JUMO flowTRANS MAG S/H

Electromagnetic flowmeter
for the process industry and hygienic applications

Operating Manual

for device versions 406012 - 406019

40601200T90Z001K000

V5.00/EN/00643278

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1.1 General information and notes for the reader

Before mounting and starting up the unit, this manual must be read carefully.

The manual is an integral part of the product and must be stored for subsequent use. In the interest of clarity, the manual does not contain all the detailed information about all product versions and cannot take into consideration every conceivable case involving the installation, operation or maintenance.

If you would like further information or if problems occur that are not covered by the manual, the required information can be obtained from the manufacturer.

The contents of this manual are not part of or a change to a previous or existing agreement, assurance or legal relationship.

This product is built based on state-of-the-art technology and safe to use. It has been tested and was shipped from the factory in perfect working order. To maintain this condition for its service life, the information contained in these instructions must be observed and followed.

Modifications and repairs to the product may only be performed if expressly permitted by this manual.

Optimum protection of the personnel and the environment and the safe and smooth operation of this product are only ensured by observing all the safety information as well as all safety and warning symbols contained in this manual.

Notes and symbols attached directly on the product must be observed. They may not be removed and must be fully legible at all times.

The symbol on the nameplate refers to:

1.2 Other applicable device documentation

This document "JUMO flowTRANS MAG S/H - Operating Manual for Devices 406012 - 406019" is supplemented by the documents listed below:

Document name	Document type	For devices
JUMO flowTRANS MAG S/H	Ex Safety Manual[a]	406012 - 406019
JUMO flowTRANS MAG S/H	SIL[a] Safety Manual	406012 - 406019

[a] Optional - depending on the device version

IMPORTANT (NOTE)!

The supplementary document "JUMO flowTRANS MAG S/H - Ex Safety Manual for Devices 406012 - 406019" is enclosed with measuring systems used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

IMPORTANT (NOTE)!

The supplementary document "JUMO flowTRANS MAG S/H - SIL Safety Manual for Devices 406012 - 406019" is enclosed with measuring systems with an SIL-certified design (safety integrity level).

The information and data contained in the document must also be strictly observed.

IMPORTANT (NOTE)!

All the documentation, declarations of conformity and certificates are also available in the download area at www.jumo.de.

1 Safety

1.3 Intended use

This device serves the following purposes:

- To transfer liquid, pulpy or pasty measurement media with electrical conductivity
- To measure the flow of the operating volume or measurement units (with constant pressure/temperature) if a physical measuring unit has been selected

Intended use also includes the following points:

- Observing and following the instructions provided in this manual
- Technical limit values must be observed, ⇨ see chapter 1.12 "Technical limit values", page 19
- approved measurement media must be observed, ⇨see chapter 1.13 "Admissible measurement media", page 19

1.4 Improper use

The device may not be used for the following:

- Operation as an elastic compensating piece in pipelines, e.g. for compensating pipe offsets, pipe vibrations, pipe expansions,
- Use as a climbing aid, e.g. for mounting purposes
- Use as a holder for external loads, e.g. as a holder for pipelines
- Applying materials, e.g. by painting over the nameplate or welding or soldering parts
- Removing materials, e.g. by drilling the housing

1.5 Target groups and qualifications

The product may only be installed, started up and maintained by adequately trained qualified personnel who have been authorized by the system operator. The qualified personnel must have read and understood the manual and follow the instructions.

Before using corrosive and abrasive measurement media, the operator must check the degree of resistance of all parts coming into contact with the media. The manufacturer is happy to provide support in selecting the media, but cannot accept any liability.

The operator must observe the national regulations, which apply in the country where the product is used, with regard to the installation, functional inspections, repairs and maintenance of electrical products.

1.6 Warranty conditions

IMPORTANT (NOTE)!

Improper use, failure to observe this manual, the use of underqualified personnel, or unauthorized modifications releases the manufacturer from liability for any resulting damage. In these cases, the manufacturer's warranty no longer applies.

1.7 Symbols and signal words

DANGER – Serious damage to health/risk to life!

This symbol in connection with the signal word "Danger" indicates an imminent threat of danger. Failure to observe the safety information results in death or serious injuries.

DANGER – Serious damage to health/risk to life!

This symbol in connection with the signal word "Danger" indicates an imminent threat of danger due to electric current. Failure to observe the safety information results in death or serious injuries.

WARNING – Personal injuries!

This symbol in connection with the signal word "Warning" indicates a potentially dangerous situation. Failure to observe the safety information may result in death or serious injuries.

WARNING – Personal injuries!

This symbol in connection with the signal word "Warning" indicates a potentially dangerous situation due to electric current. Failure to observe the safety information may result in death or serious injuries.

CAUTION – Minor injuries!

This symbol in connection with the signal word "Caution" indicates a potentially dangerous situation. Failure to observe the safety information may result in minor or moderate injuries. It may also be used for warnings against property damage.

CAUTION – Property damage!

This symbol indicates a potentially harmful situation. Failure to observe the safety information may damage or destroy the device and/or other system parts.

IMPORTANT (NOTE)!

This symbol indicates user tips, particularly useful or important information about the device; or its additional uses. This is not a signal word for a dangerous or harmful situation.

IMPORTANT (NOTE)!

This symbol is used in tables and indicates that further information is provided after the table.

DISPOSAL!

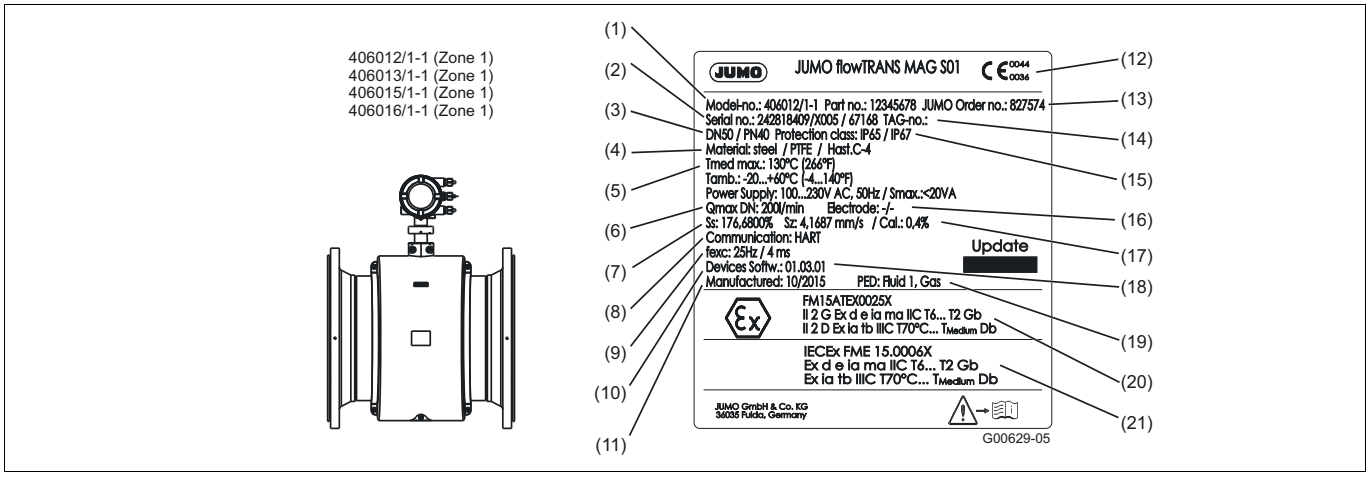
At the end of its service life, the device and any batteries present do not belong in the trash! Please ensure that they are **disposed of** properly and in an **environmentally friendly** manner.

1.7.1 Nameplate

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.



(1) Model number (for technical version details, see data sheet or order confirmation)

(2) Serial number for identification by the manufacturer

(3) Nominal width and nominal pressure levels

(4) Material: flange/lining/electrode

(5) T_{med} = Maximum admissible measurement medium temperature
T_{amb} = Maximum admissible ambient temperature

(6) Calibration value Qmax DN

(7) Calibration value Ss (range)
Calibration value Sz (zero point)

(8) Transmitter communication protocol

(9) Excitation frequency of the sensor coils

(10) Software version

(11) Year of construction

(12) CE mark

(13) Order number

(14) Customer-specific TAG number (if provided)

(15) Protection type according to DIN EN 60529

(16) Additional information: EE = Grounding electrodes, TFE = Partial filling electrode

(17) Accuracy with which the device was calibrated (e.g. 0.2 % of the measured value)

(18) Revision status (xx.xx.xx)

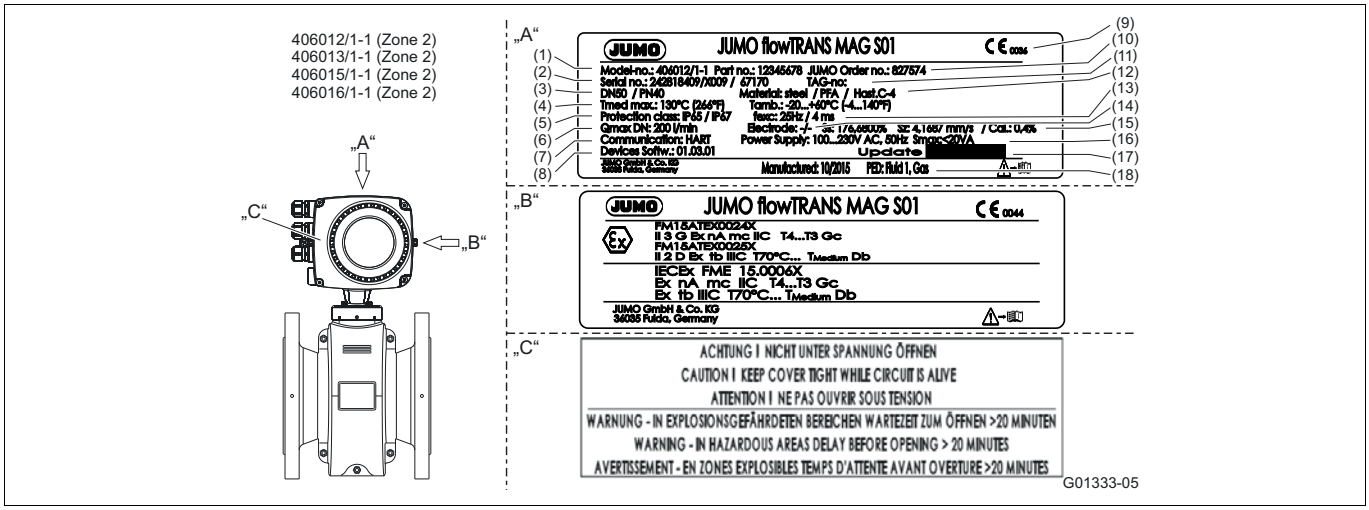
(19) Identification marking indicating whether the pressure device falls within the scope of the Pressure Equipment Directive.[a]Specification of the fluid group taken into consideration.
Fluid group 1 = Dangerous fluids, liquid, gaseous (Pressure Equipment Directive = PED)
If the pressure device is outside the scope of the Pressure Equipment Directive[a], the classification is carried out in the SEP (Sound Engineering Practice) category according to Art. 3 Para. 3 of the PED.
If the details are completely missing, then conformity with the requirements of the Pressure Equipment Directive[a] is not given. The exception for water networks and connection equipment parts according to guideline 1/16 to art. 1. para. 3.2 of the Pressure Equipment Directive applies.

(20) Ex identification marking according to ATEX (example)

(21) Ex identification marking according to IECEx (example)

[a] Pressure Equipment Directive (PED) 2014/68/EU (Mod. B+D).

1 Safety



A Nameplate

(1) Model number (for technical version details, see data sheet or order confirmation)

(2) Serial number for identification by the manufacturer

(3) Nominal width and nominal pressure levels

(4) T_{med} = Maximum admissible measurement medium temperature
T_{amb} = Maximum admissible ambient temperature

(5) Protection type according to DIN EN 60529

(6) Calibration value Qmax DN

(7) Transmitter communication protocol

(8) Software version

(9) CE mark

(10) Order number

(11) Customer-specific TAG number (if provided)

(12) Material: flange/lining/electrode

(13) Excitation frequency of the sensor coils

(14) Additional information: EE = Grounding electrodes, TFE = Partial filling electrode
Calibration value Ss (range)
Calibration value Sz (zero point)

(15) Accuracy with which the device was calibrated (e.g. 0.4 % of the measured value)

(16) Voltage supply

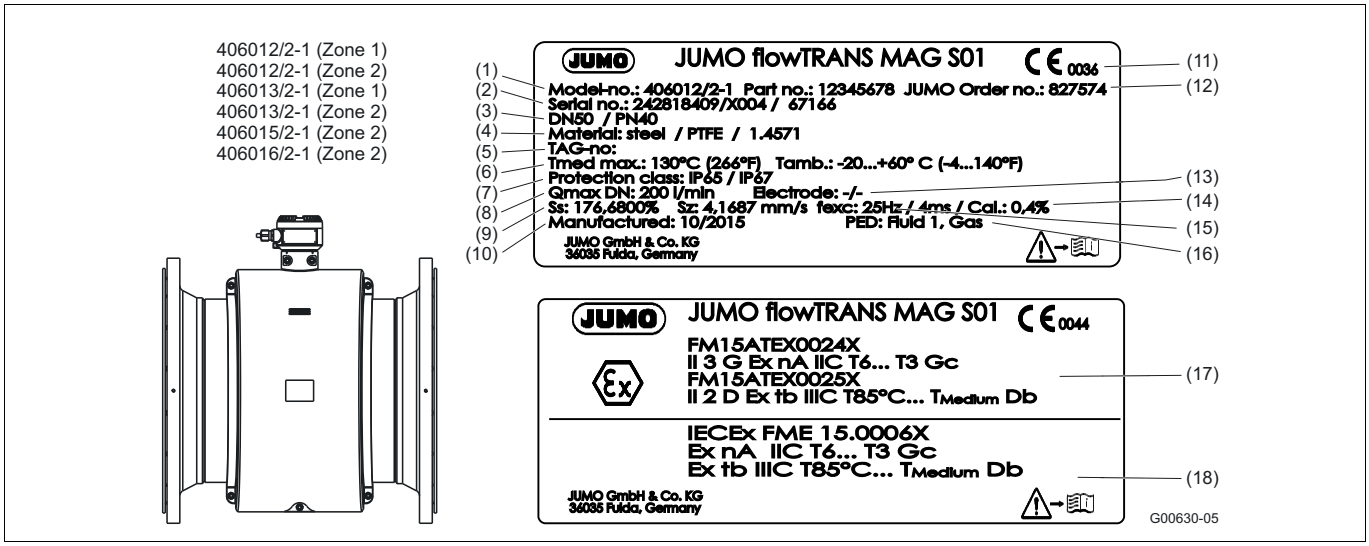
(17) Year of construction

(18) Identification marking indicating whether the pressure device falls within the scope of the Pressure Equipment Directive.[a]Specification of the fluid group taken into consideration.
Fluid group 1 = Dangerous fluids, liquid, gaseous (Pressure Equipment Directive = PED)
If the pressure device is outside the scope of the Pressure Equipment Directive[a], the classification is carried out in the SEP (Sound Engineering Practice) category according to Art. 3 Para. 3 of the PED.
If the details are completely missing, then conformity with the requirements of the Pressure Equipment Directive[a] is not given. The exception for water networks and connection equipment parts according to guideline 1/16 to art. 1. para. 3.2 of the Pressure Equipment Directive applies.

W Ex identification marking according to ATEX and IECEx (example)

C Safety plate

[a] Pressure Equipment Directive (PED) 2014/68/EU (Mod. B+D).



(1) Model number (for technical version details, see data sheet or order confirmation)

(2) Serial number for identification by the manufacturer

(3) Nominal width and nominal pressure levels

(4) Material: flange/lining/electrode

(5) Customer-specific TAG number (if provided)

(6) T_{med} = Maximum admissible measurement medium temperature
T_{amb} = Maximum admissible ambient temperature

(7) Protection type according to DIN EN 60529

(8) Calibration value Qmax DN

(9) Calibration value Ss (range)
Calibration value Sz (zero point)

(10) Year of construction

(11) CE mark

(12) Order number

(13) Additional information: EE = Grounding electrodes, TFE = Partial filling electrode

(14) Accuracy with which the device was calibrated (e.g. 0.4 % of the measured value)

(15) Excitation frequency of the sensor coils

(16) Identification marking indicating whether the pressure device falls within the scope of the Pressure Equipment Directive.[a]Specification of the fluid group taken into consideration.

Fluid group 1 = Dangerous fluids, liquid, gaseous (Pressure Equipment Directive = PED)

If the pressure device is outside the scope of the Pressure Equipment Directive[a], the classification is carried out in the SEP (Sound Engineering Practice) category according to Art. 3 Para. 3 of the PED.

If the details are completely missing, then conformity with the requirements of the Pressure Equipment Directive[a] is not given. The exception for water networks and connection equipment parts according to guideline 1/16 to art. 1. para. 3.2 of the Pressure Equipment Directive applies.

(17) Ex identification marking according to ATEX (example)

(18) Ex identification marking according to IECEx (example)

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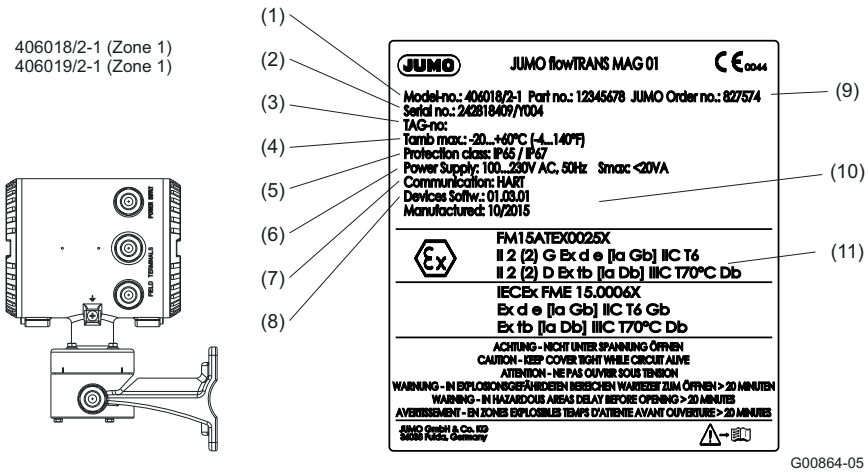
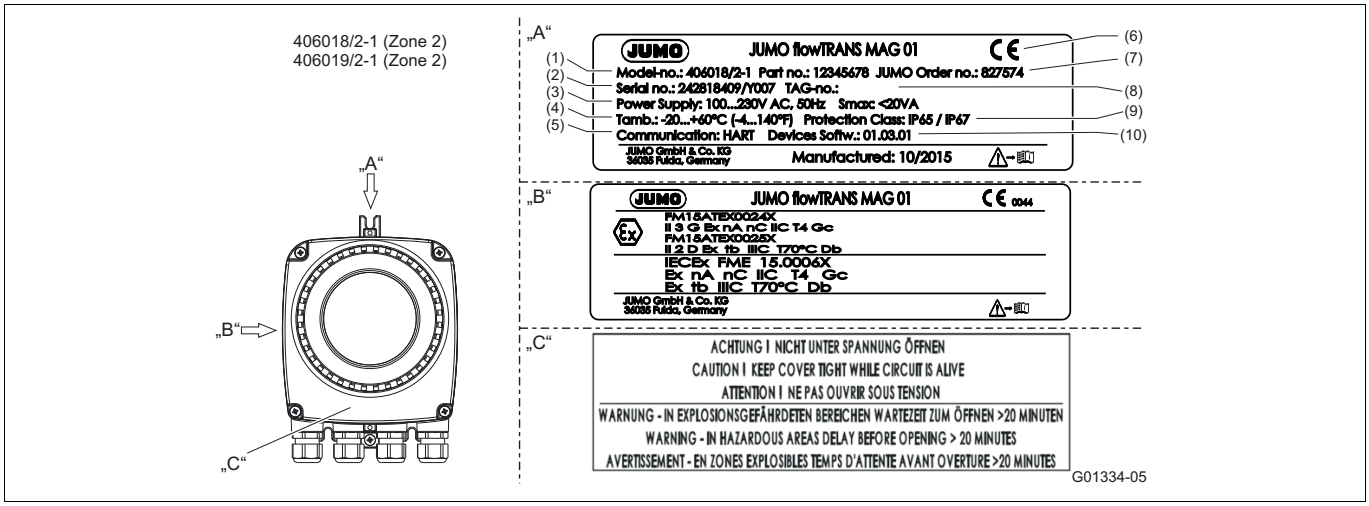
1 Safety



(1) Model number (for technical version details, see data sheet or order confirmation)
(2) Serial number for identification by the manufacturer
(3) Customer-specific TAG number (if provided)
(4) T_{amb} = Maximum admissible ambient temperature
(5) Protection type according to DIN EN 60529
(6) Voltage supply
(7) Transmitter communication protocol
(8) Software version
(9) Order number
(10) Revision status (xx.xx.xx)
(11) Ex identification marking according to ATEX (example)



A Nameplate

(1) Model number (for technical version details, see data sheet or order confirmation)

(2) Serial number for identification by the manufacturer

(3) Voltage supply

(4) T_{amb} = Maximum admissible ambient temperature

(5) Transmitter communication protocol

(6) CE mark

(7) Order number

(8) Customer-specific TAG number (if provided)

(9) Protection type according to DIN EN 60529

(10) Software version

W Ex identification marking according to ATEX and IECEx (example)

C Safety plate

1.8 Transport safety information

Depending on the device, the unit may have an eccentric center of gravity.

The mounted protective screens or protective caps on the process connections for PTFE/PFA-lined devices may only be removed immediately prior to installation. Make sure that the lining on the flange is not cut or damaged here to avoid possible leaks.

1.9 Safety information for mounting

Observe the following notes:

- The flow direction must match the identification marking on the device ⇨ see chapter 4.3.1 "Flow direction", page 41.
- the maximum torque for all flange screws must not be exceeded, ⇨ see chapter 4.2 "Tightening torques", page 35
- Install the devices without any mechanical tension (torsion, bending)
- Install the flanged/connection flange devices with plane-parallel counterflanges
- Only install devices for the designated operating conditions and with suitable seals
- In the event of pipeline vibrations, lock the flange nuts and bolts

1.10 Safety information for the electrical installation

The electrical connection must only be established by authorized qualified personnel according to the electrical diagrams.

Observe the notes in the manual concerning the electrical connection. Otherwise, the electrical protection rating may be adversely affected.

The flow measuring system and the transmitter housing must be grounded.

The voltage supply line is installed according to the applicable national and international standards.

A separate fuse must be connected upstream in close proximity to each unit, and must be marked accordingly. The nominal current of the circuit breaker must not exceed 16 A.

The device protection rating is I and the overvoltage category is II (IEC 664).

The voltage supply and the electrical circuit for the sensor coils are electrical circuits that are dangerous to touch.

The coil and signal circuit may only be connected with the corresponding sensors from the manufacturer. The supplied cable must be used.

Only electrical circuits that do not pose a contact risk can be connected to the other signal inputs and outputs.

1.11 Safety information for operation

WARNING – Personal injuries!

Bacteria and chemical substances can contaminate or pollute pipeline systems and their materials.

When hot fluids flow through the unit, contact with the surface may result in burns.

Aggressive or corrosive fluids can cause damage to parts in contact with the medium. Pressurized fluids can escape prematurely due to this.

Flange seal or process connection seal fatigue (e.g., aseptic compression fitting, Tri-Clamp, etc.) can allow pressurized medium to escape.

When using internal flat seals, these can become brittle due to the CIP/SIP processes.

If pressure surges that exceed the device's admissible nominal pressure occur continuously during operation, it can adversely affect the device's operating life.

1.12 Technical limit values

The device is only designed for use within the technical limit values specified on the nameplate and in the data sheets.

The following technical limit values must be observed:

- The admissible operating pressure (PS) and the admissible temperature (TS) must not exceed the pressure temperature ratings (p/T ratings).
- The maximum operating temperature must not be exceeded
- The admissible ambient temperature must not be exceeded
- The housing protection type must be observed during use.
- The sensor must not be operated in the vicinity of powerful electromagnetic fields, e.g. motors, pumps, transformers, etc. A minimum clearance of approx. 1 m (3.28 ft) must be maintained. When mounting units on or to steel parts (e.g. steel brackets), a minimum clearance of 100 mm (3.94 inches) must be maintained (these values were determined based on IEC 801-2 and IEC TC77B).

1.13 Admissible measurement media

When using measurement media, the following points must be observed

- Measurement media (fluids) may only be used if it can be ensured through state-of-the-art technology or the operating experience of the operator that the chemical and physical properties, which are necessary to ensure operational security, of the transmitter parts (measuring electrode or grounding electrodes, lining or connection parts or protective screen or protective flange) that come into contact with the media are not affected during their service life.
- Measurement media with unknown properties or abrasive measurement media may only be used if the operator can perform regular and suitable tests to ensure the safe condition of the device.
- The specifications on the nameplate must be observed.

1.14 Safety information for inspections and maintenance

WARNING – Danger to persons!

When the case lid is open, the EMC and touch protection are disabled. The housing contains electrical circuits that are dangerous when touched. For this reason, the voltage supply must be switched off before opening the case lid.

WARNING – Danger to persons!

The inspection screw (for draining condensate liquid) with devices ≥ DN 450 may be pressurized. Spouting medium can cause serious injuries.

Depressurize the pipeline before opening the inspection screw.

Maintenance work may only be performed by trained personnel.

- Before removing the device, depressurize the device and if necessary, the adjacent lines or containers.
- Before opening the device, check whether hazardous materials were used as a measurement medium. There may be dangerous residual quantities in the device, which can leak when opened.
- If required as part of the operator's responsibility, the following points must be checked through regular inspections:
  - The pressure-retaining walls/lining of the pressure device
  - The measurement technology function
  - The leak-tightness
  - The wear (corrosion)

1.15 Returning devices

The following applies for returning devices for repairs or recalibration:

- Use the original packaging or suitably secure shipping containers
- Enclose the completed accompanying repair form with the device

The following also applies to devices that have come into contact with hazardous materials:

- Enclose the completed accompanying repair form and the declaration of decontamination with the device

IMPORTANT (NOTE)!

According to EC guidelines for hazardous materials, the owner of hazardous waste is responsible for its disposal or must observe the following regulations when shipping:

All devices delivered to the manufacturer must be free of any hazardous materials (acids, alkalis, solvents, etc.).

The hazardous materials must be rinsed out from all hollow spaces, such as between the measuring pipe and housing, and neutralized. With sensors > DN 400, the service screw (for draining condensate fluid) at the lower point of the housing must be opened to dispose of the hazardous materials and/or neutralize the coil and electrode chamber.

These measures must be confirmed in writing in the declaration of decontamination.

Return address and documents

IMPORTANT (NOTE)!

All documents important for the return as well as the return address of the manufacturer are available at http://reparaturdienst.jumo.info.

1.16 Integrated management system

The manufacturer has an integrated management system consisting of:

- Quality management system ISO 9001:2008
- Environmental management system ISO 14001:2004 + Cor1:2009
- Energy management system ISO 50001:2011

This environmental approach is part of our corporate policy.

The impact to the environment and humans is to be kept as low as possible during the manufacturing, storage, transport, use, and disposal of our products and solutions.

In particular, this includes the sustainable use of natural resources.

1.17 Disposal

This product consists of materials that can be reused by specialized recycling facilities.

Note on the WEEE Directive 2012/19/EU (Waste Electrical and Electronic Equipment)

This product is not subject to the WEEE Directive 2012/19/EU or relevant national laws (e.g., the Electrical Equipment Act [ElektroG] in Germany).

The product must be disposed of at a specialized recycling facility. Do not use a municipal garbage collection site. According to the WEEE Directive 2012/19/EU, only privately used products may be disposed of at municipal garbage facilities. Proper disposal prevents negative impacts on humans and the environment and supports the reuse of valuable raw materials.

ROHS Directive 2011/65/EU

The Electrical and Electronic Equipment Act (ElektroG) in Germany implements the European directives 2012/19/EU (WEEE) and 2011/65/EU (RoHS) into national law. ElektroG defines the products that are subject to regulated collection and disposal or reuse in the event of disposal at the end of their operating life. ElektroG also prohibits the marketing of electrical and electronic equipment that contains certain amounts of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) (also known as prohibited substances).

The products provided by the manufacturer do not fall within the current scope of the prohibited substances or the directive on waste electrical and electronic equipment according to ElektroG. If the necessary components are available on the market at the right time, we will no longer use these substances in developing products in the future.

1 Safety

2.1 Measuring principle

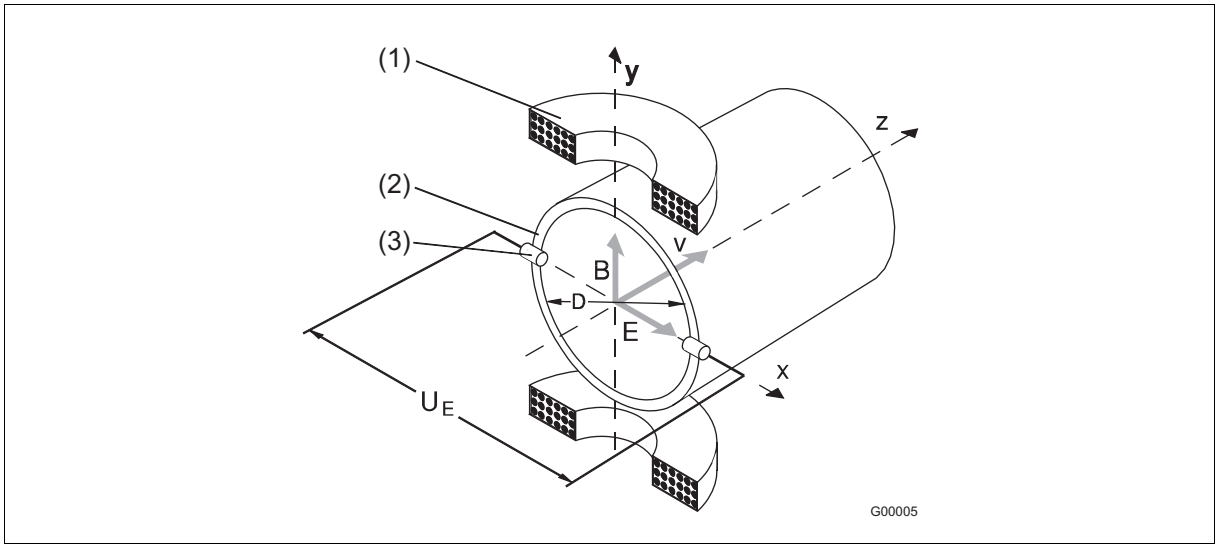
The Faraday Laws of Induction provide the basis for the electromagnetic flowmeter measurement. A voltage is generated in a conductor as it moves through a magnetic field.

When this measuring principle is applied through a device, the conductive measurement medium flows through a pipe in which a magnetic field is generated perpendicular to the flow direction (see figure).

The voltage induced in the measurement medium is tapped by two diametrically arranged electrodes. This measuring voltage V_E is proportional to the magnetic induction B, the electrode gap D as well as the average flow velocity v.

Given the magnetic induction B and the electrode gap D are constant values, it follows that there is a proportionality between the measuring voltage V_E and the average flow velocity v. The calculation of the volumetric flow rate demonstrates that the measuring voltage V_E is linearly proportional to the volumetric flow.

The induced measuring voltage is converted into standardized, analog and digital signals in the transmitter.



(1) Magnet coil
(2) Measuring pipe in the electrode plane
(3) Measuring electrode
V_E Measuring voltage
B Magnetic induction
D Electrode gap
v Mean flow velocity
qv Volume flow rate

$$U_E \sim B \cdot D \cdot v$$

$$qv = \frac{D^2 \pi}{4} \cdot v$$

$$U_E \sim qv$$

2 Design and function

2.2 Device versions

2.2.1 Device designation

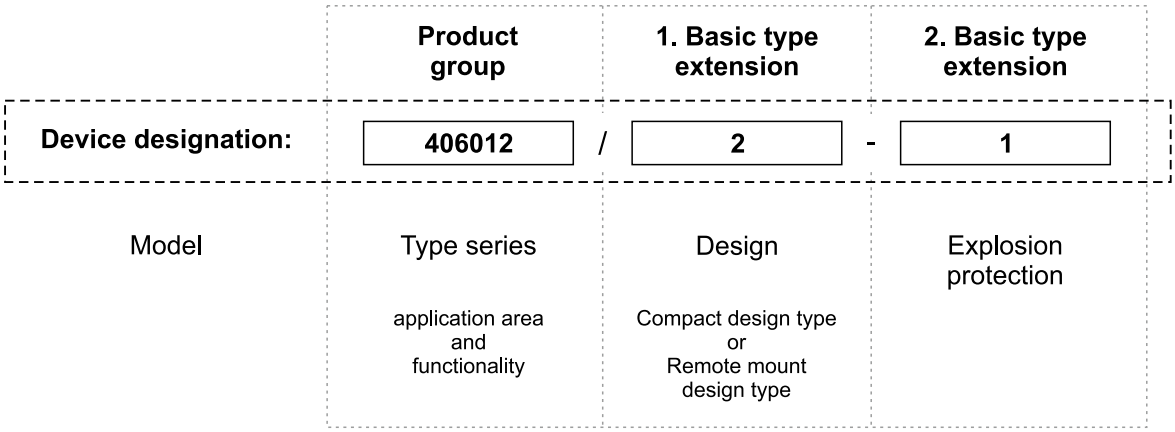
IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

The JUMO flowTRANS MAG devices use a device designation consisting of the six-digit product group number and the 1st and 2nd basic type extensions. The device versions can be distinguished on the basis of the device designation.

Example:



See also: ⇨ Chapter 2.3 ⇨ Chapter 2.4 ⇨ Chapter 2.5

2.3 Type series

This six-digit product group number designates the respective device type series. The device type series are basically distinguished by areas of application (⇨ 2.3.1) and functionalities (⇨ chapter 2.3.2 "Functionalities", page 25).

2.3.1 Areas of application

JUMO flowTRANS MAG electromagnetic flowmeters are deployed in a wide variety of areas of application.

Model	Type series	Area of application
406012	JUMO flowTRANS MAG S01	**Process industry applications** in industries such as chemicals, energy, water/wastewater engineering, oil and gas, pulp and paper, metal industry and mechanical engineering
406013	JUMO flowTRANS MAG S02	
406015	JUMO flowTRANS MAG H01	**Hygiene applications** in the food and pharmaceutical industries
406016	JUMO flowTRANS MAG H02	

2.3.2 Functionalities

JUMO flowTRANS MAG electromagnetic flowmeters are available with basic and advanced functions.

Model	Type series	Functionality
406012	JUMO flowTRANS MAG S01	**Basic functions**
406015	JUMO flowTRANS MAG H01	
406013	JUMO flowTRANS MAG S02	**Basic functions and advanced functions**
406016	JUMO flowTRANS MAG H02	

Basic functions	Model 406012, 406013 JUMO flowTRANS MAG S01/02	Model 406015, 406016 JUMO flowTRANS MAG H01/02
Measuring accuracy 0.4 % (optional 0.2 %) of the measured value	**X**	**X**
Additional software functions Measuring units, editable counters	**X**	**X**
Graphic display Line recorder function	**X**	**X**
Partial filling Detection by partial filling electrode (TFE)	**X**	**-**
Fieldbus PROFIBUS PA, Foundation Fieldbus	**X**	**X**
Verification/Diagnostic tool ScanMaster	**X**	**X**

Advanced functions	Model 406013 JUMO flowTRANS MAG S02	Model 406016 JUMO flowTRANS MAG H02
Measuring accuracy 0.3 % (optionally 0.2 %) of the measured value	**X**	**X**
Batch functions Preselection counter, after-run volume correction, external start/stop, batch end contact	**X**	**X**
Two measuring ranges	**X**	**X**
Diagnostics functions Gas bubble detection, electrode deposit detection, conductivity monitoring, temperature monitoring, fingerprint, trend	**X**	**X**
Hardware options Ceramic carbide lining	**X**	**-**
Tungsten-carbide measuring electrodes	**X**	**-**
Double-layer measuring electrodes	**X**	**-**
DN 1 to DN 2	**-**	**X**
Startup functions Grounding check	**X**	**X**

2 Design and function

2.4 Design

An electromagnetic flowmeter includes a sensor and a transmitter.

The 1st basic type extension in the device designation relates to the design type.

2.4.1 Compact design type

In devices with a compact design, the transmitter and the sensor form a mechanical unit.

The compact design type is indicated by the digit "**1**" in the 1st basic type extension of the device designation.

Examples: 406013/**1**-0, 406015/**1**-1

2.4.2 Remote mount design type

For devices with a remote mount design, the transmitter is mounted at a separate location from the sensor. The sensor is mounted in the respective pipeline, while the transmitter is mounted locally or at a central location. A signal cable is used for the electrical connection between the sensor and the transmitter.

The remote mount design type is indicated by the digit "**2**" in the 1st basic type extension of the device designation.

Examples: 406012/**2**-0, 406019/**2**-1

Combination of sensor and transmitter

In the remote mount design type, the sensor and transmitter combination options are determined by the selected functionalities.

Functionality	**Device combination**	
	Sensor	**Transmitter**
Basic functions	406012, 406015	406018
Advanced functions	406013, 406016	406019

IMPORTANT (NOTE)!

Combination of sensor and transmitter

For remote mount design type devices used in potentially explosive areas, the housing design type (⇨see chapter 2.4.3 "Housing design type", page 27) should also be considered.

⇨See also chapter 6.2 "Notes on combining the sensor and transmitter," page 47 in the "JUMO flowTRANS MAG S/H Safety manual Ex for the devices 406012 - 406019."

2.4.3 Housing design type

JUMO flowTRANS MAG electromagnetic flowmeters are deployed in a wide variety of areas of application. For devices with a remote mount design type, this distinction only relates to the transmitter housing.

Single-compartment housing

For single-compartment housing, the electronics compartment and the terminal compartment are not separated from each other in the transmitter.

Dual-compartment housing

In dual-compartment housing, the electronics compartment and the terminal compartment are separated from each other in the transmitter.

The choice of housing design type is determined by the respective area of application in or outside of potentially explosive areas:

Area of application	Housing design type
Outside the Ex-area	Single-compartment housing
Ex-zone 2	
Ex-zone 1	Dual-compartment housing

The device design type is not reflected in the device designation.

2.5 Explosion protection

JUMO flowTRANS MAG electromagnetic flowmeters are available for use in potentially explosive areas.

The design type for potentially explosive areas is indicated by the digit "**1**" in the 2nd basic type extension of the device designation.

Examples: 406013/1-**1**, 406015/1-**1**

IMPORTANT (NOTE)!

For further information on housing design types for potentially explosive areas⇨ see "JUMO flowTRANS MAG S/H - Safety manual Ex for the devices 406012 - 406019."

The information and data contained in the document must also be strictly observed.

2 Design and function

2.6 Overview of device versions

2.6.1 JUMO flowTRANS MAG S/H - compact design

JUMO flowTRANS MAG S01/S02		
406012/1-0 (without Ex-protection)	**406012/1-1 (Ex-protection zone 2)**	**406012/1-1 (Ex-protection zone 1)**
406013/1-0 (without Ex-protection)	**406013/1-1 (Ex-protection zone 2)**	**406013/1-1 (Ex-protection zone 1)**
Transmitter: Single-compartment housing **Sensor:** Steel housing Aluminum housing 	**Transmitter:** Single-compartment housing **Sensor:** Aluminum housing 	**Transmitter:** Dual-compartment housing **Sensor:** Aluminum housing 
	ATEX/IECEx Gas zone 2 Dust zone 21, 22	**ATEX/IECEx** Gas zone 1 Dust zone 21, 22

JUMO flowTRANS MAG H01/H02		
406015/1-0 (without Ex-protection)	**406015/1-1 (Ex-protection zone 2)**	**406015/1-1 (Ex-protection zone 1)**
406016/1-0 (without Ex-protection)	**406016/1-1 (Ex-protection zone 2)**	**406016/1-1 (Ex-protection zone 1)**
Transmitter: Single-compartment housing 	**Transmitter:** Single-compartment housing 	**Transmitter:** Dual-compartment housing 
	ATEX/IECEx Gas zone 2 Dust zone 21, 22	**ATEX/IECEx** Gas zone 1 Dust zone 21, 22

2.6.2 JUMO flowTRANS MAG S/H - remote mount design

JUMO flowTRANS MAG S01/S02		
406012/2-0 (without Ex-protection)	**406012/2-1 (Ex-protection zone 2)**	**406012/2-1 (Ex-protection zone 1)**
406013/2-0 (without Ex-protection)	**406013/2-1 (Ex-protection zone 2)**	**406013/2-1 (Ex-protection zone 1)**
Sensor: Steel housing Aluminum housing 	**Sensor:** Aluminum housing 	**Sensor:** Aluminum housing 
	ATEX/IEC Gas zone 2 Dust zone 21, 22	**ATEX/IEC** Gas zone 1 Dust zone 21, 22

JUMO flowTRANS MAG 01/02		
406018/2-0 (without Ex-protection)	**406018/2-1 (Ex-protection zone 2)**	**406018/2-1 (Ex-protection zone 1)**
406019/2-0 (without Ex-protection)	**406019/2-1 (Ex-protection zone 2)**	**406019/2-1 (Ex-protection zone 1)**
Transmitter: Single-compartment housing 	**Transmitter:** Single-compartment housing 	**Transmitter:** Dual-compartment housing 
	ATEX/IEC Gas zone 2 Dust zone 21, 22	**ATEX/IEC** Gas zone 1 Dust zone 21, 22

JUMO flowTRANS MAG H01/H02	
406015/2-0 (without Ex-protection)	**406015/2-1 (Ex-protection zone 2)**
406016/2-0 (without Ex-protection)	**406016/2-1 (Ex-protection zone 2)**
Sensor 	**Sensor** 
	ATEX/IEC Gas zone 2 Dust zone 21, 22

JUMO flowTRANS MAG 01/02	
406018/2-0 (without Ex-protection)	**406018/2-1 (Ex-protection zone 2)**
406019/2-0 (without Ex-protection)	**406019/2-1 (Ex-protection zone 2)**
Transmitter: single-compartment housing 	**Transmitter**: single-compartment housing 
	ATEX/IEC Gas zone 2 Dust zone 21, 22

3.1 Checking the delivery

After unpacking the devices, check them immediately for any possible damage that may have occurred due to improper transport.

Transport damage must be documented on the shipment documents.

All claims for damages must be submitted to the shipper immediately and before the installation.

3.2 Transporting flanged devices

3.2.1 Flange devices up to DN 400

WARNING – Risk of injury!

The center of gravity of the entire measuring device may be higher than the two suspension points of the carrying straps. Make sure that the device does not unintentionally rotate or slip during transport. Support the measuring device on the side.

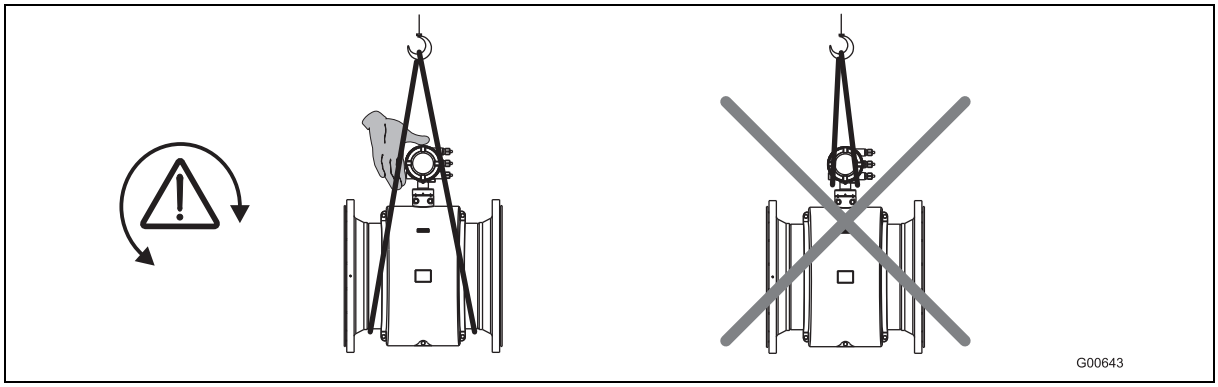
WARNING – Risk of injury!

Do not lift flange devices directly on the connection box or housing centre!

CAUTION – Device damage!

Do not use chains to lift the flange devices!

Use carrying straps to transport flange devices up to and including a nominal width of DN 400. Position the carrying straps around the two process connections to lift the device.



3.2.2 Flange devices greater than DN 400

WARNING – Risk of injury!

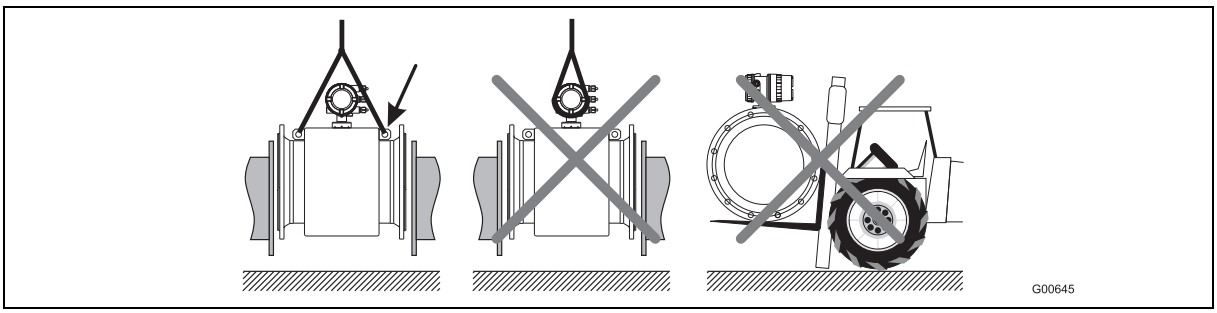
Do not lift flange devices directly on the connection box or housing centre!

CAUTION – Device damage!

- Do not use chains to lift the flange devices!
- Avoid transporting with a forklift!

During transport with a forklift, the housing and the magnetic coils on the inside can be damaged ⇨ see also chapter 3.3.1 "Nominal widths greater than DN 400", page 32.

When transporting flange devices with a nominal width greater than DN 400, always use the lifting eyes attached to the device for lifting and depositing the device in the pipeline.



3.3 Storage

When storing the device, the following points must observed:

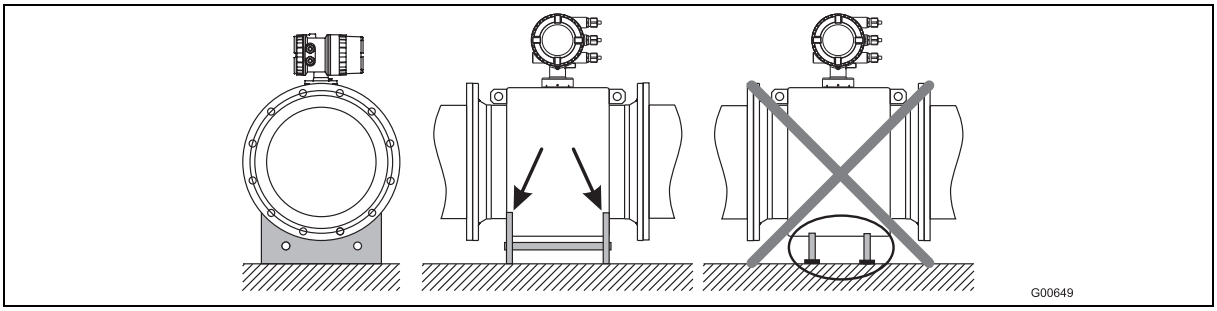
- Store the device in the original packaging at a dry and dust-free location
- Avoid continuous direct sunlight

3.3.1 Nominal widths greater than DN 400

CAUTION – Device damage!

If not supported correctly, the housing and the magnetic coils on the inside can be damaged. Apply the supports to the edge of the housing (see arrows in figure).

Devices with a nominal width greater than DN 400 must be set up on a foundation with a sufficient load-bearing capacity using a support.



IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

4.1 General information

The following points must be observed during installation:

- If a support is required for mounting devices greater than DN 400, then follow the instructions on storage! (⇨ see chapter 3.3.1 "Nominal widths greater than DN 400", page 32)
- The flow direction must match the identification marking if available.
- The maximum torque must be maintained for all flange screws. (⇨ see chapter 4.2 "Tightening torques", page 35)
- Install the devices without any mechanical tension (torsion, bending).
- Fit flange devices with plane-parallel counter-flanges only using the appropriate seals.
- Use a seal made of material compatible with the measurement medium and the measurement medium temperature.
- Seals may not extend into the flow area, since any turbulence affects the device accuracy.
- Pipelines must not exert impermissible forces and torque on the device.
- Only remove the sealing plugs in the cable fittings when installing the electrical cables.
- Make sure that the case lid seals are positioned correctly. Carefully close the lid. Tighten the lid screws hand-tight so that the O-ring is sealed.
- Install the transmitter with a remote mount design at a location that is largely free of vibration. (⇨ see chapter 13.2.7 "Pipe vibration according to EN 60068-2-6", page 185)
- Do not expose the transmitter and sensor to direct sunlight; provide sun protection if necessary.
- Ensure sufficient cooling when mounting the transmitter in a control cabinet. Maximum ambient temperature of the transmitter: 60 °C.
- In devices with a remote mount design and a measuring accuracy of 0.2 % of the measured value, the correct assignment of the sensor and transmitter must be ensured. Devices that belong together are designated with the same last digits, e.g. X001 and Y001 or X002 and Y002, on the nameplate.

4.1.1 Selecting seals

The following notes must be observed when mounting the seals:

Devices with hard rubber, soft rubber or ceramic carbide lining

- Additional seals are always needed for devices with hard/soft rubber or ceramic carbide lining.
- The manufacturer recommends using seals made of rubber or rubber-like sealing materials.
- When selecting seals, make sure that the tightening torque listed in chapter 4.2 "Tightening torques", page 35 is not exceeded.

Devices with PTFE, PFA or ETFE lining

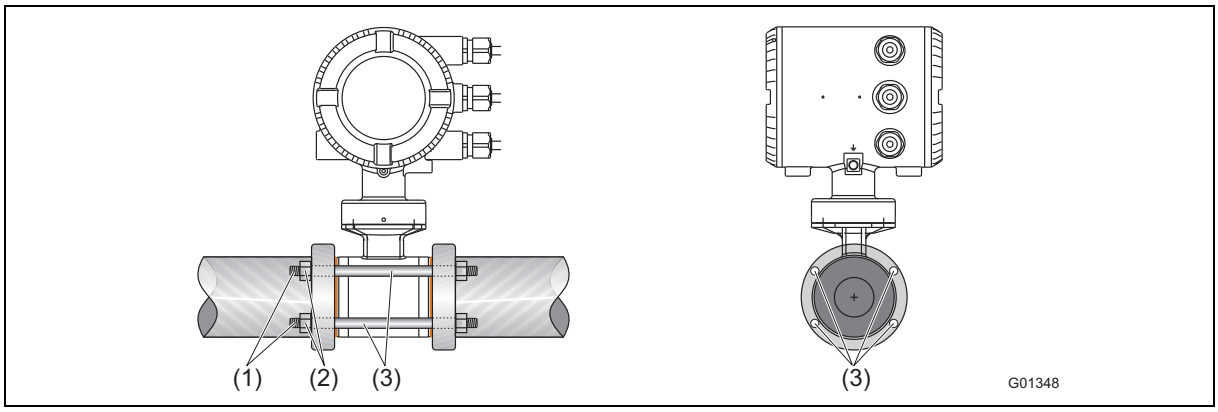
- No additional seals are needed for devices with PTFE, PFA or ETFE lining.

Devices with a connection flange design

- Sensors with a connection flange design are installed without seals directly in the pipeline.

4.1.2 Devices with a wafer design

For mounting devices with a wafer design, the manufacturer offers a mounting set as an accessory consisting of threaded rods, nuts, washers and centering sleeves.



(1) Threaded rod
(2) Nut with washer
(3) Centering sleeves

4.1.3 Installing the measuring pipes

CAUTION – Device damage!

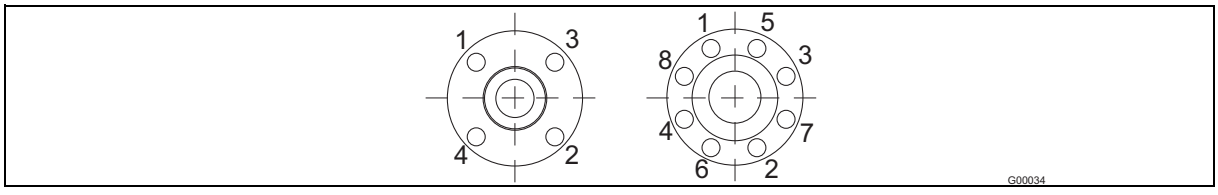
No graphite may be used for the flange or process connection seals, since it may under certain circumstances create an electrically conductive layer inside the measuring pipe.

Due to lining reasons (PTFE lining), vacuum shocks in pipelines should be avoided. They may destroy the device.

Taking the installation conditions into consideration (⇨ see chapter 4.3 "Mounting", page 41), the measuring pipe can be installed at any position in the pipeline.

1. Remove the protective plates, if installed, on the right and left of the measuring pipe. Make sure that the lining on the flange is not cut or damaged here to avoid possible leaks.
2. Set the measuring pipe parallel to the plane and in the center between the pipelines.
3. Insert seals between the surfaces; for this, refer to chapter 4.2 "Tightening torques", page 35.

   To achieve optimum measuring results, it must be ensured that the seals and the measuring pipe are fitted in the center.
4. Use suitable screws in the holes according to chapter 4.2 "Tightening torques", page 35.
5. Lightly grease the threaded bolts.
6. Tighten the nuts crosswise in line with the following figure. Observe tightening torques according to chapter 4.2 "Tightening torques", page 35! Apply 50 % of torque in the first round, 80 % in the second and the maximum torque only in the third round of tightening. Do not exceed the maximum torque!



4.2 Tightening torques

4.2.1 JUMO flowTRANS MAG S/H - Flanged/connection flange design

IMPORTANT (NOTE)!

The specified torques only apply to greased threads and to pipelines that are not under tension.

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 3 to 10[a] (1/10 to 3/8"[a])	PN 40	-	-	12.43	12.43	-	-
	PN 63/100	-	-	12.43	12.43	-	-
	CL150	-	-	12.98	12.98	-	-
	CL300	-	-	17.38	17.38	-	-
	JIS 10K	-	-	12.43	12.43	-	-
DN 15 (1/2")	PN 40	6.74	4.29	14.68	14.68	-	-
	PN 63/100	13.19	11.2	22.75	22.75	-	-
	CL150	3.65	3.65	12.98	12.98	-	-
	CL300	4.94	3.86	17.38	17.38	-	-
	CL600	9.73	9.73	-	-	-	-
	JIS 10K	2.84	1.37	14.68	14.68	-	-
DN 20 (3/4")	PN 40	9.78	7.27	20.75	20.75	-	-
	PN 63/100	24.57	20.42	42.15	42.15	-	-
	CL150	5.29	5.29	18.49	18.49	-	-
	CL300	9.77	9.77	33.28	33.28	-	-
	CL600	15.99	15.99	-	-	-	-
	JIS 10K	4.1	1.88	20.75	20.75	-	-
DN 25 (1")	PN 40	13.32	8.6	13.32	8.6	13.32	8.6
	PN 63/100	32.09	31.42	53.85	53.85	53.85	53.85
	CL150	5.04	2.84	23.98	23.98	23.98	23.98
	CL300	17.31	16.42	65.98	38.91	65.98	38.91
	CL600	22.11	22.11	-	-	-	-
	JIS 10K	8.46	5.56	26.94	26.94	26.94	26.94
DN 32 (1 1/4")	PN 40	27.5	15.01	45.08	45.08	45.08	45.08
	PN 63/100	42.85	41.45	74.19	70.07	74.19	70.07
	CL150	4.59	1.98	29.44	29.44	29.44	29.44
	CL300	25.61	14.22	45.52	45.52	45.52	45.52
	CL600	34.09	34.09	-	-	-	-
	JIS 10K	9.62	4.9	45.08	45.08	45.08	45.08

[a] Connecting flange DIN/EN 1092-1 = DN 10 (3/8"), connecting flange ASME = DN 15 (1/2")

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 40 (1 1/2")	PN 40	30.44	23.71	56.06	56.06	56.06	56.06
	PN 63/100	62.04	51.45	97.08	97.08	97.08	97.08
	CL150	5.82	2.88	36.12	36.12	36.12	36.12
	CL300	33.3	18.41	73.99	73.99	73.99	73.99
	CL600	23.08	23.08	-	-	-	-
	JIS 10K	12.49	6.85	56.06	56.06	56.06	56.06
DN 50 (1 1/2")	PN 40	41.26	27.24	71.45	71.45	71.45	71.45
	PN 63	71.62	60.09	109.9	112.6	109.9	112.6
	CL150	22.33	22.33	66.22	66.22	66.22	66.22
	CL300	17.4	22.33	38.46	38.46	38.46	38.46
	CL600	35.03	35.03	-	-	-	-
	JIS 10K	17.27	10.47	71.45	71.45	71.45	71.45
DN 65 (2 1/2")	PN 16	14.94	8	37.02	39.1	37.02	39.1
	PN 40	30.88	21.11	43.03	44.62	43.03	44.62
	PN 63	57.89	51.5	81.66	75.72	81.66	75.72
	CL150	30.96	30.96	89.93	89.93	89.93	89.93
	CL300	38.38	27.04	61.21	61.21	61.21	61.21
	CL600	53.91	53.91	-	-	-	-
	JIS 10K	14.94	8	37.02	39.1	37.02	39.1
DN 80 (3")	PN 40	38.3	26.04	51.9	53.59	51.9	53.59
	PN 63	63.15	55.22	64.47	80.57	64.47	80.57
	CL150	19.46	19.46	104.6	104.6	104.6	104.6
	CL300	75.54	26.91	75.54	75.54	75.54	75.54
	CL600	84.63	84.63	-	-	-	-
	JIS 10K	16.26	9.65	45.07	47.16	45.07	47.16
DN 100 (4")	PN 16	20.7	12.22	49.68	78.19	49.68	78.19
	PN 40	67.77	47.12	78.24	78.19	78.24	78.19
	PN 63	107.4	95.79	148.5	119.2	148.5	119.2
	CL150	17.41	7.82	76.2	76.2	76.2	76.2
	CL300	74.9	102.6	102.6	102.6	102.6	102.6
	CL600	147.1	147.1	-	-	-	-
	JIS 10K	20.7	12.22	49.68	78.19	49.68	78.19
DN 125 (5")	PN 16	29.12	18.39	61.4	64.14	61.4	64.14
	PN 40	108.5	75.81	123.7	109.6	123.7	109.6
	PN 63	180.3	164.7	242.6	178.2	242.6	178.2
	CL150	24.96	11.05	98.05	98.05	98.05	98.05
	CL300	81.64	139.4	139.4	139.4	139.4	139.4
	CL600	244.1	244.1	-	-	-	-

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 150 (6")	PN 16	46.99	23.7	81.23	85.08	81.23	85.08
	PN 40	143.5	100.5	162.5	133.5	162.5	133.5
	PN 63	288.7	269.3	371.3	243.4	371.3	243.4
	CL150	30.67	13.65	111.4	111.4	111.4	111.4
	CL300	101.4	58.4	123.6	123.6	123.6	123.6
	CL600	218.4	218.4	-	-	-	-
DN 200 (8")	PN 10	45.57	27.4	113	116.9	113	116.9
	PN 16	49.38	33.82	70.42	73	70.42	73
	PN 25	100.6	69.17	109.9	112.5	109.9	112.5
	PN 40	196.6	144.4	208.6	136.8	208.6	136.8
	PN 63	350.4	331.8	425.5	282.5	425.5	282.5
	CL150	49.84	23.98	158.1	158.1	158.1	158.1
	CL300	133.9	78.35	224.3	224.3	224.3	224.3
	CL600	391.8	391.8	-	-	-	-
DN 250 (10")	PN 10	23.54	27.31	86.06	89.17	86.06	89.17
	PN 16	88.48	61.71	99.42	103.1	99.42	103.1
	PN 25	137.4	117.6	166.5	133.9	166.5	133.9
	PN 40	359.6	275.9	279.9	241	279.9	241
	CL150	55.18	27.31	146.1	148.3	146.1	148.3
	CL300	202.7	113.2	246.4	246.4	246.4	246.4
DN 300 (12")	PN 10	58.79	38.45	91.29	94.65	91.29	94.65
	PN 16	122.4	85.64	113.9	114.8	113.9	114.8
	PN 25	180.6	130.2	151.1	106.9	151.1	106.9
	PN 40	233.4	237.4	254.6	252.7	254.6	252.7
	CL150	90.13	50.37	203.5	198	203.5	198
	CL300	333.3	216.4	421.7	259.1	421.7	259.1
DN 350 (14")	PN 10	69.62	47.56	72.49	75.22	72.49	75.22
	PN 16	133.6	93.61	124.9	104.4	124.9	104.4
	PN 25	282.3	204.3	226.9	167.9	226.9	167.9
	CL150	144.8	83.9	270.5	263	270.5	263
	CL300	424.1	252.7	463.9	259.4	463.9	259.4
DN 400 (16")	PN 10	108.2	75.61	120.1	113.9	120.1	113.9
	PN 16	189	137.2	191.4	153.8	191.4	153.8
	PN 25	399.4	366	404	246.7	404	246.7
	CL150	177.6	100	229.3	222.8	229.3	222.8
	CL300	539.5	318.8	635.8	328.1	635.8	328.1
DN 450 (18")	CL150	218.6	120.5	267.3	192.3	267.3	192.3
	CL300	553.8	327.2	660.9	300	660.9	300

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 500 (20")	PN 10	141.6	101.4	153.9	103.5	153.9	103.5
	PN 16	319.7	245.4	312.1	224.8	312.1	224.8
	PN 25	481.9	350.5	477.1	286	477.1	286
	CL150	212.5	116	237.3	230.4	237.3	230.4
	CL300	686.3	411.8	786.8	363.1	786.8	363.1
DN 600 (24")	PN 10	224.7	164.8	238.7	149.1	238.7	149.1
	PN 16	515.1	399.9	496.7	365.3	496.7	365.3
	PN 25	826.2	600.3	750.7	539.2	750.7	539.2
	CL150	356.6	202.8	451.6	305.8	451.6	305.8
	CL300	1188	719	1376	587.4	1376	587.4
DN 700 (28")	PN 10	267.7	204.9	Upon request	Upon request	267.7	204.9
	PN 16	455.7	353.2	Upon request	Upon request	455.7	353.2
	PN 25	905.9	709.2	Upon request	Upon request	905.9	709.2
	CL150	364.1	326.2	Upon request	Upon request	364.1	326.2
	CL300	1241	Upon request	Upon request	Upon request	1241	Upon request
DN 750 (30")	CL150	423.8	380.9	493.3	442	423.8	380.9
	CL300	1886	Upon request	Upon request	Upon request	1886	Upon request
DN 800 (32")	PN 10	391.7	304	Upon request	Upon request	391.7	304
	PN 16	646.4	511.8	Upon request	Upon request	646.4	511.8
	PN 25	1358	1087	Upon request	Upon request	1358	1087
	CL150	410.8	380.9	493.3	380.9	410.8	380.9
	CL300	2187	Upon request	Upon request	Upon request	2187	Upon request
DN 900 (36")	PN 10	387.7	296.3	Upon request	Upon request	387.7	296.3
	PN 16	680.8	537.3	Upon request	Upon request	680.8	537.3
	PN 25	1399	1119	Upon request	Upon request	1399	1119
	CL150	336.2	394.6	511	458.5	336.2	394.6
	CL300	1972	Upon request	1376	587.4	1972	Upon request

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 1000 (40")	PN 10	541.3	419.2	Upon request	Upon request	541.3	419.2
	PN 16	955.5	756.1	Upon request	Upon request	955.5	756.1
	PN 25	2006	1612	Upon request	Upon request	2006	1612
	CL150	654.2	598.8	650.6	385.1	654.2	598.8
	CL300	2181	Upon request	1376	587.4	2181	Upon request
DN 1100 (44")	CL150	749.1	682.6	741.3	345.9	-	-
	CL300	2607	Upon request	Upon request	Upon request	-	-
DN 1200 (48")	PN 6	363.5	Upon request	-	-	-	-
	PN 10	705.9	Upon request	-	-	-	-
	PN 16	1464	Upon request	-	-	-	-
	CL150	815.3	731.6	-	-	-	-
	CL300	3300	Upon request	-	-	-	-
DN 1350 (54")	CL150	1036	983.7	-	-	-	-
	CL300	5624	Upon request	-	-	-	-
DN 1400 (56")	PN 6	515	Upon request	-	-	-	-
	PN 10	956.3	Upon request	-	-	-	-
	PN 16	1558	Upon request	-	-	-	-
DN 1500 (60")	CL150	1284	1166	-	-	-	-
	CL300	6139	Upon request	-	-	-	-
DN 1600 (64")	PN 6	570.5	Upon request	-	-	-	-
	PN 10	1215	Upon request	-	-	-	-
	PN 16	2171	Upon request	-	-	-	-
DN 1800 (72")	PN 6	708.2	Upon request	-	-	-	-
	PN 10	1492	Upon request	-	-	-	-
	PN 16	2398	Upon request	-	-	-	-

Nominal width [mm (inch)]	Nominal pressure levels	Maximum tightening torque (Nm) with lining					
		Hard rubber, soft rubber		PTFE, PFA, ETFE		Ceramic carbide	
		Flange material		Flange material		Flange material	
		Steel	Stainless Steel	Steel	Stainless Steel	Steel	Stainless Steel
DN 2000 (80")	PN 6	857.9	Upon request	-	-	-	-
	PN 10	1840	Upon request	-	-	-	-
	PN 16	2860	Upon request	-	-	-	-

4.2.2 JUMO flowTRANS MAG H - Variable process connections

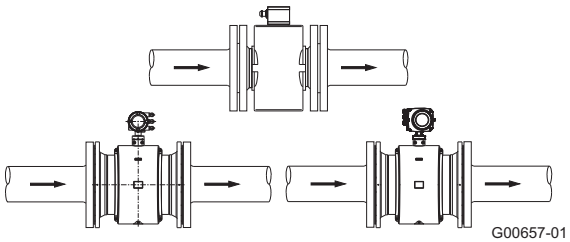
Nominal width in mm (inch)	Maximum tightening torque in Nm
DN 1 to 2 (1/25 to 3/32)	0.2 (for PVC/POM)
	3 (for 1.4571)
DN 3 to 10 (3/8)	8
DN 15 (1/2)	10
DN 20 (3/4)	21
DN 25 (1)	31
DN 32 (1 1/4)	60
DN 40 (1 1/2)	80
DN 50 (2)	5
DN 65 (2 1/2)	5
DN 80 (3)	15
DN 100 (4)	14

4.3 Mounting

4.3.1 Flow direction

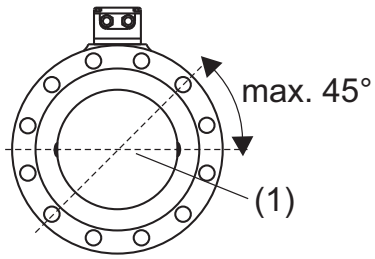
The device records the flow in both directions.
Default setting: forward flow direction
Identification marking:

- Arrow direction on the device
- Alignment of the sensor housing during initial startup (default setting) as displayed on the adjacent figures



4.3.2 Electrode axis

Electrode axis (1) horizontal if possible or rotated max. 45°.



4.3.3 Inlet section, outlet section

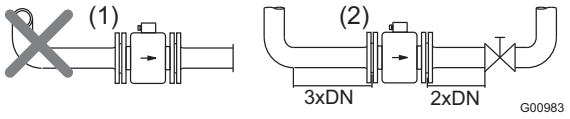
The measuring principle is independent of the flow profile as long as turbulence does not extend into the measurement zone, e.g., downstream from double elbows (1), in case of tangential inflow or where gate valves are partially open upstream of the sensor.

In these cases, measures must be taken to normalize the flow profile.

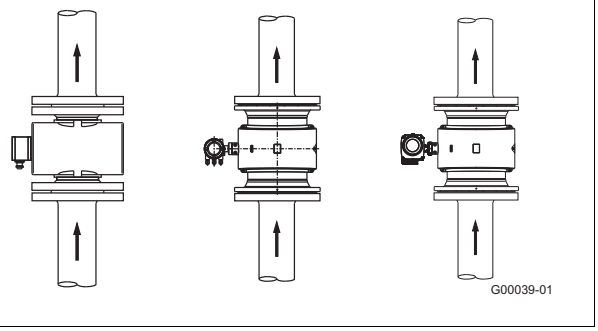
- Do not install fittings, elbows or valves, etc. directly upstream of the sensor (1).
- Flaps must be installed so that the flap blade does not extend into the sensor.
- Valves or other shut-off devices should be mounted in the outlet section (2).

Experience has shown that a straight inlet section 3 x DN and a straight outlet section 2 x DN is sufficient in most cases (DN = nominal width of the transmitter - see the adjacent figure).

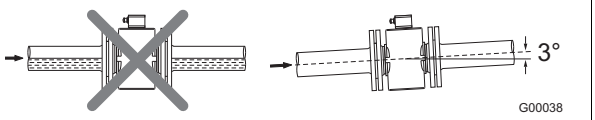
For test stands, the reference conditions of 10 x DN for the straight inlet and 5 x DN for the straight outlet must be provided according to EN 29104/ISO 9104.



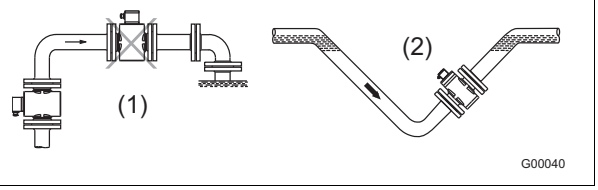
4.3.4 Vertical flow direction

• Vertical installation for measuring abrasive substances, the preferred flow direction is from bottom to top.	

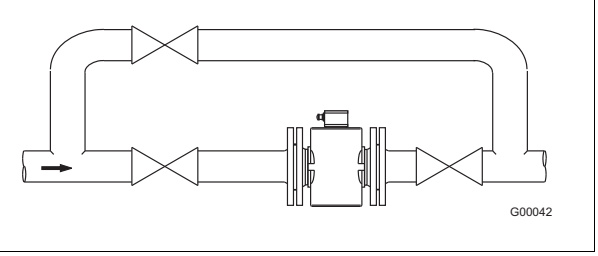
4.3.5 Horizontal flow direction

• Measuring pipe must always be full. • Ensure the line is slightly inclined for degassing.	

4.3.6 Free inlet, free outlet

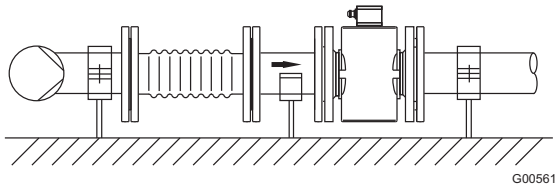
• For a free outlet, do not install the measuring device at the highest point or in the draining side of the pipeline, as the measuring pipe runs empty or air bubbles can form (1). • Provide a culvert (drain) for free inlets or outlets so that the pipeline is always full (2).	

4.3.7 Heavily contaminated measurement media

• We recommend a bypass connection, according to the figure, for heavily contaminated measuring media so that the system can continue operating without any interruptions during mechanical cleaning.	

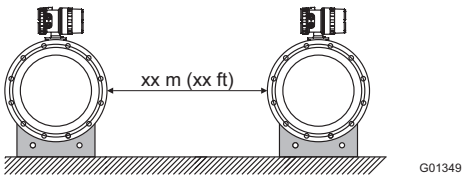
4.3.8 Installation near pumps

- We recommend using mechanical vibration dampers for sensors that are installed near pumps or other equipment generating vibrations.



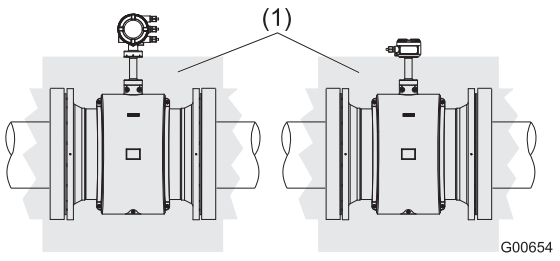
4.3.9 Minimum clearance

- Maintain a minimum clearance of 0.7 m (2.3 ft) between the devices to suppress any mutually interference.



4.3.10 Installation of the high-temperature version

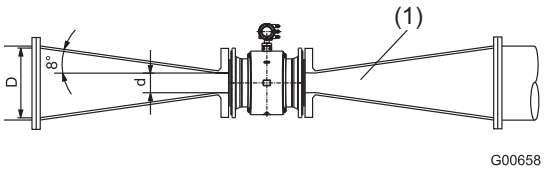
- Complete thermal insulation of the sensor part is required for the high-temperature version. The pipeline and sensor insulation (1) must be implemented as shown in the figure after installing the device.



4.3.11 Installation in pipelines with larger nominal widths

Determine the resulting pressure loss when using reducers (1):

1. Determine the diameter ratio d/D
2. Refer to the flow nomograph for the flow velocity (adjacent figure).
3. Read the pressure loss on the Y-axis in the flow nomogram.



G00658

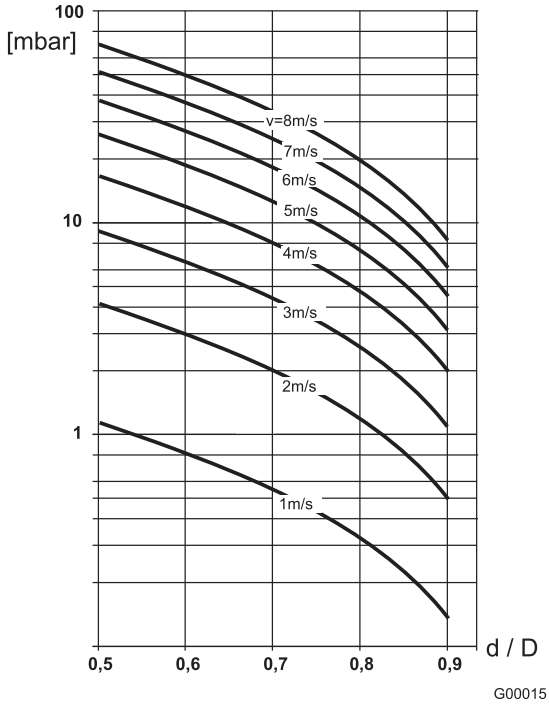
(1) Flange transition piece

(d) Inner diameter of the flowmeter

(D) Inner diameter of the pipeline

Nomograph for pressure loss calculations

For flange transition piece with α/2 = 8°



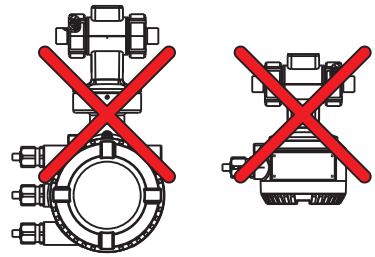
G00015

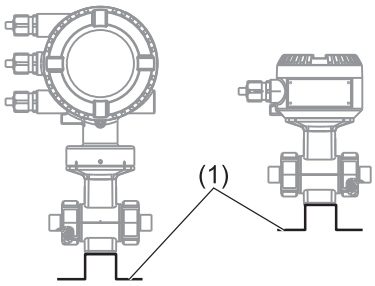
(V) Flow velocity [m/s]

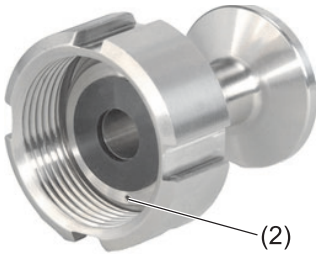
(Δp) Pressure loss [mbar]

4.3.12 3A-compliant mounting

- If concentric reducers are mounted on the device, the device must be installed vertically.
- Do not mount the device with the terminal box or the transmitter case facing down vertically.
- The "mounting bracket" option (1) is not necessary here.
- Make sure that the leakage hole (2) of the process connection is at the lowest point of the installed device.
- When maintaining/replacing seals on 3A-compliant hygienic devices, make sure that 3A-compliant seals are used. The 3A-compliance of the device is not guaranteed in case of failure to comply!







4.3.13 Devices with advanced diagnostics functions

IMPORTANT (NOTE)!

Installation conditions may deviate for devices with advanced diagnostics functions. For further information ⇨see chapter 9 "Advanced diagnostics functions", page 153.

4 Mounting

4.4 Notes on opening and closing the housing

To install, start up and maintain the JUMO flowTRANS MAG devices, it is necessary to open the housing of the sensor or transmitter.

Be sure to observe the following safety instructions before opening and after closing the housing for re-starting:

DANGER – Explosion hazard!

When the case lid is open, the Ex-protection becomes void.
Before opening the housing, de-energize all of the device's connecting cables and wait for at least 20 minutes.

DANGER – Explosion hazard!

Loosening the transmitter housing screws invalidates the Ex-protection. Before re-starting, tighten all screws on the transmitter housing.

WARNING – Personal injuries!

When the housing is open, the EMC protection is limited and the protection against contact becomes void.

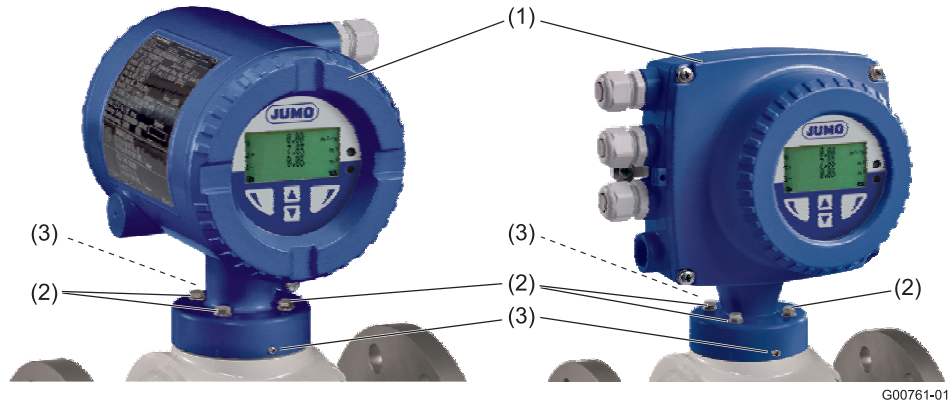
Before opening the housing switch off the voltage supply.

WARNING – Impairment of the housing protection type!

If the seal (O-ring) is not connected properly or damaged, the housing protection type is impaired. Before closing the case lid, check the seal (O-ring) for damage and replace if necessary.

When closing the case lid, make sure the seal is connected properly.

4.4.1 Rotation of the transmitter housing



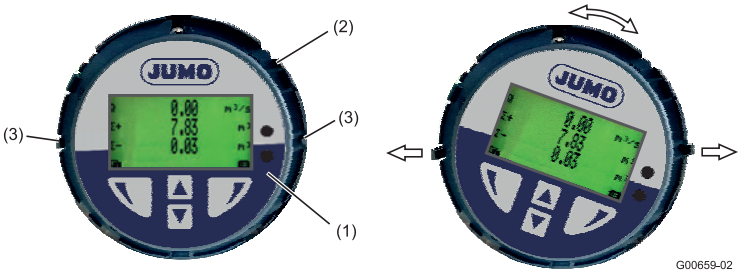
Dual-compartment housing | Single-compartment housing

(1) Transmitter housing
(2) Screw
(3) Allen screw

1. ⇨ Observe chapter 4.4 "Notes on opening and closing the housing", page 46!
2. Loosen the Allen screws (3) on the front and rear, but do not remove them completely.
3. Loosen the screws (2) and rotate the transmitter housing to the left or right by 90°.
4. Before re-starting, tighten all screws (2) and Allen screws (3) on the transmitter housing.

4.4.2 Turning the LCD display

Depending on the installation position, the LCD display or transmitter housing can be rotated to allow for horizontal read-off.



(1) Transmitter with LCD display
(2) Housing for transmitter plug-in module
(3) Rotation lock

1. Switch off voltage supply.
2. Remove case lid⇨ see chapter 11.4.2 "Replacing the transmitter", page 176.
3. Slightly pull back the rotation lock (3) and rotate the transmitter plug-in module with LCD display (1) to the left or right by 90° until the rotation lock (3) locks back into place.
4. Relocate the case lid and screw down tightly before re-starting.

4.5 Grounding

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

4.5.1 General information

IMPORTANT (NOTE)!

If the sensor is installed in plastic or stoneware pipelines or in pipelines with an insulating lining, transient currents may flow through the grounding electrode in special cases (e.g., with corrosive media, acids and lye).

Over the long term, this may destroy the sensor, since the grounding electrode degrades electrochemically. In these cases, the ground must be provided using grounding plates.

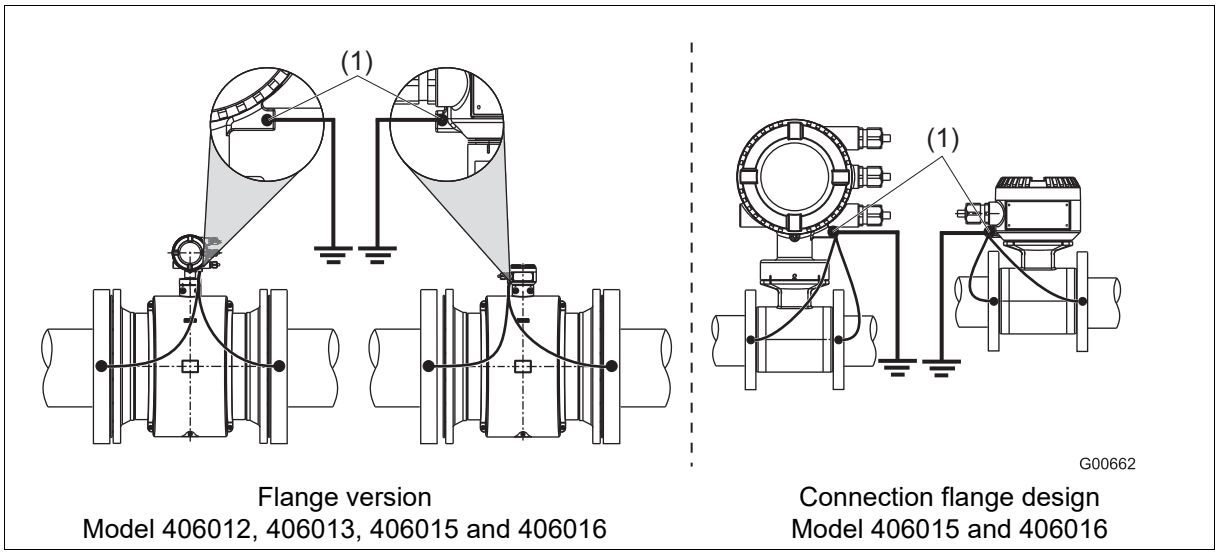
Here, a grounding plate must be installed upstream and downstream of the device.

When grounding the device, the following points must observed:

- For plastic lines or pipelines with insulating lining, the ground is provided by the grounding plate or grounding electrodes.
- If the pipe section is not free from external interference voltages, it is recommended that one grounding washer is fitted upstream and one downstream of the sensor.
- For measurement reasons, the potential of the station ground should be identical to the pipeline potential.
- An additional ground via the connection terminals is not required.

4.5.2 Metal pipe with fixed flanges

Using the example of the dual-compartment transmitter housing



Flange version
Model 406012, 406013, 406015 and 406016

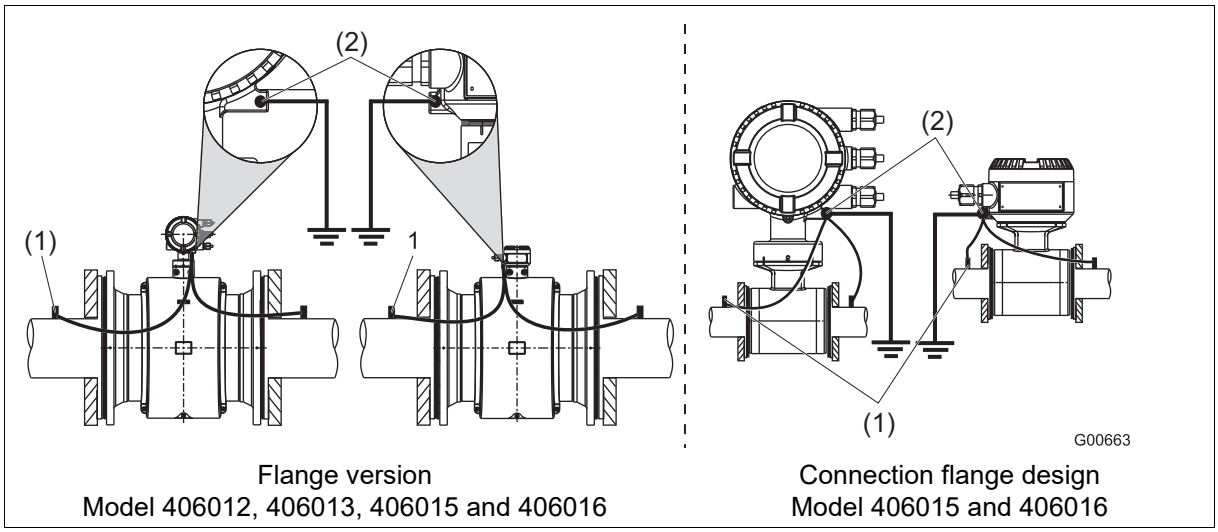
Connection flange design
Model 406015 and 406016

(1) Ground terminal

1. Establish the connection between the ground terminal (1) of the sensor, the pipeline flanges and a suitable grounding point using a copper wire [at least 2.5 mm^2 (14 AWG)] according to the figure.

4.5.3 Metal pipe with loose flanges

Using the example of the dual-compartment transmitter housing



Flange version
Model 406012, 406013, 406015 and 406016

Connection flange design
Model 406015 and 406016

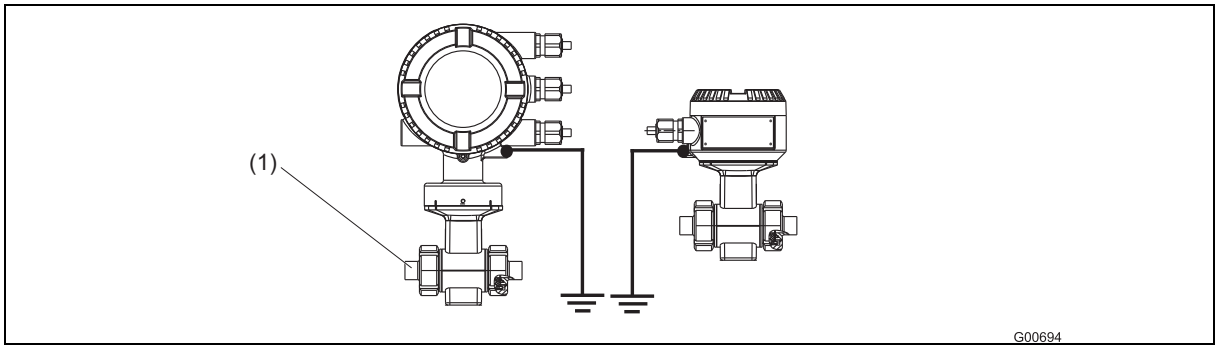
(1) Threaded bolts

(2) Ground terminal

1. Weld the threaded bolts M6 (1) to the pipeline and establish the ground connection as shown in the illustration.
2. Establish the connection between the ground terminal (2) of the sensor and a suitable grounding point using a copper wire [at least 2.5 mm^2 (14 AWG)] according to the figure.

4.5.4 Sensor model 406015 and 406016

Using the example of the dual-compartment transmitter housing



(1) Adapter

The grounding is established as displayed in the figure. The measurement medium is grounded via the adapter (1) so that an additional grounding is not required.

An additional grounding is only required for the "wafer" process connection ⇨ See figures chapter 4.5.2 "Metal pipe with fixed flanges", page 48 and chapter 4.5.3 "Metal pipe with loose flanges", page 49.

4.5.5 Plastic tubes, non-metallic tubes or tubes with insulating lining

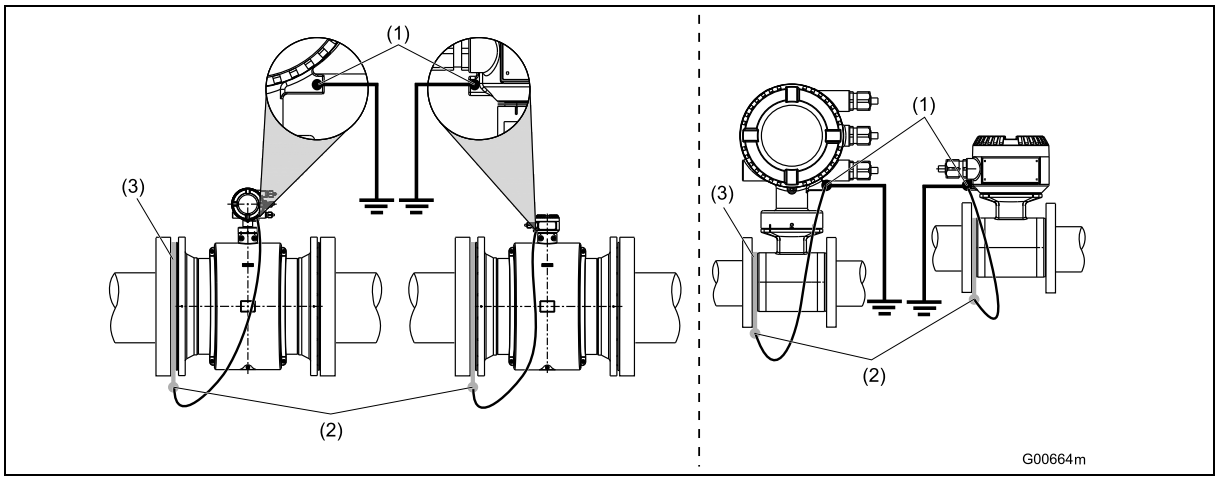
Using the example of the dual-compartment transmitter housing

IMPORTANT (NOTE)!

For plastic lines or pipelines with insulating lining, the measurement medium is to be grounded via the grounding electrodes that must be installed in the device (option).

If the pipe section is not free from external interference voltages, it is recommended that one grounding washer is fitted in front of the sensor and one is fitted behind the sensor.

If grounding electrodes are used, then the grounding washer is not needed.



(1) Ground terminal
(2) Terminal lug
(3) Grounding washer

1. Install the sensor with grounding washer (3) in the pipeline.
2. Connect the terminal lug (2) on the grounding washer (3) and the ground terminal (1) on the sensor with the earth strap.
3. Establish the connection between the ground terminal (1) on the sensor and a suitable grounding point using a copper wire [at least 2.5 mm2 (14 AWG)] according to the figure.

4.5.6 Grounding devices with protection washers

Protection washers provide edge protection for the measuring pipe lining, e.g. in case of abrasive media. Beyond this, they act as grounding washers and need to be electrically connected in the same way.

4.5.7 Grounding with conductive PTFE grounding washer

Optionally, grounding washers made of conductive PTFE are available in the nominal width range DN 10 through 250. Assembly is identical to that of conventional grounding washers.

4.5.8 Devices with advanced diagnostics functions

IMPORTANT (NOTE)!

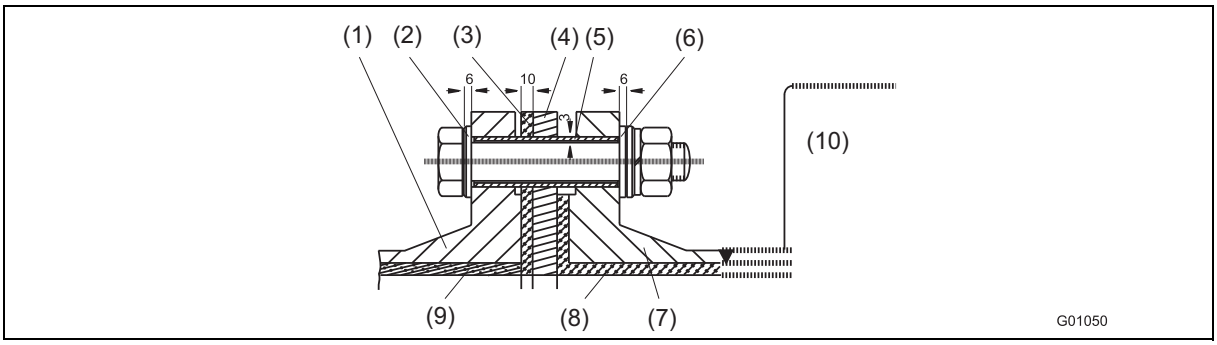
Grounding conditions may deviate for devices with advanced diagnostics functions. For further information ⇨ see chapter 9 "Advanced diagnostics functions", page 153.

4.5.9 Installation and grounding in pipelines with cathodic corrosion protection (CCP)

The installation of electromagnetic flowmeters (EMF) in systems with cathodic corrosion protection must be carried out according to the respective system conditions. In particular, the following factors are crucial here:

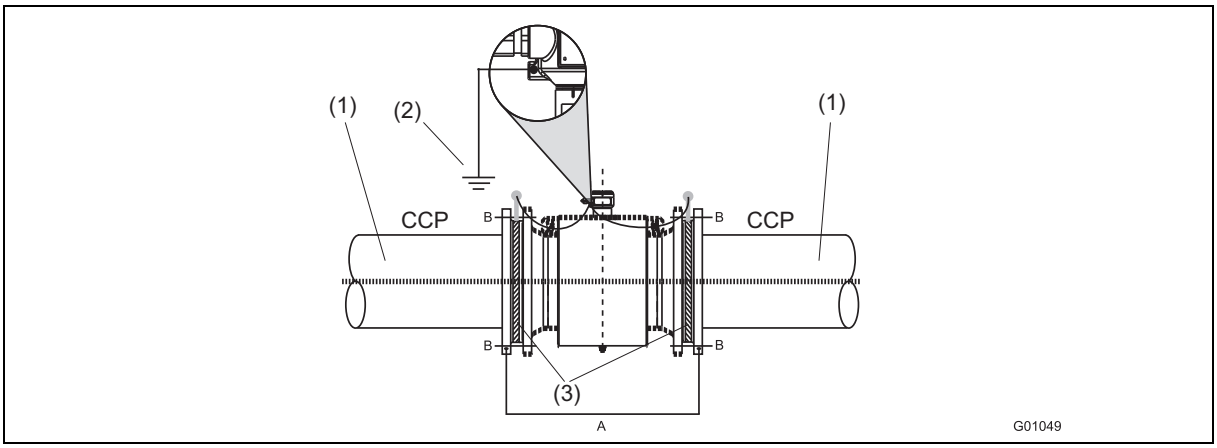
a) Pipelines with an electrically conducting or insulating liner
b) Pipelines completely or largely on CCP potential or mixed systems with areas on CCP potential and such systems on PE potential

Internally insulated pipelines with cathodic protection potential



(1) Pipeline flange
(2) Insulating washer
(3) Seal/insulating ring
(4) Grounding washer
(5) Insulating pipe
(6) Insulating washer
(7) Flange
(8) Lining
(9) Insulation
(10) Sensor

In the case of internally insulated, lined pipes free of external current, the EMF should be installed with grounding washers upstream and downstream of the EMF in the pipeline. The grounding washers must be insulated with respect to the pipeline flange and connected to the sensor and functional ground. The screw bolts for the flange connections must be installed in an insulated manner. Insulating washers and insulating pipe are not included in the scope of delivery. They must be provided by the customer.



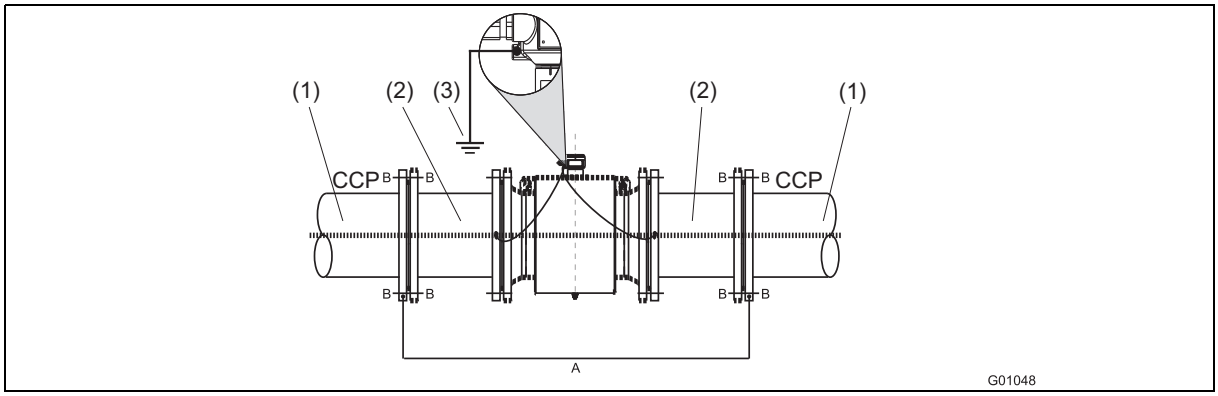
(1) Insulated pipeline
(2) Functional ground
(3) Grounding washer
A Transmitter cable CCP potential ≥ 4 mm^2 Cu, not included in scope of delivery; to be provided by customer
B Insulated screw bolts without grounding washer

The CCP potential must be bypassed by transmitter cable "A" around the insulated sensor.

Mixed system pipeline with CCP and functional ground potentials

This mixed system has an insulated pipeline with CCP potential and a non-insulated metal pipeline (L = 1/4 x sensor nominal width) with functional ground potential upstream and downstream of the sensor. The following figure shows the preferred installation for cathodic corrosion protection systems.

This installation must also be used if rogue external current is anticipated in insulated pipelines (e.g. in the case of long runs in the proximity of power supply equipment).



(1) Insulated pipeline

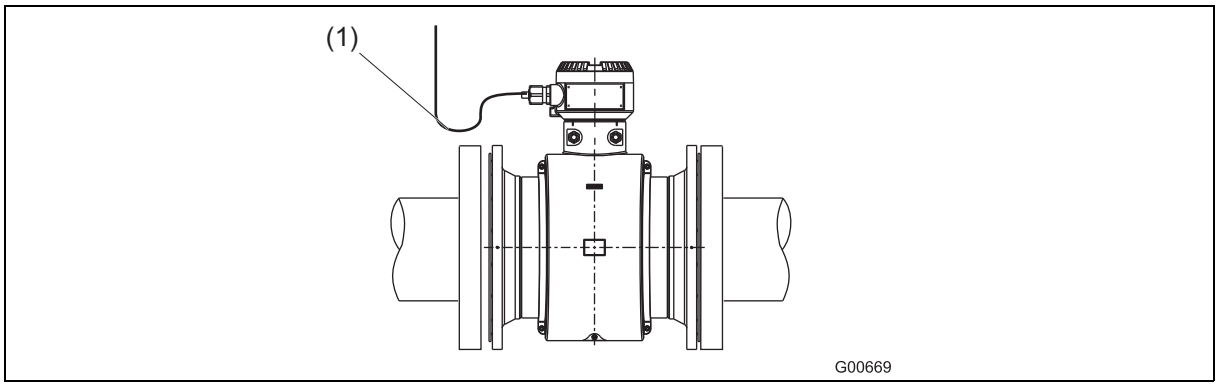
(2) Bare metal pipeline

(3) Functional ground

A Transmitter cable CCP potential ≥ 4 mm^2 Cu, not included in scope of delivery; to be provided by customer

B Insulated screw bolts without grounding washer

5.1 Installing the signal and magnet coil cable



(1) Water trap

Observe the following points when installing cables:

- A magnet coil cable (red and brown) is run parallel to the signal lines (violet and blue) so that only one cable is required between the sensor and the transmitter. Do not route the cable over junction boxes or terminal strips.
- The signal cable carries a voltage signal of only a few millivolts and must therefore be routed over the shortest possible distance. The maximum admissible signal cable length is 50 m (164 ft) without a preamplifier and 200 m (656 ft) with a preamplifier.
- Avoid routing the cable in the vicinity of electrical equipment or switching elements that can create stray fields, switching pulses, and induction. If this is not possible, run the signal and magnet coil cable through a metal pipe and connect it to the station ground.
- All lines must be shielded and connected to the signal ground potential.
- To shield against magnetic interference, the cable contains outer shielding. It is attached to the SE clamp.
- The supplied stranded steel wire is also connected to the SE clamp.
- Do not damage the cable sheathing during installation
- During installation, make sure that the cable is installed with a water trap (1). For vertical installation, align the cable fittings pointing downward.

5 Electrical connection

5.2 Assembling the signal and magnet coil cable - dual-compartment housing

Assemble both cable ends as displayed.

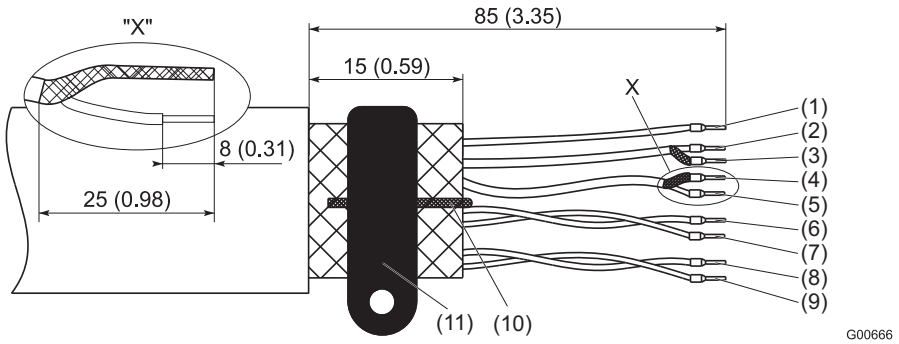
IMPORTANT (NOTE)!

Use ferrules.

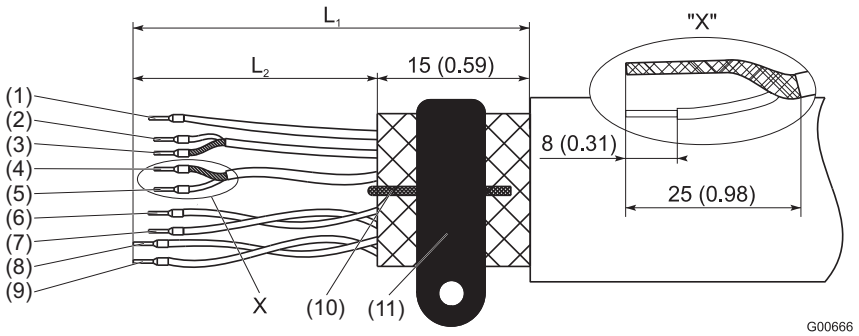
- Ferrules 0.75 mm^2 (AWG 19), for the shielding (1S, 2S)
- Ferrules 0.5 mm^2 (AWG 20) for all other specifications

CAUTION – Property damage!

The shields may not touch. Otherwise, a signal short circuit occurs.



Sensor side, dimensions in mm (inch)



Transmitter side, dimensions in mm (inch)

Description	Description, wire color	Length in mm (inch)
L_1	Maximum stripped length = 105 (4,10)	
(1)	Measurement potential 3, green	L_2 = 70 (2.76)
(2)	Signal line E1, violet	L_2 = 60 (2.36)
(3)	Shield 1S	L_2 = 60 (2.36)
(4)	Shield 2S	L_2 = 60 (2.36)
(5)	Signal line E2, blue	L_2 = 60 (2.36)
(6)	Data line D2, yellow	L_2 = 70 (2.76)
(7)	Data line D1, orange	L_2 = 70 (2.76)
(8)	Magnet coil M2, red	L_2 = 90 (3.54)
(9)	Magnet coil M1, brown	L_2 = 90 (3.54)
(10)	Ground wire, steel	
(11)	SE clamp	

5.3 Assembling the signal and magnet coil cable - single-compartment housing

Assemble the cable end on the transmitter side as displayed in the figure.

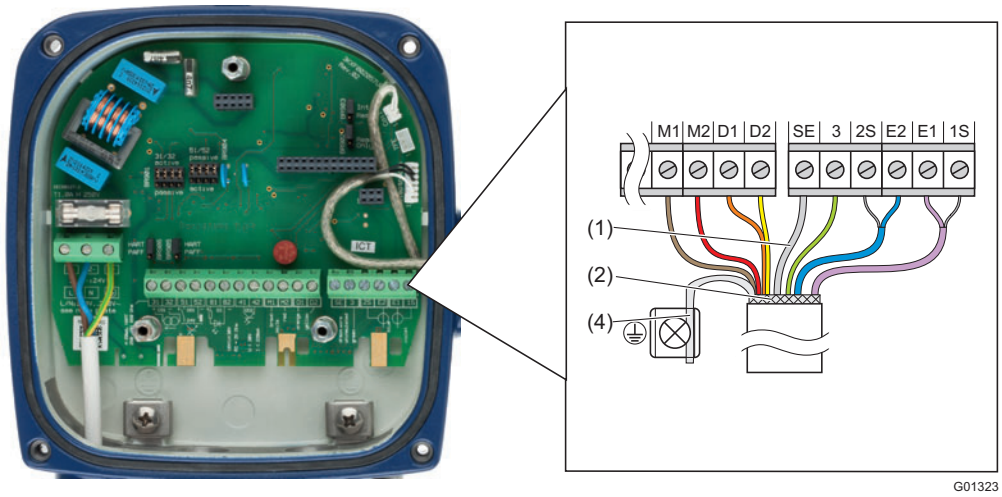
IMPORTANT (NOTE)!

Use ferrules.

- Ferrules 0.75 mm2 (AWG 19), for the shielding (1S, 2S)
- Ferrules 0.5 mm2 (AWG 20) for all other wires
- Twist the wire mesh shield of the cable and connect to the grounding terminal.
- Connect the ground wire of the cable to the SE clamp of the terminal strip.
- Connect all other wires as displayed in the figure below.

CAUTION – Device damage!

The shields may not touch. Otherwise, a signal short circuit occurs.



Transmitter side

(1) Ground wire
(2) Wire mesh shield
(4) Twisted wire mesh shield

Terminal	Description, wire color	Length in mm (inch)
M1	Magnet coil, brown	70 (2.76)
M2	Magnet coil, red	70 (2.76)
D1	Data line, orange	70 (2.76)
D2	Data line, yellow	70 (2.76)
SE	Shielding	-
3	Measurement potential, green	70 (2.76)
2S	Shield of E2	60 (2.36)
E2	Signal line, blue	60 (2.36)
E1	Signal line, violet	60 (2.36)
1S	Shield of E1	60 (2.36)

5 Electrical connection

5.4 Sensor connection

5.4.1 Metal terminal boxes

The connection must only be established when the voltage supply is switched off.

The device must be grounded according to the regulations. The sensor must be connected to the transmitter via the signal cable (part no. 00648906).

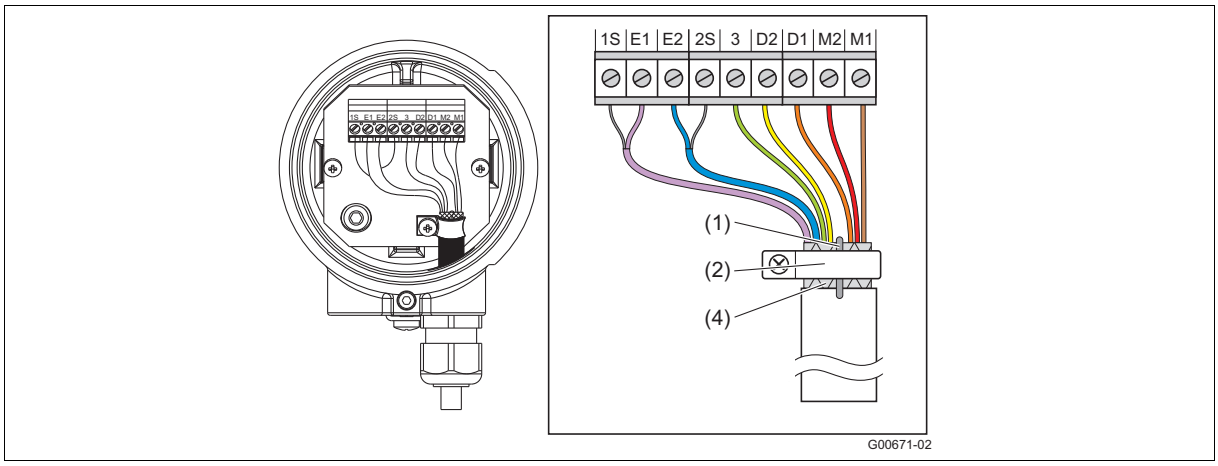
IMPORTANT (NOTE)!

Use ferrules.

- Ferrules 0.75 mm^2 (AWG 19), for the shielding (1S, 2S)
- Ferrules 0.5 mm^2 (AWG 20) for all other specifications
- Uncover the wire mesh of the cable and connect to the grounding clamp with the ground wire.
- Connect all other wires as shown in the following figure.

CAUTION – Property damage!

The shields may not touch. Otherwise, a signal short circuit occurs.



(1) Ground wire
(2) Grounding clamp
(4) Shielding mesh

Terminal	Description, wire color
M1	Magnet coil, brown
M2	Magnet coil, red
D1	Data line, orange
D2	Data line, yellow
PE	Shielding
3	Measurement potential, green
2S	Shield of E2
E2	Signal line, blue
E1	Signal line, violet
1S	Shield of E1

5.4.2 Protection type IP68

WARNING – Impairment of the IP68 protection type!

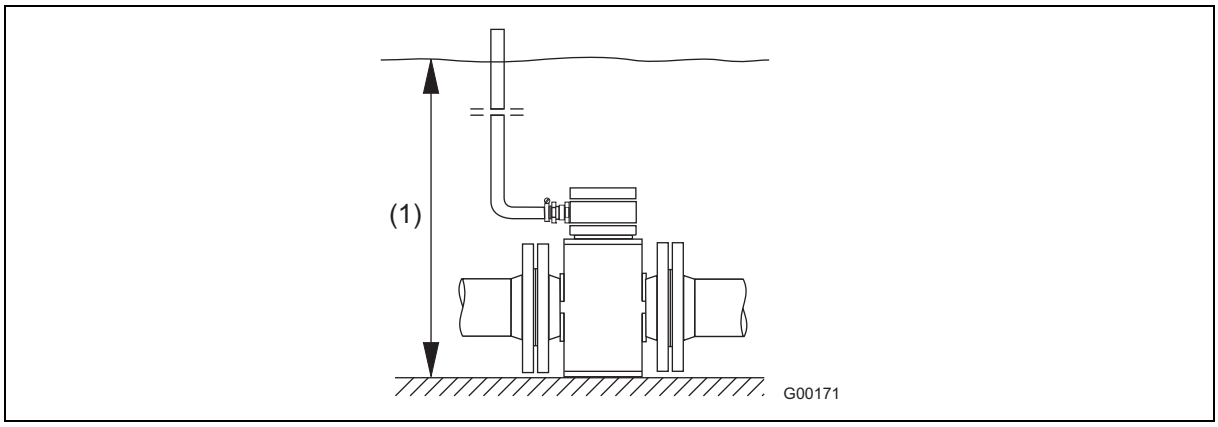
The IP68 protection type of the sensor is impaired by damage to the signal cable.

The sheath of the signal cable must not be damaged. Otherwise, the IP68 protection type for the sensor cannot be ensured.

For sensors with protection type IP68, the maximum flooding height is 5 m (16.4 ft). The cable (part no. 00648906 or 00648907) included in the scope of delivery meets all submersion capability requirements.

The sensor is type-tested according to EN 60529.

Test conditions: 14 days at a flooding height of 5 m (16.4 ft)



(1) Maximum flooding height 5 m (16.4 ft)

1. The signal cable included in the scope of delivery must be used to connect the sensor and the transmitter.
2. Connect the signal cable in the sensor terminal box.
3. Route the signal cable from the terminal box up to above the maximum flooding height of 5 m (16.4 ft).
4. Tighten the cable fitting.
   Optimum tightening torque: depends on the load of the used cable. (guide value: 4.5 Nm)
5. Carefully seal the terminal box. Make sure the housing seal is positioned correctly.

IMPORTANT (NOTE)!

The sensor can also be ordered with the signal cable already connected to the sensor and the terminal box already potted.

5.4.3 Connection via cable conduits

CAUTION – Condensate formation in terminal box!

If the sensor is permanently connected to cable conduits, moisture may enter in the terminal box due to condensate formation in the cable conduit.

Make sure that the cable inlets on the terminal box are sealed.

G01312

A mounting set for sealing the cable conduit is available under part no. 00649012.

5.4.4 Potting the terminal box

For sensors without Ex-protection or Ex-protection zone, the terminal box can be retroactively potted.

A two-component potting compound, which can be ordered separately, is available for retroactive potting of the terminal box on-site. Potting is only possible for sensors mounted horizontally.

Observe the following instructions when processing!

Preparation

Danger – Serious damage to health/risk to life!

The two-component potting compound is toxic – take appropriate protective action!

Hazard warnings: R20, R36/37/38, R42/43

Harmful to health when inhaled; avoid direct skin contact; eye irritant!

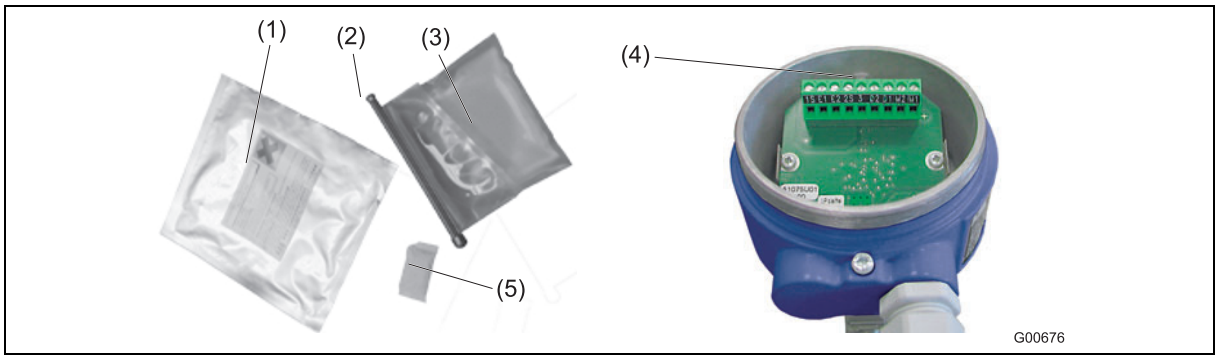
Safety advice: P4, S23-A, S24/25, S26, S37, S38

Wear suitable protective gloves; ensure sufficient ventilation.

Observe manufacturer's instructions before starting the preparations.

- Connect the sensor and check that all connections are in the correct position and tight.
- Keep the potting compound away from the O-ring and seal/groove (see illustration in Fig. 41).
- Avoid the two-component potting compound penetrating the cable protection pipe in case of installation NPT 1/2" (if used).

Potting



(1) Packaging bag
(2) Connecting clamp
(3) Two-component potting compound
(4) Maximum filling height
(5) Dry bag

1. Cut open the protective sleeve of the two-component potting compound (see packaging).
2. Remove the connecting clamp from the potting compound.
3. Knead the two components until fully homogenized.
4. Cut open one corner of the bag. Process the content within 30 minutes.
5. Carefully fill the two-component potting compound into the terminal box to a position over the connecting cable. Note the maximum filling height (4) while doing so.
6. Allow a few hours for de-gasification and drying before carefully closing the connecting lid.
7. Dispose of the packaging material and dry bag in a responsible way.

5 Electrical connection

5.5 Transmitter connection

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

5.5.1 Voltage supply connection

IMPORTANT (NOTE)!

The limit values of the voltage supply according to the specifications on the nameplate and in chapter 13.4.1 "Electrical properties", page 198 must be observed.

The voltage drop for large cable lengths and small conductor cross sections must be observed. The voltage at the device terminals may not fall below the minimum value required according to the specifications on the nameplate and in chapter 13.4.1 "Electrical properties", page 198.

Establish the electrical connection according to the connection diagrams.

The connection voltage and current consumption are specified on the nameplate of the transmitter.

A circuit breaker with a maximum nominal current of 16 A must be installed in the voltage supply line of the transmitter.

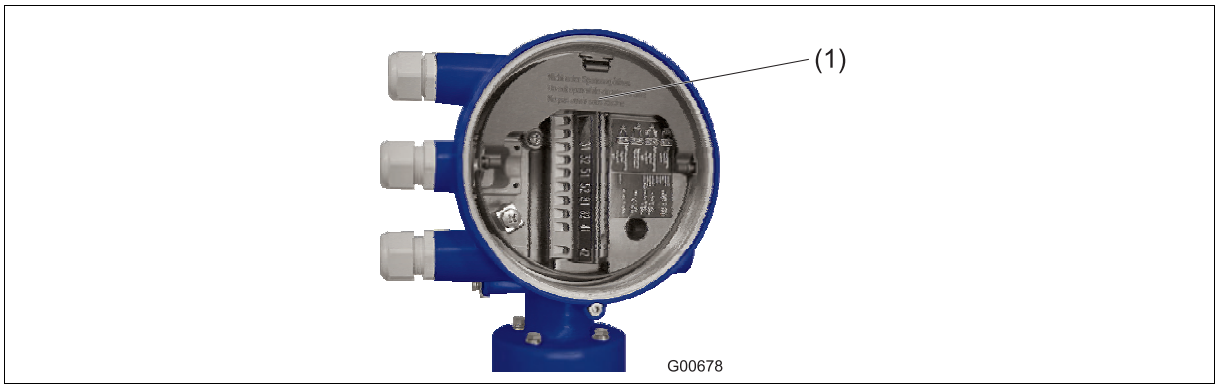
The conductor cross section of the voltage supply and the circuit breaker used must comply with VDE 0100 and must be dimensioned in accordance with the current consumption of the flowmeter measuring system. The lines must comply with IEC 227 and/or IEC 245.

The circuit breaker should be located near the transmitter and marked as belonging to the device.

The voltage supply is connected to terminal L (phase), N (neutral) or 1+, 2- and PE according to the specifications on the nameplate.

The transmitter and sensor must be connected to the functional ground.

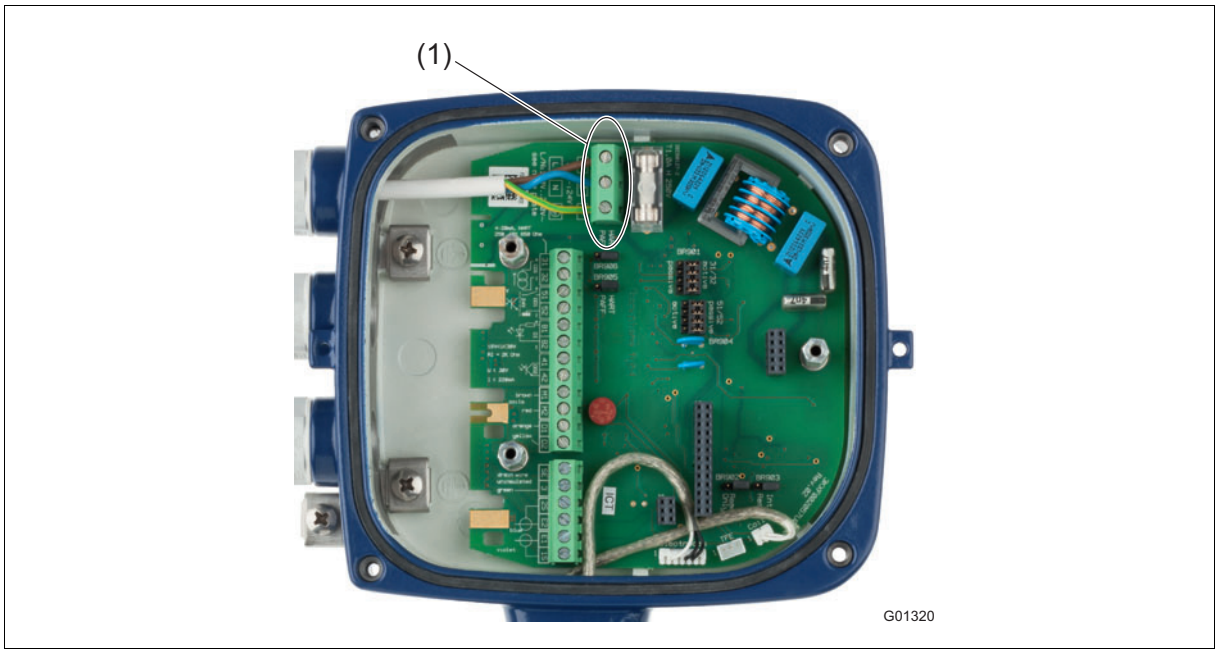
5.5.2 Transmitter - dual-compartment housing



(1) Terminal cover

The connection terminals for the voltage supply are located under the terminal cover (1).

5.5.3 Transmitter - single-compartment housing



(1) Connection terminals (voltage supply)

5 Electrical connection

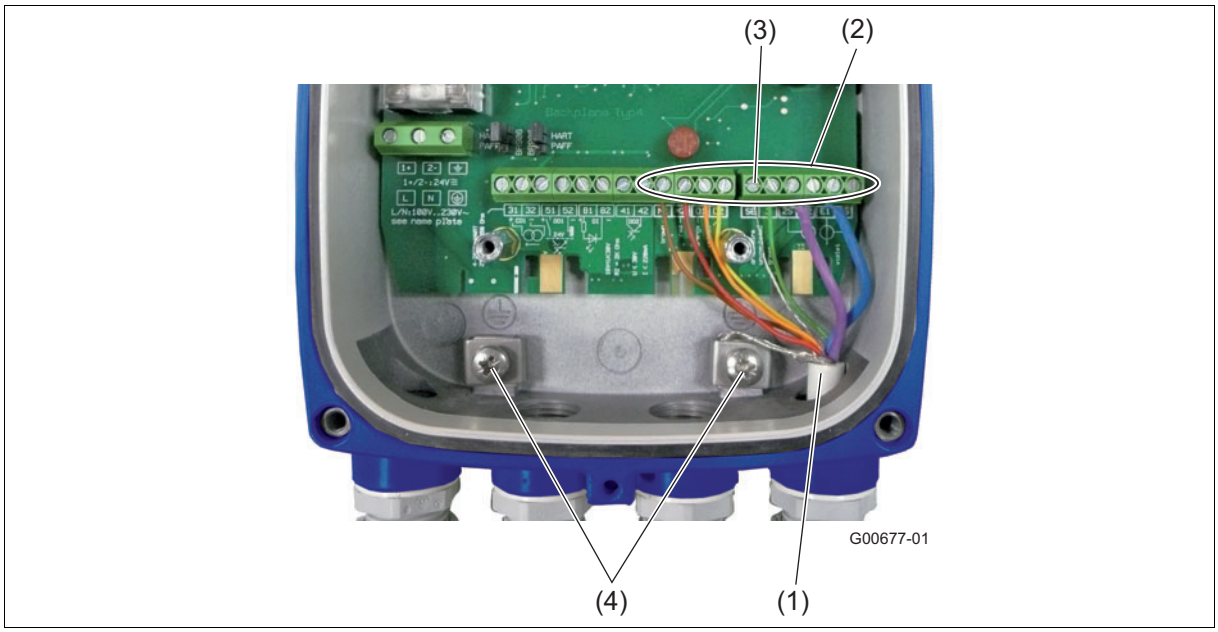
5.5.4 Signal and magnet coil cable connection

Single-compartment transmitter housing

For the single-compartment transmitter housing, the outer shielding of the signal and magnet coil cable is connected to the corresponding connection terminal for the signal and magnet coil cable.

The shielding for the signal wires functions as a "driven shield" to transmit the measurement signal.

The cable is attached to the sensor and transmitter according to the connection diagram.



(1) Signal and magnet coil cable
(2) Connection terminals for signal and magnet coil cable
(3) Connection terminal SE for the signal and magnet coil cable shielding
(4) Connection terminals for cable shielding

IMPORTANT (NOTE)!

The voltage supply for the optional preamplifier is provided via terminals 1S and 2S.

The transmitter automatically detects the preamplifier in the sensor and switches to the required voltage supply on terminals 1S and 2S.

Dual-compartment transmitter housing

10 m (32.8 ft) of signal cable is permanently connected to the transmitter in the housing of model 406018/2-1 and model 406019/2-1 for deployment in Ex-zone 1.

5.6 Connection diagrams

5.6.1 HART, PROFIBUS-PA and FOUNDATION Fieldbus protocol

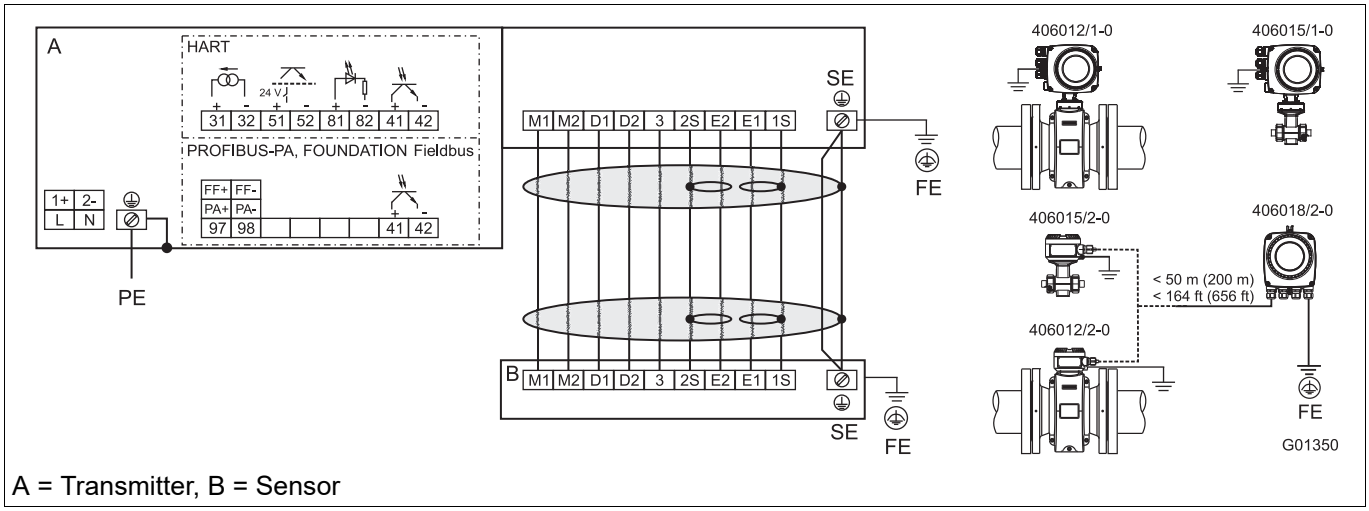
IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

IMPORTANT (NOTE)!

For more information about grounding the transmitter and the sensor, refer to chapter 4.5 "Grounding", page 48.



A = Transmitter, B = Sensor

Voltage supply

Alternating voltage (AC)		Direct voltage (DC)	
Terminal	**Function**	**Terminal**	**Function**
L	Phase	1+	+
N	Neutral conductor	2-	-
PE	Protection conductor (PE)	PE	Protection conductor (PE)

Signal cable connection (for devices with remote mount design type only)

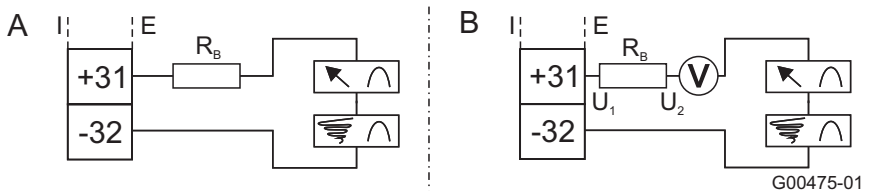
Terminal	Function	Wire color
M1	Magnet coil	Brown
M2	Magnet coil	Red
D1	Data line	Orange
D2	Data line	Yellow
SE	Shielding	-
E1	Signal line	Violet
1S	Shield of E1	-
E2	Signal line	blue
2S	Shield of E2	-
3	Measurement potential	Green

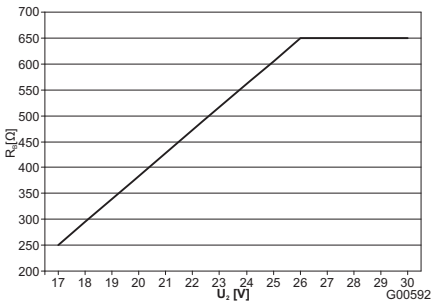
Input and output connection

Terminal	Function
31/32	**Current/HART output** - The current output is available in "active" or "passive" mode.
97/98	**PROFIBUS-PA (PA+/PA-) or FOUNDATION Fieldbus (FF+/FF-)** - according to IEC 61158-2
51/52	**Digital output DO1 active/passive** - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Pulse output".
81/82	**Digital input/contact input** - Function can be configured using software on-site as "External output switch-off", "External counter reset", "External counter stop", or "Other".
41/42	**Digital output DO2 passive** - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Binary output", flow direction signaling.
FE	**Functional ground**

5.7 Electrical data

5.7.1 Current/HART output





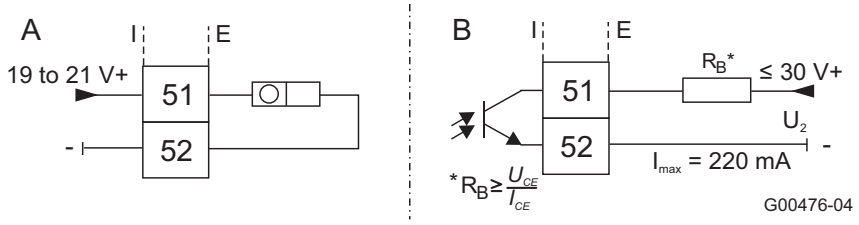
Max. admissible burden (R_B) depending on the source voltage (V_2)

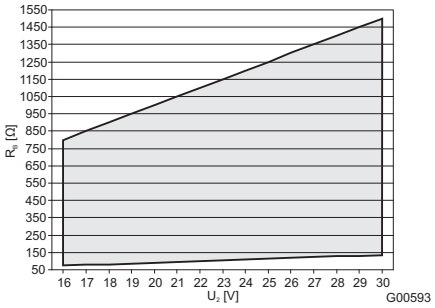
The current/HART output is available in "active" or "passive" mode.

A = "Active" configuration:	4 to 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
B = "Passive" configuration:	4 to 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
Voltage supply for the current output:	minimum 11 V, maximum 30 V
Operation in Ex-zone 1	**Maximum burden 300 Ω**

I = internal, E = external

5.7.2 Digital output DO1





Max. admissible load (R_B) depending on the source voltage (U_2).

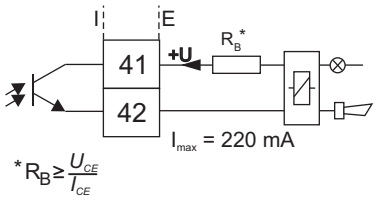
The output can be configured as an "active" or "passive" output. For a transmitter with the dual-compartment housing, the configuration is performed using the software. For a transmitter with the single-compartment housing, the configuration is performed using jumpers on the transmitter backplane. The output can be configured as an "active" or "passive" output. For a transmitter with the dual-compartment housing, the configuration is performed using the software. For a transmitter with the single-compartment housing, the configuration is performed using jumpers on the transmitter backplane.

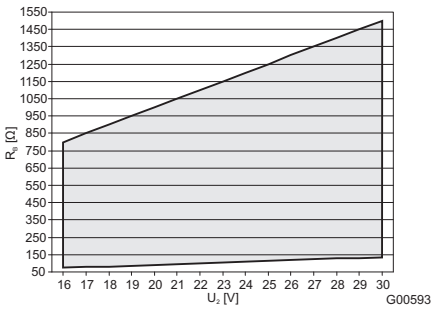
A = "Active" configuration	U = 19 to 21 V, I_{max} = 220 mA , f_{max} ≤ 5250 Hz
B = "Passive" configuration	U_{max} = 30 V, I_{max} = 220 mA , f_{max} ≤ 5250 Hz
Configuration as pulse output	Maximum pulse frequency: 5250 Hz Pulse width: 0.1 to 2000 ms The pulse factor and pulse width are interdependent and are calculated dynamically.
Configuration as switching output	Function: system alarm, empty pipe alarm, max./min. alarm, flow direction signaling, other

I = internal, E = external

= admissible range

5.7.3 Digital output DO2





Max. admissible load (R_B) depending on the source voltage (U_2).

The output is always a "passive" output (optocoupler)

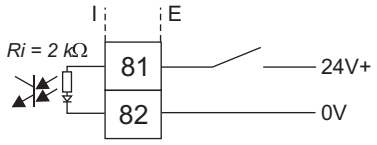
Data of the optocoupler	U_{max} = 30 V, I_{max} = 220 mA , f_{max} ≤ 5250 Hz

I = internal, E = external

= admissible range

5 Electrical connection

5.7.4 Digital input DI1



G00477-01

Data of the optocoupler	16 V ≤ U ≤ 30 V, R_i = 2 kΩ
e.g. for flowrate to zero or totalizer reset	

I = internal, E = external

5.7.5 PROFIBUS-PA (PA+/PA-) / FOUNDATION Fieldbus (FF+/FF-) - according to IEC 61158-2

G00248-01

Standard operation	V = 9 to 32 V, I = 10 mA
In case of fault/FDE	I = 13 mA

Bus connection with integrated reverse voltage protection

For the dual-compartment transmitter housing, the bus address can be set via the DIP switches in the device. For all other versions, it is set via the display of the transmitter or the fieldbus.

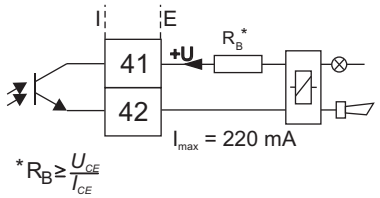
The resistor R and condenser C form the bus termination. They must be installed when the device is connected to the end of the entire bus cable. R = 100 Ω, C = 1 µF

I = internal, E = external

5.8 Connection examples

5.8.1 Digital output DO2

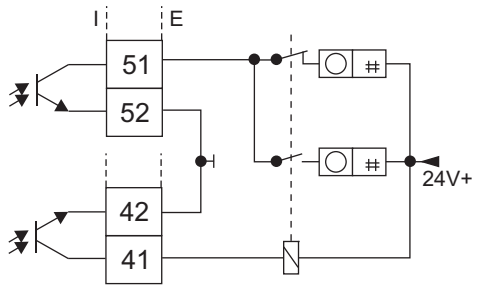
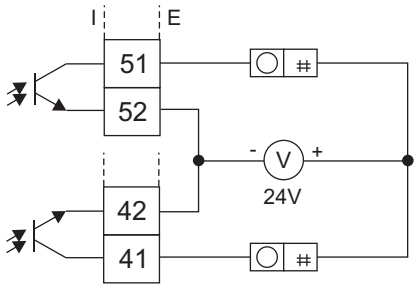
E.g. for system monitoring, max./min. alarm, empty pipe alarm, forward/backward signal, or counting pulses (can be configured using software)



G00792-01

I = internal, E = external

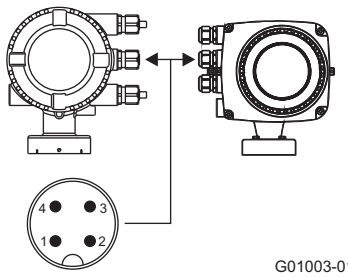
5.8.2 Digital outputs DO1 and DO2

Separate forward and reverse pulses	Separate forward and reverse pulses (connection type)
	

I = internal, E = external

5.8.3 Digital communication PROFIBUS-PA

Connection via M12 plug (only in non-potentially explosive areas!)



Pin assignment (view from front showing pin insert and pins):
PIN 1 = PA+
PIN 2 = nc
PIN 3 = PA-
PIN 4 = Shield

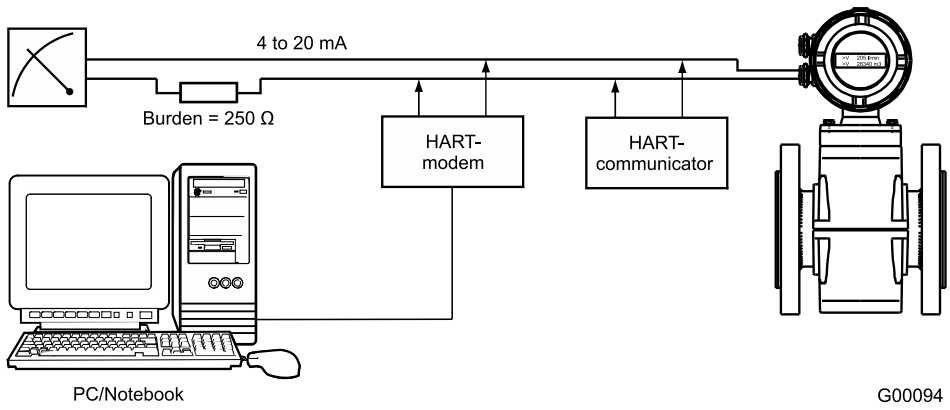
IMPORTANT (NOTE)!

For further information about the current output configuration,⇨ see chapter 7.2 "Configuring the current output", page 73

5 Electrical connection

6.1 HART protocol

The transmitter uses HART protocol (HART 5) for digital communication.



Configuration	Directly on device Via DTM in connection with the framework application
Transmission	FSK modulation on current output 4 to 20 mA according to Bell 202 standard
Max. signal amplitude	1.2 mA_{ss}
Burden for current output	min. 250 Ω, max. = 560 Ω
Cable	AWG 24 twisted
Max. cable length	1500 m
Baud rate	1200 baud
View	Log 1: 1200 Hz Log 0: 2200 Hz

For further information ⇨ see the separate interface description.

6.1.1 System integration

The communication (configuration, parameterization) can be carried out in conjunction with the DTM (Device Type Manager) available for the device and the corresponding framework applications according to FDT 1.21.

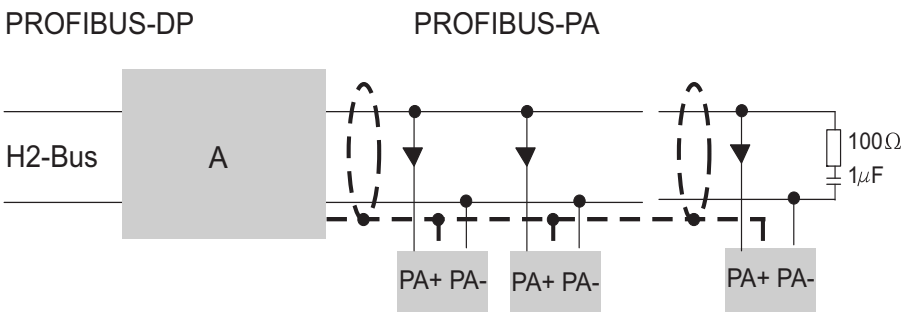
IMPORTANT (NOTE)!

The necessary device DTM is included on the CD and can be downloaded from www.jumo.de.

6 Digital communication

6.2 PROFIBUS-PA protocol

The interface complies with profile 3.01 (standard PROFIBUS, EN 50170, DIN 19245 [PRO91]).



A = Segment coupler (including bus supply and termination)

PROFIBUS-PA ID no.:	0x3430
Alternative standard ID no.:	0x9700 or 0x9740
Configuration	Directly on device via DTM in connection with the framework application
Transmission signal	According to IEC 61158-2
Cable	Shielded, twisted (Types A or B are preferred according to IEC 61158-2)
Bus topology	• Tree and/or line structure • Bus termination: passive on both ends of the main bus line (RC element R = 100 Ω, C = 1 µF)
Voltage and current consumption	• Average current consumption: 10 mA • In case of a fault, the FDE (fault disconnection electronic) function integrated into the device ensures that the current consumption can rise to a maximum of 13 mA. • The upper limit of the current is electronically limited. • The voltage on the bus line must be in the range between DC 9 and 32 V.

For further information ⇨ see the separate interface description.

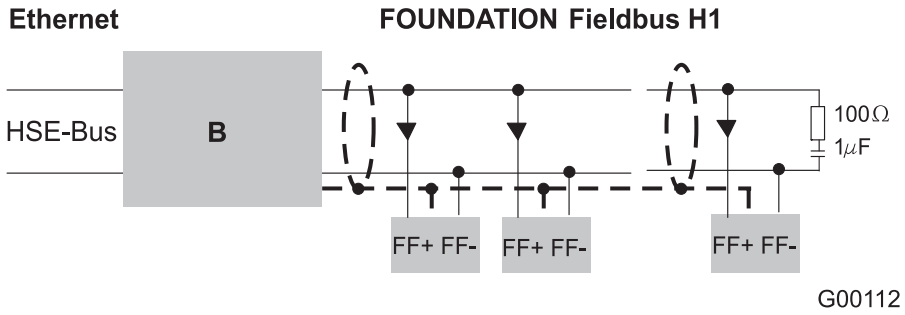
6.2.1 System integration

JUMO provides GSD files for integrating devices into the system.

IMPORTANT (NOTE)!

The necessary DTM device is included on the CD and can be downloaded from www.jumo.de.

6.3 FOUNDATION Fieldbus (FF)



B = Linking Device (incl. bus voltage supply and terminator)

Interoperability test campaign no.	ITK 5.20
Manufacturer ID	0x000320
Device ID	0x0124
Configuration	Directly on device Via services integrated in the system National configurator
Transmission signal	According to IEC 61158-2
Bus topology	• Tree and/or line structure • Bus termination: passive on both ends of the main bus line (RC element R = 100 Ω, C = 1 µF)
Voltage and current consumption	• Mean current consumption: 10 mA • In case of a fault, the FDE (fault disconnection electronic) function built into the device ensures that the current consumption can rise to a maximum of 13 mA. • The upper current limit is electronically limited. • The voltage on the bus line must be in the range between DC 9 and 32 V.
Bus address	The bus address is assigned automatically, or can be set manually on the system. The identifier (ID) is formed as a unique combination of the instrument ID, device ID and device serial no.

For further information ⇨ see the separate interface description.

6.3.1 System integration

The following are required:

- DD (device description) file, containing the device description.
- CFF (Common File Format) file; this is required for engineering the segment. Engineering can occur online or offline

IMPORTANT (NOTE)!

The files required for operation are included on the CD, or can be downloaded from www.jumo.de.

6 Digital communication

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

7.1 Checks prior to start-up

IMPORTANT (NOTE)!

The following points must be checked before startup:

- The voltage supply must be switched off.
- The voltage supply must match the specification on the nameplate.
- The pin assignment must correspond to the connection diagram.
- The sensor and transmitter must be grounded properly.
- The temperature limit values must be observed.
- The transmitter must be mounted at a location that is largely free from vibrations.
- The case lid and its lock must be sealed before switching on the voltage supply.
- For devices with a remote mount design and an accuracy of 0.2 % of the measuring value, make sure that the sensor and the transmitter have the correct assignment: sensors have the last digits X1, X2, etc. printed on the nameplates: transmitters have the last digits Y1, Y2, etc. printed on the nameplates; devices with the last digits X1/Y1 or X2/Y2 belong together.
- Unused screw connections must be sealed with the provided plugs according to IEC 60079 prior to startup

7.2 Configuring the current output

The default setting for the current output is set at 4 to 20 mA.

The following applies to devices without Ex-protection for operation in zone 2:

The signal can be configured in "active" or "passive" mode. The current setting is specified in the order confirmation.

The following applies to devices for operation in zone 1:

For devices designed for use in Ex-zone 1, the current output cannot be subsequently configured.

The desired configuration for the current output (active/passive) must be specified when the order is placed.

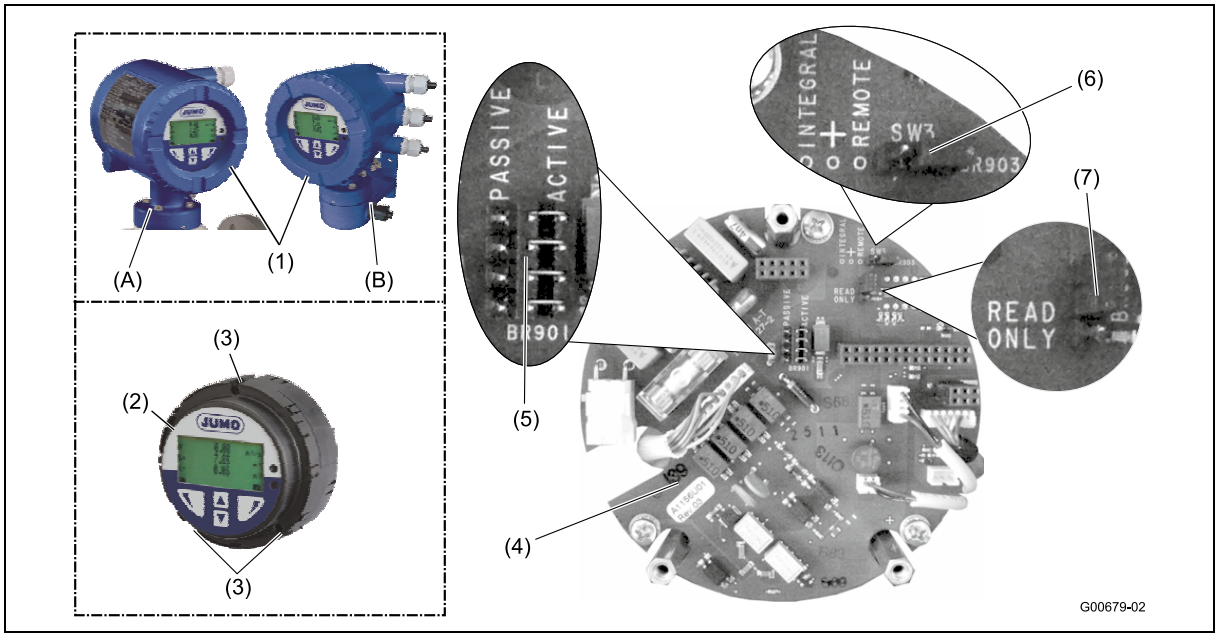
For the current output version (active/passive), see the identification marking provided in the device's terminal compartment.

If the signal is configured in "active" mode, no external power may be supplied to the current output.

If the signal is configured in "passive" mode, external power must be supplied to the current output, as with the pressure and temperature transmitters.

7 Startup

7.2.1 Transmitter - dual-compartment housing



A JUMO flowTRANS MAG S/H - compact design
B JUMO flowTRANS MAG - remote mount design
(1) Case lid
(2) Transmitter plug-in module
(3) Mounting screws
(4) Backplane (in the transmitter housing)
(5) Jumper (BR901) for active/passive current output
(6) Jumper (BR903) for integral/remote mount design
(7) Jumper (BR902) for hardware write protection

IMPORTANT (NOTE)!

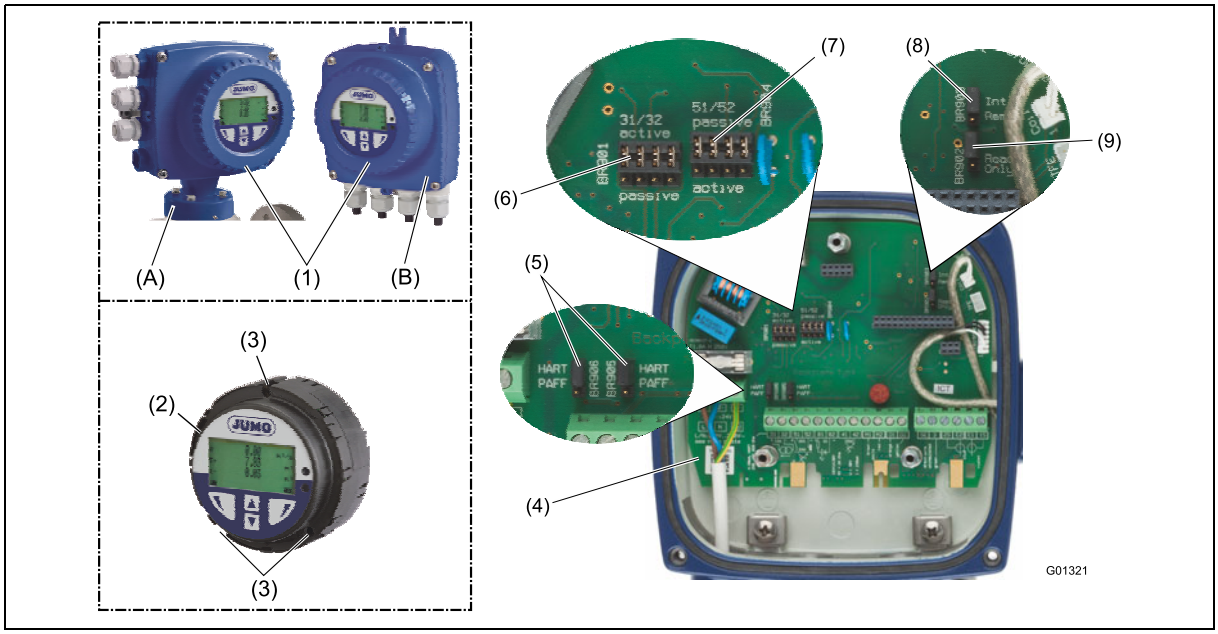
The backplane is mounted in the transmitter housing (not the transmitter plug-in module).

Configure the outputs as follows:

1. Switch off the voltage supply.
2. Open the case lid.
3. Remove the fastening screws for the transmitter electronics unit.
4. Pull out the transmitter electronics unit.
5. Set jumpers on the backplane according to the following table.
6. Reinstall the transmitter electronics unit in reverse order.

Jumper	Position	Function
BR901	active	Current output 31/32 active
	passive	Current output 31/32 passive
BR902	Read only	Hardware write protection active
BR903	Integral	Transmitter with compact design
	Remote	Transmitter with remote mount design

7.2.2 Transmitter - single-compartment housing



A JUMO flowTRANS MAG S/H - compact design
B JUMO flowTRANS MAG - remote mount design
(1) Case lid
(2) Transmitter plug-in module
(3) Mounting screws
(4) Backplane (in the transmitter housing)
(5) Jumper (BR905, BR906) for communication
(6) Jumper (BR901) for active/passive current output
(7) Jumper (BR904) for active/passive pulse output
(8) Jumper (BR903) for integral/remote mount design
(9) Jumper (BR902) for hardware write protection

IMPORTANT (NOTE)!

The backplane is mounted in the transmitter housing (not the transmitter plug-in module).

Configure the outputs as follows:

1. Switch off the voltage supply.
2. Open the case lid.
3. Remove the fastening screws for the transmitter electronics unit.
4. Pull out the transmitter electronics unit.
5. Set jumpers on the backplane according to the following table.
6. Reinstall the transmitter electronics unit in reverse order.

Jumper	Position	Function
BR901	active	Current output 31/32 active
	passive	Current output 31/32 passive
BR902	Read only	Hardware write protection active
BR903	Integral	Transmitter with compact design
	Remote	Transmitter with remote mount design
BR904	active	Pulse output 52/52 active
	passive	Pulse output 52/52 passive
BR905, BR906	HART	Digital communication via HART protocol
	PA/FF	Digital communication via PROFIBUS-PA or FOUNDATION Fieldbus

7.3 Startup of PROFIBUS-PA devices

The bus address for devices with PROFIBUS-PA must be checked or set prior to startup. If no customer specifications are provided for the bus address, the BUS address is set at "126" on delivery.

The address must be set in the valid range (0 to 125) during startup.

IMPORTANT (NOTE)!

The set address may only be in the segment once.

The device's PROFIBUS-PA interface complies with profile 3.01 fieldbus standard PROFIBUS, EN 50170, alias DIN 19245 [PRO91]).

The transmitter's transmission signal is designed according to IEC 61158-2.

IMPORTANT (NOTE)!

The manufacturer-specific PROFIBUS-PA ID no. is 0x3430.

Alternatively, the device can also be operated with the PROFIBUS standard ID numbers 0x9700 or 0x9740.

Setting the address for transmitters with a dual-compartment housing

The setting can be made locally on the device (using the DIP switch on the backplane), via System tools or via a PROFIBUS-DP master class 2.

The default setting of the DIP switch 8 is OFF, i.e. the address is set via the fieldbus.

The front housing lid must be unscrewed to configure the setting. Alternatively, the address can also be set using the menus via the push-buttons on the display board on the device.

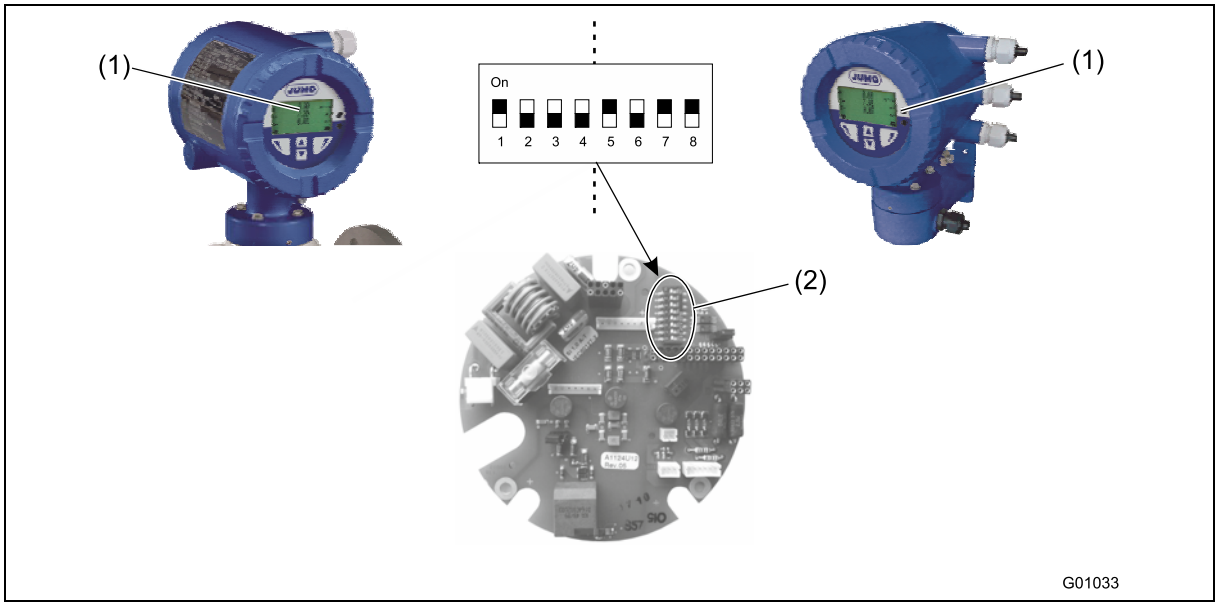
Setting the address for transmitters with a single-compartment housing

The setting can be made via System tools or via a PROFIBUS-DP master class 2.

Alternatively, the address can also be set using the menus via the transmitter's LCD display (observe chapter 8 "Parameterization", page 95).

The address cannot be set locally via the DIP switch, since the DIP switch is not available for transmitters with a single-compartment housing.

7.3.1 Setting the address locally for transmitters with a dual-compartment housing



(1) Transmitter plug-in module
(2) DIP switch

Switch assignment

Switch	Assignment
1 to 7	PROFIBUS address
8	Defining the address mode: Off = The address is set via the bus (default setting) On = The address is set via the DIP switches 1 to 7 (locally)

Device behavior on switching on the voltage supply

After the voltage supply is switched on, DIP switch 8 is queried:

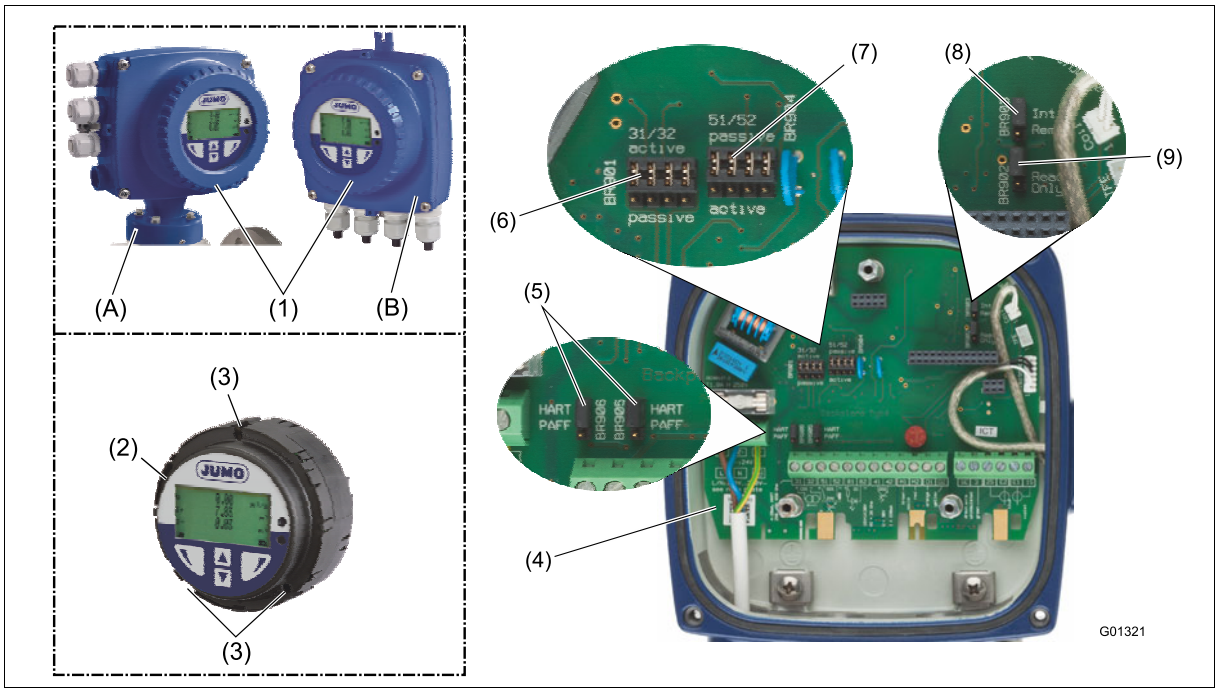
Status	
ON	The address set by DIP switches 1 to 7 applies. The address cannot be changed via the bus while the device is operating, because DIP switch 8 is queried once only when the voltage supply is switched on.
OFF (default)	The transmitter starts with the address saved in the FRAM of the gateway. On delivery, the address is 126 or the address specified by the customer. The address can be set via the bus or the push-buttons on the display board on the device while it is operating. In this case, the device must be connected to the bus.

Address setting

Switches 1, 5, 7 = ON means: 1+16+64 = 81 = Bus address 81

Switch	1	2	3	4	5	6	7	8
Status	Device address							Address mode
Off	0	0	0	0	0	0	0	Bus
On	1	2	4	8	16	32	64	Local

7.3.2 Configuration for transmitters with a single-compartment housing



A JUMO flowTRANS MAG S/H - compact design
B JUMO flowTRANS MAG - remote mount design
(1) Case lid
(2) Transmitter plug-in module
(3) Mounting screws
(4) Backplane (in the transmitter housing)
(5) Jumper (BR905, BR906) for communication
(6) Jumper (BR901) for active/passive current output
(7) Jumper (BR904) for active/passive pulse output
(8) Jumper (BR903) for integral/remote mount design
(9) Jumper (BR902) for hardware write protection

Set the jumpers on the backplane according to the following table:

Jumper	Position	Function
BR901	passive	For PROFIBUS-PA set the "passive" position
BR903	Integral	Transmitter with compact design
	Remote	Transmitter with remote mount design
BR904	active	No function for PROFIBUS-PA
	passive	
BR905, BR906	PA/FF	Digital communication via PROFIBUS-PA

7.3.3 Voltage/current consumption

- Average current consumption: 10 mA
- In case of a fault, the FDE (fault disconnection electronic) function integrated into the device ensures that the current consumption can rise to a maximum of 13 mA.
- The upper limit of the current is electronically limited.
- The voltage on the bus line must be between DC 9 and 32 V.

7.3.4 System integration

Using the PROFIBUS-PA profile B, B3.01 makes the devices interoperable and interchangeable. This means that devices from a wide range of manufacturer can be physically connected on one bus and can communicate together (interoperable). They are also interchangeable, without having to change the configuration in the process control system.

To ensure this interchangeability, the manufacturer provides three different GSD files (General Station Description) integrating the system.

When integrating the system, users can therefore decide whether they would like to use the complete range of device functions or only a part of them.

IMPORTANT (NOTE)!

This option can be toggled using the "ID number selector" parameter, which can only be changed acyclically.

The available GSD files are described in the following table:

Number of and type of function blocks	ID number:	GSD file name
1 x AI	0x9700	PA139700.gsd
1 x AI 1 x TOT	0x9740	PA139740.gsd
4 x AI 2 x TOT 1 x AO 1 x DI 1 x DO and all manufacturer-specific parameters	0x3430	JUMO_3430.gsd

The manufacturer-specific GSD file "JUMO_3430.gsd" is available for download on the manufacturer homepage at www.jumo.de.

The standard GSD files "PA1397xx.gsd" are available for download on the homepage of PROFIBUS International at http://www.profibus.com.

7.4 Startup for FOUNDATION Fieldbus devices

For devices using FOUNDATION Fieldbus, the DIP switch settings must be checked prior to startup.

The DIP switches on the device must be set correctly:

- DIP switch 1 must be set to OFF.
- DIP switch 2 must be set to OFF.

Otherwise, hardware write protection is effective, and the process control system cannot write the data to the device.

DIP switch position⇨ See figure chapter 7.4.1 "Configuration for transmitters with a dual-compartment housing", page 81.

For integration with the process control system, a DD (device description) file, containing the device description and a CFF (Common File Format) file are required. The DD file contains the device description. The CFF file is required for engineering the segment. Engineering can occur online or offline.

IMPORTANT (NOTE)!

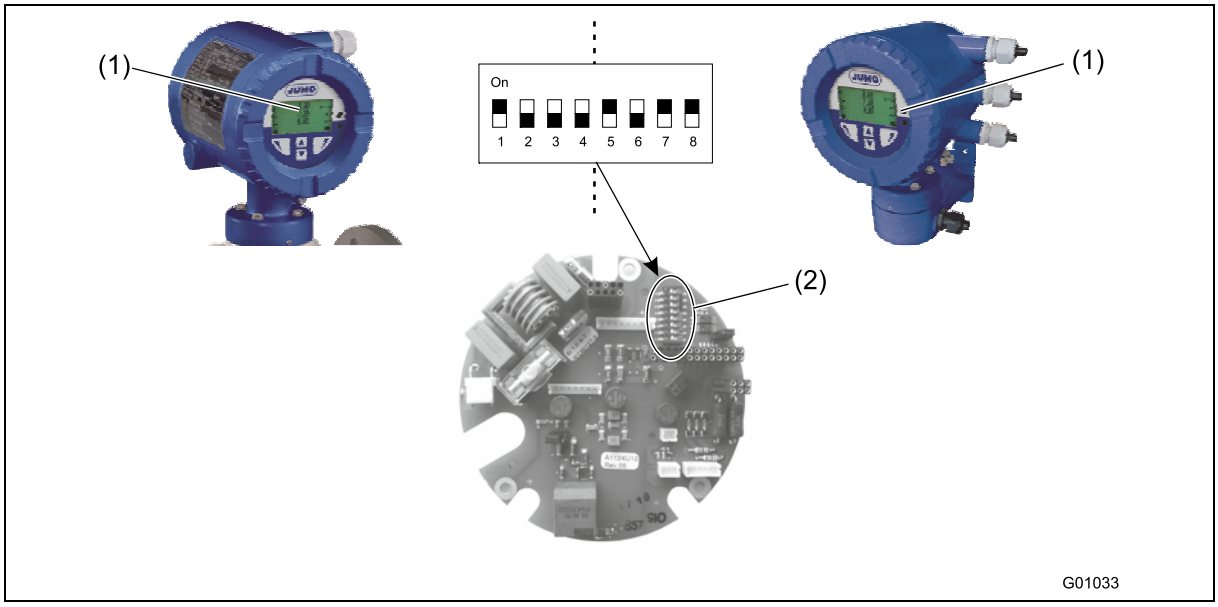
The files required for operation are included on the CD, or can be downloaded from www.jumo.de.

The device's FOUNDATION Fieldbus interface complies with the standards FF-890/891 and FF-902/90. The transmitter's transmission signal is designed for compliance with IEC 61158-2.

The device is registered with the Fieldbus Foundation.

The registration with the Fieldbus Foundation is recorded under Manufacturer ID 0x000320 and Device ID 0x0124.

7.4.1 Configuration for transmitters with a dual-compartment housing



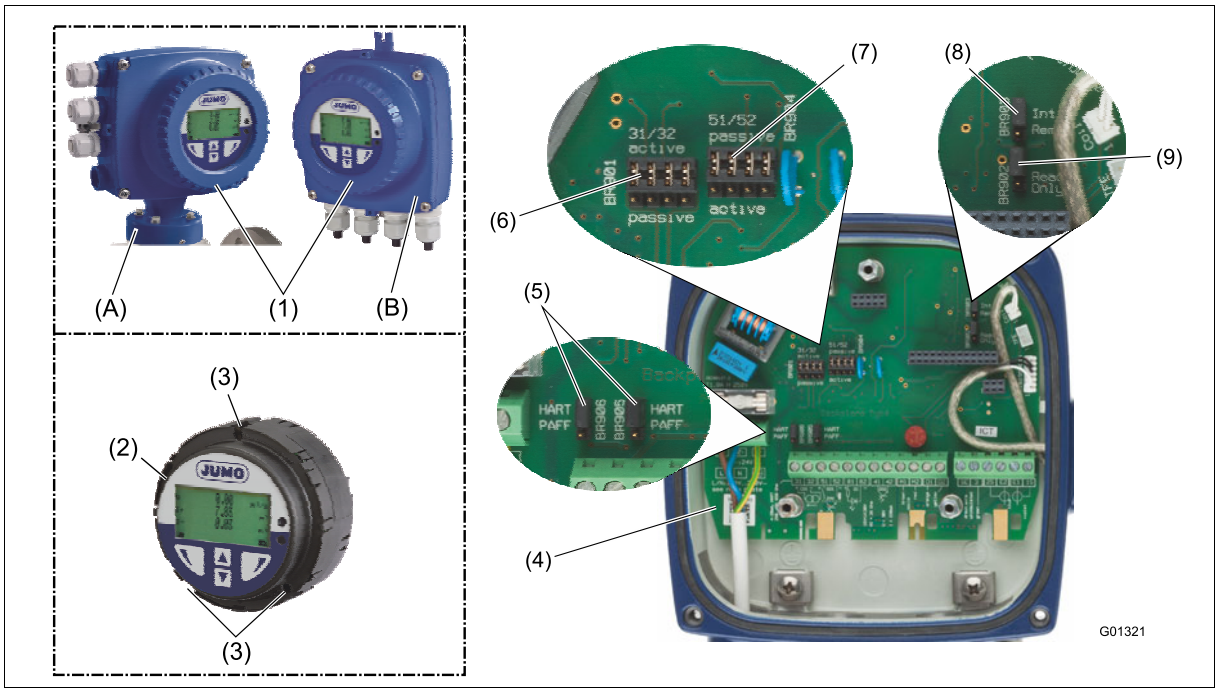
(1) Transmitter plug-in module
(2) DIP switch

Switch assignment

Switch	Assignment
1	Release of AI function block simulation
8	Hardware write protection for write access via the bus (all blocks locked)

Switch	1	2
Status	Simulation Mode	Write Protect
Off	Disabled	Disabled
On	Enabled	Enabled

7.4.2 Configuration for transmitters with a single-compartment housing



A JUMO flowTRANS MAG S/H - compact design
B JUMO flowTRANS MAG - remote mount design
(1) Case lid
(2) Transmitter plug-in module
(3) Mounting screws
(4) Backplane (in the transmitter housing)
(5) Jumper (BR905, BR906) for communication
(6) Jumper (BR901) for active/passive current output
(7) Jumper (BR904) for active/passive pulse output
(8) Jumper (BR903) for integral/remote mount design (compact/isolated)
(9) Jumper (BR902) for hardware write protection

Set the jumpers on the backplane according to the following table:

Jumper	Position	Function
BR901	passive	For FOUNDATION Fieldbus set to "passive" position
BR903	Integral	Transmitter with compact design
	Remote	Transmitter with remote mount design
BR904	active	No function for PROFIBUS-PA
	passive	
BR905, BR906	PA/FF	Digital communication via FOUNDATION Fieldbus

7.4.3 Setting the bus address

The bus address for the FOUNDATION Fieldbus is assigned automatically by the LAS (Link Active Scheduler). Address detection relies on a unique number (DEVICE_ID). The number is composed of the manufacturer ID, device ID and device serial number.

The switch-on behavior is compliant with draft DIN IEC/65C/155/CDV from June 1996.

The device's mean current consumption is 10 mA.

The voltage on the bus line must be in the range between DC 9 and 32 V.

IMPORTANT (NOTE)!

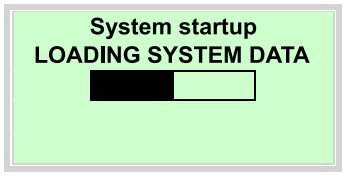
The upper current limit is electronically limited. In case of a fault, the FDE (fault disconnection electronic) function built into the device ensures that the current consumption can rise to a maximum of 13 mA.

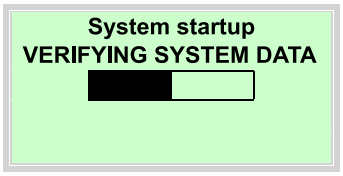
7 Startup

7.5 Starting up the device

7.5.1 Loading the system data

1. Switch on the voltage supply. After switching on the voltage supply, the following messages are displayed consecutively in the LCD display:





2. Download the system data as follows:

   For a completely new system or initial startup
   The calibration data of the sensor and the transmitter settings are loaded from the SensorMemory[1]- into the transmitter.

   After replacing the complete transmitter or transmitter electronics unit

   Use  to select "Transmitter". The calibration data of the sensor and the transmitter settings are loaded from the SensorMemory into the transmitter.

   After replacing the transmitter (sensor)

   Use  to select "Sensor". The calibration data of the sensor is loaded from the SensorMemory into the transmitter. The transmitter settings are saved in the SensorMemory. If the new sensor has a different nominal width, the measuring range setting must be checked.

3. The flowmeter is now ready for operation and operates with default settings or the pre-configured settings requested by the customer depending on the order. To change the default settings, ⇨ see chapter 8 "Parameterization", page 95

IMPORTANT (NOTE)!

System data must only be loaded during initial startup. If the voltage supply is switched off at a later time, the transmitter automatically loads all the data the next time the voltage supply is switched on again. A selection, as described below (1-3), is not required.

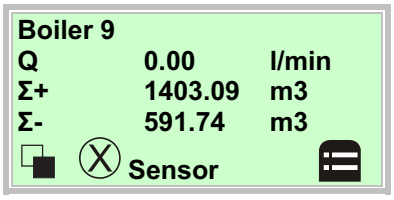
[1] The SensorMemory is a memory integrated in the sensor.

7.5.2 Error message "Incompatible sensor"

IMPORTANT (NOTE)!

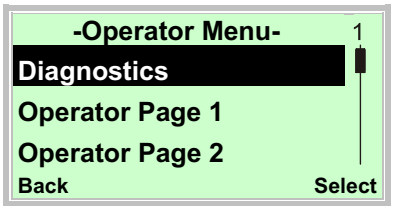
When starting up the device, make sure that the transmitter and the sensor are assigned correctly. A mixed operation of different sensors and transmitter versions is not possible. (⇨ see chapter 7.1 "Checks prior to start-up", page 73)

If the transmitter is operated with a sensor of another series, the following error message appears on the transmitter display:

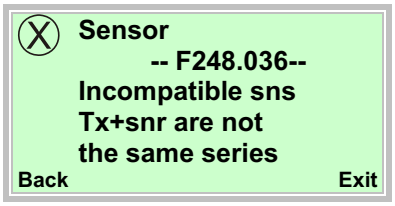


A flow of ZERO is indicated in the process display. No flow measurement is performed.

1. Use to switch to the information level.



2. Use or to select the "Diagnostics" submenu.
3. Use to confirm your selection.



When trying to start up a mixed installation, the adjacent error message appears. The device cannot perform measurements. The display for the current flow is ZERO. The current output assumes its pre-configured state (Iout for alarm).

Make sure that the sensor and the transmitter are of the same device version (e.g., sensor 406012/2-0 JUMO flowTRANS MAG S, transmitter 406018/2-0 JUMO flowTRANS MAG S).

7.5.3 Parameterization via the "Easy Setup" menu function

Upon request, the device can be parameterized at the factory according to customer specifications.

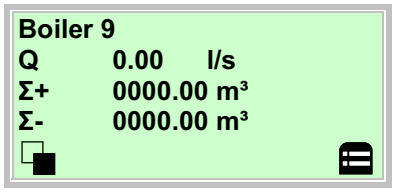
If no customer information is available, the device is delivered with default settings.

The setting of the most common parameters is summarized in the "Easy Setup" menu. This menu provides the fastest way to configure the device.

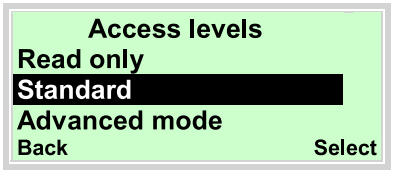
The "Easy Setup" menu allows you to select the language, the physical unit for flow, the measuring range, the totalizer unit, the pulse/frequency mode, the pulse per unit, the pulse width, damping, and the status of the current output during an alarm (Iout for alarm, Iout: low alarm, Iout: high alarm).

The detailed description of all the menus/parameters is provided in chapter 8.3 "Parameter overview in the configuration level", page 105.

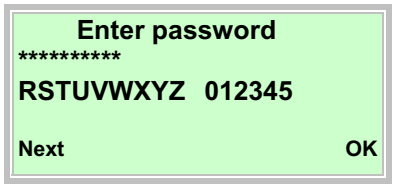
Parameterization using the "Easy Setup" menu function is described below.



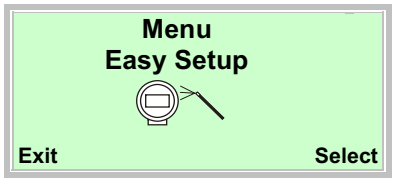
1. Use  to switch to the configuration level.



2. Use  or  to select "Standard".
3. Use  to confirm your selection.

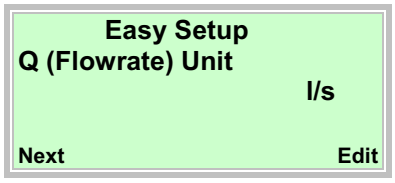


4. Use  to confirm the password. There is no password defined by default. You can continue without entering a password.

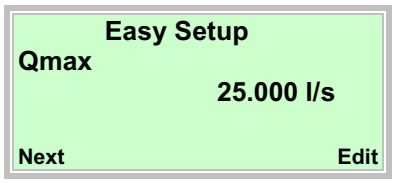


5. Use  or  to select "Easy Setup".
6. Use  to confirm your selection.

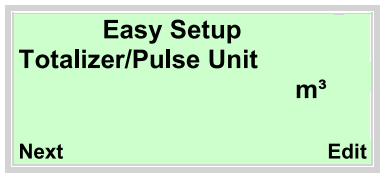
7. Use ▼ to call up the edit mode.
8. Use ▲ or ▼ to select the desired language.
9. Use ▼ to confirm your selection.



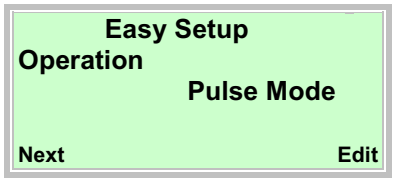
10. Use ▼ to call up the edit mode.
11. Use ▲ or ▼ to select the desired unit.
12. Use ▼ to confirm your selection.



13. Use ▼ to call up the edit mode.
14. Use ▲ or ▼ to set the desired measuring range end value.
15. Use ▼ to confirm your setting.



16. Use ▼ to call up the edit mode.
17. Use ▲ or ▼ to select the desired unit.
18. Use ▼ to confirm your selection.

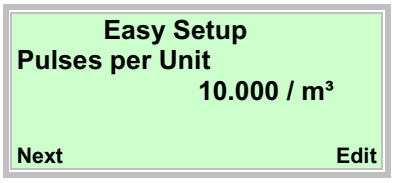


19. Use to call up the edit mode.
20. Use or to select the desired operating mode.

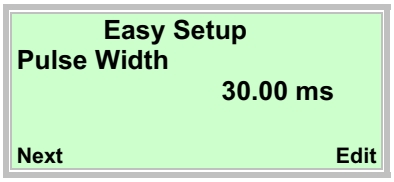
    "Pulse Mode": in pulse mode, pulses per unit are output. The settings for this are provided in the next menu.

    "Fullscale Frequency": in frequency mode, a frequency proportional to the flow is output. The maximum frequency can be configured according to the flow measuring range.

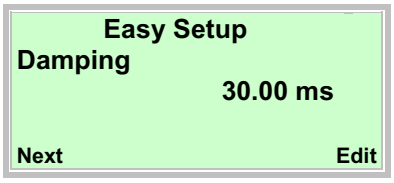
    The "Pulse Mode" operating mode is set by default.
21. Use to confirm your selection.



22. Use to call up the edit mode.
23. Use or to set the desired value.
24. Use to confirm your setting.



25. Use to call up the edit mode.
26. Use or to set the desired pulse width.
27. Use to confirm your setting.

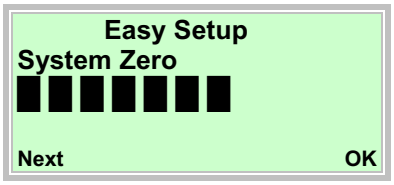


28. Use to call up the edit mode.
29. Use or to set the desired damping.
30. Use to confirm your setting.

31. Use to call up the edit mode.
32. Use or to select the desired alarm mode.
33. Use to confirm your selection.

34. Use to call up the edit mode.
35. Use or to set the desired current for low alarm.
36. Use to confirm your setting.

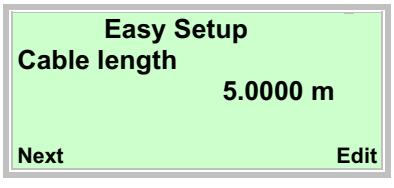
37. Use to call up the edit mode.
38. Use or to set the desired current for high alarm.
39. Use to confirm your setting.



40. Use to start the automatic zero point adjustment for the system.

NOTE!

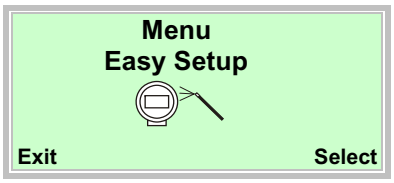
Prior to starting the zero point adjustment, make sure that:
There must be no flow through the sensor (close all valves, shut-off devices, etc.).
The sensor must be completely filled with the medium to be measured.



41. Use to call up the edit mode.
42. Use or to enter the signal cable length.

Entry of the signal cable length between the transmitter and the sensor. For compact devices, 0.01 m must be entered.

43. Use to confirm your setting.



44. Use to switch to the process display

The main menu is displayed again after all parameters are set. The most important parameters are now set.

IMPORTANT (NOTE)!

For additional information regarding operation of the LCD display, refer to chapter 8.1 "Operation", page 95.

For a detailed description of all the menus and parameters, see chapter 8.4 "Parameter description", page 113.

The LCD display is provided with capacitive push-buttons. These allow you to operate the device through the closed lid.

IMPORTANT (NOTE)!

The transmitter automatically calibrates the capacitive push-buttons on a regular basis. If the housing is opened during operation, the sensitivity of the push-buttons is first increased meaning that operating errors may occur. The sensitivity of the push-buttons returns to normal during the next automatic calibration.

Menu Q_{max} (measuring range end value)

IMPORTANT (NOTE)!

The device is set to the measuring range end value $Q_{max}DN$ at the factory provided there are no other customer specifications. Measuring range end values that correspond to a flow velocity from 2 to 3 m/s (0.2 to 0.3 × $Q_{max}DN$) are ideal.

The smallest and largest possible configurable measuring range end values are provided in the table in chapter 7.6 "Nominal width, measuring range", page 92.

Default setting of additional parameters (provided no customer-specific parameterization has been performed)

	Possible parameterization	**Default setting**
Q_{max}	Depending on the nominal width (⇨Chapter 7.6)	$Q_{max}DN$ (⇨Chapter 7.6)
Sensor TAG	Alphanumeric Max. 20 characters	None
Sensor Location TAG	Alphanumeric Max. 20 characters	None

	Possible parameterization	Default setting
Q (Flowrate) Unit	l/s; l/min; l/h; ml/s; ml/min; m3/s; m3/min; m3/h; m3/d; hl/h; g/s; g/min; g/h; kg/s; kg/min; kg/h; kg/d; t/min; t/h; t/d	l/min
Totalizer/Pulse Unit	m3; l; ml; hl; g; kg; t	l
Pulses per unit		1
Pulse width	0.1 to 2000 ms	100 ms
Damping (1 tau)	0.02 to 60 s	1
DO1 Alarm Config	Pulse F/Pulse R, Pulse F, General Alarm, Min. Flowrate Alarm, Max. Flowrate Alarm, Empty Pipe, TFE Advanced functions[a]: Gas Bubble, Conductivity, Coating, Sensor Temp	Pulse F/Pulse R
DO1 Action	Active/Passive	Passive
DO2 Alarm Config	F/R Signal, Pulse R, General Alarm, Min. Flowrate Alarm, Max. Flowrate Alarm, Empty Pipe, TFE Advanced functions[a]: Gas Bubble, Conductivity, Coating, Sensor Temp	F/R Signal
Digital Input Setup	No Function, Totalizer Reset(All), Flowrate to Zero,System Zero Adjust, TotalizerStop(All), Advanced functions[a]: Dual Range, Start/Stop Batching	Flowrate to Zero
Current Output	4 to 20 mA, 4 to 12 to 20 mA	4 to 20 mA
Iout at Alarm	High alarm, configurable 21 to 23 mA or Low alarm, configurable 3.5 to 3.6 mA	High alarm, 21.8 mA
Iout at Flow > 103 %	OFF (No signaling, current output remains at 20.5 mA), high alarm, low alarm	OFF
Low Flow Cut Off	0 to 10 %	1 %
Empty Pipe Detector	ON/OFF	OFF
TFE Detector	ON/OFF	OFF

[a] Only available for JUMO flowTRANS MAG S02/H02

with the PROFIBUS-PA version

	Possible parameterization	Default setting
PA Addr (-BUS-)	0 to 126	126
Ident Nr. Selector	0x9700, 0x9740, 0x3430	0x3430

7.6 Nominal width, measuring range

The measuring range end value can be configured between $0.02xQ_{max}DN$ and $2xQ_{max}DN$.

Nominal width	Minimum Measuring range end value $0.02xQ_{max}DN$ (≈ 0.2 m/s)		$Q_{max}DN$ 0 to ≈ 10 m/s		Maximum Measuring range end value $2xQ_{max}DN$ (≈ 20 m/s)	
DN (inch)	**l/min**	**US gal/min**	**l/min**	**US gal/min**	**l/min**	**US gal/min**
1 (1/25)	0.012	0.0032	0.6	0.16	1.2	0.32
1.5 (1/16)	0.024	0.0063	1.2	0.32	2.4	0.63
2 (1/12)	0.04	0.0106	2	0.53	4	1.06
3 (1/10)	0.08	0.02	4	1.06	8 l/min	2.11
4 (5/32)	0.16	0.04	8	2.11	16 l/min	4.23
6 (1/4)	0.4	0.11	20	5.28	40	10.57
8 (5/16)	0.6	0.16	30	7.93	60	15.85
10 (3/8)	0.9	0.24	45	11.9	90	23.78
15 (1/2)	2	0.53	100	26.4	200	52.8
20 (3/4)	3	0.79	150	39.6	300	79.3
25 (1)	4	1.06	200	52.8	400	106
32 (1 1/4)	8	2.11	400	106	800	211
40 (1 1/2)	12	3.17	600	159	1200	317

Nominal width	Minimum Measuring range end value $0.02xQ_{max}DN$ (≈ 0.2 m/s)		$Q_{max}DN$ 0 to ≈ 10 m/s		Maximum Measuring range end value $2xQ_{max}DN$ (≈ 20 m/s)	
DN (inch)	**m^3/h**	**US gal/min**	**m^3/h**	**US gal/min**	**m^3/h**	**US gal/min**
50 (2)	1.2	5.28	60	264	120	528
65 (2 1/2)	2.4	10.57	120	528	240	1057
80 (3)	3.6	15.9	180	793	360	1585
100 (4)	4.8	21.1	240	1057	480	2113
125 (5)	8.4	37	420	1849	840	3698
150 (6)	12	52.8	600	2642	1200	5283
200 (8)	21.6	95.1	1080	4755	2160	9510
250 (10)	36	159	1800	7925	3600	15850
300 (12)	48	211	2400	10567	4800	21134
350 (14)	66	291	3300	14529	6600	29059
400 (16)	90	396	4500	19813	9000	39626
450 (18)	120	528	6000	26417	12000	52834
500 (20)	132	581	6600	29059	13200	58117
600 (24)	192	845	9600	42268	19200	84535
700 (28)	264	1162	13200	58118	26400	116236
760 (30)	312	1374	15600	68685	31200	137369
800 (32)	360	1585	18000	79252	36000	158503
900 (36)	480	2113	24000	105669	48000	211337
1000 (40)	540	2378	27000	118877	54000	237754
1050 (42)	616	2712	30800	135608	61600	271217
1100 (44)	660	3038	33000	151889	66000	290589
1200 (48)	840	3698	42000	184920	84000	369841

Nominal width	Minimum Measuring range end value $0.02 \times Q_{max}DN$ (≈ 0.2 m/s)		$Q_{max}DN$ 0 to ≈ 10 m/s		Maximum Measuring range end value $2 \times Q_{max}DN$ (≈ 20 m/s)	
DN (inch)	**m^3/h**	**US gal/min**	**m^3/h**	**US gal/min**	**m^3/h**	**US gal/min**
1400 (54)	1080	4755	54000	237755	108000	475510
1500 (60)	1260	5548	63000	277381	126000	554761
1600 (66)	1440	6340	72000	317006	144000	634013
1800 (72)	1800	7925	90000	396258	180000	792516
2000 (80)	2280	10039	114000	501927	228000	1003853

7 Startup

8.1 Operation

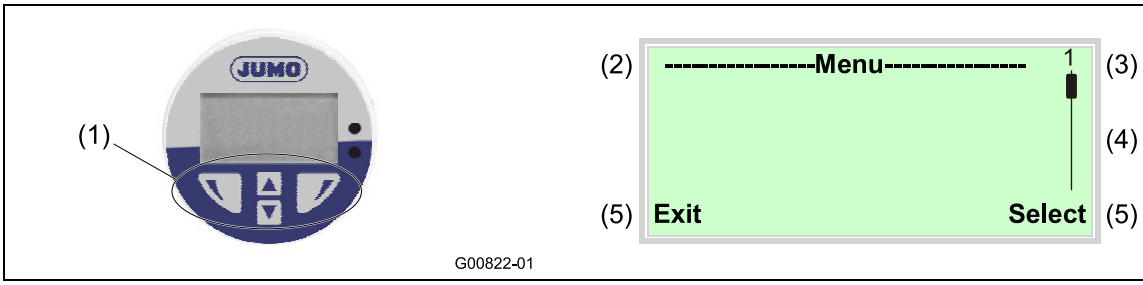
The LCD display is provided with capacitive push-buttons. They allow you to operate the device through the closed lid.

IMPORTANT (NOTE)!

The transmitter automatically calibrates the capacitive push-buttons on a regular basis. If the housing is opened during operation, the sensitivity of the push-buttons is first increased meaning that operating errors may occur.

The sensitivity of the push-buttons returns to normal during the next automatic calibration.

8.1.1 Menu navigation



(1) Operating keys for menu navigation
(2) Menu name
(3) Menu number
(4) Marker for indicating the relative position within the menu
(5) Function currently assigned to the operating keys and

You can use the or operating keys to browse through the menu or select a number or character within a parameter value.

Different functions can be assigned to the and operating keys. The function that is currently assigned to them (5) is shown on the display.

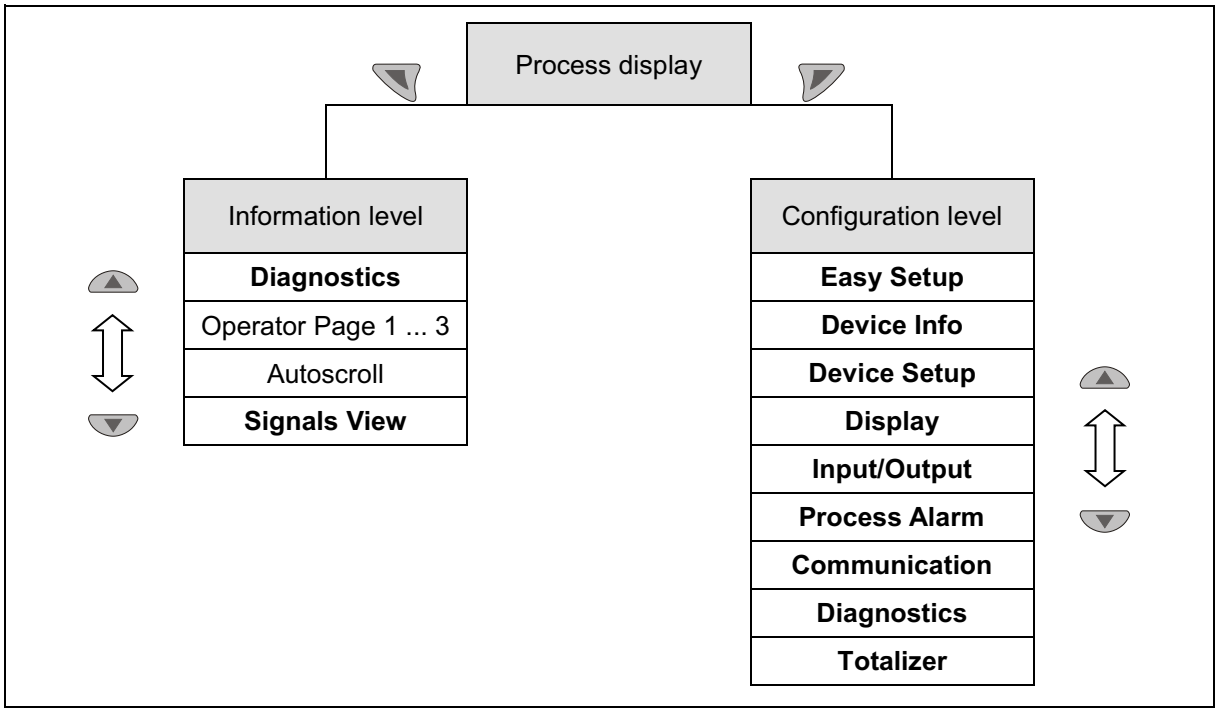
8.1.2 Operating key function

	Meaning
Exit	Exit menu
Back	Go back one submenu
Cancel	Cancel a parameter entry
Next	Selection of the next position for entering numerical and alphanumeric values

	Meaning
Select	Select submenu/parameter
Edit	Edit parameter
OK	Save the entered parameter

8 Parameterization

8.2 Menu levels



Process display

The process display shows the current process values.

Information level

The information level contains the parameters and information that are relevant for the user. The device configuration cannot be changed at this level.

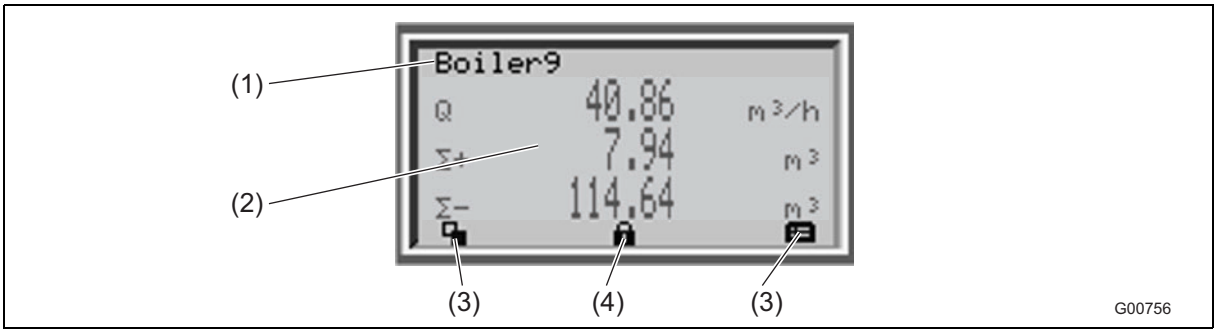
Configuration level

The configuration level contains all the parameters required for starting up and configuring the device. The device configuration can be changed here.

IMPORTANT (NOTE)!

For a detailed description of the individual parameters and menus at the configuration level, refer to chapter 8.3 "Parameter overview in the configuration level", page 105 and chapter 8.4 "Parameter description", page 113.

8.2.1 Process display



(1) Measuring point identifier
(2) Current process values
(3) Symbol indicating the button function
(4) Symbol indicating "Parameterization protected"

The process display appears on the LCD display when the device is switched on. It displays information about the device and current process values.

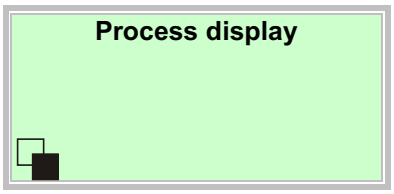
The display of the current process values (2) can be adjusted at the configuration level.

Symbol description

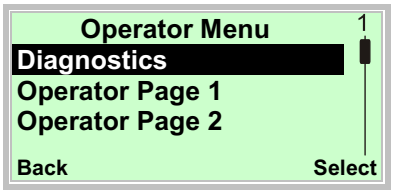
Symbol	Description
	Call up the information level. When Autoscroll mode is enabled, a ↻ symbol appears here and the operator pages are automatically displayed one after the other.
	Call up the configuration level
	The device is protected against changes to the parameterization.
Q	Display of the current flowrate
Σ+	Totalizer status in the forward direction
Σ-	Totalizer status in the reverse direction

8.2.2 Switch to the Information level (Operator Menu)

In the Information level, you can use the Operator Menu to display diagnostics information and select which operator pages are displayed.



1. Use  to switch to the Information level.

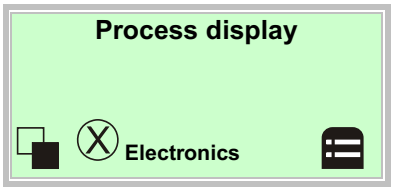


2. Use  or  to select a submenu.
3. Use  to confirm your selection.

Menu	Description
.../Operator Menu	
Diagnostics	Selection of the "Diagnostics" submenu (⇨see chapter "Calling up the error description", page 100)
Operator page 1	Selection of the displayed operator page
Operator page 2	
Operator page 3	
Operator page 4	
Autoscroll	When "Multiplex mode" is enabled, this initiates automatic switching of the operator pages on the process display.
Signal View	Selection of "Signal View" submenu (for service purposes only)

Error messages in the LCD display

In case of an error, a message consisting of a symbol and text (e.g. Electronics) appears at the bottom of the process display. The displayed text provides information about the area in which the error has occurred.



The error messages are divided into four groups in accordance with the NAMUR classification scheme:

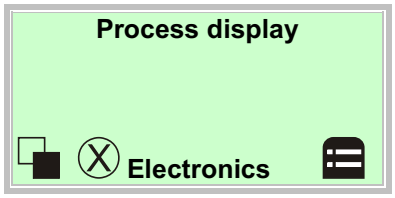
Symbol	Description
	Error/failure
	Functional check
	Outside the specification
	Maintenance required

In addition, the error messages are divided into the following areas:

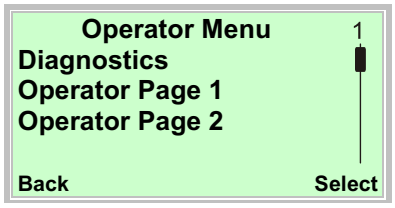
Area	Description
Electronics	Error/alarm from the electronics
Sensor	Error/alarm from the sensor
Status	Alarm due to the current device status
Operation	Error/alarm due to the current operating conditions

Calling up the error description

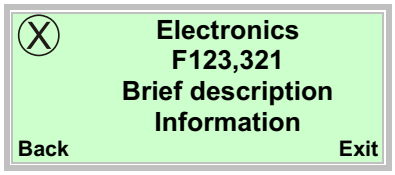
Further information about the occurred error can be called up at the Information level.



1. Use  to switch to the Information level.



2. Use  or  to select the "Diagnostics" submenu.
3. Use  to confirm your selection.



The first line shows the area where the error has occurred.

The second line shows the unique error number.

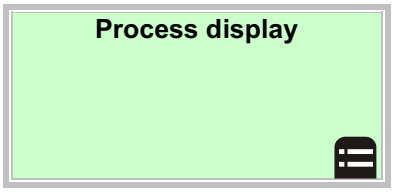
The next lines show a brief description of the error and information for the troubleshooting.

IMPORTANT (NOTE)!

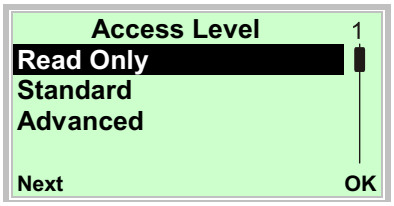
For a detailed error description and information on troubleshooting, refer to chapter 10 "Error messages", page 161.

8.2.3 Switching to the Configuration level (Parameterization)

The device parameters can be displayed and changed at the Configuration level.



1. Use  to switch to the Configuration level.



2. Use  or  to select the Access Level.
3. Use  to confirm your selection.

IMPORTANT (NOTE)!

There are four access levels.

Passwords can be defined for the "**Standard**" and "**Advanced**" levels. No passwords have a default setting.

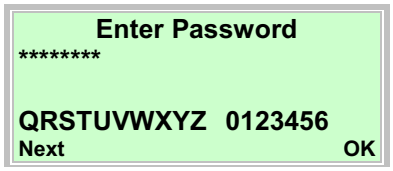
All entries in the "**Read only**" level are blocked. The parameters can be read but not changed.

In the "**Standard**" level, all parameters described in chapter 8.4 "Parameter description", page 113, except the ones displayed in ***in italics,***can be changed.

In the "**Advanced**" level, all parameters can be changed.

Only customer service can access the "**Service**" menu.

After logging into the corresponding access levels, the password can be changed or reset. A password is reset (status "no password defined") by selecting ▤ as the password.



1. Enter the corresponding password (⇨ see chapter 8.2.5 "Selecting and changing parameters", page 103). No password has a default setting; you can switch into the configuration level without entering a password.

   The selected access level remains enabled for 3 minutes. You can quickly switch between the process display and the configuration level without entering the password again.

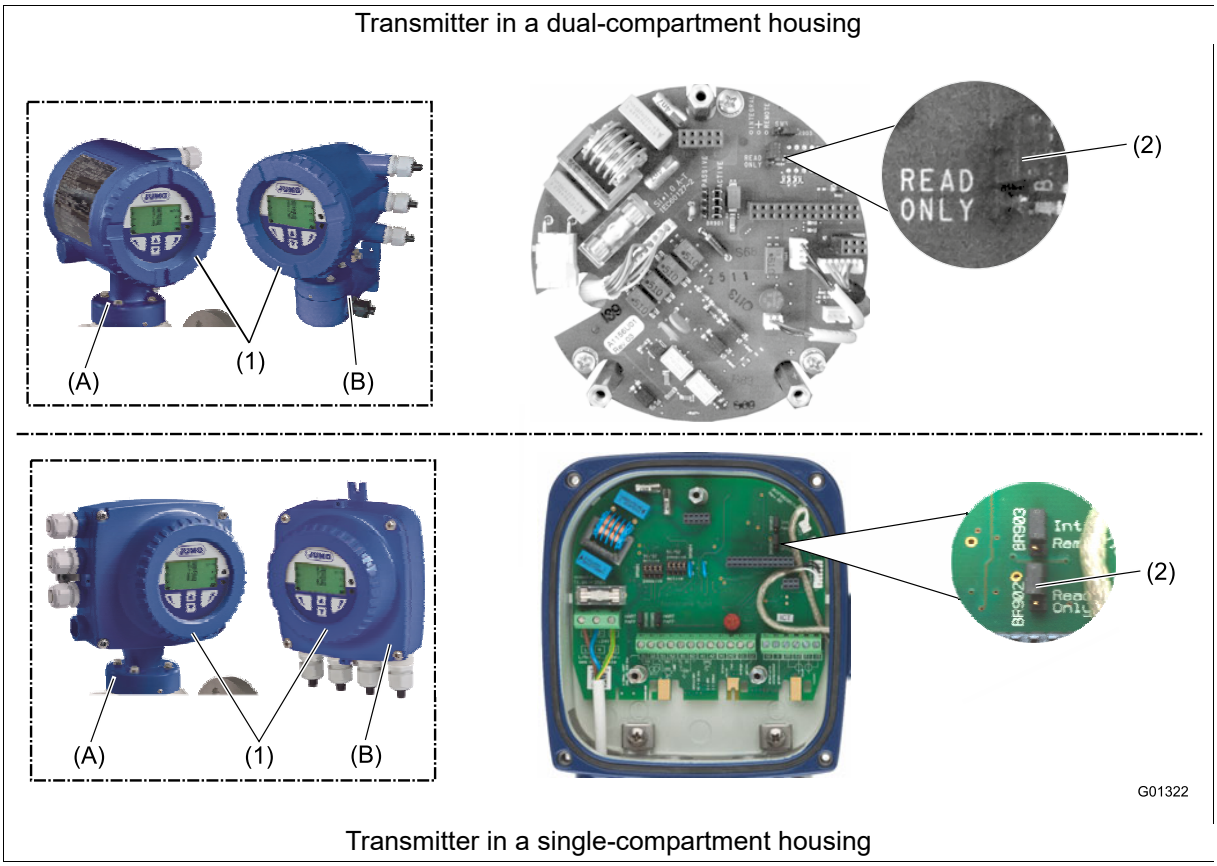
2. Use  to confirm the password.

   The first menu item of the configuration level can now be displayed in the LCD display.

3. Use  or  to select a menu.
4. Use  to confirm your selection.

8.2.4 Hardware write protection

In addition to the password protection, you can also activate hardware write protection.



A JUMO flowTRANS MAG S/H - compact design
B JUMO flowTRANS MAG - remote mount design
(1) Case lid
(2) Jumper (BR902) for hardware write protection

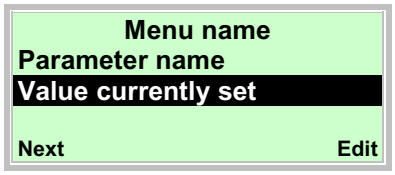
1. Switch off the voltage supply.
2. Open the case lid.
3. Remove the fastening screws for the transmitter electronics unit.
4. Pull out the transmitter electronics unit.
5. Set jumpers on the backplane according to the following table.
6. Reinstall the transmitter electronics unit in reverse order.

Jumper	Position	Function
BR902	Read only	Hardware write protection active

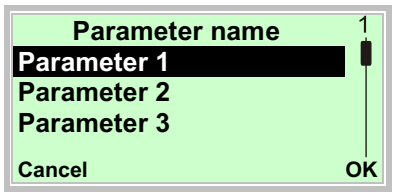
8.2.5 Selecting and changing parameters

Table entry

When an entry is made from a table, a value is selected from a list of parameter values.



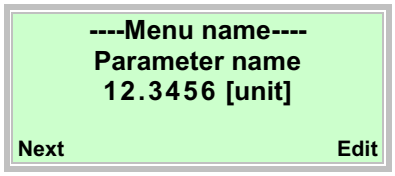
1. Selection of the parameters to be set in the menu.
2. Use to call up the list of the available parameter values. The parameter value that is currently set is highlighted.



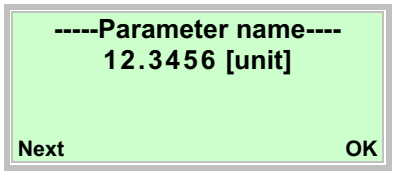
3. Use or to select the desired value.
4. Use to confirm your selection.
   This concludes the procedure for selecting a parameter value.

Numeric entry

When a numeric entry is made, a value is set by entering the individual decimal positions.



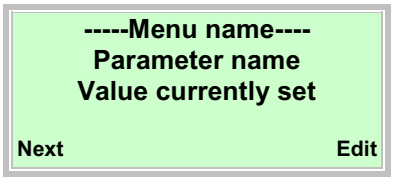
1. Selection of the parameters to be set in the menu.
2. Use to call up the parameter for editing. The decimal point currently selected is highlighted.



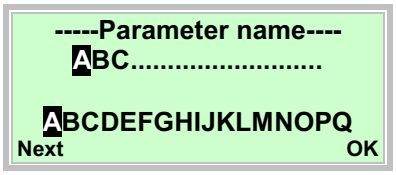
3. Use to select the decimal point to be changed.
4. Use or to select the desired value.
5. Use to select the next decimal point.
6. If necessary, select and set additional decimal points according to steps 3 to 4.
7. Use to confirm your setting.
   This concludes the procedure for changing the parameter value.

Alphanumeric entry

When an alphanumeric entry is made, a value is set by entering the individual decimal positions.



1. Selection of the parameters to be set in the menu.
2. Use  to call up the parameter value for editing. The decimal point currently selected is highlighted.



3. Use  to select the decimal point to be changed.
4. Use  or  to select the desired character.
5. Use  to select the next decimal point.
6. If necessary, select and set additional decimal points according to steps 3 to 4.
7. Use  to confirm your setting.

   This concludes the procedure for changing the parameter value.

Canceling the entry

For some menu items, a value must be entered. If you do not want to change the parameter, you can exit the menu as described below.

1. By pressing  (Next) again, the cursor moves to the right. If you move the cursor after the last position, "Cancel" is shown in the lower right of the display.
2. Use  to cancel the editing step and exit the menu item.

   Use  to start again from the beginning.

IMPORTANT (NOTE)!

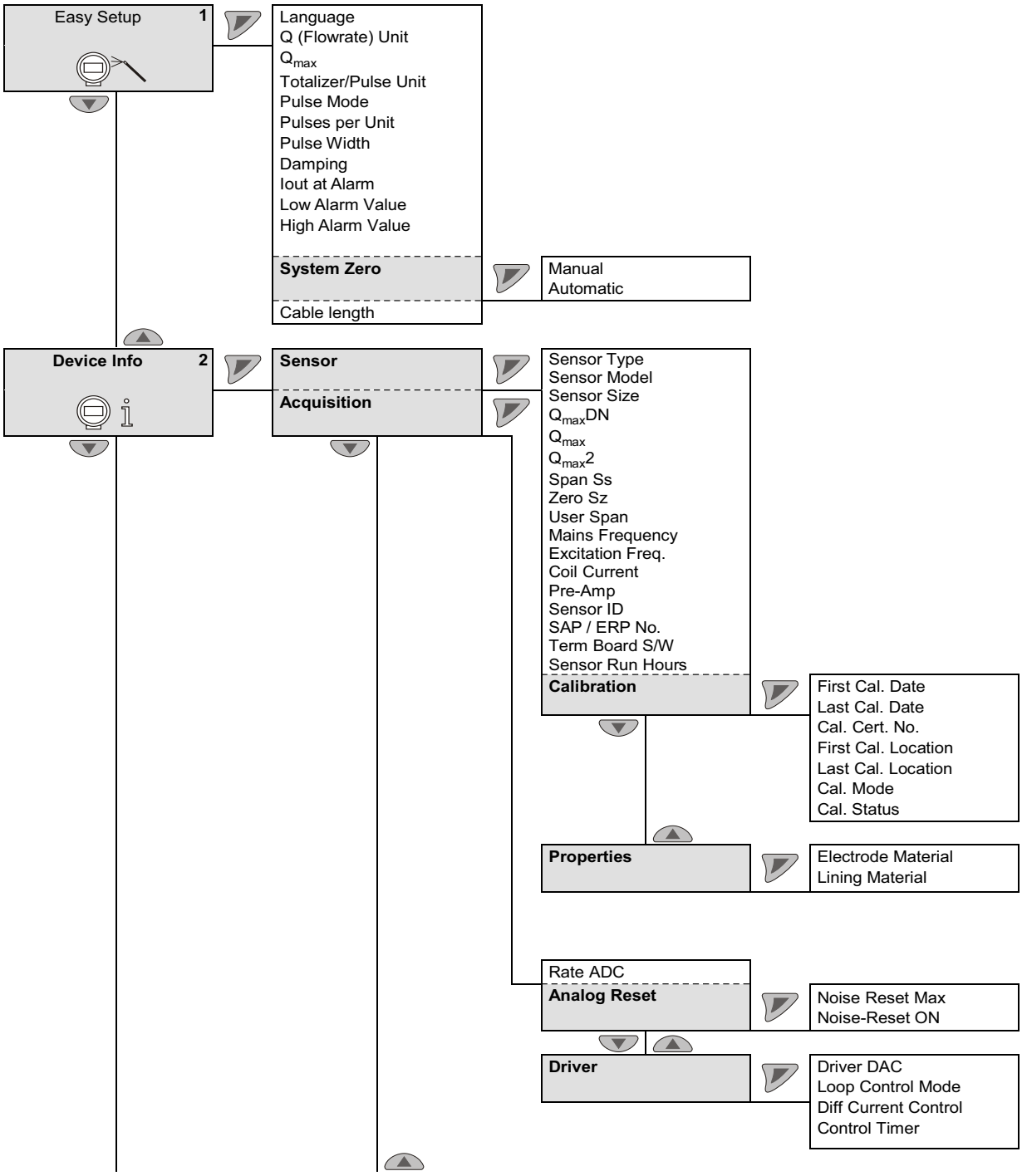
The LCD display switches back to the process display 3 minutes after the last time a button was pressed.

8.3 Parameter overview in the configuration level

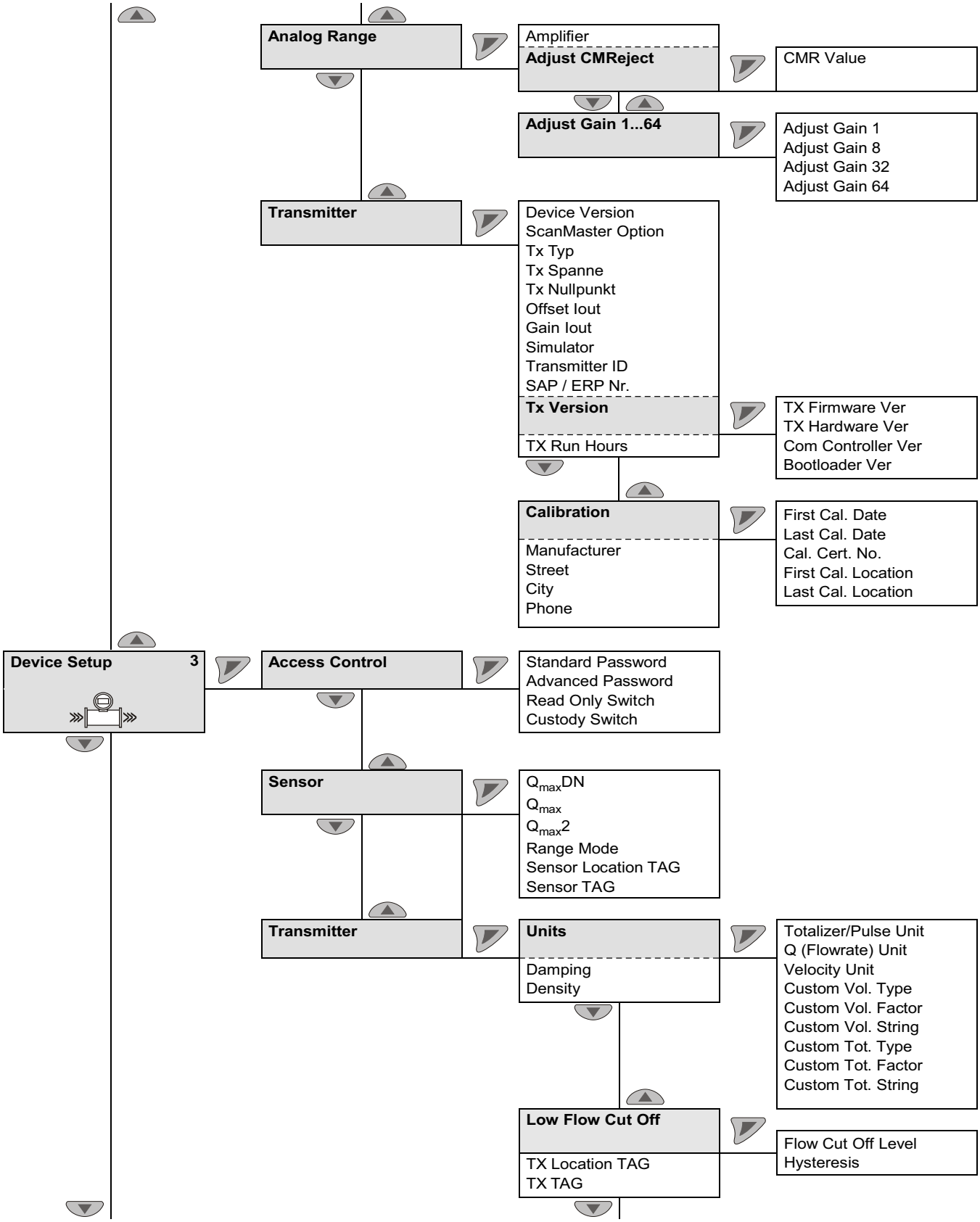
IMPORTANT (NOTE)!

This parameter overview shows all the menus and parameters available on the device.

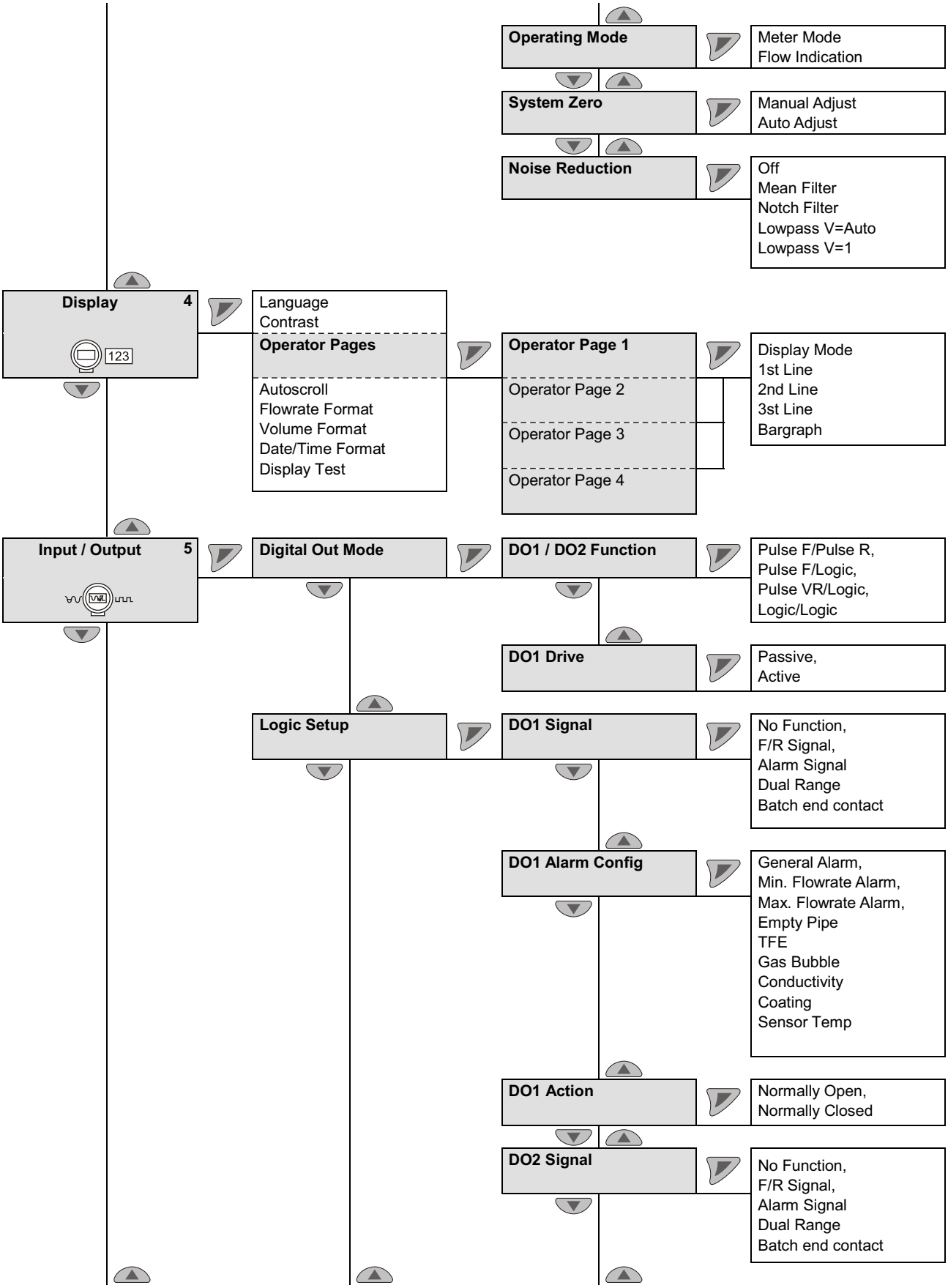
Not all of the menus and parameters may be visible on the device, depending on the device equipment and configuration.



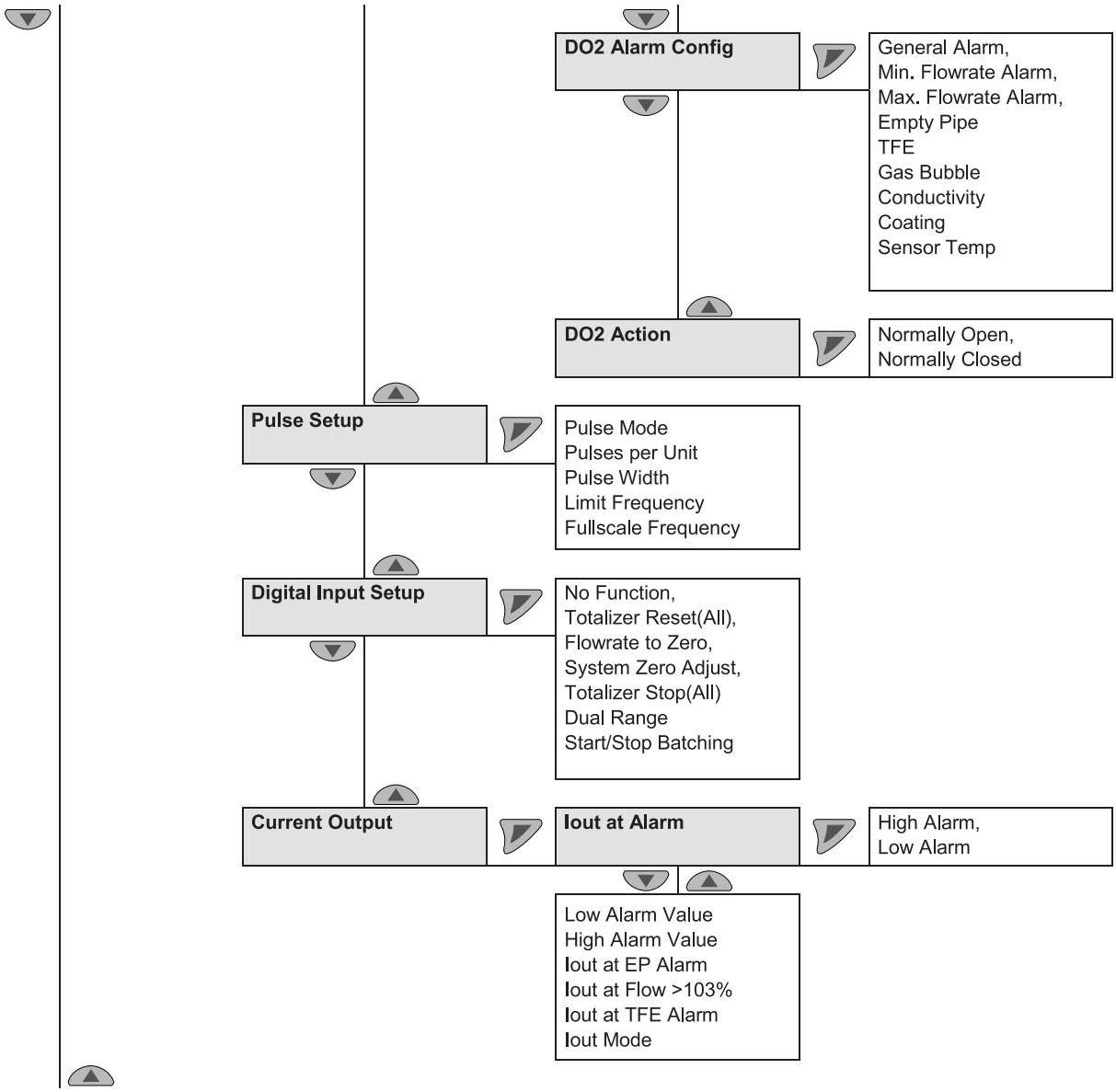
italics = Parameter can only be changed at the "advanced" password level.



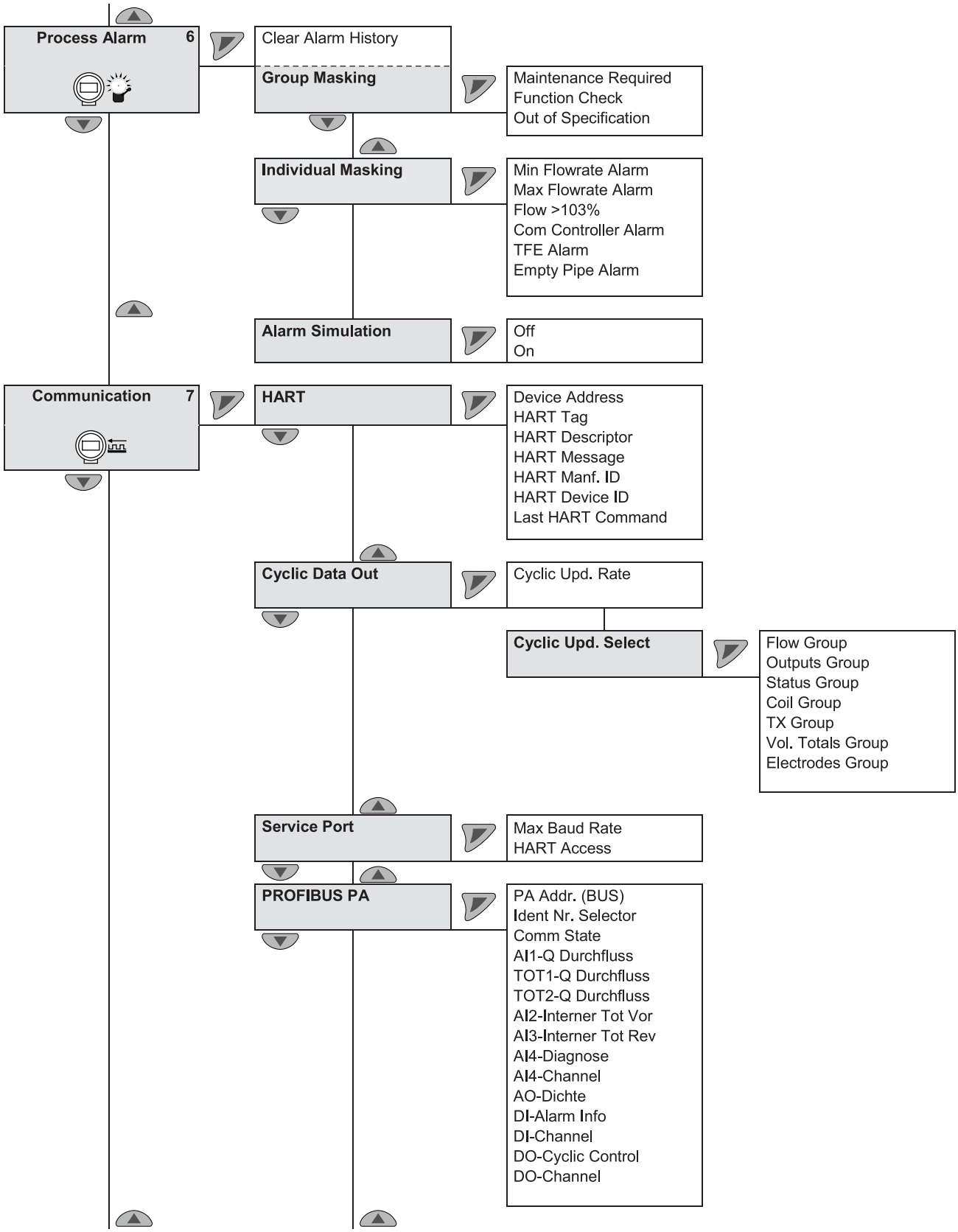
italics = Parameter can only be changed at the "advanced" password level.



italics = Parameter can only be changed at the "advanced" password level.

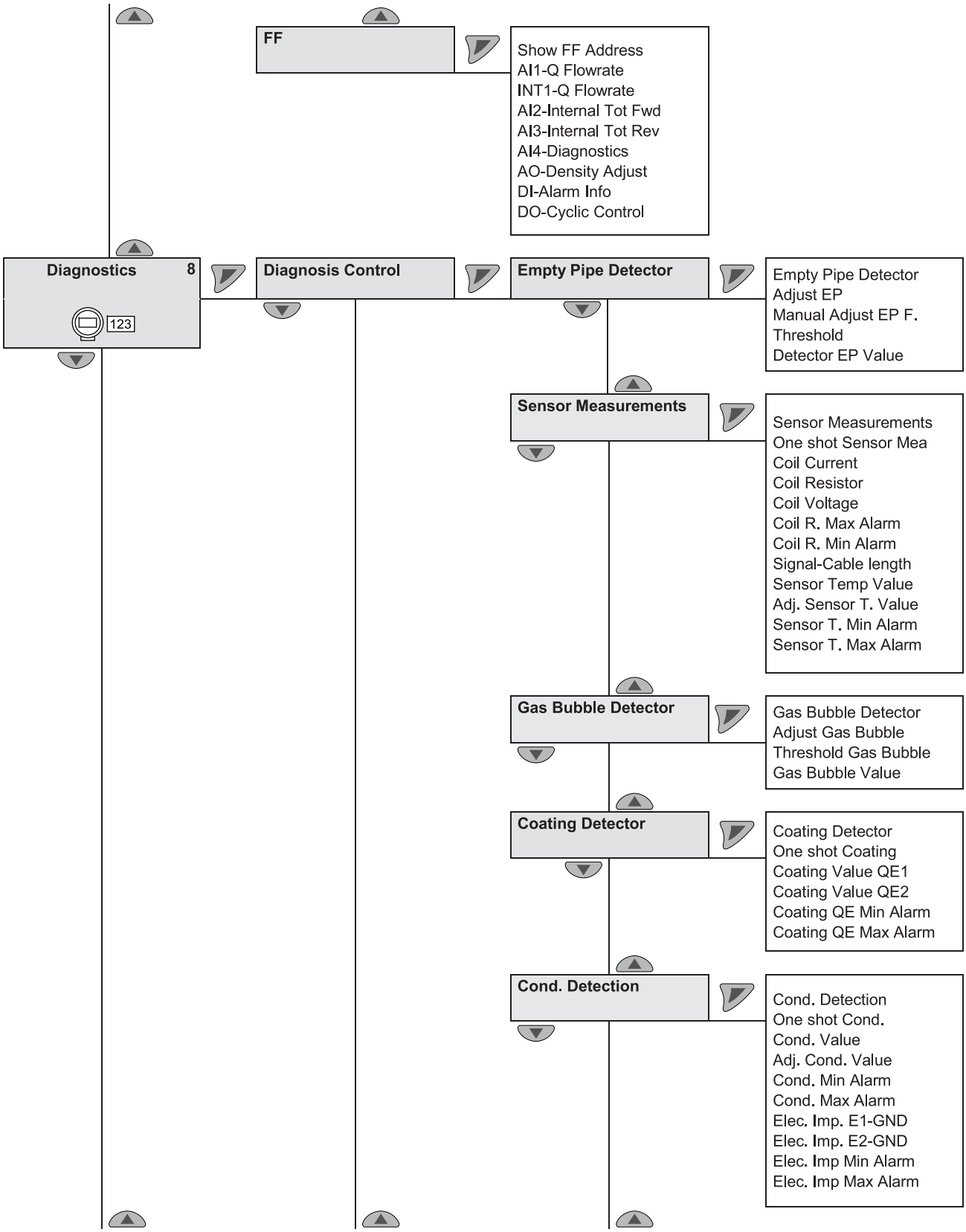


italics = Parameter can only be changed at the "advanced" password level.

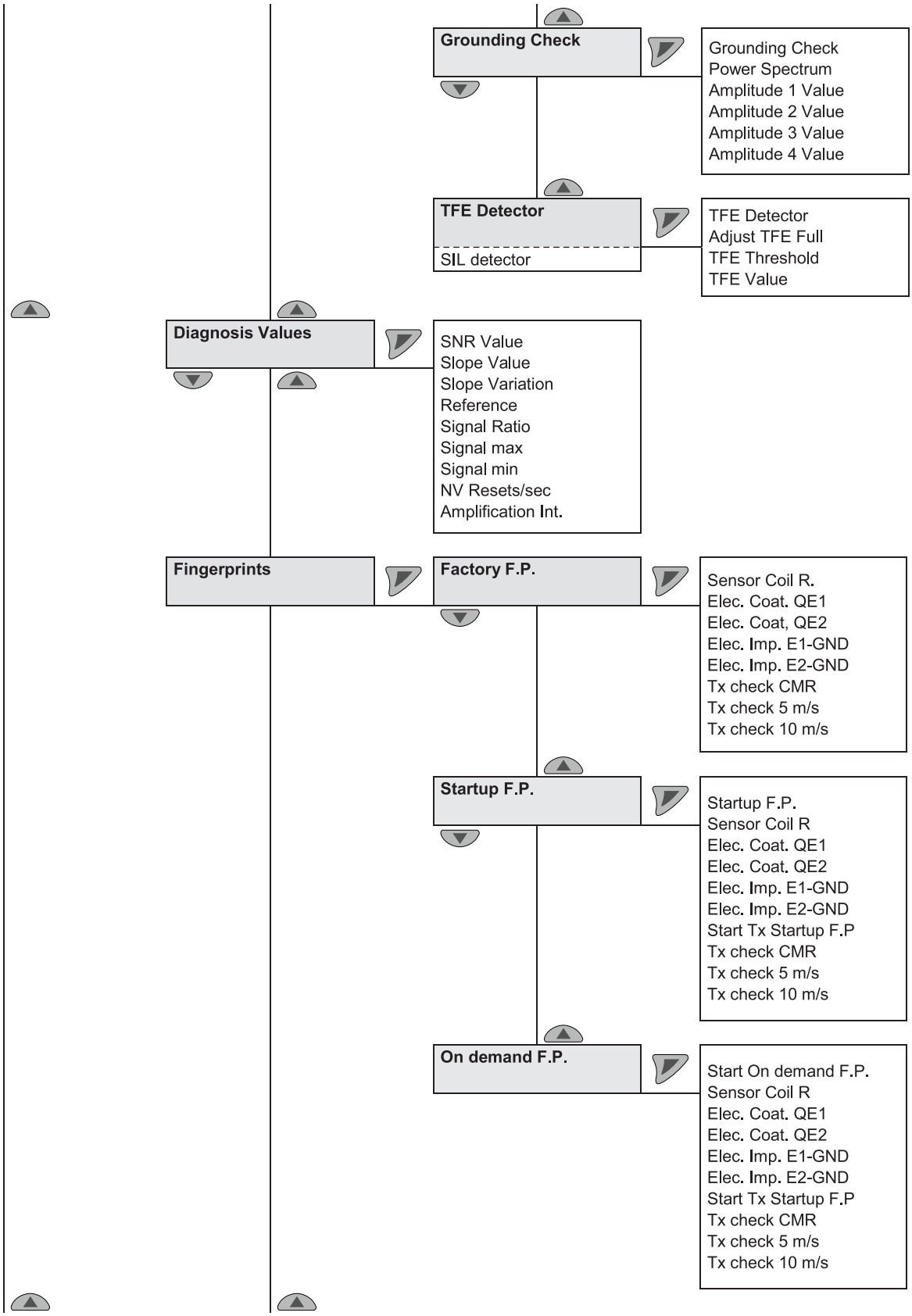


italics = Parameter can only be changed at the "advanced" password level.

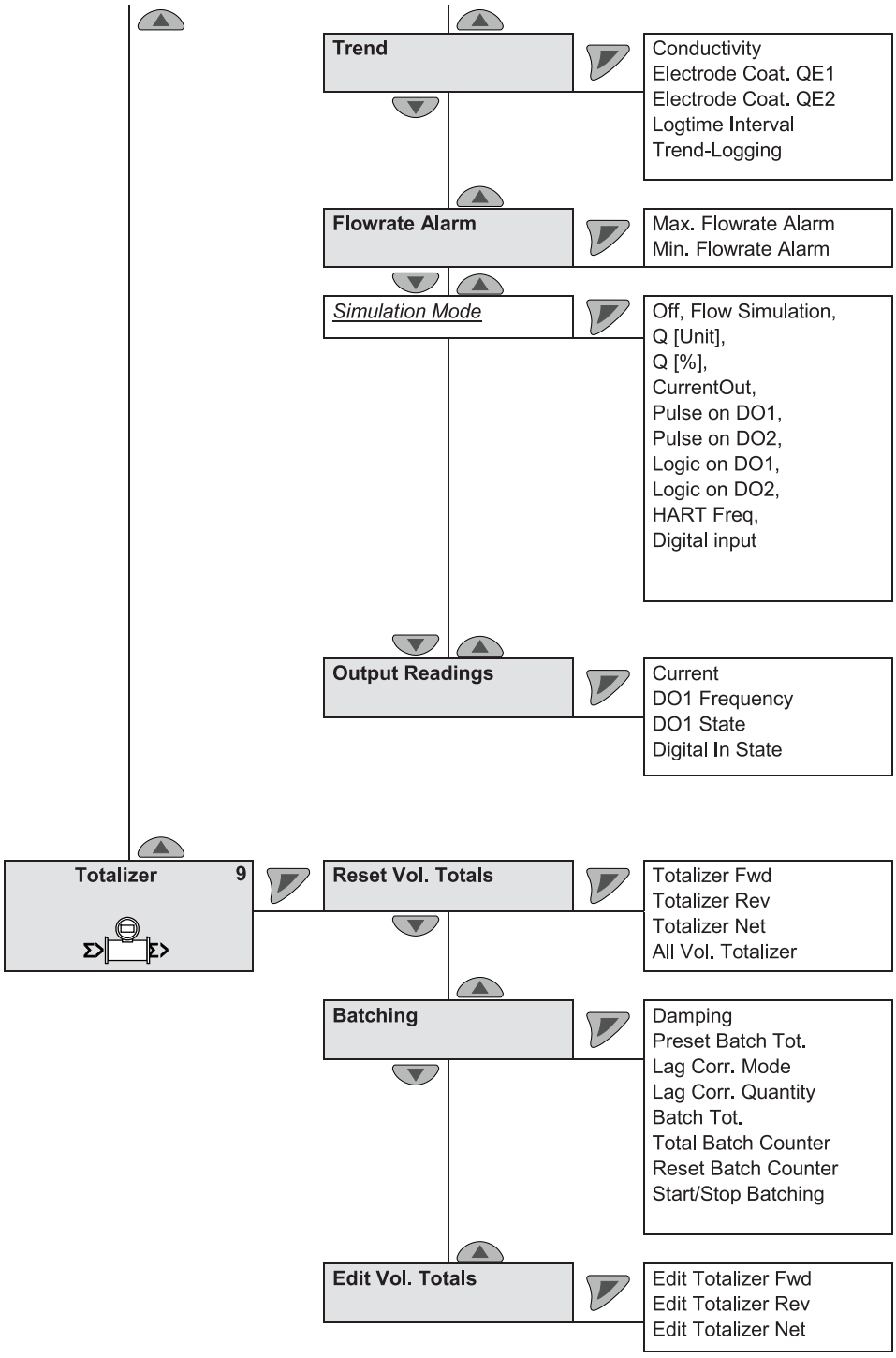
8 Parameterization



italics = Parameter can only be changed at the "advanced" password level.



italics = Parameter can only be changed at the "advanced" password level.



italics = Parameter can only be changed at the "advanced" password level.

8.4 Parameter description

8.4.1 Menu: Easy Setup

Menu/parameter	Value range	Description
Easy Setup		**Menu "Easy Setup"**
Language	Deutsch, English, Français, Español, Italiano, Dansk, Svenska, Polski, Russki, Zhongweng, Turkce	Menu language selection
Q (Flowrate) Unit	l/s; l/min; l/h; ml/s; ml/min; m3/s; m3/min; m3/h; m3/d; Ml/d; ft3/s; ft3/min; ft3/h; ft3/d; ugal/s; ugal/min; ugal/h; ugal/d; Mugal/d; igal/s; igal/min; igal/h; igal/d; bls/s; bls/min; bls/h; bls/d; hl/h; g/s; g/min; g/h; kg/s; kg/min; kg/h; kg/d; t/min; t/h; t/d; lb/s; lb/min; lb/h; lb/d; custom/s	Unit selection for the flow display Default setting: l/min
Q_{max}	Min. measuring range: 0 to 0.2 m/s (0 to 0.02 × Q_{max}DN) Max. measuring range: 0 to 20 m/s (0 to 2 × Q_{max}DN)	Measuring range selection for supply and return side Default setting: 1 × Q_{max}DN
Totalizer/Pulse Unit	m3; l; ml; ft3; hl; g; kg; t; lb; igal; ugal; bls; Ml; Mugal; custom	Unit selection for the flow counter Default setting: l
Operation	Pulse mode, Fullscale Frequency	Operating mode selection for the digital output You can choose between two operating modes: • "Pulse Mode": In pulse mode, pulses per unit are output (e.g. 1 pulse per m^3). • "Fullscale Frequency": in frequency mode, a frequency proportional to the flow is output. The maximum frequency can be configured according to the measuring range end value (maximum 5.25 kHz). Default setting: "Pulse Mode"
Pulses per unit	-	Display of pulse per unit output by the digital output The maximum possible number of pulses is 5250/ second.
Fullscale Frequency	0 to 5250 Hz	Frequency setting for the measuring range end value in "Fullscale Frequency"
Pulse Width	0.1 to 2000 ms	Pulse width selection for the digital output The pulse factor and pulse width are interdependent and are calculated dynamically.

Menu/parameter	Value range	Description
Damping	0.02 to 60 s	Damping selection The value set here refers to 1 t (tau). The specification refers to the response time for a sudden change in the flow. It affects the current value in the LCD display and the current output. Default setting: 1 second
Iout at Alarm	Low, High	Current output status in case of a fault The value for "low" or "high" is set in the following menu. Default setting: High
Low Alarm Value	3.5 to 3.6 mA	Current in case of low alarm Default setting: 3.5 mA
High Alarm Value	21 to 23 mA	Current in case of high alarm Default setting: 21.8 mA
System Zero		Selection of the "System Zero" submenu
Cable length 	0.01 to 200 m	Entry of the signal cable length between the transmitter and the sensor For compact devices, JUMO flowTRANS MAG S/H, 0.01 m must be entered.

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Easy Setup/**System Zero**		**"System zero point" submenu**
Manual 		Starts the manual zero point adjustment
Automatic		Start the automatic zero point adjustment

Italics = Parameter can only be viewed in the "Advanced" password level

Cable length

The input is required here for devices of the JUMO flowTRANS MAG S02/H02 design type to be able to use the diagnostic function.

If the ScanMaster verification software is used, the signal cable length must also be input.

Manual/Automatic

Prior to starting the zero point adjustment, make sure that:

- There must be no flow through the sensor (close all valves, shut-off devices, etc.).
- The sensor must be completely filled with the medium to be measured.

8.4.2 Menu: Device info

IMPORTANT (NOTE)!

This menu is only used for displaying the device parameters. The parameters can be viewed independently of the set access level, however cannot be changed.

Menu/parameter	Value range	Description
Device Info		
Sensor		Selection of "Sensor" submenu
Acquisition		Selection of "Acquisition" submenu
Analog Range		Selection of "Analog Range" submenu
Transmitter		Selection of "Transmitter" submenu

Menu/parameter	Value range	Description
Device Info/**Sensor**		
Sensor Type	-	Sensor type ⇨ 7.1
Sensor Model	-	Display of model number
Sensor Size	-	Size of the sensor
Q_{max}DN	-	The value indicates the maximum flow at a flow velocity of 10 m/s. The value is automatically set via the selected nominal width.
Q_{max}	-	Set measuring range end value for measuring range 1 Default setting: measuring range 1 enabled
Q_{max}2	-	Set measuring range end value for measuring range 2 Default setting: measuring range 2 enabled
Span Ss	-	Calibration value of the sensor (range)
Zero Sz	-	Calibration value of the sensor (zero)
User Span	-	Display of the correction value of the sensor range
Mains Frequency	-	Mains frequency of the voltage supply
Excitation Freq.	-	Frequency with which the magnet coils of the sensor are operated
Coil Current	-	Current with which the magnet coils of the sensor are operated
Pre-Amp	-	Display indicating whether a preamplifier is available in the sensor (yes/no)
Sensor ID	-	ID number of the sensor
SAP/ERP No.	-	Sensor order number
Term Board SW	-	Software version of the SensorMemory integrated into the sensor
Sensor Run Hours	-	Operating hours counter for the sensor
Calibration		Selection of "Calibration" submenu

Properties		Selection of "Properties" submenu

Italics = Parameter can only be viewed in the "Advanced" password level

$Q_{max}2$

You toggle between the measuring ranges using the digital input or via the "Config. Device/Sensor/Dual ranges" menu

Menu/parameter	Value range	Description
Device Info/Sensor/**Calibration.**		
First Cal. Date	-	Date of the first calibration of the sensor (calibration of the new device)
Last Cal. Date	-	Date of the last calibration of the sensor
Cal. Cert. No.	-	ID (no.) of the corresponding calibration certificate
First Cal. Location	-	Location of the first calibration of the sensor
Last Cal. Location	-	Location of the last calibration of the sensor
Cal. Mode	-	Calibration mode of the sensor
Cal. Status	-	Calibration status of the sensor

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Sensor/**Properties**		
Electrode Material	-	Electrode material of the sensor
Lining Material	-	Lining material of the sensor

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/**Acquisition**		
Rate ADC	-	Display for service purposes only
Analog Reset		Selection of "Analog Reset" submenu
Driver		Selection of "Driver" submenu

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Acquisition/**Analog Reset**		
Noise Reset Max	-	Display for service purposes only
Noise Reset ON	-	Selection of "Analog Reset" submenu

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Acquisition/**Driver**		
Driver DAC	-	Display for service purposes only
Loop Control Mode	-	
Diff Current Mode	-	
Control Timer	-	

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Acquisition/**Analog Range**		
Amplifier	-	Display for service purposes only
Adjust CMReject		Selection of "Adjust DMReject" submenu
Adjust Gain 1 ... 64		Selection of "Adjust Gain 1 to 64" submenu

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Analog Range/**Adjust CMReject**		
CMR Value	-	Display for service purposes only

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Analog Range/**Adjust Gain 1 to 64**		
Adjust Gain 1	-	Display for service purposes only
Adjust Gain 8	-	
Adjust Gain 16	-	
Adjust Gain 64	-	

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/**Transmitter**		
Device Version	-	Display of the transmitter device version
ScanMaster option	-	Display indicating whether the ScanMaster option is enabled.
TX Type	-	Display of the transmitter type
TX Span	-	Calibration value of the transmitter (range)
TX Zero	-	Calibration value of the transmitter (zero point)
Offset Iout	-	Display of the calibration value for the current output (zero point)
Gain Iout	-	Display of the calibration value for the current output (range)
Simulator	-	Display for service purposes only
Transmitter ID	-	ID number of the transmitter
SAP/ERP No.	-	Order number of the transmitter
TX Version		Selection of "TX Version" submenu
TX Run Hours	-	Operating hours counter for the transmitter
Calibration		Selection of "Calibration" submenu
Manufacturer	-	Name of the manufacturer
Street	-	Address of the manufacturer (street)
City	-	Address of the manufacturer (city)
Phone	-	Phone number of the manufacturer

Italics = Parameter can only be viewed in the "Advanced" password level

ScanMaster option

The device can be checked for diagnostics and verification purposes using a separate tool (ScanMaster). This option is subject to a surcharge and must be enabled in the transmitter.

Menu/parameter	Value range	Description
Device Info/Transmitter/**TX Version**		
TX Firmware Ver.	-	Software version of the transmitter
TX Hardware Ver.	-	Hardware version of the transmitter
Com Controller Ver.	-	Software version of the COM controller
Bootloader Ver.	-	Software version of the boot loader

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Info/Transmitter/**Calibration info.**		
First Cal. Date	-	Date of the first calibration of the transmitter (calibration of the new device)
Last Cal. Date	-	Date of the last calibration of the transmitter
Cal. Cert. No.	-	ID (no.) of the corresponding calibration certificate
First Cal. Location	-	Location of the first calibration of the transmitter
Last Cal. Location	-	Location of the last calibration of the transmitter

8.4.3 Menu: Device Setup

Menu/parameter	Value range	Description
Device Setup		
... Access Control		Selection of "... Access Control" submenu
... Sensor		Selection of "... Sensor" submenu
... Transmitter		Selection of "... Transmitter" submenu

Menu/parameter	Value range	Description
Device Setup/**... Access Control**		
Standard Password	Alphanumeric	Enter/change the password for the "Standard" access level
Advanced Password	Alphanumeric	Enter/change the password for the "Advanced" access level
Read Only Switch	Display only (ON/OFF)	Display of the BR902 switch position (hardware write protection) ⇨Chapter 8.2.4
Custody Switch	Display only (ON/OFF)	Display of the custody switch position (the switch must be enabled for the calibrated device)

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Setup/**... Sensor**		
Q_{max}DN	Display only	The displayed value indicates the flow at a flow velocity of 10 m/s. The value is automatically set via the selected nominal width.
Q_{max}	Min. measuring range: 0 to 0.2 m/s (0 to 0.2 × Q_{max}DN)	Setting of measuring range end value (measuring range 1) for supply and return side Default setting: 1 × Q_{max}DN
	Max. measuring range: 0 to 0.2 m/s (0 to 2 × Q_{max}DN)	
Q_{max}2	See Q_{max}	Setting of measuring range end value (measuring range 2) for supply and return side (see note) Default setting: 1 × Q_{max}DN, measuring range 2 is disabled
Range Mode	Q_{max} enabled	Manual toggling between the measuring ranges Q_{max} and Q_{max}2
	Q_{max}2 enabled	
Sensor Location TAG	Alphanumeric, max. 20 characters	Entry of the measuring point identifier of the sensor (the measuring point identifier is displayed on the top left of the process display)
Sensor TAG	Alphanumeric, max. 20 characters	Entry of the TAG number of the sensor

Italics = Parameter can only be viewed in the "Advanced" password level

Q_{max}2

You toggle between the measuring ranges using the digital input or via the "Device Setup/...Sensor/Dual ranges" menu

Menu/parameter	Value range	Description
Device Setup/**... Transmitter**		
... Unit		Selection of "Unit" submenu
Damping	0.02 to 60 s	Damping setting The value set here refers to 1 t (tau). The specification refers to the response time for a sudden change in the flow. It affects the current value in the LCD display and the current output. Default setting: 1 second
Density	0.01 to 5.0 g/cm^3	If the flow is counted and displayed with the units g/s, g/min, g/h, kg/s, kg/min, kg/h, kg/d, t/min, t/h, t/d, lkb/s, lb/min, lb/h und lb/d, a fixed density must be included in the calculations. To convert the mass flow, the density can be configured in the range between 0.01 and 5.0 g/cm^3.
... Low Flow Cut Off		Selection of "Low Flow Cut Off" submenu
TX Location TAG	Alphanumeric, max. 20 characters	Entry of the measuring point tag for the transmitter
TX TAG	Alphanumeric, max. 20 characters	Entry of the TAG number for the transmitter
... Operating Mode		Selection of "Operating Mode" submenu
... System Zero		Selection of the "System Zero" submenu
Noise Reduction	Off Mean Filter Notch Filter Lowpass V = Auto Lowpass V = 1	Activate the noise reduction for a turbulent flow signal When the noise reduction is switched on, the response time increases. Default setting: Off

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... Unit**		
Totalizer/Pulse Unit	m3, l, ml, ft3, hl, g, kg, t, lb, igal, ugal, bls, Ml, Mugal, Custom/s	Unit selection for the flow counter
Q (Flowrate) Unit	l/s, l/min, l/h, ml/s, ml/min, m3/s, m3/min, m3/h, m3/d, Ml/d, ft3/s, ft3/min, ft3/h, ft3/d, ugal/s, ugal/min, ugal/h, ugal/d, Mugal/d, igal/s, igal/min, igal/h, igal/d, bls/s, bls/min, bls/h, bls/d, hl/h, g/s, g/min, g/h, kg/s, kg/min, kg/h, kg/d, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, Custom/s	Unit selection for the flow display
Velocity Unit	m/s, m/min, cm/s, cm/min, feet/s, feet/min, inch/s, inch/min	Unit selection for displaying the flow velocity
Custom Vol. Type	Volume flow Mass flow	Select whether the user-defined flow unit is displayed as a mass flow (with density) or a volume flow (without density)
Custom Vol. Factor	0.0001 to 100000 l/s	Entry of the factor for a user-defined flow unit The factor refers to the flow per liter.
Custom Vol. String	Alphanumeric, max. 20 characters	Entry of the name of the user-defined flow unit
Custom Tot. Type	Volume flow Mass flow	Select whether the user-defined counter unit is displayed as a mass flow (with density) or a volume flow (without density)
Custom Tot. Factor	0.0001 to 100000 l	Entry of the factor for a user-defined counter unit The factor refers to the flow per liter.
Custom Tot. String	Alphanumeric, max. 20 characters	Entry of the name of the user-defined counter unit

Italics = Parameter can only be viewed in the "Advanced" password level

Totalizer/Pulse Unit, Q (Flowrate) Unit, Custom Vol. Type, Custom Tot. Type

If a mass unit is selected, the corresponding density must be set in the "Device Setup/... Transmitter/ Density" menu.

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... Low Flow Cut Off**		
Threshold	0 to 10 %	Select the switching threshold for monitoring the low flow If the value falls below the set switching threshold, no flow is measured. The current output is set to zero. The switching threshold of the low flow monitoring refers to the measuring range currently set. Default setting: 1 %
Hysteresis	0 to 50 %	Hysteresis setting of the low flow

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... Operating Mode**		
Meter Mode	Forward only, Forward and Reverse	Measuring direction setting for the sensor • "Forward only": the device only measures and counts in the supply direction • "Forward an Reverse": the device measures and counts in both directions Default setting: Forward an Reverse
Flow Indication	Normal, Reverse	Inverts the indicated flow direction Default setting: Normal

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... System Zero**		
Manual Adjust	-50 to +50 mm/s	Entry of the flow velocity for the system zero
Auto Adjust 		Start the automatic zero point adjustment

Italics = Parameter can only be viewed in the "Advanced" password level

Auto Adjust

Prior to starting the zero point adjustment, make sure that:

- There must be no flow through the sensor (close all valves, shut-off devices, etc.).
- The sensor must be completely filled with the medium to be measured.

8.4.4 Menu: Display

Menu/parameter	Value range	Description
Display		
Language	Deutsch, English, Français, Español, Italiano, Dansk, Svenska, Polski, Russki, Zhongweng, Turkce	Menu language selection
Contrast	0 to 100 %	Contrast setting for the LCD display
Operator Pages		Selection of "Operator Pages" submenu
Autoscroll	ON/OFF	When Multiplex mode is enabled, you can activate the "Autoscroll" function in the user menu (in the information level). As a result, the operator pages are automatically displayed in the process display one after the other in 10-second intervals. As previously described, it is no longer possible to manually scroll through the preconfigured operator pages. When Autoscroll mode is enabled, a ↻ symbol appears bottom left in the display. Default setting: OFF
Flowrate Format	x, x.x, x.xx, x.xxx, x.xxxx	Selection of the decimal places for the flow display Default setting: x.xx
Volume Format	x, x.x, x.xx, x.xxx, x.xxxx	Selection of the decimal places for the flow counter Default setting: x.xx
Date/Time Format	DD-MM-YYYY, MM-DD-YYYY, YYYY-MM-DD	Selection of the display format for the date and time Default setting: YYYY-MM-DD
Display Test		Start the display test for the LCD display with "OK"

Italics = Parameter can only be viewed in the "Advanced" password level

Operator Pages

Up to four user-defined operator pages (layouts) can be configured for the process display. If several operator pages are configured, you can **manually** scroll through the preconfigured operator pages in the information level. Only Operator Page 1 is enabled in the default setting.

Menu/parameter	Value range	Description
Display/**Operator Pages**		
Operator Page 1		Selection of "Operator page 1" submenu
Operator Page 2		Selection of "Operator page 2" submenu
Operator Page 3		Selection of "Operator page 3" submenu
Operator Page 4		Selection of "Operator page 4" submenu

Menu/parameter	Value range	Description
Display/Operator Pages/**Operator Page 1 (n)**		
Display mode	1 line with 6 characters	Configuration of the respective operator page You can choose between the variants displayed in the value range Default setting: 3 lines with 9 characters
	1 line with 6 characters + Bar graph	
	1 line with 9 characters	
	1 line with 9 characters + Bar graph	
	2 lines with 9 characters	
	2 lines with 9 characters + Bar graph	
	3 lines with 9 characters (Default setting)	
	Graphic	
	OFF (this selection disables the respective operator page)	
1st line 2nd line 3rd line	Flowrate [%]	Selection of the measured value displayed in the respective line You can choose between the variants displayed in the value range.
	Flowrate [unit]	
	Totalizer Fwd	
	Totalizer Rev	
	Totalizer Net	
	Flow velocity [unit]	
	Current Output [mA]	
	SignalProportion	
	Reference	
	Signal Max.	
	Signal Min.	
	Amplification	
	Noise Reset Count.	
	Total Batch Count.[a]	
	Batch Totalizer	
	Conductivity[a]	
	Sensor Temp[a]	

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Display/Operator Pages/**Operator Page 1 (n)**		
Bargraph	Flowrate [%]	Selection of the bar graph of the displayed measured value You can choose between the measured values displayed in the value range.
	Current output [mA]	

8.4.5 Menu: Input/Output

Menu/parameter	Value range	Description
Input/Output		
... Digital Out Mode		Selection of "... Digital Out Mode" submenu
... Logic Setup		Selection of "... Logic Setup" submenu
... Pulse Setup		Selection of "... Pulse Setup" submenu
Digital Input Setup	No Function, Totalizer Reset (all), Flowrate to Zero, System Zero Adjust, Totalizer Stop (All), Dual Range[a], Start/Stop Batching[a]	Operating mode selection for the digital input You can choose between six operating modes: • Totalizer reset for all totalizers (forward, reverse and difference totalizer) • Flowrate to Zero • System Zero Adjust • Totalizer stop for all counters (forward, reverse and difference totalizer) • Toggling between the measuring range 1 and 2 (Q_{max} and $Q_{max}2$)[a] • Start / Stop the filling function (batch)[a] Default setting: Flowrate to Zero
Current Output		Selection of "Current output" submenu

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Digital Input setup

If the filling action is stopped before reaching the configured filling quantity, the filling counter is reset to zero. The interrupted filling is **not** continued on restarting.

Menu/parameter	Value range	Description
Input/Output/**... Digital Out Mode**		
Function DO1/DO2 	Pulse F/Pulse R	Selection of functions for the digital outputs DO1 and DO2 Pulse F/Pulse R: • DO1 = Pulse output for the forward direction • DO2 = Pulse output for the reverse direction
	Pulse F/Logic	Pulse F/Logic: • DO1 = Pulse output for the forward direction • DO2 = Binary output
	Pulse FR/Logic	Pulse FR/Logic: • DO1 = Pulse output for the forward and reverse direction • DO2 = Binary output
	Logic/Logic	Logic/Logic: • DO1 = Binary output • DO2 = Binary output Default setting: Pulse FR/Logic
DO1 Drive 	Passive, Active	The digital output DO1 can be configured as an active or passive output. Refer to the order confirmation for the current configuration. Default setting: Passive

Italics = Parameter can only be viewed in the "Advanced" password level

Function DO1/DO2

The function for the binary outputs is defined in the "... Logic Setup" menu.

DO1 Drive

This parameter does not have a function for devices for transmitters in a single-compartment housing and for devices for operating in zone 1.

Devices with a transmitter in the single-compartment housing are configured via the jumpers on the transmitter backplane (see chapter 7 "Startup", page 73).

Menu/parameter	Value range	Description
Input/Output/**... Logic Setup**		
DO1 Signal	No Function, F/R Signal, Alarm Signal Dual Range[a], Batch End Contact[a]	The menu is only displayed if the "Logic/Logic" function has been selected in the "DO1/DO2 Function" menu. This menu is not displayed in the default setting. • F/R Signal: the digital output signals the flow direction • Alarm Signal: the digital output functions as an alarm output; the alarm type is set in the "DO1 Alarm Config" menu • Dual Range[a]: The digital output is activated when measuring range 2 (Qmax2) is selected. • Batch End Contact[a]: The digital output is activated when the configured filling quantity is reached. Default setting: F/R Signal
... DO1 Alarm Config		Selection of "... DO1 Alarm Config" submenu The menu is only displayed if the "Alarm Signal" function has been set in the "DO1 Signal" parameter.
DO1 Action	Normally Open, Normally Closed	Selection of the switching behavior for the digital output Default setting: Normally Open
DO2 Signal	No Function, F/R Signal, Alarm Signal Dual Range[a], Batch End Contact[a]	See "DO1 Signal" in this table
... **DO2 Alarm Config**		Selection of "... DO2 Alarm Config" submenu The menu is only displayed if the "Alarm Signal" function has been set in the "DO2 Signal" parameter.
DO2 Action	Normally Open, Normally Closed	Selection of the switching behavior for the digital output Default setting: Normally Open

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Input/Output/... Logic Setup/**... DO1 Alarm Config**		
General Alarm	ON/OFF	Each alarm can be enabled separately. This allows you to individually configure when the digital output DO1 signals an alarm.
Min. Flowrate Alarm	ON/OFF	
Max. Flowrate Alarm	ON/OFF	
Empty Pipe	ON/OFF	
TFE Alarm	ON/OFF	
Gas Bubble[a]	ON/OFF	
Conductivity[a]	ON/OFF	
Coating[a]	ON/OFF	
Sensor Temp[a]	ON/OFF	

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Input/Output/... Logic Setup/**... DO2 Alarm Config**		
-	-	See description "....DO1 Alarm Config"

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Input/Output/**... Pulse Setup**		
Operating Mode	Pulse Mode, Fullscale Frequency	The menu is only displayed after selecting a "Pulse ..." function below "Input/Output/... Setup Digital outp./Function DO1/DO2". Operating mode selection for the digital output You can choose between two operating modes: • "Pulse Mode": in pulse mode, pulses per unit are output (e.g. 1 pulse per m^3) • "Frequency mode": In frequency mode, a frequency proportional to the flow is output; the maximum frequency can be configured according to the measuring range end value (maximum 5 kHz). Default setting: "Pulse Mode"
Pulses per Unit	1 to 5250/s	Pulse setting per unit in the "Pulse Mode" operating mode
Pulse Width	0.1 to 2000 ms	Pulse Width setting in the "Pulse Mode" operating mode The pulse factor and pulse width are interdependent and are calculated dynamically.
Limit Frequency	Display only	Display of pulse output limit frequency
Fullscale Frequency	0 to 5000 Hz	Frequency setting for the measuring range end value in "Fullscale Frequency"

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Input/Output/**Current Output**		
Iout at Alarm	High Alarm, Low Alarm	Selection of the status for the current output in case of a fault The output "low" or "high" current is set in the following menu. Default setting: High
Low Alarm Value	3.5 to 3.6 mA	Selection of the current for Low Alarm Default setting: 3.5 mA
High Alarm Value	21 to 23 mA	Selection of the current for High Alarm Default setting: 21.8 mA
Iout at EP Alarm	Off, Q = 0 %, High Alarm, Low Alarm	Selection of the status for the current output in case of an empty pipe • Off: the error is not output via the current output • Q = 0 %: the current output assumes the value for "No flow" • High Alarm: the current output assumes the value for "High Alarm" • Low Alarm: the current output assumes the value for "Low Alarm" Default setting: off
Iout at Flow > 103%	Off, High Alarm, Low Alarm	Selection of the status for the current output if the value falls below the measuring range end value • Off: the error is not output via the current output • High Alarm: the current output assumes the value for "High Alarm" • Low Alarm: the current output assumes the value for "Low Alarm" Default setting: Off
Iout at TFE Alarm	Off, Q = 0 %, high alarm, low alarm	Selection of the status for the current output in case of a partial filling alarm • Off: the error is not output via the current output • Q = 0 %: the current output assumes the value for "No flow" • High Alarm: the current output assumes the value for "High Alarm" • Low Alarm: the current output assumes the value for "Low Alarm" Default setting: Off
Iout Mode	4 to 20 mA, 4 to 12 to 20 mA	Operating mode selection for the current output • 4 to 20 mA: 4 mA = No flow 20 mA = Maximum flow • 4 to 12 to 20 mA: 4 mA = Maximum reverse flow 12 mA = No flow 20 mA = Maximum forward flow

Italics = Parameter can only be viewed in the "Advanced" password level

8.4.6 Menu: Process alarm

Menu/parameter	Value range	Description
Process Alarm		
Clear Alarm History	-	The alarm list can be cleared here.
Group Masking		Selection of "Group Masking" submenu
Individual Masking		Selection of "Individual Masking" submenu
Alarm Simulation	OFF ...	Different alarm messages and output statues can be simulated. For further information, ⇨see 8.5

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Process Alarm/**Group Masking**		
Maintenance Required	ON/OFF	The alarm messages are divided into groups. When a group masking is enabled (ON), no alarm is output. For further information, ⇨see 10.2
Function Check	ON/OFF	
Out of Specification	ON/OFF	

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Process Alarm/**Individual Masking**		
Min Flowrate Alarm	ON/OFF	Individual alarm messages can also be masked. They are not included in the group masking. When alarm masking is enabled (ON), no alarm is output. For further information, ⇨see 10.2
Max Flowrate Alarm	ON/OFF	
Flow > 103 %	ON/OFF	
Com Controller Alarm	ON/OFF	
TFE Alarm	ON/OFF	
Empty Pipe Alarm	ON/OFF	

Italics = Parameter can only be viewed in the "Advanced" password level

8.4.7 Menu: Communication

Menu/parameter	Value range	Description
Communication		
HART		Selection of "HART" submenu
Cyclic Data Out		Select the "Cyclic. Data Out" submenu
Service Port		Selection of "Service Port" submenu
PROFIBUS		Selection of "PROFIBUS" submenu The menu is only displayed for devices with PROFIBUS-PA.
FIELDBUS Foundation		Selection of "FIELDBUS Foundation". The menu is only displayed for devices with FOUNDATION Fieldbus.

Menu/parameter	Value range	Description
Communication/**HART**		
Device Address 	0 to 15	Selection of HART device address The HART protocol allows a bus configuration with up to 15 devices (1 to 15) Default setting: 0
HART TAG	8 characters, only upper case letters, no special characters	Enter a unique HART TAG number for device identification
HART Descriptor	16 characters, only upper case letters, no special characters	Enter a HART Descriptor
HART Message	Display only	Display of the alphanumeric measuring point identifier
HART Manf. ID	Display only	Display of the HART manufacturer ID
HART Device ID	Display only	Display of the HART device ID
Last HART Command	Display only	Display of the last HART command sent

Italics = Parameter can only be viewed in the "Advanced" password level

Device Address

If an address greater than 0 is set, the device operates in Multidrop mode.

The current output is permanently set to 4 mA. Only the HART communication is performed via the current output.

Menu/parameter	Value range	Description
Communication/**Cyclic Data Out**		
Cyclic Upd. Rate	0.2 to 3600 sec	Setting of interval for the data output via the infrared service port Default setting: 1 sec
Cyclic Upd. Select		Selection of "Cyclic Upd. Select" submenu

Menu/parameter	Value range	Description
Communication/Cyclic Data Out/**Cyclic Upd. Select**		
Flow Group	ON/OFF	Selection of the data to be output via the infrared service port The diagnostics data is consolidated into groups. Each group can be separately switched on or off and thus added to the diagnostics data record to be output.
	Contents: Q (%), Q (l/s), v (m/s)	
Output Group	ON/OFF	
	Contents: 20 mA output [Io (mA)], frequency at digital output DO1 [f1 (Hz)], frequency at digital output DO2 [f2 (Hz)]	
Status Group	ON/OFF	
	Contents: Alarm, Empty Pipe Frequency [(EPD (Hz)], TFE Frequency [TFE (Hz)]	
Coil Group	ON/OFF	
	Contents: Coil Current [Ic (mA)], Coil Voltage [CV (V)], Total Coil Resistance [CR (Ohm)]	
TX Group	Contents: Reference Voltage Digits [Ref], Differential Signal at ADC [SP], Signal Max [SM], Signal Min [Sm], Signal Error from NR Filter [SE], Signal DC Errors [SDE], Internal Amplification [Api], Signal Noise Ratio [SNR]	
Vol. Totals Group	ON/OFF	
	Contents: Forward Totalizer [Fwd (m3)], Reverse Totalizer [Rev (m3)], Differential Totalizer [Net (m3)]	
Electrodes Group	ON/OFF	
	Contents: Electrode Impedance E1 to Ground [IE1 (kOhm)], Electrode Impedance E2 to Ground [IE2 (kOhm)], Deposit Values electrode 1 [QE1] and aE1, Electrode Values Electrode 2 [QE2] and aE2, Gas Bubble Value [Gasb], Conductivity [conduS], Sensor Temperature [sensorT°C]	

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Communication/**Service Port**		
Max. Baud Rate	2400, 4800, 9600, 19200, 38400	Transmission speed setting (Baud Rate) for the infrared service port
HART Access	ON/OFF	Activation/deactivation of the infrared service port

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Communication/**PROFIBUS**		The menu is only displayed for devices with PROFIBUS-PA.
PA Addr. (-BUS-) 	0 to 126	The "Profibus" menu is only displayed if this option was ordered. Display of the slave address Default setting: 126 For further information ⇨ see 7.3
Ident Nr. Selector	0x9700, 0x9740, 0x3430	Selection of Ident Nr. Selector The parameter can only be changed when the cyclic communication is stopped (Comm State = OFF). Default setting: 0x3430
Comm State	Offline, Operate, Clear, Stop	Display of the communication status • Offline: BUS communication deactivated • Operate: cyclic communication running • Clear: device is initialized • Stop: cyclic communication stopped, BUS communication still active
AI1-Q Flowrate	Display only	Current flow in the set unit from the transducer block flow including status
Tot1-Q Flowrate	Display only	Current counter reading in the set unit from the transducer block flow including status
Tot2-Q Flowrate	Display only	Current counter reading in the set unit from the transducer block flow including status
AI2-Internal Tot Fwd	Display only	Current counter reading of the supply counter in the set unit from the transducer block spec flow including status
AI3-Internal Tot Rev	Display only	Current counter reading of the return counter in the set unit from the transducer block spec flow including status
AI4-Diagnostics[a]	Display only	Current output value including status The channel can be selected with the "AI4 Channel" parameter. To display active values, switch on sensor measurements, and/or conductivity measurements.[a]
AI4-Channel[a]	Sensor Temp, Conductivity	Selection of the channel output by AI4 The PV_SCALE and OUT_SCALE structure is not adjusted.

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Communication/**PROFIBUS**		The menu is only displayed for devices with PROFIBUS-PA.
AO-Density	Display only	Current output value for the density from the transducer block flow including status
DI-Alarm Info	Display only	Current output value including status The channel can be selected with the "DI Channel" parameter
DI-Channel	Maintenance, Out of Spec, Function Check, Failure	Selection of the "DI Alarm Info" output by the channel
DO-Cyclic Control	Display only	Current function including status The function can be selected with the "DO Channel" parameter.
DO-Channel	Off, Totalizer Reset (all), Flowrate to Zero, System Zero Adjust, Totalizer Stop (all), Dual range[a], Start/Stop Batching[a]	Selection of function "DO Cyclic Control"

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

PA Addr (-BUS-)

DIP switch (only for transmitter in a dual-compartment housing):

- DIP switches 1 to 7 determine the PROFIBUS address
- DIP switch 8 determines the address mode:
  DIP switch 8 = Off = The address is set via the bus or via menus using the device keyboard, then "-BUS-" appears on the display
  DIP switch 8 = On = The address is set via the DIP switches 1 to 7, then "(HW Switch)" appears on the display.

The address switch setting is adopted when the device is restarted, not during ongoing operation

Default setting for DIP switch 8: off

Menu/parameter	Value range	Description
Communication/**FF**		The menu is only displayed for devices with FOUNDATION Fieldbus.
Show FF Address	Display only	Display the FOUNDATION Fieldbus address. The address is set via the FOUNDATION Fieldbus master.
AI-Q Flowrate	Display only	Current flow in the set unit from the transducer block flow including status.
INT1-Q Flowrate	Display only	Current output value with status.
AI2-Internal Tot Fwd	Display only	Current counter reading of the supply counter in the set unit from the transducer block spec flow including status.
AI3-Internal Tot Rev	Display only	Current counter reading of the return counter in the set unit from the transducer block spec flow including status.
AI4-Diagnostics	Display only	Current output value including status, The channel can only be selected via the bus.
AO-Density	Display only	Current output value for the density from the transducer block flow including status.
DI-Alarm Info	Display only	Current output value including status. The channel can only be selected via the bus.
DO-Cyclic Control	Display only	Current output value including status. The channel can only be selected via the bus.

8.4.8 Menu: Diagnostics

Menu/parameter	Value range	Description
Diagnostics		
Diagnostics Control		Selection of "Diagnostic Control" submenu
Diagnostics Values		Selection of "Diagnostics values" submenu
Fingerprints		Selection of "Fingerprints" submenu
Trend		Selection of "Trend" submenu
Flowrate Alarm		Selection of "Flowrate Alarm" submenu
Simulation mode	Off, Flow Velocity, Q [Unit], Q [%], IOut, Freq on DO1, Freq on DO2, Logic DO1, Logic DO2, HART Freq, Digital In	Manual simulation of measured values The output values correspond to the set simulated measured value. "Configuration" appears in the lower display line. After the simulation is ended, simulation mode is set back to "Off". The values specified in the "Value Range" column can be simulated.
Output Readings		Selection of "Output Readings" submenu

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/**Diagnostics Control**		
Empty Pipe Detector		Selection of "Empty Pipe Detector" submenu
Sensor Measurements		Selection of "Sensor Measurements" submenu
Gas Bubble Detector[a]		Selection of "Gas Bubble Detector" submenu
Coating Detector[a]		Selection of "Coating Detector" submenu
Cond. Detection[a]		Selection of "Conductivity Measurement" submenu
Grounding Check[a]		Selection of "Grounding check" submenu
TFE Detector		Selection of "TFE Detector" submenu
SIL Detection		Selection of "SIL Detection" submenu

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Empty Pipe Detector**		
Empty Pipe Detector	ON/OFF	Preconditions for activating the "Empty Pipe Detector" function: • Only for nominal widths ≥ DN 10 and without preamplifier • There must be no flow through the sensor (close all valves, shut-off devices, etc.). • The sensor must be completely filled with the medium to be measured. The "Empty Pipe Detector" function detects an empty measuring tube. In case of an alarm, the current output assumes the state defined in the menu "Input/Output/Current output/Iout for e. pipe" and the pulse output is stopped. Default setting: OFF
Adjust EP		The Empty Pipe Detection must be calibrated to the local conditions. The switching threshold is set during the automatic calibration. Start the automatic empty pipe detection calibration
Manual Adjust EP F. 	0 to 255	Manual calibration of the Empty Pipe Detection The value must be modified in such a way that the frequency for empty pipe detection (**Detector EP Value**) is close to 2000 Hz.
Threshold	100 to 60000 Hz	Switching threshold setting for the Empty Pipe Detection. The switching threshold is set during the automatic calibration. A fine adjustment can be manually performed by changing the switching threshold.
Detector EP Value	Display only	Display of the frequency of the empty pipe detector. If the current value is above the set switching threshold, a message is output on the LCD display and the alarm is activated at the digital output, if configured accordingly.

Italics = Parameter can only be viewed in the "Advanced" password level

Manual Adjust EP F

Prior to starting the (manual/automatic) calibration, make sure that:

- There must be no flow through the sensor (close all valves, shut-off devices, etc.).
- The sensor must be completely filled with the medium to be measured.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Sensor Measurements**		
One Shot Sensor Mea		Start of measurement The measured values for the start moment are recorded
Coil Current	Display only	Display of the coil current
Coil Resistor	Display only	Display of the coil resistor
Coil Voltage	Display only	Display of the coil voltage
Coil R. Max Alarm	0 to 1000 Ω	Setting of the maximum limit value for the coil resistor When this value is exceeded, an alarm is triggered. Default setting: 1000 Ω
Coil R. Min Alarm	0 to 1000 Ω	Setting of the minimum limit value for the coil resistor When this value is not reached, an alarm is triggered. Default setting: 0 Ω
Signal-Cable length	0.01 to 200 m	Entry of the Signal-Cable length between the transmitter and the sensor For compact devices, 0.01 m must be entered. Default setting: 0 m
Sensor Temp Value[a]	Display only	Display of sensor temperature.
Adj. Sensor Temp Value[a]	-50 to +200°C	The sensor temperature must be calibrated to the local conditions. The temperature measured using a separate measuring device can be entered here.
Sensor T. Max. Alarm[a]	-50 to +200 C°	Setting of the maximum limit value for the sensor temperature. When this value is exceeded, an alarm is triggered. Default setting: +200 C°
Sensor T. Min. Alarm[a]	-50 to +200 C°	Setting of the minimum limit value for the sensor temperature. When this value is not reached, an alarm is triggered. Default setting: -50 C°

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Gas Bubble Detector**[a]		
Gas Bubble Detector	ON/OFF	Activates the "Gas Bubble Detector" function Default setting: OFF
Adjust Gas Bubble		The Gas Bubble Detector must be calibrated to the local conditions. Start automatic gas bubble detection calibration.
Threshold Gas Bubble		Setting the switching threshold. If the current value is above the set switching threshold, a message is output on the LCD display and the alarm is activated at the digital output, if configured accordingly.
Gas Bubble Value	Display only	Display the current Gas Bubble Value

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Gas Bubble Detector

The gas bubble detector can be used in the nominal width range DN 10 to 300. More information⇨ see chapter 9 "Advanced diagnostics functions", page 153.

Adjust Gas Bubble

Prior to starting the (manual/automatic) calibration, make sure that:

- There must be no flow through the sensor (close all valves, shut-off devices, etc.).
- The sensor must be completely filled with the medium to be measured.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Coating Detector**[a]		
Coating Detector	ON/OFF	Activates the "Coating Detector" function Default setting: OFF
One Shot Coating		The electrode deposit is measured cyclically at specified intervals. A one-off measurement can be initiated here.
Coating Value QE1	Display only	Current deposit value for electrode 1
Coating Value QE2	Display only	Current deposit value for electrode 2
Coating QE Min. Alarm	0 to 100,000	Setting of the minimum limit value for detection of deposits. The smaller value of QE1, QE2 triggers an alarm if below the threshold. Default setting: 0
Coating QE Max. Alarm	0 to 100,000	Setting of the minimum limit value for detection of deposits. The smaller value of QE1, QE2 triggers an alarm if below the threshold. Default setting: 100.000

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Coating Detector

The electrode deposit detector can be used in the nominal width range DN 10 to 300. More information⇨ see chapter 9 "Advanced diagnostics functions", page 153.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Cond. Detection**[a]		
Cond. Detection 	ON/OFF	Activates the "Conductivity Detection" function Default setting: OFF
One Shot Cond.		The conductivity is measured cyclically at specified intervals. A one-off measurement can be initiated here.
Cond. Value		Displays the conductivity
Adj. Cond. Value	5 to 20,000 µS/cm	The conductivity needs to be calibrated for the local medium. The conductivity measured using a separate measuring device can be entered here.
Cond. Min Alarm	5 to 20,000 µS/cm	Sets the minimum limit value for conductivity. When the value drops below this limit, an alarm is triggered. Default setting: 5 µS/cm
Cond. Max Alarm	5 to 20,000 µS/cm	Sets the maximum limit value for conductivity. When the value exceeds this limit, an alarm is triggered. Default setting: 20,000 µS/cm
Elec. Imp. E1-GND	Display only	Current impedance between electrode E1 and GND (ground potential)
Elect Imp. E2-GND	Display only	Current impedance between electrode E2 and GND (ground potential)
Elect. Imp Min Alarm	0 to 20,000 Ω	Sets the minimum limit value for impedance. When the value drops below this limit, an alarm is triggered. Default setting: 0 Ω
Elect. Imp Max Alarm	0 to 20,000 Ω	Sets the maximum limit value for impedance. When the value exceeds this limit, an alarm is triggered. Default setting: 20,000 Ω

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Cond. Detection

The conductivity measurement can be used in the nominal width range DN 10 to 300. More information⇨ see chapter 9 "Advanced diagnostics functions", page 153.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Grounding check**[a]		
Grounding Check		Starts the "Grounding check" function
Power spectrum	Display only	Current power spectrum
Amplitude 1 Value	Display only	Displays the four strongest amplitudes in the power spectrum
Amplitude 2 Value	Display only	
Amplitude 3 Value	Display only	
Amplitude 4 Value	Display only	

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**TFE Detector**		
TFE Detector		Activation of the "Partial filling detector" function (TFE)
Adjust TFE Full		Partial filling detection must be calibrated to match the local conditions. Starts the automatic calibration of partial filling detection (see note) Cross-reference
TFE Threshold	-	Manual fine adjustment of the switching threshold The switching threshold is determined during the automatic calibration. If the current value is above the set switching threshold, a message is output on the LCD display and the alarm is activated at the digital output, if configured accordingly.
TFE Value		Displays the current measured value

Italics = Parameter can only be viewed in the "Advanced" password level

TFE Detector

To use this function, the sensor must be equipped with a measuring electrode for the partial filling detection (option).

The installation position must be horizontal with the terminal box facing up. This function is useful for sensors as of DN 50 without any Ex-protection or with Ex-protection for zone 2. More information⇨ see chapter 9 "Advanced diagnostics functions", page 153.

Adjust TFE Full

Prior to starting the (manual/automatic) calibration, make sure that:

- There must be no flow through the sensor (close all valves, shut-off devices, etc.).
- The sensor must be completely filled with the medium to be measured.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**SIL Detector**		
SIL Detection	ON/OFF	The detection level of the safety-relevant parts is increased by switching the detector on. Default setting: OFF

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/**Diagnostics Values**		
SNR Value	Display only	Display of the current diagnostics values for service purposes only
Slope Value		
Slope Variation		
Reference		
Signal Ratio (Signal difference)		
Signal Max (max. value of the pos. signal)		
Signal Min (max. value of the neg. signal)		
Signal Error (Signal error share)		
NV Reset/s		
Amplification Int.		

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/**Fingerprints**[a]		
Factory F.P.		Selection of the "Factory F.P." submenu
Startup F.P.		Selection of the "Startup F.P." submenu
On Demand F.P.		Selection of the "On Demand F.P." submenu

[a] Only available for JUMO flowTRANS MAG S02/H02

The fingerprint database built into the transmitter can be used to compare the values at the time of factory calibration or startup with the values currently acquired.

This means that changes in the measuring system can be detected at an early stage, and appropriate actions can be initiated.

Menu/parameter	Value range	Description
Diagnostics/Fingerprints/**Factory F.P.**[a]		
Sensor Coil R.	Display only	The factory fingerprint is created when calibrating the devices at the factory.
Elec. Coat. QE1		
Elec. Coat. QE2		
Elec. Imp E1-GND		
Elec. Imp E2-GND		
Tx Check CMR		
Tx Check 5 m/s		
Tx Check 10 m/s		

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Diagnostics/Fingerprints/**Startup F.P.**[a]		
Startup F.P.		Creates the startup fingerprint for the sensor
Sensor Coil R	Display only	The Startup Fingerprint is created on-site during the startup. The values measured then are displayed here.
Elec. Coat. QE1		
Elec. Coat. QE2		
Elec. Imp E1-GND		
Elec. Imp E2-GND		
Start Tx Startup F.P.		Creates the Startup Fingerprint for the transmitter.
Tx Check CMR	Display only	
Tx Check 5 m/s		
Tx Check 10 m/s		

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Diagnostics/Fingerprints/**On Demand F.P.**[a]		
Start On Demand FP		Creates the manual fingerprint
Sensor Coil R	Display only	The manual fingerprint can be created at any time. The values measured then are displayed here.
Elec. Coat. QE1		
Elec. Coat. QE2		
Elec. Imp E1-GND		
Elec. Imp E2-GND		
Start Tx Startup F.P.		Creates the manual fingerprint for the transmitter.
Tx Check CMR		
Tx Check 5 m/s		
Tx Check 10 m/s		

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Diagnostics/Fingerprints/**Trend**[a]		
Conductivity		The measured values are displayed as a line chart. If the "Trend-Logging" function is active, the measured values are stored at the set interval (cycle time). The last 12 measured values are stored and displayed in the line chart. The oldest data record is always overwritten.
Electrode Coat. QE1		
Electrode Coat. QE2		
Logtime Interval	1 to 45,000 min	Interval for the measured values created
Trend-Logging	ON/OFF	Activates the "Trend-Logging" function. If the "Trend Logger" function is active, the measured values are stored at the set interval (cycle time). The "ScanMaster" diagnostics tool can be used to extract the data records and analyze them as a trend.

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Diagnostics/**Flowrate Alarm**		
Max. Flowrate Alarm	0 to 130 %	Setting of the maximum limit value for the flow.
Min. Flowrate Alarm	0 to 130 %	Setting of the minimum limit value for the flow.

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Diagnostics/**Output Readings**		
Current	mA	Displays the current values and status of the listed inputs/outputs
DO1 Frequency	Hz	
DO2 State	open/closed	
Digital In State	open/closed	

Italics = Parameter can only be viewed in the "Advanced" password level

8.4.9 Menu: Totalizer

Menu/parameter	Value range	Description
Totalizer		
... Reset Vol. Totals		Selection of "... Reset Vol. Totals" submenu
... Batching[a]		Selection of "... Batching" submenu
... Edit Vol. Totals		Selection of "... Edit Vol. Totals"

[a] Only available for JUMO flowTRANS MAG S02/H02

Menu/parameter	Value range	Description
Totalizer/**... Reset Vol. Totals**		
Edit Totalizer Fwd		Reset the forward totalizer to zero
Edit Totalizer Rev		Reset the reverse totalizer to zero
Edit Totalizer Net		Reset the difference totalizer to zero
All Vol. Totalizer		Reset all totalizers to zero

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Totalizer/**...Batching**[a]		
Damping	ON/OFF	Switch damping on/off Default setting: ON
Preset Batch Tot.	-	Sets the filling quantity. The configured digital output is activated when the defined filling quantity is reached.
Lag Corr, Mode	Automatic/Manual	Selects the after flow quantity correction. It takes a certain time to close the filling valve; this in turn leads to an after-flow of the fluid although the filling quantity has been reached and the valve closer contact is actuated. "Automatic after-flow correction" corrects the defined filling quantity by the after-flow quantity.
Lag Corr. Quantity	-100,000 to +100,000	Manual input of the after-flow quantity

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Damping

To achieve a fast response time of the filling function, damping must be switched off. The filling time should be > 3 seconds.

Menu/parameter	Value range	Description
Totalizer/**...Batching**[a]		
Batch Tot.	Display only	After starting filling, the quantity already filled is displayed here. The counter restarts at zero each time filling starts and only counts up to the defined filling quantity.
Total Batch Counter	Display only	Total number of all fills
Reset Batch Counter		Reset filling counter to zero
Start/Stop Batching		Manual start/stop of the filling action. Alternatively, the digital input can be used to start/stop the filling action.

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

Menu/parameter	Value range	Description
Totalizer/**Totalizer Default Setting.**[a]		
Edit Totalizer Fwd	-	Enter totalizer statuses (e.g. when replacing the transmitter)
Edit Totalizer Rev	-	
Edit Totalizer Net	-	

[a] Only available for JUMO flowTRANS MAG S02/H02

Italics = Parameter can only be viewed in the "Advanced" password level

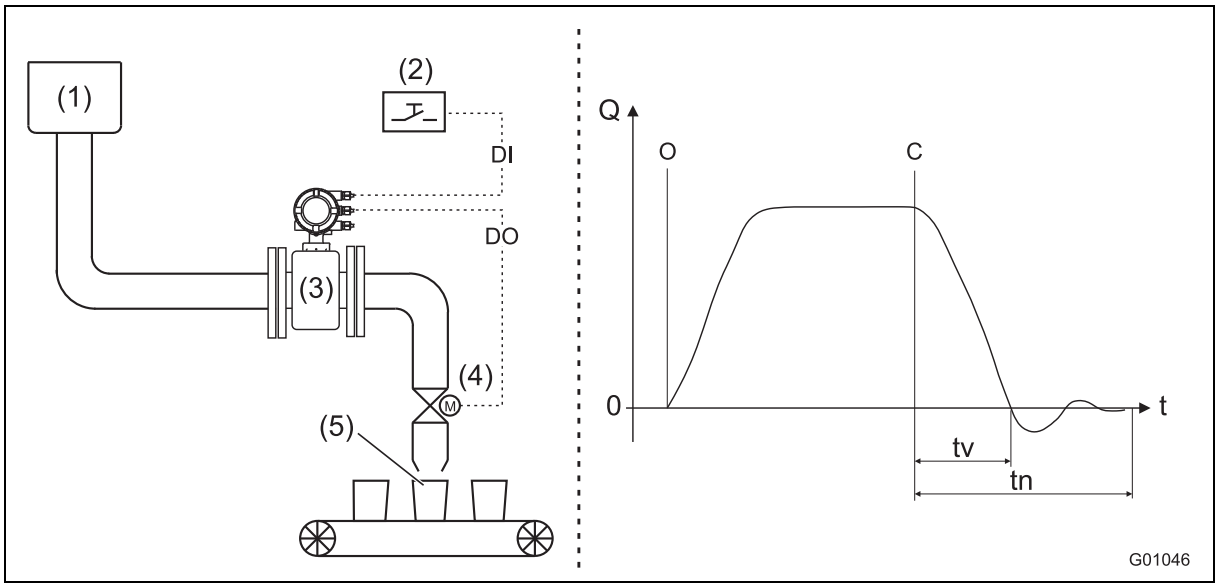
8.5 Alarm Simulation

Different alarms can be simulated in the "Process alarm/alarm simulation" menu.

Menu/Parameter	Description
Process alarm/**Alarm simulation**	
Off	Alarm simulation switched off
0-Sim.CurrentOut	Simulate current output
1-Sim.Logic on DO1	Switch on/off switching output (terminal 51/52)
2-Sim.Pulse on DO1	Simulate pulse output (terminal 51/52)
3-Sim.Logic on DO2	Switch on/off switching output (terminal 41/42)
4-Sim.Pulse on DO2	Simulate pulse output (terminal 51/52)
5-Min Alarm Flowrate	Simulate min. flow alarm
6-Max Alarm Flowrate	Simulate max. flow alarm
7-Flowrate >103%	Simulate flow > 103 % as an alarm
8-Flow Simulation	Simulate flow simulation
9-Calibration Mode	Simulate transmitter alarm at the simulator
10-Flowrate to Zero	Simulate flowrate to zero
11-Totalizer Stop	Simulate external totalizer stop
12-Tot.Display<1600h	Simulate display value < 1600 h at Q_{max}
13-Totalizer Reset	Simulate Totalizer Reset
14-Err.Sensor-Comms	Simulate distorted communication to the SensorMemory
15-HART Address <> 0	Simulate HART Multiplex mode
16-FRAM-Com Fail	
17-No Sensor	Simulate "No communication to SensorMemory" error
18-Sim.Digital Input	Simulation of the "ON/OFF" digital input
19-ADC saturated	Simulate "AD converter override" error
20-Error Coil circ	Simulate error in the coil circuit
21-Coil Resistor	Simulate "Coil resistance out of limits" error
22-Driver Err Uref=0	Simulate "Reference voltage = 0" error
23-El.Noise too High	Simulate "Noise signal too high" error
24-DC to High	Simulate "DC too high, several NV resets" error
25-Empty Pipe	Simulate "Empty pipe" error
27-NV Corrupt	Simulate "NV Corrupt" error
29-Electrode Imp.	Simulate "Electrode impedance out of limits" error
30-Hold Last Value	Simulate "Hold last good value" error
32-Digi-Pot Error	Simulate "Digital potentiometer" error
33-TFE	Simulate "Partial filling alarm" error
34-CurrentOut Error	Simulate "Loop current output interrupted" error
35-Not Calibrated	Simulate "Not calibrated" error
36-SensorIncompatib.	Simulate "Incompatible Sensor" error
37-ROM Error	Simulate ROM error in the transmitter
38-RAM Error	Simulate RAM error in the transmitter
39-Sim. HART Freq.	Simulation of a HART frequency
40-SIL	Simulate "Self check alarm" error
41-Conductivity	Simulate "Conductivity alarm" error
42-Elec.Coated	Simulate "Electrode deposits" error

Menu/Parameter	Description
43-Gas bubble	Simulate "Gas bubbles" error
44-Pulse Cut Off	Simulate "Pulse output" error
46-Sensor Temp	Simulate "Sensor temperature alarm" error

8.6 Filling operation - JUMO flowTRANS MAG S02/H02



(1) Receiver container
(2) Start/stop contact (digital input)
(3) Sensor
(4) Servo-valve
(5) Container to be filled
DI Digital input
DO Digital output

O Valve opened (filling started)
C Valve closed (fill quantity reached)
dt Valve closing time
rt After-run time

The integrated filling function (batch) on the models JUMO flowTRANS MAG S02/H02 lets you control filling actions with a filling time > 3 seconds.

To allow this to happen, the filling quantity is defined using a configurable counter.

The filling action is started via the digital input (DI) or the fieldbus.

One of the digital outputs (DO) is used to actuate the valve, which is closed again on reaching the defined filling quantity.

The transmitter measures the after-run quantity (rt) and computes the after-run quantity correction from it.

Low-flow cut off can be additionally enabled if needed.

8.6.1 Configuration

The filling function configuration is menu-driven via the LCD display.

If you want to control the filling action via the digital input DI, you need to configure the following setting in the "**Input/Output**" menu:

Menu/parameter	Value range	Description
Input/Output/...**Digital Out Mode**[a]		
Function DO1/DO2	Logic/Logic	Selects the operating mode for the Digital Input Setup • Start/Stop Batching (filling function)

[a] Only available for JUMO flowTRANS MAG S02/H02

The following settings must be configured to actuate the filling valve:

Menu/parameter	Value range	Description
Input/output		
Digital Input Setup	Start/Stop batching	Selection of functions for digital outputs DO1 and DO2 • Logic/Logic: - DO1 = Binary output - DO2 = Binary output

Menu/parameter	Value range	Description
Input/Output/...**Logic Setup**		
DO1 signal	Batch end contact	The menu is only displayed if the "Logic/Logic" function has been selected in the "DO1/DO2 Function" menu. This menu is not displayed in the default setting. • Batch end contact: The digital output is activated when the configured filling quantity is reached.
DO2 signal		

The parameters for the filling function must be configured:

IMPORTANT (NOTE)!

To achieve a fast response time of the filling function, damping must be switched off. The filling time should be > 3 seconds.

Menu/parameter	Value range	Description
Totalizer/**...Batching**[a]		
Damping	OFF	Switch damping on/off Default setting: ON
Preset Batch Tot.	-	Sets the filling quantity. The configured digital output is activated when the defined filling quantity is reached.
Lag Corr. Mode	Automatic/Manual	Selects the after-flow quantity correction. It takes a certain time to close the filling valve; this in turn leads to an after-flow of the fluid although the filling quantity has been reached and the valve closer contact is actuated. "Automatic after-flow correction" corrects the defined filling quantity by the after-flow quantity.
Lag Corr. Quantity	-100,000 to +100,000	Manual input of the after-flow quantity
Batch Tot.	Display only	After starting filling, the quantity already filled is displayed here. The Totalizer restarts at zero each time filling starts and only counts up to the defined filling quantity.
Total Batch Counter	Display only	Total number of all fills
Reset Batch Counter.		Reset filling totalizer to zero
Start/Stop Batching		Manual start/stop of filling action. Alternatively, the digital input can be used to start/stop the filling action.

[a] Only available for JUMO flowTRANS MAG S02/H02

To display the data relevant to filling in the process display, one of the operator pages should be configured accordingly in the "**Display**" menu:

Menu/parameter	Value range	Description
Display/...Operator pages/**Operator page 1 (n)**		
Display Mode	3 lines with 9 characters	Configuration of the respective operator page
1st Line	Flowrate [unit]	Selection of the measured value displayed in the respective line. You can choose between the variants displayed in the value range.
2nd Line	Number of fills	
3rd Line	Batch totalizer	

8 Parameterization

9.1 General Information

IMPORTANT (NOTE)!

- The advance diagnostics functions are only available with the JUMO flowTRANS S02/H02 devices.
- The "Partial filling detection" function is not available with the JUMO flowTRANS H02.
- When using the advanced diagnostics functions, note that a pre-amplifier must not exist on the external sensor.
- To facilitate initial startup, the advance diagnostics functions are disabled as the default setting.
- To use the advance diagnostics functions, a "Startup fingerprint" must be created on startup of the flowmeter.
- Each diagnostics function (e.g. gas bubble detection or electrode deposit detection) can be enabled individually. After activation, you need to calibrate to match the local conditions, and/or set the limit values.

9.1.1 Partial filling detection

Optionally, a measuring electrode (TFE electrode) is available for detecting partial filling of the sensor. The partial filling alarm is output via the programmable digital output.

Conditions for using the function:

- Nominal width as of DN 50 (2 inch) with the Design Level "B" sensor
- Maximum signal cable length in case of remote mount design type: 200 m (656 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.
- The function is only available for JUMO flowTRANS S/H devices without Ex-protection or with Ex-protection for zone 2.

Additional installation conditions:

- The sensor must be mounted horizontally with the connection box facing up.

9.1.2 Gas bubble detection

Gas bubbles in the measurement medium are detected by reference to a configurable maximum threshold. When the threshold is exceeded, an alarm is triggered via the programmable output, depending on the configuration.

Conditions for using the function:

- JUMO flowTRANS MAG S02:
  The function is available in the nominal width range DN 10 to 300 (3/8 to 12 inch).
- JUMO flowTRANS MAG H02:
  The function is available in the nominal width range DN 10 to 100 (3/8 to 4 inch).
- Maximum signal cable length in case of remote mount design type: 50 m (164 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.

Additional installation conditions:

- The sensor can be mounted horizontally or vertically. Vertical mounting is preferable.

9.1.3 Electrode coating detection

This function offers the ability to detect coatings on measuring electrodes by reference to a configurable maximum threshold.

When the configured threshold is exceeded, an alarm is triggered via the programmable output, depending on the configuration.

Conditions for using the function:

- JUMO flowTRANS MAG S02:
  The function is available in the nominal width range DN 10 to 300 (3/8 to 12 inch).
- JUMO flowTRANS MAG H02:
  The function is available in the nominal width range DN 10 to 100 (3/8 to 4 inch).
- Maximum signal cable length in case of remote mount design type: 50 m (164 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.

Additional installation conditions:

- For plastic pipelines, a grounding washer must be deployed upstream and downstream of the device.

9.1.4 Conductivity monitoring

The conductivity of the measurement medium is monitored by means of a configurable minimal/maximal threshold.

If the value exceeds or drops below the configured threshold, an alarm is triggered via the programmable output, depending on the configuration.

Conditions for using the function:

- JUMO flowTRANS MAG S02:
  The function is available in the nominal width range DN 10 to 300 (3/8 to 12 inch).
- JUMO flowTRANS MAG H02:
  The function is available in the nominal width range DN 10 to 100 (3/8 to 4 inch).
- Maximum signal cable length in case of remote mount design type: 50 m (164 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.

Additional installation conditions:

- For plastic pipelines, a grounding washer must be deployed upstream and downstream of the device.
- The measuring electrode must be free of deposits.

9.1.5 Electrode impedance monitoring

The impedance between the electrode and ground is monitored by means of a configurable minimal/maximal threshold. This means that the transmitter can detect an electrode carbon bridge or an electrode leak.

If the value exceeds or drops below the configured threshold, an alarm is triggered via the programmable output, depending on the configuration.

Conditions for using the function:

- JUMO flowTRANS MAG S02:
  The function is available in the nominal width range DN 10 to 300 (3/8 to 12 inch).
- JUMO flowTRANS MAG H02:
  The function is available in the nominal width range DN 10 to 100 (3/8 to 4 inch).
- Maximum signal cable length in case of remote mount design type: 50 m (164 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.

Additional installation conditions:

- For plastic pipelines, a grounding washer must be deployed upstream and downstream of the device.
- The measuring electrode must be free of deposits.
- The measuring pipe must always be completely filled, and the measurement medium may only exhibit minor conductivity fluctuations.

9.1.6 Sensor measurements

This function includes monitoring the sensor temperature and monitoring the resistance of the coils in the sensor.

Monitoring the sensor temperature

The temperature of the coils in the sensor can be monitored by means of a configurable minimal/maximal threshold. When the configured thresholds are exceeded, an alarm is triggered via the programmable output, depending on the configuration.

The coil temperature depends on the ambient temperature and medium temperature. The measurement can be used, e.g. to monitor for excess temperature via the medium. The coil temperature is determined indirectly via the coil direction current resistance.

Monitoring the coil resistance in the sensor

The coils in the sensor can be monitored for coil resistance by means of a configurable minimal/maximal threshold. When the configured thresholds are exceeded, an alarm is triggered via the programmable output, depending on the configuration.

9.1.7 Trend

The device has an internal memory in which the measured value for the electrode deposit and the conductivity is stored cyclically as a data record at a definable interval (1 min to 45,000 min). A maximum of 12 of these data records are stored. As of the 13th measurement, the oldest data record is automatically overwritten.

The external diagnostics tool (ScanMaster) can be used to extract the data records and analyze them as a trend.

9.1.8 Fingerprint

The "fingerprint" database built into the transmitter can be used to compare the values at the time of factory calibration or startup with the values currently acquired.

9.1.9 Checking the grounding

This function offers the ability to check the electrical grounding quality. Flow metering is not possible during the check.

Conditions for using the function:

- The measuring pipe must be completely filled.
- There must be no flow through the sensor.
- Maximum signal cable length in case of remote mount design type: 50 m (164 ft).
- For this function, the conductivity of the measurement medium must be between 20 µS/cm and 20,000 µS/cm.

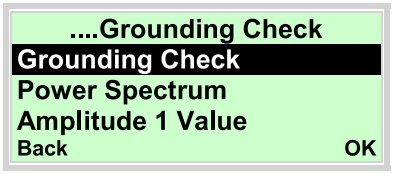
Additional installation conditions:

- There must be no pre-amplifier installed in the sensor.

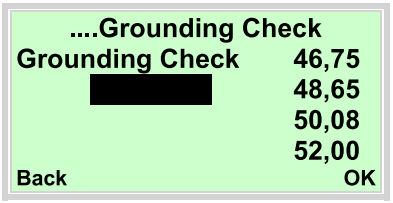
9.2 Conducting the grounding check

Menu/parameter	Value range	Description
.../Diagnostics .../Diagnostics Control /**...Grounding Check**[a]		
Grounding Check		Starts the "Grounding Check" function
Power Spectrum	Display only	Displays the four strongest amplitudes in the power spectrum
Amplitude 1	Display only	
Amplitude 2	Display only	
Amplitude 3	Display only	
Amplitude 4	Display only	

[a] Only available for JUMO flowTRANS MAG S02/H02

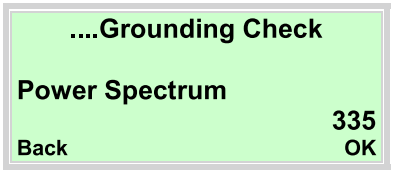


1. Use  or  to select the "Grounding Check" item.
2. Use  to start the "Grounding Check" function.

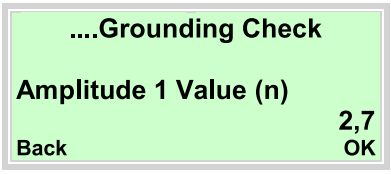


After starting the grounding check, the frequency range up to 250 Hz is measured. The 4 strongest frequencies from the spectrum are displayed on the right side of the display.

The matching amplitudes and the power spectrum across the frequency range can be displayed with the following parameters.



3. Use or to select the "Power Spectrum" item.
4. Use to display the parameter.



5. Use or to select the "Amplitude 1 Value (n)" item.
6. Use to display the parameter.

The measured values indicate potential interference on the ground line of the device at the time of the test.

No or minor interference:

- If the power spectrum is below 1,000.
- If the four amplitude measured values are above 10.

Check the grounding of the device (!):

- If the power spectrum is above 1,000.
- If the four amplitude measured values are above 10.

9 Advanced diagnostics functions

9.3 Recommended settings for diagnostics thresholds

Thresholds for the diagnostics measured values can be entered in the "**Diagnostics/Diagnostics Control/...**" menu.

To facilitate the settings, recommended settings for the individual thresholds are listed here.

The stated values are only to be understood as rough guidelines which may need to be adapted to match the local conditions.

9.3.1 Coil resistance thresholds

Coil resistance monitoring is disabled as a default setting and can be enabled in the "**Diagnostics/Diagnostics Control/Sensor Measurements**" menu.

Parameter	Default setting
Coil R Min Alarm	0.0 Ohm
Coil R Max Alarm	1000.0 Ohm

The coil resistance depends on the measurement medium temperature T_{medium} and the ambient temperature.

T_{medium}	Parameter	
	Coil R Min Alarm	**Coil R Max Alarm**
-40 °C (-40 °F)	Factory fingerprint (Coil resistance) x 0.71	Factory fingerprint (Coil resistance) x 0.79
-20 °C (-4 °F)	Factory fingerprint (Coil resistance) x 0.81	Factory fingerprint (Coil resistance) x 0.89
0 °C (32 °F)	Factory fingerprint (Coil resistance) x 0.90	Factory fingerprint (Coil resistance) x 1.00
20 °C (68 °F)	Factory fingerprint (Coil resistance) x 0.95	Factory fingerprint (Coil resistance) x 1.05
60 °C (140 °F)	Factory fingerprint (Coil resistance) x 1.19	Factory fingerprint (Coil resistance) x 1.31
90 °C (194 °F)	Factory fingerprint (Coil resistance) x 1.28	Factory fingerprint (Coil resistance) x 1.42
130 °C (266 °F)	Factory fingerprint (Coil resistance) x 1.43	Factory fingerprint (Coil resistance) x 1.58
180 °C (356 °F)	Factory fingerprint (Coil resistance) x 1.62	Factory fingerprint (Coil resistance) x 1.79

9.3.2 Electrode coating thresholds

Electrode deposit monitoring is disabled as a default setting and can be enabled in the "**Diagnostics/ Diagnostics Control/Coating Detector**" menu.

Parameter	Default setting
Coating QE min. alarm	0.0 Ohm
Coating QE max. alarm	100,000 Ohm

Recommended setting in menu "Diagnostics/Diagnostics Control/**Coationg Detector**":

- Coating QE min. alarm = 0.5 x deposit value QE
- Coating QE max. alarm = 2.0 x deposit value QE

IMPORTANT (NOTE)!

The coating value QE is the average of the startup fingerprints QE1 and QE2.

The value is determined using the following formula:

QE = (Startup Fingerprint QE1 + Startup Fingerprint QE2) / 2

9.3.3 Electrode impedance thresholds

Electrode impedance monitoring is disabled as a default setting and can be enabled in the "**Diagnostics/ Diagnostics Control/Cond. Detection**" menu.

Parameter	Default setting
Elect. Imp Min Alarm	0.0 Ohm
Elect. Imp Max Alarm	20,000 Ohm

The thresholds for the parameters "**Elect. Imp Min Alarm**" and "**Elect. Imp Max Alarm**" depend on the conductivity of the measurement medium and must be determined on-site.

Recommended setting in menu "**Diagnostics/Diagnostics Control/Cond. Detection**":

- Elect. imp. min. alarm = 0.2 x mean impedance value
- Elect. imp. max. alarm = 3.0 x mean impedance value

IMPORTANT (NOTE)!

The mean impedance value is the value of the startup fingerprints "Elec. Imp. E1-GND" and "Elec. Imp. E2-GND".

The value is determined using the following formula:

Mean impedance value = (startup fingerprint "Elec. Imp. E1-GND" + "Elec. Imp. E2-GND") / 2.

9.3.4 Trend Logger

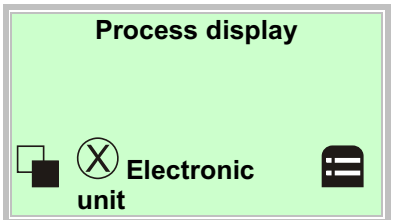
Recommended setting in menu "**Diagnostics/Trend**":

- Cycle time = 43,200 minutes

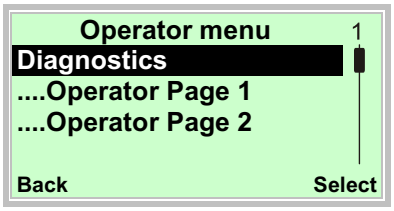
9 Advanced diagnostics functions

10.1 Calling up the error description

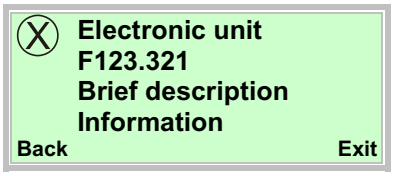
Further information about the occurred error can be called up at the Information level.



1. Use  to switch to the Information level.



2. Use  or  to select the "Diagnostics" submenu.
3. Use  to confirm your setting.



The first line shows the area where the error has occurred.

The second line shows the unique error number.

The next lines show a brief description of the error and information for the troubleshooting.

10.2 Error statuses and alarms

10.2.1 Error

Error no./ area	Text in the LCD display	Cause	Remedy
F254.038 Electronics	RAM error in Transmitter Contact service	Error in the transmitter electronics unit	Replace electronics or contact manufacturer
F253.037 Electronics	ROM error in Transmitter Contact service	Error in the transmitter electronics unit	Replace electronics or contact manufacturer
F252.017 Sensor	No Sensor Memory Check wiring Check switch SW3?	Incorrect wiring of terminals D1 and D2 Cable short-circuit or cable break on D1 or D2 wires Jumper SW3 is not correctly plugged into the backplane Old sensor connected without SensorMemory	Check the wiring of terminals D1 and D2 If an old measured value transducer without SensorMemory is connected, plug the jumper on the backplane in the "ON" position.

Error no./ area	Text in the LCD display	Cause	Remedy
F251.040 Electronics	Self Check Alarm	The SIL monitor function detected an error in the transmitter.	Replace transmitter or contact manufacturer
F250.016 Electronics	Tx memory fault detected Contact service	Error in the transmitter electronics unit	Replace electronics or contact manufacturer
F248.036 Sensor	Incompatible snsTx+ sns are not the same series	Calibration mode is not compatible	Contact manufacturer
F246.032 Electronics	Defect digital potentiometer Transmitter Hardware fault-Contact service	Internal, digital common mode rejection potentiometer defective	Replace electronics or contact manufacturer
F245.047 Electronics	Stack NV Corrupt Contact service	The internal stack memory for PROFIBUS-PA/FOUNDATION fieldbus is defective.	Replace electronics or contact manufacturer
F244.031 Electronics	Internal supply voltage error Contact service	Internal voltage supply for the transmitter is defective	Replace electronics or contact manufacturer
F236.24 Operation	DC to High Lot of NV-Resets Refer to instr. Manual	Multi-phase measurement media that produce a very high level of noise Stones or solids that produce a very high level of noise Galvanic voltages at the measuring electrodes Conductivity of fluid is not evenly distributed in the measurement medium (e.g. directly after injection points)	Check the electrical connections and ground of the device Activate empty pipe detector and calibrated when the measuring pipe is empty Contact manufacturer
F232.022 Electronics	Driver Error Uref = 0 Check wiring for open circuit Check fuse	Incorrectly wired (terminals M1, M2) or cable break/cable short-circuit. Defective fuse in the coil circuit or moisture in the terminal box	Check whether the wiring (terminals M1, M2) is connected correctly, cable break, cable short-circuit Check fuse for the coil circuit Check the terminal box for moisture
F228.020 Electronics	Error in coil circuit Check wiring for short-circuit	Incorrectly wired (terminals M1, M2) or cable break/cable short-circuit. Defective fuse in the coil circuit	Check whether the wiring (terminals M1, M2) is connected correctly, cable break, cable short-circuit Check fuse for the coil circuit
F226.019 Electronics	AD Converter saturated Chekc empty pipe or Galv. Voltage	Signal at the input for the AD converter exceeds the maximum value of 2.5 V. No further measurement is possible	If the pipeline is empty, check whether the empty pipe detection function is activated. In the "Diagnostics" menu, switch on the empty pipe detection. Check whether the current flow exceeds the set flow range limit value. If so, then increase the measuring range limit value Q_{max}.

10.2.2 Function Check

Error no./ area	Text in the LCD display	Cause	Remedy
C190.045 Config.	An alarm is simulated Switch off alarm simulation	Simulation pulse output is switched on.	In the "Diagnostics" menu, activate the simulation mode.
C186.009 Config.	Tx Simulator/Calibrator mode Switch off Calibrator mode	Transmitter is operated on the simulator.	In the "Diagnostics" menu, activate the simulation mode.
C185.030 Operation	Hold last good knwon value Switch off noise reduction Contact service	The noise exceeds the bandwidth set for the noise reduction for a long period of time.	Switch off noise reduction in the "Device Setup" menu or contact the manufacturer.
C184.010 Config.	The Flowrate is set to zero Check digital in terminals 81, 82	The function of the digital input DI is set to "Flowrate to Zero" and the digital input DI is set to high signal (DC 24 V).	Set the digital input (DI) to low signal (DC 0 V).
C182-008 Config.	Flow simulation Switch off Simulation Mode	Simulation pulse output is switched on. One of the following functions is simulated: flow [%] or flow [unit] or flow velocity. These values in simulation mode do not represent the conditions in the system.	In the "Diagnostics" menu, switch off the simulation mode.
C178.000 Config.	Simulated/Fixed Current Output Simulation Mode? HART address > 0?	The current output is simulated and is currently set to a specific path. The error message is displayed if the HART address is not 0 (HART Multidrop mode, current output permanently set to 4 mA).	In the "Process Alarm" menu, switch off the simulation mode or set the HART address to 0 in the "Communication" menu.
C177.015 Config.	HART Addr. <>0 Multidrop mode Set HART Addr. = 0	HART address is not 0 (HART Multidrop mode, the current output is permanently set to 4 mA.)	Set the HART address to 0 in the "Communication" menu.
C176.011 Config.	Totalizer Stop Check digital in terminals 81, 82	The function of the digital input DI is set to "external totalizer stop" and the digital input DI is set to high signal (DC 24 V).	Set the digital input (DI) to low signal (DC 0 V).
C175.013 Config.	Totalizer Reset Check digital in terminals 81, 82	The function of the digital input DI is set to "external totalizer stop" and the digital input DI is set to high signal (DC 24 V).	Set the digital input (DI) to low signal (DC 0 V).
C174.002 Config.	Pulse Simulation selected on DO1 Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.
C172.004 Config.	Pulse Simulation selected on DO2 Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.
C168.001 Config.	Logic Simulation selected on DO1 Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.

10 Error messages

Error no./ area	Text in the LCD display	Cause	Remedy
C164.003 Config.	Logic Simulation selected on DO2 Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.
C158.039 Config.	Simulation of HART frequency Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.
C154.018 Config.	Simulation Digital In Switch off Simulation Mode	The simulation mode is switched on	In the "Process Alarm" menu, switch off the simulation mode.

10.2.3 Operating the device out of spec

Error no./ area	Text in the LCD display	Cause	Remedy
S149.021 Operation	Coil resistor out of limits Check wiring Contact service	Coil resistance too high: coil or coil circuit fuse is defective or M1/M2 wired incorrectly or cable break or medium is too hot. Coil resistance too low: coil is defective or short-circuit in wiring of M1/M2.	Check wiring, check coil circuit fuse, contact manufacturer
S148.025 Operation	Empty Pipe Check Pipe	The pipeline in the system is empty.	Fill pipeline
S146.043 Operation	Gas Bubble Alarm	Gas bubbles were detected in the medium. The measured value is above the set switching threshold.	Check the process
S144.033 Operation	Partially filled pipe (TFE) Check pipe or adjust Detector	The partial filling detection is tripped.	Check the process, fill pipeline
S143.042 Operation	Electrode Coating Alarm	Insulating or conductive deposits were detected on measuring electrodes. The deposit value is above the set switching threshold.	Check pipe, rinse pipeline, clean measuring electrodes
S142.041 Operation	Conductivity Alarm	The medium conductivity is outside the set limit values.	Check process, adjust alarm limits if necessary.
S141.046 Operation	Sensor and or Housing Temperature to high	The sensor temperature is outside the set limit values.	Check process, adjust alarm limits if necessary.
S140.007 Operation	Flowrate > 103 % Check Flowrate Check Range Setting	The flow in the system exceeds the set measuring range end value by more than 3 %.	In the "Easy Setup - Q_{max}" menu, increase the measuring range end value
S136.006 Operation	Max Alarm Flowrate	The current flow in the pipeline is greater than the set max. alarm.	Reduce the flow or increase the value for the max. alarm.
S132.005 Operation	Min Alarm Flowrate	The current flow in the pipeline is greater than the set max. alarm.	Reduce the flow or increase the value for the max. alarm.
S124.029 Operation	Electr. Impedance too high Coating? Conductivity? Empty Pipe?	This may be caused by insulating deposits on the electrodes or conductivity that is too low or an empty measuring pipe.	If the pipeline is empty, check whether the pipe detection function is switched on. In the "Diagnostics" menu, switch on the empty pipe detection. Check conductivity, check deposits on the electrodes. Increase the value for "Elec. Imp. Max. Alarm" in the "Diagnostics - Alarm Limits" menu.
S122.026 Operation	Short circuit E1 E2 with shield	Galvanic voltages	Increase the value in the "Diagnostics - Alarm Limits - Electr. V Max Alarm" menu and decrease the value for "Electr. V Min Alarm".
S120.023 Operation	Electrode Noise too high Switch on Noise reduction	The noise at the measuring electrodes is above the limit value	Check the process

10 Error messages

Error no./ area	Text in the LCD display	Cause	Remedy
S110.035 Operation	Sensor setup Cal-Status Set Cal-Status to calibrated	Sensor is uncalibrated or Cal-Status is not set to "calibrated".	Contact manufacturer
S108.044 Operation	Pulse output is cutted off Check pulse out configuration	Incorrect configuration	In the "Easy Setup" menu, reduce the "Pulses per unit" value.

10.2.4 Maintenance

Error no./ area	Text in the LCD display	Cause	Remedy
M099.027 Electronics	NV Corrupt	NV Memory, SensorMemory, FRAM defective	Contact manufacturer
M094.034 Electronics	Current out fault Comms. to MSP Check wiring 20 mA passive? Check BR901!	20 mA loop open, cable break or no power is connected during operation as passive 20 mA output, max. permissible load exceeded or hardware defective	Check for incorrect wiring or wire break. Check that the jumper to the 20 mA active / passive switchover is connected correctly to the backplane in the transmitter housing. Check whether the external power is connected during operation as 20 mA passive.
M090.014 Sensor	Errors Sensors Comms Bad EMC environment Check wiring	EMC environment or loose contact on the D1 or D2 terminals or incorrect wiring or short-circuit or moisture in the terminal box	Check for incorrect wiring (terminals D1, D2), check terminal box
M080.012 Operation	Display value is < 1600 h at Q_{max} Change eng. Unit for Totalizer	Display value < 1600 h for Q_{max}	Change the totalizer unit

10.3 Overview of the error statuses and alarms

Error no./ area	Text in the LCD display	Current output behavior	Digital output behavior	Pulse output behavior	Display	Error can be masked?
F254.038 Electronics	RAM error in Transmitter Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No
F253.037 Electronics	ROM error in Transmitter Contact service	Ilout at alarm	General Alarm	0 Hz	0 %	No
F252.017 Sensor	No Sensor Memory Check wiring Check switch SW3?	Iout at alarm	General Alarm	0 Hz	0 %	No
F251.040 Electronics	FRAM error in the transmitter Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No
F250.016 Electronics	Tx memory fault detected Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No
F248.036 Sensor	Incompatible snsTx+ sns are not the same series	Iout at alarm	General Alarm	0 Hz	0 %	No
F246.032 Electronics	Defect digital potentiometer Transmitter Hardware fault-Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No
F245.047 Electronics	Stack NV Corrupt Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No

10 Error messages

Error no./ area	Text in the LCD display	Current output behavior	Digital output behavior	Pulse output behavior	Display	Error can be masked?
F244.031 Electronics	Internal supply voltage error Contact service	Iout at alarm	General Alarm	0 Hz	0 %	No
F236.024 Operation	DC to High Lot of NV-Resets Refer to instr. Manual	Iout at alarm	General Alarm	0 Hz	0 %	No
F232.022 Electronics	Driver Error Uref = 0 Check wiring for open circuit Check fuse	Iout at alarm	General Alarm	0 Hz	0 %	No
F228.020 Electronics	Error in coil circuit Check wiring for short-circuit	Iout at alarm	General Alarm	0 Hz	0 %	No
F226.019 Electronics	ADC saturated Empty pipe? Galvanic voltage?	Iout at alarm	General Alarm	0 Hz	0 %	No
C190.045 Configuration	An alarm is simulated Switch off alarm simulation	Current value	No response	Current value	Current value	No
C186.009 Configuration	Tx Simulator/Calibrator mode Switch off Calibrator mode	Current value	Current value	Current value	Current value	Mask group
C185.030 Operation	Hold last good knwon value Switch off noise reduction Contact service	Current value	No response	Current value	Current value	Mask group
C184.010 Configuration	The Flowrate is set to zero Check digital in terminals 81, 82	4 mA (0 % flow)	No response	0 Hz	0 %	Mask group
C182.008 Configuration	Flow simulation Switch off Simulation Mode	Current value or High Alarm (flow > 105 %)	No response, Min/Max or General Alarm	Current value	Current value	Mask group
C178.000 Configuration	Simulated/Fixed Current Output Simulation Mode? HART address > 0?	Simulated value	No response	Current value	Current value	Mask group
C177.015 Configuration	HART Addr. <>0 Multidrop mode Set HART Addr. = 0	4 mA	Current value	Current value	Current value	Mask group
C176.011 Configuration	Totalizer Stop Check digital in terminals 81, 82	Current value	No response	0 Hz	Current value	Mask group
C175.013 Configuration	Totalizer Reset Check digital in terminals 81, 82	Current value	No response	Current value	Current value	Mask group
C174.02 Configuration	Pulse Simulation selected on DO1 Switch off Simulation Mode	Current value	No response	Simulated value	Current value	Mask group

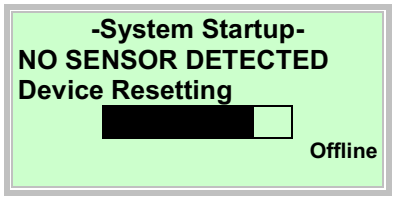
Error no./ area	Text in the LCD display	Current output behavior	Digital output behavior	Pulse output behavior	Display	Error can be masked?
C172.04 Configuration	Pulse Simulation selected on DO2 Switch off Simulation Mode	Current value	No response	Simulated value	Current value	Mask group
C168.01 Configuration	Logic Simulation selected on DO1 Switch off Simulation Mode	Current value	Simulated value	No response	Current value	Mask group
C164.03 Configuration	Logic Simulation selected on DO2 Switch off Simulation Mode	Current value	Simulated value	No response	Current value	Mask group
C158.039 Configuration	Simulation of HART frequency Switch off Simulation Mode	Current value	No response	Current value	Current value	Mask group
C154.018 Configuration	Simulation Digital In Switch off Simulation Mode	Current value	No response	Current value	Current value	Mask group
C149.021 Sensor	Coil resistor out of limits Check wiring Contact service	Current value	No response	Current value	Current value	Mask group
S148.025 Operation	Empty Pipe Check Pipe	Programmed alarm	Programmed alarm	0 Hz	0 %	Mask single alarm
S149.021 Operation	Coil resistor out of limits Check wiring Contact service	No response	No response	No response	No response	Mask group
S146.043 Operation	Gas Bubble Alarm	Current value	Programmed alarm	Current value	Current value	Mask group
S144.033 Operation	Partially filled pipe (TFE) Check pipe or adjust Detector	Programmed alarm	Programmed alarm	Current value	Current value	Mask group
S143.042 Operation	Electrode Coating Alarm	Current value	Programmed alarm	Current value	Current value	Mask group
S142.041 Operation	Conductivity Alarm	Current value	Programmed alarm	Current value	Current value	Mask group
S141.046 Operation	Sensor and or Housing Temperature to high	Current value	Programmed alarm	Current value	Current value	Mask group
S140.007 Operation	Flowrate > 103 % Check Flowrate Check Range Setting	Programmed alarm	Collective alarm	Current value	Current value	Mask single alarm
S136.006 Operation	Max Alarm Flowrate	Current value	Programmed alarm	Current value	Current value	Mask single alarm
S132.05 Operation	Min Alarm Flowrate	Current value	Programmed alarm	Current value	Current value	Mask single alarm
S124.029 Operation	Electr. Impedance too high Coating? Conductivity? Empty Pipe?	Current value	No response	Current value	Current value	Mask group
S122.026 Operation	Short circuit E1 E2 with shield	Current value	No response	Current value	Current value	Mask group

10 Error messages

Error no./ area	Text in the LCD display	Current output behavior	Digital output behavior	Pulse output behavior	Display	Error can be masked?
S120.023 Operation	Electrode Noise too high Switch on Noise reduction	Current value	No response	Current value	Current value	Mask group
S110.035 Sensor	Sensor setup Cal-Status Set Cal-Status to calibrated	Current value	No response	Current value	Current value	Mask group
S108.044 Operation	Pulse output is cutted off Check pulse out configuration	Current value	No response	Maximum possible value	Current value	Mask group
M099.027 Electronics	NV Corrupt	Current value	No response	Current value	Current value	Mask group
M94.034 Electronics	Current out fault Comms. to MSP Check wiring 20 mA passive? Check BR901!	Low alarm	No response	Current value	Current value	Mask single alarm
M90.014 Sensor	Errors Sensors Comms Bad EMC environment Check wiring	Current value	No response	Current value	Current value	Mask group
M80.012 Operation	Display value is < 1600 h at Q_{max} Change eng. Unit for Totalizer	Current value	No response	Current value	Current value	Mask group

10.3.1 Error message during startup

No sensor detected



Once the device is switched on, the calibration data of the sensor and the transmitter settings is loaded from the SensorMemory into the transmitter. If the communication cannot be established to the SensorMemory[1], the adjacent message appears on the LCD display.

Possible cause	Remedy
Terminals D1/D2 wired incorrectly.	Check wiring
Short-circuit or wire break of wires D1/D2	Check signal cable
Jumper SW3 not correctly connected to the backplane	Check jumper SW3, refer to chapter 7.2 "Configuring the current output", page 73. • off: SensorMemory provided in the sensor (standard) • on: no SensorMemory in the sensor
SensorMemory[1] is defective	Contact manufacturer service

The device restarts after the progress bar is complete until either the communication with the SensorMemory[1] is re-established or the process is canceled by selecting "Offline".

In Offline mode, the device can be operated or parameterized, but no measurement is performed.

In Offline mode, the error message "F252.017" is set.

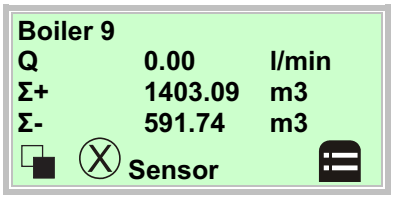
[1] The SensorMemory is a memory integrated in the sensor.

Incompatible sensor

IMPORTANT (NOTE)!

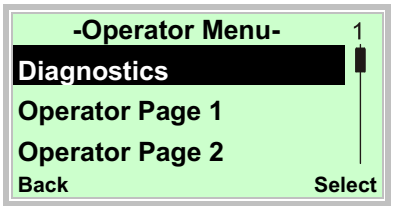
When starting up the device, make sure that the transmitter and the sensor are assigned correctly. A mixed operation of different sensors and transmitter versions is not possible. (⇨ see chapter 7.1 "Checks prior to start-up", page 73)

If the transmitter is operated with a sensor of another series, the following error message appears on the transmitter display:

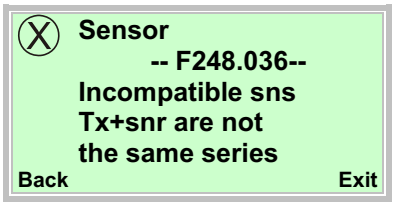


A flow of ZERO is indicated in the process display. No flow measurement is performed.

1. Use to switch to the Information level.



2. Use or to select the "Diagnostics" submenu.
3. Use to confirm your selection.



When trying to start up a mixed installation, the adjacent error message appears. The device cannot perform measurements. The display for the current flow is ZERO. The current output assumes its pre-configured state (Iout for alarm).

Make sure that the sensor and the transmitter are of the same device version (e.g., sensor 406012/2-0 JUMO flowTRANS MAG S, transmitter 406018/2-0 JUMO flowTRANS MAG S).

11.1 General information

All repair or maintenance work must only be carried out by qualified customer service personnel.

When replacing or repairing individual components, original spare parts must be used.

To install, start up and maintain the JUMO flowTRANS MAG devices, it is necessary to open the housing of the sensor or transmitter.

Be sure to observe the following safety instructions before opening and after closing the housing for re-starting:

DANGER – Explosion hazard!

When the case lid is open, the Ex-protection becomes void.
Before opening the housing, de-energize all of the device's connecting cables and wait for at least 20 minutes.

DANGER – Explosion hazard!

Loosening the transmitter housing screws invalidates the Ex-protection. Before re-starting, tighten all screws on the transmitter housing.

WARNING – Personal injuries!

When the housing is open, the EMC protection is limited and the protection against contact becomes void.

Before opening the housing switch off the voltage supply.

WARNING – Impairment of the housing protection type!

If the seal (O-ring) is not connected properly or damaged, the housing protection type is limited. Before closing the case lid, check the seal (O-ring) for damage and replace if necessary.

When closing the case lid, make sure the seal is connected properly.

CAUTION – Damage to components!

The electronic components of the circuit board may be damaged by static electricity (observe ESD guidelines).

Make sure that the static electricity in your body is discharged before touching electronic components.

11 Maintenance

11.2 Sensor

The sensor is largely maintenance-free. The following items must be checked annually:

- Environmental conditions (ventilation, moisture)
- Leak-tightness of process connections
- Cable inlets and lid screws
- Functional safety of the voltage supply, lightning protection and station ground

The sensor electrodes must be cleaned if the flow information on the transmitter changes when recording the identical flow volume. If the display shows a higher flow, the contamination is insulating. If the flow displayed is lower, the contamination results in a short-circuit.

If repairs to the lining, electrodes or magnet coils are required, the flowmeter must be returned to the manufacturer.

IMPORTANT (NOTE)!

For maintaining, repairing and returning devices, the chapter chapter 1.14 "Safety information for inspections and maintenance", page 20 and chapter 1.15 "Returning devices", page 20 must be observed!

When cleaning the outside of the measuring devices, make sure that the cleaning agent used does not corrode the housing surface and the seals.

11.3 Seals

Hygienic device versions with variable process connections are supplied with special seals between the sensor housing and the process connection. These seals must be used and installed correctly to prevent leakage, and ensure 3A conformity.

3A-compliant mounting⇨ see chapter 4.3.12 "3A-compliant mounting", page 45.

3A-compliant seals⇨ see chapter 12.4 "3A-compliant seal materials", page 180.

For all other device versions, use commercially available seals made from a material compatible with the measurement medium and prevailing temperature (rubber, PDFE, lt, EPDM, silicone, Viton, etc.).

Sensors with a connection flange design are installed without seals directly in the pipeline.

IMPORTANT (NOTE)!

When maintaining/replacing seals on 3A-compliant hygienic devices, make sure that 3A-compliant seals are exclusively used. The 3A-compliance of the device is not guaranteed in case of failure to comply!

11.4 Replacing the transmitter or sensor

DANGER – Explosion hazard!

When the case lid is open, Ex-protection and touch protection are voided. EMC protection is restricted. Before opening the housing, be sure to observe chapter 11.1 "General information", page 173!

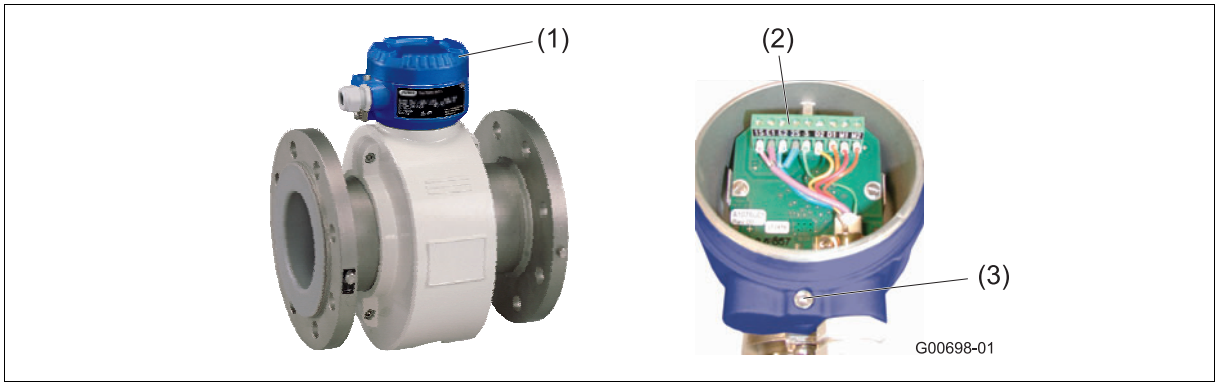
IMPORTANT (NOTE)!

When replacing the transmitter or sensor, the correct assignment must be ensured.

The respective series is specified on the nameplate of the transmitter or sensor (e.g. JUMO flowTRANS MAG S or JUMO flowTRANS MAG H).

After the transmitter is replaced, the system data must be reloaded according to the specifications in the operating manual (⇨ see chapter 7.5.1 "Loading the system data", page 84).

11.4.1 Replacing the sensor

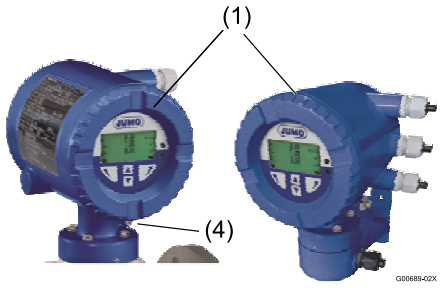


(1) Case lid
(2) Screw terminals
(3) Lid lock

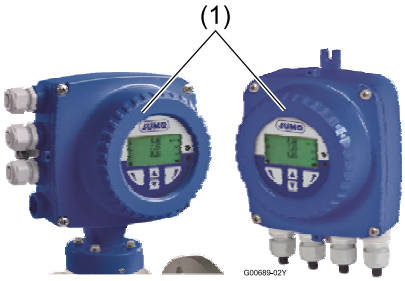
Replace the sensor as follows:

1. ⇨ Observe chapter 11.1 "General information", page 173!
2. Switch off the voltage supply and wait at least 20 minutes before performing the next step.
3. Screw in the lid lock (3) and unlock the case lid (1).
4. Open the case lid (1).
5. Loosen the screw terminals (2) and remove the cable.
6. Replace the sensor.
7. Before closing the housing, make sure the case lid (O-ring) is connected properly.
8. Mount it in reverse order. After mounting the lid, unscrew the lid lock (3) and secure the case lid (1) against twisting.
9. Reload the system data, ⇨ See chapter 7.5.1 "Loading the system data", page 84.

11.4.2 Replacing the transmitter



Transmitter in a dual-compartment housing



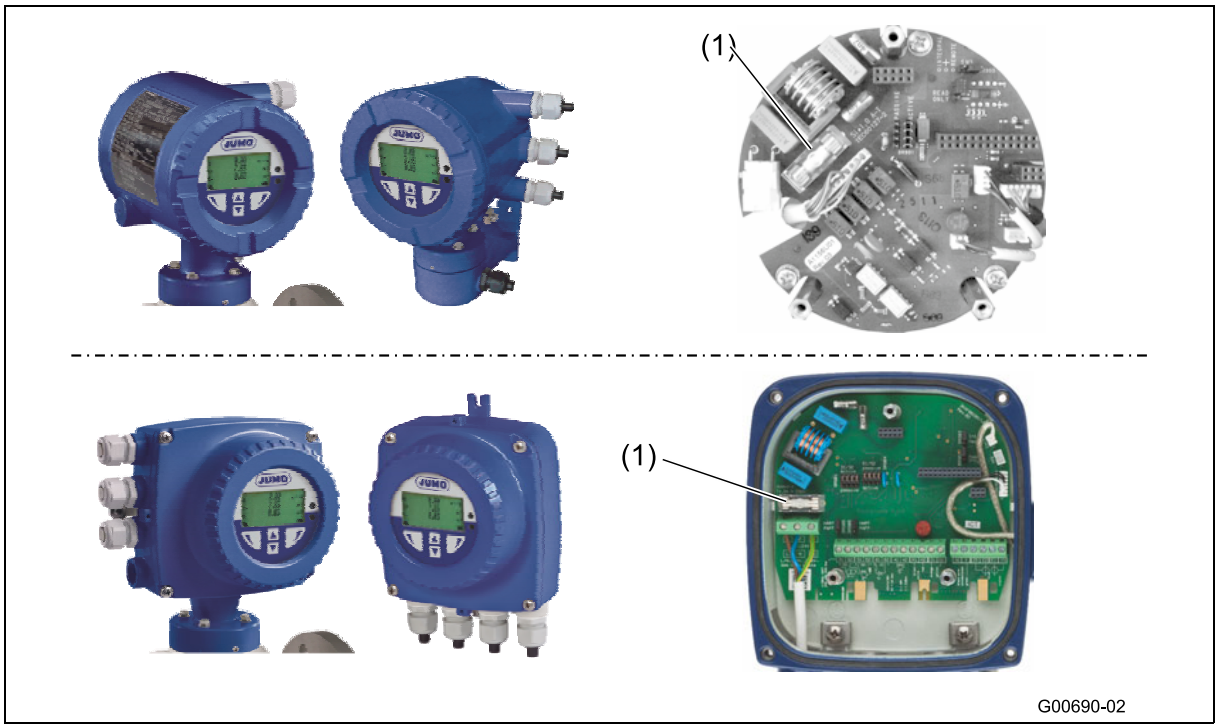
Transmitter in a single-compartment housing

(1) Case lid
(2) Transmitter plug-in module
(3) Mounting screws
(4) Lid lock

Replace the transmitter plug-in as follows:

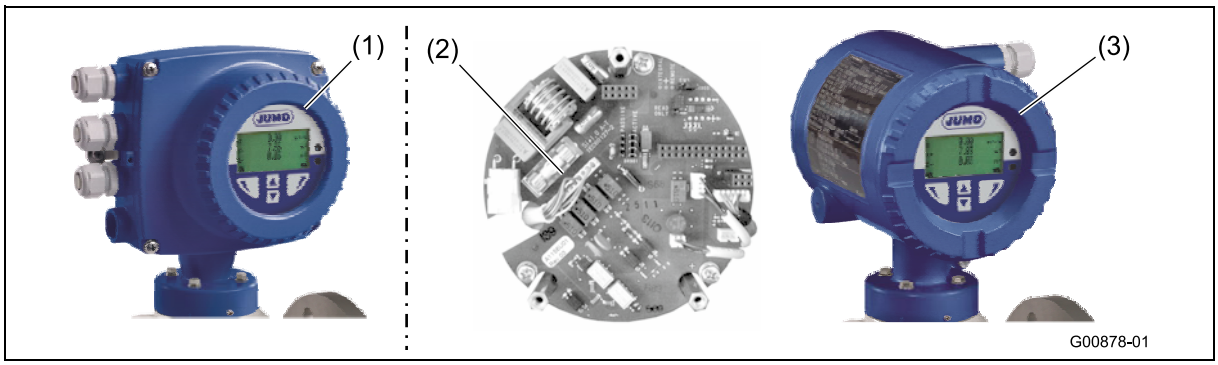
1. ⇨ Observe chapter 11.1 "General information", page 173!
2. Switch off the voltage supply and wait at least 20 minutes before performing the next step.
3. Screw in the lid lock (4) and unlock the case lid (1).
4. Open the case lid (1).
5. Loosen the screws (3) and pull out the transmitter plug-in module.
6. Insert the new transmitter plug-in module (2) and retighten the screws (3).
7. Before closing the housing, make sure the case lid (O-ring) is connected properly.
8. Close the case lid and secure the lid by unscrewing the lid lock (4).
9. Reload the system data, ⇨ See chapter 7.5.1 "Loading the system data", page 84.

12.1 Transmitter electronics unit fuse



No.	Designation	Part number
1	Fuse (1.0 A) for voltage supply; usable for all devices	00645917

12.2 Spare parts for devices with a compact design

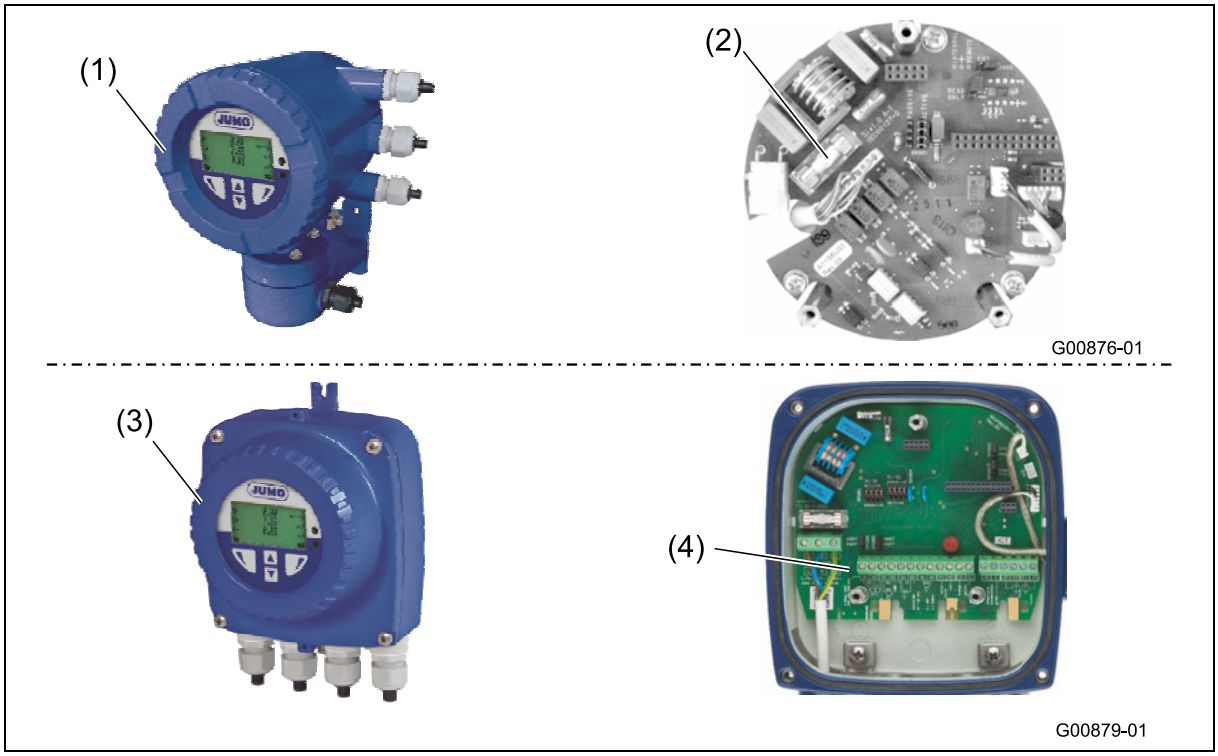


No.	Designation	Part number
1	Housing lid for transmitters in a single-compartment housing with a compact design	00645918
2	Universal backplane for transmitters in a dual-compartment housing	00645920
3	Front housing lid for transmitters in a dual-compartment housing with a compact design (ex-zone 1)	00645921

12 Spare parts list

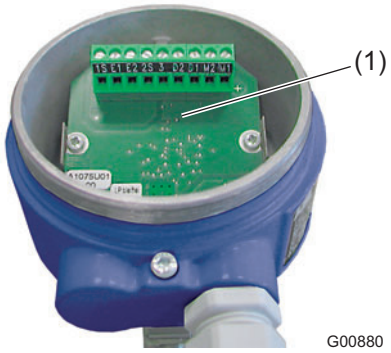
12.3 Spare parts for devices with a remote mount design

12.3.1 Field housing



No.	Designation	Part number
1	Front housing lid for transmitters in a dual-compartment housing with a remote mount design (ex-zone 1)	00645925
2	Universal backplane for transmitters in a dual-compartment housing	00645920
3	Housing lid for transmitters in a single-compartment housing with a remote mount design	00645928
4	Backplane for transmitters in a single-compartment housing with a remote mount design	00645930

12.3.2 Sensor - zone 2



No.	Designation	Part number	
		Model 406012 **Model 406013**	**Model 406015** **Model 406016**
1	Connection board (without preamplifier)	00645931	00645931
	Connection board (with preamplifier)	00645932	00645932

12.3.3 Sensor - zone 1

No.	Designation	Part number
		Model 406012 **Model 406013**
1	O-ring	00645933
2	Cable fitting for zone 1, plastic, black, M20 × 1.5	00645934

12 Spare parts list

12.4 3A-compliant seal materials

12.4.1 Flat seals EPDM

No.	Designation	Part number
1	Flat seal with FDA approval Nominal width: DN 3 to 10 (1/10″ to 3/8″)	00661158
2	Flat seal with FDA approval Nominal width: DN 15 (1/2″)	00661173
3	Flat seal with FDA approval Nominal width: DN 20 (3/4″)	00661174
4	Flat seal with FDA approval Nominal width: DN 25 (1″)	00661193
5	Flat seal with FDA approval Nominal width: DN 32 (1 1/4″)	00661194
6	Flat seal with FDA approval Nominal width: DN 40 (1 1/2″)	00661197
7	Flat seal with FDA approval Nominal width: DN 50 (2″)	00661230
8	Flat seal with FDA approval Nominal width: DN 65 (2 1/2″)	00661231
9	Flat seal with FDA approval Nominal width: DN 80 (3″)	00661232
10	Flat seal with FDA approval Nominal width: DN 100 (4″)	00661236

12.4.2 Flat seals silicone

No.	Designation	Part number
1	Flat seal with FDA approval Nominal width: DN 3 to 10 (1/10″ to 3/8″)	00661239
2	Flat seal with FDA approval Nominal width: DN 15 (1/2″)	00661240
3	Flat seal with FDA approval Nominal width: DN 20 (3/4″)	00661243
4	Flat seal with FDA approval Nominal width: DN 25 (1″)	00661244
5	Flat seal with FDA approval Nominal width: DN 32 (1 1/4″)	00661247
6	Flat seal with FDA approval Nominal width: DN 40 (1 1/2″)	00661248
7	Flat seal with FDA approval Nominal width: DN 50 (2″)	00661249
8	Flat seal with FDA approval Nominal width: DN 65 (2 1/2″)	00661250
9	Flat seal with FDA approval Nominal width: DN 80 (3″)	00661251
10	Flat seal with FDA approval Nominal width: DN 100 (4″)	00661252

13.1 General information

13.1.1 Reference conditions according to EN 29104

Measuring medium temperature	20 °C (68 °F) ±2 K
Ambient temperature	20 °C (68 °F) ±2 K
Voltage supply	Nominal voltage according to the nameplate V_n ±1 %, frequency f ±1 %
Installation conditions	Supply side > 10 x DN pipe section Return side > 5 x DN pipe section
Warm-up phase	30 min

13.1.2 Maximum measurement deviation

IMPORTANT (NOTE)!

$Q_{max}DN$ ⇨ See table chapter 7.6 "Nominal width, measuring range", page 92.

JUMO flowTRANS MAG S01

Calibration (pulse output)	Nominal width
±0.4% of the measured value, ±0.02% QmaxDN (standard)	DN 3 to 2,000
±0.2% of measured value, ±0.02% QmaxDN (optional)	DN 10 to 600, 800

JUMO flowTRANS MAG S02

Calibration (pulse output)	Nominal width
±0.3% of the measured value, ±0.02% QmaxDN (standard)	DN 3 to 600, 800
±0.4% of the measured value, ±0.02% QmaxDN (standard)	DN 700, 900 to 2,000
±0.2% of measured value, ±0.02% QmaxDN (optional)	DN 10 to 600, 800

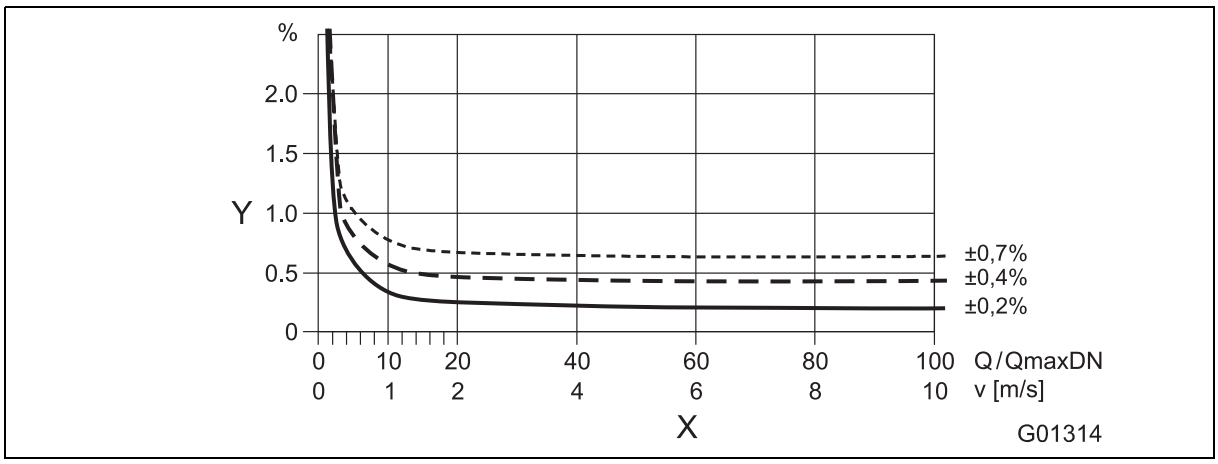
JUMO flowTRANS MAG H01

Calibration (pulse output)	Nominal width
±0.4% of the measured value, ±0.02% QmaxDN (standard)	DN 3 to 100
±0.2% of measured value, ±0.02% QmaxDN (optional)	DN 10 to 100

JUMO flowTRANS MAG H02

Calibration (pulse output)	Nominal width
±0.3% of the measured value, ±0.02% QmaxDN (standard)	DN 3 to 100
±0.7% of the measured value, ±0.02% QmaxDN (standard)	DN 1 to 2

±0.2% of measured value, ±0.02% QmaxDN (optional)	DN 10 to 100



X Flow velocity v in [m/s], $Q/Q_{max}DN$[a] [%]

Y Accuracy ± of measured value in [%]

[a] $Q_{max}DN$ ⇨ See table chapter 7.6 "Nominal width, measuring range", page 92.

Analog output effect

Same as pulse output plus ±0.1% of measured value + 0.01 mA

13.1.3 Repeatability, response time

Repeatability	≤ 0.11 % of the measured value t_{meas} = 100 s v = 0.5 to 10 m/s
Response time	For a step function 0 to 99 %
Current output With a damping of 0.02 seconds	5 τ ≥ 200 ms at 25 Hz excitation frequency 5 τ ≥ 400 ms at 12.5 Hz excitation frequency 5 τ ≥ 500 ms at 6.25 Hz excitation frequency

13.2 Sensor JUMO flowTRANS MAG S01/02

13.2.1 Temperatures

The temperature range of the device depends on a series of factors. These factors include the measurement medium temperature, the ambient temperature, the operating pressure, the lining material, and the approvals for the Ex-protection.

13.2.2 Storage temperature

-40 to +70 °C (-40 to +158 °F)

13.2.3 Minimum admissible pressure depending on the medium temperature

Sensor housing made of aluminum (double shell housing)

Lining	Nominal width	$p_{Operation}$abs	for $T_{Operation}$[a]
Hard rubber	DN 15 to 2000 (1/2 to 80″)	0 mbar	< 90 °C (194 °F)
Soft rubber	DN 50 to 2000 (2 to 80″)	0 mbar	< 60 °C (140 °F)
PTFE	DN 10 to 600 (3/8 to 24″)	270 mbar	< 20 °C (68 °F)
		400 mbar	< 100 °C (212 °F)
		500 mbar	< 130 °C (266 °F)
Thick PTFE	DN 25 to 80 (1 to 3″)	0 mbar	< 180 °C (356 °F)
	DN 100 to 80 (4 to 10″)	67 mbar	< 180 °C (356 °F)
	DN 300 (12″)	27 mbar	< 180 °C (356 °F)
PFA	DN 3 to 200 (1/10 to 8″)	0 mbar	< 180 °C (356 °F)
ETFE	DN 25 to 600 (1 to 24″)	100 mbar	< 130 °C (266 °F)
Ceramic carbide	DN 25 to 1,000 (1 to 40″)	0 mbar	< 80 °C (176 °F)

[a] Higher temperatures are allowed for CIP/SIP cleaning for a limited time (⇨ See table 13.2.4).

Sensor housings made of steel

Lining	Nominal width	$p_{Operation}$abs	for $T_{Operation}$[a]
Hard rubber	DN 40 to 600 (1 1/2 to 24″)	600 mbar	< 80 °C (176 °F)
PTFE	DN 25 to 600 (1 to 24″)	270 mbar	< 20 °C (68 °F)
		400 mbar	< 100 °C (212 °F)
		500 mbar	< 130 °C (266 °F)

[a] Higher temperatures are allowed for CIP/SIP cleaning for a limited time (⇨ See table 13.2.4).

13.2.4 Maximum admissible cleaning temperature

CIP cleaning	Lining Sensor	T_{max}	T_{max} minutes	T_{amb}
Steam cleaning	PTFE, PFA	150 °C (302 °F)	60	25 °C (77 °F)
Liquids	PTFE, PFA	140 °C (284 °F)	60	25 °C (77 °F)

If the ambient temperature is > 25 °C, the difference must be subtracted from the max. cleaning temperature. T_{max} - Δ °C. (Δ °C = T_{Amb} - 25 °C)

13.2.5 Maximum ambient temperature depending on the medium temperature

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

Compact design					
Lining	**Flange material**	**Ambient temperature**		**Medium temperature**	
		Minimum	**Maximum**	**Minimum**	**Maximum**
Hard rubber	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	80 °C (176 °F)[a] 90 °C (194 °F)
	Stainless steel	-15 °C (5 °F)	60 °C (140 °F)	-15 °C (5 °F)	80 °C (176 °F)[a] 90 °C (194 °F)
Soft rubber	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	60 °C (140 °F)
	Stainless steel	-15 °C (5 °F)	60 °C (140 °F)	-15 °C (5 °F)	60 °C (140 °F)
PFA PTFE Thick PTFE ETFE[b]	Steel	-10 °C (14 °F)	60 °C (140 °F) 45 °C (113 °F)	-10 °C (14 °F)	90 °C (194 °F) 130 °C (266 °F)
	Stainless steel	-20 °C (-4 °F) -40 °C (-40 °F)[c]	60 °C (140 °F) 45 °C (113 °F)	-25 °C (-13 °F)	90 °C (194 °F) 130 °C (266 °F)
Ceramic Carbide	Steel	-10 °C (14 °F)	60 °C (140 °F) 45 °C (113 °F)	-10 °C (14 °F)	80 °C (176 °F)
	Stainless steel	-20 °C (-4 °F)	60 °C (140 °F) 45 °C (113 °F)	-20 °C (-4 °F)	80 °C (176 °F)

[a] For version "Sensor housing made of steel"

[b] For version "Sensor housing made of aluminum (double shell housing)"

[c] for low temperature version (optional)

Compact design (high-temperature version)[a]					
Lining	**Flange material**	**Ambient temperature**		**Medium temperature**	
		Minimum	**Maximum**	**Minimum**	**Maximum**
PFA Thick PTFE	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	180 °C (356 °F)
	Stainless steel	-20 °C (-4 °F) -40 °C (-40 °F)[b]	60 °C (140 °F)	-20 °C (-4 °F)	180 °C (356 °F)
ETFE[a]	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	130 °C (266 °F)
	Stainless steel	-20 °C (-4 °F) -40 °C (-40 °F)[b]	60 °C (140 °F)	-20 °C (-4 °F)	130 °C (266 °F)

[a] For version "Sensor housing made of aluminum (double shell housing)"

[b] for low temperature version (optional)

Remote mount design					
Lining	**Flange material**	**Ambient temperature**		**Medium temperature**	
		Minimum	**Maximum**	**Minimum**	**Maximum**
Hard rubber	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	80 °C (176 °F)[a] 90 °C (194 °F)
	Stainless steel	-15 °C (5 °F)	60 °C (140 °F)	-15 °C (5 °F)	80 °C (176 °F)[a] 90 °C (194 °F)
Soft rubber	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	60 °C (140 °F)
	Stainless steel	-15 °C (5 °F)	60 °C (140 °F)	-15 °C (5 °F)	60 °C (140 °F)
PFA PTFE Thick PTFE ETFE[b]	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	130 °C (266 °F)
	Stainless steel	-25 °C (-13 °F) -40 °C (-40 °F)[c]	60 °C (140 °F) 45 °C (113 °F)	-25 °C (-13 °F)	130 °C (266 °F)
Ceramic Carbide	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	80 °C (176 °F)
	Stainless steel	-20 °C (-4 °F)	60 °C (140 °F)	-20 °C (-4 °F)	80 °C (176 °F)

[a] For version "Sensor housing made of steel"

[b] For version "Sensor housing made of aluminum (double shell housing)"

[c] for low temperature version (optional)

Remote mount design (high-temperature version)[a]					
Lining	**Flange material**	**Ambient temperature**		**Medium temperature**	
		Minimum	**Maximum**	**Minimum**	**Maximum**
PFA Thick PTFE	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	180 °C (356 °F)
	Stainless steel	-25 °C (-13 °F) -40 °C (-40 °F)[b]	60 °C (140 °F)	-25 °C (-13 °F)	180 °C (356 °F)
ETFE[a]	Steel	-10 °C (14 °F)	60 °C (140 °F)	-10 °C (14 °F)	130 °C (266 °F)
	Stainless steel	-25 °C (-13 °F) -40 °C (-40 °F)[b]	60 °C (140 °F)	-25 °C (-13 °F)	130 °C (266 °F)

[a] For version "Sensor housing made of aluminum (double shell housing)"

[b] for low temperature version (optional)

13.2.6 Protection type according to EN 60529

Compact design (internal transmitter)	IP65, IP67 (NEMA X4)
Remote mount design (external transmitter)	IP65, IP67 (NEMA X4), IP68

13.2.7 Pipe vibration according to EN 60068-2-6

Valid for:

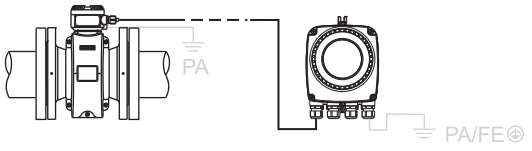
Compact design (With aluminum transmitter housing)	In the range 10 to 58 Hz max. 0.15 mm (0.006") deflection
	In the range 58 to 150 Hz max. 2 g acceleration
Remote mount design (Sensor)	In the range 10 to 58 Hz max. 0.15 mm (0.006") deflection
	In the range 58 to 150 Hz max. 2 g acceleration

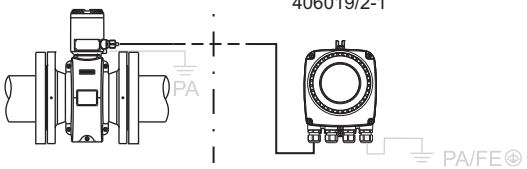
13.2.8 Insertion length

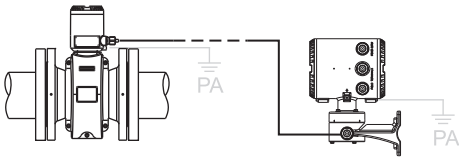
The flanged devices comply with the insertion lengths specified according to VDI/VDE 2641, ISO 13359 or according to DVGW (work sheet W420, design WP, ISO 4064 short).

13.2.9 Signal cable length and preamplifier

For devices in the remote mount design, the electrical connection between the transmitter and sensor is made via a signal cable.

Transmitter housing design	Single-compartment housing	**Ex-zone 2 or outside of Ex-area** 406012/2-0 406012/2-1 406013/2-0 406013/2-1 406018/2-0 406018/2-1 406019/2-0 406019/2-1 
Maximum signal cable length[a]		
Without preamplifier	50 m (164 ft)	
With preamplifier	200 m (656 ft)	
Scope of delivery	5 m (16.4 ft) included	
Signal cable, part no.	00648906	

Transmitter housing design	Single-compartment housing	**Ex-zone 1** 406012/2-1 406013/2-1 **Ex-zone 2 or Outside the Ex-area** 406018/2-0 406018/2-1 406019/2-0 406019/2-1 
Maximum signal cable length[a]		
Without preamplifier	50 m (164 ft)	
With preamplifier	-	
Scope of delivery	5 m (16.4 ft) included	
Signal cable, part no.	00648906	

Transmitter housing design	Dual-compartment housing	**Ex-zone 1** 406012/2-1 406013/2-1 406018/2-1 406019/2-1 
Maximum signal cable length[a]		
Without preamplifier	10 m (164 ft)	
With preamplifier	-	
Scope of delivery	10 m (32.8 ft) fixed installation	
Signal cable, part no.	00648907	

[a] At a minimum conductivity for the measurement medium of ≥ 5 µS/cm

IMPORTANT (NOTE)!

Additional requirements for signal cable length for use of optional functions ⇨ see chapter 9 "Advanced diagnostics functions", page 153

13.2.10 Sensor materials

Sensor housing made of aluminum (double shell housing)

Component	Standard	Option	touched by medium
Housing for nominal width:			
DN 10 to 400 (3/8 to 16″)	Cast aluminum double-shell housing, coated Paint coat, ≥ 80 µm thick, RAL 9002 (gray white)	-	-
DN 450 to 2,000 (18 to 80″)	Steel welded design, painted, Paint coat, ≥ 80 µm thick, RAL 9002 (gray white)	-	-
Terminal box	Alum. alloy, painted, ≥ 80 µm thickness, RAL 5013 (cobalt blue)		-
Cable fitting[a]	Polyamide, Stainless steel[b]		-
Measuring pipe	Stainless steel[c]	-	-
Lining	Hard rubber, soft rubber, PTFE, PFA, ETFE,	Thick PTFE, ceramic carbide[d]	x
Measuring/grounding electrode for lining:			
Hard rubber Soft rubber	Stainless steel 1.4571 (AISI 316 Ti)	Hastelloy C-4 (2.4610), titanium, tantalum, platinum-iridium	x
PTFE, PFA, ETFE, Thick PTFE	Stainless steel 1.4571 (AISI 316 Ti), Hastelloy C-4 (2.4610), titanium, tantalum, platinum-iridium	-	x
Ceramic carbide[d]	-	Tungsten carbide	x
Process connection For nominal width:			
DN 3 to 15 (3/8 to 1/2″)	Stainless steel[e]	-	-
DN 20 to 400 (3/4 to 16″)	Steel[e], zinc-plated	Stainless steel[b]	-
DN 450 to 2,000 (18 to 80″)	Steel[e], painted	-	-
Grounding washer	Stainless steel	On request	x
Protective screen	Stainless steel	Upon request	x

[a] Cable fitting with M20 × 1.5 or NPT thread

[b] For Ex-version for -40 °C (40 °F) ambient temperature

[c] Measuring pipe materials ⇨ see chapter 13.2.12 "Measuring pipe materials", page 189.

[d] Only for JUMO flowTRANS MAG S02 version

[e] Process connection materials⇨ see chapter 13.2.11 "Process connection materials", page 189.

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Steel sensors

Component	Standard	Option	touched by medium
Housing for nominal width:			
DN 25 to 600 (1 to 24″)	Steel, painted, Paint coat, ≥ 80 µm thick, RAL 9002 (gray white)	-	-
Terminal box	Alum. alloy, painted, ≥ 80 µm thickness, RAL 5013 (cobalt blue)		-
Cable fitting[a]	Polyamide		-
Measuring pipe	⇨ See "**Housings**" in this table	-	-
Lining	Hard rubber, PTFE		x
Measuring/grounding electrode **For lining**			
Hard rubber	Stainless steel 1.4571 (AISI 316 Ti)	Hastelloy C-4 (2.4610), titanium, tantalum, platinum-iridium	x
PTFE	Stainless steel 1.4571 (AISI 316 Ti), Hastelloy C-4 (2.4610), titanium, tantalum, platinum-iridium	-	x
Process connection **For nominal width**			
DN 25 to 600 (1 to 24″)	Steel[b], painted,	-	-
Grounding washer	Stainless steel	Upon request	x
Protective screen	Stainless steel	Upon request	x

[a] Cable fitting with M20 × 1.5 or NPT thread.

[b] Process connection materials⇨ see chapter 13.2.11 "Process connection materials", page 189.

13.2.11 Process connection materials

Stainless steel
1.4301 (AISI 304), 1.4307, 1.4404 (AISI 316 L) 1.4435 (AISI 316 L), 1.4541 (AISI 321), 1.4571 (AISI 316 Ti), ASTM A182 F304, ASTM A182 F304 L, ASTM 182 F316 L, ASTM A182 F321, ASTM A182 F316 TI, ASTM A 182 F316, 0Cr18Ni9, 0Cr18Ni10, 0Cr17Ni13Mo2, 0Cr27Ni12Mo3, 1Cr18Ni9Ti, 0Cr18Ni12Mo2Ti
Steel (painted), steel (zinc-plated)
1.0038, 1.0460, 1.0570, 1.0432, ASTM A105, Q255A, 20#, 16Mn

13.2.12 Measuring pipe materials

Stainless steel
1.4301 (AISI 304), 1.4307, 1.4404 (AISI 316 L) 1.4435 (AISI 316 L), 1.4541 (AISI 321), 1.4571 (AISI 316 Ti) ASTM materials: Grade TP304, TP304 L, TP316 L, TP321, TP316 Ti, TP317L,0Cr18Ni9, 00Cr18Ni10, 0CR17Ni14Mo2, 0Cr27Ni12Mo3, 0Cr18Ni10Ti

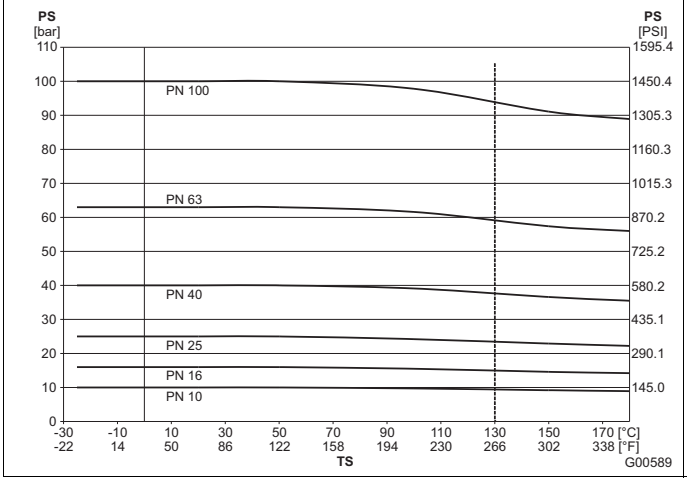
13.2.13 Material load on sensor housing

Sensor housing made of aluminum (double shell housing)

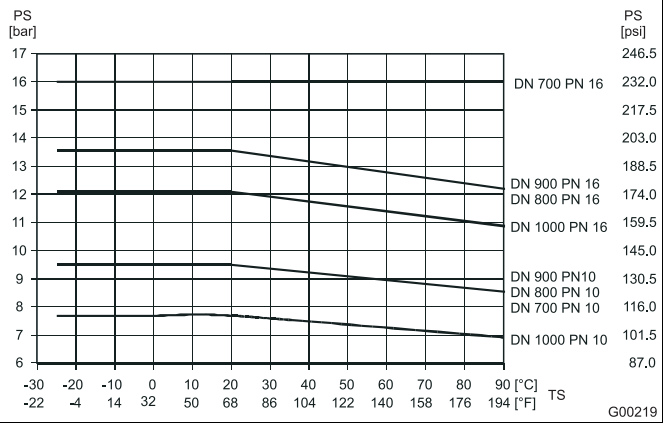
Limits for the admissible fluid temperature (TS) and admissible pressure (PS) are determined by the used liner and flange materials of the device (see device nameplate).

JIS 10K-B2210 flange				
Nominal width	**Material**	**Process connection**	**Fluid temperature (TS)**	**Admissible pressure (PS)**
DN 32 to 400 (1 1/4 to 16")	Stainless Steel	PN10	-25 to +180 °C (-13 to +356 °F)	10 bar (145 psi)
DN 32 to 400 (1 1/4 to 16")	Steel	PN10	-10 °C to +180 °C (14 to 356 °F)	10 bar (145 psi)

Stainless steel DIN flange up to DN 600 (24")



Stainless steel DIN flange DN 700 to 1,000 (28 to 40")



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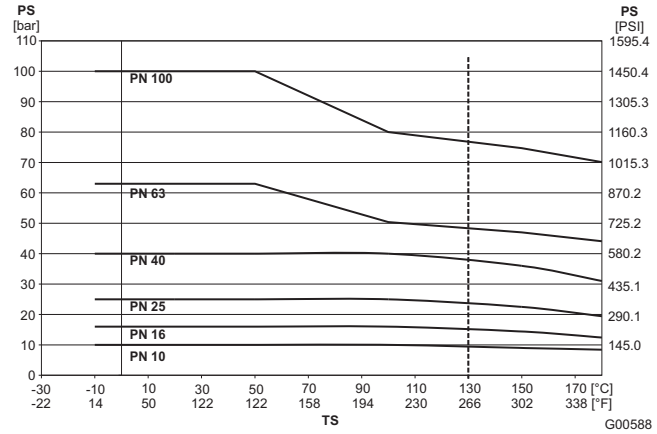
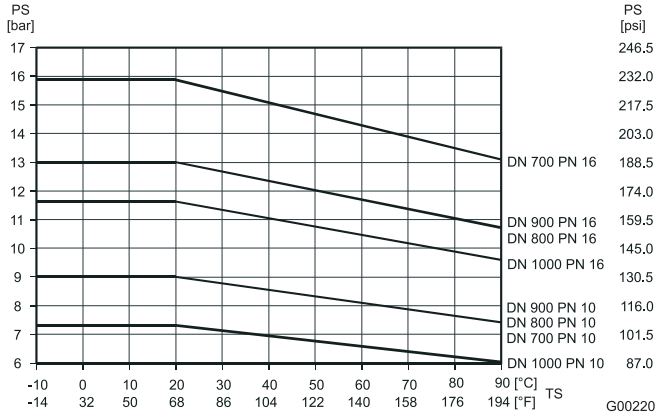
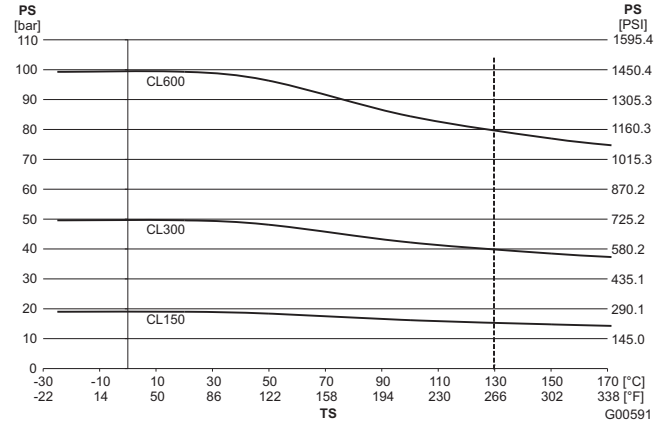
Steel DIN flange up to DN 600 (24")



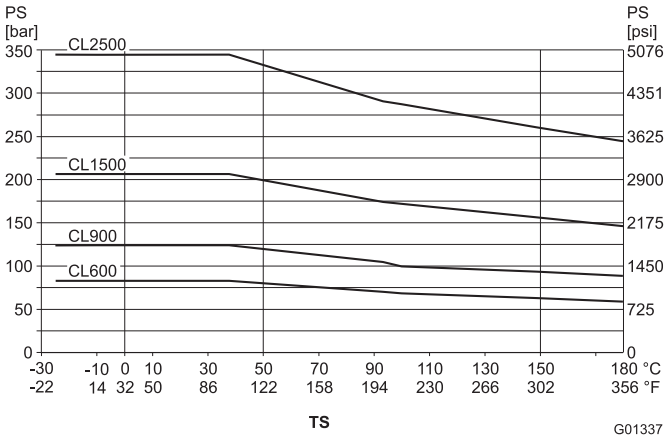
Steel DIN flange DN 700 to 1,000 (28 to 40")



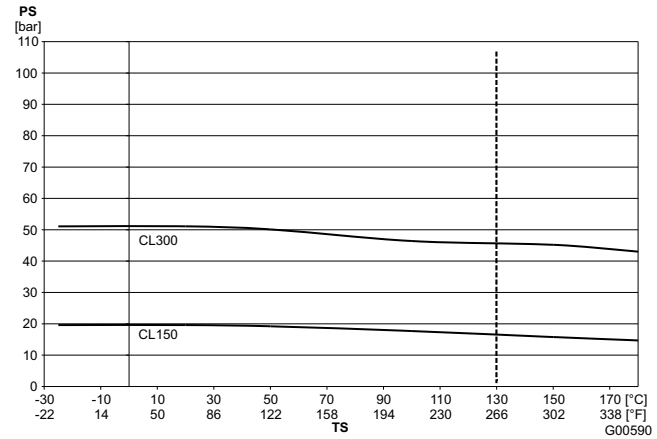
ASME Stainless steel DIN flange up to DN 400 (16") (CL150/300) up to DN 1,000 (40") (CL150)



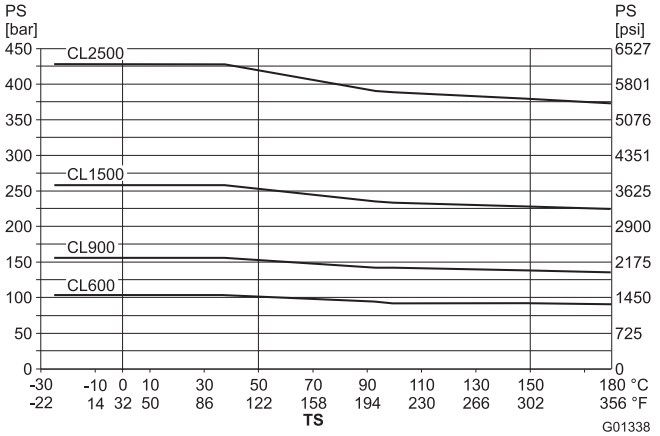
ASME Stainless steel DIN flange DN 25 to 600 (1 to 24")



ASME steel flange up to DN 400 (16") (CL150/300) up to DN 1,000 (40") (CL150)



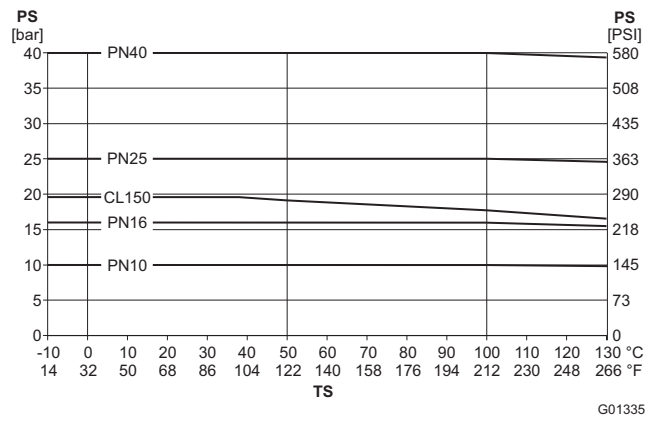
ASME steel flange DN 25 to 600 (1 to 24")



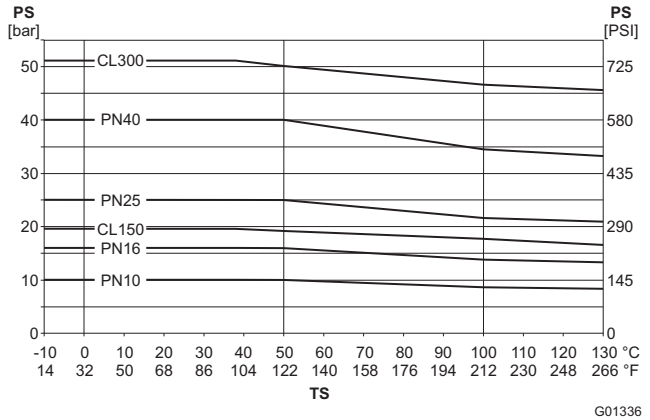
Steel sensors

Limits for the admissible fluid temperature (TS) and admissible pressure (PS) are determined by the used liner and flange materials of the device (see device nameplate).

Cast steel case
DN 25 to 600 (1 to 24")



Welded steel case
DN 25 to 600 (1 to 24")



13 Technical data

13.3 Sensor JUMO flowTRANS MAG H01/02

13.3.1 Temperatures

The temperature range of the device depends on a series of factors. These factors include the measurement medium temperature, the ambient temperature, the operating pressure, the lining material, and the approvals for the Ex-protection.

13.3.2 Storage temperature

-40 to +70 °C (-40 to +158 °F)

13.3.3 Minimum admissible pressure depending on the medium temperature

Lining	Nominal width	$p_{Operation}$abs	for $T_{Operation}$[a]
PFA	DN 3 to 100 (1/10 to 4")	0 mbar	< 180 °C (356 °F)
PEEK	DN 1 to 2 (1/25 to 1/12″)	0 mbar	< 120 °C (248 °F)

[a] Higher temperatures are allowed for CIP/SIP cleaning for a limited time (⇨ See table 13.3.4).

13.3.4 Maximum admissible cleaning temperature

CIP cleaning	Lining Sensor	T_{max}	T_{max} minutes	T_{amb}
Steam cleaning	PFA	150 °C (302 °F)	60	25 °C (77 °F)
Liquids	PFA	140 °C (284 °F)	60	25 °C (77 °F)

If the ambient temperature is > 25 °C, the difference must be subtracted from the max. cleaning temperature. T_{max} - Δ °C.

(Δ °C = T_{Amb} - 25 °C)

13.3.5 Maximum admissible temperature shock

Lining	Temp. shock max. temp. diff °C	Temp. gradient °C/min
PFA	Any	Any
PEEK	Any	Any

13.3.6 Maximum ambient temperature depending on the medium temperature

IMPORTANT (NOTE)!

There is the additional document "JUMO flowTRANS MAG S/H - Safety Manual Ex for devices 406012 - 406019" for the measuring systems that are used in potentially explosive areas.

The information and data contained in the document must also be strictly observed.

Compact and remote mount design (standard temperature version)				
Process connection	**Ambient temperature**		**Medium temperature**	
	Minimum[a]	**Maximum**	**Minimum**	**Maximum**[b]
Flange, Variable process connections	-20 °C (-4 °F)	60 °C (140 °F) 40 °C (104 °F)	-25 °C (-13 °F)	100 °C (212 °F) 130 °C (266 °F)

[a] The following applies for low temperature version (optional): -40 °C (-40 °F).

[b] Higher temperatures are allowed for CIP/SIP cleaning for a limited time (⇨ See table chapter 13.3.4 "Maximum admissible cleaning temperature", page 192).

Remote mount design (high-temperature version)				
Process connection	**Ambient temperature**		**Medium temperature**	
	Minimum[a]	**Maximum**	**Minimum**	**Maximum**
Flange	-20 °C (-4 °F)	60 °C (140 °F)	-25 °C (-13 °F)	180 °C (356 °F)

[a] The following applies for low temperature version (optional): -40 °C (-40 °F).

13.3.7 Protection type according to EN 60529

Compact design (internal transmitter)	IP65, IP67 (NEMA X4)
Remote mount design (external transmitter)	IP65, IP67 (NEMA X4), IP68

13.3.8 Pipe vibration according to EN 60068-2-6

Valid for:

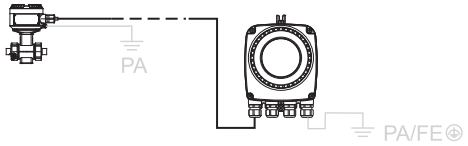
Compact design (With aluminum transmitter housing)	In the range 10 to 58 Hz max. 0.15 mm (0.006") deflection
	In the range 58 to 150 Hz max. 2 g acceleration
Remote mount design (Sensor)	In the range 10 to 58 Hz max. 0.15 mm (0.006") deflection
	In the range 58 to 150 Hz max. 2 g acceleration

13.3.9 Insertion length

The flanged devices comply with the insertion lengths specified according to VDI/VDE 2641, ISO 13359 or according to DVGW (work sheet W420, design WP, ISO 4064 short).

13.3.10 Signal cable length and preamplifier

For devices in the remote mount design, the electrical connection between the transmitter and sensor is made via a signal cable.

Transmitter **housing design**	Single-compartment housing	**Ex-zone 2 or outside of Ex-area** 406015/2-0 406015/2-1 406016/2-0 406016/2-1 406018/2-0 406018/2-1 406019/2-0 406019/2-1 
Maximum signal cable length[a]		
Without preamplifier	50 m (164 ft)	
With preamplifier	200 m (656 ft)	
Scope of delivery	5 m (16.4 ft) included	
Signal cable, part no.	00648906	

[a] At a minimum conductivity for the measurement medium of ≥ 5 µS/cm

13.3.11 Sensor materials

Component	Standard	Option	touched by medium
Housing for nominal width:			
DN 1 to 100 (1/25 to 4")	Deep-drawn housing Stainless steel 1.4301 (AISI 304), 1.4308 (ASTM)	-	-
Terminal box (Compact design type)	Alum. alloy, painted, ≥ 80 µm thickness, RAL 5013 (cobalt blue)		-
Terminal box (Remote mount design type)	Stainless steel 1.4308 (ASTM)		-
Cable fitting[a]	Polyamide, Stainless steel[b]		-
Measuring pipe	Stainless steel	-	-
Lining for nominal width:			
DN 1 to 2 (1/25 to 1/12″)	PEEK	-	x
DN 3 to 100 (1/10 to 4")	PFA	-	x
Measuring/grounding electrode	Stainless steel 1.4539 (AISI 904 L)	Stainless steel 1.4571 (AISI 316 Ti), Hastelloy C-4 (2.4610) Hastelloy B-3 (2.4600), titanium, tantalum, platinum-iridium	x
Seals **For process connection:**			x
Welded socket, compression fitting, Tri-Clamp, external thread	EPDM[c] (ethylene-propylene) – CIP-resistant, no oil and grease[d]	Silicone[c] – resistant to oil and grease	x
1/8″ sanitary connection	PTFE	Viton (only in combination with PVC process connection)	x
Process connection			
OD Tubing	Stainless steel 1.4435 (AISI 316 L)	-	x
All other	Stainless steel 1.4404 (AISI 316 L)	-	x
Flange	Stainless steel 1.4571 (AISI 316 TI)	-	-

[a] Cable fitting with M20 × 1.5 or NPT thread

[b] For Ex-version for -40 °C (40 °F) ambient temperature

[c] Compliant with 3A and FDA 21 CFR 177.

[d] Limited resistance to milk fats (max. 8 %)

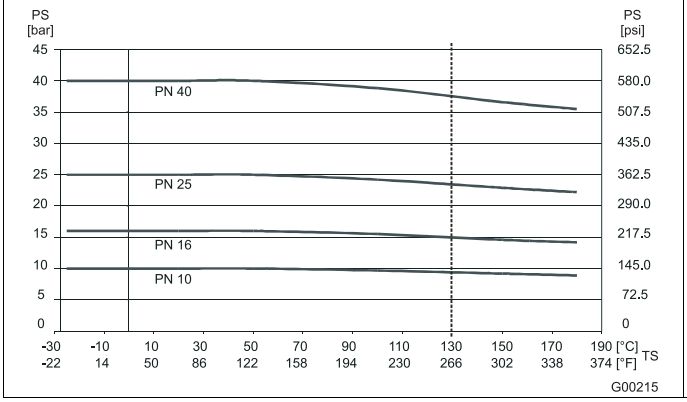
13.3.12 Material load - sensor housing

Limits for the admissible fluid temperature (TS) and admissible pressure (PS) are determined by the used liner and flange materials of the device (see device nameplate).

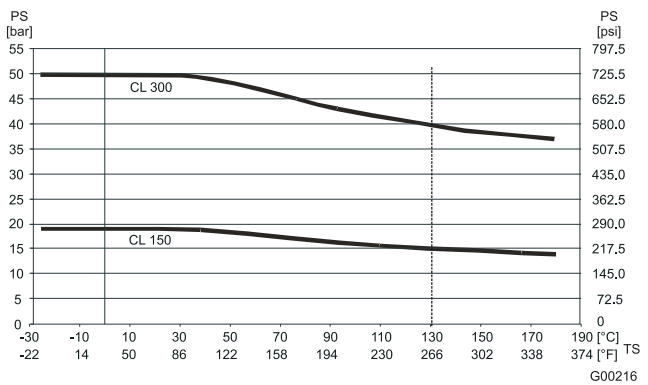
Process connection	Nominal width	PS_{max} bar (PSI)	TS
Connection flange	DN 3 to 50 (1/10" to 2") DN 65 to 100 (2 1/2″ to 4″)	40 (580) 16 (232)	-25 to +130 °C (-13 to +266 °F)
Welded socket	DN 3 to 40 (1/10″ to 1 1/2″) DN 50, DN 80 (2", 3") DN 65, DN 100 (2 1/2", 4")	40 (580) 16 (232) 10 (145)	-25 to +130 °C (-13 to +266 °F)
Compression fitting According to DIN 11851	DN 3 to 40 (1/10″ to 1 1/2″) DN 50, DN 80 (2", 3") DN 65, DN 100 (2 1/2", 4")	40 (580) 16 (232) 10 (145)	-25 to +130 °C (-13 to +266 °F)
Tri-clamp DIN 32676	DN 3 to 50 (1/10" to 2") DN 65 to 100 (2 1/2″ to 4″)	16 (232) 10 (145)	-25 to +121 °C (-13 to +250 °F)
Tri-clamp ASME BPE	DN 3 to 100 (1/10" to 4")	10 (145)	-25 to +130 °C (-13 to +266 °F)
External thread ISO 228/DIN 2999	DN 3 to 25 (1/10" to 1")	16 (232)	-25 to +130 °C (-13 to +266 °F)
OD Tubing	DN 3 to 50 (1/10" to 2")	10 (145)	-25 to +130 °C (-13 to +266 °F)
1/8″ sanitary connection	DN 1 to 2 (1/25" to 1/12")	10 (145)	-10 to +120 °C (14 to 266 °F)

JIS 10K-B2210 flange				
Nominal width	**Material**	**Process connection**	**Fluid temperature (TS)**	**Admissible pressure (PS)**
DN 25 to 100 (1 to 4")	Stainless Steel	PN10	-25 to +180 °C (-13 to +356 °F)	10 bar (145 psi)

Stainless steel DIN flange up to DN 100 (4")

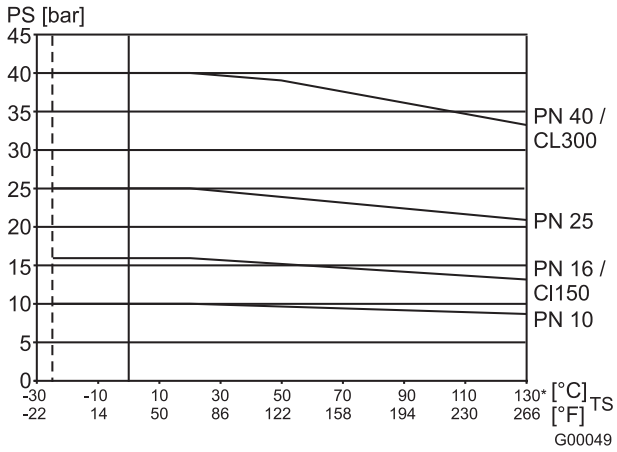


ASME Stainless steel DIN flange up to DN 100 (4") (CL150/300)



JIS 10K-B2210 Connection flange design				
Nominal width	**Material**	**Process connection**	**Fluid temperature (TS)**	**Admissible pressure (PS)**
DN 32 to 100 (1 1/4 to 4")	1.4404, 1.4435, 1.4301	PN10	-25 to +130 °C (-13 to +266 °F)	10 bar (145 psi)

Connection flange design



13 Technical data

13.4 Transmitter JUMO flowTRANS MAG 01

13.4.1 Electrical properties

Voltage supply	AC 100 to 230 V (-15 %/+10 %) AC 24 V (-30 %/+10 %) DC 24 V (-30 %/+30 %), harmonics < 5 %
Supply frequency	47 to 64 Hz
Excitation frequency	6.25 HZ, 7.5 Hz, 12.5 Hz, 15 Hz, 25 Hz, 30 Hz (50/60 Hz voltage supply)
Power consumption	Sensor including transmitter AC S ≤ 20 VA (switch-on current 8.8 A at AC 230 V) DC P ≤ 12 W (switch-on current 5.6 A)
Electrical connection	Screw terminals (maximum 2.5 mm² – AWG 14)

13.4.2 Electrical isolation

Current output, digital output DO1, DO2 and digital input are galvanically isolated from the sensor input circuit and each other. The same also applies to signal outputs of versions with PROFIBUS-PA.

13.4.3 Empty pipe detection

Requirements for the function:

- Conductivity of the medium to be measured of ≥ 20 µS/cm
- Signal cable length of ≤ 50 m (164 ft)
- Sensor without preamplifier
- Nominal width DN ≥ DN 10

13.4.4 Mechanical features

Compact design	
Housing	Aluminum casting, painted
Paint	Paint coat ≥ 80 µm thick, RAL 5013 (cobalt blue)
Cable fitting	Polyamide
Remote mount design	
Housing	Aluminum casting, painted
Paint	Paint coat, ≥ 80 µm thick, Middle part RAL 5013 (cobalt blue) Front lid/rear lid RAL 5013 (cobalt blue)
Cable fitting	Polyamide
Weight	4.5 kg (9.92 lb)

13.4.5 Temperatures

Storage temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature	-20 to +60 °C (-4 to +140 °F)

13.4.6 Protection type according to EN 60529

Transmitter housing	IP65, IP67 (NEMA 4X)

13.4.7 Vibration according to EN 60068-2

Valid for:

Remote mount design (Transmitter)	In the range 10 to 58 Hz max. 0.15 mm (0.006″) amplitude[a]
	In the range 58 to 150 Hz max. 2 g acceleration[a]

[a] = Peak load

13 Technical data

13.5 Approvals/approval marks

JUMO flowTRANS MAG S01/S02 - compact design			
Model	406012/1-0, 406013/1-0	406012/1-0, 406013/1-0	406012/1-0, 406013/1-0
			
Terminal box			
Design type	Single-compartment housing	Single-compartment housing	Single-compartment housing
Material	Aluminum	Aluminum	Aluminum
Sensor			
Design type	Steel pipe	Shell housing	Shell housing
Material	Steel	Aluminum	Aluminum
Process connection			
Material	Steel	Steel	Stainless steel
Ex-protection zone 2			
2014/34/EU - ATEX	-	-	-
IECEx	-	-	-
Ex-protection zone 1			
2014/34/EU - ATEX	-	-	-
IECEx	-	-	-
Pressure Equipment Directive (PED)			
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1		
2014/68/EU Article 13			
Ordering code features			
JUMO flowTRANS MAG S01	(1) 406012 / (2) 1 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406012 / (2) 1 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406012 / (2) 1 - (3) 0 - ... ... - (10) 02 - ... - (16) 0 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 1 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406013 / (2) 1 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406013 / (2) 1 - (3) 0 - ... ... - (10) 02 - ... - (16) 0 - ...

JUMO flowTRANS MAG S01/S02 - compact design		
Model	406012/1-1, 406013/1-1	406012/1-1, 406013/1-1
		
Terminal box		
Design type	Single-compartment housing	Single-compartment housing
Material	Aluminum	Aluminum
Sensor		
Design type	Shell housing	Shell housing
Material	Aluminum	Aluminum
Process connection		
Material	Steel	Stainless steel
Ex-protection zone 2		
2014/34/EU - ATEX	FM15ATEX0024X FM15ATEX0025X	FM15ATEX0024X FM15ATEX0025X
IECEx	FME15.0006X	FME15.0006X
Ex-protection zone 1		
2014/34/EU - ATEX	-	-
IECEx	-	-
Pressure Equipment Directive (PED)		
2014/68/EU – Mod. B+D 2014/68/EU Article 13	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1	
Ordering code features		
JUMO flowTRANS MAG S01	(1) 406012 / (2) 1 - (3) 1 - ... ... - (10) 01 - ... - (16) 2 - ...	(1) 406012 / (2) 1 - (3) 1 - ... ... - (10) 02 - ... - (16) 2 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 1 - (3) 1 - ... ... - (10) 01 - ... - (16) 2 - ...	(1) 406013 / (2) 1 - (3) 1 - ... ... - (10) 02 - ... - (16) 2 - ...

13 Technical data

JUMO flowTRANS MAG S01/S02 - compact design		
Model	406012/1-1, 406013/1-1	406012/1-1, 406013/1-1
		
Terminal box		
Design type	Dual-compartment housing	Dual-compartment housing
Material	Aluminum	Aluminum
Sensor		
Design type	Shell housing	Shell housing
Material	Aluminum	Aluminum
Process connection		
Material	Steel	Stainless steel
Ex-protection zone 2		
2014/34/EU - ATEX	-	-
IECEx	-	-
Ex-protection zone 1		
2014/34/EU - ATEX	FM15ATEX0025X	FM15ATEX0025X
IECEx	FME15.0006X	FME15.0006X
Pressure Equipment Directive (PED)		
2014/68/EU – Mod. B+D 2014/68/EU Article 13	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1	
Ordering code features		
JUMO flowTRANS MAG S01	(1) 406012 / (2) 1 - (3) 1 - ... ... - (10) 01 - ... - (16) 1 - ...	(1) 406012 / (2) 1 - (3) 1 - ... ... - (10) 02 - ... - (16) 1 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 1 - (3) 1 - ... ... - (10) 01 - ... - (16) 1 - ...	(1) 406013 / (2) 1 - (3) 1 - ... ... - (10) 02 - ... - (16) 1 - ...

JUMO flowTRANS MAG S01/S02 – remote mount design			
Model	406012/2-0, 406013/2-0	406012/2-0, 406013/2-0	406012/2-0, 406013/2-0
			
Terminal box			
Design type	-	-	-
Material	Aluminum	Aluminum	Aluminum
Sensor			
Design type	Steel pipe	Shell housing	Shell housing
Material	Steel	Aluminum	Aluminum
Process connection			
Material	Steel	Steel	Stainless steel
Ex-protection zone 2			
2014/34/EU - ATEX	-	-	-
IECEx	-	-	-
Ex-protection zone 1			
2014/34/EU - ATEX	-	-	-
IECEx	-	-	-
Pressure Equipment Directive (PED)			
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1		
2014/68/EU Article 13			
Ordering code features			
JUMO flowTRANS MAG S01	(1) 406012 / (2) 2 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406012 / (2) 2 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406012 / (2) 2 - (3) 0 - ... ... - (10) 02 - ... - (16) 0 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 2 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406013 / (2) 2 - (3) 0 - ... ... - (10) 01 - ... - (16) 0 - ...	(1) 406013 / (2) 2 - (3) 0 - ... ... - (10) 02 - ... - (16) 0 - ...

13 Technical data

JUMO flowTRANS MAG S01/S02 – remote mount design		
Model	406012/1-1, 406013/1-1	406012/1-1, 406013/1-1
		
Terminal box		
Design type	-	-
Material	Aluminum	Aluminum
Sensor		
Design type	Shell housing	Shell housing
Material	Aluminum	Aluminum
Process connection		
Material	Steel	Stainless steel
Ex-protection zone 2		
2014/34/EU - ATEX	FM15ATEX0024X FM15ATEX0025X	FM15ATEX0024X FM15ATEX0025X
IECEx	FME15.0006X	FME15.0006X
Ex-protection zone 1		
2014/34/EU - ATEX	-	-
IECEx	-	-
Pressure Equipment Directive (PED)		
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1	
2014/68/EU Article 13		
Ordering code features		
JUMO flowTRANS MAG S01	(1) 406012 / (2) 2 - (3) 1 - ... ... - (10) 01 - ... - (16) 2 - ...	(1) 406012 / (2) 2 - (3) 1 - ... ... - (10) 02 - ... - (16) 2 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 2 - (3) 1 - ... ... - (10) 01 - ... - (16) 2 - ...	(1) 406013 / (2) 2 - (3) 1 - ... ... - (10) 02 - ... - (16) 2 - ...

JUMO flowTRANS MAG S01/S02 – remote mount design		
Model	406012/1-1, 406013/1-1	406012/1-1, 406013/1-1
		
Terminal box		
Design type	-	-
Material	Aluminum	Aluminum
Sensor		
Design type	Shell housing	Shell housing
Material	Aluminum	Aluminum
Process connection		
Material	Steel	Stainless steel
Ex-protection zone 2		
2014/34/EU - ATEX	-	-
IECEx	-	-
Ex-protection zone 1		
2014/34/EU - ATEX	FM15ATEX0025X	FM15ATEX0025X
IECEx	FME15.0006X	FME15.0006X
Pressure Equipment Directive (PED)		
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1	
2014/68/EU Article 13		
Ordering code features		
JUMO flowTRANS MAG S01	(1) 406012 / (2) 2 - (3) 1 - ... ... - (10) 01 - ... - (16) 1 - ...	(1) 406012 / (2) 2 - (3) 1 - ... ... - (10) 02 - ... - (16) 1 - ...
JUMO flowTRANS MAG S02	(1) 406013 / (2) 2 - (3) 1 - ... ... - (10) 01 - ... - (16) 1 - ...	(1) 406013 / (2) 2 - (3) 1 - ... ... - (10) 02 - ... - (16) 1 - ...

13 Technical data

JUMO flowTRANS MAG H01/H02	Compact design	Remote mount design
Model	406015/1-0, 406016/1-0	406015/2-0, 406016/2-0
		
Terminal box		
Design type	Single-compartment housing	-
Material	Aluminum	CrNi steel 1.4308 (ASTM)
Flange		
Material	CrNi steel 1.4571 (AISI 316 Ti)	CrNi steel 1.4571 (AISI 316 Ti)
Process connection		
Material	CrNi steel 1.4404 (AISI 316 L)	CrNi steel 1.4404 (AISI 316 L)
Ex-protection zone 2		
2014/34/EU - ATEX	-	-
IECEx	-	-
Ex-protection zone 1		
2014/34/EU - ATEX	-	-
IECEx	-	-
Pressure Equipment Directive (PED)		
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1	
2014/68/EU Article 13		
Ordering code features		
JUMO flowTRANS MAG H01	(1) 406015 / (2) 1 - (3) 0 - ... ... - (16) 0 - ...	(1) 406015 / (2) 2 - (3) 0 - ... ... - (16) 0 - ...
JUMO flowTRANS MAG H02	(1) 406016 / (2) 1 - (3) 0 - ... ... - (16) 0 - ...	(1) 406016 / (2) 2 - (3) 0 - ... ... - (16) 0 - ...

JUMO flowTRANS MAG H01/H02	Compact design		Remote mount design
Model	406015/1-1, 406016/1-1	406015/1-1, 406016/1-1	406015/2-1, 406016/2-1
			
Terminal box			
Design type	Single-compartment housing	Dual-compartment housing	-
Material	Aluminum	Aluminum	CrNi steel 1.4308 (ASTM)
Flange			
Material	CrNi steel 1.4571 (AISI 316 Ti)	CrNi steel 1.4571 (AISI 316 Ti)	CrNi steel 1.4571 (AISI 316 Ti)
Process connection			
Material	CrNi steel 1.4404 (AISI 316 L)	CrNi steel 1.4404 (AISI 316 L)	CrNi steel 1.4404 (AISI 316 L)
Ex-protection zone 2			
2014/34/EU - ATEX	FM15ATEX0024X FM15ATEX0025X	-	FM15ATEX0024X FM15ATEX0025X
IECEx	FME15.0006X	-	FME15.0006X
Ex-protection zone 1			
2014/34/EU - ATEX	-	FM15ATEX0025X	-
IECEx	-	FME15.0006X	-
Pressure Equipment Directive (PED)			
2014/68/EU – Mod. B+D	07 202 1045 Z 0075/15/D/0046-rev.1 07 202 1045 Z 0076/15/D/0046-rev.1 07 202 1045 Z 0077/15/D/0046-rev.1		
2014/68/EU Article 13			
Ordering code features			
JUMO flowTRANS MAG H01	(1) 406015 / (2) 1 - (3) 1 - ... ... - (16) 2 - ...	(1) 406015 / (2) 1 - (3) 1 - ... ... - (16) 1 - ...	(1) 406015 / (2) 2 - (3) 1 - ... ... - (16) 2 - ...
JUMO flowTRANS MAG H02	(1) 406016 / (2) 1 - (3) 1 - ... ... - (16) 2 - ...	(1) 406016 / (2) 1 - (3) 1 - ... ... - (16) 1 - ...	(1) 406016 / (2) 2 - (3) 1 - ... ... - (16) 2 - ...

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JUMO flowTRANS MAG 01/02 – remote mount design			
Model	406018/2-0, 406019/2-0	406018/2-1, 406019/2-1	406018/2-1, 406019/2-1
			
Terminal box			
Design type	Single-compartment housing	Single-compartment housing	Dual-compartment housing
Material	Aluminum	Aluminum	Aluminum
Ex-protection zone 2			
2014/34/EU - ATEX	-	FM15ATEX0024X FM15ATEX0025X	-
IECEx	-	FME15.0006X	-
Ex-protection zone 1			
2014/34/EU - ATEX	-	-	FM15ATEX0025X
IECEx	-	-	FME15.0006X
Pressure Equipment Directive (PED)			
2014/68/EU – Mod. B+D	-	-	-
2014/68/EU Article 13			
Ordering code features			
JUMO flowTRANS MAG 01	(1) 406018 / (2) 2 - (3) 0 - ... ... - (7) 0 - ... - (14) 003 - ...	(1) 406018 / (2) 2 - (3) 1 - ... ... - (7) 2 - ... - (14) 003 - ...	(1) 406018 / (2) 2 - (3) 1 - ... ... - (7) 1 - ... - (14) 003 - ...
JUMO flowTRANS MAG 02	(1) 406019 / (2) 2 - (3) 0 - ... ... - (7) 0 - ... - (14) 003 - ...	(1) 406019 / (2) 2 - (3) 0 - ... ... - (7) 2 - ... - (14) 003 - ...	(1) 406019 / (2) 2 - (3) 1 - ... ... - (7) 1 - ... - (14) 003 - ...

14.1 Setting parameter overview (default setting)

	Possible parameterization	Default setting
Sensor TAG	Alphanumeric, max. 20 characters	-
Sensor Location TAG	Alphanumeric, max. 20 characters	-
Q_{max}	Depending nominal diameter (⇨Chapter 7.6)	Q_{max}DN (⇨Chapter 7.6)
Q (Flowrate) Unit	l/s, l/min, l/h, ml/s, ml/min, m3/s, m3/min, m3/h, m3/d, hl/h, g/s, g/min, g/h, kg/s, kg/min, kg/h, kg/d, t/min, t/h, t/d	l/min
Totalizer/Pulse Unit	m3, l, ml, hl, g, kg, t	l
Pulses per Unit	-	1
Pulse Width	0.1 to 2000 ms	100 ms
Damping (1 tau)	0.02 to 60 s	1
DO1 Alarm Config	Pulse F/Pulse R, Pulse F, General Alarm, Min. Flowrate Alarm, Max. Flowrate AlarmEmpty Pipe, TFE, Gas Bubble[a], Conductivity[a], Coating[a], Sensor Temp[a]	Pulse F/Pulse R
DO1 behavior	Active, Passive	Passive
DO2 Alarm Config	F/R Signal, Pulse R, General Alarm, Min. Flowrate Alarm, Max. Flowrate Alarm, Empty Pipe, TFE, Gas Bubble[a], Conductivity[a], Coating[a], Sensor Temp[a]	F/R Signal
Digital input Setup	No Function, Totalizer Reset(All), Flowrate to Zero,System Zero Adjust, TotalizerStop(All), Dual Range[a], Start/Stop Batching[a]	Flowrate to Zero
Current Output	4 to 20 mA 4 to 12 to 20 mA	4 to 20 mA
Iout at Alarm (according to NE43)	High alarm, configurable 21 to 23 mA or Low alarm, configurable 3.5 to 3.6 mA	High alarm, 21.8 mA
Iout at Flow > 103 %	OFF (No signaling, current output remains at 20.5 mA), high alarm, low alarm	OFF
Low Flow Cut Off	0 to 10 %	1 %
Empty Pipe Detector	ON/OFF	OFF
TFE Detector	ON/OFF	OFF

[a] Only available for JUMO flowTRANS MAG S02/H02

14.1.1 With the PROFIBUS-PA version

	Possible parameterization	Default setting
PA Addr. (-BUS-)	0 to 126	126
Ident Nr. Selector	0 × 9700, 0 × 9740, 0 × 3430	0 × 3430

14.2 Approvals and certifications

CE mark	CE	The device version that we market complies with the regulations of the following EU directives. • Pressure Equipment Directive (PED) 2014/68/EU (Article 13) • Pressure Equipment Directive (PED) 2014/68/EU (Mod. B+D) • EMC directive 2014/30/EC • Low-voltage directive 2014/35/EU • ATEX directive 2014/34/EC
Explosion protection	Ex IECEx	Identification marking for intended use in potentially explosive areas according to: • ATEX Directive (identification marking in addition to CE mark) • IECEx standards

IMPORTANT (NOTE)!

All the documentation, declarations of conformity and certificates are also available in the download area www.jumo.de.

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 704

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG S01	406012	406012

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61326-1	2013	
EN 61326-2-3	2013	

Gültig für Typ
Valid for Type / Valable pour le type
406012/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type
406012/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-*-1-...
406012/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-*-3-...

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Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406012/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle
Reference / Référence
FM15ATEX0025X

Benannte Stelle
Notified Body / Organisme notifié
FM Approvals Ltd.

Kennnummer
Identification no. / N° d'identification
1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-1	2007	
EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Richtlinie 4
Directive / Directive

Name *Name / Nom*	PED
Fundstelle *Reference / Référence*	2014/68/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2015

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 12516-2	2014	

Gültig für Typ
Valid for Type / Valable pour le type

406012/...

EU-Baumusterprüfbescheinigung 4.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	07/202/1045/Z/0075/15/D0046-rev.2
Benannte Stelle *Notified Body / Organisme notifié*	TÜV NORD Systems GmbH
Kennnummer *Identification no. / N° d'identification*	0045

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EU-Baumusterprüfbescheinigung 4.2
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0076/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Non Alloy Steel Body

EU-Baumusterprüfbescheinigung 4.3
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0077/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Spheroidal Cast Body

Anerkannte Qualitätssicherungssysteme der Produktion
Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle	**Kennnummer**
Notified Body / Organisme notifié	*Identification no. / N° d'identification*
TÜV SÜD Industrie Service GmbH	0036

JUMO GmbH & Co. KG

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Richtlinie 5
Directive / Directive

Name RoHS
Name / Nom

Fundstelle 2011/65/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type
406012/...

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Aussteller
Issued by / Etabli par

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Ort, Datum
Place, date / Lieu, date

Fulda, 2018-09-06

Rechtsverbindliche Unterschriften
Legally binding signatures /
Signatures juridiquement valable

Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 705

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG S02	406013	406012

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61326-1	2013	
EN 61326-2-3	2013	

Gültig für Typ
Valid for Type / Valable pour le type

406013/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type

406013/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-1-...

406013/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-3-...

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Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406013/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle
Reference / Référence
FM15ATEX0025X

Benannte Stelle
Notified Body / Organisme notifié
FM Approvals Ltd.

Kennnummer
Identification no. / N° d'identification
1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-1	2007	
EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Richtlinie 4
Directive / Directive

Name *Name / Nom*	PED
Fundstelle *Reference / Référence*	2014/68/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2015

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 12516-2	2014	

Gültig für Typ
Valid for Type / Valable pour le type

406013/...

EU-Baumusterprüfbescheinigung 4.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	07/202/1045/Z/0075/15/D0046-rev.2
Benannte Stelle *Notified Body / Organisme notifié*	TÜV NORD Systems GmbH
Kennnummer *Identification no. / N° d'identification*	0045

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EU-Baumusterprüfbescheinigung 4.2
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0076/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Non Alloy Steel Body

EU-Baumusterprüfbescheinigung 4.3
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0077/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Spheroidal Cast Body

Anerkannte Qualitätssicherungssysteme der Produktion
Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle	**Kennnummer**
Notified Body / Organisme notifié	*Identification no. / N° d'identification*
TÜV SÜD Industrie Service GmbH	0036

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Richtlinie 5
Directive / Directive

Name RoHS
Name / Nom

Fundstelle 2011/65/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type
406013/...

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Aussteller
Issued by / Etabli par

JUMO GmbH & Co. KG

Ort, Datum
Place, date / Lieu, date

Fulda, 2018-09-06

Rechtsverbindliche Unterschriften
Legally binding signatures /
Signatures juridiquement valable

Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

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Internet: www.jumo.net

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 706

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG H01	406015	406015

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61326-1	2013	
EN 61326-2-3	2013	

Gültig für Typ
Valid for Type / Valable pour le type
406015/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type
406015/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-1-...
406015/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-3-...

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Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406015/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle
Reference / Référence
FM15ATEX0025X

Benannte Stelle
Notified Body / Organisme notifié
FM Approvals Ltd.

Kennnummer
Identification no. / N° d'identification
1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-1	2007	
EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Richtlinie 4
Directive / Directive

Name *Name / Nom*	PED
Fundstelle *Reference / Référence*	2014/68/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2015

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 12516-2	2014	

Gültig für Typ
Valid for Type / Valable pour le type

406015/...

EU-Baumusterprüfbescheinigung 4.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	07/202/1045/Z/0075/15/D0046-rev.2
Benannte Stelle *Notified Body / Organisme notifié*	TÜV NORD Systems GmbH
Kennnummer *Identification no. / N° d'identification*	0045

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EU-Baumusterprüfbescheinigung 4.2
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0076/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Non Alloy Steel Body

EU-Baumusterprüfbescheinigung 4.3
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0077/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Spheroidal Cast Body

Anerkannte Qualitätssicherungssysteme der Produktion
Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle	**Kennnummer**
Notified Body / Organisme notifié	*Identification no. / N° d'identification*
TÜV SÜD Industrie Service GmbH	0036

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Richtlinie 5
Directive / Directive

Name RoHS
Name / Nom

Fundstelle 2011/65/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type
406015/...

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Aussteller *Issued by / Etabli par*	JUMO GmbH & Co. KG
Ort, Datum *Place, date / Lieu, date*	Fulda, 2018-09-12
Rechtsverbindliche Unterschriften *Legally binding signatures /* *Signatures juridiquement valable*	Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement ppa. Dimitrios Charisiadis Qualitätsbeauftragter und Leiter Qualitätswesen i. V. Harald Gienger

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 707

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG H02	406016	406015

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Internet: www.jumo.net

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61326-1	2013	
EN 61326-2-3	2013	

Gültig für Typ
Valid for Type / Valable pour le type

406016/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type

406016/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-*-1-...

406016/1-0-*-*-*-*-*-*-*-*-*-*-*-*-*-*-3-...

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36039 Fulda, Germany

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Fax: +49 661 6003-500

E-Mail: mail@jumo.net
Internet: www.jumo.net

Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406016/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0025X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-1	2007	
EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Internet: www.jumo.net

More than sensors + automation

Richtlinie 4
Directive / Directive

Name *Name / Nom*	PED
Fundstelle *Reference / Référence*	2014/68/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2015

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 12516-2	2014	

Gültig für Typ
Valid for Type / Valable pour le type

406016/...

EU-Baumusterprüfbescheinigung 4.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	07/202/1045/Z/0075/15/D0046-rev.2
Benannte Stelle *Notified Body / Organisme notifié*	TÜV NORD Systems GmbH
Kennnummer *Identification no. / N° d'identification*	0045

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EU-Baumusterprüfbescheinigung 4.2
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0076/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Non Alloy Steel Body

EU-Baumusterprüfbescheinigung 4.3
EU type examination certificate / Certificat d'examen de type UE

Fundstelle 07/202/1045/Z/0077/15/D0046-rev.2
Reference / Référence

Benannte Stelle TÜV NORD Systems GmbH
Notified Body / Organisme notifié

Kennnummer 0045
Identification no. / N° d'identification

Gültig für Typ
Valid for Type / Valable pour le type
Spheroidal Cast Body

Anerkannte Qualitätssicherungssysteme der Produktion
Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle	**Kennnummer**
Notified Body / Organisme notifié	*Identification no. / N° d'identification*
TÜV SÜD Industrie Service GmbH	0036

JUMO GmbH & Co. KG

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Internet: www.jumo.net

More than sensors + automation

Richtlinie 5
Directive / Directive

Name RoHS
Name / Nom

Fundstelle 2011/65/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type
406016/...

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E-Mail: mail@jumo.net
Internet: www.jumo.net

More than sensors + automation

Aussteller
Issued by / Etabli par

JUMO GmbH & Co. KG

Ort, Datum
Place, date / Lieu, date

Fulda, 2018-09-06

Rechtsverbindliche Unterschriften
Legally binding signatures /
Signatures juridiquement valable

Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

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Internet: www.jumo.net

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 708

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG 01	406018	406012

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61326-1	2013	

Gültig für Typ
Valid for Type / Valable pour le type
406018/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type
406018/*-0-*-*-*-*-*-1-...
406018/*-0-*-*-*-*-*-3-...

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Internet: www.jumo.net

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Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406018/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
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EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle
Reference / Référence
FM15ATEX0025X

Benannte Stelle
Notified Body / Organisme notifié
FM Approvals Ltd.

Kennnummer
Identification no. / N° d'identification
1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
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EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Internet: www.jumo.net

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Richtlinie 4
Directive / Directive

Name *Name / Nom*	RoHS
Fundstelle *Reference / Référence*	2011/65/EU
Bemerkung *Comment / Remarque*	
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2017

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type

406018/...

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Internet: www.jumo.net

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Aussteller
Issued by / Etabli par

JUMO GmbH & Co. KG

Ort, Datum
Place, date / Lieu, date

Fulda, 2018-09-06

Rechtsverbindliche Unterschriften
Legally binding signatures /
Signatures juridiquement valable

Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

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Internet: www.jumo.net

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EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr.
Document No. / Document n°.
CE 709

Hersteller
Manufacturer / Etabli par
JUMO GmbH & Co. KG

Anschrift
Address / Adresse
Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

Produkt
Product / Produit

Name *Name / Nom*	**Typ** *Type / Type*	**Typenblatt-Nr.** *Data sheet no. / N° Document d'identification*
JUMO flowTRANS MAG 02	406019	406012

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclare sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1
Directive / Directive

Name
Name / Nom
EMC

Fundstelle
Reference / Référence
2014/30/EU

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit
2015

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Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61326-1	2013	

Gültig für Typ
Valid for Type / Valable pour le type
406019/...

Richtlinie 2
Directive / Directive

Name LVD
Name / Nom

Fundstelle 2014/35/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2015
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	Ausgabe *Edition / Édition*	Bemerkung *Comment / Remarque*
EN 61010-1	2010	

Gültig für Typ
Valid for Type / Valable pour le type
406019/*-0-*-*-*-*-*-1-...
406019/*-0-*-*-*-*-*-3-...

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Richtlinie 3
Directive / Directive

Name *Name / Nom*	ATEX
Fundstelle *Reference / Référence*	2014/34/EU
Bemerkung *Comment / Remarque*	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt *Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit*	2016

Gültig für Typ
Valid for Type / Valable pour le type

406019/*-1-...

EU-Baumusterprüfbescheinigung 3.1
EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0024X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-11	2012	
EN 60079-15	2010	
EN 60529	1991+A1:2000	

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EU-Baumusterprüfbescheinigung 3.2

EU type examination certificate / Certificat d'examen de type UE

Fundstelle *Reference / Référence*	FM15ATEX0025X
Benannte Stelle *Notified Body / Organisme notifié*	FM Approvals Ltd.
Kennnummer *Identification no. / N° d'identification*	1725

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
EN 60079-0	2012	
EN 60079-1	2007	
EN 60079-7	2007	
EN 60079-11	2012	
EN 60079-18	2009	
EN 60079-31	2009	
EN 60529	1991+A1:2000	

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle *Notified Body / Organisme notifié*	**Kennnummer** *Identification no. / N° d'identification*
TÜV NORD CERT GmbH	0044

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Richtlinie 4
Directive / Directive

Name RoHS
Name / Nom

Fundstelle 2011/65/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017
Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen
Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle *Reference / Référence*	**Ausgabe** *Edition / Édition*	**Bemerkung** *Comment / Remarque*
VDK Umweltrelevante Aspekte bei der Produktentwicklung und -gestaltung	V1	

Gültig für Typ
Valid for Type / Valable pour le type
406019/...

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Aussteller
Issued by / Etabli par

JUMO GmbH & Co. KG

Ort, Datum
Place, date / Lieu, date

Fulda, 2018-09-06

Rechtsverbindliche Unterschriften
Legally binding signatures /
Signatures juridiquement valable

Bereichsleiter Vertrieb Inland / Globales Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

14.3 China RoHS

产品组别 Product group: 406012 部件名称 Component Name	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

产品组别 Product group: 406013 部件名称 Component Name	产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

产品组别 Product group: 406015	产品中有害物质的名称及含量 China EEP Hazardous Substances Information
部件名称 Component Name	

	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （Cr(VI)）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

产品组别 Product group: 406016	产品中有害物质的名称及含量 China EEP Hazardous Substances Information
部件名称 Component Name	

	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （Cr(VI)）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

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Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

产品组别 Product group: 406018	产品中有害物质的名称及含量 China EEP Hazardous Substances Information
部件名称 Component Name	

	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （Cr(VI)）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

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This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

产品组别 Product group: 406019	产品中有害物质的名称及含量 China EEP Hazardous Substances Information
部件名称 Component Name	

	铅 （Pb）	汞 （Hg）	镉 （Cd）	六价铬 （Cr(VI)）	多溴联苯 （PBB）	多溴二苯醚 （PBDE）
外壳 Housing (Gehäuse)	○	○	○	○	○	○
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○
螺母 Nuts (Mutter)	○	○	○	○	○	○
螺栓 Screw (Schraube)	○	○	○	○	○	○

本表格依据SJ/T 11364的规定编制。
This table is prepared in accordance with the provisions SJ/T 11364.
○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.

×：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.

14 Annex

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