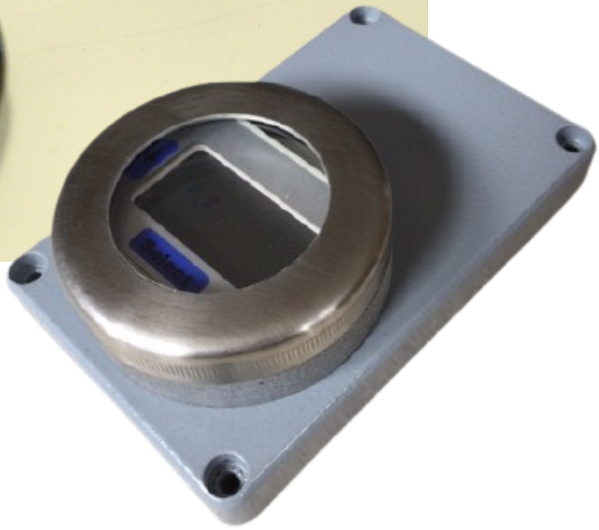
BOX100 Connection box for 4-20 mA transmitters and Modbus transmitters



Connection box

This specially designed connection box, BOX100, can be delivered as an accessory. The box is equipped with cable glands and terminals for connection of the transmitter cable and the signal/supply cable.
Connection of Modbus communication can easily be done both from the transmitter and to a control system.
The box can also be equipped with a local display.
BOX100 can also be equipped with an efficient lightning protection.

BOX100 can be used for connection of any type of 4-20 mA transmitters but is specially designed for use with submersible level transmitters like LT600, LT60, LT300, LT100.
If the transmitter can communicate via HART a modem or handheld terminal easily can be connected over an inbuilt 250 ohm resistor.
HART and Modbus (RS485) modem together with suitable PC programs can be delivered as accessories.

The box is equipped with an appropriate connection for the transmitter cables atmospheric vent tube if needed (when used with a submersible level transmitter). This connection does not affect the tightness of the box. The vent connection is designed so that high pressure water from for example cleaners not can enter the vent or the box.
Protection class IP67.

PONDUS INSTRUMENTS

Display

BOX100 can be equipped with a local display, D10RSS. The display can show the signal in optional engineering units, for example mWc or mH2O and a bargraph also with optional units and limits.
Unit and limits can be set by customer on the display.
If the connected transmitter has Modbus communication the display can also be used for configuring the transmitter.
Configuration of the display and a Modbus connected transmitter can be done from the outside without opening the connection box.
The display is connected in series with the 4-20 mA loop.
For display handling see separate Operating manual delivered with the display.

Autozero

If the connected transmitter are connected to Modbus A and B (only Modbus connected transmitters, like PT600RSH, PT06RS, LT600, LT60, LT300 etc.) and needs to be set to zero due to orientation dependence or other reason this can easily be done in different ways.
Press the Autozero switch SW3 for ten seconds, done (see page 3).
Or use the display and choose function Autozero.
Autozero can also be done from distance via the Modbus cables A and B (if connected to P5, see page 3).
Just shorten the cables for ten seconds, done.
NOTE that the pressure on the transmitter diaphragm must represent zero when performing Autozero.

Lightning protection

As an option BOX100 can be equipped with lightning protection. The box will then have the code BOX100L where L indicates ”Lightning protected”.
The lightning protection is built in at the factory. No external changes or external components are needed. This option must be made to order.
The protection is designed to withstand a lightning stroke close to the transmitter cable and Supply/Signal cables but can not withstand a direct stroke. The protection is designed to meet the demands for Class 1 testing according to IEC61643-1 5 kA (10/350 uS).
The lightning protection is built up as a three step protection.
The pulse that enters the box is catched by two varistors, three transient protection diodes and a double surge arrester.
The box must be appropriately grounded for the protection to fulfill its purpose.

Dimensions

Width	81 mm
Length	126 mm
Height	57 mm
Cable glands:	
Two for round cable	5-12 mm diameter
Screw terminals:	Cable area max 2,5 mm2

Order codes and accessories

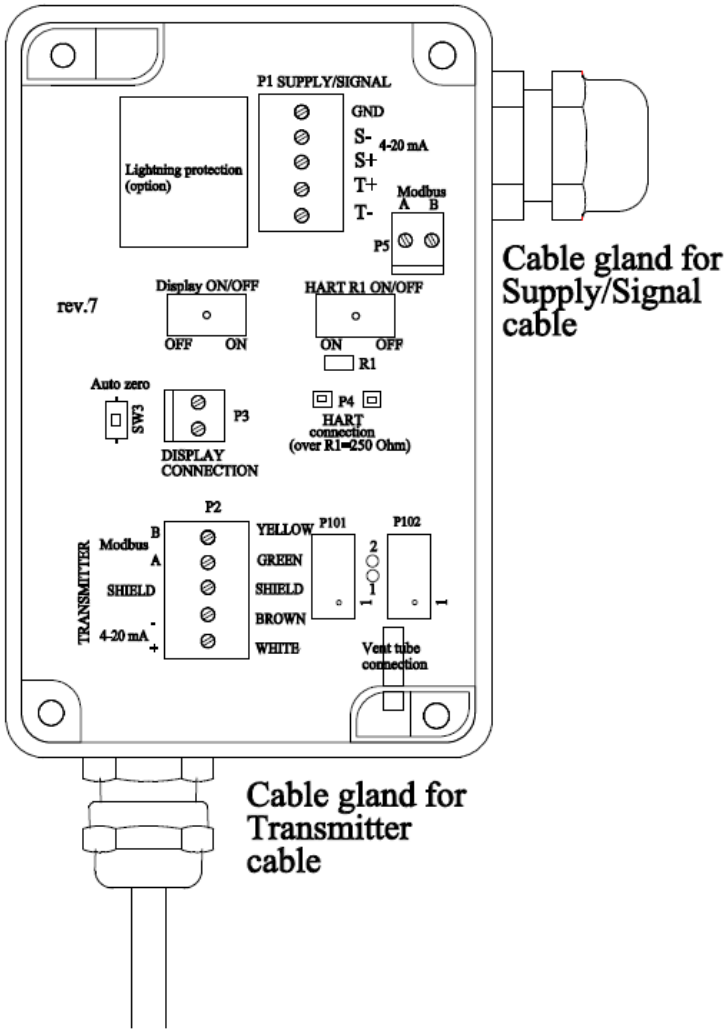
Description:	Code:	Description:	Code:
Connection box	BOX100	Adapter Pg11 to M20x1,5	P144401
Connection box with lightning protection	BOX100L	M12 contact mounted on BOX100	P144501
Connection box with display D10RSS	BOX100D	HART USB modem with PC program PI100	PI100H
Connection box with display and lightning protection	BOX100DL	Modbus (RS485) USB modem with PC program MEP7 PC Tool	PI200M

Connection and use:

The transmitter cable is connected to the terminal marked "Transmitter", P2.

White	4-20 mA Signal/supply + (plus)
Brown	4-20 mA Signal/supply - (minus)
Shield	Ground connection
Green	Modbus A / Autozero 1
Yellow	Modbus B / Autozero 2

If a submersible level transmitter with Modbus communication like LT600, LT60 or LT300 is connected the transmitter cable consists of 4 wires, shield and a vent tube. The wires are then color coded according to above.



Modbus connection:
From transmitter, see above.
To a control system:
Terminal P5 Modbus A and Modbus B

Terminal P1 Supply/Signal:

Ground	Ground connection
S-	4-20 mA Signal/supply - (minus)
S+	4-20 mA Signal/supply + (plus)
T+	+ Test connection
T-	- Test connection

To the terminal marked T+ and T- a low resistance mA meter can be connected for test purposes. The mA meter will then show the output signal. This will not affect the S+/S- mA output signal.

Display ON/OFF:
If a display is connected to the box, either via P3 Display connection or via P101-P102 this switch must be set to ON. If a display is not connected the switch, if set to ON, will break the 4-20 mA loop.

HART R1 ON/OFF:
If a HART modem or a hand held terminal is connected to P4 this switch must be set to ON. This connects the 250 ohm resistor in series with the 4-20 mA loop and makes HART communication possible (NOTE a HART compatible transmitter must be used, like PT600RSH, LT600, LT100).

Vent tube connection:
Atmospheric pressure connection.
If a submersible level transmitter (like LT600, LT60, LT300, LT100 etc.) is connected there is a Fluid Filter mounted on the cables vent tube. This must be connected between the Vent tube and the Vent tube connection in the box.