Quick setup guide

Pressure transmitter with ceramic measuring cell

VEGABAR 82

Profibus PA

Document ID: 46309

Contents

Information:
This quick setup guide enables quick setup and commissioning of your instrument.

You can find supplementary information in the corresponding, more detailed Operating Instructions Manual as well as the Safety Manual that comes with instruments with SIL qualification. These manuals are available on our homepage.

Operating instructions VEGABAR 82 - Profibus PA: Document-ID 45031
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1 For your safety

1.1 Authorised personnel

All operations described in this documentation must be carried out only by trained and authorized personnel.

During work on and with the device, the required personal protective equipment must always be worn.

1.2 Appropriate use

The VEGABAR 82 is a pressure transmitter for process pressure and hydrostatic level measurement.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

1.3 Warning about incorrect use

Inappropriate or incorrect use of this product can give rise to application-specific hazards, e.g. vessel overfill through incorrect mounting or adjustment. Damage to property and persons or environmental contamination can result. Also, the protective characteristics of the instrument can be impaired.

1.4 General safety instructions

This is a state-of-the-art instrument complying with all prevailing regulations and directives. The instrument must only be operated in a technically flawless and reliable condition. The operating company is responsible for the trouble-free operation of the instrument. When measuring aggressive or corrosive media that can cause a dangerous situation if the instrument malfunctions, the operating company has to implement suitable measures to make sure the instrument is functioning properly.

The safety instructions in this operating instructions manual, the national installation standards as well as the valid safety regulations and accident prevention rules must be observed.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by us. Arbitrary conversions or modifications are explicitly forbidden. For safety reasons, only the accessory specified by us must be used.

To avoid any danger, the safety approval markings and safety tips on the device must also be observed.

1.5 Conformity

The device complies with the legal requirements of the applicable country-specific directives or technical regulations. We confirm conformity with the corresponding labelling.

The corresponding conformity declarations can be found on our homepage.

Due to the design of its process fittings, the device does not subject of EU pressure device directive if it is operated at process pressures ≤ 200 bar.

1.6 NAMUR recommendations

NAMUR is the automation technology user association in the process industry in Germany. The published NAMUR recommendations are accepted as the standard in field instrumentation.

The device fulfils the requirements of the following NAMUR recommendations:

● NE 21 – Electromagnetic compatibility of equipment
● NE 53 – Compatibility of field devices and display/adjustment components
● NE 107 – Self-monitoring and diagnosis of field devices

For further information see www.namur.de.

1.7 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

● Chapter " *Packaging, transport and storage*"
● Chapter " *Disposal*"

2 Product description

2.1 Configuration

Type label

The type label contains the most important data for identification and use of the instrument:

● Instrument type
● Information about approvals
● Configuration information
● Technical data
● Serial number of the instrument
● QR code for device identification
● Numerical code for Bluetooth access (optional)
● Manufacturer information

Documents and software

To find order data, documents or software related to your device, you have the following options:

● Move to " www.vega.com" and enter in the search field the serial number of your instrument.
● Scan the QR code on the type label.
● Open the VEGA Tools app and enter the serial number under " *Documentation*".

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3 Mounting

3.1 General instructions for use of the instrument

Protection against moisture

Protect your instrument against moisture ingress through the following measures:

● Use a suitable connection cable (see chapter " *Connecting to power supply*")
● Tighten the cable gland or plug connector
● Lead the connection cable downward in front of the cable entry or plug connector

This applies mainly to outdoor installations, in areas where high humidity is expected (e.g. through cleaning processes) and on cooled or heated vessels.

⚠ **Note:**
Make sure that during installation or maintenance no moisture or dirt can get inside the instrument.

To maintain the housing protection, make sure that the housing lid is closed during operation and locked, if necessary.

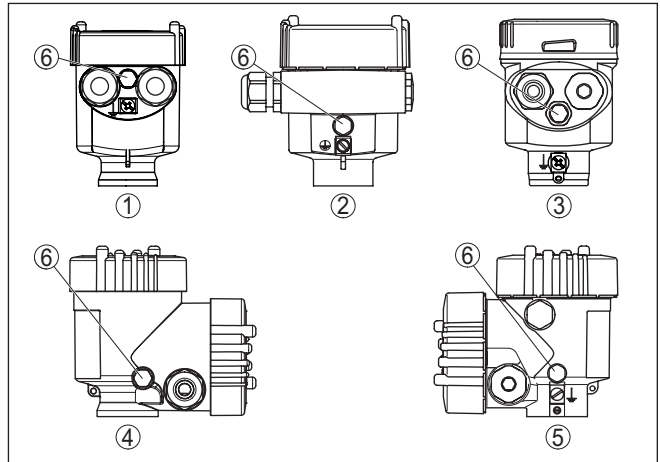## 3.2 Ventilation and pressure compensation

Filter element - Position

Fig. 1: Position of the filter element

1 Plastic, stainless steel single chamber (precision casting)
2 Aluminium - single chamber
3 Stainless steel single chamber (electropolished)
4 Plastic double chamber
5 Aluminium, stainless steel double chamber housing (precision casting)
6 Filter element

With the following instruments a blind plug is installed instead of the filter element:

46309-EN-230914

- Instruments in protection IP66/IP68 (1 bar) - ventilation via capillaries in non-detachable cable
- Instruments with absolute pressure

4 Connecting to the bus system

4.1 Connecting

Connection technology

The voltage supply and signal output are connected via the spring-loaded terminals in the housing.

Connection to the display and adjustment module or to the interface adapter is carried out via contact pins in the housing.

● **Information:**
The terminal block is pluggable and can be removed from the electronics. To do this, lift the terminal block with a small screwdriver and pull it out. When reinserting the terminal block, you should hear it snap in.

Connection procedure

Proceed as follows:

1. Unscrew the housing lid

2. If a display and adjustment module is installed, remove it by turning it slightly to the left

3. Loosen compression nut of the cable gland and remove blind plug

4. Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) of insulation from the ends of the individual wires

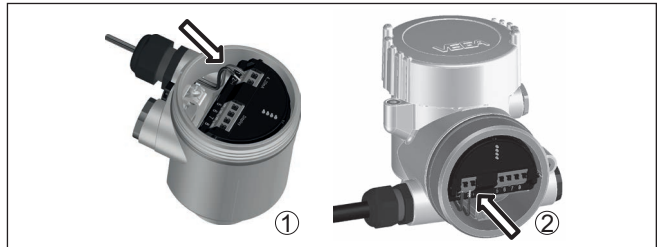5. Insert the cable into the sensor through the cable entry

Fig. 2: Connection steps 5 and 6

1 Single chamber housing
2 Double chamber housing

6. Insert the wire ends into the terminals according to the wiring plan

● **Note:**
Solid cores as well as flexible cores with wire end sleeves are inserted directly into the terminal openings. In case of flexible cores without end sleeves, press the terminal from above with a small screwdriver, the terminal opening is then free. When the screwdriver is released, the terminal closes again.

7. Check the hold of the wires in the terminals by lightly pulling on them

8. Connect the shielding to the internal ground terminal, connect the external ground terminal to potential equalisation

9. Tighten the compression nut of the cable entry gland. The seal ring must completely encircle the cable

10. Reinsert the display and adjustment module, if one was installed

11. Screw the housing lid back on

The electrical connection is finished.

4.2 Single chamber housing

The following illustration applies to the non-Ex, Ex ia and Ex d version.
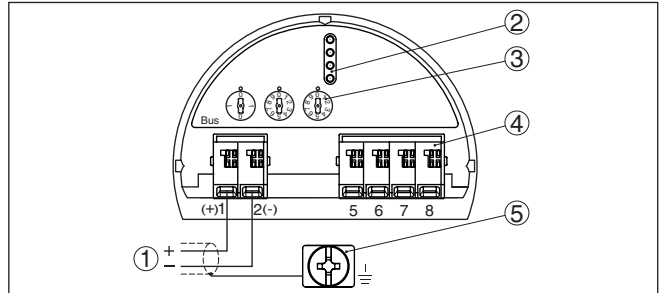
Electronics and connection compartment

Fig. 3: Electronics and connection compartment - single chamber housing

1 Voltage supply, signal output
2 For display and adjustment module or interface adapter
3 Selection switch for instrument address
4 For external display and adjustment unit
5 Ground terminal for connection of the cable screening

4.3 Double chamber housing

The following illustrations apply to the non-Ex as well as to the Ex-ia version.
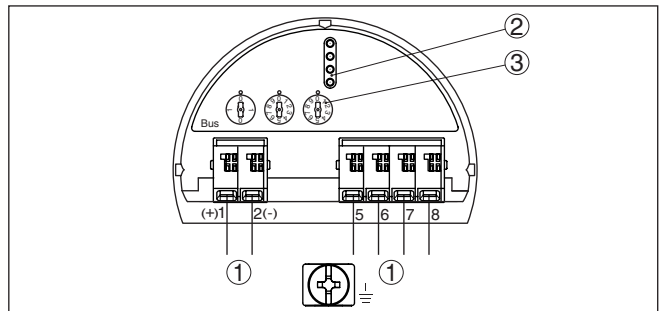
Electronics compartment

Fig. 4: Electronics compartment - double chamber housing

1 Internal connection to the connection compartment
2 Contact pins for the display and adjustment module or interface adapter
3 Selection switch for bus address

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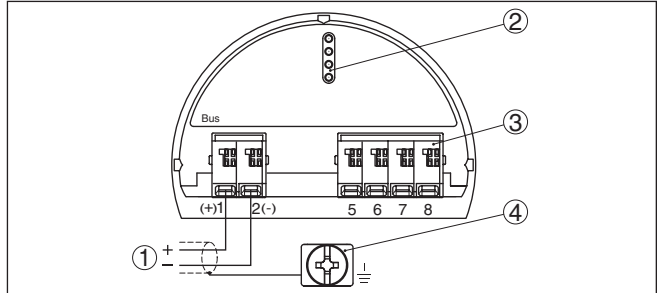
Connection compartment

Fig. 5: Connection compartment - double chamber housing

1   *Voltage supply, signal output*
2   *For display and adjustment module or interface adapter*
3   *For external display and adjustment unit*
4   *Ground terminal for connection of the cable screening*

5 Set up with the display and adjustment module

5.1 Insert display and adjustment module

The display and adjustment module can be inserted into the sensor and removed again at any time. You can choose any one of four different positions - each displaced by 90°. It is not necessary to interrupt the power supply.

Proceed as follows:

1. Unscrew the housing lid

2. Place the display and adjustment module on the electronics in the desired position and turn it to the right until it snaps in.

3. Screw housing lid with inspection window tightly back on

Disassembly is carried out in reverse order.

The display and adjustment module is powered by the sensor, an additional connection is not necessary.

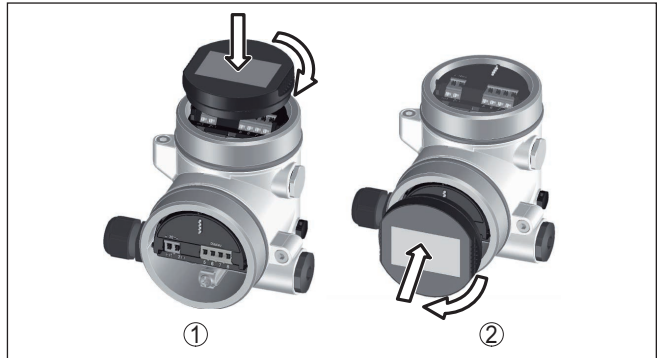*Fig. 6: Installing the display and adjustment module in the electronics compartment of the single chamber housing*

Fig. 7: Installing the display and adjustment module in the double chamber housing

1 In the electronics compartment
2 In the connection compartment

● **Note:**
ℹ If you intend to retrofit the instrument with a display and adjustment module for continuous measured value indication, a higher lid with an inspection glass is required.

5.2 Parameter adjustment - Quick setup

To quickly and easily adapt the sensor to the application, select the menu item " *Quick setup*" in the start graphic on the display and adjustment module.

Carry out the following steps in the below sequence.

You can find " *Extended adjustment*" in the next sub-chapter.

Quick setup - Presettings

Sensor address
In the first menu item you have to enter a sensor address. The selection switches on the electronics module are preset to sensor address 126. This means that the sensor address can be changed via the display and adjustment module.

Measurement loop name
In this menu item you assign a suitable measurement loop name. Permitted are names with a maximum of 19 characters.

Parameterization example

VEGABAR 82 always measures pressure independently of the process variable selected in the menu item "*Application*". To output the selected process variable correctly, an allocation of the output signal to 0 % and 100 % must be carried out (adjustment).

With the application "*Level*", the hydrostatic pressure, e.g. with full and empty vessel, is entered for adjustment. See following example:
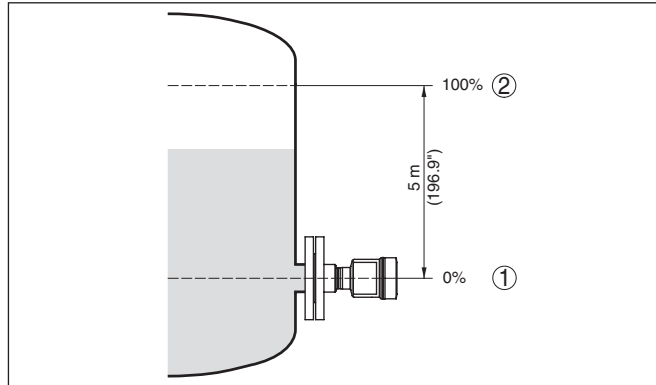

Fig. 8: Parameter adjustment example Min./max. adjustment, level measurement

1   Min. level = 0 % corresponds to 0.0 mbar
2   Max. level = 100 % corresponds to 490.5 mbar

If these values are not known, an adjustment with filling levels of e.g. 10 % and 90 % is also possible. By means of these settings, the real filling height is then calculated.

The actual product level during this adjustment is not important, because the min./max. adjustment is always carried out without changing the product level. These settings can be made ahead of time without the instrument having to be installed.

5.3   Parameter adjustment - Extended adjustment

For technically demanding measuring points, you can carry out extended settings in "*Extended adjustment*".
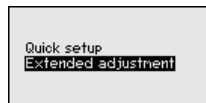
Main menu

The main menu is divided into five sections with the following functions:

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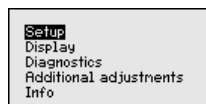**Setup:** Settings, for example, to measurement loop name, application, units, position correction, adjustment, AI FB 1 Channel - scaling - damping

Display: Settings, e.g., for language, measured value display, lighting

Diagnosis: Information, e.g. on instrument status, peak indicator, measurement reliability, AI FB 1 simulation

Additional adjustments: PIN, date/time, reset, copy function

Info: Instrument name, hardware and software version, date of manufacture, sensor features

To ensure optimum adjustment of the measurement, the individual submenu items in the main menu " *Setup*" should be selected one after the other and provided with the correct parameters. The menu items are described in the following.

5.4 Menu overview

The following tables show the adjustment menu of the instrument. Depending on the instrument version or application, all menu items may not be available or some may be differently assigned.

Setup

Menu item	Parameter	Default value
Sensor address		126
Measurement loop name	19 alphanumeric characters/special characters	Sensor
Application	Level, process pressure	Level
	Secondary Device for electronic differential pressure [1]	Deactivated
Units	Adjustment unit (m, bar, Pa, psi … user-defined)	mbar (with nominal measuring range ≤ 400 mbar)
		bar (with nominal measuring ranges ≥ 1 bar)
	Temperature unit (°C, °F)	°C
Position correction		0.00 bar
Adjustment	Zero/Min. adjustment	0.00 bar
		0.00 %
	Span/Max. adjustment	Nominal measuring range in bar
		100.00 %
Linearisation	Linear, cylindrical tank, … user-defined	Linear

[1] Parameter only active if the instrument is connected to the Secondary sensor

Menu item	Parameter	Default value
AI FB 1	Channel	Primary Value
	Scaling format	Pressure
	Scaling	0 % corresponds to 0 bar 100 % corresponds to measuring range final value
	Damping	PV FTime 1 s
Lock adjustment	Blocked, released	Released

Display

Menu item	Default value
Menu language	Selected language
Displayed value 1	Signal output in %
Displayed value 2	Ceramic measuring cell: Measuring cell temperature in °C Metallic measuring cell: Electronics temperature in °C
Display format	Number of positions after the decimal point, automatically
Backlight	Switched on

Diagnostics

Menu item	Parameter	Default value
Device status		-
Peak indicator	Pressure	Current pressure measured value
Peak indicator temp.	Temperature	Actual measuring cell and electronic temperature
Simulation	Pressure, percent, signal output, linearized percent, measuring cell temperature, electronics temperature	Process pressure

Additional adjustments

Menu item	Parameter	Default value
Date/Time		Actual date/Actual time
Reset	Delivery status, basic settings	
Copy instrument settings	Read from sensor, write into sensor	
Scaling	Scaling size	Volume in l
	Scaling format	0 % corresponds to 0 l 100 % corresponds to 100 l
Special parameters	Service-Login	No reset

Info

Menu item	Parameter
Device name	VEGABAR 82
Instrument version	Hardware and software version
Factory calibration date	Date
Profibus Ident Number	Identification number of the instrument on a Profibus system
Sensor characteristics	Order-specific characteristics

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6 Set up with smartphone/tablet, PC/notebook via Bluetooth

6.1 Preparations

Activate Bluetooth

Make sure that the Bluetooth function of the display and adjustment module is activated. For this, the switch on the bottom side must be set to " *On*".
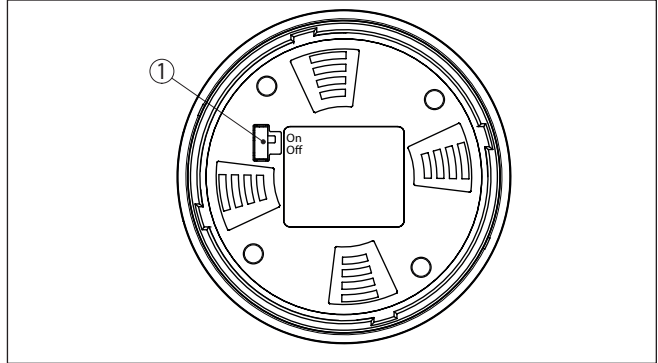

Fig. 9: Activate Bluetooth

1 Switch
On = Bluetooth active
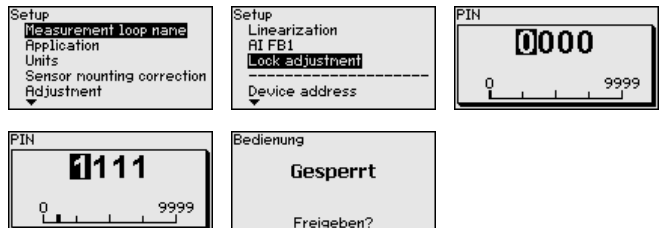*Off = Bluetooth not active*

Change sensor PIN

The security concept of Bluetooth operation absolutely requires that the default setting of the sensor PIN be changed. This prevents unauthorized access to the sensor.

The default setting of the sensor PIN is " **0000**". First of all you have to change the sensor PIN in the adjustment menu of the sensor, e.g. to " **1111**":
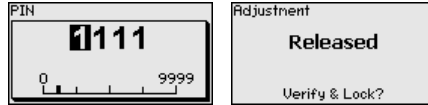
1. Go to setup via the extended operation
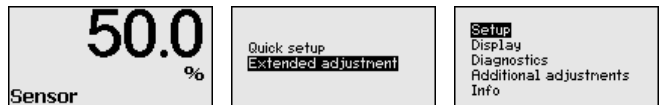
2. Lock operation by changing sensor PIN

3. Enable operation by entering the sensor PIN once more

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```
PIN
   1111
0          9999
```

```
Adjustment
  Released

Verify & Lock?
```

Sensor adjustment via the display/adjustment module or PACTware/
DTM by means of VEGACONNECT is thus released again. For ac-
cess (authentication) with Bluetooth, the changed PIN is still effective.

Note:

Bluetooth access can only be established if the current sensor PIN
differs from the default setting " **0000**". It is possible both when the
adjustment is unlocked and when it is locked.

6.2 Connecting

Preparations

Smartphone/Tablet
Start the adjustment app and select the function "Setup". The smart-
phone/tablet searches automatically for Bluetooth-capable instru-
ments in the area.

PC/Notebook
Start PACTware and the VEGA project assistant. Select the device
search via Bluetooth and start the search function. The device auto-
matically searches for Bluetooth-capable devices in the vicinity.

Connecting

The message " *Instrument search running*" is displayed. All devices
found are listed in the operating window. The search is automatically
continued continuously.

Select in the device list the requested device. The message " *Con-
necting*" is displayed.

Authenticate

For the first connection, the operating device and the sensor must
authenticate each other. After successful authentication, the next con-
nection functions without authentication.

For authentication, enter in the next menu window the 4-digit sensor
PIN.

6.3 Sensor parameter adjustment

The sensor parameterization is carried out via the adjustment app on
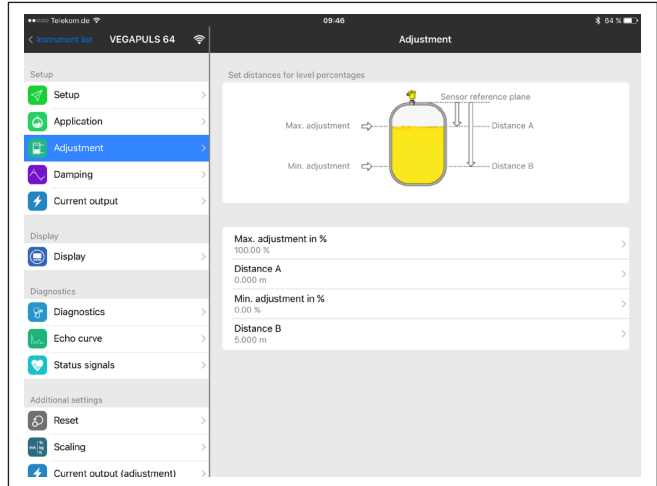the smartphone/tablet or the DTM on the PC/notebook.

App view

Fig. 10: Example of an app view - Setup sensor adjustment

7 Supplement

7.1 Technical data

Note for approved instruments

The technical data in the respective safety instructions which are included in delivery are valid for approved instruments (e.g. with Ex approval). These data can differ from the data listed herein, for example regarding the process conditions or the voltage supply.

All approval documents can be downloaded from our homepage.

Electromechanical data - version IP66/IP67 and IP66/IP68 (0.2 bar) [2]

Options of the cable entry

− Cable entry	M20 x 1.5; ½ NPT
− Cable gland	M20 x 1.5; ½ NPT (cable ø see below table)
− Blind plug	M20 x 1.5; ½ NPT
− Closing cap	½ NPT

Material cable gland/Seal insert	Cable diameter			
	5 … 9 mm	6 … 12 mm	7 … 12 mm	10 … 14 mm
PA/NBR	√	√	–	√
Brass, nickel-plated/NBR	√	√	–	–
Stainless steel/NBR	–	–	√	–

Wire cross-section (spring-loaded terminals)

− Massive wire, stranded wire	0.2 … 2.5 mm² (AWG 24 … 14)
− Stranded wire with end sleeve	0.2 … 1.5 mm² (AWG 24 … 16)

Voltage supply

Operating voltage U_B	9 … 32 V DC
Operating voltage U_B with lighting switched on	13.5 … 32 V DC
Number of sensors per DP/PA segment coupler, max.	32

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[2] IP66/IP68 (0.2 bar), only with absolute pressure.

46309-EN-230914

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