

# *Operating Instructions*

# **METROTEC**

Systems for Measuring and Controlling Oxygen

## **U03-VQ100**

Flow sensor

**Series U03-VQ100**

\*\*\* Version 1.2 \*\*\*

**EC Declaration of Conformity**

for

Flow sensorSeries U03-VQ100

This device has been designed for industrial purposes in accordance with:

*EN 61000-6-4**EN 61000-6-2*

It is compliant with the directives:

*EMC Directive: 2014/30/EU**Low Voltage Directive: 2014/35/EU**RoHs: 2011/65/EU*

This device complies with following standards:

*EN 61010-1**EN 61000-6-4**EN 61000-6-2**EN 63000*

Description of measures taken to assure compliance:

*Quality management system DIN EN ISO 9001:2015, No. 12 100 27736 TMS*This declaration becomes invalid if changes are made without  
our consent.

Kirchheim/Teck, 15/07/2019

Place, Date










Signature

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## 1 Safety Instructions

	<p>Please read these operating instructions carefully before installing and using the device. Improper use of the product will invalidate the warranty!</p>
	<p>The ambient conditions described in the Specifications chapter must be complied with in order to ensure the device's proper functioning and operational safety.</p>
	<p>The device may only be started up and operated by qualified and trained personnel. The operator of the device must ensure that all applicable regulations and guidelines are complied with. These are, among others, the EU Directive on work safety, national work safety legislation, accident prevention regulations, etc.</p>
	<p>Please ensure that the supply voltage corresponds with the information given on the type plate. All coverings necessary to provide touch protection must be installed. In case the device is interconnected with other devices and/or installations, the consequences must be considered and appropriate precautions taken before switching the device on.</p>
	<p>In some cases, hot parts or surfaces may be unprotected during or after installing or uninstalling the device. Appropriate precautions must be taken to avoid injuries and/or damage.</p>
	<p>In case the device shows defects which suggest that it will not be possible to operate it safely, it must not be put into operation. We recommend to have the device inspected at least once a year at the factory or by a customer service provider.</p>
	<p>Disposal of the device must be performed according to the applicable regulations.</p>

## 2 Layout

### 2.1 Display



#### **Flow display U03**

The flow display U03 serves to display the gas flow rate captured by the sensor VQ100. The flow display U03 is designed for mounting in a front panel.

## 2.2 Front view



Normal flow



Flow too low



Maximum flow

A bar graph of 0-10 elements, consisting of 3 LEDs each, displays the current flow rate.

A green display shows flow rates are in a normal range.

A red display shows flow rates are in a range below a fixed value. This condition is linked with an output relay.

If the flow rate is in a range above the maximum, the top element flashes.

If the flow rate is in a range below the minimum, the bottom element flashes.

## 2.3 Installation

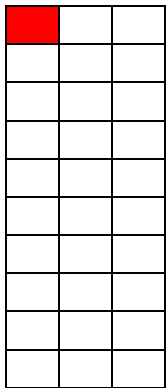


The display is mounted by means of a screw fastening (see illustration).

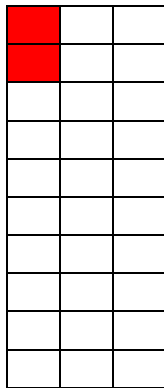
## 2.4 Types of gas

As sample gases have different properties, the measuring range must be adjusted accordingly. For this purpose 4 measuring ranges have been pre-programmed.

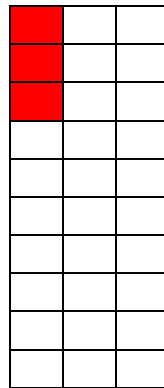
When switching the supply voltage on, the red and green LEDs are tested in sequence. Then the selected type of gas is displayed by multiple flashes according to the pattern given in the following table. Subsequently the display changes into display mode.



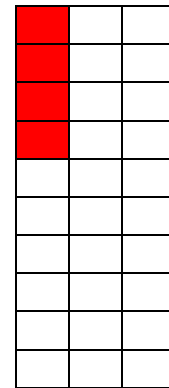
Nitrogen



Forming gas



Argon

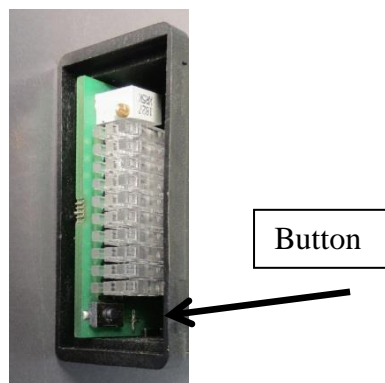


Special gas

Table: LED information on active types of gas

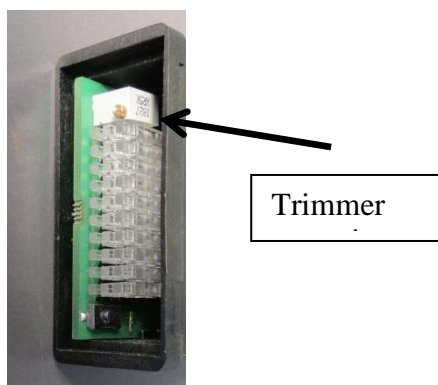
## 2.5 Changing and displaying the active type of gas

If necessary, the button can be operated after removing the outer front frame and the cover plate. When pressed, the display skips to the next type of gas until the desired type is reached. (See table Types of gas.) After a short pause the flow rate is displayed again.

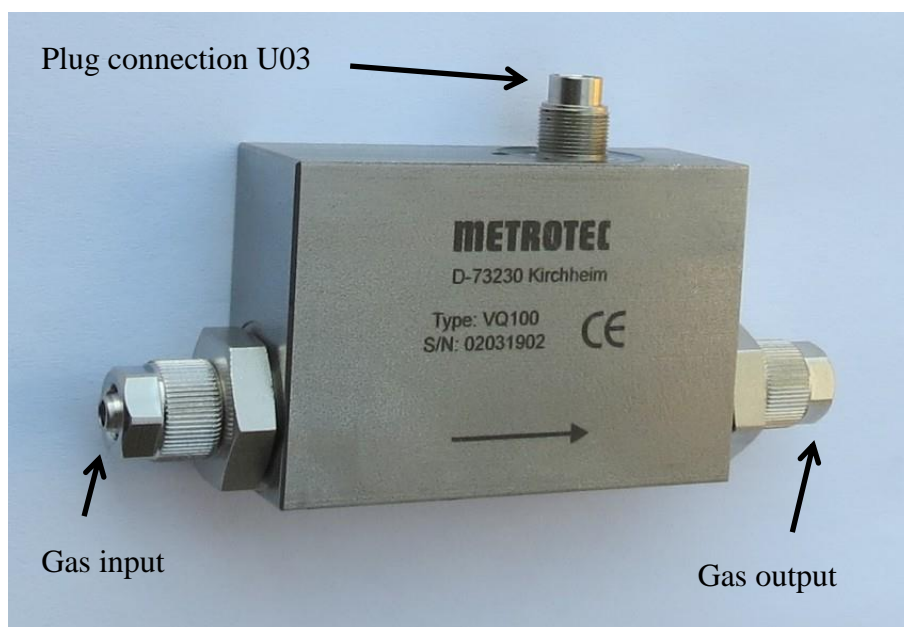


## 2.6 Adjusting the flow rate

If necessary, the trimmer potentiometer can be used to trim the flow display to the desired display type after removing the outer front frame and the cover plate.



## 2.7 Sensor VQ100



**Sensor VQ100**



The sensor VQ100 captures the flow rate. It consists of a stainless steel body and is connected with the flow rate display U03 by means of a cable.

Due to the large bore holes for the gas flow path it is non-sensitive with regard to contaminants and humidity in the sample gas.

### 3 Wiring diagram

The flow rate display U03 must be connected with the sensor VQ100.

The cable between U03 and VQ100 should not be longer than 10 m.

A shielded three-core cable must be used and the shield must be grounded on one end.

<b>U03 Plug</b>	<b>VQ100 Built-in plug*</b>	<b>Description</b>
Terminal 1	Pin 1 (gn)	Sensor 1
Terminal 2	Pin 2 (ye)	Sensor 2
Terminal 3	Pin 3 (rd)	GND
Terminal 4		Relay NO
Terminal 5		Relay COM
Terminal 6		NC
Terminal 7**		Power supply -
Terminal 8**		Power supply +

\*The connecting cable between U03 and VQ100 must be shielded and grounded. The shield must be grounded on one side.

\*\* Observe type plate!!

### 4 Specifications

<b>VQ100</b>	
Measuring range	0-100 l/h
Gas temperature	0 to 100 degrees Celsius
Sensor heating-up time	ca.10 minutes
Weight	ca. 200 g
Dimensions	HxWxD 50x20x60 mm
Gas input thread	1/4 inch G
Gas output thread	1/4 inch G

**U03**

Ambient temperature	10 to 45 degrees Celsius
Supply voltage	90-240 V, 50 Hz (Observe type plate!) 22-30 VDC (Observe type plate!)
Power	ca. 2 VA
Relay output	60V AC/DC 500 mA (Semiconductor relay)
Weight	ca. 120 g
Dimensions excl. mounting lugs	HxWxD 45x22x120 mm
Panel cutout	44x21 mm