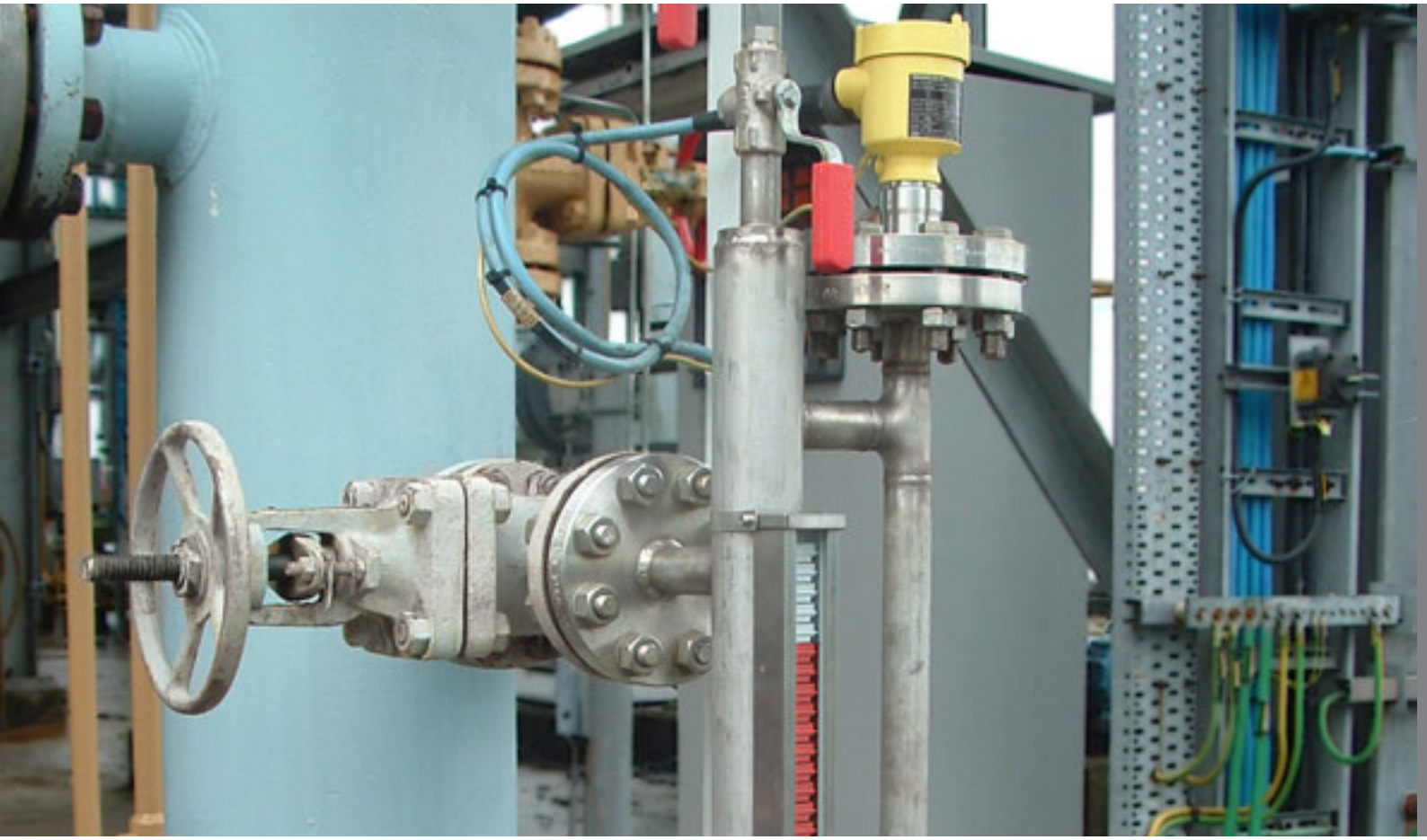
Technologies, Solutions and Applications

Magnetic Level Indication and Bridle Measurements

Looking Forward VEGA



“By choosing a VEGA bypass mounted level solution you get a system engineered, assembled, calibrated and supported by one of the market leaders in level instrumentation”

Magnetic Level Indicators and Bridles

VEGA is dedicated to offering complete magnetic level indication and engineered chamber and bridle solutions for level measurement and visualisation. For the added assurance of redundant monitoring, VEGA offer a complete line of Magnetic Level Indicators (MLIs) and Bridle combination units using Non-Contact and Guided Wave Radar technology.

VEGAMAG

Each product is treated as a custom solution in order to best serve the customer's specific application. The VEGAMAG series of MLIs are externally mounted chambers with visual indicators that are completely isolated from the process liquid. The Magnetic Level Indicator includes 2-colour flags that are coupled magnetically to a float assembly inside the chamber. The indicator is easily viewed by the high contrast, white and red flags, which indicate liquid level position and vapour space, respectively.

VEGAPASS

The VEGAPASS is a non-mechanical bypass mounted level system that provides a direct reading of the liquid level using radar energy transmitted within a metallic chamber, or bridle. It is unaffected by specific gravity, temperature, or pressure conditions that often cause problems with other mechanical devices which rely on a stable liquid density. The VEGAPASS can be easily isolated to allow calibration or maintenance to be conducted without disruption to the process.

Certifications

VEGA Non-Contact and Guided Wave Radar instrumentation used in conjunction with a bridle is designed for certification compliance with the following standards:

- ATEX Standard
- CSA & FM Standard
- GOST-R Standard
- SIL2
- IECEx
- WHG
- FDA
- ABS
- NACE
- CRN

Made accordingly to meet requirements of PED 97.23 EC.

Benefits of VEGA Magnetic Level Indicators and Bridles

VEGA offers visual indication and level measurement solutions that are easy to install, commission and operate. VEGA Magnetic Level Indicators and Bridles are designed to provide reliable, continuous monitoring of liquid process levels and are customised per individual application requirements This custom engineering ensures that the best solution is implemented for each and every application.

Engineered Solutions

From management and coordination of the installation to start up and commissioning. We also provide training on the features of the system and onsite project management thus delivering the customer a complete solution.

Each VEGA MLI/Bridle system is engineered and manufactured to ASME B31.1/31.3 or AD2000 standards, as well as the customer's specific pipe requirements. VEGA provides an array of test procedures ranging from dye penetration to x-ray, as well as qualifications such as Material Test Reports (MTR) and Positive Material Identification Certificates (PMI).

Easy Retrofit

VEGA MLI and Bridle products are excellent replacement technologies for older electromechanical displacers and sight glass gauges, which can be maintenance-intensive due to build-up, calibration drift, leaking or fogging. The VEGA MLI/bridle eliminates leak paths and significantly reduces maintenance. The flexible mounting configurations mean you can achieve redundant monitoring, without adding additional process connections to your vessel.

Safety Through Diversity

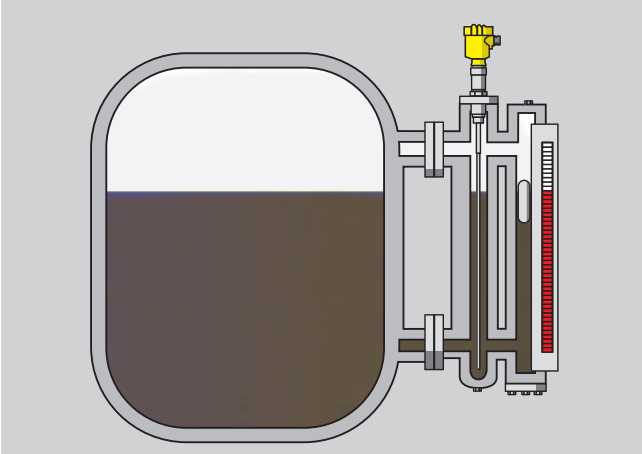
When combining an MLI and bypass chamber, redundant monitoring is achievable when used with a VEGA Guided Wave or Non-Contact Radar level transmitter. VEGA offers several options for redundant measurement indication. The VEGAMAG 82 MLI/Bridle combination unit utilises a VEGAFLEX Guided Wave instrument to ensure process safety and accuracy through redundancy. Alternatively, a VEGAMAG 83 uses a VEGAPULS Radar instrument as a non-contact option combined with a flat topped float. All systems can offer additional safety through diversity.

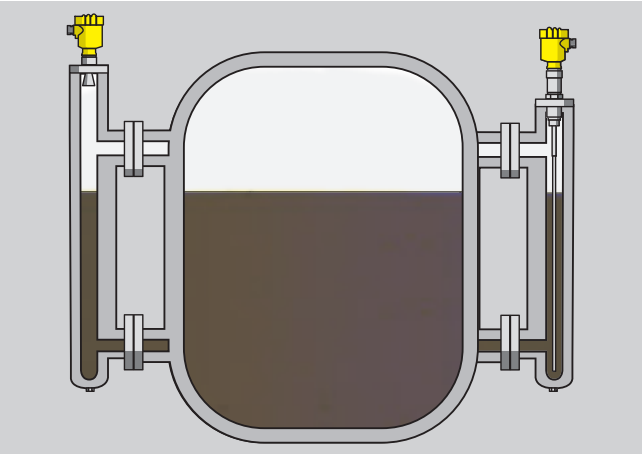
Service and Support

Service for VEGAMAG and VEGAPASS products are provided by the same team who service your existing VEGA products. The team is also available to provide these services in the field or on location at customer sites. Field Service can commission, set up and calibrate equipment to each customer's individual needs, ensuring the best measurement. In the rare event of an instrument performance issue, troubleshooting can be done remotely or on-site, in the interest of minimising any possible downtime to the process.

Principle of Operation

Magnetic Level Indicators and Bridles are both installed either to the process vessel using existing process connections or new connections that have been added for the purpose of installing the chambers.





Magnetic Level Indicator

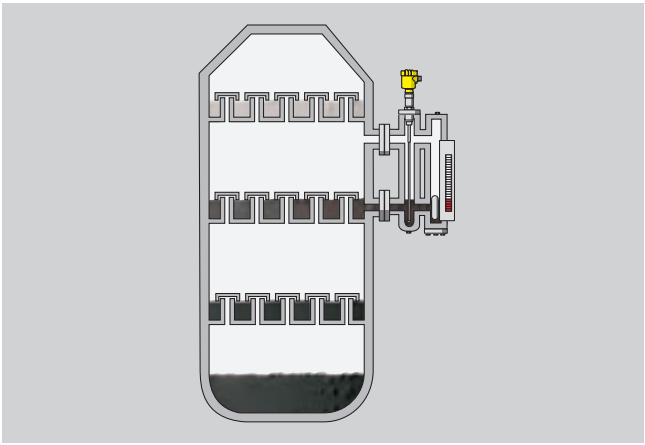
The VEGAMAG series MLI uses a chamber that houses a sealed float with a circular magnetic array. A visual indicator, containing a series of magnetised flags, mounts external to the chamber. As the process liquid fills the chamber the liquid lifts the float, which rotates the flags from white to red, giving a visual indication of the liquid level inside the vessel. When a 4…20 mA signal is needed for a redundant level measurement, a secondary or shared chamber that contains a VEGAFLEX Guided Wave Radar or VEGAPULS Non-Contact Radar is added. The VEGAMAG series MLI can be configured to also monitor interface level. In situations where there may be limited room to install an MLI using two chambers, a non-contact radar transmitter can be installed directly on top of the MLI and be configured to track the top of a specially designed flat top float, which eliminates the need for the second chamber.

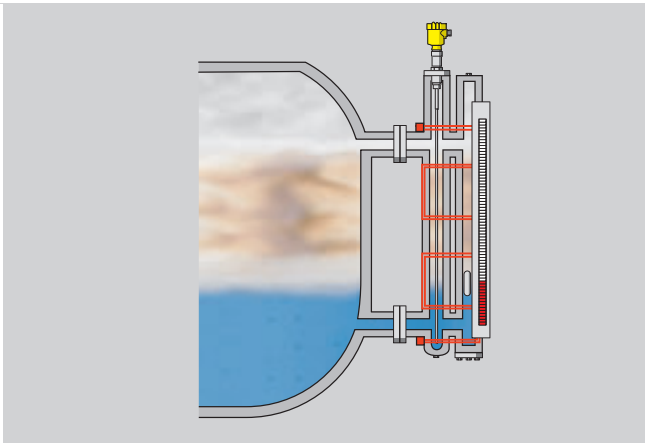
Bridle Measurement

A VEGAPASS series Bridle utilises a chamber mounted directly to the process vessel with two or more process connections. The connections are the inlet and outlet that allow the liquid level in the chamber to match the level in the process vessel. The VEGAPASS incorporates a VEGAFLEX Guided Wave Radar that measures the process level. A microwave pulse is sent along the surface of the VEGAFLEX cable or rod and is reflected back to the sensor by the process liquid. The transit time of the pulse is measured and used to calculate the process level. Alternatively, a VEGAPULS Non-Contact Radar can be used as a non intrusive option. All of the microwave energy is focused within the pipe, making it a reliable and robust measurement, even when measuring low dielectric materials such as hydrocarbons.

Application Areas

The VEGAMAG Magnetic Level Indicator series offers visual indication on standard and complex liquid applications in many industries. Paired with a guided wave or non-contact radar, the system provides a continuous signal directly to the control room. The VEGAPASS Bridle series also provides continuous monitoring, and is an excellent retrofit for maintenance intensive sight glass gauges and displacer systems.





Distillation Columns

Redundant monitoring is critical in such applications which can require control and/or monitoring by multiple technologies. With the VEGAMAG 82, the operator has visual indication from the Magnetic Level Indicator and a separate 4…20 mA signal from a standby VEGAFLEX Guided Wave Radar, which is installed in a parallel bridle attached to the MLI. The VEGAMAG 82's ability to operate in high temperature and high pressure environments makes it a perfect solution for such refining applications.

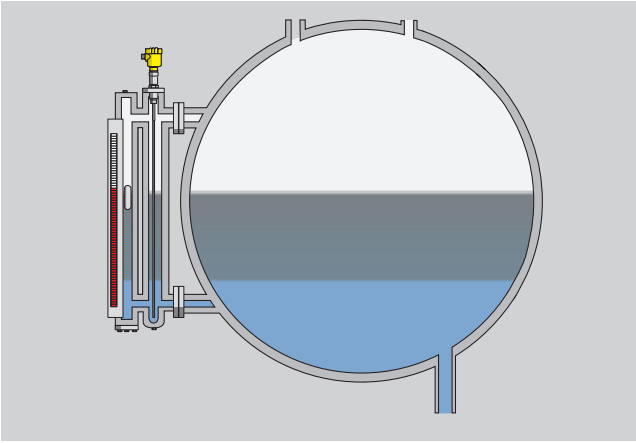
- MLI and Guided Wave Radar provide redundancy
- Robust material options are resistant to extreme process conditions

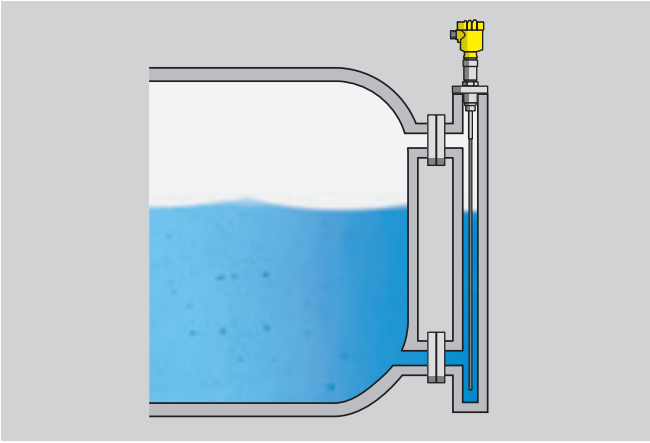
Flare Knockout Drum

A reliable, accurate level is required to stop any flammable liquids from reaching the flare stack. A VEGAMAG fitted with a SIL 2 VEGAFLEX Guided Wave Radar tracks the level reliably, is unaffected by density changes and has no moving parts, thus reducing maintenance. The Magnetic Level Indicator provides a back up reading, direct level display with optional 4…20 mA output signal, thus delivering safety through diversity. A SIL 2 rated tuning fork level switch can also be fitted in the chamber for high level alarm. Trace heating/insulation is supplied fitted to prevent any waxing on the external bridle system.

- Guided Wave Radar works with turbulent surfaces and changing densities
- Dual redundancy system with optional high levels for ultimate safety

"The VEGAMAG and VEGAPASS 80 series of products are excellent retrofit technologies for outdated and high maintenance displacer transmitters as well as problematic visual sight glass systems."





Sight Glass Replacement

Retrofit opportunities are available as the chemical and petrochemical industries slowly remove the older and sometimes leak-prone sight glass gauge units, popular 20 to 30 years ago. The VEGAMAG 82 directly replaces almost any type of process gauge using the existing vessel connections. The benefit to the customer is reduced maintenance, and clearer indication on a magnetic level gauge. Now a VEGAFLEX Guided Wave Radar can be added to provide continuous control where only a visual indicator was before.

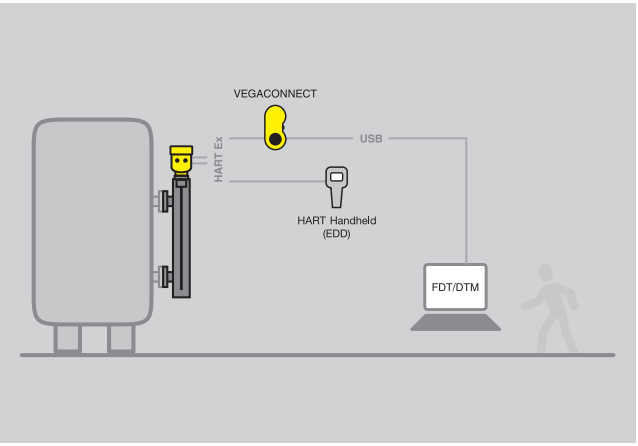
- Guided Wave Radar measures accurately with either a fully flooded chamber or vapour layer
- MLI technology eliminates risk of leaks often associated with sight glass systems

Displacer Replacement

As with process and sight gauges, a large number of displacer level gauges require a significant amount of maintenance to keep them operational. The VEGAPASS 81 is a perfect technology to retrofit to the existing vessel connections. Unlike displacer technology that can be prone to mechanical failure, the VEGAPASS 81 uses a VEGAFLEX Guided Wave Radar housed inside of a bridle or chamber for monitoring the liquid level. Replacing the old mechanical device with guided wave radar greatly reduces maintenance and potential downtime.

- Non-moving parts are immune to mechanical failure
- Low maintenance requirements reduce downtime and costs

Setup and Adjustment



PLICSCOM – Multi-Function Ability

The PLICSCOM indicating and adjustment module plugs into any plics® instrument on-demand. It functions both as a measured value indicator on the instrument and a local adjustment device. The structure of the adjustment menu is clearly organised and makes setup and commissioning easy. In addition, the status messages are displayed directly on the screen. If an instrument is exchanged, PLICSCOM ensures fast availability of the measuring point — all sensor data is quickly saved into the PLICSCOM and can then easily be copied into the replacement sensor.

External Indicating and Adjustment

An external indicating and adjustment unit, VEGADIS 81 with integrated PLICSCOM, can also be connected to the sensor with a standard cable up to 50 meters long. It allows setup of the measuring point and indication, even in difficult to access locations, no external power supply is required and it has hazardous area approval.

PC Adjustment with VEGACONNECT

For increased setup versatility, the mobile VEGACONNECT easily connects VEGA instruments to any PC through the USB interface. The parameter adjustment of these instruments is accomplished by PACTware adjustment software and a DTM. VEGACONNECT also acts as a universal HART modem for sensors of other manufacturers.

Setup with a HART Handheld

A HART Handheld is an additional tool that enables on-site sensor parameter adjustment. To access the HART parameters of a sensor, it connects to the sensor cable through a minimum working resistance of 220 Ω.

Magnetic Level Indicator: Models and Versions

VEGAMAG 81

Standard Magnetic Level Indicator

- An ideal replacement for existing process sight gauge systems
- Provides better visibility, even in the highest temperature applications. No power required.
- Flag indication used in conjunction with the scale provides a clear understanding of the process liquid levels

Measuring Range:	Up to 15 m (50 ft); Consult factory for lengths over 15 m
Process Temperature:	-195° … 538°C (-320° … 1,000°F)
Measuring Precision:	±5 mm (± 0.2”)

VEGAMAG 82

Combination measuring system — Magnetic Level Indicator paired with Bridle and Guided Wave Radar

- SIL2 qualified VEGAFLEX or VEGAPULS; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus
- Used for any application that requires visual and electronic level monitoring
- Mount to most standard tank process connections as well as applications where interface measurements are needed

Measuring Range:	Up to 15 m (50 ft); Consult factory for lengths over 15 m
Process Temperature:	-195° … 450°C (-320° … 842°F)
Measuring Precision:	±3 mm (± 0.1”)

VEGAMAG 83

Integrated chamber measuring system with magnetic level indication with Guided Wave or Non-Contact Radar measurement

- SIL2 qualified VEGAPULS; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus
- Used for processes with low dielectric constant values, flashing, foaming or in light hydrocarbons
- Compact design can provide a smaller installation envelope

Measuring Range:	Up to 15 m (50 ft); Consult factory for lengths over 15 m
Process Temperature:	-195° … 450°C (-320° … 842°F)
Measuring Precision:	±3 mm (± 0.1”) or ±10 mm (± 0.4”)

Bridle:
Models and Versions

VEGAPASS 81

Bridle chamber

- SIL2 qualified VEGAFLEX or VEGAPULS; standard version
- Ideal for installations when mounting on the top of a vessel is not possible
- Manufactured to meet a wide range of pipe specifications
- Unaffected by specific gravity, temperature or pressure

Measuring Range:	Up to 15 m (50 ft); Consult factory for lengths over 15 m
Process Temperature:	-195° ... 450°C (-320° ... 842°F)

VEGAPASS 81 (In-Tank Measurements)

Integral stilling well

- SIL2 qualified VEGAFLEX or VEGAPULS; standard version
- Unaffected by specific gravity, temperature or pressure
- Slotted design to promote liquid flow; ideal for interface measurements
- Manufactured to meet a wide range of pipe specifications

Measuring Range:	Up to 15 m (50 ft); Consult factory for lengths over 15 m
Process Temperature:	-195° ... 450°C (-320° ... 842°F))

Additional design features can be integrated into the VEGA MLI and Bridle products:

- Steam and electric heat tracing, paint finishes
- Insulation for both high temperature and cryogenic applications
- Level detection technologies such as SIL2 VEGASWING liquid level switches
- Other level or pressure technologies installed to suit application requirements

Associated Technologies

VEGAPULS Non-Contact Radar

Contactless radar sensor for level measurement

- SIL2 qualified; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus
- Completely non-contact radar transmitter can be used with ball-valve isolation

Measuring Range:	0 … 35 m (0 … 115 ft)
Process Temperature:	-195 … +450°C (-320 … +842°F)
Process Pressure:	-1 … +160 bar (-14 … +2,320 psi)

VEGAFLEX Guided Wave Radar

Guided wave radar sensor for level measurement

- SIL2 qualified; standard version
- Output signals include 4 … 20 mA/HART, Profibus PA or Foundation Fieldbus
- Ideal retrofit of displacer technology

Probe:	Cable, rod
Measuring Range:	Cable: 0 … 32 m (0 … 104 ft) Rod: 0 … 4 m (0 … 13 ft)
Process Temperature:	-195 … +450°C (-320 … +842°F)
Process Pressure:	-1… +400 bar (-14 … +5,800 psi)

VEGASWING Liquid Level Switch

Vibrating level switch for liquids

- SIL2 qualified; standard version
- Output signals include Two-Wire, Relay, NAMUR or Transistor (NPN/PNP)

Process Temperature:	-196 … +450°C (-320… +842°F)
Process Pressure:	-1 … +160 bar (-14 … +2,320 psi)

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