



Motion Control – MOC3SA Speed Monitor Safety Controllers

Optimal protection in maintenance mode

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Product description

The MOC3SA Speed Monitor is a zero speed and drive monitor which protects against dangerous movements by safely monitoring speed. It covers different safety drive functions as SLS (safety limited speed) and SSM (safe speed monitor). It offers different operating

modes of the monitoring function: With two independent proximity sensors or mixed, with one proximity and one signal monitoring speed. Moreover, the MOC3SA Speed Monitor is connectable to all SICK safety controllers.

At a glance

- Zero speed and drive monitoring
- 4 safe semiconductor outputs
- PL e (EN ISO 13849), SIL3 (IEC 61508), B50SILCL3 (EN 62061)
- Maximal input frequency 2 kHz
- Adjustable monitoring limit/monitoring frequency from 0.1 to 9.9 Hz or 0.5 to 99 Hz, depending on the version
- 2 application diagnostic outputs for failure and status display
- Diagnostic LEDs

Your benefits

- Easy commissioning using only a screwdriver
- Tool backup using the Flexi Soft Designer and the Flexi Classic Configurator
- Additional HTL encoder evaluation
- Cascading of multiple axes possible



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Detailed technical data

You can find more detailed data in the operating instructions. Download at www.mysick.com.

General system data

Safety-related parameters	
Safety integrity level	SILCL3 (EN 62061), SIL3 (IEC 61508)
Stop category	0 (EN 60204)
Performance level	PL e (EN ISO 13849-1)
PFHd (mean probability of a dangerous failure per hour)	5.0×10^{-9} (EN ISO 13849-1)
Supply voltage V_s	24 V DC (19.2 V DC ... 30 V DC)
Power consumption	3 W
Residual ripple	$3 V_{pp}^{1)}$

¹⁾ Within the limits of V_s

Electrical data

Input circuits S1, S2, I5, I6

Input voltage		
	HIGH	13 V ... 30 V
	LOW	-5 V ... 5 V
Input current		
	HIGH	2.4 mA ... 3.8 mA
	LOW	-2.5 mA ... 2.1 mA
Switch-on time		70 ms
Switch-off time		70 ms
Testimpulse		
	Test gap	4 ms
	Test period	192 ms

Input circuits I1, I2, I3, I4

Input voltage		
	HIGH	13 V ... 30 V
	LOW	-5 V ... 5 V
Input current		
	HIGH	2.4 mA ... 3.8 mA
	LOW	-2.5 mA ... 2.1 mA
Maximum frequency		2 kHz ¹⁾
Frequency change		21 kHz/s

¹⁾ Duty cycle 60%.

Response time when speed is exceeded

Monitoring frequency		
	< 1 Hz	1 s ... 10 s
	> 1 Hz < 10 Hz	100 ms ... 1,000 ms
	> 10 Hz	10 ms ... 100 ms

Output circuits X1, X2

Output voltage	18.4 V ... 30 V
Output current	≤ 120 mA

Output circuits Q1, Q2, Q3, Q4

Output voltage	18.4 V ... 30 V
Output current	2 A ¹⁾
Total current	4 A ²⁾
Testimpulse	
Width	650 µs
Test period	31 ms

¹⁾ 1.6 A at 45 °C < Tu < 55 °C.

²⁾ 5 A at 45 °C < Tu < 55 °C.

Operating data

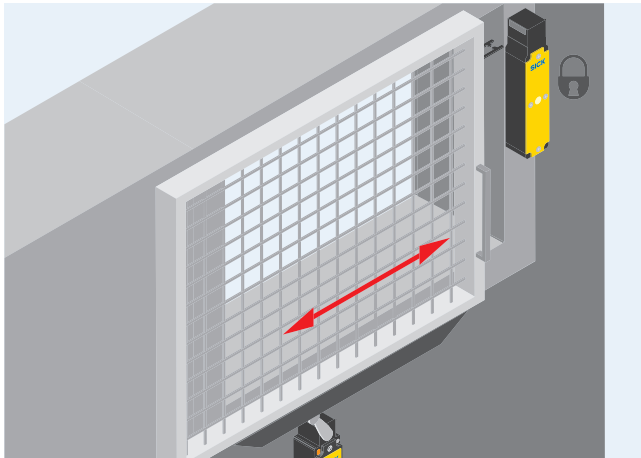
Protection class	III
Enclosure rating	EN/IEC 60529
Clamps	IP 40
Housing	IP 20
Vibration resistance	5 Hz, 500 Hz (EN 60068-2-64)
Air humidity from ... to	10 % ... 95 %, non-condensing
Climate conditions according to	EN 61131-2
Ambient operating temperature	-25 °C ... +55 °C
Storage temperature	-25 °C ... +70 °C
Electromagnetic compatibility (EMC)	Class A (EN 61131-2, EN 55011)
Connection type	Screw-type terminals / dual-level spring clamp terminals (depending on type)
Connection conductor cross-section	Single-wire or fine-wire conductor: 1 x 0.14 mm ² ... 2.5 mm ² or 2 x 0.14 mm ² ... 0.75 mm ² / fine-wire with terminal crimp according to EN 46228: 1 x 0.25 mm ² ... 2.5 mm ² or 2 x 0.25 mm ² ... 0.5 mm ²
Weight	180 g

Ordering information

Selectable speed limit	Connection type	Type	Part no.
0.1 Hz ... 9.9 Hz	Screw-type terminals	MOC3SA-AAB43D31	6034245
	Dual-level spring clamp terminals	MOC3SA-AAB44D31	6034246
0.5 Hz ... 99 Hz	Screw-type terminals	MOC3SA-BAB43D31	6034247
	Dual-level spring clamp terminals	MOC3SA-BAB44D31	6034248

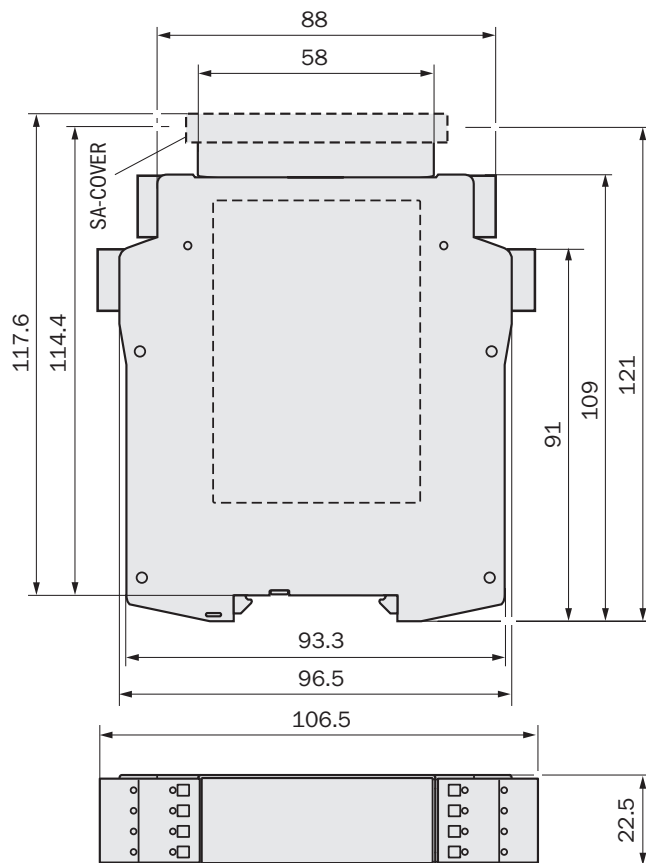
Application

- Use of the zero speed monitoring for access monitoring (e.g. machines for material processing, applications of palletizing and robotics)
- Use of the safely limited speed in maintenance mode (e.g. machines for material processing, applications of palletizing and robotics)

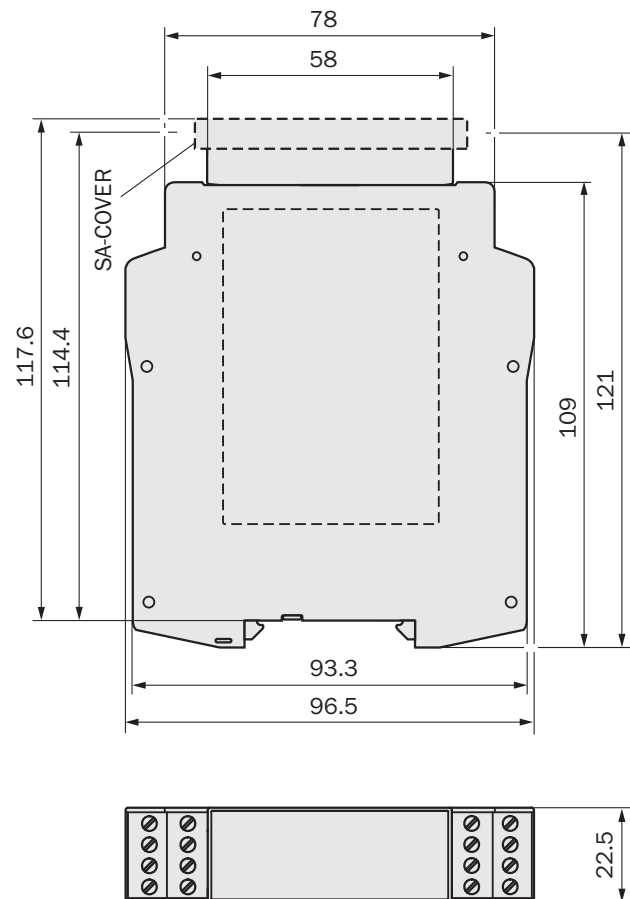


Dimensional drawings

MOC3SA-AAB43D31
MOC3SA-BAB43D31

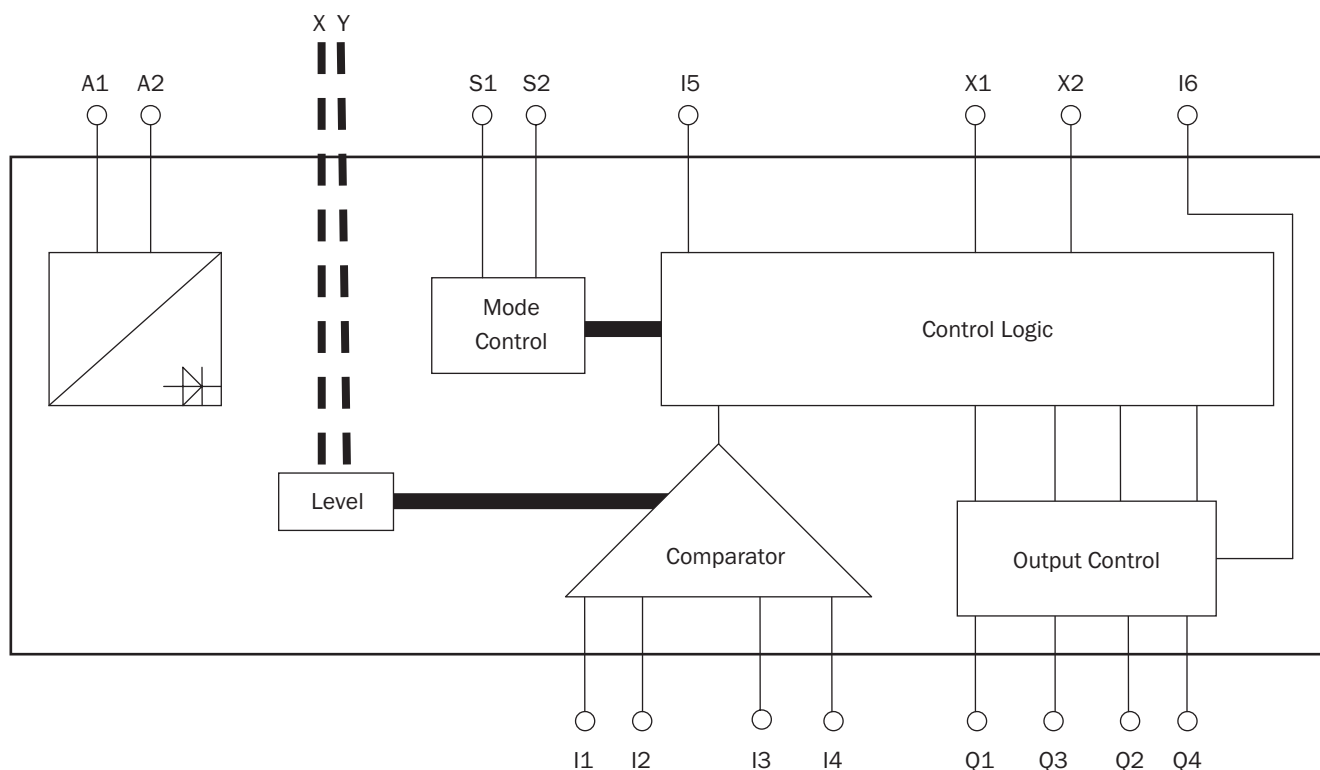


MOC3SA-AAB44D31
MOC3SA-BAB44D31



All dimensions in mm

Internal circuitry



Function description

The module's user modes

The module offers multiple operating modes, the configurations of which depend on the input wiring as well as the rotary switch settings on the module.

Depending on the input wiring (S1, S2, I2, I3 and I4) the operating mode of the speed monitor can be configured. Depending on the required safety level, there are nine different modes available. These allow the unit to operate with different sensor and signal wirings.

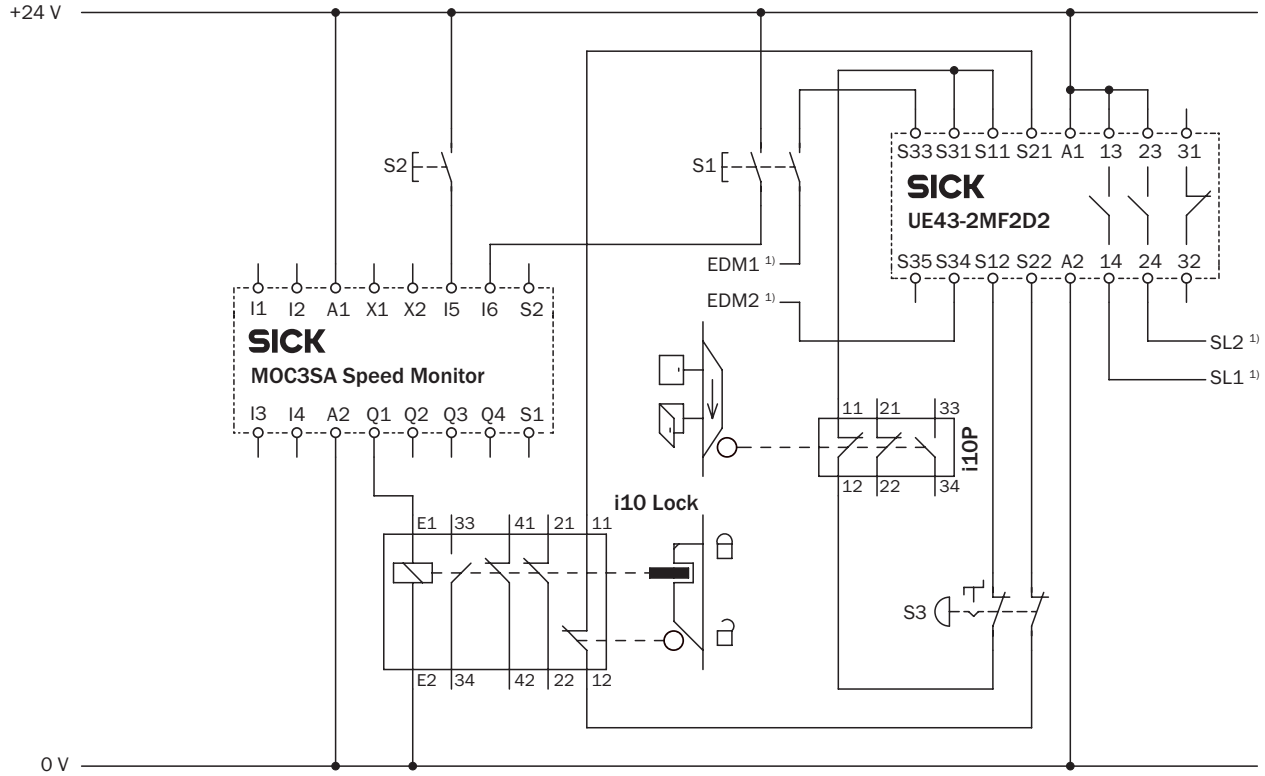
The speed to be monitored is configured via the rotating switches X and Y. In this way, it is possible to configure speeds between 0.1 and 9.9 Hz or 0.5 and 99 Hz.

Depending on the configuration of the reset, pin I6 (signal input) acts as either a start-up-bridging (inhibit) function or as a means to cascade multiple axis with additional Speed Monitor MOC3SA modules. Start-up-bridging is used to lock the locking device of a movable guard during the start process while the speed is not above the configured speed level. This means the safety outputs Q1 to Q4 will act as if a non-safe speed is present, even when the actual speed is below the speed limit.

Connection diagrams

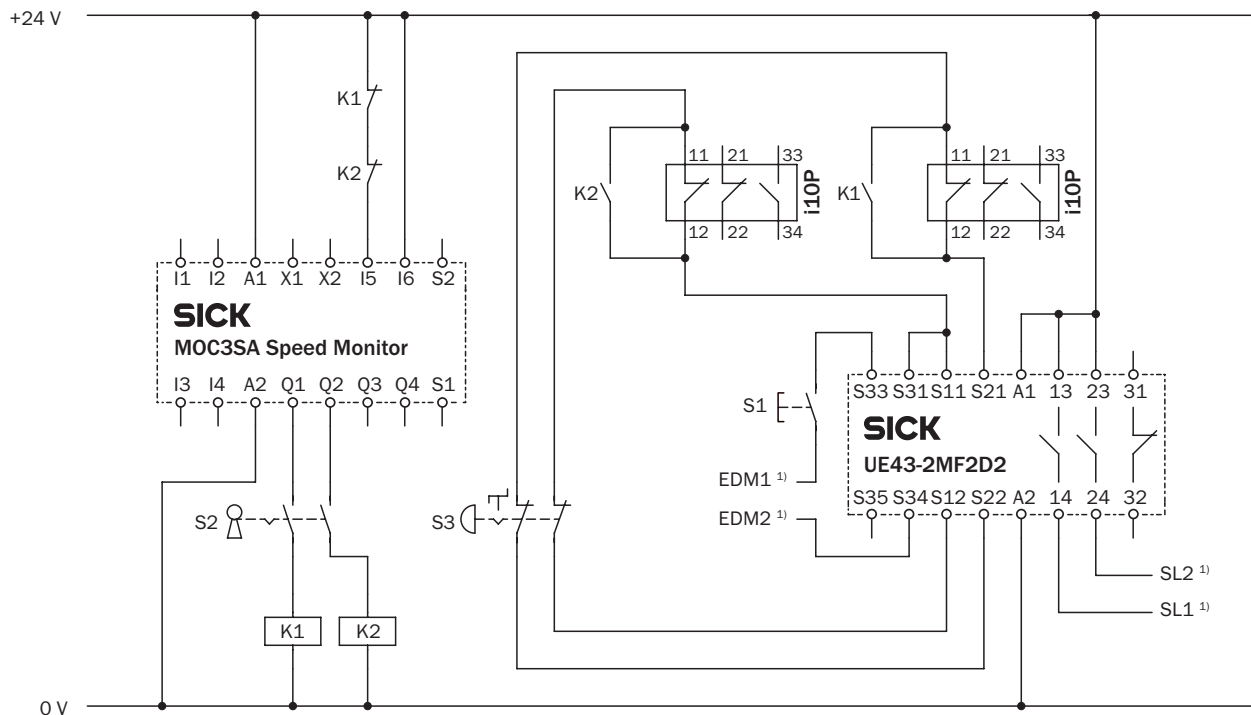
You can find more connection diagrams at www.mysick.com.

Standstill detection with unlocking of movable guard and controller inhibit



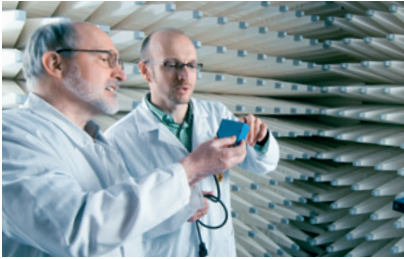
¹⁾ Information about integration into the drive controller can be found in the operating instructions of the MOC3SA Speed Monitor.

Monitoring of safely limited speed SLS in setup mode



¹⁾ Information about integration into the drive controller can be found in the operating instructions of the MOC3SA Speed Monitor.

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