

Wiring

WARNING! Read the product documentation carefully before installing or operating the product. If you encounter the following marking during installation or operation, consult product documentation to find out

the nature of the potential hazards and any actions which have to be taken to avoid them:



WARNING! Make sure that you prepare and connect only de-energized wires.

For field wiring terminals, use copper conductors only.

- Allen key (4 mm) for opening the transmitter cover
- Open-ended wrenches of sizes 17 mm, 19 mm, 22 mm, and 24 mm
- Flat head screwdriver
- Cable glands as required by your application (available from Vaisala)
- Cables as required by your application (probe connection cables and power cables are available from Vaisala)

Power supply terminals and lead-through – PELV option

WARNING! Connect only cables with temperature rating of minimum +80 °C (+176 °F) to the PELV power supply terminal.

WARNING! Local and state legislation and regulations may require you to replace the power supply lead-through. If you remove the factory installed lead-through, use a replacing lead-through that is approved by UL, and has type rating 4. Ensure the replacing part provides sufficient ingress protection. Use a replacing part with M20×1.5 threads. Tightening torque is 10 Nm unless otherwise specified by the part manufacturer.

CAUTION! Always choose a power supply unit that conforms to the local standards and requirements.

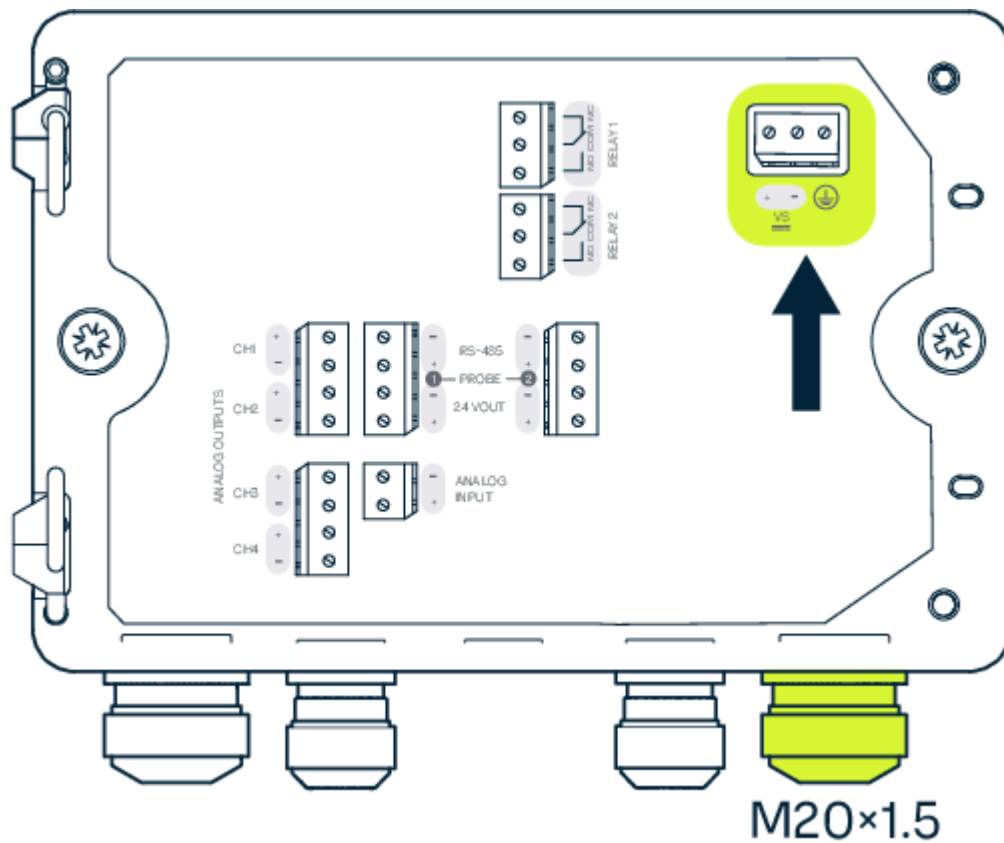
In North America, only power Indigo510 and Indigo520 PELV version transmitters with one of the following:

- An approved/certified Class 2 power supply. The output of the power supply may not exceed 100 VA, with operating voltage not more than 30 V_{rms}, 42.4 V_{peak}, or 60 V DC.
- An approved/certified Limited Power Source (LPS) (CAN/CSA-C22.2 No. 60950-1 or UL 60950-1).

For more information on powering, see Indigo500 specifications.

Power supply input wiring is required only for transmitters powered with protective extra-low voltage (PELV) or AC (mains) power.

For the M20×1.5 cable gland ordered together with the transmitter from Vaisala, the cable diameter is 5.0–9.0 mm (0.20–0.35 in). Tightening torque for the cable gland is 8 Nm.



Power supply terminals and lead-through – PELV option

PELV power supply input terminals

Terminal	Function	Notes
	Power supply ground	
VS+	Positive supply voltage	15–35 V DC or 24 V AC $\pm 20\%$
VS-	Negative supply voltage	

Power supply terminals and lead through - AC (mains) power option

WARNING! Only licensed experts may install electrical components. They must adhere to local and state legislation and regulations.

WARNING! Transmitters powered with AC (mains) power must be connected only to a grounded (earthed) power supply (class I equipment).

WARNING! Only licensed experts may connect the AC (mains) power connection to the power supply. A readily accessible disconnect device must be incorporated in the fixed wiring.

WARNING! Local and state legislation and regulations may require you to replace the power supply lead-through. If you remove the factory installed lead-through, use a replacing lead-through that is approved by UL, and has type rating 4. Ensure the replacing part provides sufficient ingress protection. Use a replacing part with M20×1.5 threads. Tightening torque is 10 Nm unless otherwise specified by the part manufacturer.

WARNING! Make sure that you prepare and connect only de-energized wires.

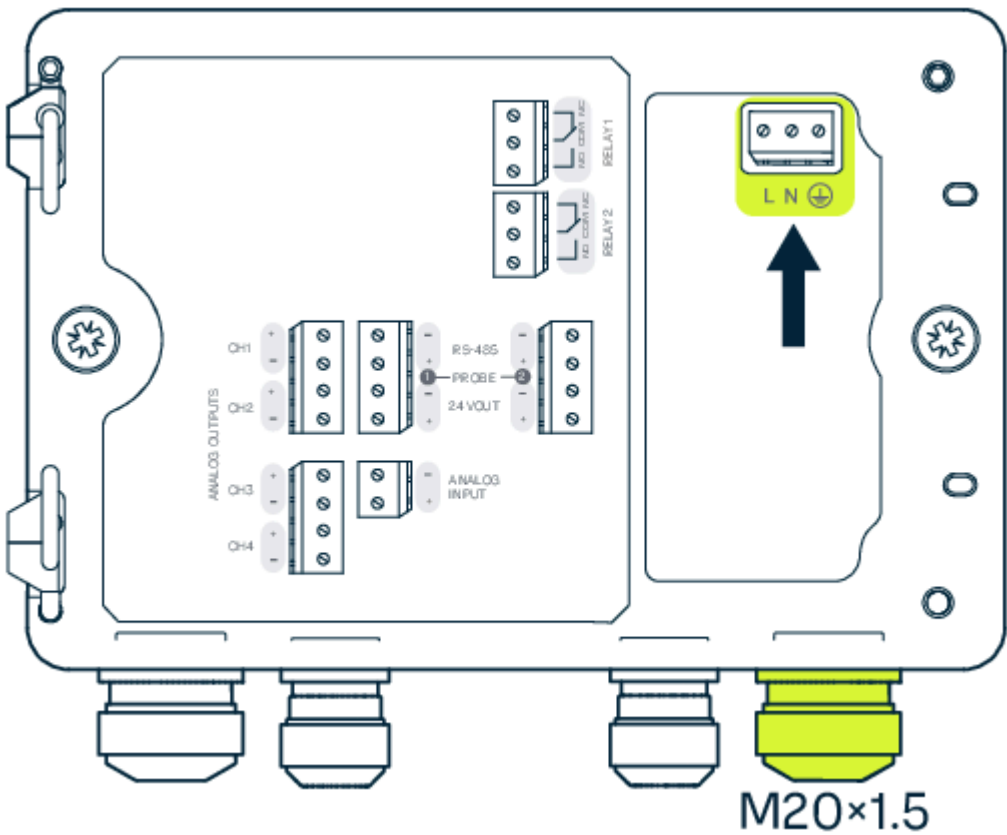
CAUTION! Only factory installed AC (mains) cables have been safety type tested and assembly tested with the product. When replacing the cable, select the replacement and install the cable according to local regulations. Modifying or replacing the factory installed AC (mains) cable may also void UL/SGS listing. For more information on AC (mains) cable requirements, see [Power cable specifications](#).

CAUTION! Do not modify the unit or use it in ways not described in the documentation. Improper modification or use may lead to safety hazards, equipment damage, failure to perform according to specification, decreased equipment lifetime, or the warranty or third party approvals becoming void.

CAUTION! Do not use the transmitter in a manner not specified by Vaisala. If the transmitter is used in an unspecified manner, the protection provided by the equipment may be impaired.

CAUTION! Do not replace detachable mains supply cables by inadequately rated cables.

- Cable stripping tool
- Power supply cord, for example Feller GmbH SJTOW3x18AWGWB105CVW1



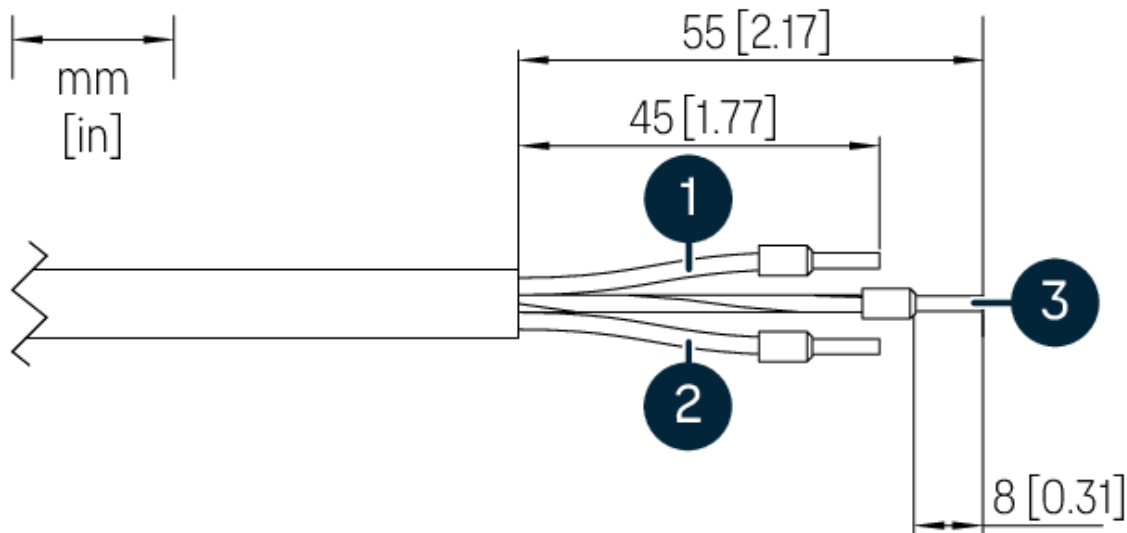
Power supply terminals and lead-through – AC (mains) power option

Power supply input wiring is required only for transmitters powered with protective extra-low voltage (PELV) or AC (mains) power.

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AC power supply input terminals

Terminal	Function	Notes
	Power supply ground	
L	Line	100–240 V AC 50/60 Hz
N	Neutral	



Example of stripped AC (mains) power cable

Number in figure	Wire	Min-max. wire cross-section
1	Line wire	0.5–2.5 mm ² (20–14 AWG)
2	Neutral wire	
3	Grounding wire	

Power cable specifications

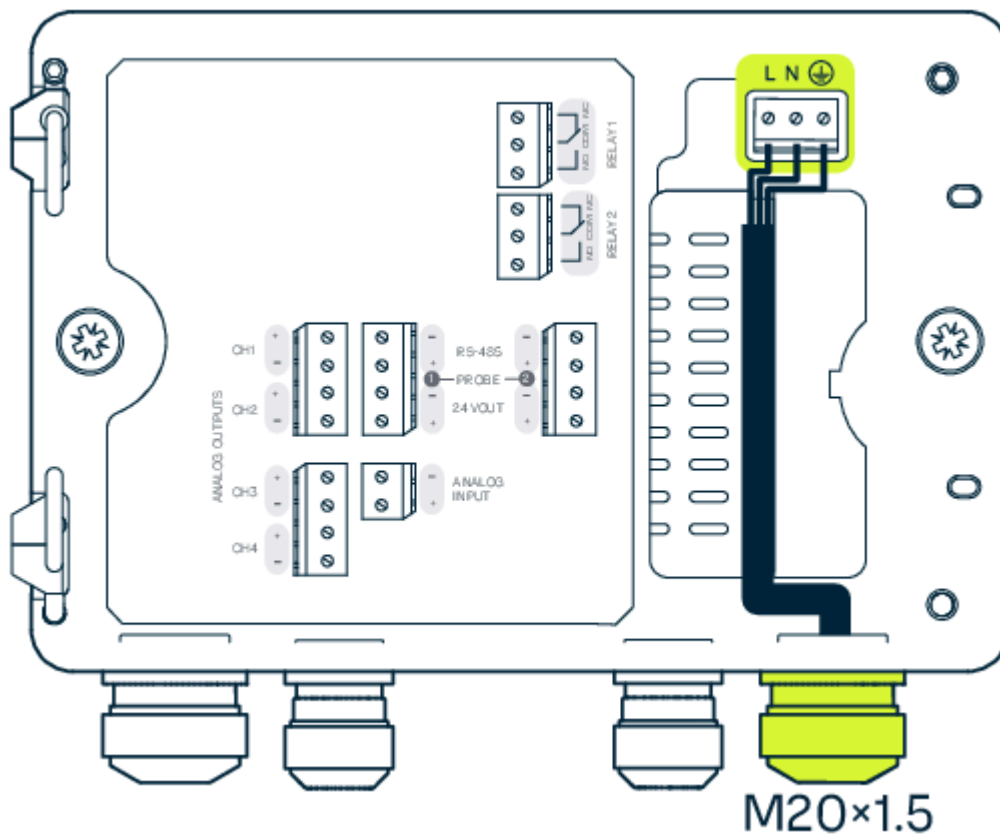
Property	Description/Value
Example of powering cable	Feller GmbH SJTOW3x18AWGWB105CVW1
Cable diameter	5.0–9.0 mm (0.20–0.35 in)
Tightening torque for the cable gland	8 Nm
Minimum temperature range	-40 ... +90°C (-40 ... +194°F)
Minimum voltage/AC rating of the wall plug	10 A / 250 V AC
Minimum flammability rating	VW-1 or equivalent
UL approved with CCN	ZJCZ
Torque value for terminal screws	min. 0.5 Nm, max. 0.6 Nm

Choose a power cable, that fits the intended application. The power cable should have a cable jacket. Prepare the AC (mains) power cable and connect the cable to the power supply input terminal:

1. Strip 55 mm (2.17 in) of the cable to expose the wires.
2. Cut off 10 mm (0.39 in) of the line and neutral wires. Leave the grounding wire 55 mm (2.17 in) long.

CAUTION! Make sure that the grounding wire is longer than the line and neutral wires. Under mechanical stress, the grounding wire must be the last to disconnect from the protective ground terminal.

3. Strip the ends of the individual wires to expose the conductors for a length of 8 mm (0.32 in).
4. Attach the wires to the power supply terminal.
5. Pull the power cable to the rightmost lead-through and install the wires to the power module's screw terminals.



6. Tighten the lead-through so that the cable does not move back and forth.

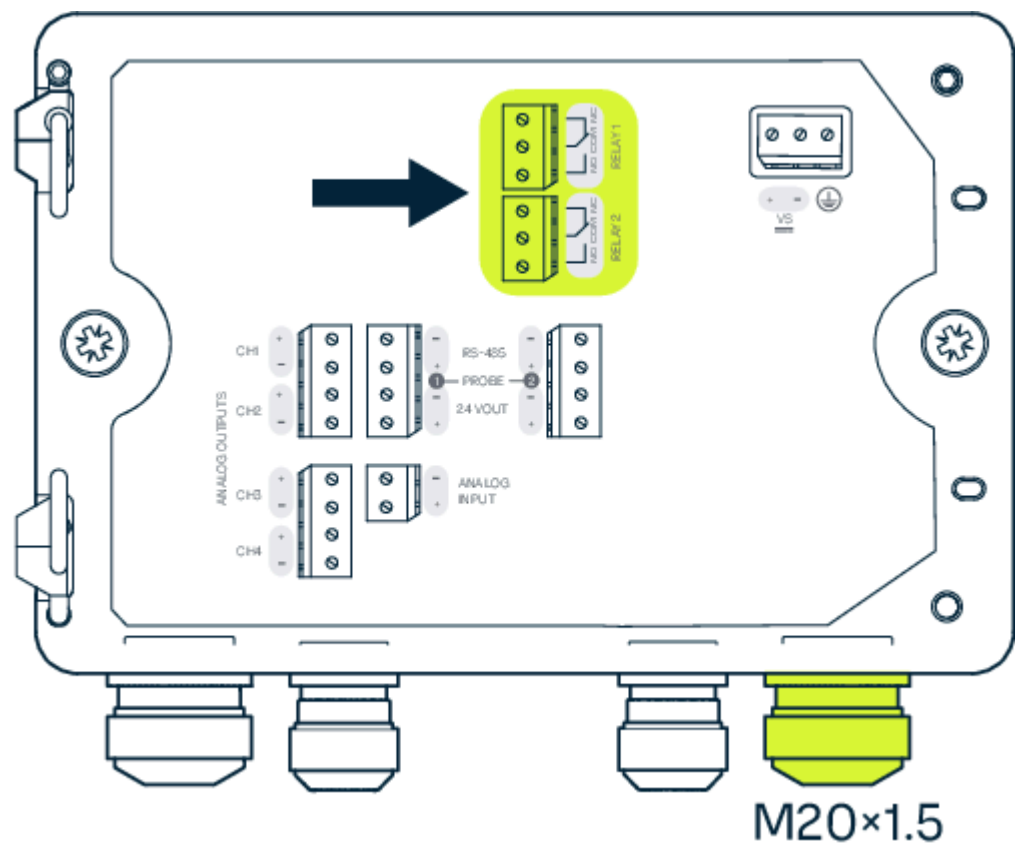
Relay output terminals and lead-through

Before connecting wires or cables, make sure that the transmitter is powered off.

Relays are not available in transmitters that are powered with Power over Ethernet (PoE).

Wire the relay connections as normally open (NO) or normally closed (NC). Use the touchscreen or web interface to configure the relay activation parameters.

For the M20×1.5 cable gland ordered together with the transmitter from Vaisala, the cable diameter is 5.0–9.0 mm (0.20–0.35 in). Tightening torque for the cable gland is 8 Nm.



Relay output terminals and lead-through

Output terminals for relay 1 and relay 2

Terminal	Function	Notes
COM	Relay 1 or 2 common	Terminals in PELV power supply version: - Type: Screw terminals - Max. wire size: 2.5 mm² (14 AWG) Terminals in AC (mains) power supply version: - Type: Push-in spring connection - Max. wire size: 1.5 mm² (16 AWG), solid wires or ferrules recommended
NO	Relay 1 or 2 normally open	
NC	Relay 1 or 2 normally closed	

Analog output terminals and lead-through

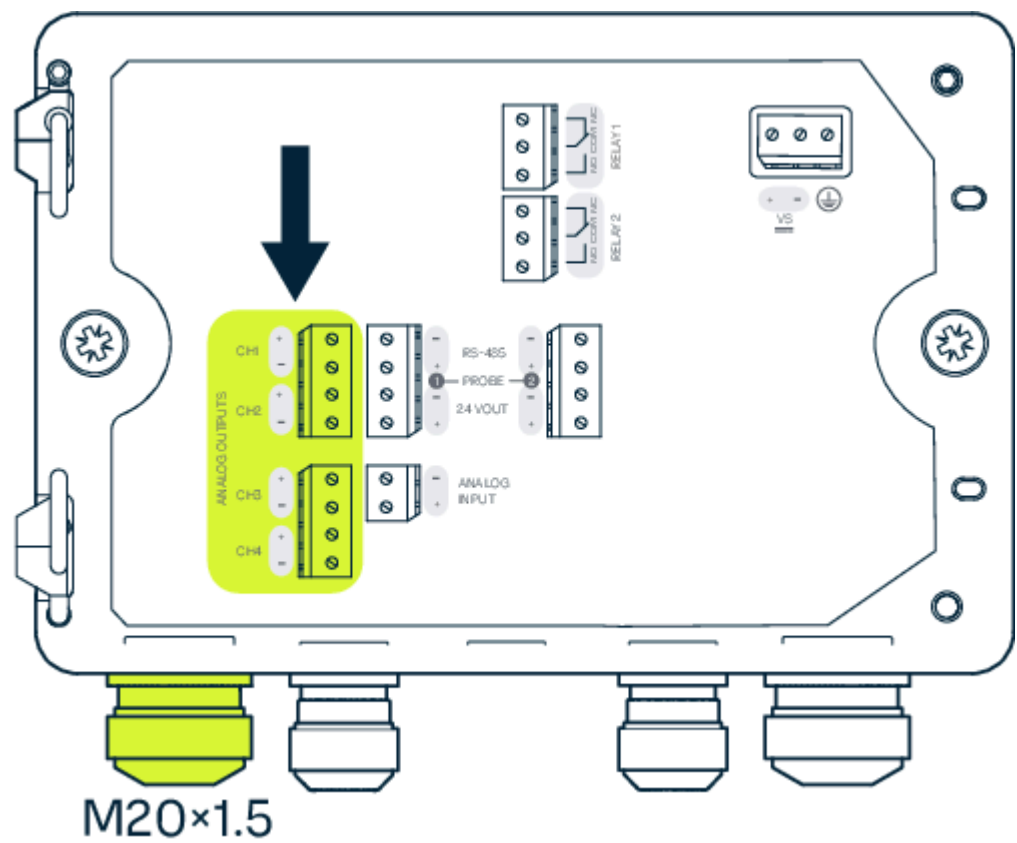
Before connecting wires or cables, make sure that the transmitter is powered off.

Analog outputs are not available in transmitters that are powered with Power over Ethernet (PoE).

Use the touchscreen or web interface to change the output mode (for example, 0–5 V or 4–20 mA) and scaling of the analog outputs.

For the M20×1.5 cable gland ordered together with the transmitter from Vaisala, the cable diameter is 5.0–9.0 mm (0.20–0.35 in). Tightening torque for the cable gland is 8 Nm.

For the M20×1.5 cable gland with split bushing, the cable diameter is 7 mm (0.28 in).



Analog output terminals and lead-through

Analog output terminals

Terminal	Function	Notes
CH1 +	Analog output channel 1 +	Max. wire size: 2.5 mm ² (14 AWG)
CH1 -	Analog output channel 1 -	
CH2 +	Analog output channel 2 +	
CH2 -	Analog output channel 2 -	
CH3 +	Analog output channel 3 +	
CH3 -	Analog output channel 3 -	
CH4 +	Analog output channel 4 +	
CH4 -	Analog output channel 4 -	

Analog input terminals and lead-through

Before connecting wires or cables, make sure that the transmitter is powered off.

Analog input is not available in Indigo510 transmitters or transmitters that are powered with Power over Ethernet (PoE).

Use the touchscreen or web interface to set the analog input and analog input powering on.

Analog input terminals

Terminal	Function	Notes
ANALOG INPUT +	Analog input channel 1 +	Max. wire size: 2.5 mm ² (14 AWG)
ANALOG INPUT -	Analog input channel 1 -	
24 VOUT +	Power GND and RS-485 common	

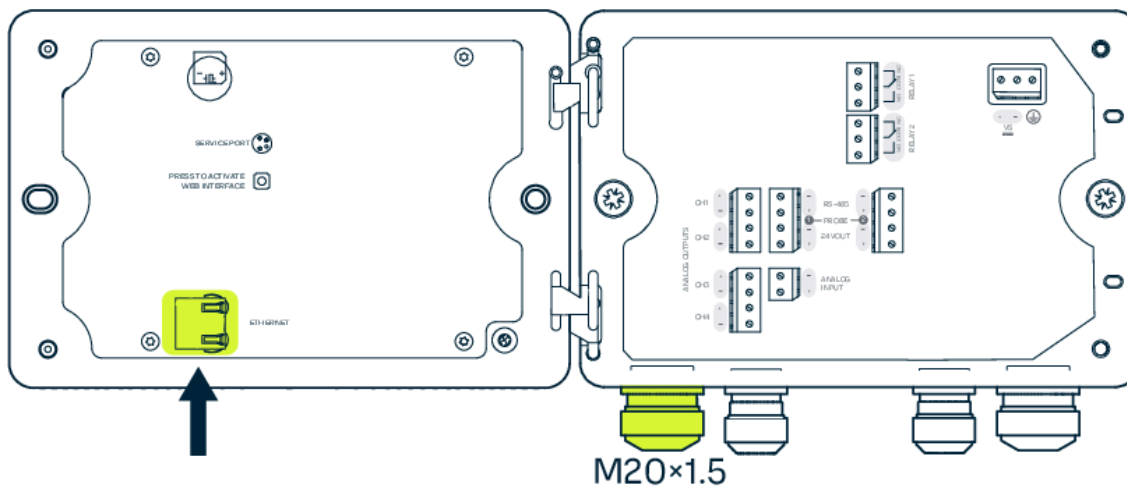
For information on wiring analog input, see [Indigo500 User Guide \(M212287EN\)](#), available at docs.vaisala.com.

Ethernet connector and lead-through

You must use a shielded cable to meet the rated EMC performance of the device.

Before connecting wires or cables, make sure that the transmitter is powered off.

The 8P8C (RJ45) Ethernet connector is located on the inside of the transmitter cover. The supported standards are 10BASE-T and 100BASE-TX.

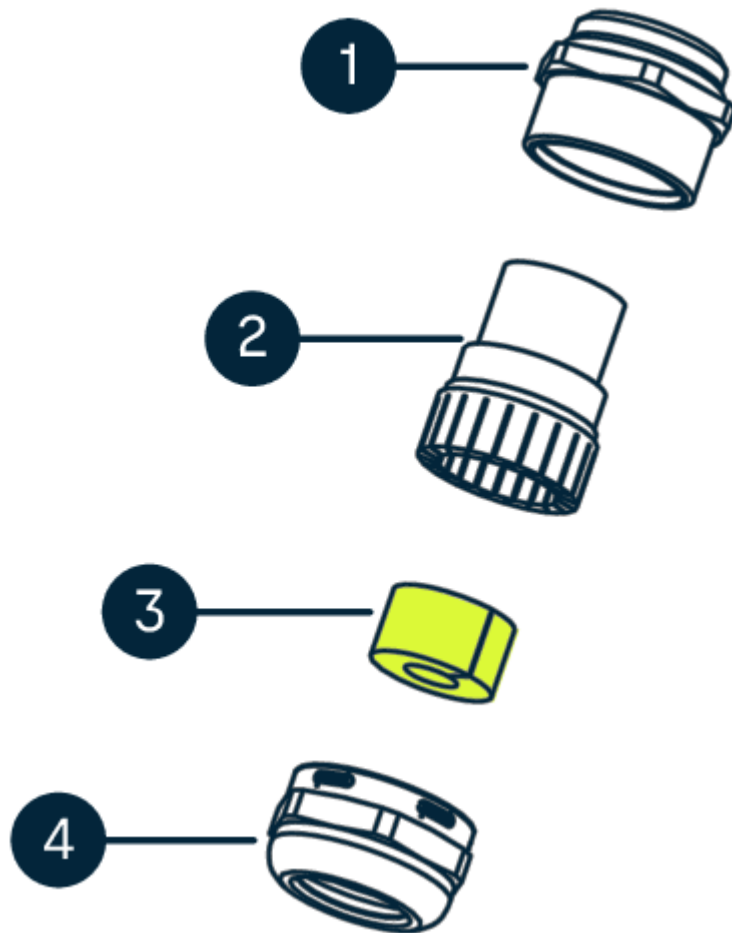


Ethernet connector and lead-through

For the M20x1.5 cable gland with split bushing, the cable diameter is 7 mm (0.28 in).

When configuring the non-display transmitter, the Ethernet connector can be used without taking the cable through the cable gland. Always wire through the cable gland for more long-term wiring.

When you insert the cable through the gland parts, also remove the split bushing (3) inside the nylon seal (2) to make the cable fit through the seal. Then place the bushing around the cable and push it back inside the seal. See the following figure.



M20×1.5 cable gland with split bushing

- 1 Base of the cable gland
- 2 Nylon seal
- 3 Split bushing inside the seal
- 4 Nut of the cable gland

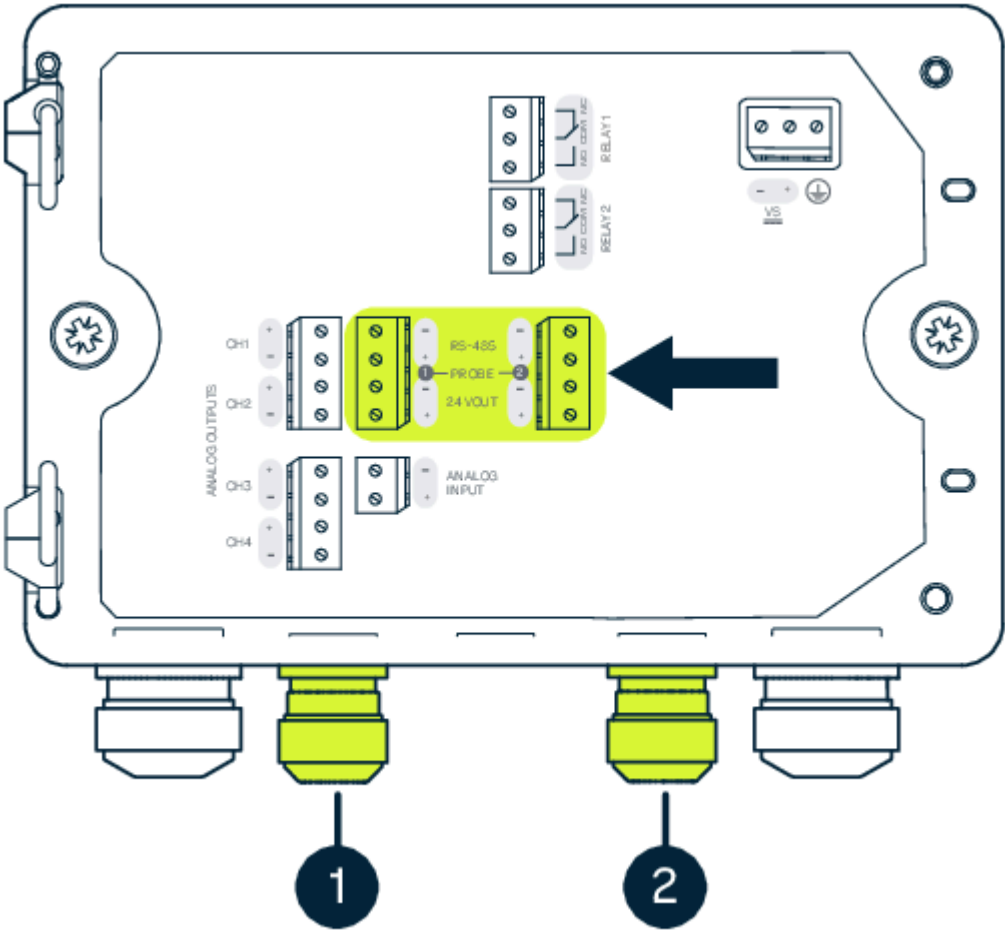
Probe connection terminals and lead-throughs

Probe connection terminals are used to connect measurement devices, such as probes and refractometers, to the transmitter.

Before connecting wires or cables, make sure that the transmitter is powered off.

For the M16×1.5 cable glands ordered together with the transmitter from Vaisala, the cable diameter is 2.0–6.0 mm (0.08–0.24 in) or 4.0–8.0 mm (0.16–0.31 in) depending on your configuration. Tightening torque for the cable gland is 6 Nm.

The minimum length of the measurement device connection cable is 30 cm (11.81 in). The recommended maximum length of the measurement device connection cable is 30 m (98 ft).



Probe connection terminals and lead-throughs

- 1 Probe 1 lead-through, M16×1.5
- 2 Probe 2 lead-through, M16×1.5

Connection terminals for probe 1 and probe 2

Terminal	Function	Wire color in standard Vaisala cables	Wire color in Vaisala refractometer cables	Notes
RS-485-	RS-485-	White	Green	Max. wire size: 2.5 mm ² (14 AWG)
RS-485+	RS-485+	Black	Yellow	
24 VOUT -	Power GND and RS-485 common	Blue	White	
24 VOUT +	Positive supply voltage to probe	Brown	Brown	

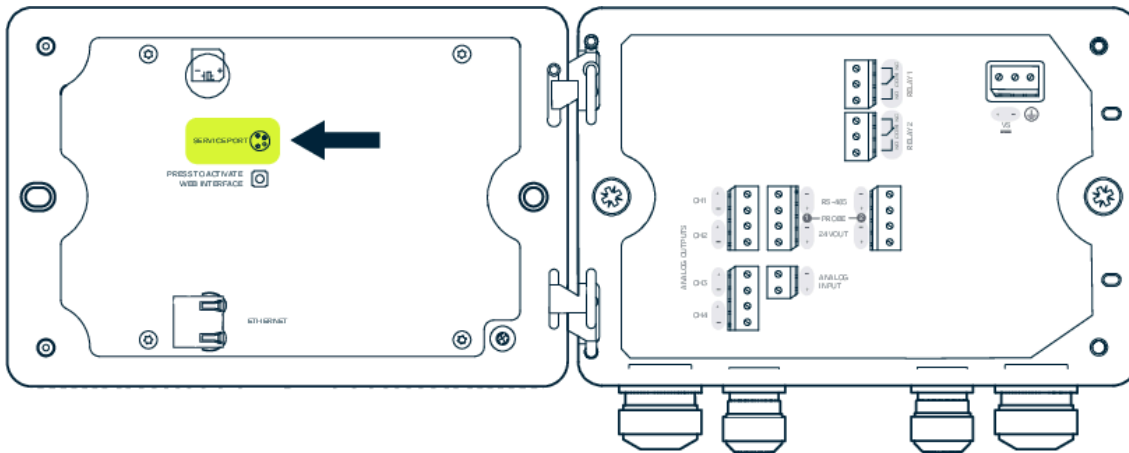
Service port connection

CAUTION! The service port connection is only intended for temporary use during configuration, and must not be used for permanent installations. The IP rating, UL type 4 rating, and EMC properties of the transmitter can be affected by using the service port in permanent installations.

CAUTION! Do not touch the PCB while it is energized – risk of electric shock.

Service port is used to connect Indigo80 handheld indicator to the transmitter. The service port is located on the inside of the transmitter cover.

To connect Indigo80 to the Indigo500 transmitter, use M12 - M8 service cable 1.5 m (4.9 ft) (Vaisala item code 262195SP).



Service port connection

For more information on connecting Indigo80 to the transmitter, see [Indigo500 User Guide \(M212287EN\)](#), available at docs.vaisala.com.

Verifying tightness of cable glands

- Adjustable wrench

To maintain enclosure tightness and provide strain relief to the cables, all cable glands must be tightened. Unused cable glands must remain plugged.

1. Check every cable gland that is in use:
 - a. Pull on the cable to verify that the cable is securely held by the cable gland.
 - b. Tighten the cable gland if the cable moves.
2. Check that every unused cable gland is plugged and tightened.