JUMO flowTRANS MAG S/H

Electromagnetic flowmeter
for the process industry and hygienic applications

Safety Manual SIL

for device versions 406012 - 406019

40601200T99Z005K000

V2.01/EN/00677819

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1.1 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.

1.2 Other applicable device documentation

For measuring systems with an SIL-certified design (safety integrity level), this document "JUMO flowTRANS MAG S/H - SIL Safety Manual for Devices 406012 - 406019" supplements the operating manual "JUMO flowTRANS MAG S/H for devices 406012 - 406019".

Both documents contain detailed information on the current output's functional specification as well as information on using and configuring the device.

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

Document name	Document type	For devices
JUMO flowTRANS MAG S/H	Operating manual	406012 - 406019
JUMO flowTRANS MAG S/H	Ex safety manual[a]	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)!

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

2.1 Acronyms and abbreviations

Abbreviation	Identification marking	Description
HFT	Hardware Fault Tolerance	Hardware fault tolerance of a device. The ability of a functional unit to continue performing a required function in cases in which errors or deviations exist.
MTBF	Mean Time Between Failures	Mean time between two failures.
MTTR	Mean Time To Restoration	Mean time between the occurrence of an error in a device or system and the repair.
PFD	Probability of Dangerous Failure on Demand	Probability of dangerous failures of a safety function on demand.
PFD_{AVG}	Average Probability of Dangerous Failure on Demand	Average probability of dangerous failures of a safety function on demand.
SIL	Safety Integrity Level	The international IEC 61508 standard defines four discrete Safety Integrity Levels (SIL 1 to SIL 4). Each level corresponds to a probability range for the failure of a safety function. The higher the Safety Integrity Level of the safety-related systems is, the lower the probability of the systems failing to perform the required safety functions is.
Low Demand Mode	Low Demand Mode of operation	Measuring type with a low demand rat. Measuring type where the demand rate for the safety-related system is no more than once per year, and no greater than twice the frequency of the regular inspection.
DCS	Distributed Control System	Control system used in process industry applications for monitoring and controlling decentralized devices.
HMI	Human Machine Interface	In this case, the HMI is a combined module consisting of a LCD display with or without a local keyboard.
DTM	Device Type Manager	A DTM is a software module that provides specific functions for accessing device parameters, configuring and operating devices, and diagnosing problems. The DTM itself is not an executable piece of software. It only becomes active in a FDT container program.
LRV	Device configuration	Start of measurement, lowest value of a measuring range
URV	Device configuration	End of measurement, highest value of a measuring range
DC	Diagnostic Coverage	Component of dangerous failures detected by cyclical diagnostic functions at runtime.
Multidrop	Multidrop mode	In Multidrop mode, up to 15 field devices are connected in parallel to a single wire pair. The analog current signal is solely used to supply a fixed current of ≤ 4 mA to the devices in two-wire operation.

2 Standards and definitions of terms

2.2 IEC 61508 standard (2010), part 1 and 2

English:

Functional safety of electrical/electronic/programmable electronic safety-related systems (Target group: Manufacturers and Suppliers of Devices)

German:

Funktionale Sicherheit sicherheitsbezogener elektrischer/elektronischer/programmierbarer elektronischer Systeme (Zielgruppe: Hersteller und Lieferanten von Geräten)

2.3 Dangerous failure

A failure with the potential of placing the safety-related system in a dangerous state or a state without functional capability.

2.4 Safety-related system

A safety-related system performs the safety functions required to reach or maintain a safe state, e.g., in a system.

Example:

The pressure measuring device, logic unit (e.g. limit signal transducer) and valve form a safety-related system.

2.5 Safety function

A defined function performed by a safety-related system with the aim of achieving or maintaining a safe state for the plant considering a specified dangerous incident.

Example:

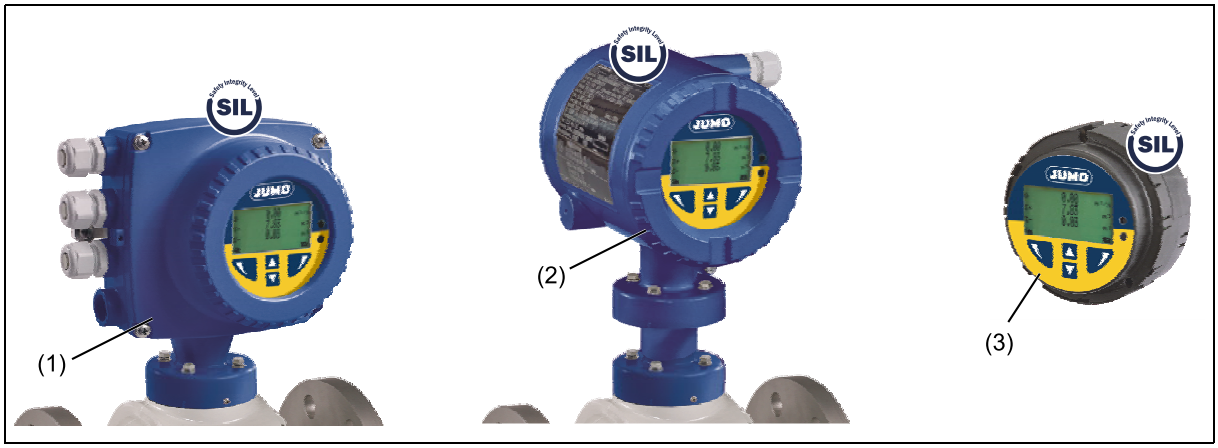
Limit pressure monitoring

3.1 Identifying the device version

IMPORTANT (NOTE)!

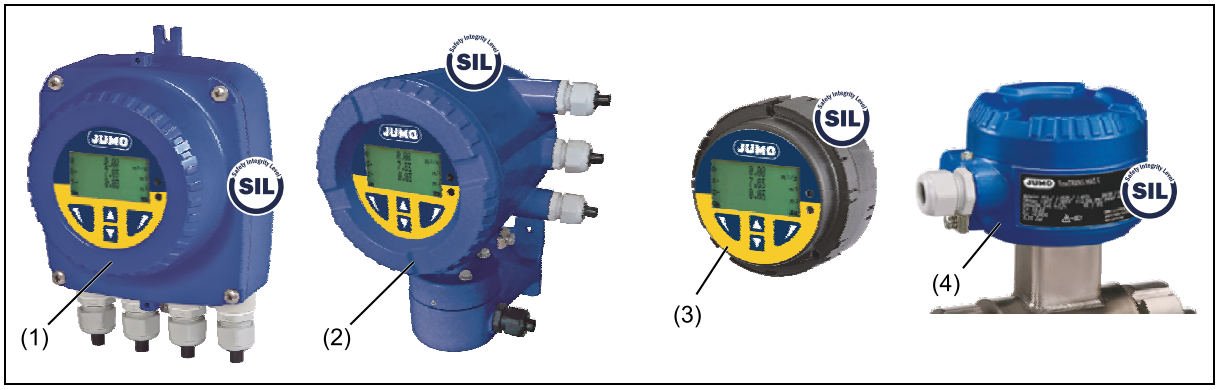
The JUMO flowTRANS MAG S/H - SIL devices in compact and remote mount design types are additionally marked with a SIL log on the housing for unambiguous identification.

3.1.1 JUMO flowTRANS MAG S/H - compact design



(1) Single-compartment housing
(2) Dual-compartment housing
(3) Transmitter plug-in module

3.1.2 JUMO flowTRANS MAG S/H - remote mount design



(1) Single-compartment housing (transmitter)
(2) Dual-compartment housing (transmitter)
(3) Transmitter plug-in module
(4) Connection box (sensor)

3 Identification marking

3.2 Identifying SIL capable type series

IMPORTANT (NOTE)!

The JUMO flowTRANS MAG S/H - SIL devices in compact and remote mount design types are additionally marked with a SIL log on the housing for unambiguous identification, ⇨ see chapter 3.1 "Identifying the device version", page 9.

3.2.1 Operation outside of potentially explosive areas

Compact design type:

Model	Type series
406012/1-0	JUMO flowTRANS MAG S01
406015/1-0	JUMO flowTRANS MAG H01
406013/1-0	JUMO flowTRANS MAG S02
406016/1-0	JUMO flowTRANS MAG H02

Remote mount design type:

Sensor			Transmitter	
Model	**Type series**		**Model**	**Type series**
406012/2-0	JUMO flowTRANS MAG S01	with	406018/2-0	JUMO flowTRANS MAG 01
406015/2-0	JUMO flowTRANS MAG H01			
406013/2-0	JUMO flowTRANS MAG S02	with	406019/2-0	JUMO flowTRANS MAG 02
406016/2-0	JUMO flowTRANS MAG H02			

3.2.2 Operation in potentially explosive areas

Compact design type:

Model	Type series
406012/1-1	JUMO flowTRANS MAG S01
406015/1-1	JUMO flowTRANS MAG H01
406013/1-1	JUMO flowTRANS MAG S02
406016/1-1	JUMO flowTRANS MAG H02

Remote mount design type:

Sensor			Transmitter	
Model	**Type series**		**Model**	**Type series**
406012/2-1	JUMO flowTRANS MAG S01	with	406018/2-1	JUMO flowTRANS MAG 01
406015/2-1	JUMO flowTRANS MAG H01			
406013/2-1	JUMO flowTRANS MAG S02	with	406019/2-1	JUMO flowTRANS MAG 02
406016/2-1	JUMO flowTRANS MAG H02			

IMPORTANT (NOTE)!

Remote mount design type:

The combination of sensors for operation in potentially explosive areas with sensors for operation outside of potentially explosive areas is not SIL-compliant!

3.3 Identification via the firmware version

In addition to the marking on the housing, identification is also possible via the process display. The firmware version with safety relevance can be accessed at configuration level.

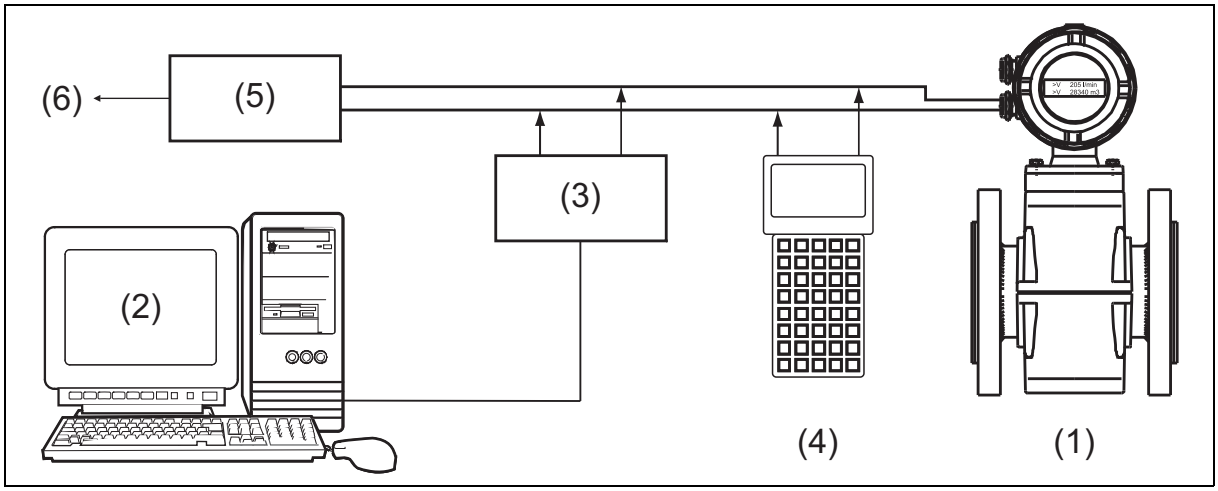
Menu/parameter	Value range	Description
Device info/Transmitter/**TX Version**		
TX Firmware Ver	-	01.02.XX to 01.03.XX[a]

[a] Version number

IMPORTANT (NOTE)!

For a detailed description of the individual parameters and menus at configuration level, see the JUMO flowTRANS MAG S/H operating manual for the devices 406012 - 406019, section 8.3 "Parameter overview at configuration level" and section 8.4 "Parameter description"

3 Identification marking



(1) Flowmeter
(2) PC/Notebook
(3) FSK modem
(4) Handheld
(5) Automation system, PLC, etc.
(6) Actuator

The flowmeter's transmitter generates an analog signal of 4 to 20 mA at the current output in proportion to the flow. The analog signal is fed to a downstream logic unit, for example, a PLC or to a limit signal transducer, where it is monitored for exceeding a maximum or minimum value.

IMPORTANT (NOTE)!

The safety-related signal is the current output signal (4 to 20 mA) from the transmitter. All safety functions refer exclusively to this current output (connection terminals 31/32).

4.1 Device specific data relating to functional safety

Safety properties	Description/value
Type series ⇨ see also chapter 3.2 "Identifying SIL capable type series", page 10	JUMO flowTRANS MAG S01/02
	JUMO flowTRANS MAG H01/02
	JUMO flowTRANS MAG 01/02
Firmware	Version number revision 01.02.XX to 01.03.XX
Hardware version	Transmitter plug-in module revision 5 to 13
Systematic Capability Type of test and evaluation	SC 2 Verification of operational capability IEC 61508-2, Route 2_S
SIL-capability	SIL 2 (Low Demand Mode)
HFT (Hardware Fault Tolerance)	0 Architecture Route 2_H as per IEC 61508-2
Component type	B

Failure rates	SIL detector	
	OFF	ON
DC	71.1 %	82.6 %
PFD_{AVG} after 10 years[a] with acceptance testing interval of 1 year and test coverage of 90%	2.65E-03	1.51E-03
PFD_{AVG} after 6 years[b] with acceptance testing interval of 1 year and test coverage of 90%	2.09E-03	1.20E-03
λ_{SD}	0 FIT	0 FIT
λ_{SU}	943 FIT	943 FIT
λ_{DD}	937 FIT	1070 FIT
λ_{DU}	317 FIT	181 FIT

[a] (Does **not** apply to models 406012/2-0, 406013/2-0, 406015/2-0, 406016/2-0, 406018/2-0, 406019/2-0)

[b] (**only** applies to models 406012/2-0, 406013/2-0, 406015/2-0, 406016/2-0, 406018/2-0, 406019/2-0)

IMPORTANT (NOTE)!

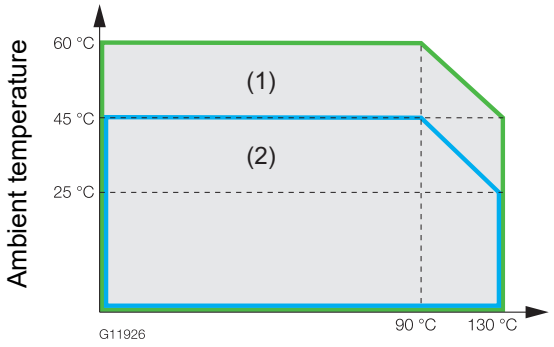
The configuration menu of the devices contains the "SIL Detector" parameter. To guarantee a PFD value as per the above table, the detector must be adjusted accordingly.

⇨ see chapter 5.3 "Transmitter configuration", page 19

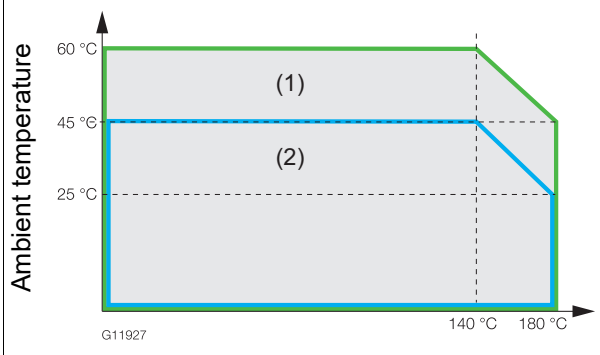
IMPORTANT (NOTE)!

The stated failure rates λ_{SD}, λ_{SU}, λ_{DD}, and λ_{DU} depend on the device version (standard version or high-temperature version).
The stated failure rates λ_{SD}, λ_{SU}, λ_{DD}, and λ_{DU} apply for ambient temperatures up to 45 °C.
In the case of higher ambient temperatures up to 60 °C, the failure rates and the PFD_{AVG} value must be multiplied by a factor of 2.5 ⇨ see the following diagram.

Standard temperature version



High-temperature version



(1) Failure rates and PFD_{AVG} must be multiplied by a factor of 2.5

(2) Failure rates and PFD_{AVG} according to table

4.2 Preconditions for device operations in line with the safety requirements

- The flow output signal from the transmitter can be regarded as safe after 30 minutes (warm-up time).
- A hazardous error is an error in which the flow output of the transmitter no longer reacts to the input signal, or deviates from it by more than 2% relative to the upper measuring range limit $Q_{max}DN$.
- $Q_{max}DN$ specifications ⇨ see nameplate and operating manual "JUMO flowTRANS MAG S/H" for the devices 406012 - 406019.
- The maximum response time of the device in case of a malfunction is less than 3 hours.
- The response time of the current output depends on the parameterization (noise filter settings and attenuation) and is less than 5 minutes.

4 Flow measuring devices in the safety function system

5.1 Current output

The status of this current output (4 to 20 mA) in case of alarm states can be configured for a high alarm level or a low alarm level.

⇨ See operating manual "JUMO flowTRANS MAG S/H" for the devices 406012 - 406019

A value in the range of 21 to 23 mA can be assigned to the current output for a high alarm level. A value in the range of 3.5 to 3.6 mA can be assigned for the low alarm level.

IMPORTANT (NOTE)!

The safety function of the automation system must be able to detect errors that cause a high alarm level or a low alarm level.

The analog output signal from the transmitter can be configured as "active" or "passive."

If the current output was configured as "passive," the external power supply of the 20 mA loop must also be able to provide the required voltage level in case of a high alarm level.

IMPORTANT (NOTE)!

After completing the parameter configuration, the safety function must be checked.

The menu of the transmitter software supports simulating the current output. Behavior during operation and in case of a malfunction is described in the Operating Manual.

⇨ see operating manual "JUMO flowTRANS MAG S/H" for the devices 406012 - 406019

5.2 Locking/unlocking the configuration level

WARNING – Injuries to persons!

During the configuration and during simulation and operation of the device in HART® Multidrop mode, the device does not comply with the safety requirements.

Unauthorized changes to the parameterization can influence the safety function.

The device can be configured using the local keyboard or via HART® communication.

After completing the configuration, the device must be protected against unauthorized access.

The hardware write protect switch must be set such that the keyboard is locked and HART® write-protection is activated.

To make sure that the write protect mechanism is correctly activated, you should attempt to change a parameter while the hardware write protection is activated.

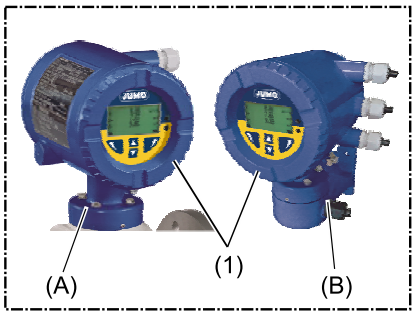
To lock the device, access the "Device Setup/Access Control" menu and set the password for the corresponding login level.

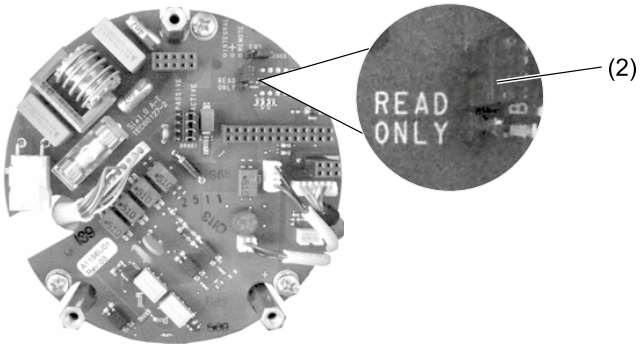
Menu/parameter	Value range	Description
Device Setup/**... Access Control**		
Standard password	Alphanumeric	Enter/change the password for the "Standard" access level
Advanced password	Alphanumeric	Enter/change the password for the "Advanced" access level
Read Only Switch	Display only (ON/OFF)	Display the BR902 switch position (hardware write protection) ⇨ chapter 5.2.1 "Hardware write protection", page 18

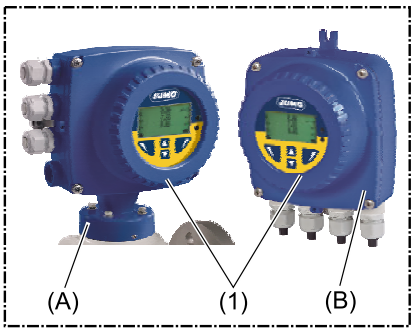
5.2.1 Hardware write protection

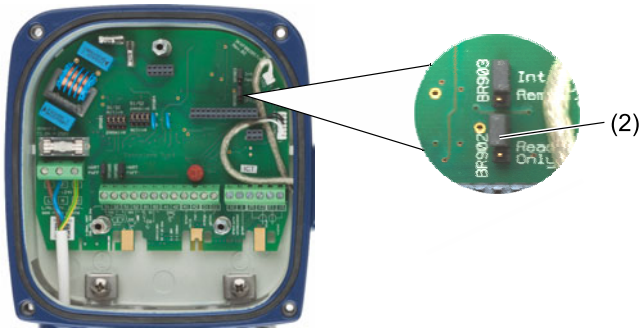
In addition to the password protection, you can also activate hardware write protection.

Transmitter in a dual-compartment housing









Transmitter in a single-compartment housing

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

5.3 Transmitter configuration

WARNING – Injuries to persons!

The parameterization described here can influence the safety function.

The safety function must be rechecked each time that these parameters are changed.

IMPORTANT (NOTE)!

Instructions on startup, settings and installation ⇨ see operating manual "JUMO flowTRANS MAG S/H" for the devices 406012 - 406019.

Menu/parameter	Value range	Description
Diagnostics/Diagnostics functions/**SIL Detector**		
SIL Detector	ON/OFF	To ensure a PFD value as in the table in chapter 4.1, the detector must be adjusted accordingly. The detection level of the safety-relevant parts is increased by switching the detector on. Default setting: OFF

Menu/parameter	Value range	Description
Easy Setup		
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
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 malfunction The value for "low" or "high" is set in the following menu. Default setting: High

Menu/parameter	Value range	Description
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
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.

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.

Menu/parameter	Value range	Description
Easy Setup/**System Zero**		
Manual 		Starts the manual zero point adjustment

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.

Menu/parameter	Value range	Description
Device Setup/**... Sensor**		
$Q_{max}2$ 	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	

$Q_{max}2$

To toggle between the measuring ranges, use the digital input or the "Device Setup/... Sensor/Range Mode" menu.

Menu/parameter	Value range	Description
Device Setup/**... Transmitter**		
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.

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... Unit**		
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. 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 %	Selecting 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

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 and Reverse": the device measures and counts in both directions Default setting: Forward and Reverse

Menu/parameter	Value range	Description
Device Setup/... Transmitter/**... Noise Reduction**		
Noise Reduction	Off Mean Filter Notch Filter Lowpass V = Auto Lowpass V = 1	Activate the noise reduction for a turbulent flow signal When noise reduction is switched on, the response time of the SIL-relevant output (4 to 20 mA) increases. Default setting: Off

Menu/parameter	Value range	Description
Input/output/**Current output**		
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 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 forwards flow

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.
Function Check		
Out of Specification		

WARNING – Injuries to persons!

Masking is not admissible for applications with functional safety. The parameter must be set to "Off."

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.
Max Flowrate Alarm		
Flow > 103 %		
Com Controller Alarm		
Empty Pipe Alarm		

Menu/parameter	Value range	Description
Process Alarm/**Alarm Simulation**		
Alarm Simulation	OFF ...	Manual simulation of measured values. The output values correspond to the set simulated measured value. A "Configuration" message appears in the lower display line. When done, set the simulation mode back to "OFF." The values specified in the "Value range" column can be simulated.

IMPORTANT (NOTE)!

When done, set the simulation mode back to "Off."

Menu/parameter	Value range	Description
Diagnostics/Diagnostics Control/**Empty Pipe Detector**		
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.

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**		
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 the value exceeds this limit, an alarm is triggered. Default setting: 0 Ω

5 Configuration

6.1 Device testing

IMPORTANT (NOTE)!

According to IEC 61508, the safety function of the measuring device must be tested at appropriate intervals.

The operator must define the test interval and take this into consideration when determining the flowmeter's probability of failure PFDavg.

The test must be performed such that it confirms correct operation of the device.

The device can be tested in the following steps:

1. **Calibration**

   Calibration of the device on a certified calibration test bed in order to verify the safety function of the current output results in a degree of diagnostics coverage of > 98% in terms of detection of undetected errors.

2. **On-site test by Service**

   An on-site test by Service results in a degree of diagnostics coverage of > 90% in terms of detection of undetected errors.

3. **ScanMaster verification**

   Performing ScanMaster verification results in a degree of diagnostics coverage of > 50% in terms of detection of undetected errors. If the device fails the test, it must no longer be used as part of a protection system.

   The influence of systematic errors on the safety function is not covered by the test and must be tested separately. Systematic errors can be caused, e.g., by medium properties, operating conditions, deposits or corrosion.

6.2 Repairs

To guarantee the safety-related function, all repair or maintenance work must be carried out by qualified customer service personnel only.

When replacing or repairing individual components, original spare parts must be used.

IMPORTANT (NOTE)!

When returning devices, observe chapter 1.14 "Returning devices," page 19 in the operating manual JUMO flowTRANS MAG S/H for the devices 406012 - 406019!

6 Regular tests

7.1 Approvals and certifications

DAkkS
Deutsche
Akkreditierungsstelle
D-ZE-11074-01-00

TÜV NORD

Certificate

No. SEBS-A.161422/17 V 1.0

TÜV NORD Systems GmbH & Co. KG hereby certifies to

JUMO GmbH & Co.KG
Moritz-Juchheim-Straße 1
36039 Fulda

that the safety related electromagnetic flowmeters

JUMO flowTRANS MAG

meet the relevant requirements listed in the following standards.

- DIN EN 61508-1/-2: 2011 capable up to SIL 2 in low demand applications
- IEC 61508-1/-2: 2010 capable up to SIL 2 in low demand applications

The type-list of the products is pictured on the backside of this certificate.

The certification is based on the report No. SEBS-A.161422/17TB in the valid version.
This certificate entitles the holder to use the pictured Safety Approved mark.

Expiry date: 2022-04-04
Reference No.: 8114373837

Hamburg, 2017-04-04

B. Pfuff

Bianca Pfuff

TÜV NORD
TÜV NORD Systems GmbH & Co. KG
Safety Approved
JUMO flowTRANS MAG
DIN EN 61508-1/-2: 2011, SIL 2
IEC 61508-1/-2: 2010, SIL 2
SEBS-A.161422/17
Voluntary Certification

Certification body SEECERT
TÜV NORD Systems GmbH & Co. KG
Große Bahnstraße 31, 22525 Hamburg, Germany

7 Annex

Product-Typelist for certificate SEBS-A.161422/17, V 1.0

Flowmeter Variant
JUMO flowTRANS MAG S01 406012/1-0
JUMO flowTRANS MAG H01 406015/1-0
JUMO flowTRANS MAG S02 406013/1-0
JUMO flowTRANS MAG H02 406016/1-0
JUMO flowTRANS MAG S01 406012/2-0 with Transmitter JUMO flowTRANS MAG 01 406018/2-0
JUMO flowTRANS MAG H01 406015/2-0 with Transmitter JUMO flowTRANS MAG 01 406018/2-0
JUMO flowTRANS MAG S02 406013/2-0 with Transmitter JUMO flowTRANS MAG 02 406019/2-0
JUMO flowTRANS MAG H02 406016/2-0 with Transmitter JUMO flowTRANS MAG 02 406019/2-0
JUMO flowTRANS MAG S01 406012/1-1
JUMO flowTRANS MAG H01 406015/1-1
JUMO flowTRANS MAG S02 406013/1-1
JUMO flowTRANS MAG H02 406016/1-1
JUMO flowTRANS MAG S01 406012/2-1 with Transmitter JUMO flowTRANS MAG 01 406018/2-1
JUMO flowTRANS MAG H01 406015/2-1 withTransmitter JUMO flowTRANS MAG 01 406018/2-1
JUMO flowTRANS MAG S02 406013/2-1 with Transmitter JUMO flowTRANS MAG 02 406019/2-1
JUMO flowTRANS MAG H02 406016/2-1 with Transmitter JUMO flowTRANS MAG 02 406019/2-1

Reference No.: 8114373837

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