

# Non-contact emergency end-stop system for crane installations



## SCHMERSAL

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Portal cranes are used to hoist and transfer heavy loads. Typical areas of use are the transshipment of goods in ports, in railway stations and at docksides. Whenever they are used in production plants, they are called process cranes.

The movement of the travelling crab and the portal is stopped in end position by an appropriate safety switch. This system for emergency end-stop at maximum travel complies with the requirements of IEC 60204-32.

Usually, positive-break position switches (cross-lever switches) are used to stop movement at the end position.

Schmersal now offers a non-contact solution with considerable advantages, allowing for a safe switch-off in the end position. This solution consists of two non-contact BN 20 magnetic reed switches and an appropriate SRB 400 NE or SRB 402 NE safety monitoring module.

The BN 20 magnetic reed switches are frequently used in crane construction. Their latching feature enables a change of switching positions when passed by the corresponding BP 21 N actuator. If the magnetic reed switch is actuated in one direction, the reed contacts will open. When actuated in the opposite direction the reed contacts will close again.

These switching conditions are used as input signals for the corresponding SRB 400 NE safety monitoring module. Depending on the input signal received, this module switches both enabling paths independently from each other, thus guaranteeing that the movement in the direction of the end position will be

stopped when the magnetic reed switch is actuated, whether the operator gives the command or not.

Optionally, this SRB can be supplied with two time-delayed auxiliary contacts (SRB 402 NE) that trigger a creeping speed from the crane control after the fast movement has been switched off, in order to reduce overload due to braking.

Since the system is operating without physical contact, i.e. non-contact, it is insensitive to soiling as well as mechanical wear and play. Configured switch-on and switch-off points are memorised and will not shift in time.

This non-contact system, which allows for actuating speeds of up to 18 m/s, is also interesting for process cranes: the maximum actuating speed for positive-break position switches is approximately 1.5 m/s, which is far too slow for certain cranes and applications.

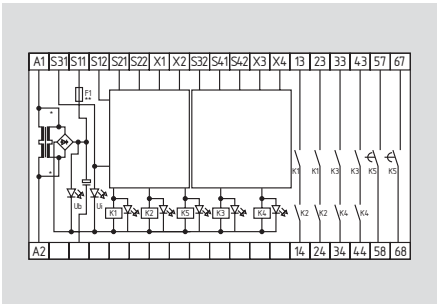
The use of non-contact magnetic reed switches instead of positive-break position switches is authorised to IEC 60204-32, provided that the safety level offered remains similar or is increased.

The components used for this emergency end-stop device comply with this requirement: the system has a complete two-channel redundant structure and reaches electrically control category 4 to EN 954-1 or class PDF-M to IEC 60947-5-3. The corresponding BG-test certificate is under preparation.



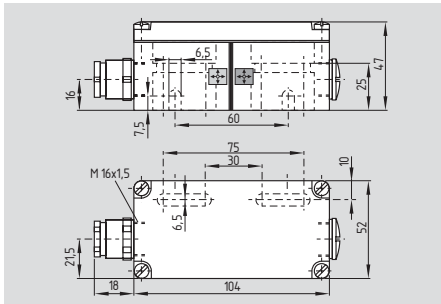
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SRB 400 NE



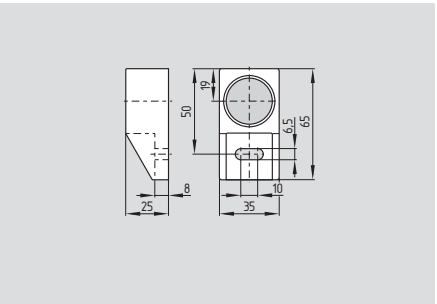
- Monitoring of 2 magnetic reed switches, 2-channel
- 2 independent sets of enabling paths
- Cross-wire detection
- Auxiliary contact with switch-on delay (option)
- Operating voltage: 24VDC and 230VAC
- 45 mm width housing
- IEC 60947-5-3, EN 954-1, GS-ET-20

BN 20



- Robust metal housing
- Large wiring compartment
- High resistance to vibration
- High switching capacity
- Bi-stable contacts
- IP 67
- IEC 60947-5-3, EN 954-1

BP 21 N



- Robust metal housing
- High switching distance of 35 mm

Approvals

under preparation

Ordering data

SRB 40①-NE-② Safety monitoring module		
Nr.	Insert	Description
①	0	no switch-on delay contacts
	2	two auxiliary contacts with switch-on delay from 0 to 5 sec.
②	24V	24 VDC
	230V	230 VAC

Approvals

under preparation

Ordering data

BN 20-2rz      Magnetic reed switch

Ordering data

Switching distance 10 to 35 mm:	1 x BP 21 N
Switching distance 15 to 50 mm:	2 x BP 21 N

**Note:**  
A system consists of: 2 x BN 20-2rz;  
2 x BP 21 N and 1 x SRB 400 NE  
or SRB 402 NE.  
To increase the switching distance,  
use 2 x BP 21 N per magnetic reed switch  
(i.e. a total of 4 x BP 21 N).

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