Measuring and monitoring relays Current/voltage measuring relays SXT 12, SXT 32

## Voltage or current measuring relay

- For monitoring the upper and lower limit values of single phase voltages
- Response value selectable in a 1:10 ratio
- Release value adjustable from to 50 to 95 % of the response value
- With auxiliary voltage
- SXT 12: Open-circuit principle
- SXT 32: Closed-circuit principle



KS 0233/1

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## Applications

- Monitoring of field excitation of motors
- Monitoring of interference voltage in networks with external power supply
- Monitoring of overvoltage levels
- Monitoring of overcurrent levels

#### Function

The measuring relay is connected to a permanent supply voltage of 50 to 60 Hz. The current or voltage to be monitored is supplied via terminals B1/B2. The supply voltage circuit and the measuring circuit are electrically isolated by means of a transformer. A response value and a release value are set on the relay. If the measured value exceeds the response value, the relay will switch. If the measured value falls below the release value, the relay will fall back into its initial position. The release value is adjustable within the range between 0.5 and 0.95 of the response value.

## SXT 12 - open-circuit principle

When supply voltage is applied, the SXT 12 is in OFF position.

If the response value is exceeded, it will switch into the ON position.

If it falls below the release value, the relay will switch back into the OFF position.

## SXT 32 - closed-circuit principle

When supply voltage is applied, the SXT 32 switches into the ON position. If the response value is exceeded, it will switch back into the OFF position. If it falls below the release value, the relay will switch back into the ON position.

## Accessories

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#### Notes

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 Unfiltered or partially filtered DC voltages and currents can also be monitored in the measuring circuit. It should be observed that the relay responds to the positive peak values, but is adjusted to the corresponding root-mean-square values at 50 Hz.

 Negative currents are not measured but also not influenced (same operating range as for the positive currents).

## Circuit diagram



## Measuring range U/I

Measuring range *	Internal	Rated	Permiss. overcurrent/overvoltage	
	resistance	frequency	continuous	max. 3 s **
0.01 – 0.1 A AC	2 Ω	50 – 60 Hz	0.25 A AC	1 A AC
0.05 – 0.5 A AC	400 mΩ	50 – 60 Hz	1.25 A AC	5 A AC
0.1 – 1 A AC	200 m $\Omega$	50 – 60 Hz	2.5 A AC	10 A AC
0.5 – 5 A AC	10 m $\Omega$	50 – 60 Hz	12.5 A AC	50 A AC
1 – 10 A AC	$5\mathrm{m}\Omega$	50 – 60 Hz	17.5 A AC	50 A AC
2 – 20 mA DC	10 Ω	-	0.05 A DC	0.2 A DC
0.1 – 1 A DC	200 m $\Omega$	-	2.5 A DC	10 A DC
0.5 – 5 A DC	10 mΩ	-	12.5 A DC	50 A DC
1 – 10 A DC	$5\mathrm{m}\Omega$	-	17.5 A DC	50 A DC
0.5 – 5 V DC	125 <b>Ω</b>	-	12.5 V DC	-
5 – 50 V DC	12.5 Ω	_	125 V DC	_

\* all measuring ranges with half-wave rectifier

\*\* with break of 100 s until the next overload

#### Setting example:

- Measuring range end value x ratio factor = response value (ON) e.g. 10 A AC x 0.75 = 7.5 A AC
- Response value x ratio factor = release value (OFF) e.g. 7.5 A AC x 0.85 = 6.4 A AC
- Hysteresis: 7.5 A AC 6.4 A AC = 1.1 A AC

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## Application examples RPM monitoring

The rpm delivered by the tachogenerator is transformed into a voltage measurement. This voltage (measured value) is monitored by the SXT 32 measuring relay. If the voltage exceeds the pre-selected response value, the relay will switch into the OFF position (closed-circuit principle). The fault will be indicated by lamp H1. The flow can be controlled by the PLC.



#### Current monitoring for the load

If the current in the load (measured value) exceeds the pre-selected response value, the relay switches into the OFF position (closed-circuit principle). The fault will be indicated by lamp H1. If the current falls below the release value, the relay will switch back into the operating position.

### **Response time**



The response time is the time interval between the occurrence of a measured value and the change-over of the relay. It is influenced by the factor by which the measured value exceeds the response value. The permissible interference pulse width is the duration of an interference pulse at which the relay does not yet respond.

(ms) interference pulse width (ms) response time



# Measuring and monitoring relays Current/voltage measuring relays SXT 12, SXT 32 Interface

Technical data	SXT 12	SXT 32		
Type of function according to DIN EN 60255-6:11.94	Measuring relay with supply voltage	Measuring relay with supply voltage		
	Open-circuit principle	Closed-circuit principle		
Function control	1 green LED, 1 red LED	1 green LED, 1 red LED		
Function diagram	FD 0075 W1	FD 0076 W1		
Power supply circuit AC				
Rated voltage (U.)	110 – 127 V 220 – 240 V			
Bated consumption at 50 Hz and U. (AC)	25 VA 25 VA			
Rated consumption at 50 Hz and U., (AC)	21W 21W			
Bated frequency	50 – 60 Hz			
Operating voltage range	08-11×U.			
Parallel loads permissible	ves			
Measuring circuit				
Electrical isolation from power supply circuit	VAS			
Setting / number of measuring ranges	analog / 1			
Setting ranges Measuring circuit – Response values	see table "Measuring ranges U/I"			
Setting ranges Measuring circuit – Release values	$0.5 - 0.95 \times \text{response value}$			
Dispersion	< + 0.5 %			
Influence of the supply voltage	< ± 0.5 % / % AU.			
Influence of the ambient temperature	$\leq \pm 0.1 \% / KAT$			
Output circuit				
Contact assignment / contact material	2 change-over contacts / Ag alloy, gold-plated			
Rated operating voltage U <sub>M</sub>	AC/DC 230/230 V			
Max. continuous current l, per contact	5 A			
Application category according to EN 60947-5-1:1991	AC-15: U 230 V AC, I 3 A DC-13: U 24 V DC, I 2 A			
Short circuit protection; max. fuse insert class gG	6A			
Permissible switching frequency	≤ 6000 switching cycles/h			
Mechanical life	30 x 10 <sup>6</sup> switching cycles			
Response time t	see diagram "Response time"			
Release time t <sub>R</sub>	30 ms			
General information				
Creepage distances and clearances between the circuits	according to DIN VDE 0110-1:04.97			
Rated impulse voltage	4 kV			
Overvoltage category				
Pollution degree	3 outside, 2 inside			
Rated voltage	250 V AC			
Test voltage U <sub>eff</sub> 50 Hz according to DIN VDE 0110-1, table A.1	2.21 kV			
Protection degree housing/terminal according to DIN VDE 0470 sec. 1:11.92	IP 30/ IP 20			
Noise immunity according to IEC 61000-4	Test severity 3			
Ambient temperature, operating range	-20 - +60 °C			
Dimension diagram	S 3 - 4			
Circuit diagram	KS 0233/1			
Conductor cross sections fine-stranded / solid or	2 x 0.75 – 1.5 mm²/2 x 0.75 – 2.5 mm²			
fine-stranded with ferrules	1 or 2 x 0.5 – 1.5 mm <sup>2</sup>			
Permissible tightening torque	0.8 – 1 Nm			
Weight	0.24 kg			
Accessories	Cover Z 29			
Approvals	S.			

Overview of devices/Part numbers								
Туре	Measuring range	Rated voltage		Part number	Std. Pack			
SXT 12	DC 0.1 – 1 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0090.0	1			
	DC 0.5 – 5 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0050.0	1			
	DC 1 – 10 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0070.0	1			
	DC 0.5 – 5 V	AC 220 – 240 V	50 – 60 Hz	R3.185.0140.0	1			
	AC 0.01 – 0.1 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0100.0	1			
	AC 0.05 – 0.5 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0170.0	1			
	AC 0.1 – 1 A	AC 110 – 127 V	50 – 60 Hz	R3.185.0010.0	1			
		AC 220 – 240 V	50 – 60 Hz	R3.185.0030.0	1			
	AC 0.5 – 5 A	AC 110 – 127 V	50 – 60 Hz	R3.185.0160.0	1			
		AC 220 – 240 V	50 – 60 Hz	R3.185.0040.0	1			
	AC 1 – 10 A	AC 220 – 240 V	50 – 60 Hz	R3.185.0060.0	1			
SXT 32	DC 2 – 20 mA	AC 220 – 240 V	50 – 60 Hz	R3.185.0180.0	1			
	DC 5 – 50 V	AC 220 – 240 V	50 – 60 Hz	R3.185.0130.0	1			
	AC 0.05 – 0.5 A	AC 110 – 127 V	50 – 60 Hz	R3.185.0330.0	1			
		AC 220 – 240 V	50 – 60 Hz	R3.185.0150.0	1			
	AC 0.1 – 1 A	AC 110 – 127 V	50 – 60 Hz	R3.185.0110.0	1			
		AC 220 – 240 V	50 – 60 Hz	R3.185.0080.0	1			