

SITRANS F

Electromagnetic flowmeters SITRANS FMT020

Operating Instructions

7ME6942 (SITRANS FMT020)
7ME6532 (SITRANS FM520)
7ME6362 (SITRANS FM320)
7ME6162 (SITRANS FM120)

Getting started	1
Introduction	2
Safety notes	3
Description	4
Installing/mounting	5
Connecting	6
Commissioning	7
Operating	8
Parameter assignment	9
Service and maintenance	10
Diagnostics and troubleshooting	11
Technical specifications	12
Dimension drawings	13
Product documentation and support	A
Communication	B
Remote operation	C
HMI menu structure	D
Accessories	E

6.4 Electrical connection

** WARNING****Safety requirement for DC power supply input**

The DC power supply version is intended to be supplied from one of the following:

- Isolated limited energy source UL61010-1, 3rd ed cl. 9.4
- Limited power source per UL62368-1
- PS2 per UL62368-1
- Class 2 per NEC

** WARNING****Safety requirement for power supply for communication terminals**

When applicable, the communication terminals are intended to be supplied from one of the following:

- Isolated limited energy source UL61010-1, 3rd ed cl. 9.4
- Limited power source per UL62368-1
- PS2 per UL62368-1
- Class 2 per NEC

** WARNING****Safety requirement for power supply for communication terminals**

The device is intended to be supplied from an isolated Limited Energy Source per UL61010-1, 3rd ed cl. 9.4 or Limited Power Source per UL62368-1 or Class 2 per NEC.

** WARNING****Disconnecting the device from power**

To be able to disconnect the device from the electrical supply source, install an external switch or a circuit breaker upstream to the device.

Choose a position so that it is easy to operate the disconnecting protection device.

** WARNING****Grounding**

Connect mains protective ground earth to PE terminal in accordance with diagram (due to class 1 power supply).

** WARNING****High vibration environment**

Use relay output only in NO mode in an environment with high vibration.

Note**Mains cable connection**

Mains cable connection with cable glands is allowed for NFPA79 applications only.

Note

For mains wiring: Use cables in copper material, with a conductor temperature rating of at least 65 °C.

Note

Terminals 81 and 84 are only to be connected if a special electrode cable with double shielding is used.

Note

In applications with a risk of low supply voltage below the specifications for more than 10 minutes, install an under voltage relay or protection circuit for DC installations.

Note**Output cables**

Use shielded cables if long cables are used in noisy environments.

Note**Digital output**

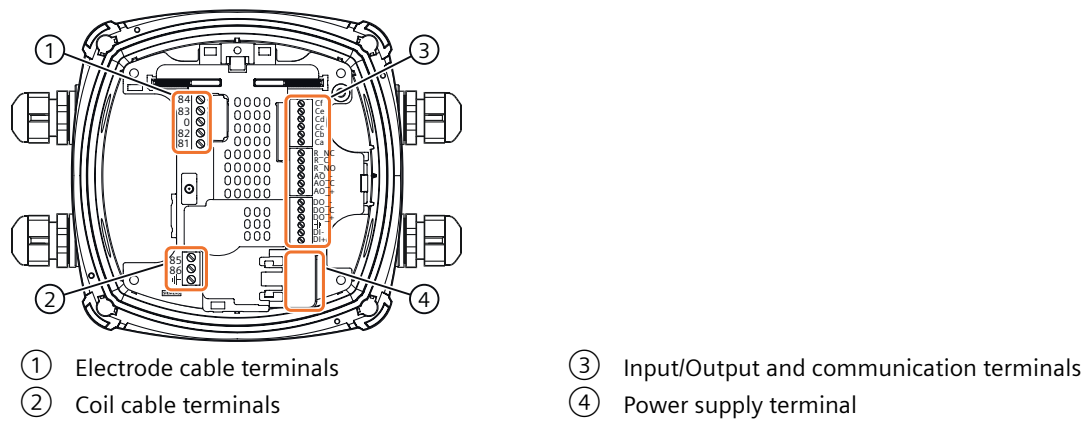
If internal resistance of a load exceeds 10 kΩ, connect an external 10 kΩ load resistor in parallel to this load.

Note**Mains frequency**

Select the right mains frequency in parameter 2.1.2 for the mains supply frequency, that you are using.

For input and output specification refer to Technical specifications (Page 159).

Connection board overview



Power supply

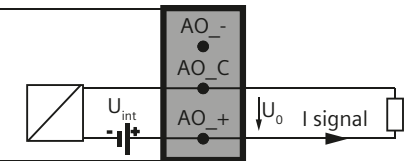
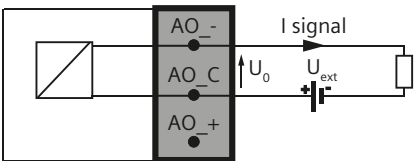
Table 6-1 Power supply transmitter side

AC power supply	DC power supply
 ← P	 ← PE
N ← N	+ ← +
L ← L	- ← -

Cable section and insulation as described in Technical specifications (Page 159).

Current output

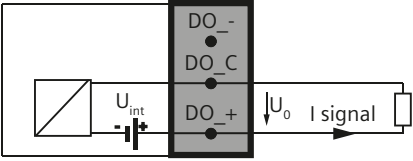
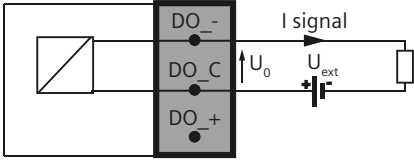
Table 6-2 Current output

Active output	Passive output
	

Rload < 470 Ω, max. current 30 mA

Digital output

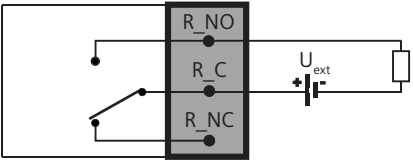
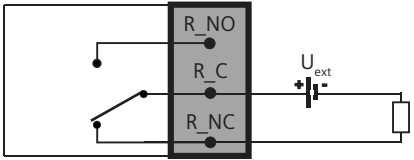
Table 6-3 Digital output - current driven

Active output	Passive output
	

Rload < 1 kΩ, max. current 30 mA

Relay output

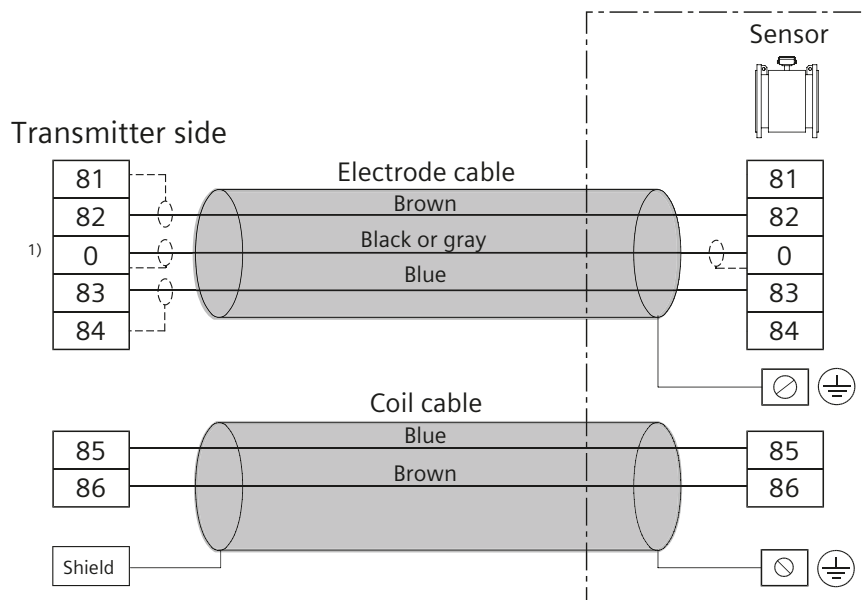
Table 6-4 Relay output

Relay output normally open	Relay output normally closed
	

Communication cable

Ca, Cb, Cc, Cd, Ce, Cf are reserved for communication modules as described in Connecting a communication cable (Page 75).

Transmitter to sensor cable connection



1) Note:

Special cable with individual wire shields (shown as dotted lines) are only required when in a noisy environment or using long cables.

Figure 6-2 Electrode and coil cable

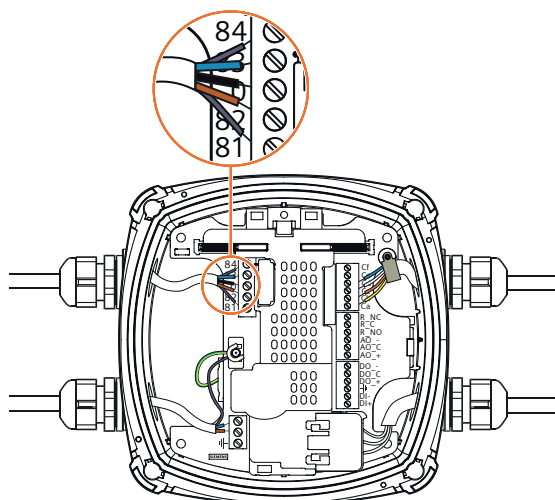


Figure 6-3 Electrode cable with individual wire shields

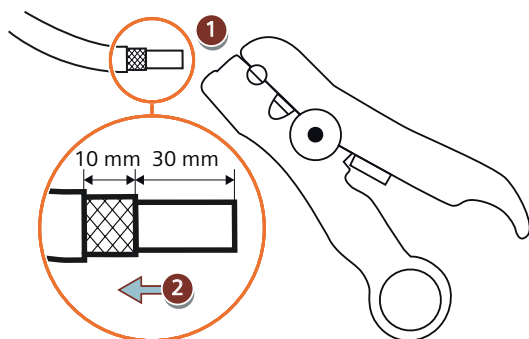
6.5 Connecting a communication cable

Before you start

- Read the Safety notes (Page 19)
- Read the Basic safety notes: Connecting (Page 55)

Connecting the communication cable

1. Remove 40 mm of outer insulation.
2. Shorten shield to 10 mm and fold it back over the outer insulation.



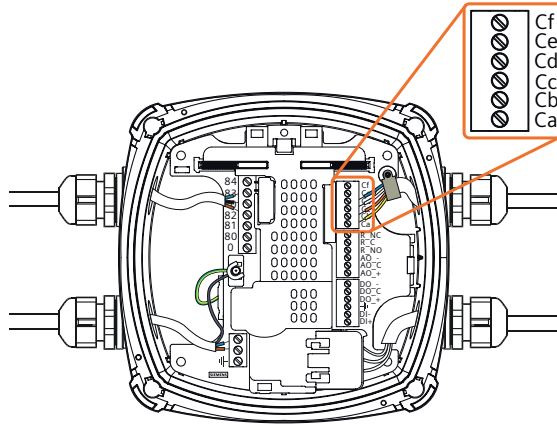
3. Mount cable clamp and remove inner insulation. Remove 7 mm of insulation for each wire.



Figure 6-4 Example for EtherNet/IP & PROFINET

6.5 Connecting a communication cable

4. Adjust the wiring on the connection board in accordance with the type of communication module that you are using.
See below table as a reference. The wiring info can also be found on a label on the communication module itself:



Terminal	Function						
	HART active	HART passive	EtherNet/IP, Modbus TCP & PROFINET	MODBUS RTU	Profibus PA/DP	Digital out-put active	Digital out-put pas-sive
Cf	nc	nc	nc	nc	nc	DI-	DI-
Ce	nc	nc	nc	nc	nc	DI+	DI+
Cd	nc	-	RD- (blue ¹⁾)	A _{out} (+)	PA+/DP+ (red) out	nc	nc
Cc	nc	+	RD+ (white ²⁾)	B _{out} (-)	PA-/DP- (green) out	nc	DO-
Cb	-	nc	TD- (orange ³⁾)	A _{in} (+)	PA+/DP+ (red) in	DO-	DO+
Ca	+	nc	TD+ (yellow ⁴⁾)	B _{in} (-)	PA-/DP- (green) in	DO+	nc

nc = not connected

¹⁾ RJ45-T568B (EU): green; RJ45-T568A (USA): orange

²⁾ RJ45-T568B (EU): white-green; RJ45-T568A (USA): white-orange

³⁾ RJ45-T568B (EU): orange; RJ45-T568A (USA): green

⁴⁾ RJ45-T568B (EU): white-orange; RJ45-T568A (USA): white-green

Note

Reversed logic for some devices

Some devices might use a reversed logic, which can lead to the communication not working. To resolve this you need to inverse the polarity in these cases.

5. Screw the cable clamp to the connection board. Tighten the cable gland.