OIML Member State Denmark	**OIML Certificate No.** R49/2013-A-DK2-25.02 Revision 2

OIML CERTIFICATE ISSUED UNDER SCHEME A

OIML Issuing Authority

Name: FORCE Certification A/S
Address: Park Allé 345, 2605 Brøndby, Denmark
Person responsible: Lars Poder

Applicant

Name: Siemens AG
Address: DE – 76181 Karlsruhe, Germany

Manufacturer

Name: Siemens SAS
Address: 1 Chemin de la Sandlach
67506 Haguenau Cedex, France

Name: Siemens Sensors and Communication Ltd.
Address: 117, Guangxian Road, Qi Xian Ling, High-Tech Industry Zone,
116023 Dalian, China

Identification of the certified type *(the detailed characteristics will be defined in the additional pages)*

Water meter, type FM520 consisting of FMS500 and FMT020

Designation of the module *(if applicable)*

-

This OIML Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML type evaluation report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

OIML R 49, Edition (year): 2013

For accuracy class (if applicable): 1 and 2

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Task no.: 125-27857.53 and ID no.: FC-OIML-20829-2

OIML Certificate No.
R49/2013-A-DK2-25.02 Revision 2

This OIML Certificate relates only to metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML Recommendation identified above.

This OIML Certificate does not bestow any form of legal international approval.

The conformity was established by the results of tests and examinations provided in the associated reports:

- Performance tests: 124-30210-2_Type evaluation report - Siemens AG - OIML R 49-2 tests of FM520 water meter version 2
- Environmental tests: 124-31871-2 - Test report - Siemens AG - OIML R 49-2 tests of FM520 water meter

The technical documentation relating to the identified type is contained in documentation file:

Internal FORCE Technology file folder no. 124-30210 and 124-31871

OIML Certificate History

Revision No.	Date	Description of the modification
Revision 0	7 July 2025	Original certificate
Revision 1	10 December 2025	Addition of more meter sizes
Revision 2	21 April 2026	New label examples and minor editorial changes

Identification, signature and stamp
The OIML Issuing Authority

Date: 21 April 2026

Michael Møller Nielsen
Certification manager

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate is issued, partial quotation of the Certificate and of the associated OIML type evaluation report(s) is not permitted, although either may be reproduced in full.

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Measuring system description

The operating principle of this electromagnetic water meter FM520 is that a constant pulsed DC electrical current through the coil circuit results in a magnetic field through the sensor bore with direction from coil to coil. When a conductive liquid passes through the magnetic field a differential DC voltage is induced between the measuring electrodes, and this voltage is proportional to the fluid velocity (Faraday's Law).

FM520 is designed for the following main applications: Water abstraction, Water treatment, Water distribution network (leak detection management), custody transfer water meters, Irrigation, Wastewater treatment, Filtration plant (e.g. reverse osmosis and ultra-filtration), Industrial water applications. For OIML R 49, the product can be used only for cold potable water and hot water (according to OIML R 49).

The design consists of following 25 sizes:
DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300, DN350, DN400, DN450, DN500, DN600, DN700, DN750, DN800, DN900, DN1000, DN1200, DN1400, DN1500, DN1600, DN1800, DN2000.

Please see "Operating Instructions" for more details about the dimensions.

Photo of FM520

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Flow designations

The table below shows the sensor variants that have been approved based on the type approval tests performed.

Other sensor variants are also covered by this approval provided the following is fulfilled:

- "R" (Q_3/Q_1) shall not exceed the values in the tables and shall be chosen from OIML R 49-1:2013 list 4.1.4
- Q_3 shall not exceed the values in the tables and shall be chosen from OIML R 49-1:2013 list 4.1.3
- Q_1 shall be larger than the values in the tables
- Q_2 shall be larger than the values in the tables

Class 1 and 2:

SIZE	DN50 (2")	DN65 (2½")	DN80 (3")	DN100 (4")	DN125 (5")	DN150 (6")	DN200 (8")	DN250 (10")	DN300 (12")
"R" Q_3/Q_1	400	400	400	400	400	400	400	400	400
Q_1 [m³/h]	0.16	0.25	0.4	0.63	1	1.6	2.5	4	4
Q_2 [m³/h]	0.25	0.4	0.63	1	1.6	2.5	4	6.4	6.4
Q_3 [m³/h]	63	100	160	250	400	630	1000	1600	1600
Q_4 [m³/h]	78.75	125	200	312.5	500	787.5	1250	2000	2000

SIZE	DN350 (14")	DN400 (16")	DN450 (18")	DN500 (20")	DN600 (24")	DN700 (28")	DN750 (30")	DN800 (32")	DN900 (36")
"R" Q_3/Q_1	400	400	400	400	400	160	160	160	160
Q_1 [m³/h]	6.3	10	10	15.8	15.8	39.4	39.4	39.4	62.5
Q_2 [m³/h]	10	16	16	25.2	25.2	63	63	63	100
Q_3 [m³/h]	2500	4000	4000	6300	6300	6300	6300	6300	10000
Q_4 [m³/h]	3125	5000	5000	7875	7875	7875	7875	7875	12500

SIZE	DN1000 (40")	DN1200 (48")	DN1400 (56")	DN1500 (60")	DN1600 (64")	DN1800 (72")	DN2000 (80")
"R" Q_3/Q_1	160	160	80	80	80	80	80
Q_1 [m³/h]	62.5	62.5	125	125	125	125	125
Q_2 [m³/h]	100	100	200	200	200	200	200
Q_3 [m³/h]	10000	10000	10000	10000	10000	10000	10000
Q_4 [m³/h]	12500	12500	12500	12500	12500	12500	12500

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Orientation requirements:

- The meter can be installed in all orientations up to DN300.
- The meter can be installed in horizontal and vertical orientation from DN350 up to DN1200.
- The meter must be installed in horizontal orientation from DN1400 up to DN2000.

Sensitivity class:

- The meter requires 0xD straight pipe upstream from the sensor
- The meter requires 0xD straight pipe downstream from the sensor

Other information

The meter is approved for forward metering but is also designed to be used in reverse.

The meter complies with OIML R49:2013 Annex B "Checking facilities - Type P".

Ancillary devices (§4.3.6 – OIML R 49-1): HART, PROFINET, MODBUS and ETHERNET IP. Where national regulations permit, the remote reading ancillary device may be used for testing and verification and for remote reading of the water meter. It has been proven during the type-examination tests, that the addition of these devices does not alter the metrological characteristics of the meter.

Pressure, pressure loss and temperature ranges

Pressure:
Even if the pressure rating of the flange is designed to reach higher pressure, the MAWP of FM520 product is limited at 16 bar for OIML R 49 certified products. The maximum admissible working pressure is printed on the label for the minimum and for the maximum media temperatures.

Temperature class:
FM520 is qualified for T30 and T50 temperature classes.

Pressure loss class:
FM520 is qualified for Δp10 class.

Climatic environments

Environmental class:
Ambient temperature class chosen for OIML is -25°C…+55°C/ condensing. This range will be limited to -20°C ...+55°C due to material properties of the sensor.

Mechanical class:
M1: This class applies to instruments used in locations with vibration and shocks of low significance, e.g. for instruments fastened to light supporting structures subject to negligible vibrations and shocks transmitted from local blasting or pile-driving activities, slamming doors, etc. M1 is equivalent to B and O for OIML R 49.

Electromagnetic class:
E2: This class applies to instruments used in locations with electromagnetic disturbances corresponding to those likely to be found in other industrial buildings.

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Protection class

The product can be IP67 or IP68.

Compact/remote

The product can be equipped with cable lengths up to 500 m

Power supply

100 – 240 VAC, 50 – 60 Hz, 25 VA
12 – 42 VDC, 12 W (24 VDC nominal)

Software

Designed according to

- WELMEC Guide 7.2:2023 – with editorial changes
- OIML R 49-1:2024 Annex D "Requirements for software-controlled water meters"

Inscriptions

The water meter type FM520 shall be clearly and indelibly marked with the following information:

- System designation
- Manufacturer designation or logo
- Manufacturer postal address
- Type, production year and serial number
- Accuracy class
- Max pressure loss
- Mechanical and electromagnetic environment classes
- Climatic class
- Flow limits
- Sensitivity velocity field classes
- Temperature of medium
- Maximum working pressure (PN)
- Supply voltage
- Protection class
- Dynamic Range (Q3/Q1)
- Software version
- Direction of flow by means of an arrow

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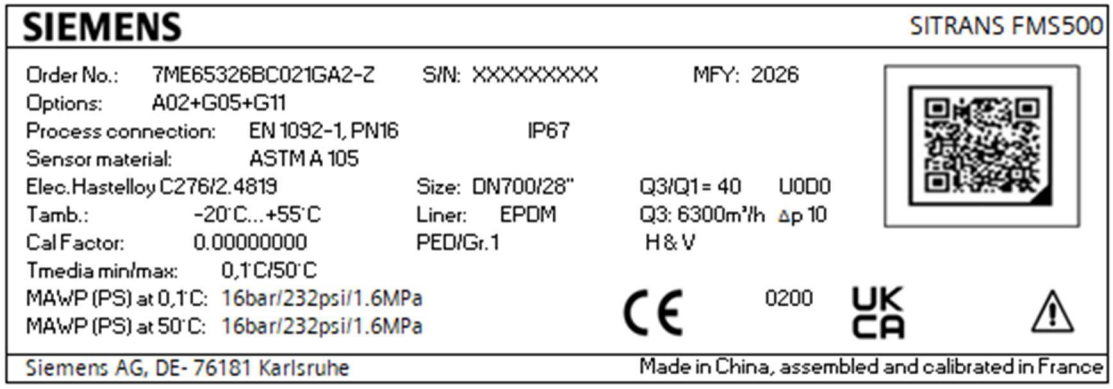
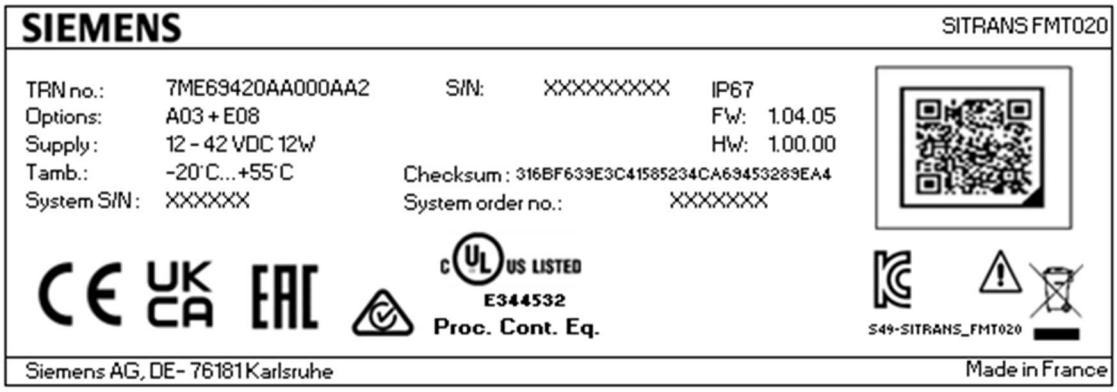
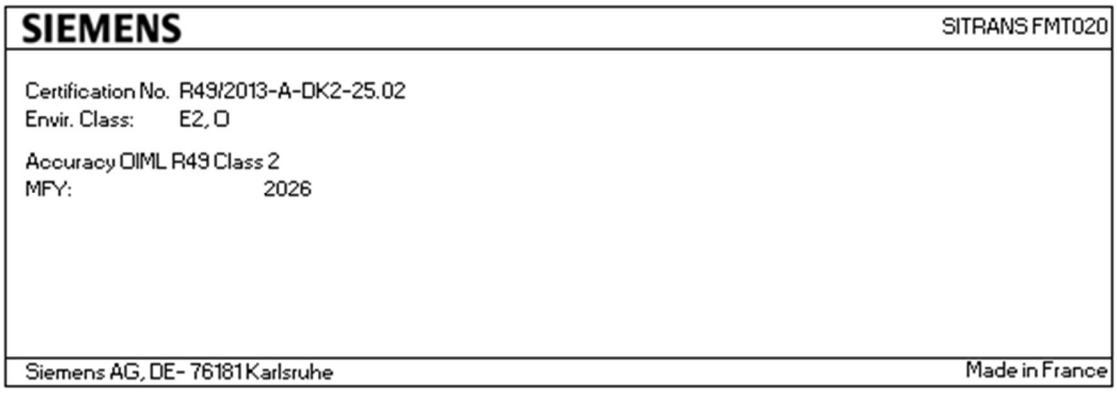
Labelling examples

Sensor labels



Transmitter labels





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Security measures

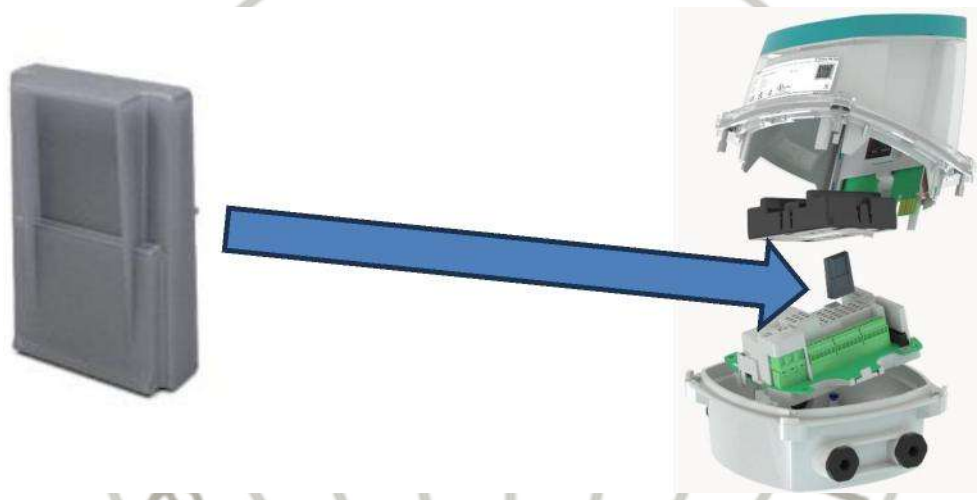
Parameter protection mechanism

Device configuration

While being produced, FM520 systems will pass several parametrization operations ensuring that the match-pair system, made of a FMS500 sensor and a FMT020 transmitter can ensure CT mode, which supports metrological parameter protection mechanism.

FMS500 sensor parameter protection in SENSORPROM

During sensor production, the SENSORPROM is specifically configured for CT application.



Picture 1 - Programmed SENSORPROM

FMT020 transmitter parameter protection in EEPROM

During transmitter production, the transmitter is specifically configured for CT application.

Picture 2 - FMT020 transmitter

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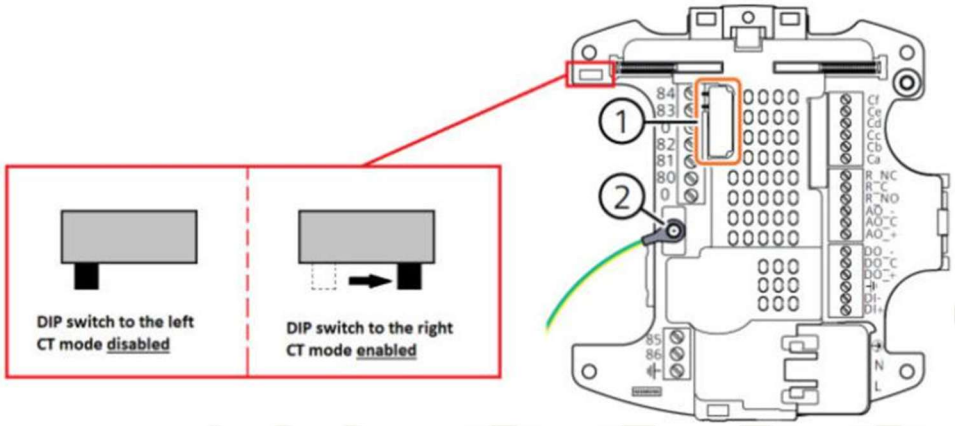
HW switch

CT mode is activated when the CT switch on the PSU is switched to the right side.
The CT switch position is secured with an internal seal.
This CT switch is the physical mean for the user of the system to enter or exit the CT mode.



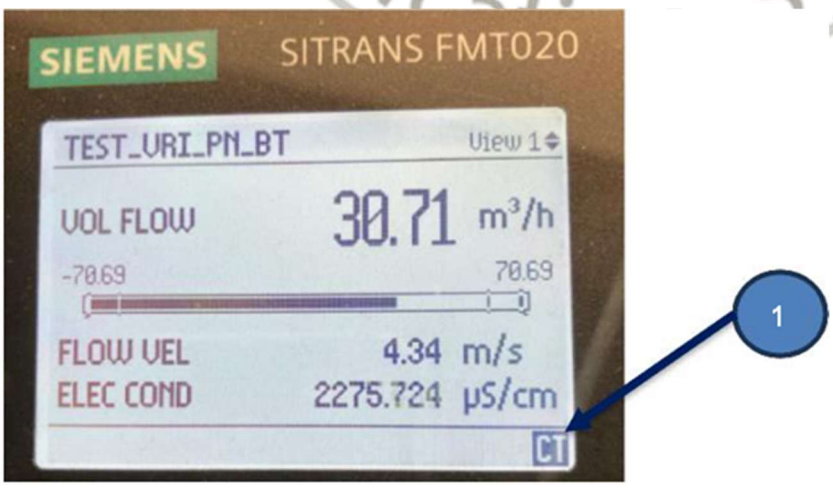
Picture 3 - CT switch on power supply unit

CT mode enabled

The combination of the three following steps allows the system to enter CT mode:

- SENSORPROM programmed for CT purpose
- FMT020 programmed for CT purpose
- CT switch of the PSU positioned to CT mode enabled

When CT mode is enabled a logo (1) on the HMI indicates to the user that the system is running into CT mode. CT mode protects all metrological relevant parameters.



Picture 4 - Identification of CT mode enabled on FMT020 HMI

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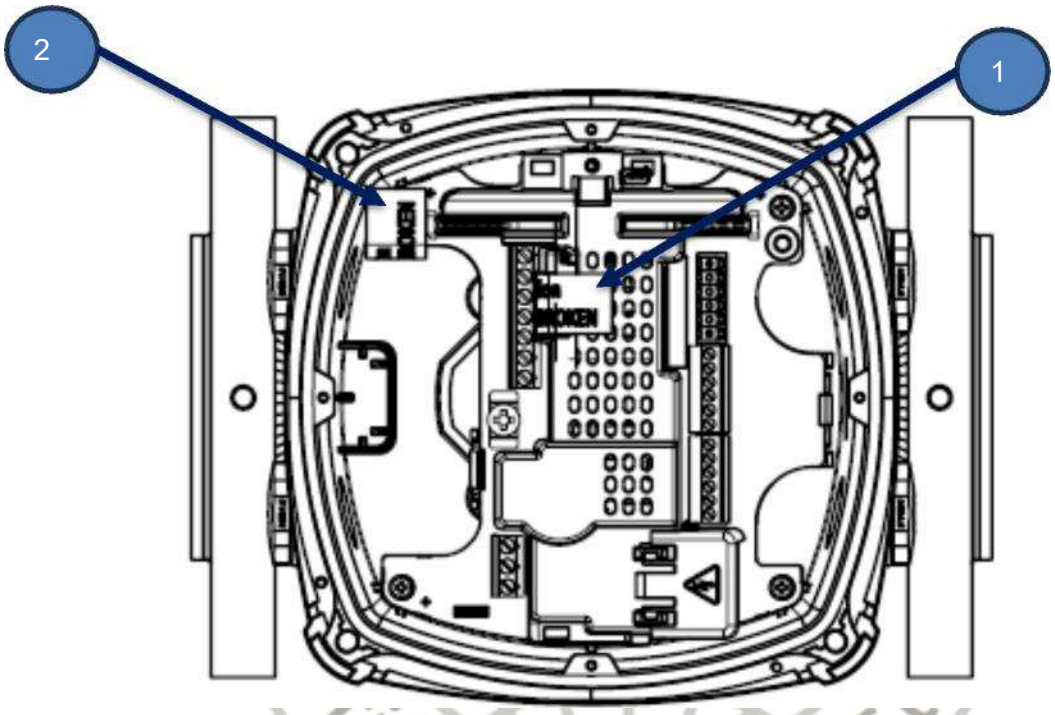
Sealing

Internal sealing – metrological sealings

The internal sealing is carried out at factory to prevent the unauthorized dismantling of the SENSORPROM (1), containing metrological characteristics of the systems.

Another seal is applied to the CT switch and to one fixing screw of the PSU (2) to secure the position of the CT switch and to prevent the disassembly of the PSU from the terminal box.



Picture 5 - Internal sealing securing the SENSORPROM and the CT-switch into the PSU

External sealing – user sealings

FM520 systems are delivered with user sealings. These user sealings are meant to be installed in the field, after commissioning, by an authorized person. These sealings prevent the opening of the enclosure and any replacement of the terminal box by an unauthorized person.

User sealing in remote operation

User sealing in remote operation consists of four seals. Two seals installed on the sensor terminal box (1) prevent access to the sensor connections. Two seals installed on the transmitter prevent unauthorized access to the electronic parts of the system.

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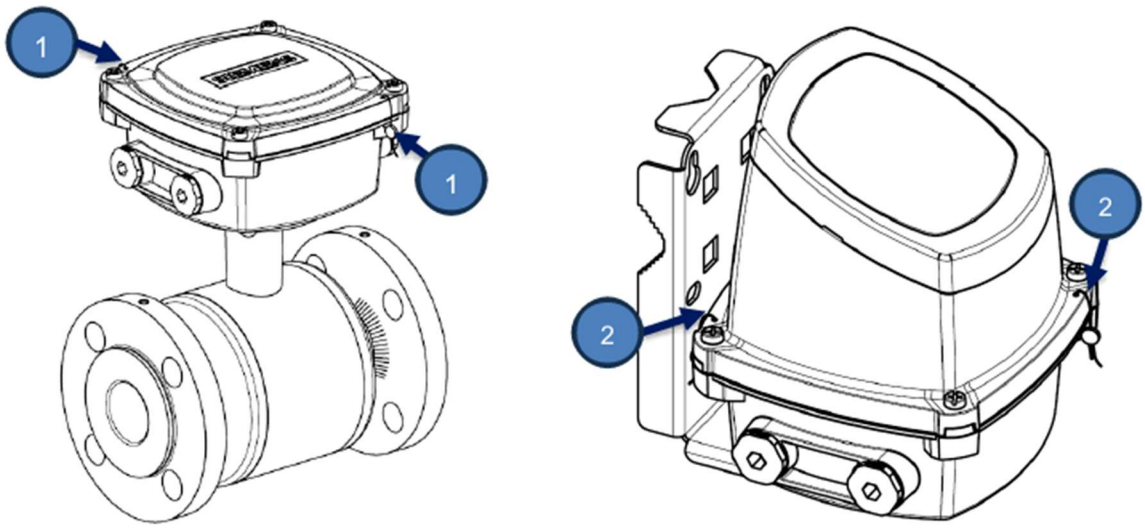
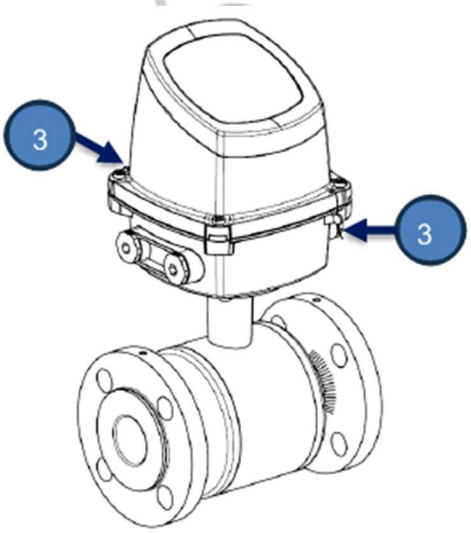


Picture 6 - User sealing in remote operation

User sealing in compact operation

User sealing in compact operation consists of two seals (3), preventing the access to the sensor connections and to the electronic parts of the system.



Picture 7 – User sealing in compact operation

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