

### SAFEMASTER STS Safety Switch- And Key Interlock System Basic Unit YRX10B01M

Translation of the  
german original



**Presentation in the deactivated condition:**  
1st key inserted; Actuator and 2nd key removed

#### 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, solenoid locking 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

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



#### Function

Safety switch (type 2) for separating guards with electromechanical solenoid locking, forced key inserting and optional key removal. Only when a signal is connected to the magnet, the first key can be inserted.

#### Application

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

#### Design and Operation

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

#### Attention!



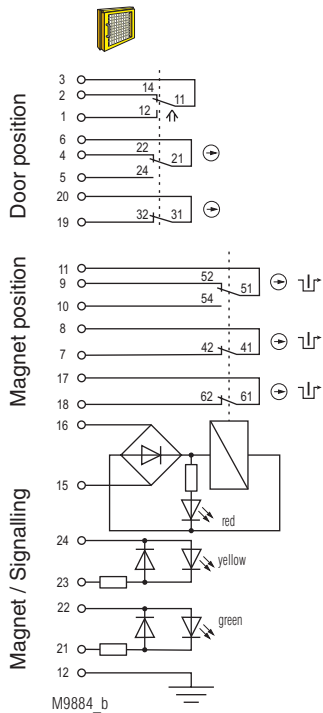
Hazards must be ruled out before a key can be inserted and the movable part of the guard can then be opened!

The 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.

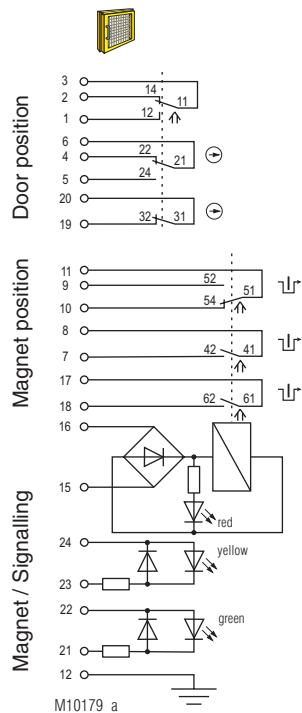
An access can only be opened after a release signal was sent by the machine control to the YRX10B01M solenoid locking unit. The actuator can only be removed from actuator module and the access opened after inserting the key in the key module. Optionally the second key can be removed. The Key operation of the first key is forced. Key entry is blocked when the door is open. The key can be removed again after the access was closed again. Only after removing the key is the solenoid locking activated again and the machine can be restarted.

Key and magnet position are monitored by separate contacts.

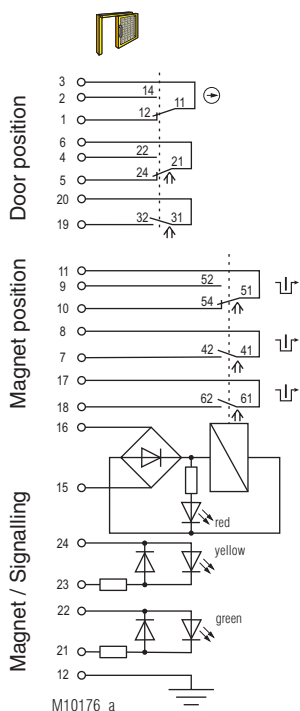
YRX10B01M is usually used in the system in connection with additional STS units and SAFEMASTER products (e.g. release by speed monitor UH 5947, standstill monitor LH 5946 or speed/standstill monitor BH 5932). The second key with forced removal can be used as protection against lock-in or for the operating release of additional units.



**Fig. 1:**  
Solenoid locking activated:  
Magnet locked, 1st key  
removed, actuator and  
2nd key inserted,  
Door closed



**Fig. 2:**  
Solenoid locking deactivated:  
Magnet released, optionally 1st  
key inserted, actuator and key  
inserted,  
Door closed



**Fig. 3:**  
Solenoid locking deactivated:  
Magnet released,  
1st key inserted,  
Actuator removed,  
Door open,  
optionally 2nd key removed

Switching logic

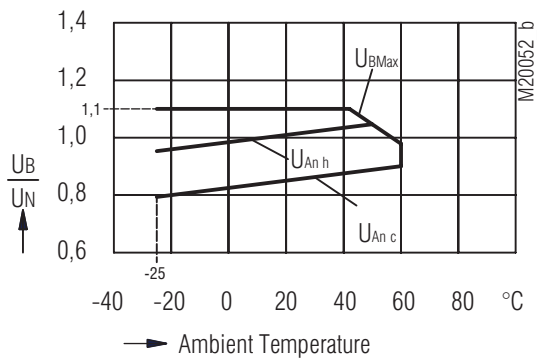
			Fig. 1	Fig. 2	Fig. 3
Door contacts	3	2			
	3	1			
	6	4			
	6	5			
Magnet contact	11	9			
	11	10			
	7	8			
	17	18			
Control signal Magnet	$U_N$				
	15	16			

■ 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 actuator inserted the solenoid locking changes to the state of **Figure 2**.  
If no signal is applied and the solenoid locking is inserted the solenoid locking changes to the state of **Figure 1**

Enclosure:	Stainless steel V4A / AISI 316L / AISI 630
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 <sup>2</sup>
max. connection cross-section:	0.75 mm <sup>2</sup>
Cable entry:	1 x M20 x 1.5
B10 <sub>d</sub> :	2 x 10 <sup>6</sup> switching cycles
Electrical service life:	5 x 10 <sup>6</sup> switching cycles
Locking force:	min. 1000 N
Shearing force:	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
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 $U_N$ (at 23 °C ambient temperature)
Power consumption:	6 W
Rated impulse voltage:	0.8 kV
Rated insulation voltage:	≤ 50 V
Contacts	
Door position:	1 NC contact, 2 antivalent 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
Rated conditional short circuit current:	1000 A
Contact material:	Ag / AgSnO <sub>2</sub>
Short circuit strength, max. fusing:	2 A gG
Utilization category of switching elements to AC 15:	1 A / AC 230 V
to DC 13:	0.5 A / DC 60 V
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
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 ZRHBB01M
Diagnostic coverage (DC), (mechanical):	
<b>Logic and output</b>	
YRX10B01M:	<b>cat. 2</b> 60 % <b>cat. 3</b> 90 % <b>cat. 4</b> 90 %
YRX10 BB01M:	90 % 99 % 99 %
Protection against faults of common cause:	see table in STS design guide by manufacturer only
Repair and replacement:	
Test intervals:	
for PL a to d:	min. once a year
for PL e:	min. once a month

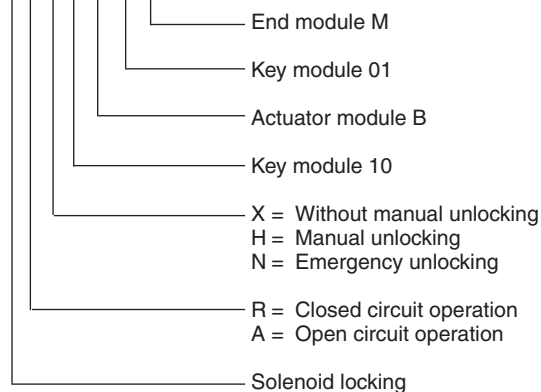
## Solenoid derating graph



$U_{BMax}$  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  $1.1 \times U_n$

## Ordering Example

STS-Y R X 10 B 01 M



## 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

Functions	Safety switches design type 2	Safety switches design type 2 with solenoid lock	Mechanical units design type 2	Mechanical units with electrical monitoring	Mechanical units with electrical release
Units with standard function	SXA	ZRHA	M10A	RX10A RXK01M	YRXKM YRXK01M
Units with mechanical lock and forced key extraction	SX01A	ZRH01A	M11A	RX11A RXK11M	YRX10A YRX11A
Units with optional key extraction	SXB01M	ZRHB01M	M10B01M	RX10B01M RX10K01M	YRX10B01M
Units without actuator	SX01M	ZRH01M	M12M	RX11M	YRX11M

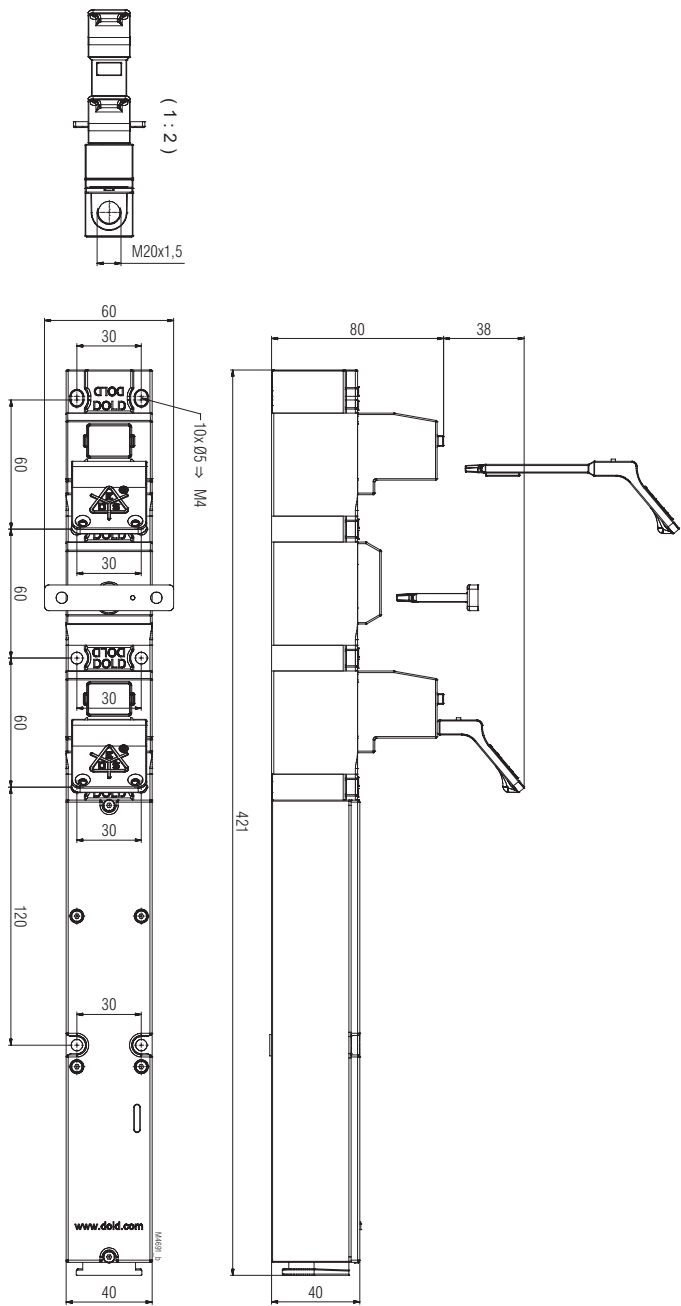
For additional information refer to the data sheets of the individual modules and other basic units.

### Data sheets

Solenoid locking modules YRX/YRH/YAX  
 Actuator module B  
 Key module 01/10  
 End module M



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



Illustrations: YRH10B01M  
Clearance tolerances  $\pm 2\%$

