



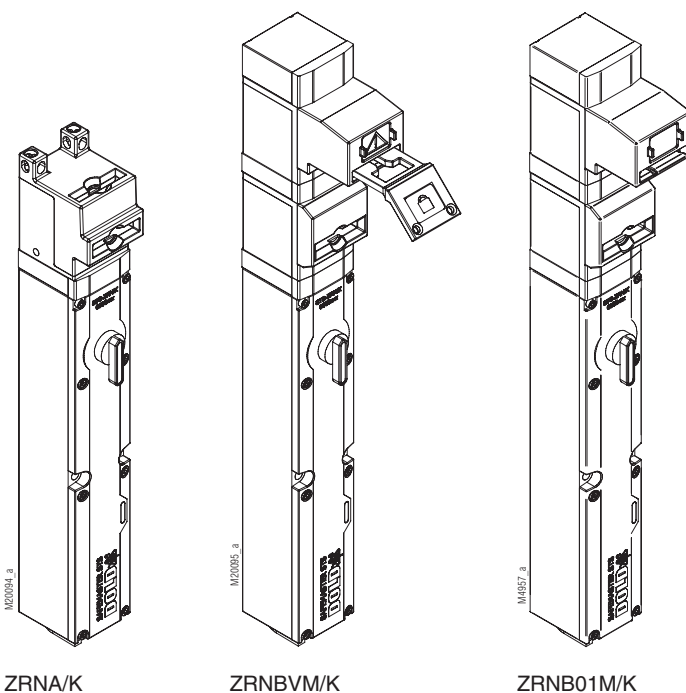
STS/K-System Benefits

- 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 composite version of stainless steel and plastic 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

- Locking module for monitoring doors and entries
- Optionally with emergency unlocking
- De-energized on trip (ZRN) or energized on trip (ZAN)
- Status indication by integrated LEDs
- Separate monitoring of actuator / key position and locking module position
- This modules are also available in stainless steel

Installation Examples



Approvals and Markings



Application

Locking modules ZRN/K and ZAN/K are assembled with other modules to an STS/K unit. They serve as a solenoid lock of separating guards on machines with cycle or overrun times or other hazards, which may still be present even after the access query. 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

Rugged and flexible solenoid lock monitoring the safe position of an access in the system. For this purpose the modules are used in combination with other mechanical modules, for instance, actuator, key and/or padlock modules. Access can only be released after the safety of the equipment has been ensured for the operating personnel.

With ZRN/K an access can only be opened when a signal is applied to the magnet. In addition, both modules offer protection against lock-in. In emergency situations a door can be opened through manual operation of the emergency release (ZRN) without a signal being applied to the magnet.

However, key modules 01/K, 01S/K as well as padlock module V/K can be installed above an actuator module B/K.

With the Locking module ZAN/K an entry can be opened when no signal is applied to the magnet. In addition, this module offers possible protection against lock-in. A door can be released in emergency situations by manually operating the emergency release.

ATTENTION !



The module ZAN may be used only in connection with the mechanical modules e.g. key modules 01/K, 01S/K, padlock modul V/K or an actuator module A/K or B/K. Combination with other mechanical STS modules is not permitted and may cause the unit to be blocked.

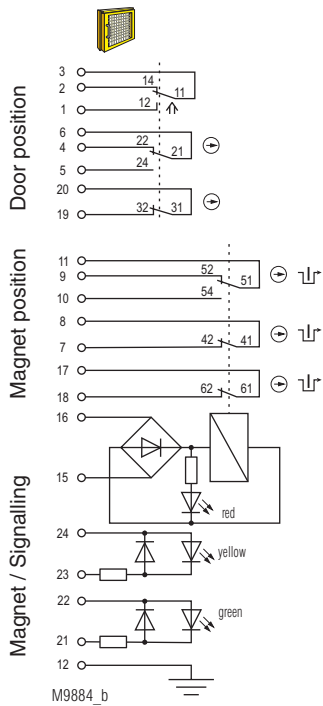


Fig. 1:
Locking module activated:
Magnet locked,
Actuator inserted,
Door closed

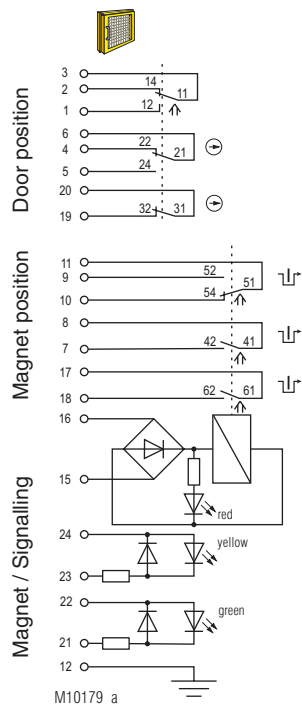


Fig. 2:
Locking module deactivated:
Magnet released,
Actuator inserted,
Door closed

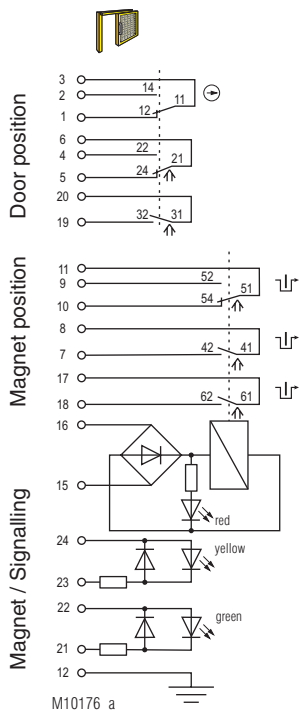


Fig. 3:
Locking module deactivated:
Magnet released,
Actuator removed,
Door open

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

Enclosure: PA + GF
Internal parts and inserting slots: Stainless steel V4A / AISI 316 / AISI 630
Degree of protection: IP 65
Temperature range standby current principle: - 25 °C to + 38 °C
Temperature range load current principle: - 25 °C to + 38 °C
Storage temperature: - 25 °C to + 60 °C
Mechanical principle: Rotating axis with redundant actuator
Connection method: Cage clamp terminals
min. connection cross-section: 0.25 mm²
max. connection cross-section: 0.75 mm²
Cable entry: 1 x M20 x 1.5
B10_d: 2 x 10⁶ switching cycles
Electrical service life: 5 x 10⁶ switching cycles
Locking force: min. 2000 N
Shearing force: depending on actuator
Locking module principle: Failure locking-proof
Standby current (STS-ZRN)
Load current (STS-ZAN)
Magnetic principle: Standby current or load current
min. operating speed: 100 mm/s
max. operating speed: 250 mm/s
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
(see solenoid derating graph)
Power consumption: 6 W
Rated impulse voltage: 0.8 kV
Rated insulation voltage: ≤ 50 V
Overvoltage category: III
Pollution degree: 2
Max. operating current
Standby current principle: 2 A
Load current principle: 1 A
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 switch

Utilization category of switching elements to AC 15: 1 A
to DC 13: 0.5 A
Contact material: Ag / AgSnO₂
Short circuit strength, max. fusing: 2 A gG
Rated conditional short circuit current: 1000 A
Indicator: LED red/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
Diagnostic coverage (DC): see data sheets STS/K basic units and STS design guide



The diagnostic coverage of the units based on the locking module ZAN/K (load current principle) corresponds to the SAFEMASTER STS/K units based on the switch modules SX/K.
Refer to the Important Notes at the end of this data sheet.

Protection against faults joint cause: see table in STS design guide
Repair and replacement: by manufacturer only
Test intervals: for PL a to d: min. once a year
for PL e: min. once at month

Technical Data

ATTENTION !



To avoid wrong usage (e.g. by overload, mounting position or usage in acid, alkaline or other hostile ambient conditions) the limitations of the product have to be observed. Please check in advance if your application requires the usage of the more robust stainless steel model of SAFEMASTER STS. The requirements of the mounting and operating instruction must be fulfilled.

Variants

Locking module ZAN/K

Locking module, energized on trip, emergency unlocking. In emergency situations, for instance, in the event of confinement, the emergency release allows for the mechanical release of an access from outside the hazard area without the help of a tool. With the actuation of the emergency release, 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. This opening of the circuits must generate an emergency-stop.

Locking module ZRN

Locking module, de-energized on trip, emergency release. Emergency unlocking in the Locking module ZRN/K is equipped with a lever similar to the ZAN/K. After operating the lever the locking module magnet is pressed down mechanically and the locking module function of the STS/K unit is unlocked. Especially for machines with overrun time this means that with the emergency release activated the access is open while the machine or plant still represents hazards. When using a locking module with emergency release we recommend combining it with acoustic and also visual warning signals and to provide additional locking on the control level. When using the ZRN/K module within a dangerous area, it can also be used as an emergency release.

Function selection / Versions

Locking module	Selectable functions			
	Standby current	Load current	Escape unlocking	Emergency release
ZRN/K	X			X
ZAN/K		X		X

Important Notes

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

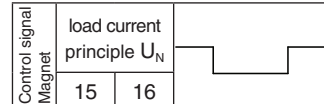
Locking modules based on the standby current principle are in de-energized condition when in the locked position. This must be remembered especially when examining faults such as power failure or wire break.

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.

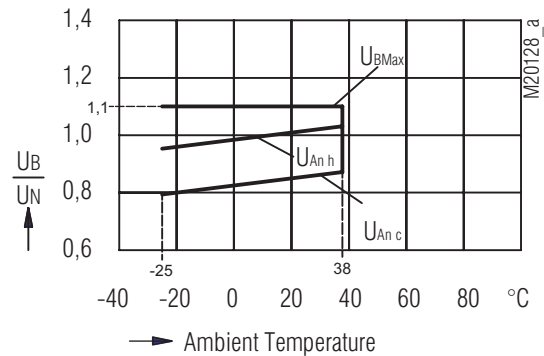
See DIN EN ISO 14119:2014-03 Abs. 5.7.1.

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.

With the load current principle the control signal for the magnet is inverted (see switching logic).



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 x U_N

Ordering Designation

Locking module ZRN/K
Article number: 0066966

Locking module ZRN/K cover
Article number: 0063868

Locking module ZAN/K
Article number: 0066986

Dimensional Drawing [mm]

