

SAFEMASTER STS Safety Switch- And Key Interlock System Locking Module STS-ZRX, STS-ZRH, STS-ZAX



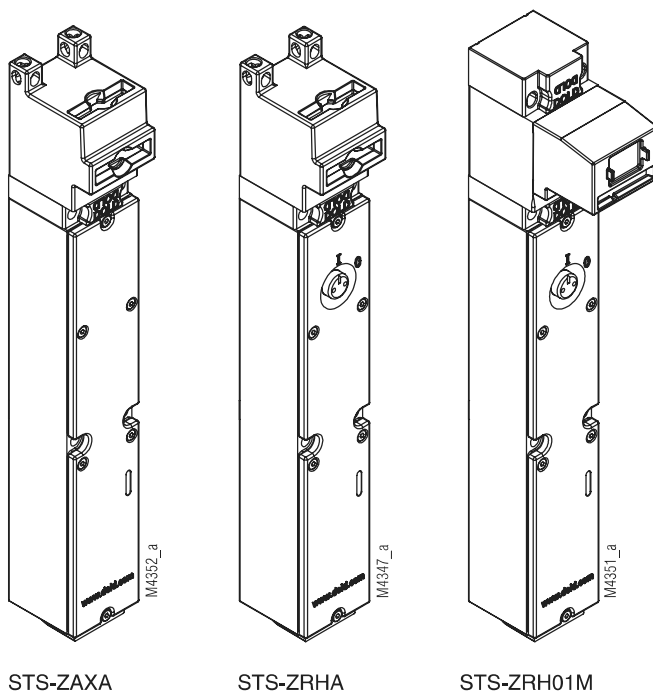
STS-System Benefits

- TÜV certificate according to the legal and standard requirements
- For safety applications up to PL_e/Category 4 according to EN/ISO 13849-1
- Modular and expandable system
- Rugged stainless steel design
- Wireless mechanical safeguarding
- Combines the benefits of safety switch, locking module and key transfer in a single system
- Easy installation through comprehensive accessories
- Protection against lock-in

Features STS-ZRX, STS-ZRH and STS-ZAX

- Locking module to monitor
 - Actuator and key position
 - Doors and entries
 - Locking module position
- Module expansions possible only above the module
- Standby current or load current principle
- Optionally with manual unlocking
- With integrated LEDs for status indication

Installation Examples



Approvals and Marking



Application

Locking modules STS-ZRX, STS-ZRH and STS-ZAX are assembled with other modules to an STS unit. They serve as a solenoid lock of separating guards on machines, e.g. with cycle and overrun times or other hazards which may still be present even following access queries. It must therefore be ensured that there is no hazard remaining when removing the actuator or key and access can be unlocked.

Design and Operation

An extremely robust and flexible solenoid lock, which monitors the safe position of one or more entries in a system, for instance, of a guard or protective door. For this purpose the module is used in combination with other mechanical modules, for instance, actuator, key and/or padlock module. The key and padlock modules can only be installed above the Locking module.

The entries can only be released after the safety of the plant for the operating personnel has been ensured.

The locking modules STS-ZRX, STS-ZAX and STS-ZRH with manual unlocking can also be used without actuator module only for releasing keys in a key interlock system. This function is used in key interlock systems with central shut-off or shut-off outside the system, for instance in Ex zones, with strong vibration or dirt build-up, etc.

When installing one of the modules STS-01, STS-01S, STS-V, STS-B, STS-D or STS-A above a locking module STS-ZRX and/or STS-ZRH, their release only takes place after applying a control signal to the magnet of the locking module. If emergency or escape unlocking is required, please refer to data sheet STS-ZRN, STS-ZRF, STS-ZAN.

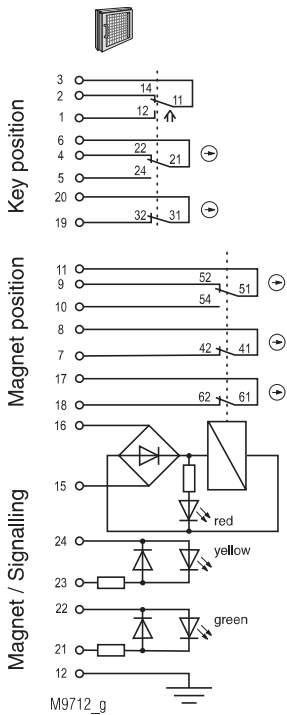


Fig. 1:
Locking module activated:
Magnet locked, key and actuator
inserted,
Door closed

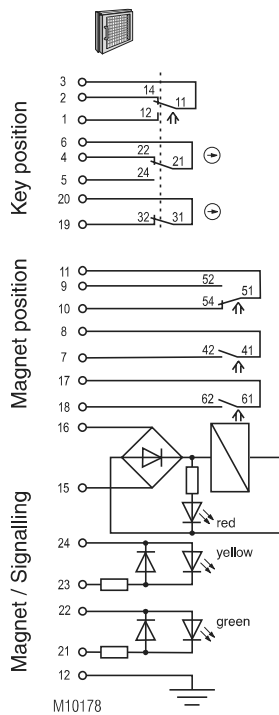


Fig. 2:
Locking module deactivated:
Magnet released, key and
actuator inserted,
Door closed

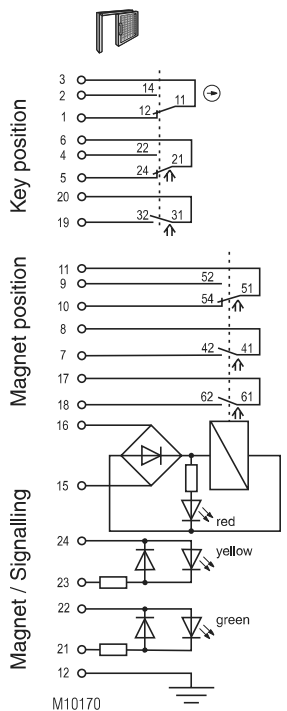


Fig. 3:
Locking module deactivated:
Magnet released, key and actu-
ator removed,
Door open

Switching logic

		Fig. 1	Fig. 2	Fig. 3
Key contacts	3	2		
	3	1		
	6	4		
Magnet contact	6	5		
	19	20		
	11	9		
Control signal Magnet	11	10		
	7	8		
	17	18		
		U_N		
	15	16		

■ closed
□ open

The state shown in **Figure 3** does not depend on the control signal of the magnet.

If the control signal is applied and the key inserted the locking module changes to the state of **Figure 2**.
If no signal is applied and the key inserted the locking module changes to the state of **Figure 1**

Enclosure:	Stainless steel V4A / AISI 316L
Degree of protection:	IP 65
Temperature range standby current principle:	- 25 °C to + 60 °C
Temperature range load current principle:	- 25 °C to + 40 °C
Storage temperature:	- 40 °C to + 80 °C
Mechanical principle:	Rotating axis with redundant actuation
Connection method:	Cage tension spring clamping
min. connection cross-section:	0.25 mm ²
max. connection cross-section:	1.5 mm ²
Cable entry:	1 x M20 x 1.5
B10 _g :	2 x 10 ⁶ switching cycles
Electrical service life:	5 x 10 ⁶ switching cycles
Locking force:	min. 1000 N Depending on actuator and actuator module
Shearing force:	min. 1000 N; depending on actuator
Locking module principle:	Standby current, failure locking-proof
Magnetic principle:	Standby current or load current
min. operating speed:	100 mm/s
max. operating speed:	500 mm/s (by exception, 1500 mm/s is permitted)
max. switching frequency:	360/h
Operating mode:	100% ED
Nominal voltage U_N :	AC/DC 24 V
Nominal voltage range:	0.85 ... 1.1 U_N
Power consumption:	6 W
Rated impulse voltage:	0.8 kV
Rated insulation voltage:	< 60 V
Contacts	
Door position:	1 NC contact, 2 diverse changeover contacts
Magnet position:	2 NC contacts + 1 changeover contact
Switching principle:	Changeover contact with forced-opening snap-action switches
max. operating current	
Standby current principle:	2 A
Load current principle:	1 A
Contact material:	Ag / AgSnO ₂
Short circuit strength, max. fusing:	4 A gG
Indicator	LED red: Magnet energized LED yellow/green (separate selection possible)
Test principles:	EN ISO 13849-1:2008 EN 1088+A2:2008 EN 60947-5-1:2005 GS-ET 19:04.2004
Intended use:	up to max. cat. 4, PL e according to EN ISO 13849-1
Installation:	according to DIN EN 50041
Contact elements:	IEC EN 60947-5-1 Appendix K
Diagnostic Coverage (DC):	see data sheets STS basic units and STS design guide
Fault exclusions:	none
Protection against faults of common cause:	see table in STS design guide
Repair and replacement:	by manufacturer only
Test intervals:	semi-annually recommended min. once a year

Variants

Locking module STS-ZRX

Locking module, standby current principle, without additional functions.

Locking module STS-ZRH

Locking module, standby current principle, manual unlocking.

In the case of electrical faults, for instance, during power failure, the manual unlocking allows the mechanical release of an access from outside the dangerous area with the help of a tool.

With the actuation of the manual unlocking, the circuits on terminals 7 and 8; 9 and 11 as well as 17 and 18 will be cut off at the same time and contact between 10 and 11 will be closed. Opening of these circuits must generate an emergency-stop.

The manual unlockings are not sealed or lead-sealed because of the typically rugged applications. When using a locking module with manual unlocking we therefore recommend combining it with acoustic and also visual warning signals and to provide additional locking on the control level.

Locking module STS-ZAX

Locking module, load current principle, without additional functions.

Locking modules STS-YRX and STS-YRH

For applications where the key modules STS-10, STS-10S or an actuator module STS-K, STS-E or STS-W shall be installed above the Locking module, the STS-YRX, STS-YRH and STS-YAX versions are available. Additional information about the Circuit Diagram and use of the Locking modules STS-YRX, STS-YRH and STS-YAX is available in the data sheet STS-YRX, STS-YRH, STS-YAX as well as in data sheets STS-K and STS-E.

Function Selection / Variants

Locking module	Selectable functions		
	Standby current	Load current	Manual unlocking
STS-ZRX	X		
STS-ZRH	X		X
STS-ZAX		X	

Important Notes

Function differences of locking modules with load current principle and locking modules with standby current principle.

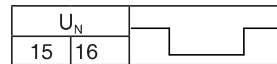
Locking modules based on the standby current principle are in de-energized condition when in the locked position. This must be remembered especially when examining faults such as power failure or wire break.

Contrary to the locking modules based on the standby current principle locking modules based on the load current principle lock only when the circuit is closed. The locking modules unlock if the circuit opens with the load current principle.

If a plant represents a hazard in the event of a power failure, it must not be secured using a locking module based on the load current principle. In these cases a locking module based on the standby current principle must be used. Refer also to EN1088 1995 section. 3.4.

If a locking module is used based on the load current principle terminals 7 and 8 or 17 and 18 must be included in the safety circuit.

With the load current principle the control signal for the magnet is inverted.



Manual unlocking

If misuse of the manual unlocking must be suspected a locking module based on the standby current principle without manual unlocking can also be used as an alternative. In the event of a power interruption the locking module must be unlocked in this case by removing the cover and subsequently pushing back the magnetic tappet (refer to the SAFEMASTER STS Installation and Operating Instructions).

A SAFEMASTER-STS locking module based on the load current principle with manual unlocking is not available since it releases in the event of a power interruption.

Ordering Designation

Locking module STS-ZRX

Article number: 0060982

Locking module STS-ZRH

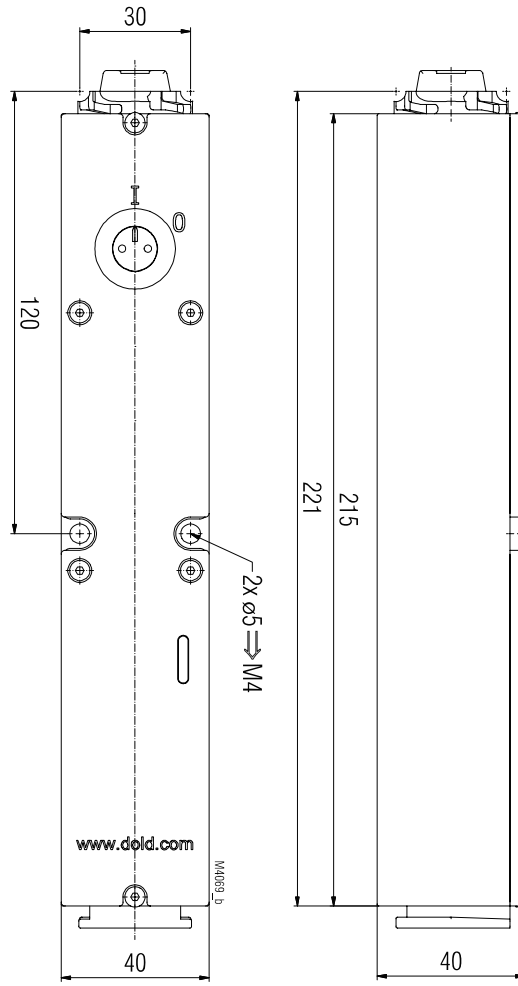
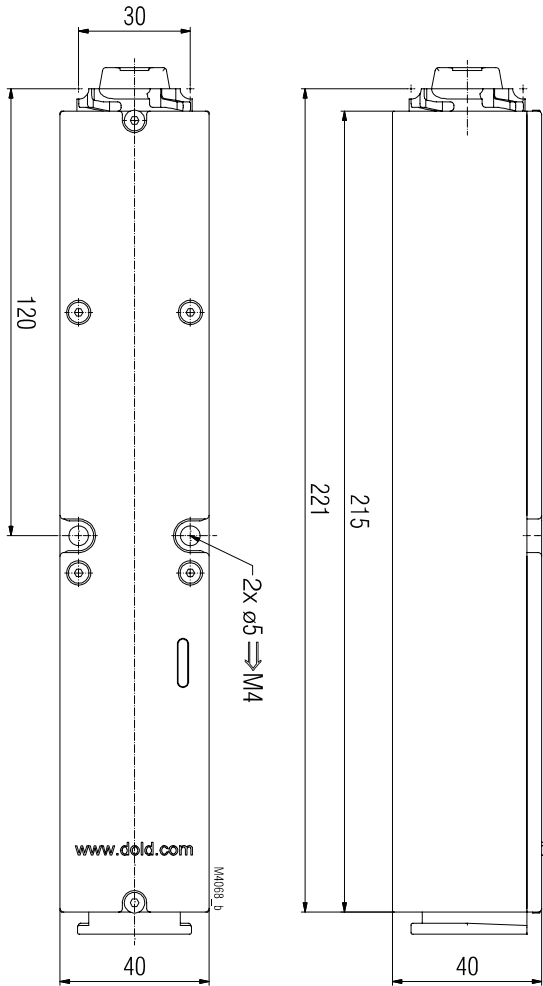
Article number: 0060983

Locking module STS-ZRH cover

Article number: 0065273

Locking module STS-ZAX

Article number: 0063406



Locking module STS-ZRX, STS-ZAX without manual unlocking

Locking module STS-ZRH with manual unlocking

