

# Contact protection relay CM-KRN

## Ordering details

2

1SVR 450 081 F0000



### CM-KRN

- ① Time range selector switch
- ② Response (ON-)delay
- ③ U: green LED - control supply voltage
- ④ R: yellow LED - relay status
- ⑤ Marker label

- Protects and reduces load from sensitive control contacts
- Adjustable ON-delay 0.05-30 s
- Acts as two-position switch
- Stores switch positions
- Electrically isolated circuits
- 2 c/o contacts
- 2 LEDs for status indication

The CM-KRN protects sensitive control contacts from excessive load. It can be used with latching function or without. Bounce time of control contacts can be bypassed by the adjustable response delay time.

#### Use for contact protection

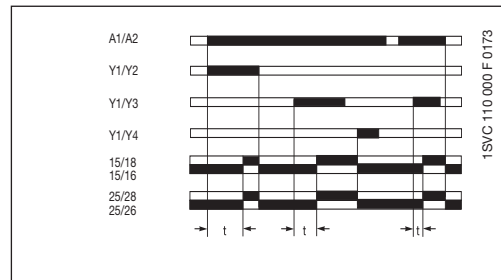
The contact to be protected is connected to terminals Y1 and Y2.

#### Use for contact protection with latching capacity

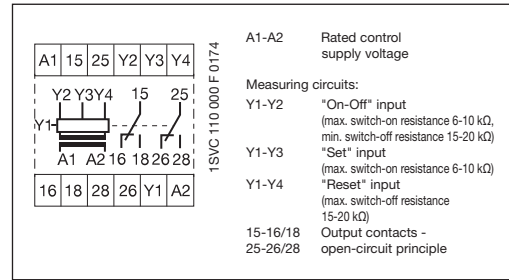
The output relay energizes after contact Y1-Y3 has been closed for at least 20 ms. It remains energized until contact Y1-Y4 closes. The switching positions are stored.

The relay is suitable for load reduction purposes for devices with minimum and maximum contacts. The CM-KRN can be operated via 3-wire proximity sensors for switching of higher power. The supply circuit, the control circuit and the output circuit are electrically isolated against each other.

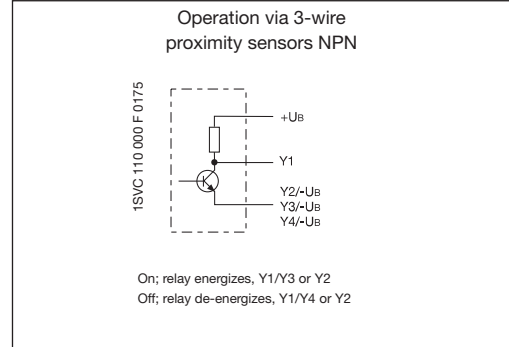
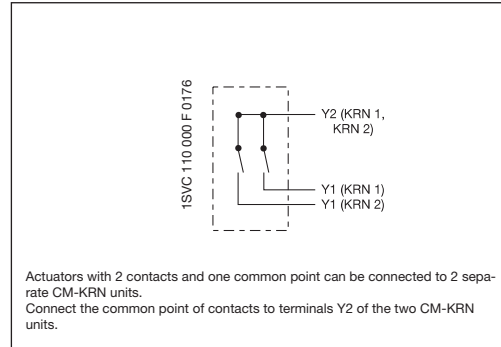
#### Function diagram CM-KRN



#### Connection diagram CM-KRN



#### Use, applications



Type	Rated control supply voltage 50-60 Hz	Order code	Pack. unit pieces	Price 1 piece	Weight 1 piece kg / lb
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#### with timing circuit 0.05-30 s

<b>CM-KRN</b>	24 V AC	<b>1SVR 450 089 R0000</b>	1		0.30 / 0.66
	110-130 V AC	<b>1SVR 450 080 R0000</b>	1		0.30 / 0.66
	220-240 V AC	<b>1SVR 450 081 R0000</b>	1		0.30 / 0.66
	380-415 V AC	<b>1SVR 450 082 R0000</b>	1		0.30 / 0.66

#### without timing circuit

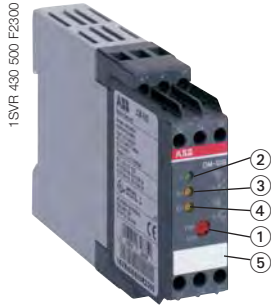
<b>CM-KRN</b>	24 V AC	<b>1SVR 450 099 R0000</b>	1		0.30 / 0.66
	110-130 V AC	<b>1SVR 450 090 R0000</b>	1		0.30 / 0.66
	220-240 V AC	<b>1SVR 450 091 R0000</b>	1		0.30 / 0.66
	24 V AC/DC <sup>1)</sup>	<b>1SVR 450 099 R1000</b>	1		0.30 / 0.66

<sup>1)</sup> not electrically isolated

• Technical data.....2/94	• Technical diagrams.....2/102	• Dimensional drawings.....2/103
• Accessories.....2/104		

# Sensor interface relay CM-SIS

## Ordering details



**CM-SIS**

- ① Rotary switch for sensor type selection
- ② U: green LED - control supply voltage
- ③ R1: red LED - relay status R1
- ④ R2: red LED - relay status R2
- ⑤ Marker label

- High efficiency
- Low heating
- Wide range of supply voltage
- Constant output voltage 24 V DC
- Safe isolation acc. to EN 50178 (VDE 0160)
- Short-circuit and overload proof
- Input protected by internal fuse
- 2 x 1 c/o contact
- 3 LEDs for status indication

The CM-SIS is used to supply 2- or 3-wire NPN or PNP sensors with power and to evaluate their switching signals. Two sensors of the types NPN or PNP can be connected simultaneously. Selection is done via the front-face rotary switch.

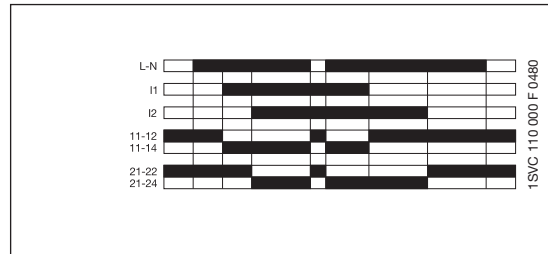
The CM-SIS (terminals L+, L-) supplies the connected sensors with voltage (24 V DC), the maximum power supply current is 0.5 A. The supply voltage and the sensor inputs are electrically isolated from the supply circuit. To ensure maximum safety when using these sensors, the principle of safe isolation has been included.

Each sensor input signal energizes the corresponding output relay without delay. The relay is energized as soon as a threshold current is exceeded at input I1 or I2. Sensor leakage currents of up to 8 mA don't affect the evaluation. The threshold value is about 9 mA. If the threshold value at input I1 or I2 is exceeded the corresponding relay R1 or R2 energizes and the corresponding LED lights up.

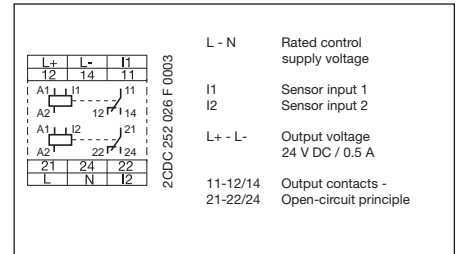
The wide-range supply voltage input of CM-SIS allows its application in nearly all supply systems.

The CM-SIS is also suitable for other applications, for example it is also possible to connect PTC or NTC resistors instead of PNP or NPN sensors or to operate the SIS directly by switching contacts.

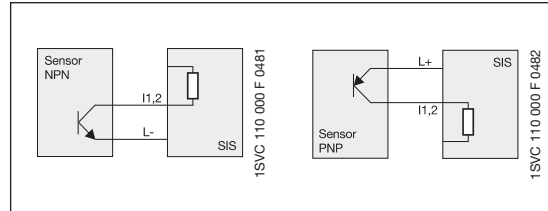
### Function diagram CM-SIS



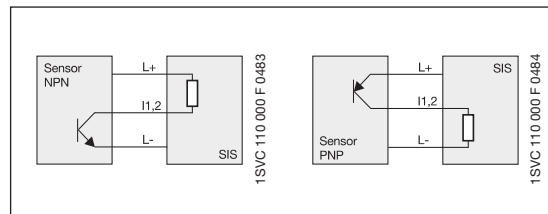
### Connection diagram CM-SIS



### Connection of 2-wire sensors



### Connection of 3-wire sensors





Type	Rated control supply voltage 50-60 Hz	Order code	Pack. unit pieces	Price 1 piece	Weight 1 piece kg / lb
<b>CM-SIS</b>	110-240 V AC / 105-260 V DC	<b>1SVR 430 500 R2300</b>	1		0.22 / 0.48

• Technical data..... 2/95	• Technical diagrams..... 2/102	• Dimensional drawings..... 2/103
• Accessories..... 2/104		

# Contact protection relay CM-KRN

## Technical data

2




Type		CM-KRN
<b>Supply circuit</b>		<b>A1-A2</b>
Rated control supply voltage $U_s$ - power consumption	A1-A2	24 V AC - approx. 3.5 VA
	A1-A2	24 V AC/DC - approx. 3.5 VA
	A1-A2	110-130 V AC - approx. 3,5 VA
	A1-A2	220-240 V AC - approx. 3.5 VA
	A1-A2	380-415 V AC - approx. 3.5 VA
Rated control supply voltage $U_s$ tolerance		-15...+10 %
Rated frequency		50-60 Hz
Duty time		100 %
<b>Timing circuit</b>		
ON-delay time		0.05-1 s, 1.5-30 s
OFF-delay time		max. 50 ms
<b>Measuring circuit / contact circuit</b>		<b>Y1-Y2/Y3/Y4</b>
Measuring input	contact protection without latching	Y1-Y2
	contact protection with latching	Y1-Y3/Y4
Threshold	Y1-Y2/Y3	6-10 k $\Omega$
Threshold-Hysteresis	Y1-Y2/Y4	15-20 k $\Omega$
No-load voltage at the measuring input		$\leq$ 10 V DC
Contact time for latching (CM-KRN without timing circuit)		min. 20 ms
Switching current at the measuring input		3 mA
Maximum applied voltage at the measuring input		$\leq$ $\pm$ 30 V (contact voltage)
<b>Indication of operational states</b>		
Control supply voltage	U: green LED	 : control supply voltage applied
Relay status	R: yellow LED	 : output relay energized
<b>Output circuit</b>		<b>15-16/18, 25-26/28</b>
Kind of output		relay, 2 c/o contacts
Operating principle <sup>1)</sup>		open-circuit principle
Rated operational voltage (VDE 0110, IEC 60947-5-1)		400 V
Rated switching voltage		400 V AC
Rated operational current $I_o$ (IEC/EN 60947-5-1)	AC12 (resistive) 230 V	5 A
	AC15 (inductive) 230 V	3 A
	DC12 (resistive) 24 V	5 A
	DC13 (inductive) 24 V	2.5 A
AC rating (UL 508)	Utilization category (Control Circuit Rating Code)	B 300
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		30 x 10 <sup>6</sup> switching cycles
Electrical lifetime (AC12, 230 V, 5 A)		0.1 x 10 <sup>6</sup> switching cycles
Max. fuse rating to achieve short circuit protection n/c / n/o contact		10 A fast-acting / 10 A fast-acting
<b>General data</b>		
Dimensions (W x H x D)		45 x 78 x 100 mm (1.77 x 3.07 x 3.94 in)
Mounting position		any
Degree of protection enclosure / terminals		IP20 / IP50
Ambient temperature range operation / storage		-25...+65 °C / -40...+85 °C
Mounting		DIN rail (IEC/EN 60715)
<b>Electrical connection</b>		
Wire size fine-strand with wire end ferrule		2 x 2.5 mm <sup>2</sup> (2 x 14 AWG)
<b>Standards</b>		
Product standard		IEC 255-6, EN 60255-6
Low Voltage Directive		2006/95/EC
EMC Directive		2004/108/EC
<b>Electromagnetic compatibility</b>		
Interference immunity		
electrostatic discharge	IEC/EN 61000-4-2	6 kV / 8 kV
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	10 V/m
electrical fast transient / burst	IEC/EN 61000-4-4	2 kV / 5 kHz
surge	IEC/EN 61000-4-5	2 kV symmetrical
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	10 V
<b>Isolation data</b>		
Rated insulation voltage (IEC 60947-1)		400 V
Rated impulse withstand voltage $U_{imp}$ (IEC 644-6)		4 kV
Pollution category (IEC 255-5, IEC 664)		3
Overvoltage category (IEC 255-5, IEC 664)		III

<sup>1)</sup> Open-circuit principle: Output relay is energized if the measured value exceeds/drops below the adjusted threshold.

# Sensor interface relay

## CM-SIS

### Technical data

Type	CM-SIS	
<b>Input circuit</b>		
Supply voltage	L-N	AC
		DC
		110-240 V AC (-15...+10 %)
		110-240 V (max. 105-260 V DC)
Frequency, AC supply		47-440 Hz
Supply voltage failure bridging time		10 ms min. at 100 % load
Current consumption		max.
		at 115 V AC
		at 230 V AC
		0.35 A
		0.27 A
		0.14 A
Inrush current at 25°C (≤ 2 ms)		33 A
Internal input fuse		800 mA slow-acting
<b>Measuring circuit</b>		
		<b>L+, L- / I1, I2</b>
Sensor voltage	L+ L-	24 V DC ± 3%
Sensor current / power		max. 0.5 A / 12 W
Residual ripple		max. 100 mV <sub>pp</sub>
Deviation with	load change statical	max. ± 0.5 %
	load change dynamical 10-90 %	max. .5 %
	change of the input voltage	max. ± 0.5 %
Short-circuit protection		overcurrent switch-off with automatic restart
Overload protection		excess temperature and overcurrent switch-off
Reset after thermal overload switch-off		automatic reset after cooling down
Sensor type connection possibilities	I1, I2	2- or 3-wire connection, NPN or PNP selectable by front-face switch
Input resistance		approx. 2.5 kΩ
Threshold value for relays R1, R2		U <sub>emitter-collector</sub> < 2,3 V (I1, I2 > 8 mA)
Maximum switching frequency		approx. 20 Hz
<b>Output circuit</b>		
		<b>11-12/14, 21-22/24</b>
Kind of output		2 relays, 1 c/o contact each
Operating principle <sup>1)</sup>		open-circuit principle
Rated operational voltage		250 V
Maximum switching voltage		250 V AC
Rated operational current I <sub>e</sub> (IEC/EN 60947-5-1)	AC12 (resistive) 230 V	4 A
	AC15 (inductive) 230 V	3 A
	DC12 (resistive) 24 V	4 A
	DC13 (inductive) 24 V	2 A
AC rating (UL 508)	Utilization category (Control Circuit Rating Code)	B 300
	max. rated operational voltage	300 V AC
	max. continuous thermal current at B 300	5 A
	max. making/breaking apparent power at B 300	3600/360 VA
Mechanical lifetime		10 x 10 <sup>6</sup> switching cycles
Electrical lifetime		0.1 x 10 <sup>6</sup> switching cycles
Max. fuse rating to achieve short circuit protection	n/c / n/o contact	6 A fast-acting / 10 A fast-acting
<b>Indication of operational states</b>		
Control supply voltage	U: green LED	 l: control supply voltage applied
Relay status R1	R1: yellow LED	 l: threshold value at input I1 exceeded
Relay status R2	R2: yellow LED	 l: threshold value at input I2 exceeded
<b>General data</b>		
Efficiency at rated load		approx. 84 % (at 230 V AC)
Ambient temperature range	operation / storage	0...+55 °C / -25...+75 °C
Dimensions (W x H x D)		22.5 x 78 x 100 mm (0.89 x 3.07 x 3.94 in)
Mounting position		horizontally
Mounting		DIN rail (IEC/EN 60715)
Minimum distance to other units		left-hand side 10 mm (0.39 in), vertical distance 50 mm (1.97 in)
<b>Electrical connection</b>		
Wire size		2 x 2,5 mm <sup>2</sup> (2 x 14 AWG)
<b>Standards</b>		
Product standard		IEC 255-6, EN 60255-6
Electrical safety		IEC(EN) 60255-5, EN 50178 (VDE 0160), EN60950, UL 508, CSA 22.2
Galvanic isolation		safe isolation between L+,L-, I1,I2, and L,N,11,12,14,21,22,24



# Sensor interface module

## CM-SIS

### Technical data

2

Type		CM-SIS
<b>Electromagnetic compatibility</b>		
Interference immunity		EN 61000-6-2
electrostatic discharge	IEC/EN 61000-4-2	Level 3 (6 / 8 kV)
radiated, radio-frequency, electromagnetic field	IEC/EN 61000-4-3	Level 3 (10 V/m)
electrical fast transient / burst	IEC/EN 61000-4-4	Level 4 (4 kV)
surge	IEC/EN 61000-4-5	Inst. class 3 (2 kV)
conducted disturbances, induced by radio-frequency fields	IEC/EN 61000-4-6	Level 3 (10 V)
Interference emission	EN 50081-2	radiated noise EN 55011, class B
Input current harmonics		no limitation
<b>Isolation data</b>		
Insulation testing		2.5 kV AC (routine test), 3 kV AC (type test)
Degree of pollution		2
Overvoltage category		II

<sup>1)</sup> Open-circuit principle: Output relay is energized if the measured value exceeds/drops below the adjusted threshold.