



# Radar level measurement

Simple. Precise. BASIC.

# Radar level measurement

Simple. Precise. BASIC.

## Small, simple, reasonably priced

The VEGAPULS BASIC series is the precise and reliable solution for standard level applications from VEGA. Whether in liquids or bulk solids, small tanks or even silos up to 30 m high – these compact, non-contact radar level transmitters are maintenance-free and extremely accurate. Ideal for anyone who values robust and universal level measurement. Because radar works – always.










## Fast and reliable

Diagnostics, service, and documentation: With the free myVEGA app, all important transmitter information is at your fingertips – including secure and unlimited backup & restore functions.

## Experience that convinces

For over 30 years now, VEGA has been setting standards in level measurement with high-precision radar transmitter technology. More than 1 million PRO transmitters worldwide testify to this claim.

And for the past five years, VEGA has also demonstrated clear leadership in standard applications with the BASIC series: Over 500,000 installed BASIC transmitters have replaced many ultrasonic sensors and the trend is showing no signs of slowing down.

 <p>Headquarters in Schiltach</p>	 <p>World market leader in radar measurement technology</p>	 <p>Innovation hub in Karlsruhe</p>
 <p><b>28</b> subsidiaries</p>	 <p><b>2,600</b> employees worldwide</p>	 <p>Founded in <b>1959</b></p>
 <p><b>80</b> apprentices &amp; students from Cooperative State University</p>	 <p><b>3,000</b> patents pending</p>	<p>About us</p> <p>VEGA is a worldwide manufacturer of level, switching and pressure transmitters. With 28 subsidiaries and numerous sales partners, we're on the ground at our customers' locations worldwide. Investments in infrastructure and the commitment of our employees ensure our innovative strength for the future.</p>
 <p><b>1,200</b> employees in Schiltach</p>		



Radar transmitters measure where other devices reach their limits – regardless of environmental influences, temperature or installation conditions.

**Reliable right up to the antenna – even under high water conditions**

VEGA radar transmitters deliver reliable results even when the antenna is flooded. This eliminates the need for submersion tubes or shields and other mechanical components.

**Measures right through plastic**

Since radar signals pass through plastics, the transmitters can be easily mounted above a container – without any direct connection to the process.

**Robust in any environment**

Radar transmitters from VEGA measure safely and reliably – unaffected by temperature, pressure or vacuum. All the materials and the design of the instruments are tailored to the application, to be chemically resistant and durable.

**Reliable despite challenging tank geometries**

Thanks to their excellent focussing, radar transmitters work reliably even in tanks or narrow shafts with internal installations or deposits on the walls.

**Non-sensitive to dirt, buildup, and condensation.**

The optimised signal processing of VEGA 80-GHz radar transmitters ensures stable measured values, even under harsh conditions.

**Maintenance-free and contactless**

The radar transmitters reliably withstand temperature fluctuations, steam, dirt, vacuum, changing pressures, dust and pneumatic filling.

# BASIC radar from VEGA

## Good measuring results under all conditions

VEGAPULS BASIC radar transmitters measure the level of liquids and bulk solids contactlessly. They are deployed in water treatment facilities, in vessels with alkalis, acids or auxiliary materials, in small bulk material silos and in plastic tanks, in which case the transmitter measures from the outside. In applications where ultrasonic sensors reach their limits, radar measures reliably and accurately – even with challenging environmental influences, temperatures or installation conditions.

### Compact design

Compact transmitters with PVDF process fitting and PBT housing, equipped with cable connection terminals.

Optionally available with integrated on-site display and 3-button operation for easy adjustment directly on the instrument.

Can be used in all Ex areas from Zone 0.

### Weatherproof housing

With robust weatherproof housings and materials, it makes the radar extremely durable. Additional protective housings are not necessary.



### Intelligente Software

The intelligent software detects transmitter submersion, eliminating the need for an additional submersion protection shields. This not only saves procurement and installation costs, but also avoids the problem of a dirtied sleeve.

### Cable version

C-series transmitters are made entirely of chemically resistant PVDF, with axial or lateral sealed cable outlet. Encapsulated electronics for maximum leak tightness (IP68/3 bar) and reliable measurement – even when flooded. Ex approval for all hazardous areas, such as gas and dust filled spaces, is available.



### Fast startup time

The short startup time of less than 15 seconds ensures a smooth start. When operated with battery-powered data loggers, energy consumption is reduced to a minimum.

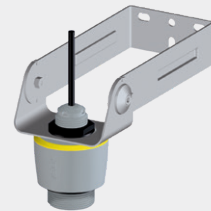
## Mounting? Simply well thought out.

The versatile accessories offer a comprehensive package consisting of high-quality stainless steel components: pre-assembled mounting bracket, including screws, dowels and drilling template – for quick and secure installation.

If a mounting socket is already available on the tank, the radar can be mounted directly on it. Adapter flanges of glass fibre-reinforced PPh in universal sizes according to DIN, ANSI or JIS are also available in the product portfolio.

### Suitable controllers

These are used in combination with one to two radar transmitters. They consist of a weatherproof instrument housing with a large graphic display and colour status indicator. This provides quick and easy setup and commissioning on site.



Mounting brackets with adjustable transmitter mount: 80, 200, 400 mm



Mounting bracket for ceiling installation



Swivelling holder



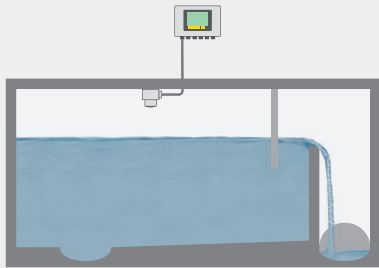
VEGAPULS BASIC transmitters are certified for a wide range of applications: from Ex areas and overfill protection to food processing, where food-grade materials according to 3A and FDA are required. They also comply with country-specific standards such as mCerts certification for flow measurement in flumes.

**This means maximum flexibility of use worldwide.**

# BASIC radar transmitters in use

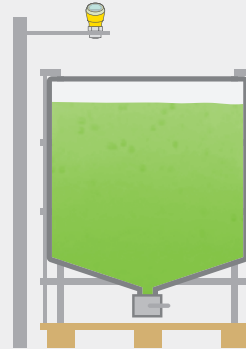
## Reliable measuring results over the entire measuring range

Radar transmitters measure stormwater basin volumes and discharge flows so precisely that only one is needed. An advantage that reduces costs and effort.



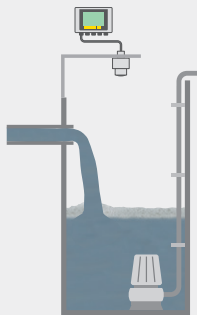
## Auxiliary materials under control – from liquids to bulk solids

Radar transmitters are particularly well suited for level measurement in plastic tanks. Easy to install on the outside, they measure right through the tank wall. They can also be used in storage containers and small silos containing auxiliary materials such as acids, alkalis, or a wide variety of bulk solids. Radar sensors deliver reliable, accurate measurement data regardless of the ambient conditions.



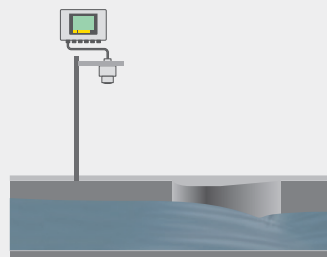
## Precise measurement in confined spaces

In pumping stations, radar transmitters ensure precise level measurement, even in the presence of foam, condensate or contamination. Thanks to its tight focussing, the radar sensor delivers extremely accurate measured values – in narrow shafts or even in tanks with many internal fixtures or buildup on the walls. Spider webs and other sources of interference do not affect the measurement.



## Unaffected by environmental conditions

Radar level transmitters deliver precise flow data in open channels or flumes – totally unaffected by sunlight or temperature fluctuations. Accuracy is crucial for correct calculation of the levy costs associated with wastewater treatment plants.



## Level detection in open containers

Radar transmitters also detect levels in open containers or small bulk solids silos accurately – from the bottom to the top. Thanks to their universal applicability, they always deliver reliable measuring results, even in dusty conditions or if the measured surfaces are uneven.



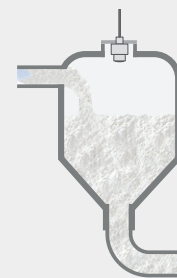
## Trouble-free operation despite widely varying bulk solids geometries

VEGAPULS radar transmitters measure levels contactlessly and precisely – even under the extreme conditions common to the building materials industry. Widely varying angles of repose, dust, buildup or noise do not affect the measuring result. The robust transmitters ensure reliable material availability at all times.



## Optimal focussing for maximum reliability

Raw materials stored in segmented mixing towers, such as gravel of different grain sizes or sand, are dispensed according to specific formulas. With its excellent signal focussing, 80-GHz level measurement enables precise material detection even in narrow container segments and of surfaces that greatly vary. This ensures high availability and efficient plant operation.






## Reliable despite dust and buildup

Whether flour, sugar, grain, lime or dried sewage sludge – radar transmitters monitor dust-generating bulk solids like these with great precision. They deliver reliable measured values even when there is buildup in the silo, thus ensuring a continuous material flow.

# VEGAPULS BASIC

## compact versions





Compact radar transmitter for continuous level measurement with robust plastic housing (IP66/IP67). Robust cable entries and spring-loaded terminals allow for individual connection of the transmitters.

	VEGAPULS 11	VEGAPULS 21	VEGAPULS 31
			
<b>Application</b>	Uncomplicated process conditions, typical measuring range, moderate ambient conditions	Moderate process and ambient conditions, universal measuring range	Moderate process and ambient conditions, universal measuring range, on-site display and adjustment
<b>Process temperature</b>	-40 ... +60 °C	-40 ... +80 °C	-40 ... +80 °C
<b>Process pressure/ measuring range</b>	-1 ... +3 bar (-100 ... +300 kPa)	-1 ... +3 bar (-100 ... +300 kPa)	-1 ... +3 bar (-100 ... +300 kPa)
<b>Measuring range</b>	10 m	20 m	20 m
<b>Beam angle</b>	8°	8°	8°
<b>Deviation</b>	≤ 5 mm	≤ 2 mm	≤ 2 mm
<b>Signal output</b>	Two-wire 4 ... 20 mA	Two-wire 4 ... 20 mA/HART	Two-wire 4 ... 20 mA/HART
<b>Adjustment</b>	Smartphone/tablet/PC and PACTware or VEGA Tools app (Bluetooth)		
<b>Approvals</b>	–	WHG (overflow protection), mCerts, food, ship, Ex approval for gas Ex areas	

# VEGAPULS BASIC





## cable versions

Radar transmitter with sealed cable for continuous level measurement with IP66/IP68 protection. The entire transmitter is made of highly resistant PVDF and is hermetically sealed. The cable and all electronics are encapsulated.

	VEGAPULS C 11	VEGAPULS C 21	VEGAPULS C 22	VEGAPULS C 23
				
<b>Application</b>	Uncomplicated process conditions, typical measuring range, strict requirements on the ambient conditions	Moderate process conditions, universal measuring range, strict requirements on the ambient conditions	Moderate process conditions, universal measuring range, strict requirements on the ambient conditions, cable entry on the side	Moderate process conditions, large measuring range and very good signal focussing, strict requirements on the ambient conditions
<b>Process temperature</b>	-40 ... +60 °C	-40 ... +80 °C	-40 ... +80 °C	-40 ... +80 °C
<b>Process pressure/ measuring range</b>	-1 ... +3 bar (-100 ... +300 kPa)	-1 ... +3 bar (-100 ... +300 kPa)	-1 ... +3 bar (-100 ... +300 kPa)	-1 ... +3 bar (-100 ... +300 kPa)
<b>Measuring range</b>	10 m	20 m	20 m	30 m
<b>Beam angle</b>	8°	8°	8°	4°
<b>Deviation</b>	≤ 5 mm	≤ 2 mm	≤ 2 mm	≤ 2 mm
<b>Signal output</b>	Two-wire 4 ... 20 mA	Two-wire 4 ... 20 mA/HART, SDI-12, Modbus	Two-wire 4 ... 20 mA/HART, SDI-12, Modbus	Two-wire 4 ... 20 mA/HART, SDI-12, Modbus
<b>Adjustment</b>	Smartphone/tablet/PC and PACTware or VEGA Tools app (Bluetooth)			
<b>Approvals</b>	–	WHG (overflow protection), mCerts, food, ship, Ex approval for dust and gas Ex areas		

# VEGAMET controllers



The controller features a large display for data visualisation and is integrated in a housing designed for harsh field conditions. It enables precise process monitoring, pump control, flow measurement and limit value monitoring.

	VEGAMET 841/842	VEGAMET 861/862	
			
<b>Application</b>	Controllers for VEGA transmitters for field installation	Controllers for VEGA transmitters for field installation	<b>Accessories</b>
<b>Data logger</b>	–	yes	Stainless steel sunshield
<b>Input</b>	1/2x 4 ... 20 mA transmitter input	1/2x 4 ... 20 mA transmitter input, 2/4x digital input	
<b>Output</b>	1/2x 0/4 ... 20 mA current output 3x operating relay, 1x fail safe relay (instead of an operating relay)	1/3x 0/4 ... 20 mA current output 4/6x operating relay, 1x fail safe relay (instead of an operating relay)	Stainless steel pipe mounting kit
<b>Operating voltage</b>	24 ... 65 V DC 100 ... 230 V AC, 50/60 Hz	24 ... 65 V DC 100 ... 230 V AC, 50/60 Hz	
<b>Mounting</b>	Wall/pipe mounting in the field		
<b>Indication</b>	LCD matrix display, black-white backlight with colour change according to status, relay or measured value		
<b>Adjustment</b>	On-site adjustment with 4 buttons, smartphone/tablet/PC and PACTware or VEGA Tools app (Bluetooth)		
<b>Approvals</b>	Explosion protection, WHG and mCerts		

The controllers are suitable for a wide range of measuring tasks.

- Feed pumps, for example, are optimally controlled to ensure equal operating times
- A wide range of characteristic curves are saved in the device for flow measurement
- A totaliser documents the flow rate
- In addition to diagnostic functions for detecting foam formation, data logging functions are also available

Compact controllers and display instruments for level transmitters for installation in switching cabinets or for panel mounting. With a graphic display and a rotary/push button for quick commissioning or on-site monitoring of a measuring point.

	VEGAMET 141/142	VEGAMET 341/342
		
<b>Application</b>	Controllers for VEGA transmitters for control cabinet installation	
<b>Data logger</b>	–	–
<b>Input</b>	1/2x 4 ... 20 mA transmitter input	1/2x 4 ... 20 mA transmitter input
<b>Output</b>	1/2x 0/4 ... 20 mA current output 3x operating relay 1x fail safe relay (instead of an operating relay)	1/2x 0/4 ... 20 mA current output 3x operating relay 1x fail safe relay (instead of an operating relay)
<b>Operating voltage</b>	24 ... 65 V DC, 100 ... 230 V AC, 50/60 Hz	
<b>Mounting</b>	Carrier rail 35 x 7.5 according to EN 50022	Front panel mounting
<b>Indication</b>	LCD matrix display, black-white backlight with colour change according to status, relay or measured value	
<b>Adjustment</b>	On-site adjustment with 4 rotary knob/push-button, smartphone/tablet/PC and PACTware or VEGA Tools app (Bluetooth)	
<b>Approvals</b>	Explosion protection, WHG	

The radar transmitters can send precise data to the controller via a 4 ... 20 mA current signal or HART communication, enabling efficient monitoring, for example for overflow protection in bulk solids silos.

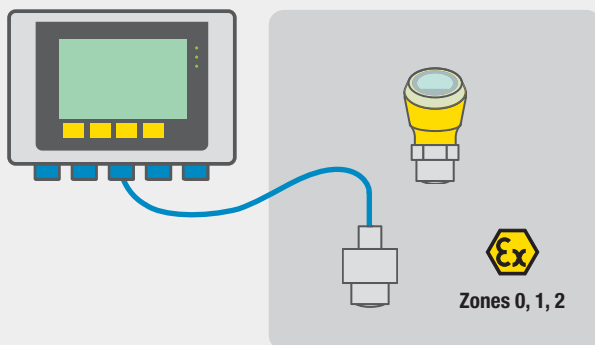
- Large display for visualising levels in the silo
- Direct minimum signal for control of further processes
- Overflow protection through an individual maximum switching function

# Ex has never been so easy

## BASIC radar transmitters with Ex-ia approval for Zones 0, 1, and 2

Transmitters in Ex hazardous areas are typically connected via an intrinsically safe circuit. The circuit's power is limited by a separate barrier or a barrier integrated in the controller.

**Ex concept:**  
**Intrinsic safety, Ex-ia transmitter (for Zones 0, 1 and 2)**



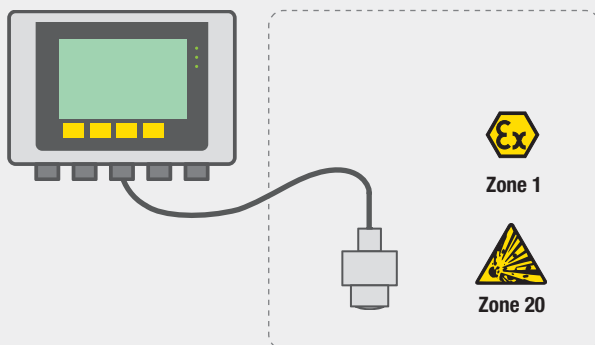
The transmitter is operated via an intrinsically safe power supply.

- suitable for Ex areas from Zone 0
- Protective barrier limits the current
- The cables are marked and laid separately
- An intrinsic safety assessment is required

## BASIC radar transmitters from the VEGAPULS C series with gas Ex approval for Zones 1, 2 and dust Ex approval for Zone 20, 21 and 22

Thanks to the right choice of encapsulation material and the special electronics version that meets Zone 1 requirements, the VEGAPULS C series can be used with protection type "Protection by enclosure" – this allows for very simple use in Zone 1 without a barrier.

**Ex concept:**  
**Protection by enclosure gas Ex (for Zones 1, 2)  
and dust Ex (for Zones 20, 21, and 22)**



Explosion protection is achieved by encapsulating all electrical components and the connection cable.

- No barrier is required for operation
- The cables do not need to be specially labelled or routed separately
- An intrinsic safety assessment of the circuits is not necessary
- Minimal cost and effort for new installation or replacement of existing ultrasonic transmitters

# Adjustment? Simply uniform.

VEGA radar transmitters and controllers feature an integrated Bluetooth module. The standardised adjustment structure enables quick setup and diagnostics – via the VEGA Tools app on iOS/Android or via PACTware/DTM on Windows tablets. With a range of up to 50 m if there is a direct line of sight to the transmitter.



## Plant operations in view at all times

With the free VEGA Tools app, Bluetooth-enabled transmitters can be monitored wirelessly during operation. Advantage: Even transmitters that are difficult to access can be checked very easily during operation.



## Transmitter test certificate included

The integrated self-test with storable test report is standard with VEGA. It can be activated via the VEGA Tools app – at no extra charge.

## Documentation of instrument status

All relevant transmitter data, such as status, default settings and echo curve, can be easily downloaded as a PDF file via PACTWare/DTM or the VEGA Tools app.

VEGA

Loop current mode: Analogue current output (4 ... 20 mA)  
 Fieldbus Profile Rev.: 7  
 Expanded Device Type: 25276

**2.6.3 Sensor details**

Details	Version
Explosion protection	without, for Ex-free area (CE, UKCA, c-FM-us, c-CSA/...)
Approved as overfill protection	without
Stop approval	without
Foodstuff/Pharmaceutical certificate	without
Process fitting	Thread G1/4
Cable entry / Connection	M20x1.5 / Cable gland PA black (ø5-50mm), standard
Electronics	Two-wire 4 ... 20 mA/HART
Sensor setting via smartphone and VEGA Tools	with
...app	
Certificate/Standard	without

**3 Special parameters**

(1) Limitation measuring range beg  
 (2) Limitation measuring range beg  
 (3) Averaging factor on increasing  
 (6) Averaging factor on decreasing  
 (15) "First large echo" active  
 (16) Amplitude threshold "First larg

**Echo curve**  
 20.08.2020 10:21:36

Distance 0.777 m

**Echo data**

Place [m]	Amplitude [dB]	Width [m]	P-false signal [%]	Measurement reliability [dB]	P-level echo [%]
0,017	103,7	0,112	0,0	5,8	100,0
0,777	63,6	0,309	0,0	22,1	61,3

## Setup and commissioning with direct support

Our service team provides direct, free support to our customers during setup and commissioning via TeamViewer. And this is supplemented by digital channels such as chat and e-mail support.

# Your personal customer portal

## myVEGA

In myVEGA, your personal customer portal, you have access to powerful online functions that optimise your VEGA products and make your processes more efficient.

VEGA Cloud ensures that all your data are protected in accordance with strict European requirements. Storing transmitter data is, of course, free of charge. For this, all you need to do is register with myVEGA.



### Transmitter documentation

All important documents – from the quotation to the transmitter test certificate – are reliably documented in myVEGA.



### Backup & restore

Save your instrument settings and documentation in the VEGA Cloud. Access your transmitter data at any time – for easy setup and recovery.



### 2D & 3D drawings

Generate exact drawings of your instruments in 2D and 3D formats of your choice. Ideal for project planning.



### Order history

Keep an eye on all your transactions. With myVEGA you can view your entire order history – regardless of the date of your registration.



### Prices & delivery times

Get the current prices and delivery times quickly via our online configurator or request a customised offer here.



### Online ordering

Order the products you want directly online. This includes everything from your individually configured instruments to accessories and spare parts.



### Shipment tracking

Track the status of your order. The order status with shipment tracking keeps you informed about the progress of your order at all times.

# VEGA's value-added service

Personal, fast and at no extra cost.

Day or night, at VEGA you can reach technical support specialists who, in many cases, can solve problems over the phone.

But if that's not possible, they do everything that needs to be done to get things moving: From having spare parts or instruments made to arranging for express delivery to deploying a specialist to your location as quickly as possible, should that be necessary.



## 24-hour support

Our technical support is always available for urgent cases – 24 hours a day. Our telephone support is, of course, free of charge.

## Technical training

In our seminars, we pass on our expertise and our experience to you.  
At our training centre in Schiltach or at your location.  
Contact: [vega.com/trainings](https://vega.com/trainings)

## Selection

From initial planning to setup and commissioning – we're there for you! You'd like to talk with one of our experts and work out together with him which transmitter best meets your needs? Just get in touch with us. We're happy to give advice and help you select the right instrument.



**Just give us a call:**  
+49 7836 50-0

## Online purchasing

Find the full range of our solutions quickly and conveniently online. User-friendly search functions guide you to the right product with just a few clicks – and then on to your order.

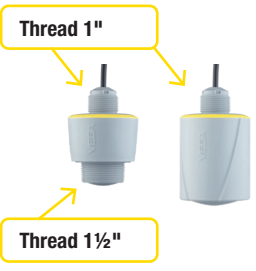




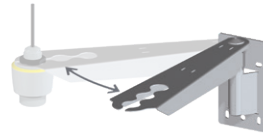

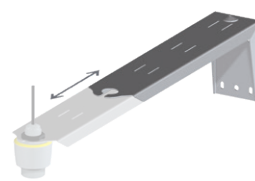
## Delivery with "SPEED"

Because time is money, we have a delivery concept called "SPEED". Our transmitters are delivered to you within the shortest possible time.

# Overview of mounting accessories

## for VEGAPULS BASIC radar sensors

These **versatile accessories** offer a comprehensive package consisting of **high-quality stainless steel components**: pre-assembled mounting bracket, including screws, dowels and drilling template – for quick and secure installation.

		VEGAPULS C 11, C 21, C 23	VEGAPULS C 22, VEGAPULS 11, 21, 31
<b>Accessories</b>	<b>Version</b>		
Alignment device for flange mounting, with movable sensor holder Order code: MBH		✓	-
Ceiling mounting bracket Order code: MBB		✓	✓ only for C 22
Adjustable sensor mounting bracket: 80, 200, 400 mm Order code: MBA		✓	✓
Adjustable horizontally swivelling extension arm bracket Order code: MBD		✓	✓
Adjustable and vertically foldable extension arm bracket 400 mm Order code: MBD		✓	✓
Adjustable and extendable extension arm mounting bracket 500 – 800 mm Order code: MBD		✓	✓

If a mounting socket is already available on the tank, the radar can be mounted directly on it. Adapter flanges of glass fibre-reinforced PPh in universal sizes according to DIN, ANSI or JIS are also available in the product portfolio.

Accessories	Version	VEGAPULS C 11, C 21, C 23	VEGAPULS C 22, VEGAPULS 11, 21, 31
Chain or wire suspension mounting bracket Order code: MBC		<input checked="" type="checkbox"/>	-
Mounting bracket for plastic vessels/IBC Order code: MBF		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fixed 200 mm wall mounting bracket Order code: MBE		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Adapter for 1 1/2" or 1" for existing mounting brackets VEGAPULS 61, 64, 67, 69, 6X Order code: MONTZUB-MB.X1/X2		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Universal flange Order code: GFL-PULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Threaded adapter 2" on 1 1/2" Order code: GEWADA		<input checked="" type="checkbox"/> only for C 11/C 21	<input checked="" type="checkbox"/>
Alignment flange for vessel mounting Order code: MBG.G		<input checked="" type="checkbox"/> only for C 11/C 21	<input checked="" type="checkbox"/>

VEGA Grieshaber KG  
Am Hohenstein 113  
77761 Schiltach, Germany  
Phone +49 7836 50-0  
E-mail [info.de@vega.com](mailto:info.de@vega.com)  
[vega.com](http://vega.com)



1094637-EN-250910