

RXIK 1



(SE980082)

RXEEB 1



(SE980081)

RXIB 24



(SE970869)

Features

RXIK low current relay, 50-60 Hz and dc

- High sensitivity 0,5-2 mA ac
- Low power consumption in measuring circuit, 20 μ W
- High overload capacity, 125 mA continuously

RXIB high speed current relay, 50 or 60 Hz

- Operate time 4–15 ms
- Resetting time 5–11 ms

- 10 mA to 15 A total range for four models
- Low CT burden and high overload capacity

RXEEB low voltage relay, dc

- High sensitivity 0,1-1,2 and 1-12 V dc
- 0-0,12 and 0-1,2 V setting of hysteresis
- Low power consumption in measuring circuit, down to 0,056 μ W
- High overload capacity, 150 V continuously

Application

The current and voltage measuring relays are mainly intended for power and system industrial applications. The relays should be mounted on terminal bases and combined with auxiliary relays, time relays etc.

The current relay **RXIK 1** is used where high sensitivity is required, e.g. in the shaft current relay type RARIC, where a variant of RXIK 1 constitutes the measuring unit. When shunt connected, the relay can be used to measure large direct currents. The shunt wires may be long and have small area as the relay power consumption is very low. In conjunction with additional units, special versions of RXIK 1 may be used in e.g. overcurrent relays, neutral point voltage relays and differential relays to operate even at very low frequencies.

The current relay **RXIB 24** is generally used where high-speed and consistent operate and reset times are required. Its speed and consistency make the RXIB especially suitable for breaker-failure applications where it is important that the set breaker-failure time is not unduly influenced by variations in operate or reset time of the current-measuring relay. The RAICA breaker-failure relay, for example, incorporates the RXIB for its current-measuring function. Similarly, the RXIB's speed and precision in both operate and reset time are ideal for high-speed current-blocking relay applications. For example, to supervise the operation of transformer sudden-pressure relays, which may operate incorrectly as a result of severe external faults. The RXIB is then used in a protective system which responds rapidly to the external fault condition, operating quickly enough to open the pressure relay trip circuit before the pressure-relay has operated.

Application (cont'd)

Additionally, this high-speed relay can be used to improve the security of other sensitive high-speed relays by modifying their pick-up setting without adversely affecting overall operating time. The RXIB should also be considered for high-set direct trip applications because of its high-speed and low transient overreach.

The dc voltage relay **RXEEB 1** has high sensitivity. The relay can be used in control circuits, to monitor and indicate voltage levels or, via a tachometer generator, rotation speed. The version with normally energized output terminal can also be used in equipment for lifts or cranes where, for safety reasons, failure to operate due to interruption of the auxiliary power supply is not accepted.

Design

The **RXIK 1** is a static, sensitive, high-speed ac and dc overcurrent relay with two change-over contacts. It consists mainly of a level detector with an amplifier, a potentiometer, RC-circuits and regulating (zener) diodes. The operate value is set with a knob at the front. To reduce the risk of undesired operation upon high frequency signals, the input has an RC-circuit which causes the operate value of the relay to increase with the frequency. The output circuit has a smoothing filter which ensures stable function of the output relay. The measuring input is galvanically connected with the terminal for the auxiliary voltage (± 12 V dc). Therefore the auxiliary voltage should be supplied via galvanically isolated converters. Suitable converters are RXTUG 22H for dc and RXTUB 2 for ac voltage. RXIK 1 can be used for measuring in both voltage and current circuits. The input is therefore connected both to current terminals 31 and 41 and to voltage terminals 21 and 22.

A short-circuiting connector, type RTXK, is supplied with ac current measuring relays. The connector is mounted on the rear of the terminal base (not supplied). The relay current-measuring is fed through the RTXK so that the current transformer secondary circuit is automatically short-circuited when the relay is removed from the terminal base. If the short-circuiting function is not required, e.g. if RXIK 1 is connected to a shunt, connection can be made to the current terminals (31 and 41) via a connector RTXI or to the voltage terminals (21 and 22). The relay occupies one seat (2U 6C).

The **RXIB 24** is a static, high-speed ac overcurrent relay. It consists mainly of an air-gapped input current transformer with three setting taps on the primary side, voltage converter, rectifier, level detector, potentiometer for setting, and amplifier (which drives a reed-type output relay with one make contact). The voltage from the input CT is converted to a three-phase quantity to reduce the

ripple voltage at the output of the rectifier circuit. This technique reduces filtering requirements, thus contributing to the relay's high speed on both operate and reset.

The operating value is set by means of the potentiometer knob which can be continuously adjusted from one to three times the scale factor (I_s).

The scale factor (I_s) is changed by reconnecting a lead to one of three positions on a screw-type CT tap block, located at the lower right side of the module face plate. In order to avoid opening the CT secondary circuit, reconnection of the scale factor is only to be carried out when the relay is withdrawn from the terminal base. There are four sets of Reconnectable scale factors available:

Scale factor, I_s
10; 25; 50 mA
0,1; 0,25; 0,5 A
0,2; 0,5; 1 A
1; 2,5; 5 A

Two variants of RXIB are available with respect to auxiliary voltage. One can be reconnected (via a screw-type block at the upper right side of the face plate) for dc 36 and 48-55 V, the other for dc 110-125, 220 and 250 V. Auxiliary voltage is normally supplied directly from the station battery.

A short-circuiting connector, type RTXK, is supplied with ac current relay modules. This connector mounts on the rear of the terminal base (not supplied). The relay current-measuring circuits is fed through the RTXK so that the current transformer secondary circuit is automatically short-circuited when the relay is removed from the terminal base. The relay occupies two seats (2U 12C).

The **RXEEB 1** is a static dc voltage relay with electronic output. It measures the absolute voltage or only the positive or negative dc voltage. The relay requires auxiliary voltage dc ± 24 V or 48 V with the supply galvan-

ically isolated from the input signal source. Auxiliary output relays suitable for use with RXEEB 1 are RXMA 1, RXMB 1, RXMC 1, RXMT 1, RXMM 1 or RXME 1. The relay occupies one seat (2U 6C).

Technical data

RXIK 1

Current scale, I_s	0,5-2 mA, 50-60 Hz	
Operate value dc	approx. 1,35 x set value	
Input impedance	82 ohm	
Overload capacity	125 mA cont. 500 mA in 1 s	
Resetting ratio	ac dc	> 99% > 80%
Operate time Resetting time		10-30 ms at $1,3 \times I_s$ approx. 200 ms at $10 \times I_s$
Auxiliary voltage		± 12 V $\pm 20\%$
Permitted ambient temperature		-20°C to +55°C
Power consumption: Current circuit Auxiliary voltage		approx. 20 μ VA at lowest value 0,7 W before operation 1,3 W after operation
Insulation tests: Dielectric test Impulse test		2,0 kV 50 Hz 1 min 5 kV 1,2/50 ms, 0,5 J
Disturbance tests:		
Power frequency test Fast transient test 1 MHz burst test		0,5 kV 50 Hz 4-8 kV 2 min 2,5 kV 2 s
Dimensions		2U 6C modules
Weight		0,2 kg
Contact data:		
No. of contacts		2 change-over
Max. system voltage ac or dc		250 V
Current carrying capacity continuously during 1 s		4 A 10 A
Making and conducting capacity with an inductive load L/R > 10 ms during 200 ms during 1 s		20 A 10 A
Breaking capacity ac PF > 0,1 dc L/R < 40 ms	48 V 110 V 220 V	0,5 A 0,2 A 0,1 A

Technical data (cont'd)

RXIB 24

Total scale range	10 mA-15 A			
Rated frequency, f_n	50 or 60 Hz			
Auxiliary voltage, EL	36, 48-55 or 110-125, 220, 250 V dc + 20%			
Operate time at instantaneous current change from 0 to 1,1 x set value 2,5 x set value	10-15 ms 4-6 ms			
Resetting ratio	> 70%			
Resetting time at instantaneous current change to 0 from 1,1 x set value 70 x set value	5 ms 10-11 ms			
Consistency of operate value/ setting and graduation error (% of highest setting)	<1/<5 (<1/<10 for $I_s = 5$ A)			
Percent change in operate current: at frequency change within $f_n \pm 5$ Hz per °C temperature change per % auxiliary voltage change	-2,5%/Hz < 0,15% 0,05%			
Transient overreach at lowest/ highest setting	10/10% at $\tau > 10$ ms			
Permitted ambient temperature	-25°C to +55°C			
Power consumption				
Auxiliary voltage circuit at rated dc voltage	48/55 V 110/125 V 220/250 V	Before operation 0,7/1,2 0,5/0,7 1,6/1,8	After operation 1,2/1,6 W 1,1/1,4 W 2,3/2,6 W	
Current circuit Overload capacity and power consumption				
Scale factor I_s	Overload			Power cons.
	Cont. A	1 s A	0,5 s A	$I = I_s$ mVA
10 mA	0,30	4,4	5,7	5
25 mA	0,70	12	15	6
50 mA	1,2	15	19	7
0,1 A	2,7	33	43	6
0,25 A	6,5	100	130	7
0,5 A	10	180	230	9
0,2 A	6,8	180	230	6
0,5 A	11	230	300	9
1 A	15	230	300	18
1 A	15	230	300	18
2,5 A	20	350	450	55
5 A	20	350	450	150
Insulation tests:				
Dielectric test, Voltage circuits to contact circuits and earth	2,0 kV, 50 Hz, 1 min			
Current circuits to other circuits and earth	2,5 kV, 50 Hz, 1 min			
Impulse voltage test	5,0 kV, 1,2/50 μ s, 0,5 J			

RXIB 24

Disturbance tests:	
Power frequency test	0,5 kV, 50 Hz, 2 min
Fast transient test	4-8 kV, 2 min
1 MHz burst test	2,5 kV, 2 s
Dimensions	2U 12C modules
Weight	0,7 kg
Contact data:	
No. of contacts	1 make
Max. system voltage dc/ac	250/250 V
Current carrying capacity (for already closed contact)	3/2,5 A
200 ms/1 s continuously	2 A
Making and conducting capacity L/R > 10 ms, 200 ms/1 s	2/2 A
Breaking capacity ac PF > 0,1 max. 250 V	0,6 A
dc L/R < 40 ms	1/0,5 A
24/48 V	0,2/0,16 A
110/125 V	0,1/0,08 A
220/250 V	

RXEEB 1

Operate dc value, adjustable	$(1-12) \times U_S$
Scale factor, U_S (Reconnectable)	0,1 V or 1 V
Setting and graduation error (% of highest setting)	< 5
Hysteresis, adjustable (the difference between operate value and reset value)	$(0-1,2) \times U_S$
Overload capacity continuously	150 V
Input resistance:	
Input voltage < 12 V	180 kohm
For input voltages > 12 V < 150 V	100 kohm
Output dc voltage	24 or 48 V
Permitted output current	< 100 mA
Operate time at instantaneous voltage change from 0 to:	
1,3 x set value	< 30 ms
2 x set value	< 25 ms
Auxiliary dc voltage, EL	± 24 V or 48 V
Permitted auxiliary voltage deviation	-20% to +10%
Permitted ambient temperature	-20°C to +55°C
Power consumption	excl. aux. relay
auxiliary voltage circuit	1,6 W
measuring circuit, highest/lowest setting	0,8 mW/0,056 μ W
Percent change in operate and reset voltage:	
per % auxiliary voltage change	
1-12 V	< 0,05%/%
0,1-1,2 V	< 0,15%/%
per °C temperature change	< 0,15%/°C

Technical data (cont'd)

RXEEB 1

Insulation test: Dielectric test Impulse voltage test	Not applicable 5,0 kV, 1,2/50 μ s, 0,5 J
Disturbance test: 1 MHz burst test common mode differential mode	2,5 kV, 2 s 1,0 kV, 2 s
Dimensions	2U 6C modules
Weight	0,25 kg

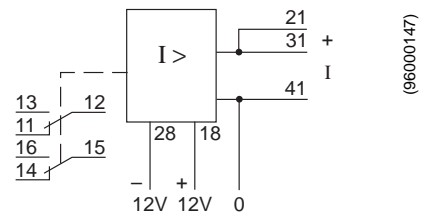
Ordering and terminal diagrams

Specify for each relay;

- Type
- Quantity
- Ordering No.
- Scale range

RXIK 1

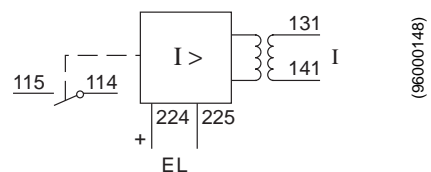
Ordering No. RK 418 004-AA



RXIB 24

Ordering No. selection table;

Ordering No.	Rated auxiliary dc voltage V (EL)
RK 413 140-..	36, 48-55 V
RK 413 141-..	110-125, 220, 250 V



Please note that the ordering number is completed with letters from the selection table below, depending on measuring frequency and scale range.

Letter selection table

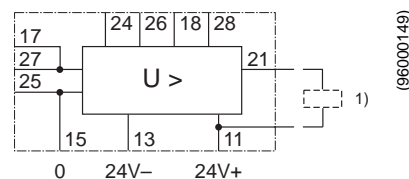
Frequency	Scale range (A)			
	0,01-0,15	0,1-1,5	0,2-3	1-15
50 Hz	BB	BC	BD	BE
60 Hz	CB	CC	CD	CE

Example: A 48 V dc relay with 1-15 A setting range for 50 Hz has the ordering number RK 413 140-BE.

RXEEB 1

With normally non-energized output terminal **RK 427 102-AD**

With normally energized output terminal **RK 427 102-BD**



1) 48V output relay

$U_s = 0,1\text{ V}$	–
$U_s = 1\text{ V}$	Connect 18 to 28
$\pm U$	–
$\pm U$	Connect 25 to 26
$-U$	Connect 25 to 24

References

Breaker failure relay RAICA	1MRK 505 005-BEN
RARIC shaft current relay	1MRK 502 003-BEN
RXMB 1, RXMC 1 auxiliary relays	1MRK 508 006-BEN
RXMA 1, RXME 1, RXMM 1, RXMT 1 auxiliary relays	1MRK 508 015-BEN
COMBIFLEX accessories incl. power supply	1MRK 513 004-BEN
COMBIFLEX connection and installation components	1MRK 513 003-BEN

Manufacturer

ABB Automation Products AB
 Substation Automation Division
 SE-721 59 Västerås
 Sweden
 Tel: +46 (0) 21 34 20 00
 Fax: +46 (0) 21 14 69 18

