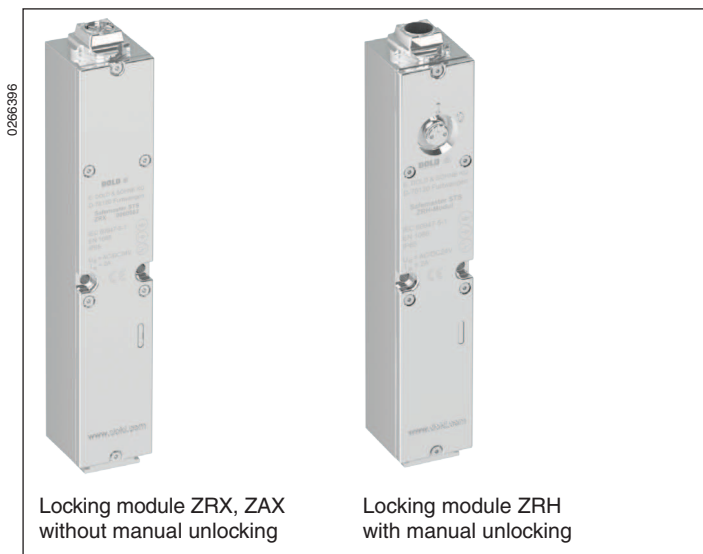


SAFEMASTER STS Safety Switch- And Key Interlock System Locking Module ZRX, ZAX and ZRH

Translation of the
german original



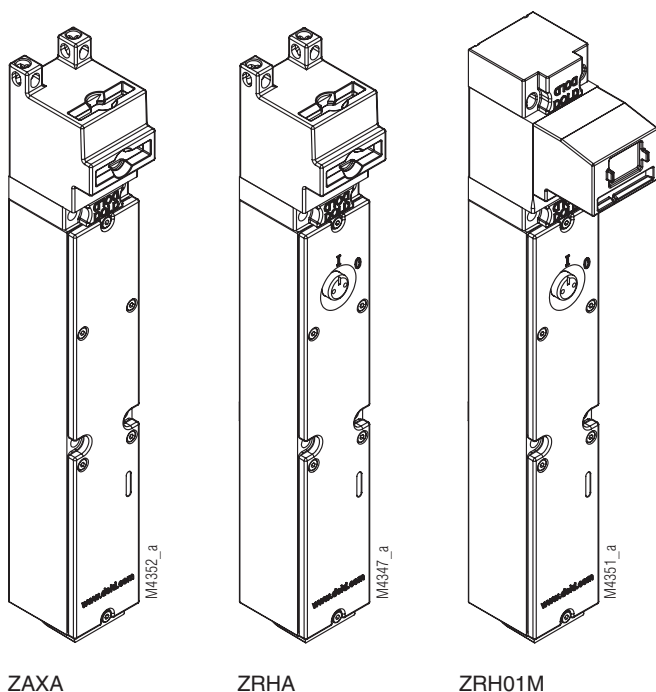
STS-System Benefits

- EU-Test certificate according to the directive 2006/42/EG, annex IX
- For safety applications up to PLe/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
- Coding level low, medium, high according to DIN EN ISO 14119:2014-03

Features

- 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 Markings



Applications

Locking modules ZRX, ZAX and ZRH 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 Function

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 ZRX, ZAX and 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 e.g. key module 01, 01S, padlock module V, actuator module B, D or A above a locking module ZRX and/or 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 locking module ZRN, ZAN and ZRF.

Circuit Diagrams (Example ZRH01BM)

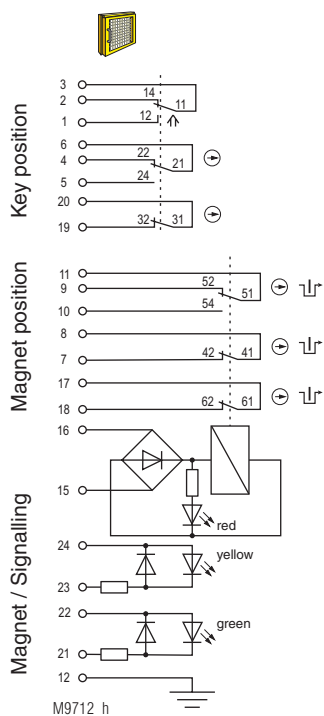


Fig. 1:
Locking module activated:
Magnet locked, key and actuator
inserted,
Door closed

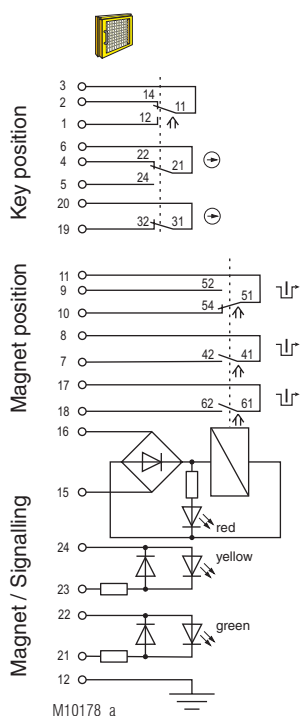


Fig. 2:
Locking module deactivated:
Magnet released, key and
actuator inserted,
Door closed

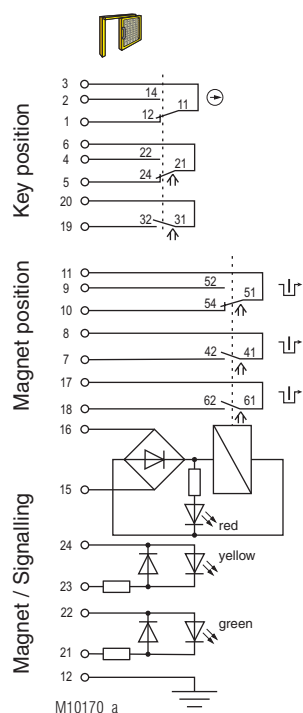


Fig. 3:
Locking module deactivated:
Magnet released, key and actuator
removed,
Door open

Switching logic

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

■ closed
□ open

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

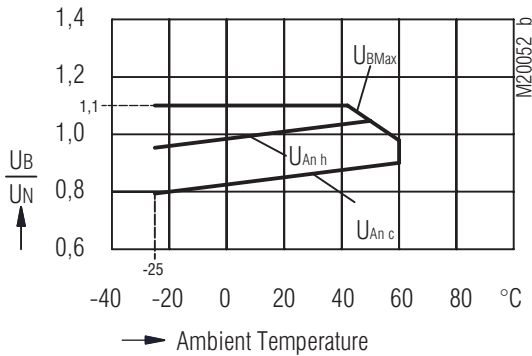
If the control signal is applied and the key removed the lock changes to the state of **Figure 2**.

If no signal is applied and the key is removed the lock changes to the state of **Figure 1**

Technical Data

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 _d :	2 x 10 ⁶ switching cycles
Electrical service life:	5 x 10 ⁶ switching cycles
Locking force:	min. 3800 N depending on actuator and actuator module
Shearing force:	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
Power supply	„class 2“ in accordance to UL508 table 32
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
Utilization category of switching elements	
to AC 15:	1 A
to DC 13:	0.5 A
Contact material:	Ag / AgSnO ₂
Short circuit strength, max. fusing:	2 A gG
Indicator	LED red: Magnet energized LED yellow/green (separate selection possible)
Test principles:	EN ISO 13849-1:2008 DIN EN ISO 14119:2014-03 EN 60947-5-1:2005 GS-ET-15:02.2011 GS-ET-19:02-2011 GS-ET-31:02-2010
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
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

Solenoid derating graph



U_{BMax} maximum power supply dependent upon temperature
 $U_{An c}$ response voltage at coil temperature = ambient temperature
 $U_{An h}$ response voltage at preceding agitation at $1.1 \times U_n$

Variants

Locking module ZRX

Locking module, de-energized on trip, without additional functions.

Locking module ZAX

Locking module, energized on trip, without additional functions.

Locking module ZRH

Locking module, de-energized on trip, 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 modules YRX and YRH

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

Function selection / Versions

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

Only when the safety evaluation shows, that a solenoid lock with closed circuit operation is not suitable or is not required, a solenoid lock with open circuit operation can be used.

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 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 (see switching logic).

Control signal Magnet	load current principle U_N	
	15	16

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

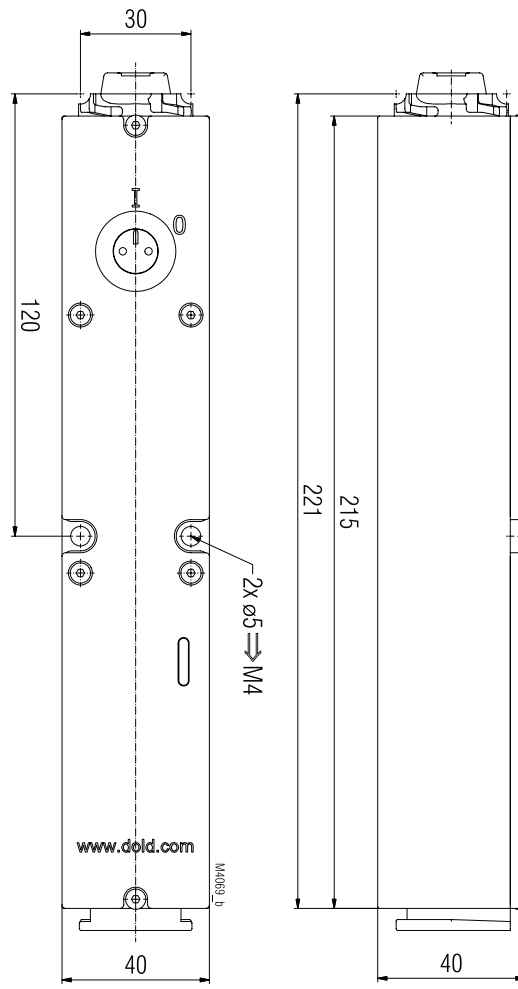
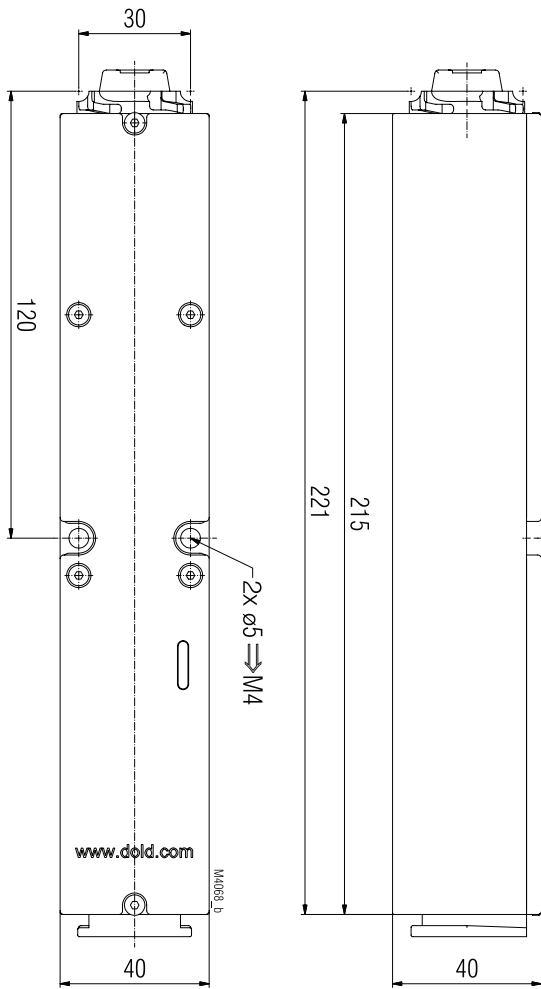
Ordering Designation

Locking module ZRX
Article number: 0060982

Locking module ZAX
Article number: 0063406

Locking module ZRH
Article number: 0060983

Locking module ZRH cover
Article number: 0065273



Locking module ZRX, ZAX without manual unlocking

Locking module ZRH with manual unlocking

