STS – Non-contact safety switches with coding

Applications

- Protection of people or machines
- Position monitoring of machine parts
- Position monitoring of doors and switches of isolating protective devices

Features

- Individual coding for maximum manipulation protection
- Up to PL e / category 4 (EN 13849-1)
- Up to SIL_{CL} 3 (EN 62061)
- Up to 30 sensors can be cascaded
- Automatic or manual start
- LED and semiconductor output for diagnostics
- Switching distance of 8 mm / 10 mm
- Protection class IP67 / IP69K

Function

The non-contact safety switches from the STS series are used for monitoring the position of machine parts and the position of doors and switches of isolating protective devices.

The STS series features integrated evaluation and built-in manipulation protection.

In the event of a hazard, access is approved or the machine is shut down, for example, by a device from the ***safe*** RELAY series or the ***samos***®/***samos***®PRO safety system or by the safety switch directly.

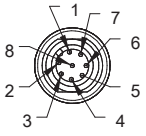
Safety switches from the STS series are also able to switch larger loads without wear via safe outputs (OSSDs).

Connection assignment STS with cable connection

Function	Colour
UB	BN
Safety input 1	WH
GND	BU
Safety output 1	BK
Diagnostic output	GY
Safety input 2	PK
Safety output 2	VT
EDM-start input	OG

Connection assignment STS with connection M12

Function	PIN
UB	1
Safety input 1	2
GND	3
Safety output 1	4
Diagnostic output	5
Safety input 2	6
Safety output 2	7
EDM-start input	8



M12x1 8-polig

STS – Non-contact safety switches with coding

Tailor-made manipulation protection

Different applications require different solutions when it comes to existing manipulation protection.

Safety switches from the STS series have 3 different coding variations, which means that they can always offer the right solution.

Coded:
The safety switch accepts every STS actuator.

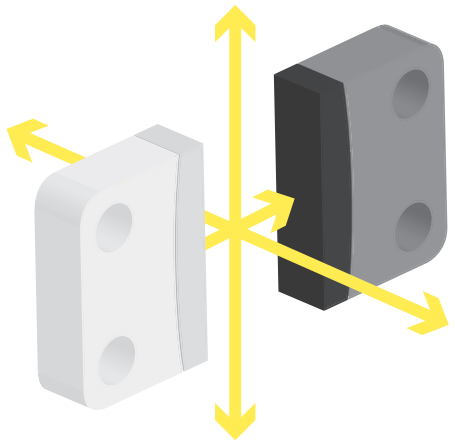
Fully coded:
The safety switch only accepts the programmed-in STS actuator.

Unique:
The safety switch only accepts STS actuator delivered with it. An STS actuator cannot be programmed in.

Diverse installation

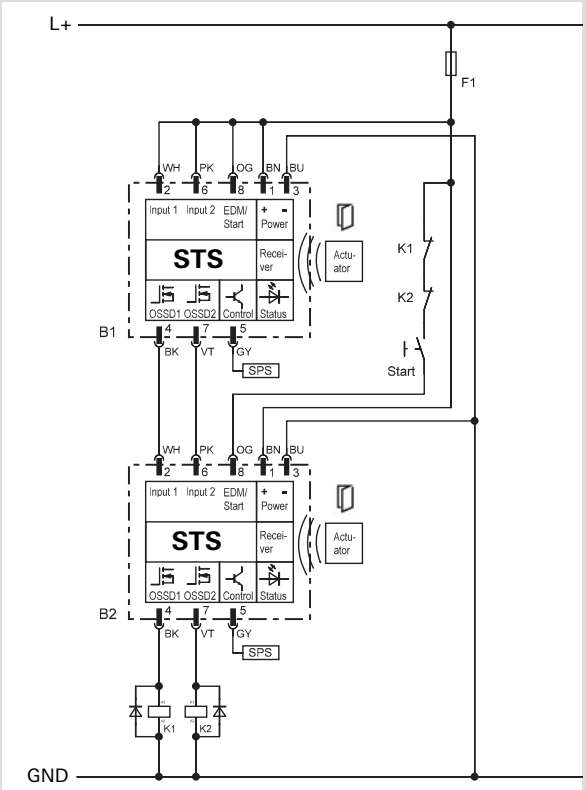
The 5 actuation directions of the STS series and the maximum displacement between the actuator and switch element of 8 mm make installation easy even when the protective device to be monitored has large mechanical tolerances.

The resulting advantage is that it can be used universally on removable, rotatable, or sideways-moving protective devices.

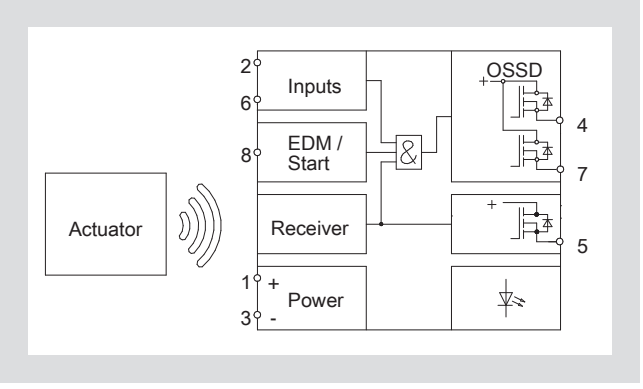


5 different actuation directions for universal use

Application



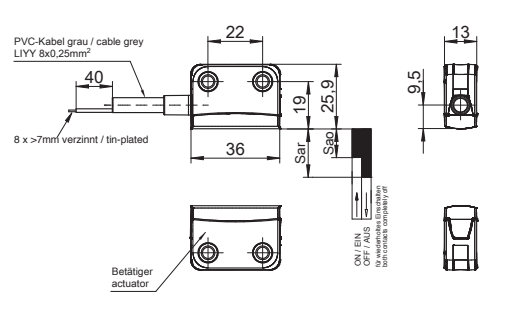
Circuit diagram



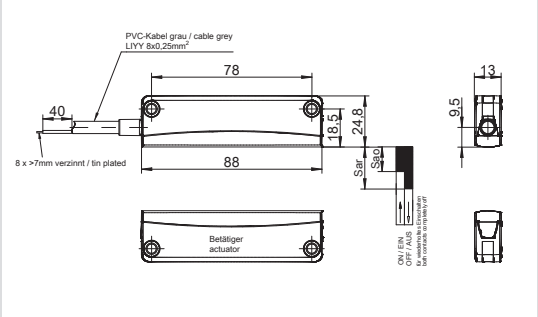
Serial wiring of 2 safety switches STS with manual start and EDM

STS – Non-contact safety switches with coding

Circuit diagram



STS 01xx



STS 02xx

Technical data

Function		Non-contact safety switch
Function display		LED, three-colored
Supply circuit		
Nominal voltage U_N		24 V DC
Operating voltage range U_B		0.9 - 1.1 x U_N
Galvanic isolation supply circuit - output circuit		no
Control circuits		
Number of safety inputs		2
EDM/start input		1
Input current, max.		2 mA
Output circuits		
Number	OSSD	2
	Diagnostics	1
Short-circuit monitoring		yes
Switching current, max.	OSSD	400 mA
	Diagnostics	50 mA
Switching voltage, max.		UB - 0.2 V
Series connection		max. 30 sensors
Switching behavior		
Switching distance / (Sao / Sar)		8 mm / 18 mm
Hysteresis		2 mm
Actuator displacement, max.		8 mm
Actuation directions		Operator definable
Switching frequency		3 Hz
General data		
Creepage distances and clearances between the circuits		EN 60664-1
Protection class as per EN 60529		IP67
Operating ambient temperature		-25 °C - +70 °C
Connection		M12 (8 pole) / cable (8 pole)
Standards		EN ISO 13849-1, EN 62061
Certificates / Approvals		TÜV, cULus

STS – Non-contact safety switches with coding

Overview of devices | part numbers

Type	Description	Coding	Part no.	Std. pack
STS 0110	Switch-set, automatic start, connection M12-8	coded	R1.400.0110.0	1
STS 0113	Switch-set, automatic start, connection cable 3m	coded	R1.400.0113.0	1
STS 0114	Switch-set, automatic start, connection cable 5m	coded	R1.400.0114.0	1
STS 0116	Switch-set, automatic start, connection cable 10m	coded	R1.400.0116.0	1
STS 0130	Switch-set, automatic start, connection M12-8	fully-coded	R1.400.0130.0	1
STS 0133	Switch-set, automatic start, connection cable 3m	fully-coded	R1.400.0133.0	1
STS 0134	Switch-set, automatic start, connection cable 5m	fully-coded	R1.400.0134.0	1
STS 0136	Switch-set, automatic start, connection cable 10m	fully-coded	R1.400.0136.0	1
STS 0150	Switch-set, automatic start, connection M12-8	unique	R1.400.0150.0	1
STS 0153	Switch-set, automatic start, connection cable 3m	unique	R1.400.0153.0	1
STS 0154	Switch-set, automatic start, connection cable 5m	unique	R1.400.0154.0	1
STS 0156	Switch-set, automatic start, connection cable 10m	unique	R1.400.0156.0	1
STS 0120	Switch-set, manual start, connection M12-8	coded	R1.400.0120.0	1
STS 0123	Switch-set, manual start, connection cable 3m	coded	R1.400.0123.0	1
STS 0124	Switch-set, manual start, connection cable 5m	coded	R1.400.0124.0	1
STS 0126	Switch-set, manual start, connection cable 10m	coded	R1.400.0126.0	1
STS 0140	Switch-set, manual start, connection M12-8	fully-coded	R1.400.0140.0	1
STS 0143	Switch-set, manual start, connection cable 3m	fully-coded	R1.400.0143.0	1
STS 0144	Switch-set, manual start, connection cable 5m	fully-coded	R1.400.0144.0	1
STS 0146	Switch-set, manual start, connection cable 10m	fully-coded	R1.400.0146.0	1
STS 0160	Switch-set, manual start, connection M12-8	unique	R1.400.0160.0	1
STS 0163	Switch-set, manual start, connection cable 3m	unique	R1.400.0163.0	1
STS 0164	Switch-set, manual start, connection cable 5m	unique	R1.400.0164.0	1
STS 0166	Switch-set, manual start, connection cable 10m	unique	R1.400.0166.0	1
STS 0210	Switch-set, automatic start, connection M12-8	coded	R1.400.0210.0	1
STS 0213	Switch-set, automatic start, connection cable 3m	coded	R1.400.0213.0	1
STS 0214	Switch-set, automatic start, connection cable 5m	coded	R1.400.0214.0	1
STS 0216	Switch-set, automatic start, connection cable 10m	coded	R1.400.0216.0	1
STS 0230	Switch-set, automatic start, connection M12-8	fully-coded	R1.400.0230.0	1
STS 0233	Switch-set, automatic start, connection cable 3m	fully-coded	R1.400.0233.0	1
STS 0234	Switch-set, automatic start, connection cable 5m	fully-coded	R1.400.0234.0	1
STS 0236	Switch-set, automatic start, connection cable 10m	fully-coded	R1.400.0236.0	1
STS 0250	Switch-set, automatic start, connection M12-8	unique	R1.400.0250.0	1
STS 0253	Switch-set, automatic start, connection cable 3m	unique	R1.400.0253.0	1
STS 0254	Switch-set, automatic start, connection cable 5m	unique	R1.400.0254.0	1
STS 0256	Switch-set, automatic start, connection cable 10m	unique	R1.400.0256.0	1
STS 0220	Switch-set, manual start, connection M12-8	coded	R1.400.0220.0	1
STS 0223	Switch-set, manual start, connection cable 3m	coded	R1.400.0223.0	1
STS 0224	Switch-set, manual start, connection cable 5m	coded	R1.400.0224.0	1
STS 0226	Switch-set, manual start, connection cable 10m	coded	R1.400.0226.0	1
STS 0240	Switch-set, manual start, connection M12-8	fully-coded	R1.400.0240.0	1
STS 0243	Switch-set, manual start, connection cable 3m	fully-coded	R1.400.0243.0	1
STS 0244	Switch-set, manual start, connection cable 5m	fully-coded	R1.400.0244.0	1
STS 0246	Switch-set, manual start, connection cable 10m	fully-coded	R1.400.0246.0	1
STS 0260	Switch-set, manual start, connection M12-8	unique	R1.400.0260.0	1
STS 0263	Switch-set, manual start, connection cable 3m	unique	R1.400.0263.0	1
STS 0264	Switch-set, manual start, connection cable 5m	unique	R1.400.0264.0	1
STS 0266	Switch-set, manual start, connection cable 10m	unique	R1.400.0266.0	1
STS 3110	Actuator for STS 011x, 012x, 013x, 014x		R1.400.3110.0	1
STS 3210	Actuator for STS 021x, 022x, 023x, 024x		R1.400.3210.0	1

STS – Accessories

STS-CON-448

T-Connector for serial wiring of STS-switches

STS-CON-TER

Terminal-connector of the serial wiring

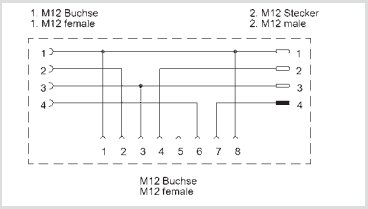
STS-CON-488

T-Connector for the extraction of the diagnostic output or coupling a restart signal into the switch (optional)

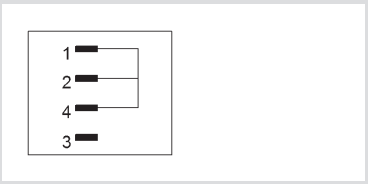
STS-CON-444

T-Connector for coupling an additional power supply into the serial wiring (optional)

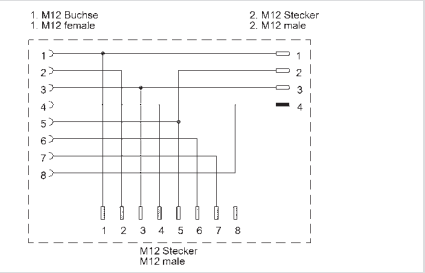
Dimensions diagramm



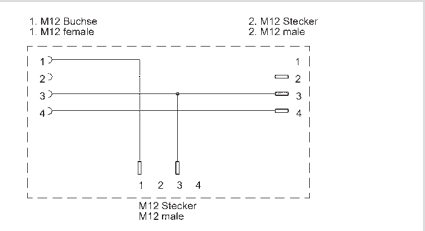
STS-CON-448



STS-CON-TER



STS-CON-488



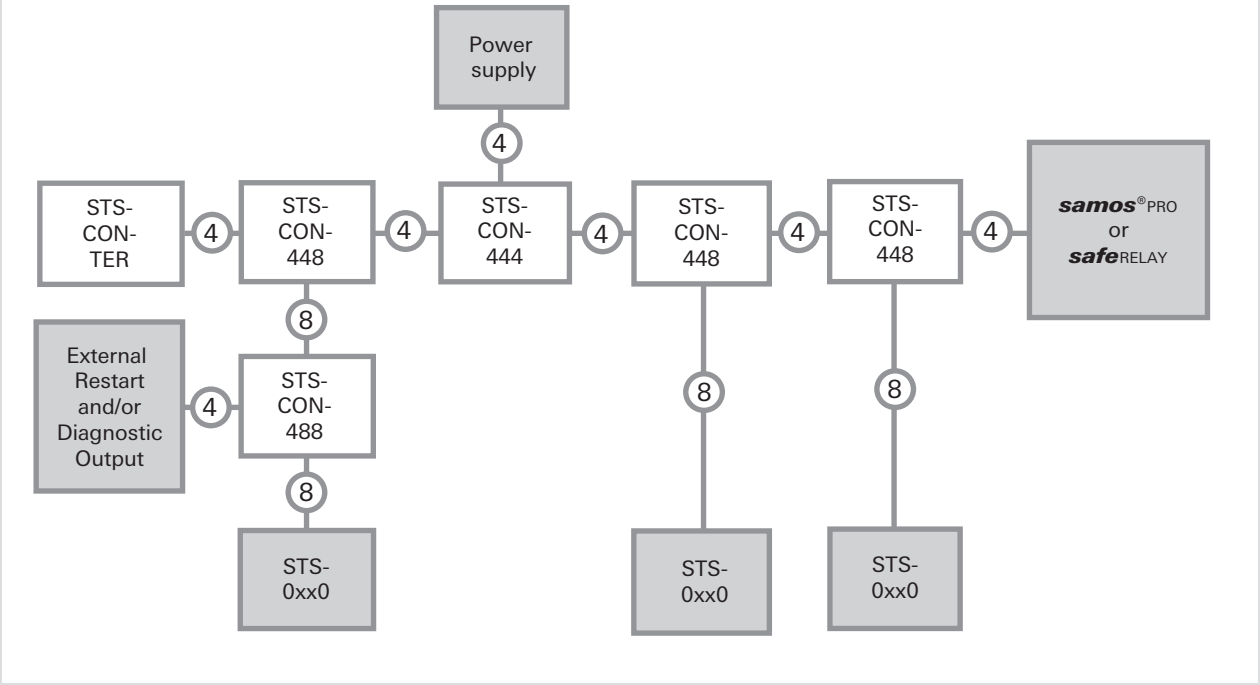
STS-CON-444

Overview of devices | part numbers

Type	Description	Part no.	Std. pack
STS-CON-444		R1.400.9444.0	1
STS-CON-448		R1.400.9448.0	1
STS-CON-488		R1.400.9488.0	1
STS-CON-TER		R1.400.9000.0	1

STS – Accessories

Application



Connection assignment with *saris*® cable M12 (female – free end)

Function	PIN	Color
UB	1	WH
Safety input 1	2	BN
GND	3	GN
Safety output 1	4	YE
Diagnostic output	5	GY
Safety input 2	6	PK
Safety output 2	7	BU
EDM-start input	8	RD

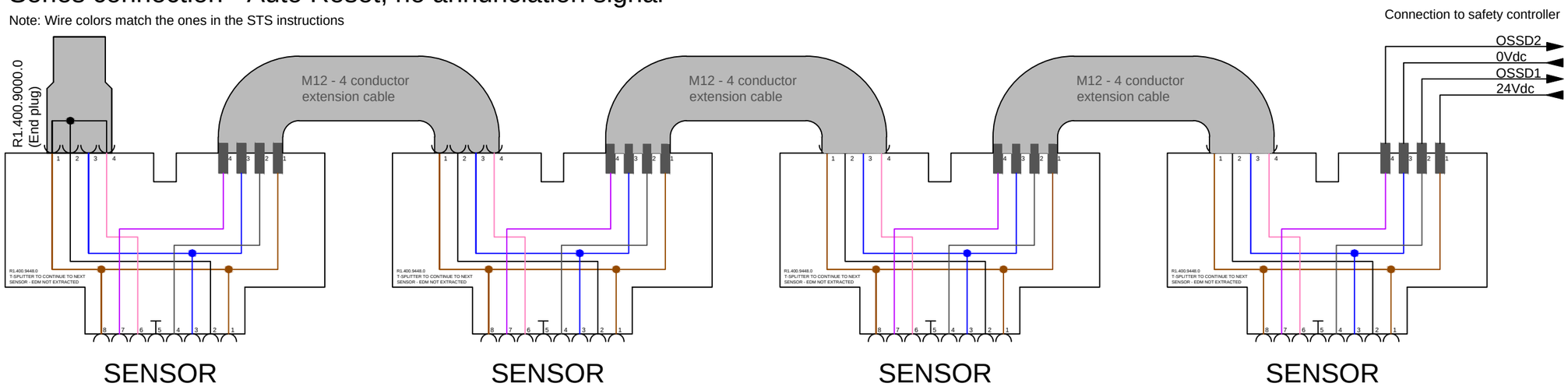
Overview of devices | part numbers *saris*® M12 cable

	Cable M12, 4-pole, straight		Cable M12, 8-pole, straight	
Length	Female – male	Female – free end	Female – male	Female – free end
0.3 m	M2.K42.0344.0	–	M2.K81.0344.0	–
0.6 m	M2.K42.0644.0	–	M2.K81.0644.0	–
1 m	M2.K42.1044.0	M2.K42.1004.0	M2.K81.1044.0	M2.K81.1004.0
1.5 m	M2.K42.1544.0	M2.K42.1504.0	M2.K81.1544.0	M2.K81.1504.0
2 m	M2.K42.2044.0	M2.K42.2004.0	M2.K81.2044.0	M2.K81.2004.0
3 m	M2.K42.3044.0	M2.K42.3004.0	M2.K81.3044.0	M2.K81.3004.0
5 m	M2.K42.5044.0	M2.K42.5004.0	M2.K81.5044.0	M2.K81.5004.0
10 m	M2.K42.X044.0	M2.K42.X004.0	M2.K81.X044.0	M2.K81.X004.0

STS SERIES CONNECTION

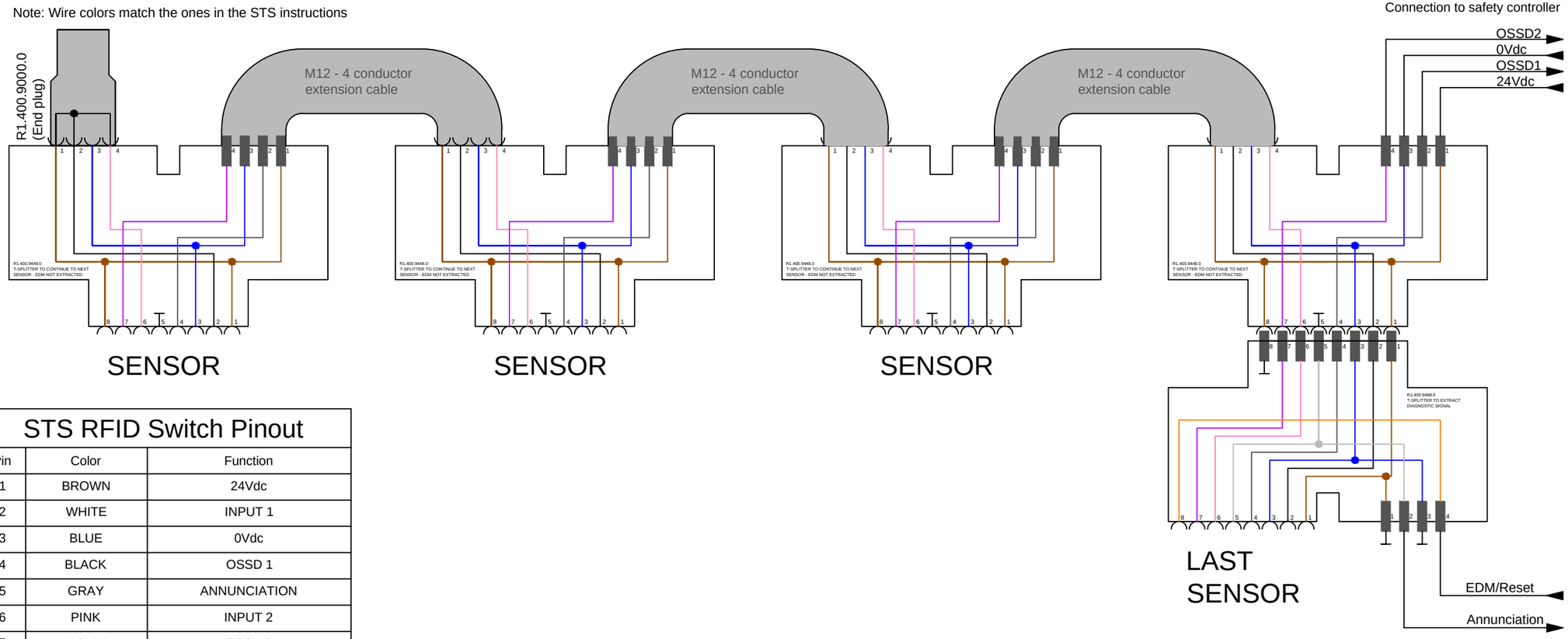
Series connection - Auto Reset, no annunciation signal

Note: Wire colors match the ones in the STS instructions



Series connection - Manual Reset, no annunciation signal (except on last switch)

Note: Wire colors match the ones in the STS instructions



STS RFID Switch Pinout		
Pin	Color	Function
1	BROWN	24Vdc
2	WHITE	INPUT 1
3	BLUE	0Vdc
4	BLACK	OSSD 1
5	GRAY	ANNUNCIATION
6	PINK	INPUT 2
7	VIOLET	OSSD 2
8	ORANGE	RESET / EDM

30-JUNE 2016 Date	1.1 Revision	1 of 4 Page	
Martin Lalonde Drawn	Checked		

Do Not Scale
Dimensions are approximate
For representation only.

Notes

Company

Name

Title

Date Approved

Signature

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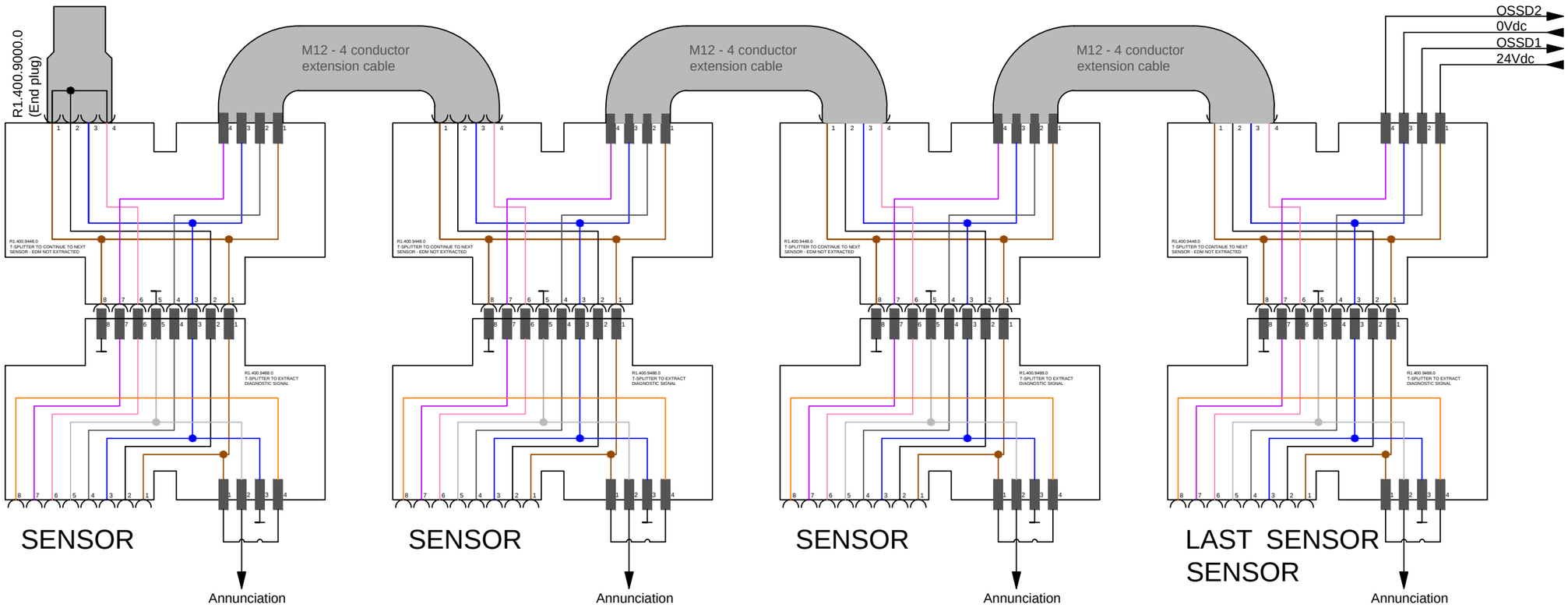
Series connection - Auto Reset, with annunciation signal

Note: Wire colors match the ones in the STS instructions



STS RFID Switch Pinout

Pin	Color	Function
1	BROWN	24Vdc
2	WHITE	INPUT 1
3	BLUE	0Vdc
4	BLACK	OSSD 1
5	GRAY	ANNUNCIATION
6	PINK	INPUT 2
7	VIOLET	OSSD 2
8	ORANGE	RESET / EDM

wieland

STS SERIES CONNECTION

30-JUNE 2016 Date	1.1 Revision	2 of 4 Page	
Martin Lalonde Drawn		Checked	

Do Not Scale
Dimensions are approximate
For representation only.

Notes

Company

Name

Title

Date Approved

Signature

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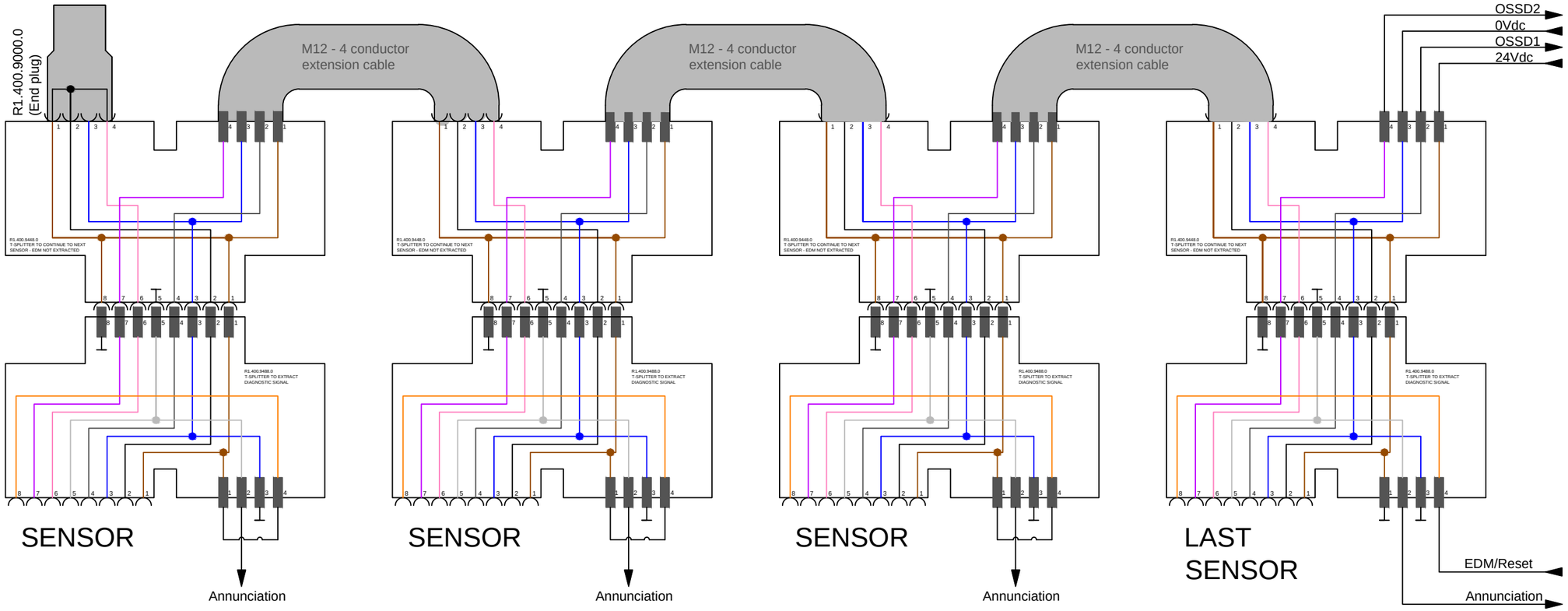
Series connection - Manual Reset, with annunciation signal

Note: Wire colors match the ones in the STS instructions



STS RFID Switch Pinout

Pin	Color	Function
1	BROWN	24Vdc
2	WHITE	INPUT 1
3	BLUE	0Vdc
4	BLACK	OSSD 1
5	GRAY	ANNUNCIATION
6	PINK	INPUT 2
7	VIOLET	OSSD 2
8	ORANGE	RESET / EDM

wieland

STS SERIES CONNECTION

30-JUNE 2016 Date	1.1 Revision	3 of 4 Page	
Martin Lalonde Drawn	Checked		

Do Not Scale
Dimensions are approximate
For representation only.

Notes

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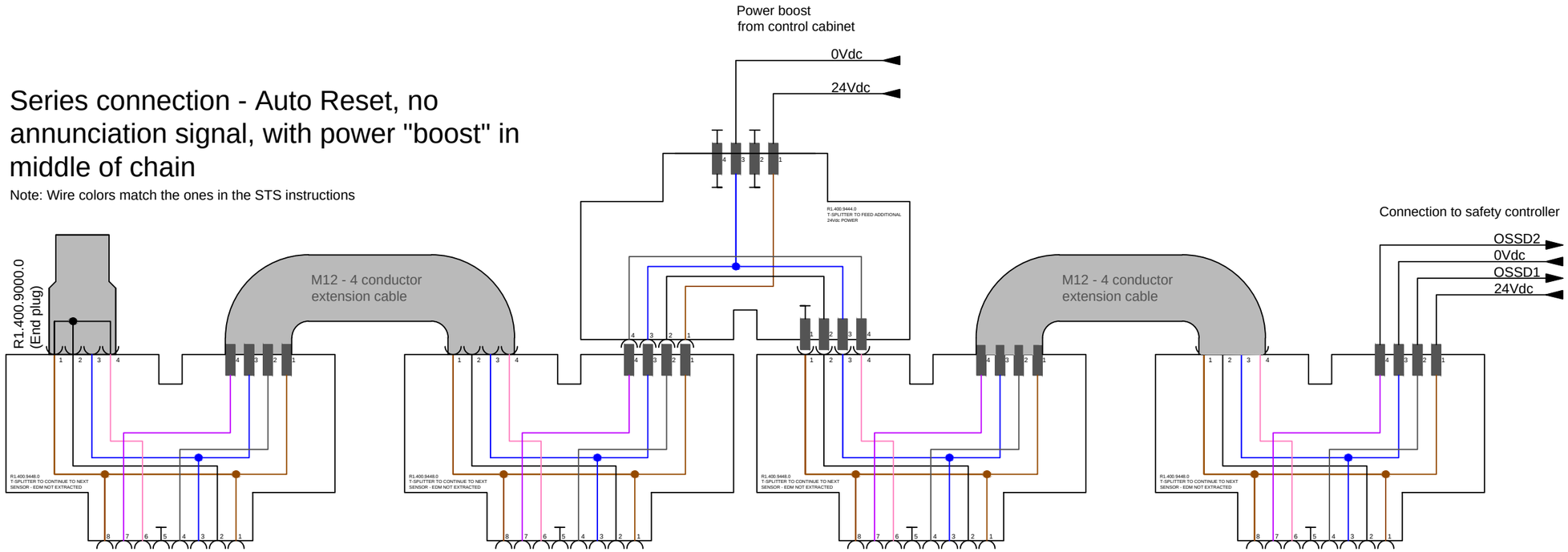
Series connection - Auto Reset, no annunciation signal, with power "boost" in middle of chain

Note: Wire colors match the ones in the STS instructions



Power boost is required if the 24Vdc load is heavy and the 24Vdc load exceeds 2A.

- when large loads are driven by the OSSD outputs
- when large loads are driven by multiple annunciation outputs

STS RFID Switch Pinout

Pin	Color	Function
1	BROWN	24Vdc
2	WHITE	INPUT 1
3	BLUE	0Vdc
4	BLACK	OSSD 1
5	GRAY	ANNUNCIATION
6	PINK	INPUT 2
7	VIOLET	OSSD 2
8	ORANGE	RESET / EDM

wieland

STS SERIES CONNECTION

30-JUNE 2016 Date	1.1 Revision	4 of 4 Page	
Martin Lalonde Drawn	Checked		

Do Not Scale
Dimensions are approximate
For representation only.

Notes

Company

Name

Title

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Signature

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wieland
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1 About this operating instructions

The operating instructions is to be made available to the person who is installing the safety sensor. The operating instructions are to be kept in a legible condition and accessible at all times. Definition of symbols:

CAUTION
• Failure to comply can result in malfunctions or interference. Failure to comply can result in injury and/or damage to the machine.

NOTE
• Identifies available accessories and useful additional information.

2 Intended Use

The safety sensors STS 01xx ... and actuator STS 02xx ... may be used exclusively for monitoring movable, separating safety guards. This can be done in conjunction with a Wieland safety evaluation unit or comparable safety controller. The sensor can also be used without additional safety evaluation/controller, due to the integrated evaluation logic in the sensor as well as EDM input. The overall control concept in which the security sensor is incorporated is to be validated, for example, according to EN ISO 13849-2.

Number key actuator
E.g.: R1.400.XXXX.0

	R1 .	400.	X	X	X	X
Safety products						
Safety product group Secure transponder switch						
Delivery form 0 = Set						
Type 1 = box-shaped, large switching distance STS 01xx 2 = square-shaped, large switching distance STS 02xx						
Coding/Start 1 = coded, automatic start 2 = coded, manually monitored start 3 = fully coded, automatc start 4 = fully coded, manually monitored start 5 = unique, automatic start 6 = unique, manually monitored start						
Connection 0 = Pigtail with M12-plug 3 = cable 3m 4 = cable 5m 6 = cable 10m						

3 Approvals

TÜV SÜD

cULus LISTED [Proximity Switch] E477003

SLG Prüf- und Zertifizierungs GmbH
(tested in accordance with ECOLAB standard)

Test media:
- Distilled water
- P3 topax66
- P3 topactive 200
- P3 topax 52
- P3 topax 990

4 Safety Informations

CAUTION
• Make sure that the safety sensors are mounted only by specially trained, authorized and qualified personnel and put into service safely. • Only install and commission the device if you have read and understood the operating instructions and are familiar with the applicable regulations on occupational safety and accident prevention. • The safety sensor may only be operated exclusively by the actuator which is properly mounted on the guard. Actuation when not mounted on the guard is prohibited. • Operate the safety sensors only if they are in undamaged condition. • Make sure that the safety sensors are used exclusively to protect against hazards. • Make sure that all applicable safety requirements for the respective machine are complied with. • Make sure that all applicable laws and regulations are complied with. • Residual risks are not known when the instructions in this manual are adhered to.

5 Warnings against misuse

CAUTION
• Inexpert or improper use or tampering in combination with the use of safety sensors can lead to hazards for personnel or damage to machine or system parts. Also observe the relevant notes relating to EN ISO 14119. • Make sure that no external component causes current or voltage peaks which are higher than the specified electrical data of the safety evaluation. Current or voltage peaks are produced for example by capacitive or inductive loads. • Exceeding the electrical data of the safety sensor (e.g. in case of faulty wiring or shorts) can damage it irreparably. • Operation of the safety sensor is only allowed with the appropriate actuator and with the approved control options (see chapter 17 **"Technical specifications"**).

6 Disclaimer

No liability can be accepted for damage or outages resulting from non-compliance with this instruction manual. For damage resulting from the use of spare parts or accessories unapproved by the manufacturer, any further liability of the manufacturer is excluded. Any unauthorized repairs, modifications and additions are not permitted for safety reasons and the manufacturer is also not liable for any resulting damage.

7 Function

Coded, electronic safety sensor, which is operated by a non-contact coded actuator.

7.1 Coding variants

The various versions of the safety sensors arise from the different encodings designated as type keys under chapter 2. Depending on the variant, a corresponding manipulation protection is achieved.

Coded
The safety sensor accepts any STS actuator.
Type 4; low level coding level according to EN ISO 14119.

Individual
The safety sensor accepts a STS actuator. This actuator is configured individually to the STS. A non-matching actuator in the sensor range will result in an error. The process for teaching-in a new actuator can be carried out unlimited times and is descried in detail under chapter 11 **"Commissioning"**; high level coding level according to EN ISO 14119.

Type 4; low level coding according to EN ISO 14119

Unique
The safety sensor only accepts the STS actuator supplied. The pair, consisting of sensor and actuator cannot be separated. If a component should be lost and is no longer functional, both components must be replaced.

Type 4; high level coding according to EN ISO 14119.

7.2 Safety outputs

The safety sensor has 2 short-circuit proof PNP safety outputs (OSSD), which have a max. load of 400 mA per channel. The safety outputs connect through under the following conditions:
- the correct actuator is detected in the operating range (safety guard closed)
- a high signal is present at both safety inputs
- the EDM input is set correctly
- there is no internal error detected

The safety sensors will switch themselves off under the following conditions:
- there is no actuator or the wrong actuator in the detection zone
- there is a low signal on one of the two inputs
- a fault has been detected

The two safety outputs can be connected under the following conditions to the inputs of a safety controller:
- the input must be appropriate (OSSD signals) for clocked safety signals; the controller must tolerate test pulses on the inputs (see chapter 17 **"Technical specifications"**). Please refer to the instructions of the controller manufacturer.

Wiring examples can be found in chapter 17.4 **"Connection Examples"**.

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Internet: www.wieland-electric.com
Email: info@wieland-electric.com

7.3 Safety inputs

The safety sensor has 2 safety inputs:
- Connect the safety inputs of +24 V DC for single use of the sensor.
- When using the sensor in a series circuit, the safety inputs of the first sensor can be connected to +24 V DC. The safety inputs of the following sensors are connected to the safety outputs of the previous sensor. Please also refer to chapter **10.1 "Series connection"**.
- Pulses with a duration of max. 900 µs are tolerated on the safety inputs.

Wiring examples can be found in chapter 17.4 **"Connection Examples"**.

7.4 EDM-input

The EDM input can be configured as "automatic" or "monitored" (see number key). If the EDM input is not required, the "automatic" variant must be selected and connected to +24 V DC.

EDM-input: automatic
For contactor monitoring, the open contactors must be connected to the EDM input. For series connection of multiple sensors all EDM inputs must be connected to +24 V DC. The monitor for the contactors must be connected to the last sensor of the chain.

Wiring examples can be found in chapter 17.4 **"Connection Examples"**.

EDM-input: monitors (start button)
Connect the EDM input to an external start button on your machine control. The EDM input is only then recognized as set properly if after pressing the sensor and after setting the safety inputs at least one valid start pulse is detected. The valid start pulse is detected when after a rising edge, a falling edge within the allowable start pulse duration between 30 ms and 5 s is detected.

Wiring examples can be found in chapter 17.4 **"Connection Examples"**.

7.5 Diagnostic output

The diagnostic output is positive switching, short-circuit protected and transmits the various sensor states with different signals, for example, to a ***sensor***PRO ***STS***.The pulsed signals corresponding to the respective timing of the LED. The various symbols are described in more detail under chapter 7.6.

7.6 LED displays, flash codes and clocking diagnostic output

Sensor non-actuated	
LED green	off
LED red	off
LED yellow	on
Diagnostic output	0 V
Safety outputs OSSD	0 V
Note	Voltage is applied

Actuator in the detection area (sensor activated), all inputs correctly set	
LED green	on
LED red	off
LED yellow	off
Diagnostic output	24 V DC
Safety outputs OSSD	24 V
Note	Actuator in the detection area

Actuator in the detection area (sensor actuated), safety inputs not set (low level)	
LED green	flashes [1]
LED red	off
LED yellow	off
Diagnostic output	24 V DC
Safety outputs OSSD	0 V
Note	set safety inputs

Actuator in the detection area (sensor actuated), safety inputs set (high level), waits for start pulse	
LED green	Rapid flashing [2]
LED red	off
LED yellow	off
Diagnostic output	24 V DC
Safety output OSSD	0 V
Note	press start button

Actuator in the boundary area	
LED green	off
LED red	off
LED yellow	flashes[1]
Diagnostic output	24 V DC clocked
Safety outputs OSSD	Previous state
Note	Readjust sensor

Teach-in process	
LED green	off
LED red	off
LED yellow	Rapid flashing[2]
Diagnostic output	24 V DC clocked
Safety outputs OSSD	0 V
Note	Disconnect voltage to complete teach-in

Fault condition	
LED green	off
LED red	flashes[1]
LED yellow	off
Diagnostic output	0 V
Safety outputs	0 V
Note	See chapter 13 **"Troubleshooting"**

[1] Flashing: The pulse interval (1 s) of the LED ratio is 1:1.
[2] Rapid flashing: The pulse interval (0,25 s) of the LED ratio is 1:5.

7.7 Boundary area monitoring

If the actuator is in the boundary area of the switching distances with corresponding offset values of the sensor, it is transmitted to a ***sensor***PRO ***STS*** or indicated by the LED (see chapter 7.6 **"LED displays, flash codes and clocking diagnostic output"**).

8 Assembly

- Safety sensor and actuator
  - Do not use as a stopper
  - External fields can affect switching distances
- Installation of the safety sensor and the associated actuator is allowed only when de-energized.
- Make sure that the markings on the sensor and actuator face each other congruently.
- The mounting position is arbitrary. However, security sensor and actuator must be mounted parallel and opposite each other.
- Note the specified installation tolerances and the approved control options.

To ensure trouble-free operation and to avoid any impact on the operating distance, the following points should be noted:

- In order to guarantee the specified switching distance, the free zone (environment free of electrically and magnetically conductive materials) must be adhered to.

NOTE
- Matching space plates for mounting on metal parts are available under the order-Nb.
- R1.100.4100.0 Quader 8 mm
- R1.100.4101.0 Quader 10 mm
- R1.100.4200.0 Rechteck 8 mm
- R1.100.4201.0 Rechteck 10 mm
- Available at Wieland Electric GmbH

- The mounting distance between two systems of the safety sensor and actuator must be min. 15 cm.
- Attach safety sensor and actuator to the protective device so that they cannot be removed.
- Use only M4 screws with flat head (e.g. M4 cheese head screws ISO 4762) for installation of the safety sensor and actuator. Tightening torque max. 0,5 – 0.7 Nm. Use non-ferromagnetic material (e.g. brass) screws.

NOTE
- We recommend using the screw covers included to secure the mounting screws against easy disassembly.

- The safety sensor must be mounted on flat surfaces.
- The connecting cable of the safety sensor must be protected against mechanical damage.
- Consider the requirements of EN ISO 14119 during installation.
- Also consider the requirements of EN 60204-1, in particular regarding the proper laying of cable. It is recommended to lay the sensor cable so that it is covered.

9 Adjustment

The stated operating distances (see chapter 17 **"Technical Specifications"**) are only valid for mounting on non-metallic material if the safety sensor and actuator are mounted in parallel opposite each other. Other arrangements may lead to different switching states.

10 Electrical Connection

CAUTION
- The electrical connection may only be carried out with the power off and by authorized personnel.

- Connect the safety sensor according to the specified wire colors and pin assignment (see chapter 17.1 **"Circuit diagram and pin assignment"**).

CAUTION
- Both safety outputs must always be evaluated to ensure safety.
- Since the diagnostic output is not a safety output, it may not be used for safety-relevant information and monitoring functions.

- Make sure that the required minimum input voltage of the downstream safety evaluation unit is not undershot. Observe the voltage drop at the safety sensor and the connecting cable.

10.1 Series connection

The safety sensors enable a series circuit with up to 30 sensors while achieving PLe with correct wiring. For a series circuit it must be noted that the time delay accumulates for each additional sensor. The relevant technical specifications can be found in chapter 17 **"Technical Data"**. Configuration EDM input see chapter **"7.4 EDM input"**.

10.2 Information about power supply

- The sensor must be powered directly or indirectly with a SELV/PELV power supply.
- For use and applications as per the requirements[1], the power supply must be classified "for use in class 2 circuits".

[1] Notice regarding the scope of the UL approval: The devices have been tested in accordance with the requirements of UL508 and CSA/C22.2 no. 14 (protection against electric shock and fire).

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10.3 Note for use in safety control systems

- Do not use controllers with test pulses or turn off the test pulses in your control system. The device generates its own test pulses to the safety outputs. A downstream control system must be able to tolerate these test pulses, which may have a length up to 300 µs. Depending on the inertia of the connected device (control, relay, etc.), this can lead to short switching processes.
- The inputs of a connected evaluation unit must be positive-switching, as the two outputs on the safety switch in the ON state deliver a level of +24 V DC.

11 Commissioning

During commissioning, you must make sure of the following points:
- safety sensor and actuator mounted in the correct position and firmly
- integrity of the supply line

After installation and any fault, a complete check of the safety function must be performed.

11.1 Teach-in variant "individual"

The first permitted actuator is detected immediately after the supply voltage is applied, if it is located in the detection range of the sensor. Each additional teach-in process must be done as described in the following:

1. Apply the supply voltage to the safety sensor.
2. Bring an allowable actuator into the detection range of the sensor.
3. Actuator is detected, red LED flashes six times.
4. After 10 s the LED switches to yellow flashing.
5. Switch off power supply within the next 2 min.
6. Re-apply power supply, the programming procedure is finished and the actuator will be accepted.
7. If an actuator is re-taught, the safety sensor disables the code of the previous process, so this is no longer permitted.
8. Do not remove the actuator during the process, as long as it is located in the detection area.

If the teach-in procedure is terminated, the supply voltage must be switched off and the process restarted. The teaching-in of actuators to a security sensor can be undertaken an unlimited number of times, as long as the code of the actuator is not locked in the sensor.

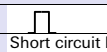
12 Maintenance

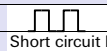
If the safety sensor correctly installed and used as intended, no maintenance measures are required. We recommend periodically carrying out a visual and functional test:

- Check the safety sensor and actuator for tightness.
- Check the connection cable for damage.

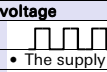
CAUTION
• Damaged or faulty equipment must be replaced with original spare parts! In variant "unique", the safety sensor and actuator must be replaced. For the "individual" variant, a teach-in process must be performed after replacement of the safety sensor OR the actuator.

13 Troubleshooting

Safety output faults	
Flash code	
Cause	Short circuit between safety outputs to ground or to +24 V DC. Wire breakage
Remedy	• Switch off supply voltage. • Eliminate short/wire break at the output. • Re-apply supply voltage.

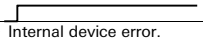
Safety input faults	
Flash code	
Cause	Short circuit between safety inputs, to ground or to+24 V DC. Wire breakage
Remedy	• Switch off supply voltage. • Eliminate short/wire break at the output. • Re-apply supply voltage.

Safety output faults	
Flash code	
Cause	• EDM automatic: Error on connected safety relay. • EDM manual: Start pulse does not take place in the defined area. • All variants: Wire breakage.
Remedy	• Switch off supply voltage. • Check safety relay or set start pulse correctly, check for broken wire. • Re-apply supply voltage.

Error overvoltage or undervoltage	
Flash code	
Cause	• The supply voltage has not been applied in the defined region.
Remedy	• Switch off supply voltage. • Ensure correct supply voltage and reconnect it.

Temperature outside the acceptable range	
Flash code	
Cause	• The defined temperature range has been exceeded or undershot.
Remedy	• Switch off supply voltage. • Ensuring proper ambient temperature. • Re-apply supply voltage.

Incorrect actuator	
Flash code	
Cause	• Incorrect actuator in the detection range of the sensor.
Remedy	• Use correct actuator.

Internal device error	
Flash code	
Cause	• Internal device error.
Remedy	• Switch off power supply and re-connect.

If the errors described cannot be resolved, the device must be replaced to ensure the safety function.

14 Dismantling

Dismantle the safety sensor in a powered down state.

15 Disposal

Dispose of packaging and used parts according to the regulations of the country in which the device is installed.

16 Information about production date

NOTE
• The date of manufacture can be seen on the safety sensor housing in the format "calendar week/year", e.g.: "37/15" = week 37, year 2015

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17 Technische Daten / Technical Specifications / Caractéristiques techniques / Dati tecnici / Datos técnicos

DE	EN	FR	IT	ES	Norm	STS 01xx	STS 02xx
Elektrische Daten	**Electrical Specifications**	**Caractéristiques Électriques**	**Specifiche Elettriche**	**Especificaciones Eléctricas**			
Kontakttyp (Schließerfunktion)	Contact type (make function)	Type de contact (fonction de fermeture)	Tipo di contatto (funzione die chiusura)	Tipo de contacto (función de cierre)	DIN EN 60947-5-2:2014-01	OSSD ✓	
Reaktionszeit max.	Reaction time max.	Temps de réaction max.	Tempo di reazione max.	Tiempo máx. de reacción		75 ms	
Einschaltverzug (t_{on}) max.	Activation delay (t_{on}) max.	Retard à l'activation (t_{on}) max.	Ritardo di attivazione (t_{on}) max.	Retardo máx. de conexión(t_{on})	DIN EN 60947-5-2: 2014-01	75 ms	
Ausschaltverzug (t_{off}) max. Betätiger Eingänge	Deactivation delay (t_{off}) max. actuator inputs	Retard à la désactivation (t_{off}) max. actionneur entrées	Ritardo di disattivazione (t_{off}) max. attuatori ingressi	Retardo máx. de desconexión (t_{off}) accionador entradas	DIN EN 60947-5: 2014-01	75 ms 3 ms	
Bereitschaftsverzug (t_v)	Time delay (t_v)	Retard à l'ordre de marche (t_v)	Ritardo di standby (t_v)	Retardo de reserva (t_v)	DIN EN 60947-5-2: 2014-01	1000 ms	
Testpulsdauer max. typ.	Test pulse duration max. type	Durée d'impulsion d'essai max. type	Durata max. impulso di prova tipo	Duración máx. del impulso de prueba type		0,3 ms	
Periodendauer Testpuls typ.	Period testpulse type	Durée de période d'impulsion d'essai	Durata periodo impulso di prova tipo	Duración de periodo del impulso de brueba type		1000 ms	
Diskrepanzzeit	Discrepancy time	Temps différentiel	Tempo di discrepanza	Tiempo de discrepancia		5 ms	
Schaltfrequenz	Frequency of operating cycles	Fréquence de commutation	Frequenza di commutazione	Frecuencia de conmutación		3 Hz	
Gebrauchskategorie	Utilization category	Catégorie d'utilisation	Categoria d'utilizzo	Categoría de uso	DIN EN 60947-5-1: 2010-04	DC12 / DC13	
Schaltstrom pro Sicherheitsausgang max.	Switching current per safety output max.	Courant de commutation par sortie de sécurité max.	Corrente di commutazione per ogni uscita di sicurezza max.	Corriente de conmutación por salida de seguridad max.		400 mA	
Schaltstrom Diagnoseausgang max.	Switching current diagnostic output max.	Courant de commutation de diagnostic de sortie max.	Corrente di commutazione uscita di diagnostica max.	Corriente de conmutación de diagnóstico de salida máx.		50 mA	
Reststrom (I_{mr})	Off-state current (I_{mr})	Courant résiduel (I_{mr})	Corrente di dispersione (I_{mr})	Coriente de fuga (I_{mr})	DIN EN 60947-5-2: 2014-01	0,5 mA	
Leerlaufstrom I_0 Unbetätigt typ. Betätigt typ.	No load supply current I_0 non-actuated type actuated type	Courant hors-charge I_0 non actionné typ actionné typ	Corrente a vuoto I_0 tipo non azionato tipo azionato	Corriente sin carga I_0 norm. desactivado norm. activado	DIN EN 60947-5-2: 2014-01	10 mA 30 mA	
Betriebsspannung (U_b)	Operating voltage (U_b)	Tension de fonctionnement (U_b)	Tensione di esercizio (U_b)	Tensión de funcionamiento (U_b)		24 V DC ±10%	
Bemessungsisolationsspannung (U_i)	Rated insulation voltage (U_i)	Tension d'isolation assignée (Ui)	Tensione di isolamento di misurazione (U_i)	Tensión de aislamiento asignada (U_i)	DIN EN 60947-5-2: 2014-01	50 V	
Bemessungsstoßspannungsfestigkeit (U_{imp})	Rated impulse withstand voltage (U_{imp})	Résistance à la tension de choc assignée (U_{imp})	Tensione impulsiva di dimensionamento di misurazione (U_{imp})	Resistencia a sobretensión asignada (U_{imp})	DIN EN 60947-5-2: 2014-01	1000 V	
Spannungsabfall (U_d) Ausgänge	Voltage drop (U_d) outputs	Chute de tension (U_d) sorties	Calo di tensione (U_d) uscite	Caída de tensión (U_d) salidas	DIN EN 60947-5-2: 2014-01	0,2 V	
Lastkapazität max.	Load capacity max.	Capacité de charge max.	Capacità di carico max.	Capacidad de carga máx.		20 nF	
Überspannungskategorie II	Overvoltage category II	Catégorie de surtension II	Categoria di sovratensione II	Categoría de sobretensión II		✓	
Verschmutzungsgrad	Pollution degree	Degré d'encrassement	Grado di sporcamento	Grado de suciedad		2	
Schutzklasse Netzteil	Protection class	Classe de protection bloc d'alimentation	Classe di protezione alimentazione	Clase de protección adaptador de corriente	DIN EN 61140: 2007-03	III	
Stabilisiertes PELV/SELV-Netzteil (vorgeschrieben)	Stabilized PELV/SELV power supply (required)	Bloc d'alimentation TBTS/TBTP stabilité (prescrit)	Alimentatore PELV/SELV stabilizzato (prescritto)	Fuente de alimentación PELV/SELV estabilizada (obligatorio)		✓	
Sicherung Betriebsspannung lastabhängig	Fuse for operating voltage depending on the load	Fusible, tension de service dépendant de la charge	Fusibile tensione di esercizio dipendente dal carico	Fusible de tensión de servicio en función de la carga		1 A (flink)	
Sicherheitsausgang kurzschlussfest	Backup safety output short-circuit proof	Fusible, sortie de sécurité, protégé contre des courts-circuits	Fusibile uscita di sicurezza, a prova di corto circuito	Fusible de la salida de seguridad, a prueba de cortocircuitos		✓	
Diagnoseausgang kurzschlussfest	Backup diagnostic output short-circuit proof	Fusible sortie de diagnostique, protégé contre des courts-circuits	Fusibile uscita di diagnosi, a prova di corto circuito	Fusible de la salida de diagnosis		✓	
Interne elektronische Sicherung (regenerierbar)	Internal electronic protection (regenerated)	Fusible électronique internet (régénérable)	Fusibile elettronico interno (rigenerabile)	Fusible electrónico interno (regenerable)		✓	
Stromaufnahme je Eingang max.	Power consumption per input max.	Consommation de courant par entrée max.	Corrente assorbita per ingresso max.	Consumo de corriente por entrada max.		2,75 mA	
Leistungsaufnahme (bei Vollast) max.	Power consumption (at full load) max.	Puissance absorbée (à pleine charge) max.	Potenza assorbita max. (a pieno carico)	Consumo de potencia (a plena carga) máx.		23,75 W	
Kurzschlusserkennung	Short-circuit detection	Détection de court-circuit	Rilevamento corto-circuito	Detección de cortocircuito		✓	
Querschlusserkennung	Short-circuit recognition	Détection de court-circuits transversaux	Rilevamento allacciamento incrociato	Detección de derivación		✓	
Übertragungstechnologie	Transmission technology	Technologie de transmission	Tecnologia di trasmissione	Tecnología de transmisión		RFID	

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DE	EN	FR	IT	ES	Norm	STS 01xx	STS 02xx
Schaltabstände (s.S. 22)	**Operating distances (page 22)**	**Intervalles de commutation (page 22)**	**Distanzias di commutazione (page 22)**	**Distancia de conmutación (page 22)**			
gesicherter Schaltabstand (S_{ao})	Assured operating distance (S_{ao})	Intervalle de commutation sécurisé (S_{ao})	Distanza di commutazione protetta (S_{ao})	Distancia de conmutación asegurada (S_{ao})	DIN EN 60947-5-3: 2014-12	8 mm	
gesicherter Ausschaltabstand (S_{ar})	Assured switch-off distance (S_{ar})	Intervalle de désactivation sécurisé (S_{ar})	Distanza di disattivazione protetta (S_{ar})	Distancia de desconexión asegurada (S_{ar})	DIN EN 60947-5-3: 2014-12	18 mm	
Bemessungsschaltabstand (S_n)	Rated operating distance (S_n)	Intervalle de commutation assigné (S_n)	Distanza di commutazione di misurazione (S_n)	Distancia de conmutación asignada (S_n)	DIN EN 60947-5-2: 2014-01	12 mm	
Mindestschaltabstand (S_0min)	Minimum sensing distance (S_0min)	Intervalle de commutation minimal (S_0min)	Distanza di commutazione minima (S_0min)	Distancia de conmutación mínima (S_0mín)		0,5 mm	
Wiederholgenauigkeit (R)	Repeatability (R)	Fidélité de reproduction (R)	Precisione di ripetizione (R)	Precisión de repetición (R)		<0,5 mm	
Hysterese max.	Differential travel max.	Course différentielle max.	Isteresi max.	Histéresis máx.		2 mm	
Versatz Betätiger max.	Offset actuator max.	Décalage de l'actionneur max.	Spostamento attuatori max.	Desplazamiento máx. del actuador		± 8 mm	
Umweltdaten	**Environmental specifications**	**Données Environnementales**	**Dati Ambientali**	**Datos Ambientales**			
Schutzart (ausgenommen Stecker)	Protection class (excluding connectors)	Indice de protection (hormis le connecteur)	Tipo di protezione (ad esclusione del connettore)	Tipo de protección (excepto conectores)	DIN EN 60529: 2014-09 ISO 20653: 2013-02	IP 67 IP6K9K	
Schutzart Stecker	Protection plugs	Indice de protection du connecteur	Tipo di protezione connettore	Tipo de protección de los conectores	DIN EN 60529:2014-09	IP67	
EMV	EMC	EMC	EMC	EMV	DIN EN 61000-4-2:2009-12 DIN EN 61000-4-3:2012-04 DIN EN 61000-4-4:2013-04 DIN EN 61000-4-6:2014-08 DIN EN 61000-4-8:2010-11	✓	
Betriebstemperatur min.	Operating temperature min.	Température de service min.	Temperatura di esercizio min.	Temperatura mín. de servicio		-25°C	
Betriebstemperatur max. (UL-Kabelvariante, UL-Steckervariante)	Operating temperature max. (UL cable version, UL plug version)	Température de service max. (UL variante avec câble, UL variante avec prise)	Temperatura di esercizio max. (UL variante di cavi, UL variante di connettore)	Temperatura máx. de servicio (ULversíon cable, UL variante con enchufe)		+70°C +60°C (UL) +45°C (UL)	
Lagertemperatur min.	Storage temperature min.	Température de stockage min.	Temperatura di stoccaggio min.	Temperatura mín. de almacenamiento		-25°C	
Lagertemperatur max.	Storage temperature max.	Température de stockage max.	Temperatura di stoccaggio max.	Temperatura máx. de almacenamiento		+70°C	
Kabel Temperaturbereich bewegt min.	Cable temperature range moved min.	Plage de température du câble déplacé min.	Cavo intervallo di temperatura in movimento min.	Rango de temperatura mín. de cable en movimiento		-5°C	
Kabel Temperaturbereich bewegt max.	Cable temperature range moved max.	Plage de température du câble déplacé max.	Cavo intervallo di temperatura in movimento max.	Rango de temperatura máx. de cable en movimiento		+80°C	
Kabel Temperaturbereich fest verlegt min.	Cable temperature range fixed installation min.	Plage de température du câble posé à demeure min.	Cavo intervallo di temperatura posato fisso min.	Rango de temperatura mín. de cable tendido fijamente	N 60947-5-2	-30°C	
Kabel Temperaturbereich fest verlegt max.	Cable temperature range fixed installation max.	Plage de température du câble posé à demeure max.	Cavo intervallo di temperatura posato fisso max.	Rango de temperatura máx. de cable tendido fijamente	N 60068-2-6	+80°C	
Schockfestigkeit	Shock resistance	Résistance aux chocs	Resistenza agli urti	Resistencia a choques	DIN EN 60947-5-2: 2014-01	30 g / 11 ms	
Vibration/Schwingfestigkeit (Amplitude)	Vibration/vibration resistance (Amplitude)	Résistance aux vibrations/ oscillations (Amplitude)	Resistenza alle vibrazioni/alle oscillazioni (Ampiezza)	Resistencia a vibraciones/ oscilaciones (Amplitud)	DIN EN 60068-2-6: 2008-10	11…55 Hz (1mm)	
Relative Luftfeuchtigkeit min.	Relative humidity min.	Humidité relative de l'air min.	Umidità relativa dell'aria min.	Humedad relativa del aire mín.		5 %	
Relative Luftfeuchtigkeit max.	Relative humidity max.	Humidité relative de l'air max.	Umidità relativa dell'aria max.	Humedad relativa del aire máx.		85 %	
Luftdruck min.	Air pressure min.	Pression atmosphérique min.	Pressione dell'aria min.	Presión del aire mín.		860 hPa	
Luftdruck max.	Air pressure max.	Pression atmosphérique max.	Pressione dell'aria max.	Presión del aire máx.		1060 hPa	
Temp. Anderungsgeschwindigkeit Δt_{max}	Temp. changing speed Δt_{max}	Vitesse de variation de la température Δt_{max}	Tasso di variazione della temperatura Δt_{max}	velocidad de modificación de la temperatura Δt_{max}		0,5°C/min	
Mechanische Daten	**Mechanical Specifications**	**Caractéristiques Mécaniques**	**Caratteristiche Meccaniche**	**Especificaciones Mecánicas**			
Verpolungsschutz	Reverse battery protection	Protection contre les inversions de polarité	Protezione da inversione di polarità	Protección contra inversión de polaridad		✓	
Anzahl Sicherheitsausgänge elektronisch	Number of safety outputs electronically	Nombre de sorties de sécurité électroniques	Numero di uscite di sicurezza elettroniche	Número de salidas de seguridad electrónicas		2	
Anzahl Diagnoseausgänge elektronisch	Number of diagnostic outputs electronically	Nombre de sorties de contrôle électroniques	Numero di uscite di controllo elettroniche	Número de salidas de control electrónicas		1	
Anzahl Sicherheitseingänge	Number of safety inputs	Nombre d'entrées de sécurité	Numero di ingressi di sicurezza	Número de entradas de seguridad		2	

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Deutsch	EN	FR	IT	ES	Norm	STS 01xx	STS 02xx
EDM-Eingang automatisch / EDM-Eingang überwacht (Starttaste)	EDM input automatically/ EDM input monitored (start button)	Entrée EDM automatique/ Entrée EDM surveillée (touche de démarrage)	Ingresso EDM automatico/ Ingresso EDM monitorato (tasto di avvio)	Entrada EDM automática/ entrada EDM controlada (tecla de arranque)		✓	
LED-Anzeige (Anzahl Farben)	LED display (number of colors)	Affichage à LED (nombre de couleurs)	Visualizzazione LED (numero di colori)	Indicador LED (número de colores)		3	
Aktive Fläche	Active area	Surface active	Area attiva	Superficie activa		1	
Schaltprinzip elektronisch	Switching principle electronically	Principe de commutation électronique	Principio di commutazione elettronico	Principio de conmutación electrónico		✓	
Reihenschaltung max.	Series circuit max.	Installation en série max.	Commutazione in serie max.	Conexión en serie máx.		30	
Material Gehäuse	Housing material	Matériau du boîtier	Materiale alloggiamento	Material de la carcasa		PBT	
Material Deckel	Cover material	Matériau du couvercle	Materiale coperchio	Material de la tapa		PC	
Farbe Gehäuse (schwarz)	Case color (black)	Couleur du boîtier (noir)	Colore alloggiamento (nero)	Color de la carcasa (negro)		✓	
Gehäusebauform (STS 01 quaderförmig, STS 02 rechteckig)	Housing construction (STS 01, square STS 02 rectangular)	Type de construction du boîtier (STS 01 carrée, STS 02 rectangulaire)	Forma costruttiva alloggiamento (STS 01 quadrata, STS 02 rettangolare)	Forma de la carcasa (STS 01 cuadrático, STS 02 rectangular)		✓	✓
Anfahrgeschwindigkeit beliebig	Approach speed arbitrarily	Vitesse de démarrage arbitraire	Velocità di avvio arbitrariamente	Velocidad de arranque arbitraria		✓	
Betätigungshäufigkeit	Operating frequency	Fréquence d'actionnement	Frequenza di attivazione	Frecuencia de accionamiento		180/min	
Freizone	Free zone	Zone libre	Zona libera	Zona libre	DIN EN 60947-5-2: 2014-01	50 mm	
Mindestmontageabstand	Minimum mounting distance	Distance de montage minimale	Distanza minima di montaggio	Distancia mínima de montaje		150 mm	
Bündig einbaubar	Flush mount-able	Encastrable	Installabile a filo	Admite montaje empotrado sin sobresalir		✓	
Abmessungen	Dimensions	Dimensions	Dimensioni	Dimensiones		26x36x13 mm	25x88x13 mm
Einbau beliebig	Installation arbitrarily	Montage arbitraire	Installazione arbitrariamente	Montaje arbitraria		✓	
Befestigungsart: Verschraubung mit M4-Schrauben (versenkt)	Mounting type: Fitting with M4 screws (recessed)	Type de fixation : Vissage avec des vis M4 (fraisées)	Tipo di fissaggio Avvitamento con viti M4 (accecate)	Tipo de fijación: Atornillada con tornillos M4 (avellanados)	ISO4762:2004-06	✓	
Anzugsdrehmoment für Befestigungschrauben	Tightening torque for fixing screws	Couple de serrage des vis de fixation	Coppia di serraggio per le viti di fissaggio	Par de apriete para tornillos de fijación		0,5 - 0,7 Nm	
Gewicht Typ Pigtail Gewicht Typ 3m Kabel	Weight pigtail Weight 3m cable	Masse typ pigtail Masse typ 3m câble	Massa tipo pigtail Mass tipo 3m cavo	Peso tipo pigtail Peso tipo 3m cable		60 g 200 g	100 g 240 g
Anschlussarten	**Connection Types**	**Types de Connexion**	**Tipi di Connessione**	**Tipos de Conexión**			
Anschlussleitung LiYY, grau, PVC	Connection LiYY, grey, PVC	Câble de raccordement LiYY, gris, PVC	Cavo di collegamento LiYY, grigio, PVC	Cable de conexión LiYY, gris, PVC		✓	
Stecker mit Pigtail M12x1, 8-polig, schwarz/grau (0,15m)	Connector with pigtail - M12x1, 8-pin, black/grey (0,15m)	Connecteur avec Pigtail - M12x1, à 8 pôles, noir/gris (0,15m)	Connettore con Pigtail - M12x1, 8 pin, nero/grigio (0,15m)	Conector con pigtail - M12x1, 8 polos, negro/gris (0,15m)	EN 61076-2-101: 2012	✓	
Standard-Anschlusskabellängen	Standard lead wire lengths	Longueurs de câble de raccordement standard	Lunghezze standard dei cavi di collegamento	Longitudes de cables de conexión estándar		3 m, 5 m, 10 m	
Anschlusskabellänge max.	Connection cable length max.	Longueur de câble de raccordement max.	Lunghezza max dei cavi di collegamento	Longitud máx. del cable de conexión		30 m	
Litzenanzahl	Number of wires	Nombre de torons	Numero di fili	Número de cables trenzados		8	
Litzenquerschnitt	Wire diameter	Section des torons	Sezione trasversale dei fili	Sección transversal del cable trenzado		0,25 mm²	
Sicherheitstechnische Kenndaten	**Safety Specifications**	**Caractéristiques de sécurité**	**Caratteristiche di sicurezza**	**Características de seguridad**			
PL	PL	PL	PL	PL	DIN EN ISO 13849-1:2008-12	PL e	
SIL nach IEC 61508	SIL according to IEC 61508	SIL selon IEC 61508	SIL secondo IEC 61508	SIL conforme a IEC 61508	IEC 61508:2010	SIL 3	
SIL CL nach IEC 62061	SIL CL according to IEC 62061	SIL CL selon IEC 62061	SIL CL secondo IEC 62061	SIL CL conforme a IEC 62061	IEC 62061:2005+A1:2013	SILCL 3	
PFH_D [1)]	PFH_D	PFH_D	PFH_D	PFH_D	IEC 61508:2010	$2{,}24x10^{-9}$	
Kategorie	Category	Catégorie	Categoria	Categoría	DIN EN ISO 13849-1:2008-12	4	
Struktur (zweikanalig)	Structure (dual channel)	Structure (á deux canaux)	Struttura (bicanale)	Estructura (de dos canales)		✓	
Kodierung niedrig (codiert) hoch (vollcodiert und Unikat)	**Coding** low (coded) high (fully coded and unique)	**Codage** faible (codeé) hautement (codeé et unikat)	**Codifica** inferiore (codificato) altamente (pienamente codificato e unico)	**Codificación** bajo (codificado) muy (totalmente codificada y único)	DIN EN ISO 14119:2014-03	✓	
Hardware Fehlertoleranz (HFT)	Hardware fault tolerance (HFT)	Tolérance d'erreur matérielle (HFT)	Tolleranza errori hardware (HFT)	Tolerancia de error del hardware (HFT)		1	
Gebrauchsdauer in Jahren	Service life in years	Durée d'utilisation en années	Durata di utilizzo in anni	Vida útil en años		20	

1) Annahmen zur Berechnung gemäß IEC TR 62380: tägliches Abkühlen auf 20°C mit anschließendem Dauerbetreib bei 70°C

1) Assumptions for the calculation according to IEC TR 62380: daily cooling to 20°C followed by continuous operation at 70°C

1) Hypothèses de calcul conforme IEC TR 62380 : refroidissement quotidien à 20°C avec fonctionnement permanent ultérieur à 70°C

1) Ipotesi per il calcolo aisensi della normativa IEC TR 62380: raffreddamento giornaliero a 20°C con successivo esercizi

1) Supuestos de cálculo según IEC TR 62380: refrigeración diaria a 20°C con servicio continuo posterior a 70°C

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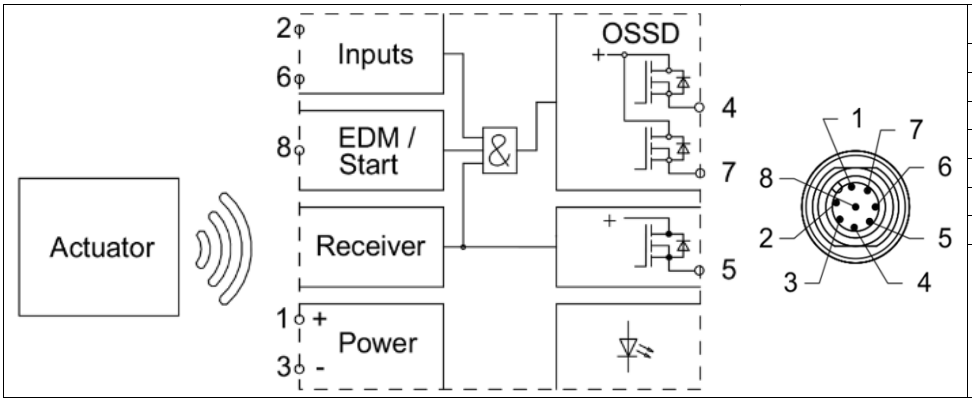
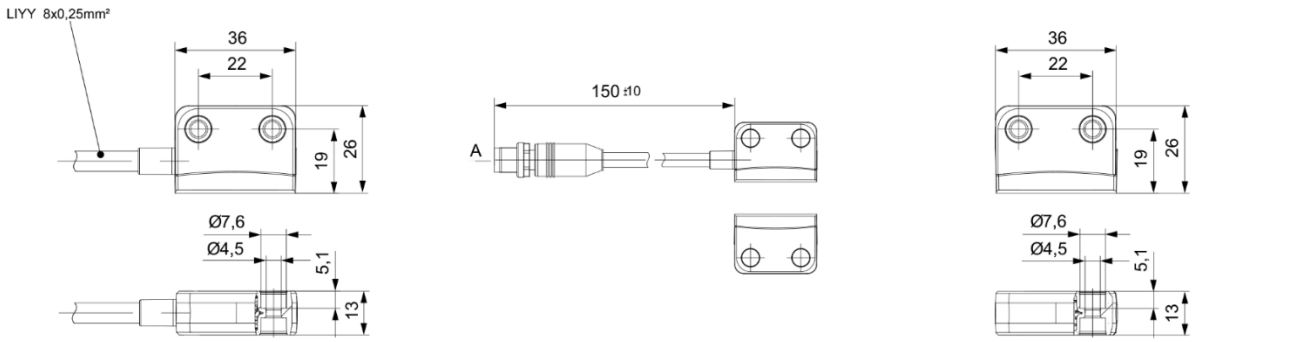
17.1 Schaltbild & Kontaktbelegung / Circuit Diagram & Pin Assignment / Schéma des connexions et affectation descontacts / Schema di commutazione e piedinatura / Plano de conexiones y distribución de contactos



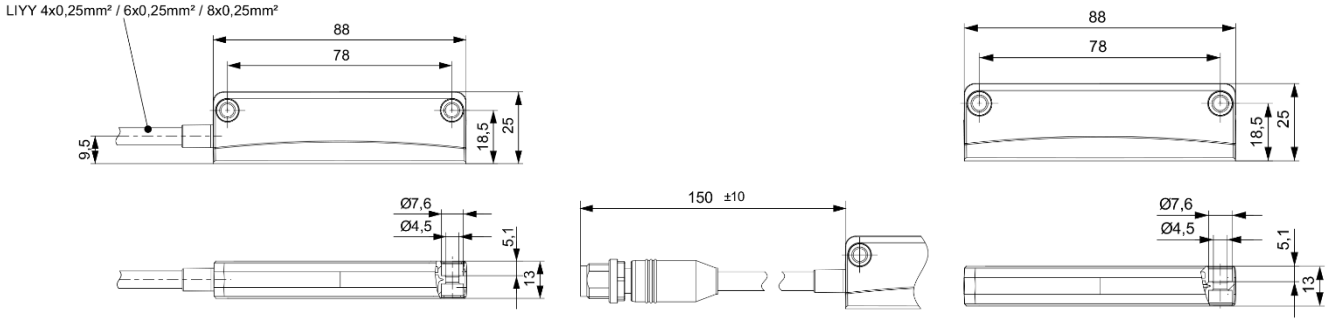
Pin	Farbe / Colour	Funktion / function
1	BN	Versorgungsspannung UB / Supply voltage UB
2	WH	Sicherheitseingang 1 / Safety input 1
3	BU	GND
4	BK	Sicherheitsausgang 1 / Safety output 1
5	GY	Diagnoseausgang / Diagnostic output
6	PK	Sicherheitseingang 2 / Safety input 2
7	VT	Sicherheitsausgang 2 / Safety output 2
8	OG	EDM-Eingang / EDM input

17.2 Abmessungen / Dimensions / Mesures / Dimensioni / Dimensiones

STS 01xx



STS 02xx



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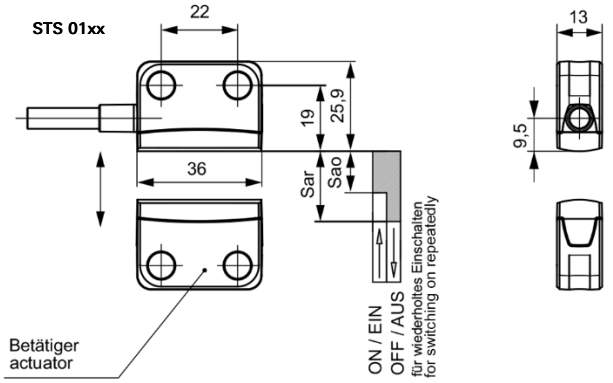
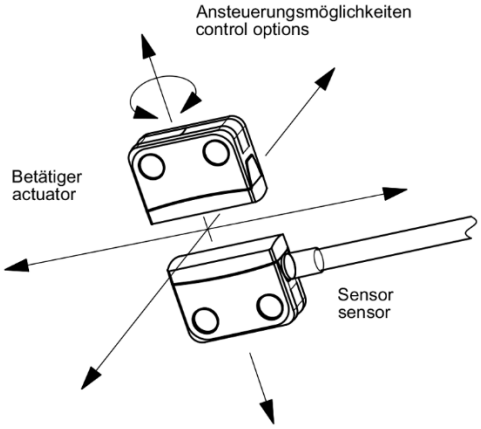
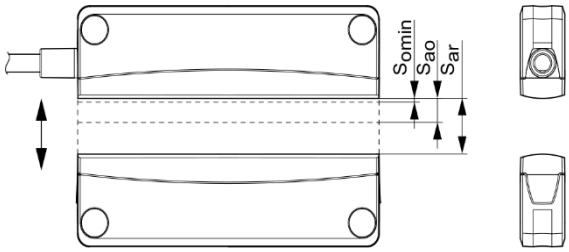
17.3 Ansteuerungsmöglichkeiten / Operating directions / Possibilités d'actionnement / Possibilità di comando / Posibilidades de activación

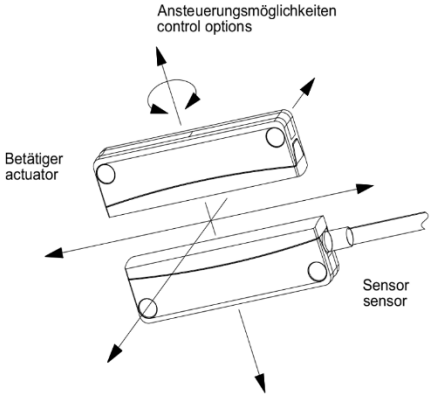
STS 01xx





STS 02xx





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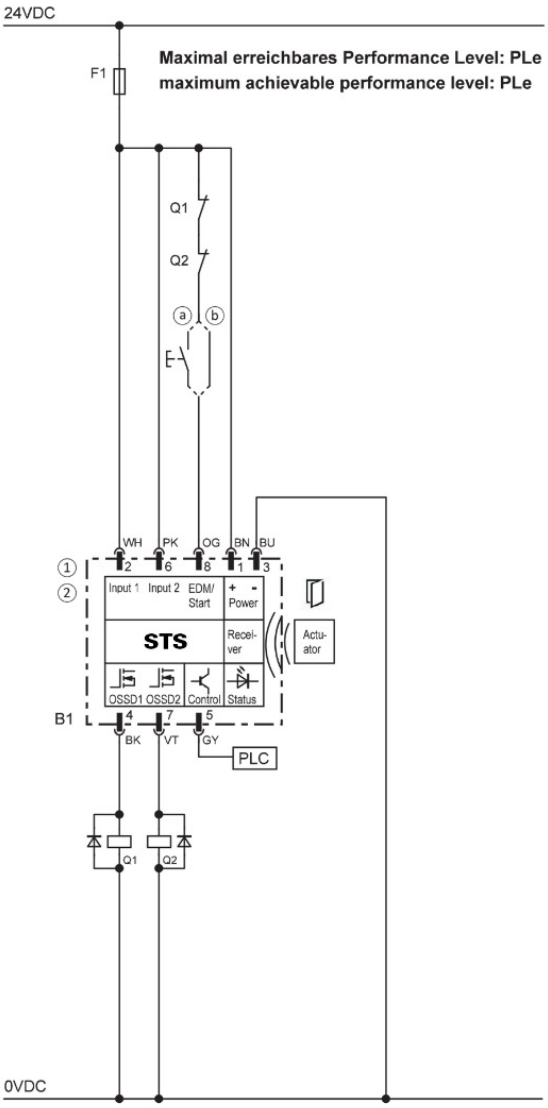
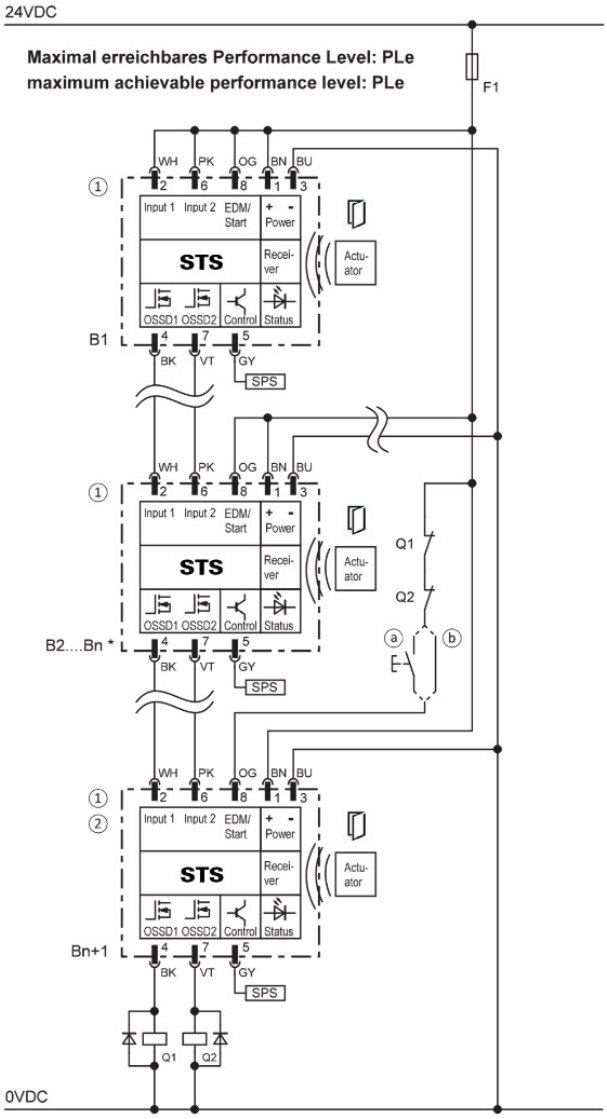
17.4 Schaltbeispiele / Connection Examples / Exemples de commutation / Esempi di commutazione / Ejemplos de conexiones

Direkte Schützansteuerung (Stand-Alone-Function)



Reihenschaltung /3er-Kaskade (Series Connection / 3-cascade)



ⓐ Start manuell (mit Starttaste)
Manual start (with press button)

ⓑ Start automatisch
automatic start

① Typen / series STS 01xx
② Typen / series STS 02xx

*Limitierung Anzahl der Sensoren (B2…Bn) durch die maximale Strombelastung ist zu beachten, siehe Hinweise in der Betriebsanleitung.
Bn+1 = letzter Sensor in der Kaskade.

*Limitation amount of sensors (Bn2…Bn) due to the maximum current rating has to be considered, see notes in the manual.
Bn+1 = last sensor in the cascade.

Die Schaltbeispiele dienen als Vorschlag und entbinden den Verantwortlichen der Anlage nicht vor der Überprüfung der Sicherheitsfunktionen. Wieland Electric GmbH übernimmt keine Gewährleistung für Funktion und Sicherheit, sowie eventuelle Fehler.

The wiring diagrams are proposals and do not release the responsible person of the system against the review of the safety function. Wieland Electric GmbH assumes no liability for function and safety.

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18 CE-Erklärung / CE declaration / Déclaration CE / Marcatura CE / Declaratión CE

DE

EG-KONFORMITÄTSERKLÄRUNG FÜR SICHERHEITSBAUTEILE

(gemäß Art. 5 der RICHTLINIE 2006/42/EG über Maschinen)

Wir,

Wieland Electric GmbH,
Brennerstrasse 10-14,
D-96052 Bamberg

erklären hiermit, dass das Gerät

Marke: **Wieland**

Name: Sicherheitsschalter

Typ: STS...,

in seiner Auslegung und Konstruktion den Anforderungen der anwendbaren europäischen Richtlinien entspricht:

Richtlinie:	2004/108/EG 2006/42/EG 1999/005/EG 2011/65/EU
Norm:	DIN EN 61508-1,-2,-3,-4:2011-02; DIN EN ISO 13849-1; DIN EN 62061:2013-09; DIN EN 60947-5-3:2014-12; DIN EN 60947-5-2:2014-01; ETSI EN 300 330-1,-2; ETSI 301 489-1,-3; DIN EN 50364:2010-11 DIN EN 60664-1:2008-01; DIN EN 60664-5:2008-05

sofern es gemäß seiner Bestimmung, den geltenden Vorschriften, Normen und den Herstelleranweisungen entsprechend installiert, verwendet und gewartet wird.

Dokumentationsbevollmächtigter:

Klaus Stadelmaier, Manager R&D, EL PE
Wieland Electric GmbH, Brennerstrasse 10-14,
D-96052 Bamberg

Bamberg, den 01.10.2015
i.V.
Klaus Stadelmaier
Manager R & D, Electronics

Wieland Electric GmbH
i.V.
Klaus Jungstädt
Manager Approvals, Standards

EN

EG DECLARATION OF CONFORMITY FOR SAFETY COMPONENTS

(according to EC DIRECTIVE 2006/42/EC on machinery, article 5)

We,

Wieland Electric GmbH,
Brennerstrasse 10-14,
D-96052 Bamberg

hereby declare that the unit

Trademark: **Wieland**

Product: Safety Switches

Type: STS...,

which, through its design and construction, conforms to the applicable European Directives:

Directive:	2004/108/EU 2006/42/EG 1999/005/EG 2011/65/EU
Standard:	DIN EN 61508-1,-2,-3,-4:2011-02; DIN EN ISO 13849-1; DIN EN 62061:2013-09; DIN EN 60947-5-3:2014-12; DIN EN 60947-5-2:2014-01; ETSI EN 300 330-1,-2; ETSI 301 489-1,-3; DIN EN 50364:2010-11 DIN EN 60664-1:2008-01; DIN EN 60664-5:2008-05

It is important that the unit is subject to correct installation, maintenance and use conforming to its intended purpose, to the applicable regulations and standards, to the supplier's instructions.

Documentation authority:

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Bamberg, den 01.10.2015
i.V.
Klaus Stadelmaier
Manager R & D, Electronics

Wieland Electric GmbH
i.V.
Klaus Jungstädt
Manager Approvals, Standards

FR

DÉCLARATION DE CONFORMITÉ CE POUR COMPOSANTS DE SÉCURITÉ

(conformément à l'art. 5 de la DIRECTIVE 2006/42/CE relative aux machines)

Nous,

Wieland Electric GmbH,
Brennerstrasse 10-14,
D-96052 Bamberg,

déclarons que l'appareil

Marque : **Wieland**

Nom : interrupteurs de sécurité

Type : STS...,

répond, en termes de conception et de construction, aux exigences des directives européennes applicables:

Directive:	2004/108/EU 2006/42/EG 1999/005/EG 2011/65/EU
Norme:	DIN EN 61508-1,-2,-3,-4:2011-02; DIN EN ISO 13849-1; DIN EN 62061:2013-09; DIN EN 60947-5-3:2014-12; DIN EN 60947-5-2:2014-01; ETSI EN 300 330-1,-2; ETSI 301 489-1,-3; DIN EN 50364:2010-11 DIN EN 60664-1:2008-01; DIN EN 60664-5:2008-05

sous réserve d'installation, d'entretien et d'utilisation conformes à sa destination, à la règlementation et aux normes en vigueur, ainsi qu'aux instructions du constructeur.

Responsable de la documentation :

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Bamberg, den 01.10.2015
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Manager Approvals, Standards