WIO200B
Water in oil sensor

INSTALLATION MANUAL Rev. 1.26

111686-903 Rev. 1.26 WIO200B Installation Manual

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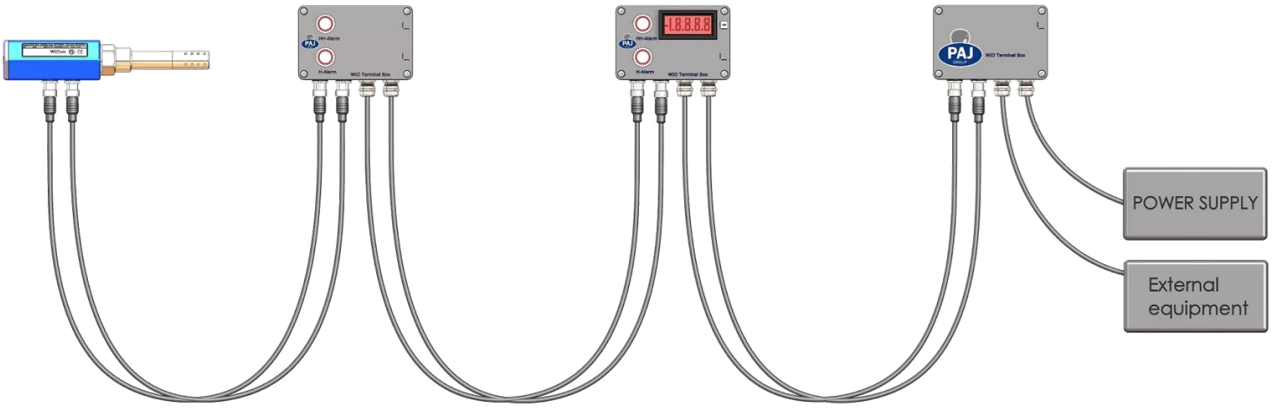
Introduction

Only use the manufacturer specified cable for connecting the WIO-sensor with the terminal box.

The connections of the external cables are based on the special IP66- cable glands for the power supply, relay contacts, and analog outputs, respectively.

Connecting the devices must be performed only by qualified and trained professionals! All external power supplies, including circuits connected to the relay contacts, must be disconnected and verified de-energised before installation or maintenance.

The WIO-Sensor can be extended with up to three terminal boxes.



The distance between the boxes and sensor shall not be longer than 50 meters.

Only the last connected box can be connected to the power supply and the analog output, as shown in the figure above.



WIO Standard ¾” (ISO 228-1 G¾”), Short

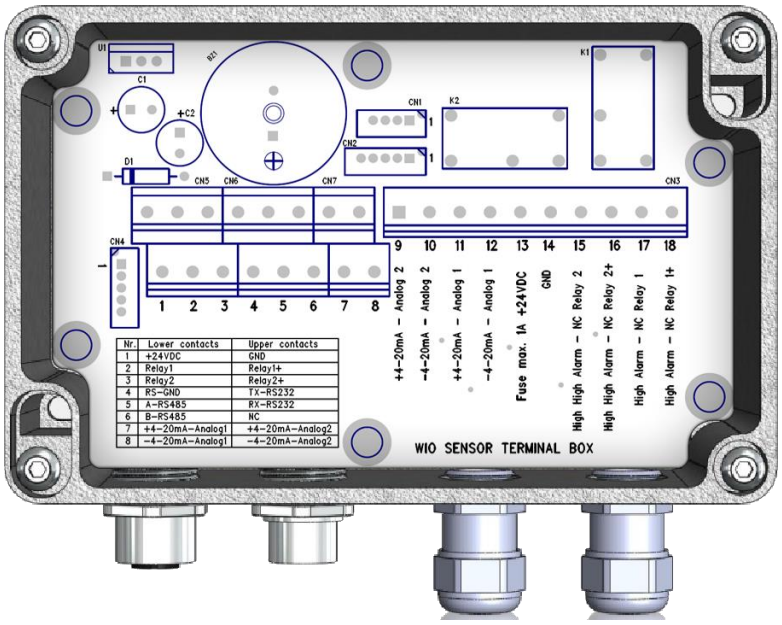


WIO Standard ½” (ISO 228-1 G½”), Short



WIO Ball Valve pipe, Long

Pin assignment of the terminal box connector for customer

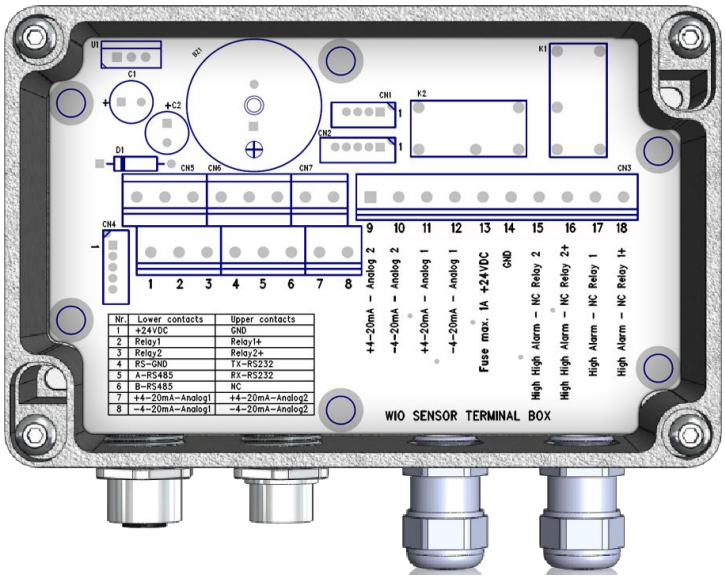


To sensor Power and Alarms

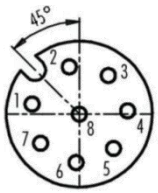
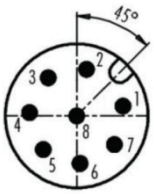
There is only one connector, CN3, for using of the terminal box contacts

Contact-No.	Description
9	+4 – 20 mA positive analog output signal for indication of temperature in oil. **The jumper should only be removed if the analog signal is used in following unit or external device. Otherwise this contact is connected to contact no. 10.** **Only for WIO and WIOI 300/400/500**
10	-4 – 20 mA return analog signal for indication of temperature in oil. **The jumper should only be removed if the analog signal is used in following unit or external device. Otherwise this contact is connected to contact no. 9.** **Only for WIO and WIOI 300/400/500**
11	+4 – 20 mA positive analog output signal for indication of Aw or PPM in oil. **The jumper should only be removed if the analog signal is used in following unit or external device. Otherwise this contact is connected to contact no. 12.**
12	-4 – 20 mA return analog signal for indication of Aw or PPM in oil. **The jumper should only be removed if the analog signal is used in following unit or external device. Otherwise this contact is connected to contact no. 11.**
13	Power supply, 24VDC ±10% and with max. residual voltage ripple 10%
14	Power supply ground terminal contact
15	Relay contact for HH alarm
16	Relay contact for HH alarm
17	Relay contact for H alarm
18	Relay contact for H alarm

Pin assignment of the terminal box connector for WIO-sensor



To sensor Power and Alarms

8 pole Connectors pin layout							
Female				Male			
Female illustration	Assignment			Male illustration	Assignment		
	1	White	Relay1		1	White	+4-20mA - Analog1
	2	Brown	Relay1+		2	Brown	-4-20mA - Analog1
	3	Green	Relay2		3	Green	+4-20mA – Analog2 **Only for WIO and WIOI 300/400/500**
	4	Yellow	Relay2+		4	Yellow	-4-20mA – Analog2 **Only for WIO and WIOI 300/400/500**
	5	Gray	+24 VDC		5	Gray	NC
	6	Pink	GND		6	Pink	NC
	7	Blue	NC		7	Blue	NC
	8	Red	NC		8	Red	NC

Pin assignment of the WIO200B sensor

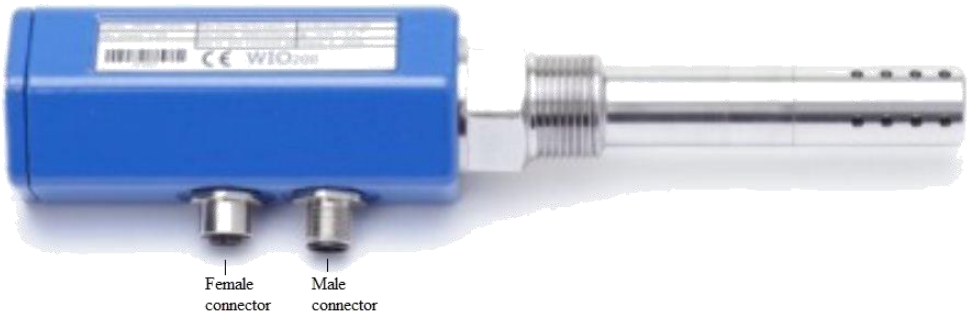
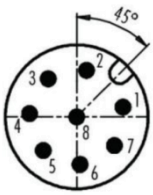
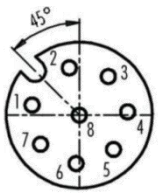
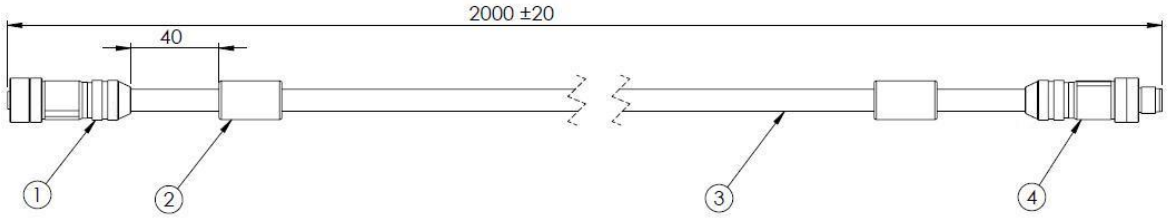
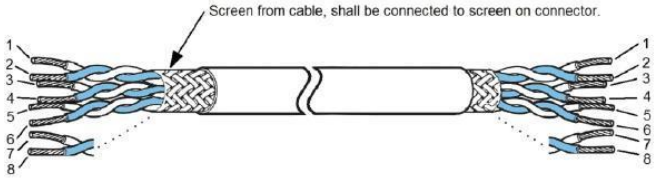


Figure: WIO-sensor connectors

8 pol. Connectors pin layout							
Male				Female			
Male illustration	Assignment			Female illustration	Assignment		
	1	White	Relay1		1	White	+4-20mA - Analog1
	2	Brown	Relay1+		2	Brown	-4-20mA - Analog1
	3	Green	Relay2		3	Green	+4-20mA – Analog2 **Only for WIO and WIOI 300/400/500**
	4	Yellow	Relay2+		4	Yellow	-4-20mA – Analog2 **Only for WIO and WIOI 300/400/500**
	5	Gray	+24 VDC		5	Gray	NC
	6	Pink	GND		6	Pink	NC
	7	Blue	NC		7	Blue	NC
	8	Red	NC		8	Red	NC

WIO-sensor cable specification





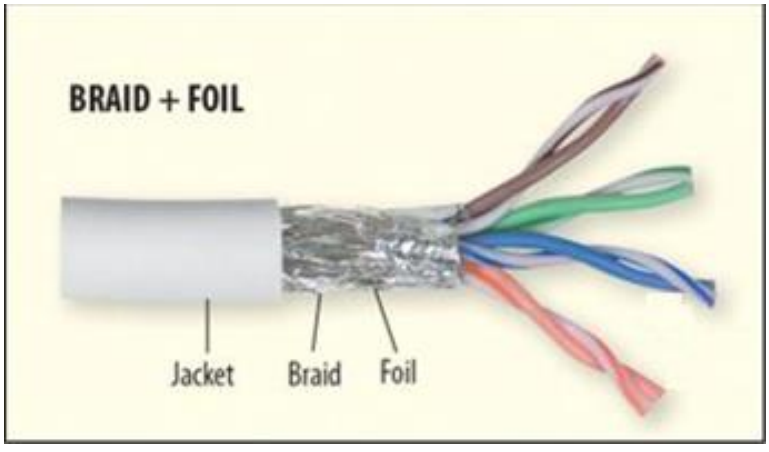
8 pol. Connectors pin layout						
Female			Male			
A	Assignment		B	Assignment		
	Socket	Wire		Plug	Wire	
	1	1		1	1	
	2	2		2	2	
	3	3		3	3	
	4	4		4	4	
	5	5		5	5	
	6	6		6	6	
	7	7		7	7	
	8	8		8	8	

Item No.	Description	Qty.
1	Female Plug	1
4	Ferrite Core	2
2	CL105 4x2x0.75-PO – 2m	1
3	Male Plug	1

Cable requirements for EMC

When connecting cables to the WIO/WIOI sensor terminal boxes, PAJ Group recommends to use:

- ø6-12 mm cables (IP66 compliance)
- Cables with braided and foil shielding, with at least 85% coverage (EMC compliance).
- Ferrite beads with inner diameter appropriate to the chosen cable, 28 mm length, and ø17.5mm outer diameter, King Electronics supplier.

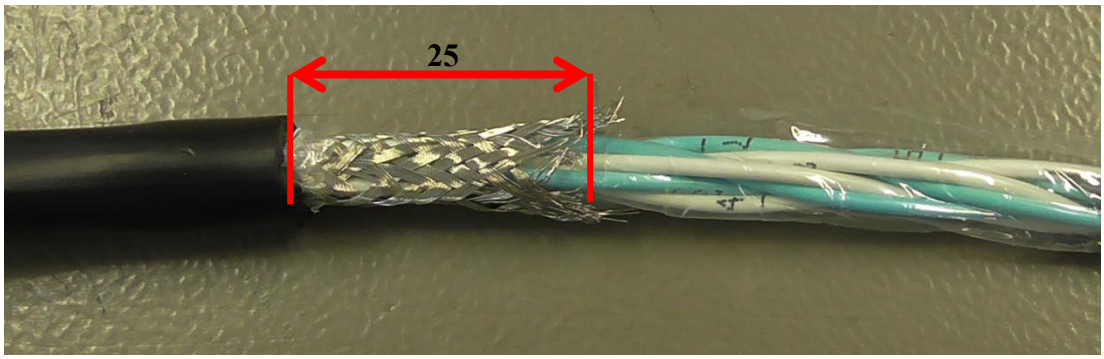


Cable installation

Using cable specifications any different that the recommended ones may lead the product to be non-IP66 or EMC compliant. Also the cable shielding should be connected to the M20 glands in a specific way, in order to maintain EMC compatibility.

The pictures serve only demonstrational purposes. Actual installation may vary according to each terminal box and /or customer cables.

Remove cable insulation as needed to connect to the terminal box. Then cut cable shielding to 25mm.

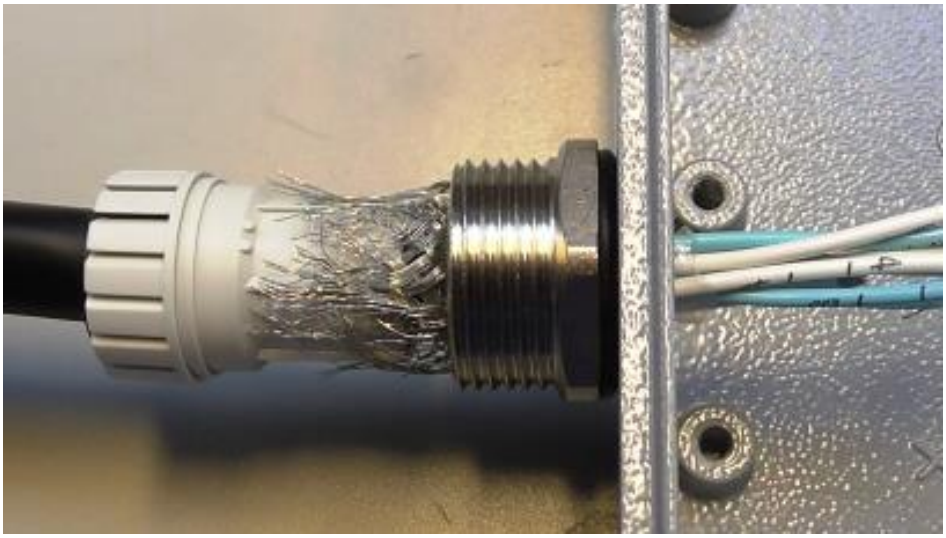


Remove the metal pressing nut from the M20 Gland and plastic pinch ring and install them on the cable. It is recommended to install a ferrite bead first, with the specifications mentioned earlier.

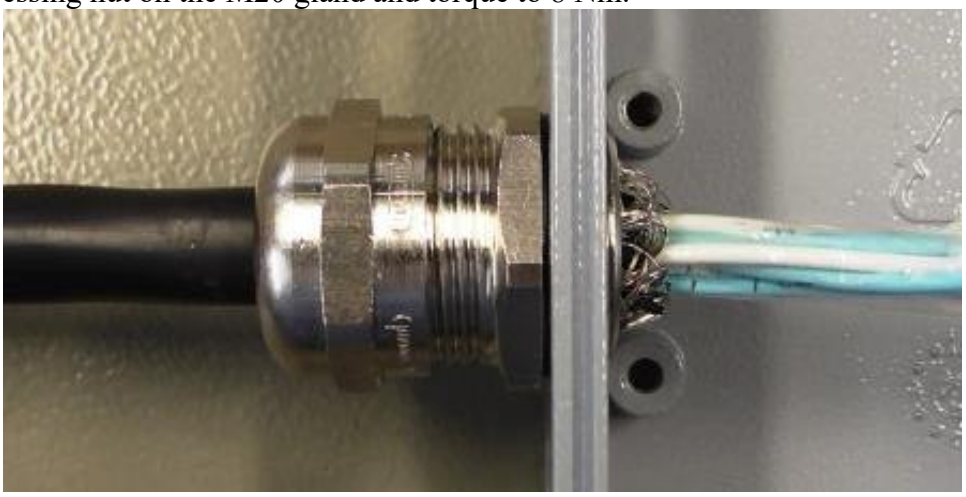


Roll the cable shielding back on the plastic pinch ring installed previously, then install the cable in the M20 gland. Ensure that the cable shield makes contact with the M20 gland evenly, in the 360° of the periphery.





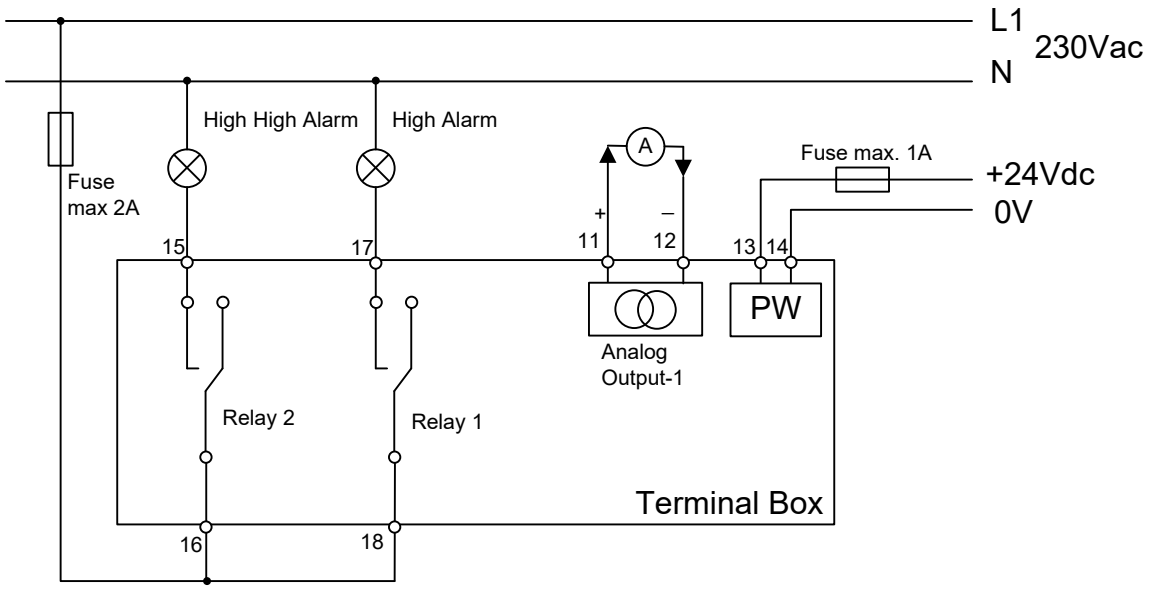
Install the pressing nut on the M20 gland and torque to 8 Nm.



These are the generic steps to be taken in order to ensure EMC compatibility of the WIO Sensor. They should be followed wherever cables go from the device itself to any of the users other devices.

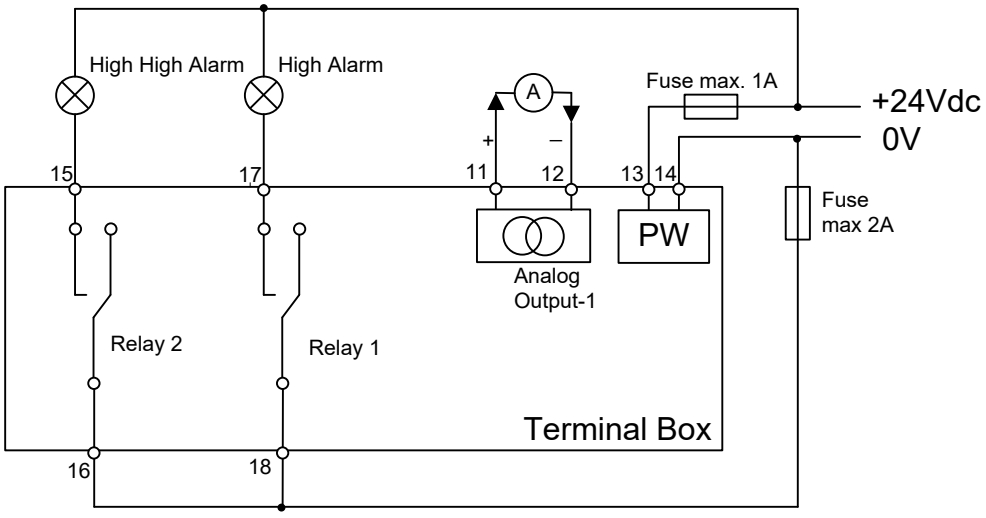
Terminal box wiring example 1 (230 Vac)

This is a 230Vac setup, there is 230Vac on L1 & N. There is 24Vdc at Terminal Box 13 & 14. There is no alarm. The lamps are off, everything is OK.



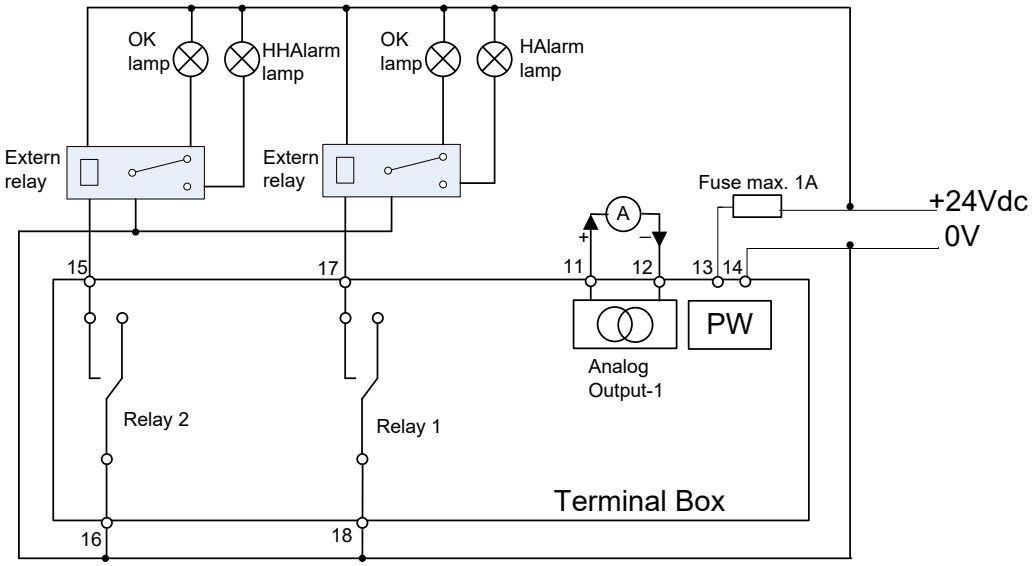
Terminal box wiring example 2 (24Vdc)

This is a 24Vdc setup, there is no alarm. The lamps are off, everything is OK.

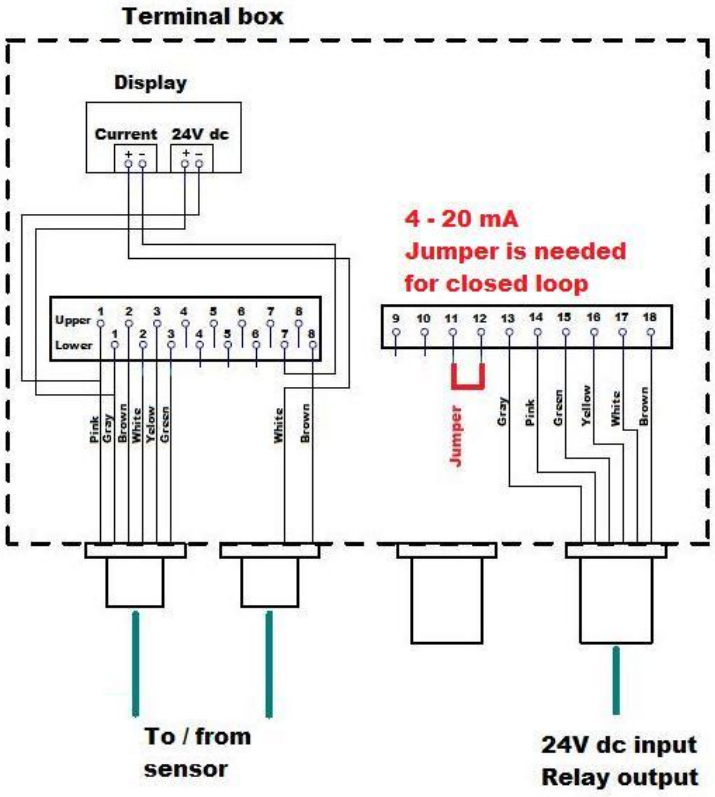


Terminal box wiring example 3 (24Vdc)

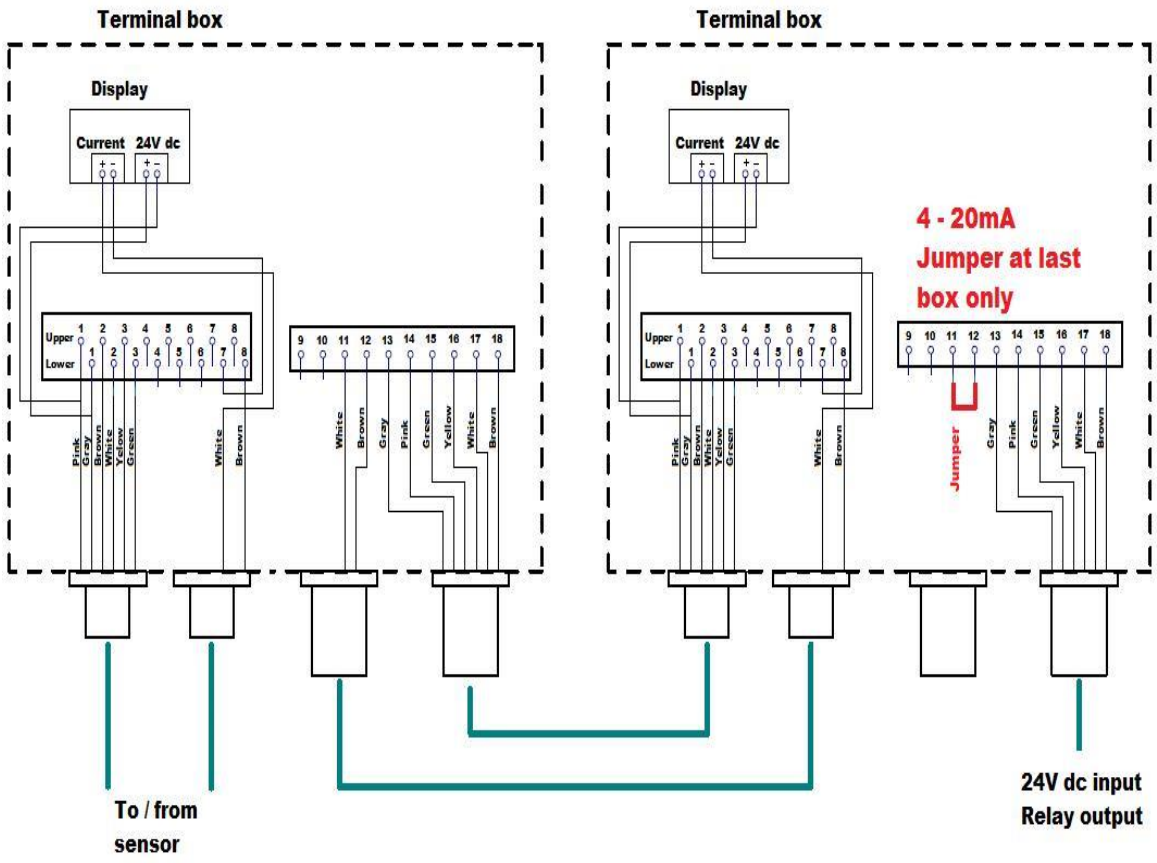
This is a 24Vdc setup, there is no alarm. The OK lamps are lit and everything is OK.



Installation of 1 Terminal Box with 1 display

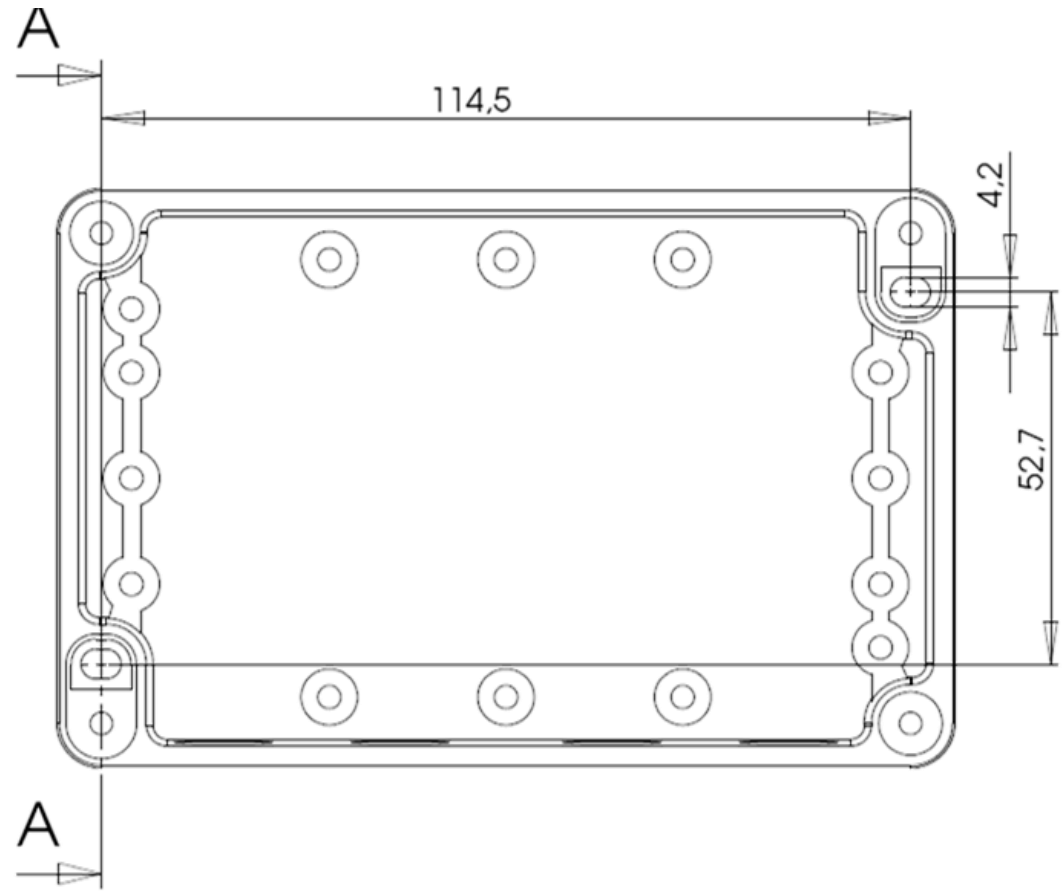


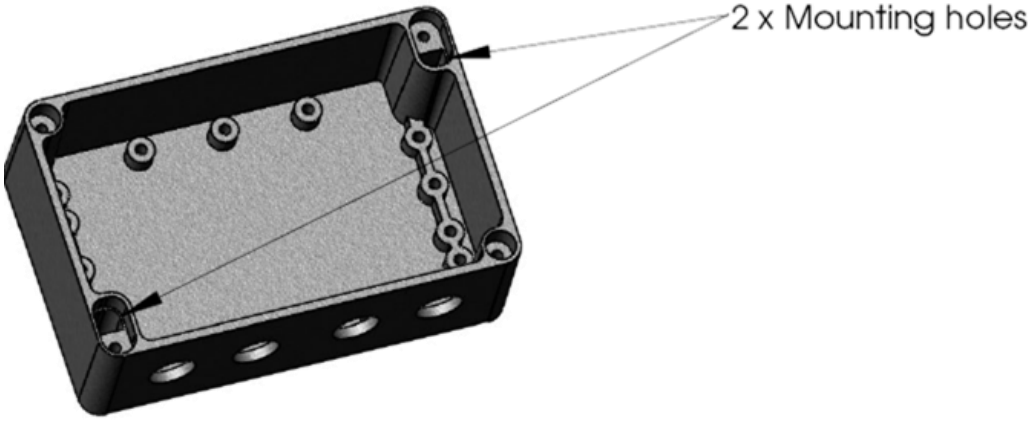
(Installation of 2 Terminal Boxes with 2 displays)



More examples are shown in the user manual.

Drilling distances for the terminal box

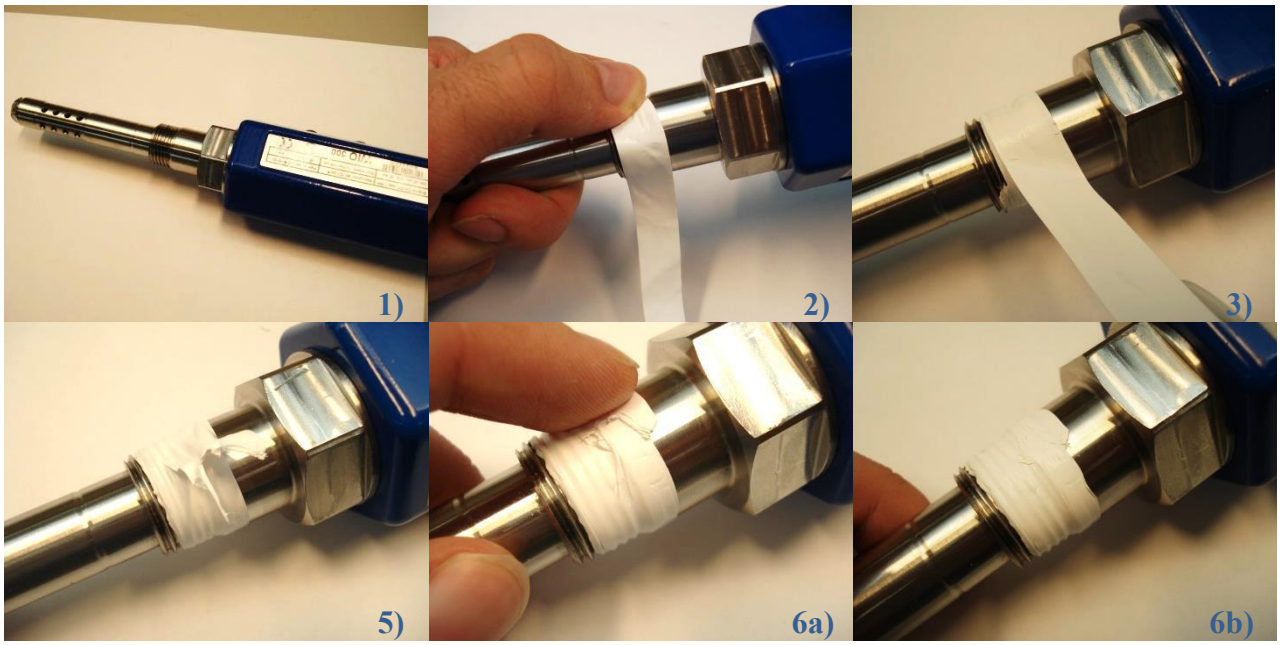




Installation of WIO Sensor into pipe using PTFE seal tape

Our recommended seal tape is Unipak's TOPSEAL product, which is attached to the sensor shipment if requested.

Follow the steps as seen below:



1) Clean the sensor thread by removing any dirt or metal scraps.
2) Place the end of the tape on the second thread from the end of pipe, and hold it there with a finger.
3) Begin to wrap the tape tightly around sensor pipe, parallel to the thread. The direction of application has to be the opposite to the direction the pipe will be turned.
4) Wraps has to be done in a fashion, so the tape gets thicker on the opposite end, creating a better seal when turned into the pipe. 4-6 turns are recommended.
5) Break the tape from the roll by gripping it between thumb and forefinger and pulling sharply, it breaks easily.
6) Smooth the loose end over the threads.

WIO Sensor is now ready to be inserted into pipe.

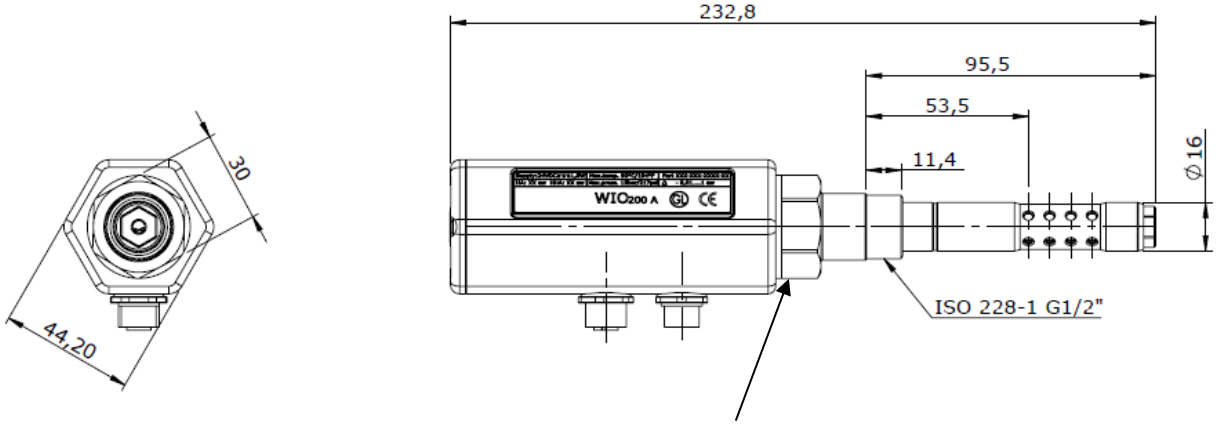
Data of seal tape:

TOPSEAL (12 m x 12 mm x 0.10 mm). HD. (density: 1.3 g/ cm3).
Temperature resistant from -200°C to +260°C.

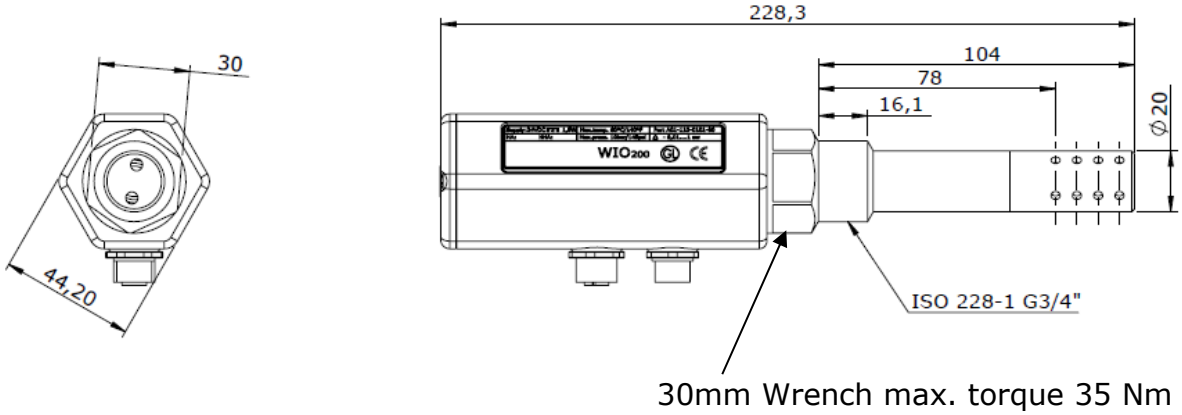
		Item no.	VVS-no.	RSK-no.	NRF-no.	LVI-no.
Topseal	(10/250 stk./krt.)	1000700	271406112	4054040	9507760	3265367

WIO Sensor dimensions in mm

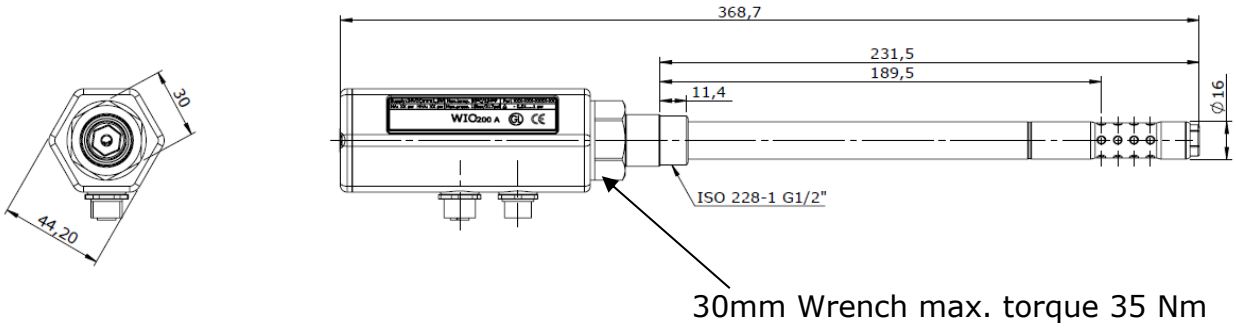
WIO Standard ½” thread Sensor, Short dimensions in mm:



WIO Standard ¾” thread Sensor, Short dimensions in mm:



WIO Ball Valve pipe ½” thread Sensor, Long dimensions in mm:



Terminal box dimensions in mm

