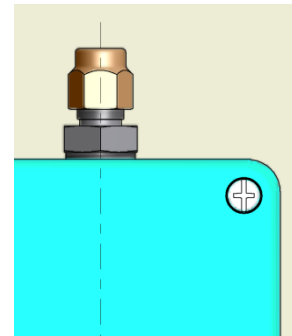
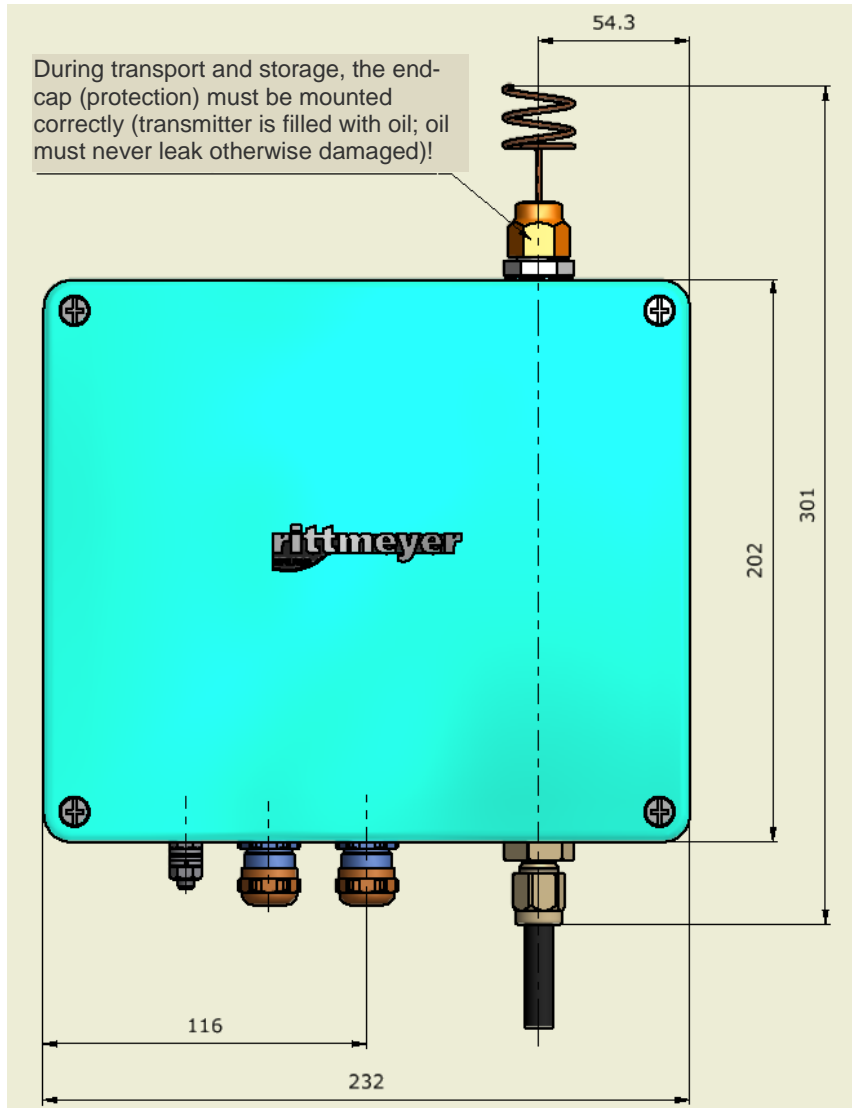


## Dimensional drawing

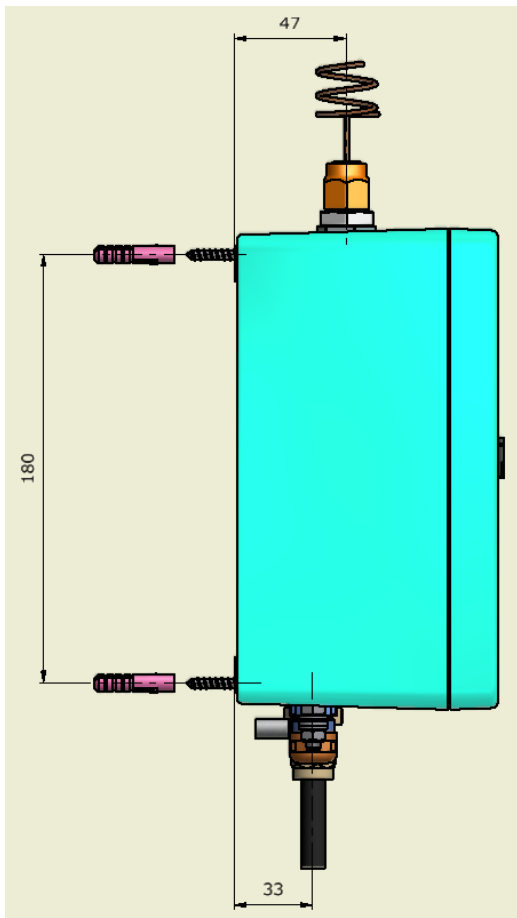
All dimensions in mm.

Front hydrostatic:

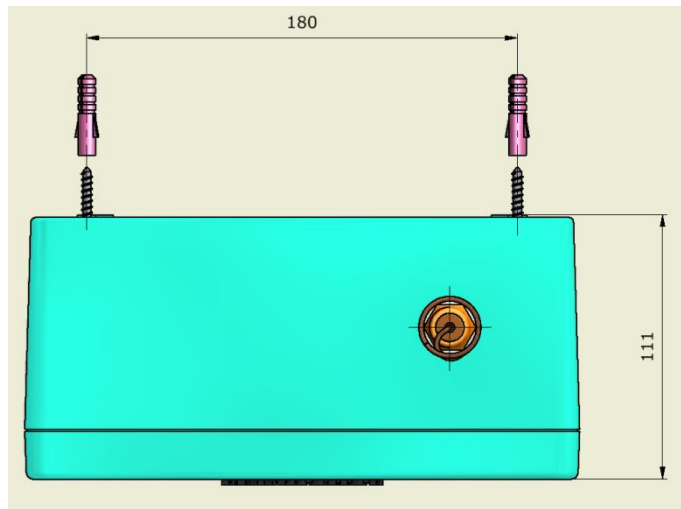
Front pneumatic:



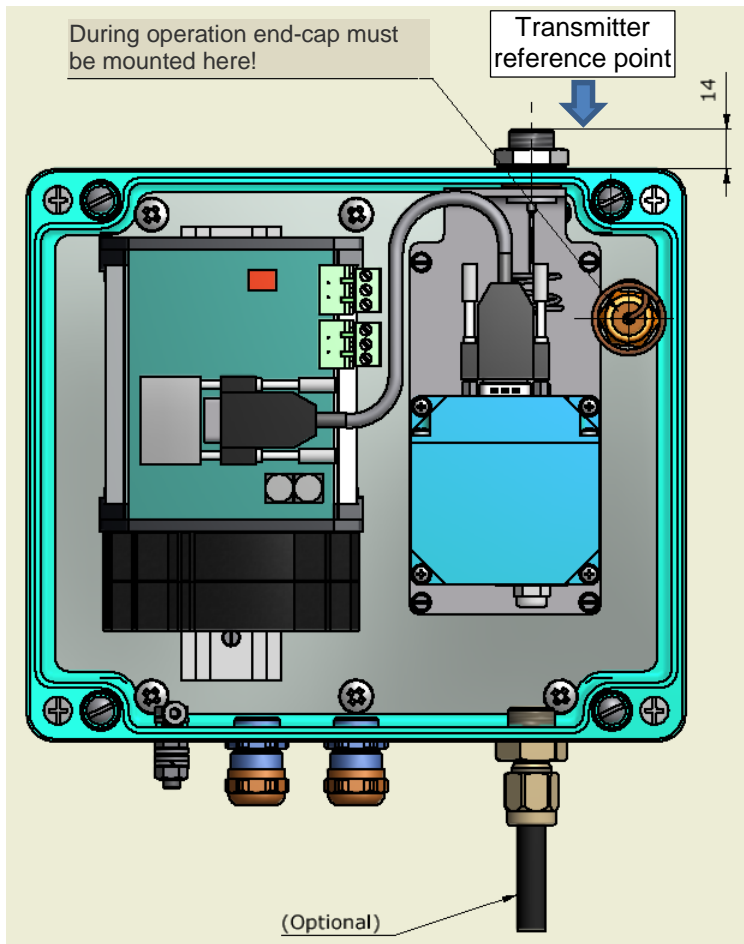
Lateral view



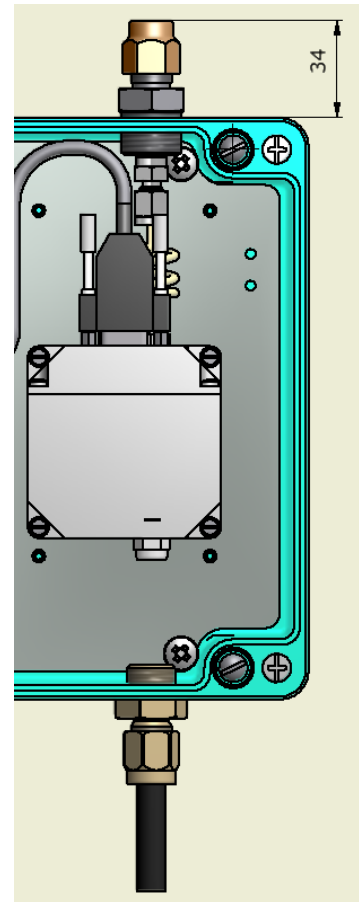
Top view:



Interior view hydrostatic:



pneumatic:



## Application

The RIPRESS premium Pressure Transmitter Digital (RIPDI), together with a Rittmeyer Instrumentation Controller, builds the high precision pressure measurement system RIPRESS premium. Accordingly, pressure and level measurement with the highest precision can be made.

Two different types of pressure and level measurement are supported:

- High precision pressure to level conversion **pneumatic**:
  - Pressure measurement with “bubbler installation”
  - Needs 1 RIPDIP.xxx for each measurement section
  
- High precision pressure to level conversion **hydrostatic**:
  - Direct pressure measurement of the hydrostatic pressure on the measurement point (pressure sensor is oil-filled and in direct contact with water head)
  - Needs 1 or 2 RIPDIH.xxx for each measurement section (2 sensors are needed for 200m and 275m measurement range due to compensation of the ambient pressure)

## Brief description

The RIPRESS premium Pressure Transmitter Digital (RIPDI) contains a highly accurate and very long-term stable (quartz crystal oscillator based) pressure transducer and an according Modbus RTU protocol converter.

A Rittmeyer Instrumentation Controller (RICTRL) can be operated with up to 8 RIPDI. Power supply and communication interfaces are directly connected to the RICTRL (24 VDC OUT and COM3 RS485 / Modbus RTU). The RICTRL is parameterized via a user-friendly Web interface; only operating mode and address settings must be carried out on the RIPDI.

## Design versions

### Preferred types

Measuring range	Measuring principle	Type	Article-No.
65 mWC	<b>Hydrostatic</b> , relative	RIPDIH.065	0067669.002
135 mWC	<b>Hydrostatic</b> , relative	RIPDIH.135	0067669.004
20 mWC	<b>Pneumatic</b> , relative	RIPDIP.020	0067670.002
65 mWC	<b>Pneumatic</b> , relative	RIPDIP.065	0067670.003

Table 1: Design versions – preferred types

## Additional types

Measuring range	Measuring principle	Type	Article-No.
20 mWC	<b>Hydrostatic</b> , relative	RIPDIH.020	0067669.001
100 mWC	<b>Hydrostatic</b> , relative	RIPDIH.100	0067669.003
200 mWC	<b>Hydrostatic</b> , absolute <b>Note: needs add. 1.0 bar air pressure sensor!</b>	RIPDIH.200	0067669.005
275 mWC	<b>Hydrostatic</b> , absolute <b>Note: needs add. 1.0 bar air pressure sensor!</b>	RIPDIH.275	0067669.006
1.0 bar (air pressure)	<b>Pneumatic</b> , absolute	RIPDIP.010	0067670.001
100 mWC	<b>Pneumatic</b> , relative	RIPDIP.100	0067670.004
135 mWC	<b>Pneumatic</b> , relative	RIPDIP.135	0067670.005

Table 2: Design versions – additional types

## Important application notes

- The hydrostatic pressure transmitter must be **mounted on a vertical wall** such that the pressure port is at the top and the cable connections at the bottom.
- The hydrostatic pressure transmitters RIPDIH.xxx measure the pressure of the water column directly and are therefore filled with a special type of oil (Dow Corning FS-1265). **This oil must never leak out of the transmitter, otherwise the transmitter may be damaged irreparably!**
- With the two hydrostatic measuring ranges of **200 mWC** and **275 mWC**, an absolute 1.0 bar air pressure sensor (RIPDIP.010, 0067670.001) must be used in addition for the measurement and compensations of the ambient air pressure!
- In order to avoid measuring errors, the additional 1.0 bar air pressure sensor (RIPDIP.010, 0067670.001) must be installed on the same altitude as the absolute pressure sensor!

## Specifications

**Attention:** a pressure transmitter consists of very delicate parts, handle with care and avoid excessive shock and vibration, e.g. during transport and installation!  
Excessive mechanical shock may cause irreparable damage!  
Do not drop a pressure transmitter or allow tools to fall on the unit or its pressure port!

## Setup

- Housing: Aluminum housing, varnished with blue green (NCS-S-2555 B60G) powder coating, thickness app. 60 µm / 2.36 mils
- Protection class: IP66 (guaranteed with supplied cable glands and accessory cables)
- Dimensions: Height: 200 mm / 7.87 “, width: 230 mm / 9.06 “, depth: 110 mm / 4.33 “
- Weight: Approx. 4.1 kg / 9.04 lb. (without cables and packaging)

## Process connection

- Hydrostatic (top side): M16 x 1
- Pneumatic (top side): Serto screw connection for 10 mm pipe/tube
- Compensation (bottom side), Serto screw connection for 10 mm pipe/tube  
both versions: (usually unconnected / open)

## Power supply

- Supply voltage range: The device shall be supplied with a power supply with double or reinforced insulation and 24 VDC - 20% / +25%, SELV
- Polarity: protected against inverse polarity
- Torque of connector screws: 0.56 – 0.79 Nm / 5 – 7 lbf in
- Power consumption: < 3 W, typically 1.5 W (measuring mode)
- Galvanic isolation: 500 V

## Overvoltage protection

- Power supply: With built-in Phoenix Contact module type PLT-SEC-T3-24-FM (replaces former PT 2-PE/S- 24AC-SET)
- RS485: With built-in Phoenix Contact module type PT 3-HF-12DC-SET

## Ground terminal

- The boxes are to be connected with minimum 4 mm<sup>2</sup> strand cable to earth, thereby pay attention to a low impedance wiring as short as possible

## Measurement range and accuracy

- Max. overpressure: 120% FS<sup>1</sup>
- Min. pressure hydrostatic version: environmental atmospheric pressure (~1 bar / 14.7 psi)<sup>2</sup>
- Min. pressure pneumatic version: environmental atmospheric pressure (~1 bar / 14.7 psi)
- Accuracy: typically better than 0.01% FS
- Resolution: typically 1 ppm
- Repeatability ≤ ±0.005% FS
- Hysteresis ≤ ±0.005% FS
- Acceleration sensitivity ≤ ±0.0038% FS/g
- Acceleration sensitivity, FS ≤ ±0.008% FS/g worst axis<sup>3</sup>
- Supply voltage sensitivity < 0.001% FS/V

## Protocol converter displays

- STATUS LED  
Green: system / measurement ok  
Red: system / measurement failure  
Alternatively red/green blinking: simulation mode

<sup>1</sup> FS = Full Scale of used pressure transmitter

<sup>2</sup> Otherwise oil may leak out of the transmitter and the transmitter may get damaged irreparably!

<sup>3</sup> Under full scale pneumatic pressure load

## Protocol converter controls


### Rotary switches for MODE and ID

With the rotary switch MODE, the Modbus communication parameters can be set. In normal operation the MODE switch must be set to position 0. The rotary switch ID then determines the Modbus slave address.

Default factory setup:

- Rotary switch MODE = 0
- Rotary switch ID= 0

The parameters set with the rotary switches are applied when the power is switched on.

	<b>Notes:</b> <ul style="list-style-type: none"> <li>- If the parameter has been accepted, the status LED blinks green.</li> <li>- If the parameter is invalid, the status LED will blink red.</li> </ul>
---	---

Rotary switch MODE	Rotary switch ID
Position 0 (normal operation, Modbus-address)	Position 0: Modbus-address 230 (Default) Position 1 ... F: Modbus-address 1 ... 15
Position 1 (simulation mode)	Like position 0, but the measuring value linearly changes from 0.001 bar/s to the maximum measuring range of the selected transducer, then linearly back to 0 bar. No sensor needs to be connected.  Note: Status-LED blinks alternatively red/green.
Position 2 (parameter for simulation mode)	Position 0: Transducer relative 2.1 bar (30 psi) Position 1: Transducer relative 6.9 bar (100 psi) Position 2: Transducer relative 10.3 bar (150 psi) Position 3: Transducer relative 13.8 bar (200 psi) Position 4: Transducer absolute 1.0 bar (15 psi) <sup>4</sup> Position 5: Transducer absolute 2.1 bar (30 psi) Position 6: Transducer absolute 20.7 bar (300 psi) Position 7: Transducer absolute 27.6 bar (400 psi)
Position A (parameter default factory setup)	Position 1: Reset to default factory setup
Position B (parameter Baud rate)	Position 0: 1200 Position 1: 2400 Position 2: 4800 Position 3: 9600 (default) Position 4: 19200 Position 5: 38400 Position 6: 57600
Position C (parameter parity)	Position 0: none (default) Position 1: even Position 2: odd

<sup>4</sup> For ambient air pressure (constant value of 0.96612 bar)

## DIP switches for termination

- Activation / deactivation of the bus termination for COM1 (RS485).



**Note:** Always set both switches together!

## Protocol converter data interfaces

- RS485                      RS485 interface (Modbus RTU slave)  
Galvanic isolation 500 V  
**Max. allowed cable length** (tested with Rittmeyer devices, suitable shielded twisted pair cables Cat5e 4x2xAWG24 and overvoltage protection devices for RS-485 signals): **1200 m**

## Environmental conditions

- Operating temperature range<sup>5</sup>:        -20 ... +60 °C / -4 ... 140 °F
- Storage temperature range:            -40 ... +85 °C / -40 ... 185 °F
- Relative humidity:                        0...100% @ 25 °C
- Installation site:                          Protected from direct sunlight, vibrations and mechanical shock,  
max. altitude 5000 m

## Quality tests

The device meets the requirements for CE certification according to:

- |                     |   |
|---------------------|---|
| • IEC/EN 61000-6-2  | Generic standards – Immunity for industrial environments  |
| • IEC/EN 61000-6-3  | Generic standards – Emission standard for residential, commercial and light-industrial environments |
| • EN 60068-2-14     | Climatic environmental conditions, change of temperature  |
| • EN 60068-2-30     | Climatic environmental conditions, damp heat, cyclic  |
| • IEC/EN 61010-1    | Safety regulations for electrical measuring instruments, control and laboratory equipment           |
| • IEC/EN 61010-2-30 |   |
| • EN 60529 + A1     | Protection class IP66   |
| • RoHS              | Restriction of the use of certain hazardous substances in electrical and electronic equipment       |
| • WEEE              | Directive on electronic waste   |

See also Declaration of Conformity 21.281.00676xx.00x.

## Operation

The basic configuration can be set by means of the rotary switches Mode and ID.

<sup>5</sup> On hydrostatic measurements: make sure the water does not freeze in the sensor lines!



## Parameter configuration

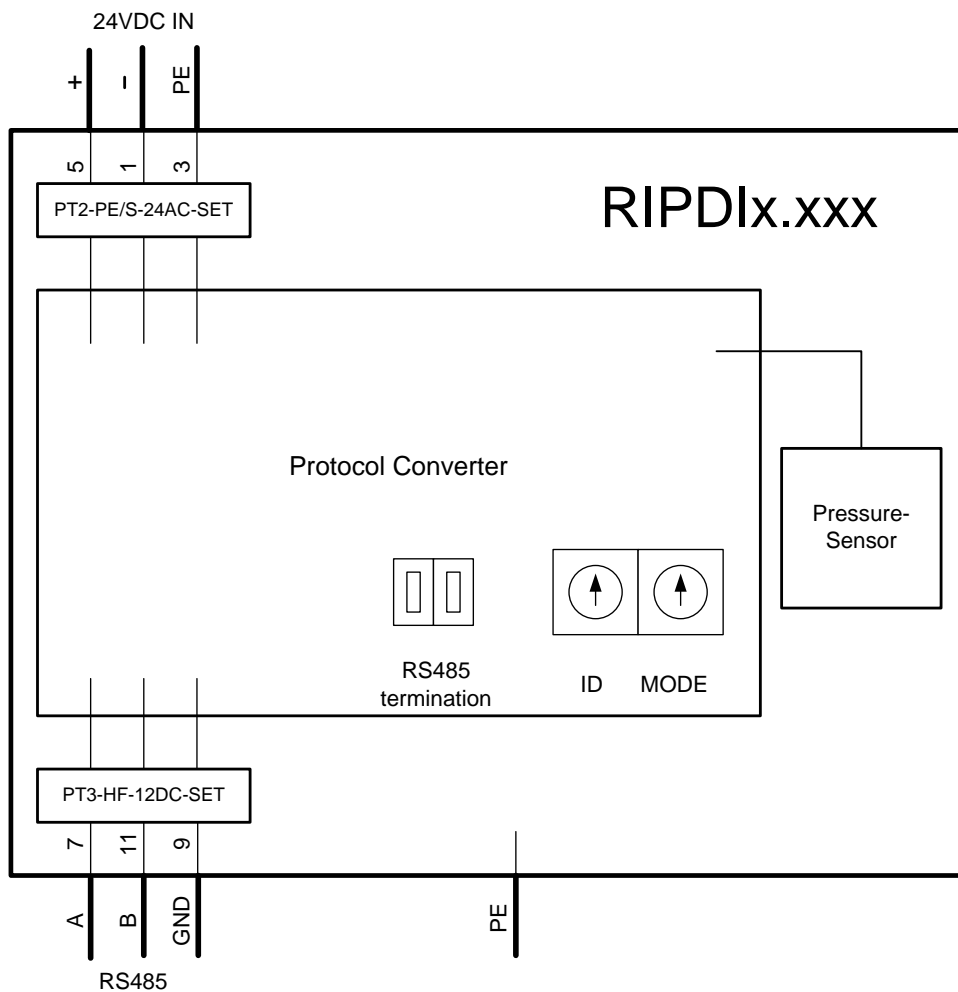
The user-friendly standard parameterization takes place in a few steps via remote access/Web interface on the connected RICTRL (application RIPRESS premium).

## Electrical connections

Power supply and signal cables are directly connected to the built-in overvoltage protection devices. Power and signals must be connected in a protected environment; no moisture or humidity may get into the housing.

A ground screw terminal M6 is placed near the device connection. The low impedance earth connection must be done with a strand wire of at least 4 mm<sup>2</sup> / max. 6 AWG.

Depending on the environment and cable length, additional overvoltage protection devices must be provided externally i.e. near the instrumentation controller.



### Inside view and notes (label)

The label stuck to the case cover (for both versions hydrostatic and pneumatic analogously) shows an overview of all interfaces and the most important settings and user notes:

**rittmeyer**  
BRUGG

**Important notes:**

- Modbus RTU default address = 230
- Sensing port:
  - RIPDIH.xxx (hydrostatic): M16x1 hydraulic connection
  - RIPDIP.xxx (pneumatic): Serto connection for 10 mm pipe
- Parameters set with the rotary switches are applied when the power is switched on!
- IP66 protection grade is only guaranteed with certified cables
- Keep sealing/O-ring clean!
- Pressure sensor is filled with oil: do not let leak oil out of sensor or remove end cap until properly mounted; otherwise sensor may get damaged!
- Must be transported in original, shock-absorbing packaging
- Refer to manual / datasheet for additional information!

**Switch Termination:**  
- (de)activate both switches for correct RS485 line termination

**LED STATUS:**  
- Green: system / measurement ok  
- Red: system / measurement failure  
- Red/green blinking: simulation mode

Rotary switch MODE	Rotary switch ID
Position 0 (normal operation, Modbus-address)	Position 0: Modbus-address 230 (Default) Position 1 ... F: Modbus-address 1 ... 15
Position A (parameter default factory setup)	Position 1: Reset to default factory setup
Position B (parameter Baud rate)	Position 0: 1200 Position 1: 2400 Position 2: 4800 Position 3: 9600 (default) Position 4: 19200 Position 5: 38400 Position 6: 57600
Position C (parameter parity)	Position 0: No (default) Position 1: Even Position 2: Odd

Sensing port on upper side of RIPDIx!  
Sensor reference level  
RIPDIH: end-cap shall be mounted here during operation; remount cap for transportation!

POWER RS485  
ID MODE

≥4 mm<sup>2</sup>  
≤6 AWG

Cable glands for electrical connection to RICTRL / another RIPDIx

Optional pressure compensation port on lower side of RIPDIx

### Connections

Pin order POWER (power supply):

Pin	Signal
1	Power-
3	PE
5	Power+

Pin order RS485 (Modbus RTU):

Pin	Signal
7	A
9	GND
11	B

## Supplied accessories

- 4 screws with wall plugs for wall mounting
- Heat shrink tube for ring terminal earth connection
- Documentation (Quick Start Guide, CDROM)

## Optional accessories

Item text	Type	Item no.
Unitr.BUS cable 3x2x0.22+3x1.0 (RS485 plus supply)	RVFK.002	0464987
Ball valve complete for RIPDIH.xxx	MPZKH	0066190.001
Fluorosilicone polymer oil 8 ml (DOW CORNING® FS 1265 FLUID)		6001041