SAFEMASTER STS
Safety Switch- And Key Interlock System
Basic Unit STS-ZRH01A

0258047

Presentation
in the deactivated condition:
Key and actuator removed

STS-System Benefits
- TÜV certificate according to the legal and standard requirements
- 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, solenoid locking and key transfer in a single system
- Easy installation through comprehensive accessories
- Protection against lock-in

Features STS-ZRH01A
The unit is particularly suitable for applications with:
- Full body access (lock-in danger)
- Several secured entries
- Single-channel/ redundant/ diverse safety circuits
- Rugged ambient conditions

Approvals and marking

CE TÜVRheinland Functional Safety Type Approved FS

Function

Safety switch with forced key removal and electromagnetic blocking of the key

Application

To secure separating guards such as safety gates and hoods in machine and plant engineering.

Design and Operation

STS solenoid locking units prevent opening of separating guards and keep them closed as long as their is a risk of injury in the secured plant.

Attention!

Hazards must be ruled out before a key can be removed and the movable part of the guard can then be opened!

The STS solenoid locking unit is to be integrated into a system and connected with a control unit so that the hazardous machine can run only when the guard is locked and closed.

An access can only be opened after a release signal was sent by the machine control to the STS-ZRH01A solenoid locking unit. The actuator can only be removed from actuator module A and the access opened after removing the key from key module 01. Key operation is forced. Key entry ins blocked when the door is open. The key can be entered again after the access was closed again. Only after entering the key is the solenoid locking activated again and the machine can be restarted.
Key and magnet position are monitored by separate contacts.

STS-ZRH01A is usually used in the system in connection with additional STS units and SAFEMASTER products (e.g. release by speed monitor UH 5947, standstill monitor LH 5946 or speed/standstill monitor BH5932). The key with forced removal can be used as protection against lock-in.

Circuit Diagrams

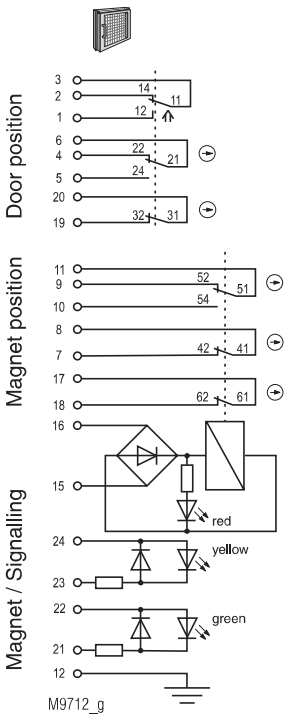


Fig. 1:
Solenoid locking activated:
Magnet locked, key
and actuator inserted,
Door closed

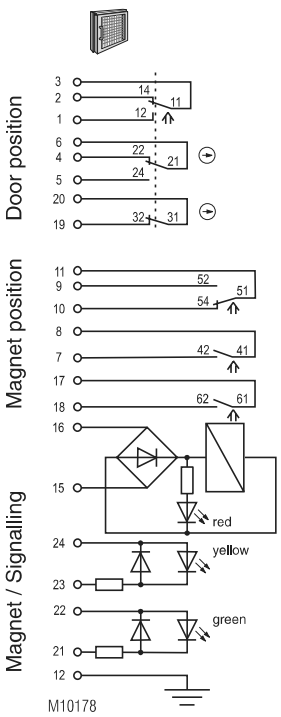


Fig. 2:
Solenoid locking deactivated:
Magnet released, key
and actuator inserted,
Door closed

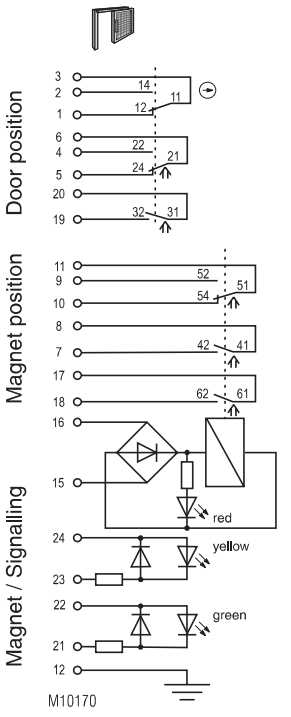
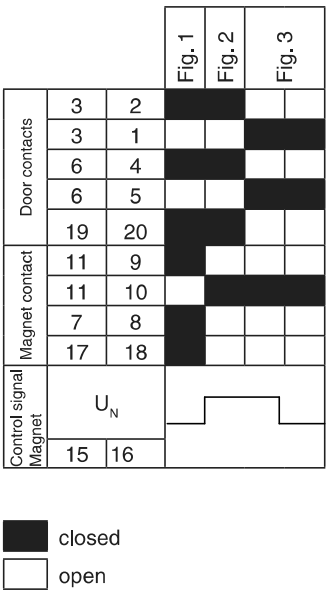


Fig. 3:
Solenoid locking deactivated:
Magnet released, key
and actuator removed,
Door open

Switching logic



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 solenoid locking changes to the state of **Figure 2.**
If no signal is applied and the key inserted the solenoid locking 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 mm²
max. connection cross-section:	1.5 mm²
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. 1000 N Depending on actuator and actuator module
Shearing force:	min. 1000 N; depending on actuator
Solenoid locking 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
Mounting:	according to DIN EN 50041
Contact elements:	IEC EN 60947-5-1 Appendix K
Additional requirement for cat. 4 structure (as single unit):	Add 2nd actuator module, Type STS-ZRH01BA

Diagnostic coverage (DC), (mechanical):

Logic and output	**cat. 2**	**cat. 3**	**cat. 4**
STS-ZRH01A	84 %	85 %	85 %
STS-ZRH01BA	98 %	99 %	99 %

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 and Combination Options

Because of their modular design the basic units of the Safemaster STS System can be combined and expanded according to customer requests. This allows for a variety of possible units and functions.

Overview of the basic units

	Application			
Group of the basic unit	**Basic function with separate actuator**	**Forced key removal as protection against lock-in or to operate additional units**	**Optional key removal as protection against lock-in or to operate additional units**	**Units without actuator**
Mechanical	STS-M10A	STS-M11A	STS-M10B01M	STS-M12M
Locking	STS-ZRHA	STS-ZRH01A	STS-ZRHB01M	STS-ZRH01M
Switch	STS-SXA	STS-SX01A	STS-SXB01M	STS-SX01M
For additional information refer to the data sheets of the individual modules and other basic units.				

Data sheets

STS Solenoid locking modules ZRX/ZRH/ZAX
STS Key module 01/10
STS Actuator module A

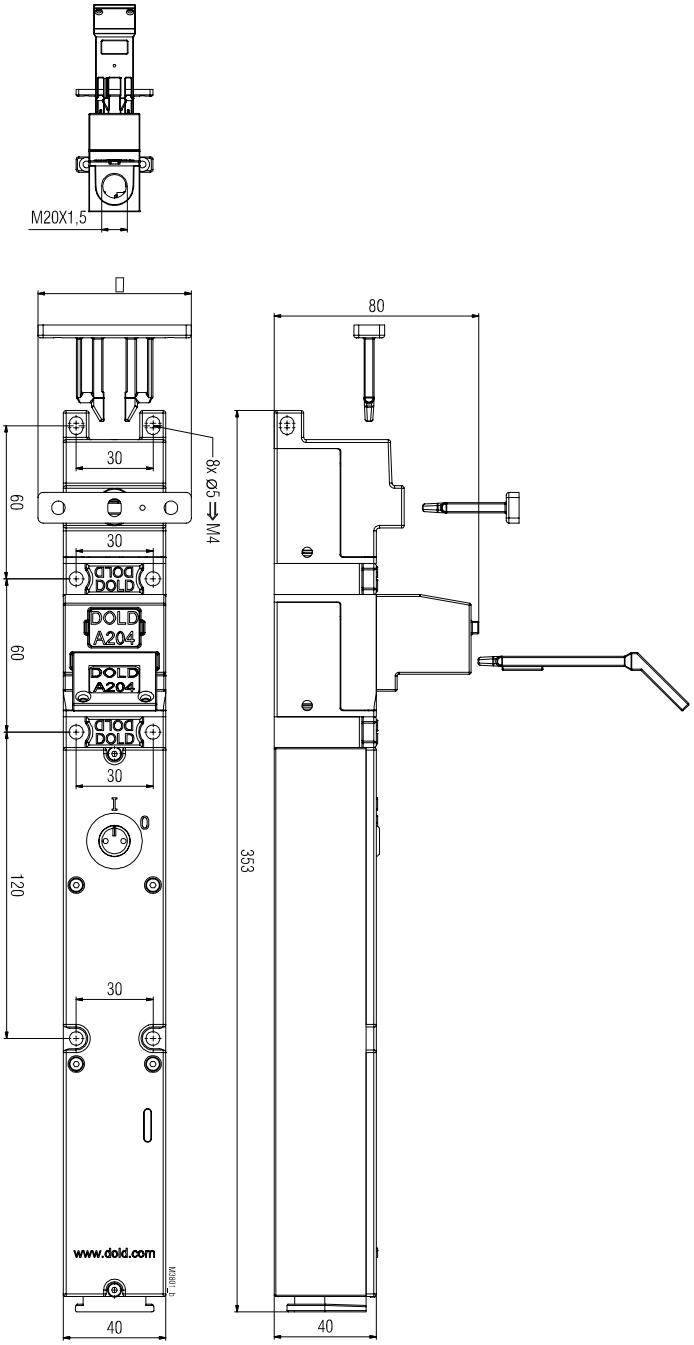
Take advantage of the advice of the **E. DOLD & SÖHNE KG** specialists regarding the choice of units and combination of a system.

Ordering Example

STS- Z R H 01 A

- A — Actuator module A
- 01 — Key module 01
- H — H = Manual unlocking / H = Without manual unlocking / N = Emergency unlocking
- R — R = Closed circuit operation / A = Open circuit operation
- Z — Solenoid locking

Dimensional Drawing [mm]



Clearance tolerances ± 2%