71625447

Brief Operating Instructions
Micropilot FMR20
Modbus RS485

Free space radar for bulk solids

These Brief Operating Instructions are not a substitute for the Operating Instructions pertaining to the device.

Detailed information is provided in the Operating Instructions and other documentation.

Available for all device versions via:
- Internet: www.endress.com/deviceviewer
- Smartphone/tablet: Endress+Hauser Operations app

Basic safety instructions

Requirements for personnel

Personnel must meet the following requirements to perform their tasks:
- ▶ Trained specialists must have a qualification that is relevant to the specific function and task.
- ▶ Must be authorized by the plant owner/operator.
- ▶ Must be familiar with national regulations.
- ▶ Must have read and understood the instructions in the manual and supplementary documentation.
- ▶ They must follow instructions and comply with general policies.

Intended use

The device is designed for non-contact continuous level measurement of solids.

Application

- ▶ Measured process variables: distance
- ▶ Calculable process variables: volume or mass in any shape of vessel

Operational safety

Risk of injury!
- ▶ Operate the device only if it is in proper technical condition, free from errors and faults.
- ▶ The operator is responsible for the trouble-free operation of the device.

Installation

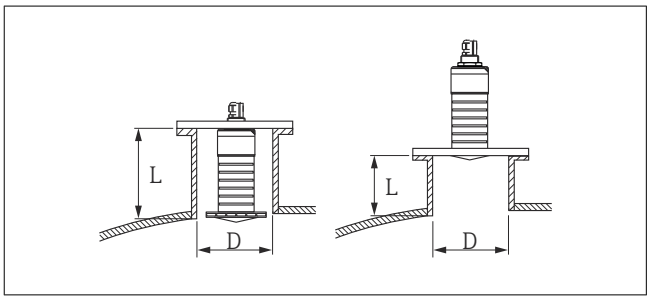
Wall, ceiling or nozzle installation is possible.

Wall and ceiling installation; see Operating Instructions.

Caution!
- The sensor cables are not designed as supporting cables. Do not use them for suspension purposes.
- Always operate the device in a vertical position in free-space applications.
- In the case of devices with a rear-side process connection "FNPT1/2 conduit", the cable protective plug must be removed before installation.

Nozzle installation

To ensure optimum measurement, the antenna should protrude from the nozzle. The interior of the nozzle must be smooth and may not contain any edges or welded joints. The edge of the nozzle should be rounded if possible.



1 *Nozzle installation*

L Nozzle length
D Nozzle diameter

The maximum nozzle length **L** depends on the nozzle diameter **D**.

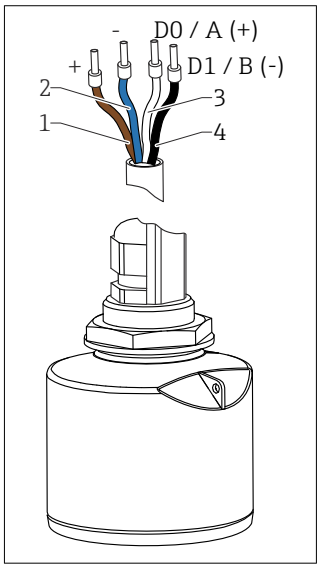
Please note the limits for the diameter and length of the nozzle.

80 mm (3 in) antenna, installation inside nozzle
- D: min. 120 mm (4.72 in)
- L: max. 205 mm (8.07 in) + D × 4.5

80 mm (3 in) antenna, installation outside nozzle
- D: min. 80 mm (3 in)
- L: max. D × 4.5

Electrical connection

Cable assignment



2 FMR20 cable assignment, Modbus

1 Plus, brown wire
2 Minus, blue wire
3 Modbus D0/A (+), white wire
4 Modbus D1/B (-), black wire

Supply voltage

5 to 30 V_{DC}

An external power supply is necessary.

Battery operation
The sensor's *Bluetooth*® wireless technology communication can be disabled to increase the operating life of the battery.

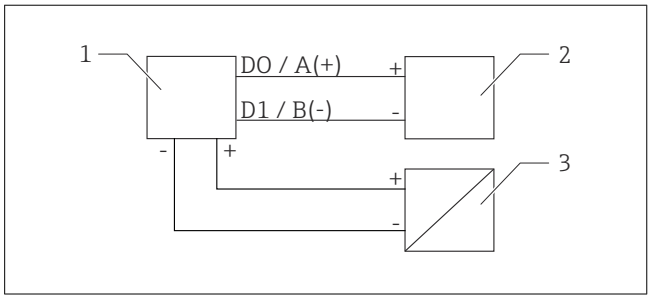
Potential equalization
No special measures for potential equalization are required.

Various power supply units can be ordered as an accessory from Endress +Hauser.

Connecting the device

Block circuit diagram for Modbus RS485 connection

The RS485 connection meets the requirements of the RS485-IS specification for use in hazardous environments.



3 Block circuit diagram for Modbus RS485 connection

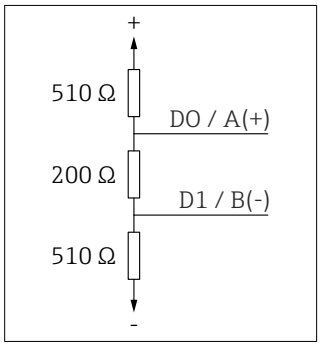
1 Device with Modbus communication
2 Modbus master/RTU
3 Power supply

Up to 32 users can be connected on the RS485 bus; see the Operating Instructions.

Modbus RS485 bus terminating resistor

A terminating resistor must be connected at both ends of the RS485 bus.

The bus terminating resistor should be installed as per the RS485-IS specification.



4 Representation of the bus terminating resistor as per the RS485-IS specification