable function test via simple keypress
- Simple installation and setup

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Looking Forward