Quick setup guide

Pressure transmitter with metallic measuring cell

VEGABAR 83

HART and accumulator pack

Document ID: 46314

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 83 - HART and power pack: Document-ID 45035
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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, qualified personnel authorised by the plant operator.

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

1.2 Appropriate use

The VEGABAR 83 is a pressure transmitter for process pressure and hydrostatic level measurement. Due to the integrated accumulator the instrument is particularly suitable as a portable measuring system or test sensor for special applications.

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 operator 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 operator 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 by the user.

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 the manufacturer. Arbitrary conversions or modifications are explicitly forbidden. For safety reasons, only the accessory specified by the manufacturer must be used.

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

1.5 EU conformity

The device fulfils the legal requirements of the applicable EU directives. By affixing the CE marking, we confirm the conformity of the instrument with these directives.

The EU conformity declaration 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]

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 43 – Signal level for fault information from measuring transducers
● 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*"

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[1] Exception: Versions with measuring ranges from 250 bar. These are subject of the EU Pressure Device Directive.

2 Product description

2.1 Configuration

Type label

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

Fig. 1: Layout of the type label (example)

1 Product code
2 Field for approvals
3 Technical data
4 Serial number of the instrument
5 QR code
6 Symbol of the device protection class
7 ID numbers, instrument documentation

Serial number - Instrument search

The type label contains the serial number of the instrument. With it you can find the following instrument data on our homepage:

● Product code (HTML)
● Delivery date (HTML)
● Order-specific instrument features (HTML)
● Operating instructions and quick setup guide at the time of shipment (PDF)
● Test certificate (PDF) - optional

Move to " www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can access the data via your smartphone:

● Download the VEGA Tools app from the " *Apple App Store*" or the " *Google Play Store*"
● Scan the QR-code on the type label of the device or
● Enter the serial number manually in the app

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.

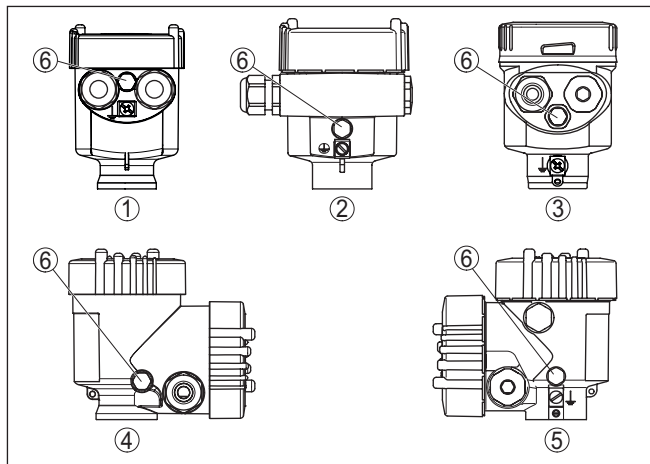## 3.2 Ventilation and pressure compensation

Filter element - Position

Fig. 2: 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:

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

4 Connecting to power supply

4.1 Connection of the battery charger

We recommended charging the integrated accumulator completely before setting up the instrument. You can find the charging time in chapter " *Technical data*".

The battery charger is plugged into a socket in the supply room, see chapter " *Wiring plan*".

The LEDs in the supply room show the charging process and condition of the accumulator, see chapter " *Wiring plan*".

4.2 Wiring plan

Overview

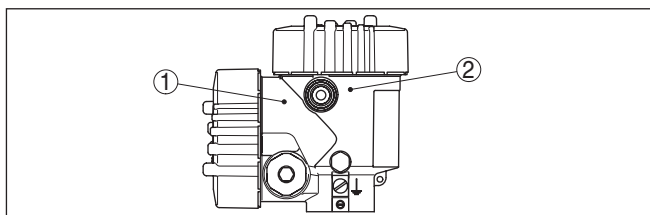*Fig. 3: Position of the power supply and electronics compartment*

1   Supply room (accumulator)
2   Electronics compartment
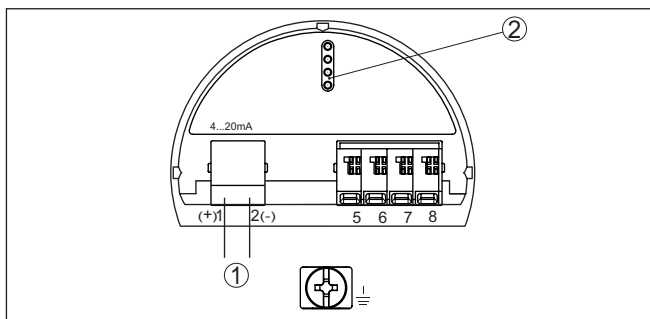
Electronics compartment

Fig. 4: Electronics compartment - double chamber housing

1   Internal connection to the connection compartment
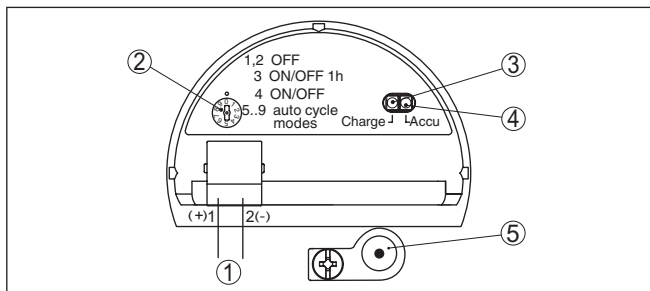*2   Contact pins for the display and adjustment module*

Supply room

Fig. 5: Supply room
1   Internal connection of the socket for the battery charger
2   Mode switch
3   LED green, charging process
4   LED yellow, charging status
5   Socket for the battery charger

The mode switch enables the selection of the following modes:

● 0 = sensor off, LEDs show the accumulator status
● 1, 2 = sensor off, LEDs off
● 3 = sensor on for 1 hour after pressing a key (delivery status)
● 4 = sensor permanently on, switching on/off via button
● 5 = sensor is switched on every 30 minutes for 3 minutes
● 6 = sensor is switched on every hour for 3 min.
● 7 = sensor is switched on every 6 hours for 3 minutes
● 8 = sensor is switched on every 12 hours for 3 minutes
● 9 = sensor is switched on every 24 hours for 3 minutes

The green LED characterizes the charging process:

● LED flashes = Accumulator is charging
● LED lights = accumulator is full, battery charger should be unplugged (accumulator life time)

After pressing the key or changing the mode the yellow LED shows the accumulator status for approximately 10 s as follows:

● LED lights = accumulator is full
● LED flashes = accumulator should be charged
● LED off = accumulator is empty

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: Insertion of the display and adjustment module

● **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.
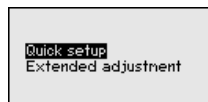
Carry out the following steps in the below sequence.

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

Presettings

Measurement loop name
In the first menu item you assign a suitable measurement loop name. Permitted are names with max. 19 characters.

Application
In this menu item, you activate/deactivate the Secondary sensor for the electronic differential pressure and select the application. The application comprises process pressure and level measurement.

Units
In this menu item you determine the adjustment and temperature units of the instrument. Depending on the selected application in the menu item " *Application*", different adjustment units are available.

Measurement loop name	Slave for electronic differential pressure	Units of measurement
Sensor	**Disabled!**	m ▼
	Application	Temperature unit
	Pressure ▼	°C ▼

Quick setup - Process pressure measurement

Position correction
In this menu item you compensate the influence of the installation position of the instrument (offset) on the measured value.

Zero adjustment
In this menu item you carry out the zero adjustment for the process pressure.

Enter the corresponding pressure value for 0 %.

Span adjustment
In this menu item you carry out the span adjustment for the process pressure

Enter the corresponding pressure value for 100 %.

Sensor mounting correction	Zero	Span
Offset	**0.00 %**	**100.00%**
=	≙	≙
−0.0003 bar	0.0000 bar	1.0000 bar
0.0001 bar	0.0000 bar	0.0000 bar

Quick setup - Level measurement

Position correction
In this menu item you compensate the influence of the installation position of the instrument (offset) on the measured value.
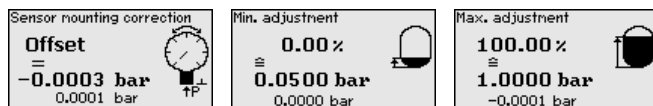
Max. adjustment
In this menu item you carry out the max. adjustment for level

Enter the percentage value and the corresponding value for the max. level.

Min. adjustment
In this menu item you carry out the min. adjustment for level

Enter the percentage value and the corresponding value for the min. level.

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Sensor mounting correction	Min. adjustment	Max. adjustment
Offset	**0.00 %**	**100.00 %**
=	≙	≙
-0.0003 bar	**0.0500 bar**	**1.0000 bar**
0.0001 bar	0.0000 bar	-0.0001 bar

The quick setup is finished.

Parameterization example VEGABAR 83 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:
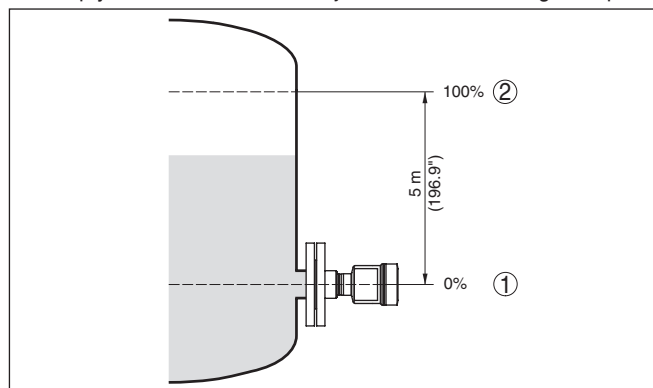

*Fig. 7: Parameter adjustment example Min./max. adjustment, level measurement*

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.
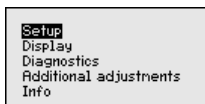
5.3   Parameter adjustment - Extended adjustment

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

Quick setup
Extended adjustment
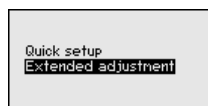
Main menu The main menu is divided into five sections with the following functions:

```
Setup
Display
Diagnostics
Additional adjustments
Info
```

Setup: Settings e. g. for measurement loop name, application, units, position correction, adjustment, signal output, disable/enable operation

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

Diagnosis: Information, for example, of device status, peak value, simulation

Additional adjustments: date/time, reset, copy function

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

● **Note:**
For optimum setting of the measuring point, the individual submenu items in the main menu item " *Setup*" should be selected one after the other and provided with the correct parameters. If possible, go through the items in the given sequence.

The submenu points are described below.

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
Measurement loop name		Sensor
Application	Application	Level
	Secondary sensor for electronic differential pressure	Deactivated
Units	Unit of measurement	mbar (with nominal measuring range ≤ 400 mbar)
		bar (with nominal measuring ranges ≥ 1 bar)
	Temperature unit	°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 %
Damping	Integration time	1 s
Lock adjustment	Blocked, released	Released

Display

Menu item	Default value
Menu language	Selected language
Displayed value 1	Current 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 value	Pressure	Current pressure measured value
Pointer function temp.	Temperature	Actual measuring cell and electronic temperature
Simulation		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 0 l
Special parameters	Service-Login	No reset

Info

Menu item	Parameter
Device name	VEGABAR 83
Instrument version	Hardware and software version
Factory calibration date	Date
Sensor characteristics	Order-specific characteristics

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*".
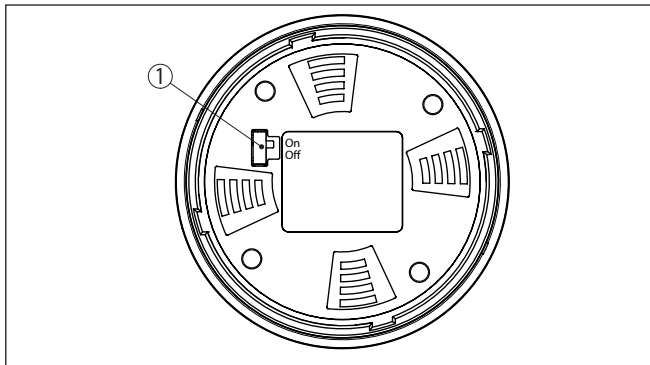

Fig. 8: Activate Bluetooth

1 Switch
On = Bluetooth active
Off = Bluetooth not active
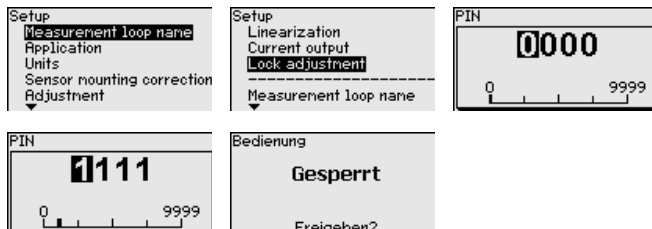
Change sensor PIN

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**":

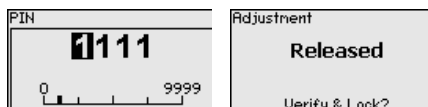1. Go to setup via the extended operation
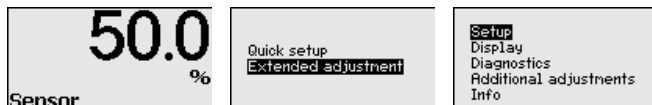
2. Lock operation by changing sensor PIN

3. Enable operation again 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 access (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 smartphone/tablet searches automatically for Bluetooth-capable instruments 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 automatically 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 " *Connecting*" is displayed.

Authenticate

For the first connection, the operating device and the sensor must authenticate each other. After successful authentication, the next connection 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.
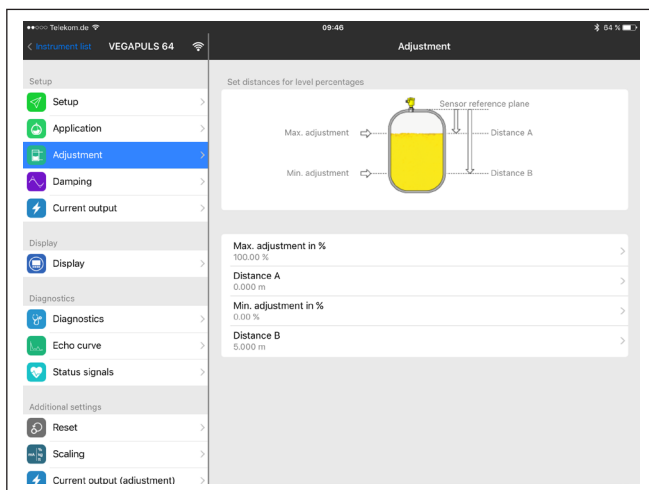
App view

Fig. 9: 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)

External battery charger

Mains voltage	100 … 240 V AC
Output voltage	24 V DC
Max. output current (short-circuit proof)	500 mA
Load current limitation	70 mA
DC plug (inside plus, outside minus)	2.1 mm

Integrated accumulator

Type	Lithium ions
Voltage	14.8 V
Accumulator capacity	4.7 Wh
Charging period from 0 % to 100 %	approx. 4 h
Operating time after 10 minutes charging of 0 %	> 3 h
Operating time in mode 4 (sensor permanently on) with completely charged accumulator	> 60 h

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

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Temperature range
  − Charge accumulator   0 … +45° C (+32 … +167 °F)
  − Accumulator operation   -20 … +60° C (-4 … +140 °F)
Temperature derating accumulator capacity
  − +25° C (+77 °F)   100 %
  − -10° C (+14 °F)   50 %

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