Supplementary instructions

M12 x 1 plug connector

for continuously measuring sensors

Document ID: 30377

Contents

Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions and come with the Ex-approved instruments.

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30377-EN-220509

1 For your safety

1.1 Appropriate use

The described plug connectors are accessory parts for continuously measuring sensors.

They are used for separable connection to power supply/signal processing for two-wire sensors. Those are sensors whose power supply as well as measurement signal are transmitted over one pair of wires.

1.2 Impermissible use

As a rule, it is not allowed to use plug connectors with four-wire instruments. Those are sensors whose power supply and measurement signal are transmitted over two separate pairs of wires.

1.3 General safety instructions

The safety information in the operating instructions manual of the respective sensor must be noted.

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2 Product description

Scope of delivery

The scope of delivery encompasses:

- Plug connector
- Documentation
  - This supplementary instructions manual

Function

The plug connector is an accessory part for sensors with single or double chamber housing. It is used as separable connection to:

- the voltage supply or signal processing
- an external display and adjustment unit
- a Secondary sensor

Configuration

The connector consists of an M12 x 1 plug and a multi-core, permanently connected connection cable.

The individual cores are marked with numbers for the terminals of the electronics module. The number and colours of the cores vary depending on the signal output of the sensor.

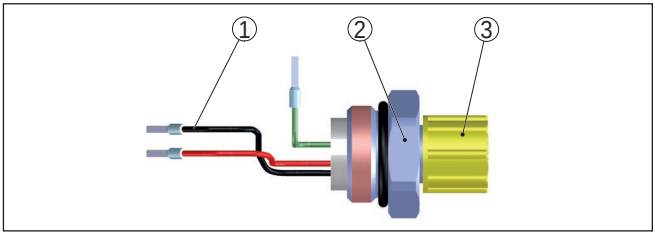

Fig. 1: Configuration M12 x 1 plug connector - Example

1 Connection cable
2 M12 x 1 plug
3 Protective cap

Application area

The plug connector is inserted instead of the cable gland into the single chamber or the blind plug into the double chamber housing. The plug connector is available with M16 (for blind plugs) and M20 (for cable glands) threads.

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3 Mounting

3.1 Mounting preparations

Tools

The following tools are required for mounting:

- Single chamber housing
  - Spanner SW 24 for unscrewing the cable gland
  - Screwdriver SW 24 for screwing in the plug
- Double chamber housing
  - Screwdriver SW 19 for unscrewing the blind plug
  - Screwdriver SW 24 for screwing in the plug

3.2 Installation procedure

Position in the housing

The following illustration shows the position of the plug connector in the respective housing:

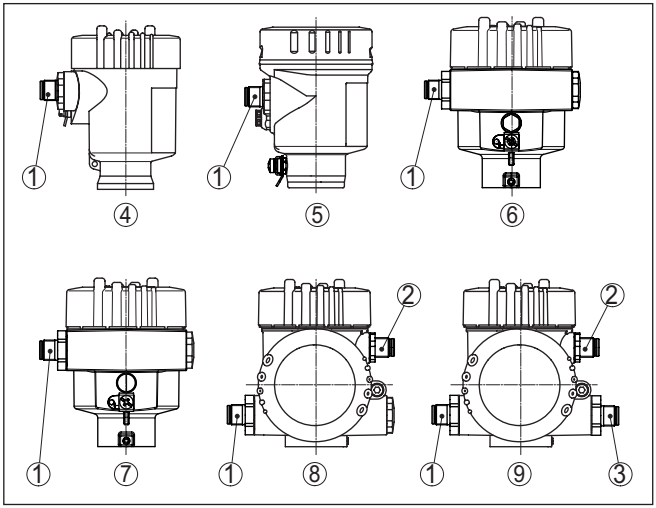

Fig. 2: Position, plug connector

1 Plug, connector voltage supply or signal processing
2 Plug connector external display and adjustment unit or Secondary sensor
3 Plug connector additional current output
4 Single chamber plastic
5 Single chamber stainless steel (electropolished)
6 Single chamber stainless steel (precision casting)
7 Single chamber aluminium
8 Double chamber plastic, stainless steel (precision casting), Aluminium
9 Double chamber plastic, stainless steel (precision casting), Aluminium with additional current output

Installation

Proceed as follows to mount the plug connector:

1. Open the cover of the electronics compartment
2. Unscrew the blind plug
3. Screw in the M12 plug

4. Correct the cores acc. to the chapters " *Connection*"

The mounting of the plug connector is finished.

Disassembly is carried out in reverse order.

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4 Connection to voltage supply

The illustrations show the configuration and the occupied pins of the plug connector.

The tables show the connection of the individual contact pints to the terminals of the electronics module in the sensot.

4.2 4 … 20 mA/HART

Plug connector - Assignment A

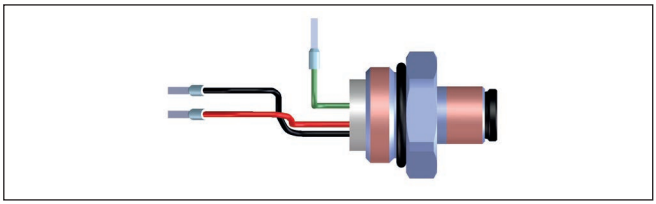

Fig. 3: Configuration M12 x 1 plug connector - 4 … 20 mA/HART sensor - Assignment A

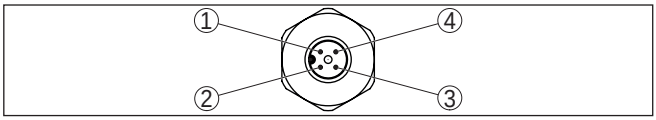

Fig. 4: Top view of the plug connector - 4 … 20 mA/HART - assignment A

Voltage supply/Signal output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Green	⏚	Shielding
2	free	free	free
3	Black	Terminal 2	Power supply/-
4	Red	Terminal 1	Power supply/+

Additional current output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Green	⏚	Shielding
2	free	free	free
3	Black	Terminal 8	Power supply/-
4	Red	Terminal 7	Power supply/+

Plug connector - Assignment B

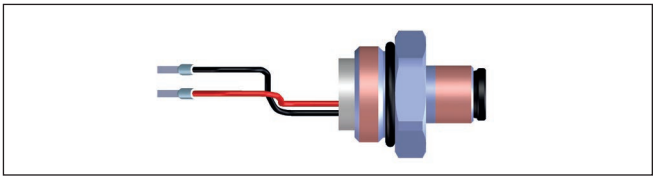

Fig. 5: Configuration M12 x 1 plug connector - 4 … 20 mA/HART sensor - Assignment B

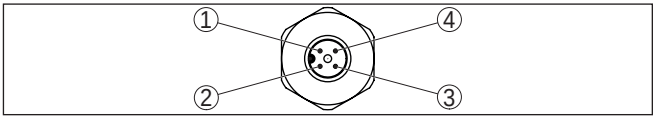

Fig. 6: Top view of the plug connector - 4 … 20 mA/HART - assignment B

Voltage supply/Signal output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Red	Terminal 1	Power supply/+
2	Black	Terminal 2	Power supply/-
3	free	free	free
4	free	free	free

Additional current output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Red	Terminal 7	Power supply/+
2	Black	Terminal 8	Power supply/-
3	free	free	free
4	free	free	free

Plug connector - Assignment C

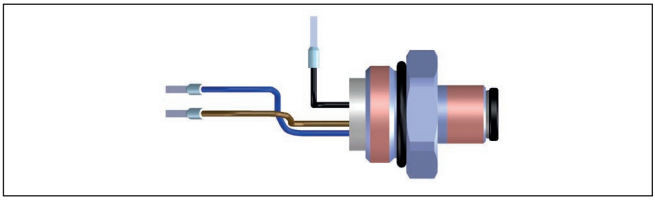

Fig. 7: Configuration M12 x 1 plug connector - 4 … 20 mA/HART sensor - Assignment C

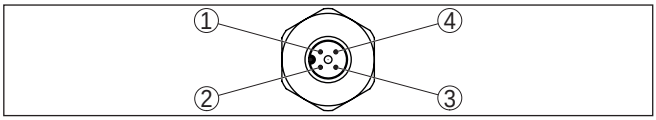

Fig. 8: Top view of the plug connector - 4 … 20 mA/HART - assignment C

Voltage supply/Signal output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Brown	Terminal 1	Power supply/+
2	free	free	free
3	Blue	Terminal 2	Power supply/-
4	Black	⏚	Shielding

Additional current output

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Brown	Terminal 1	Power supply/+
2	free	free	free
3	Blue	Terminal 2	Power supply/-
4	Black	⏚	Shielding

4.3 Profibus PA

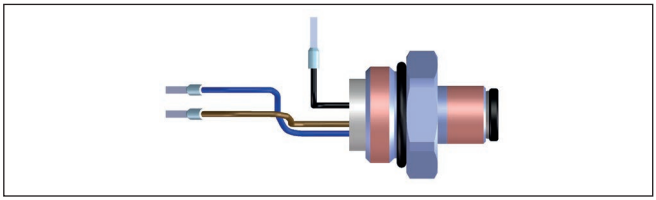

Fig. 9: Configuration M12 x 1 plug connector - Profibus PA

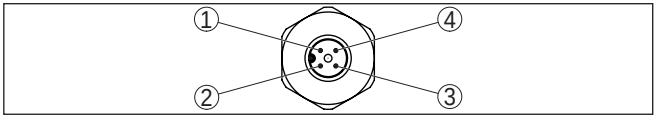

Fig. 10: View to the plug connector - Profibus PA

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Brown	Terminal 1	Bus signal/+
2	free	free	free
3	Blue	Terminal 2	Bus signal/-
4	Black	⏚	Shielding

4.4 Foundation Fieldbus

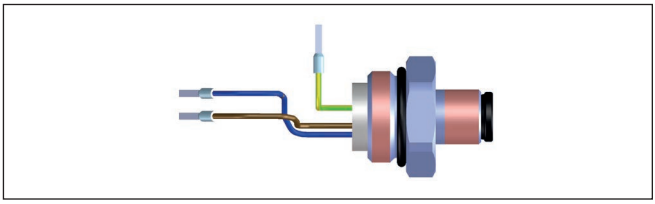

Fig. 11: Configuration M12 x 1 plug connector - Foundation Fieldbus

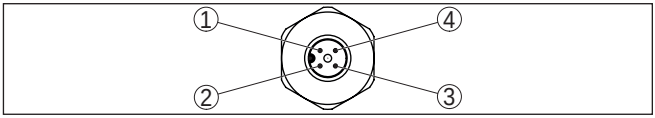

Fig. 12: View to the plug connector - Foundation Fieldbus

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Blue	Terminal 2	Bus signal/-
2	Brown	Terminal 1	Bus signal/+
3	free	free	free
4	Green/Yellow	⏚	Shielding

4.5 Modbus

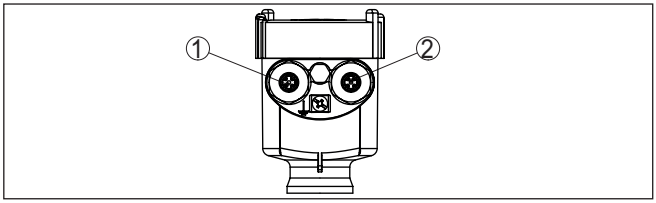

Fig. 13: Position plug connector in the single chamber housing

1 First M12 plug (terminals 1 to 4)
2 Second M12 plug (terminals 5 to 8)

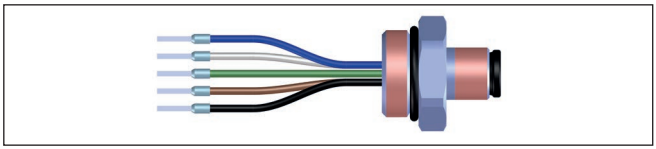

Fig. 14: Configuration M12 x 1 plug connector - Modbus

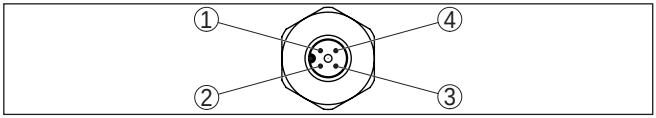

Fig. 15: View to the plug connector - Modbus

First M12 plug (terminals 1 to 4)

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Brown	Terminal 1	Power supply/+
2	White	Terminal 4	Modbus signal D1/-
3	Blue	Terminal 2	Power supply/-
4	Black	Terminal 3	Modbus signal D0/+
4	Green/Yellow	⏚	Shielding

Second M12 plug (terminals 5 to 8)

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
1	Brown	Terminal 5	Power supply/+
2	White	Terminal 8	Modbus signal D1/-
3	Blue	Terminal 6	Power supply/-

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module	Function/Polarity
4	Black	Terminal 7	Modbus signal D0/+
4	Green/Yellow		Shielding

5 Connection to the external display and adjustment unit

5.1 4 … 20 mA/HART

The illustrations show the structure and the assigned pins of the plug connector. The table shows the assignment of the individual contact pins to the terminals of the sensor electronics.

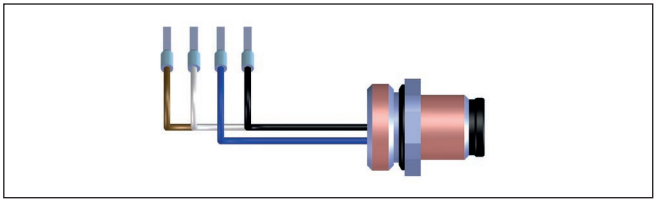

Fig. 16: Configuration M12 x 1 plug connector for the external display and adjustment unit - 4 … 20 mA/HART sensor, thread M16

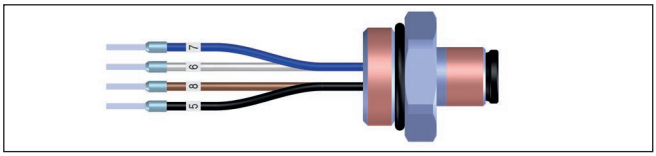

Fig. 17: Configuration M12 x 1 plug connector for the external display and adjustment unit - 4 … 20 mA/HART sensor, thread M20

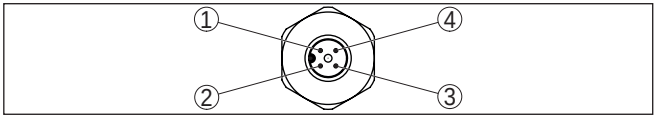

Fig. 18: View to the plug connector for VEGADIS 61/81 with sensor 4 … 20 mA/HART

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module
Pin 1	Brown	Terminal 5
Pin 2	White	Terminal 6
Pin 3	Blue	Terminal 7
Pin 4	Black	Terminal 8

5.2 Profibus PA, Foundation Fieldbus

The illustrations show the structure and the assigned pins of the plug connector. The table shows the assignment of the individual contact pins to the terminals of the sensor electronics.

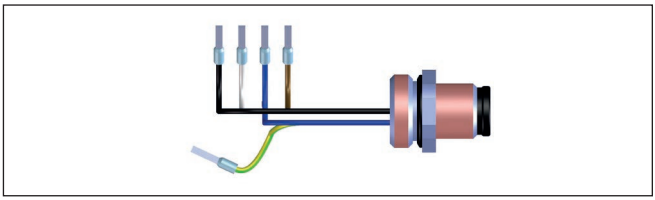

Fig. 19: Configuration M12 x 1 plug connector for the external display and adjustment unit - Profibus PA, Foundation Fieldbus sensor, thread M16

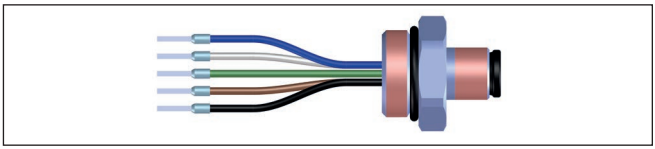

Fig. 20: Configuration M12 x 1 plug connector for the external display and adjustment unit - Profibus PA, Foundation Fieldbus sensor, thread M20

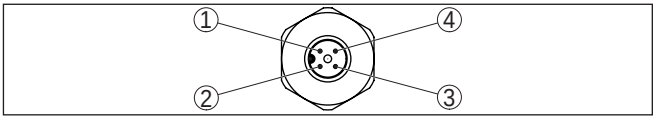

Fig. 21: View to the plug connector for VEGADIS 61/81 with sensor Profibus PA, Foundation Fieldbus

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module
1	Black	Terminal 5
2	White	Terminal 6
3	Blue	Terminal 7
4	Brown	Terminal 8
	Green/Yellow	⏚

6 Connection to a Secondary sensor

6.1 Wiring plan

4 … 20 mA/HART, Profibus PA, Foundation Fieldbus sensor

The illustrations show the structure and the assigned pins of the plug connector. The table shows the assignment of the individual contact pins to the terminals of the sensor electronics.

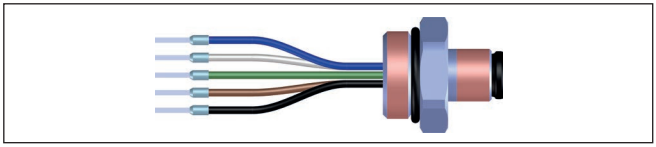

Fig. 22: Configuration M12 x 1 plug connector for Secondary sensor, thread M20

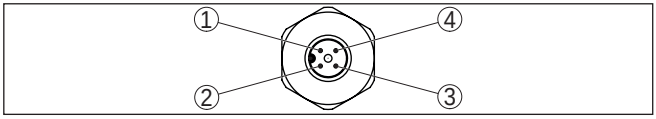

Fig. 23: View to the plug connector for Secondary sensor

Contact pin	Colour, connection cable in the sensor	Terminal, electronics module
1	Black	Terminal 5
2	White	Terminal 6
3	Blue	Terminal 7
4	Brown	Terminal 8
	Green/Yellow	⏚

7 Supplement

7.1 Technical data

Materials	
Contact support	PA
Contacts	CuZn
Contact surface	CuSnZn, Au
Housing	316L
O-ring	FKM

Temperature range	
Plug connector - separate	-40 … +85 °C (-40 … +185 °F)
Plug - mounted on the sensor	The lower temperature applies

Electrical data	
Rated current	4 A
Reference voltage	
– 4-pole	250 V
– 5-pole	125 V
Reference surge voltage	2.5 kV
Overvoltage category	II
Pollution degree	3

Protection rating	
Plug connector - separate [1]	IP67 according to EN 60529/IEC 529
Plug connector - mounted on the sensor [2]	the lower protection category applies

[1] in connected state
[2] in connected state

Printing date:

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.
Subject to change without prior notice

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