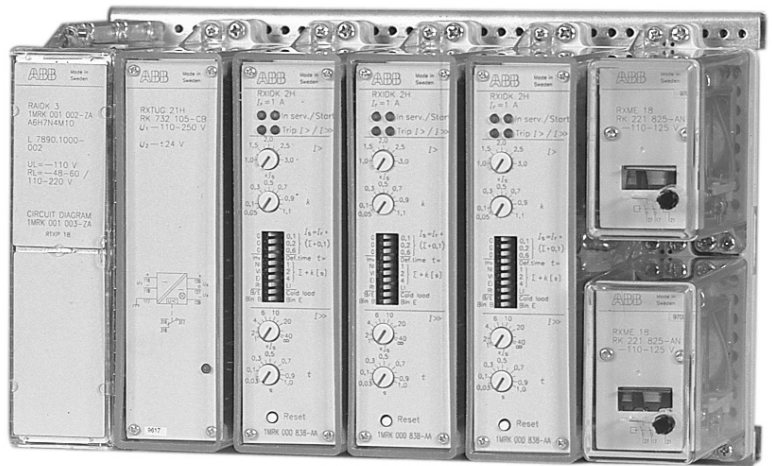


(SE970134)



(SE970150)

Features

RXIDK 2H relay and assemblies

- Single-, two-, three-phase and three-phase to earth variants for short-circuit and earth fault protection
- Independent measuring elements with; In service, start and trip indications per phase
- Test switch, DC/DC converter and heavy duty trip relays are available as specified options
- Micro-processor based time-overcurrent relay with continuous settings for current operate values and time delays
- Three current range variants, with wide setting ranges
- Low set stage 0,015-0,65 A or 0,075-3,25 A or 0,375-16,25 A
- High set stage or 0,02-8 A 0,1-40 A or 0,5-200 A and ∞ *)
- *)16 2/3 Hz alternative version 0,075-40 A or 0,0375-200 A and ∞
- Low set stage programmable for the following time characteristics:
 - Normal inverse
 - Very inverse
 - Extremely inverse
 - RI-inverse time
 - Long time inverse
 - Definite time delay settable 50 ms-8,1 s

- Available with optional filters for different frequency characteristics

0,2 A Variant

- 50-60 Hz sharp
- 150-180 Hz sharp
- 40-2000 Hz flat

1 A and 5 A Variants

- 50-60 Hz sharp
- 150-180 Hz sharp
- 40-2000 Hz flat
- 16 2/3 Hz flat

- High set stage can be delayed up to 1 s for fuse selectivity coordination
- Reset ratio 95% enables a setting close to maximum load current
- Recovery time < 40 ms enables small time steps between time selective protection
- Low transient overreach i.e. the relay is insensitive to dc component in fault current.

RXIDG 21H relay and assemblies

- Pioneering method for selective sensitive earth fault protection in solidly earthed systems

Features (cont'd)

- Earth fault relay with current-dependent operating time. The time characteristic provides complete selectivity for earth fault tripping in solidly earthed networks, when largest infeed is < 80% of current on faulty object
- Wide setting range 15 mA-2,60 A
- Binary input for enabling or blocking in combination with 2nd harmonic restraint or directional earth fault relay
- Minimum definite time setting to achieve selectivity with instantaneous functions in distance protection at very high zero sequence fault currents

Application

RXIDK

RXIDK is a time-overcurrent relay mainly used as short-circuit and earth fault protection on all types of objects in the network. The available different time-lag characteristics and the short recovery times, together with the independent measuring element in each phase, ensures suitability on networks of major importance, where selectivity and short back-up tripping times are essential.

By selecting from six time characteristics available on the relay makes RXIDK suitable for protection of a variety of power apparatus including applications requiring coordination with existing time-overcurrent relays. RXIDK is directly replacing RXIDF. RXIDK has LEDs on the front for indication. The delay on the high set stage achieves selectivity on fuses. RXIDK has one fully isolated binary input. With the dip switch on the front it can be used to enable or block the relay, or raise the operate value of the low set stage ($I_{>}$) with 40% for “cold load” restoration of a system.

Definite-time characteristic

The operate time is independent of the fault current magnitude. This characteristic is suitable for use mainly on systems where fault current magnitude is relatively constant for different fault locations (i.e. source impedance is much larger than line impedance). Definite time-lag delay also simplifies selectivity planning in conjunction with other relays having instantaneous or definite time characteristics.

Normal inverse characteristic

See Fig. 1.

The operate time is dependent of the fault current magnitude. This characteristic is therefore most suitable for systems where there is a large variation in fault currents for different fault locations. The inverse characteristic enables improved utilization of the protected object overload capability and gives shorter back-up tripping times in a network, compared with a definite time characteristic.

Very inverse characteristic

See Fig. 2.

The operate time is more dependent of the fault current magnitude. Therefore this characteristic is most suitable for systems where there is a large variation in fault currents for different fault locations. The inverse characteristic enables improved utilization of the protected object overload capability and gives shorter back-up tripping times in a network, compared with a definite-time characteristic. Very inverse gives a steeper curve than normal inverse and will thus give advantages in achieving time selectivity between incoming and outgoing bays with smaller difference in fault current, however, the maximum fault current through objects requiring time selectivity may not be too high compared to setting, as time difference will be small with this characteristic.

Extremely inverse characteristic

See Fig. 3.

The operate time is very dependent of the fault current magnitude. This characteristic is intended for coordinating with fuses on distribution or industrial circuits. They are used in situations requiring a high degree of overload capacity utilization and where cold-load pick-up or energizing transient currents could be a problem. Extremely inverse time characteristic is normally only suitable as first step in the selectivity chain.

RI inverse characteristic

See Fig. 4.

This characteristic is provided for applications requiring coordination with the original ASEA type RI electromechanical inverse time overcurrent relays.

Long time inverse characteristic

See Fig. 5.

This characteristic has the same current dependence as Very inverse. It is used when longer delays are desired.

Following main applications with RXIDK assemblies can be mentioned:

Short-circuit protection

Two- and three-phase, instantaneous and definite time delayed variants are available for use as short-circuit protection on all type of objects. The low transient overreach and short recovery time ensures suitability for most applications.

The high set stage is used for motors, transformers and capacitor banks and other objects. The stage can be delayed up to 1 s to achieve selectivity to fuses, the stage can be switched off by setting to infinite (∞). RXIDK is used as directional short circuit protection with inverse time delay in packages together with RXPE 42. The start contact of the directional relay is connected to the binary input on RXIDK, see RXIDK terminal diagram. When the binary input is used for enabling, the two lowest contacts in the programming switch on the front of the relay shall be set to position B/E and Enable.

Earth fault protection

Single-phase, definite or inverse time delayed, assemblies are used as earth fault protection for low-impedance earthed or solidly earthed systems.

Assemblies are available as directional units where RXIDK is combined with directional earth fault relay, type RAEPA. The start of the directional relay is then connected to the binary input for enabling. RXIDK is also used in the harmonic restraint earth current relay RAISB.

Voltage controlled overcurrent protection

An undervoltage relay may be used to enable the RXIDK overcurrent relay through the opto-coupled binary input. The RXIDK overcurrent relay can then be set more sensitive than maximum load current for e.g. generator protection applications.

Diode failure (for rotating generator excitation system) relay

The standard RXIDK 2H relay may be used to detect an AC component superimposed used on a DC current flowing through the relay input transformer. Two current levels are settable for a shorted or open diode.

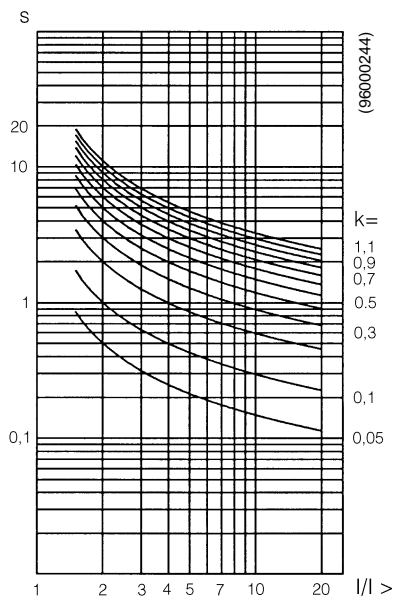


Fig. 1 Normal inverse

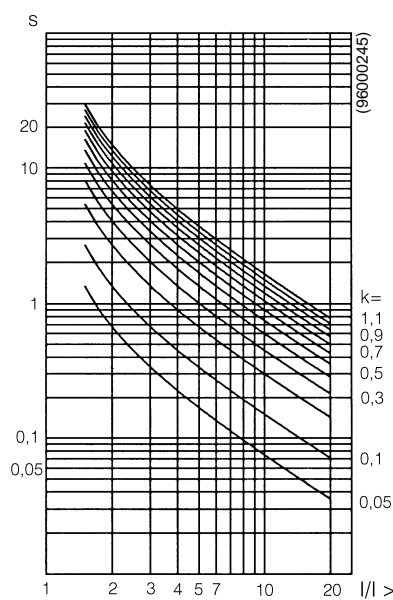


Fig. 2 Very inverse

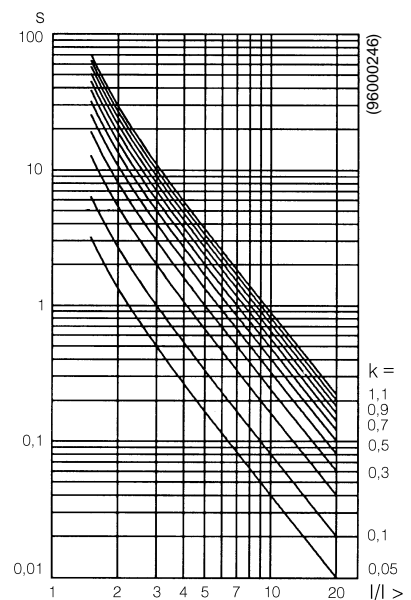


Fig. 3 Extremely inverse

Application (cont'd)

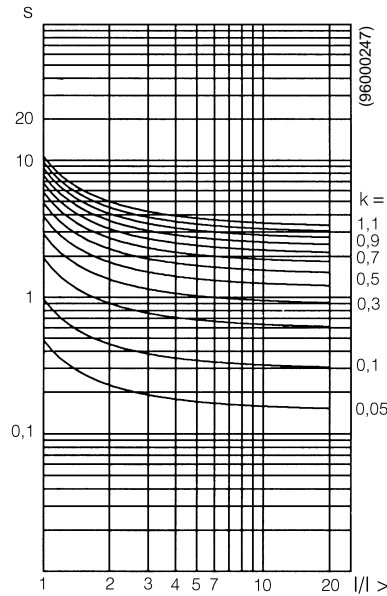


Fig. 4 RI inverse

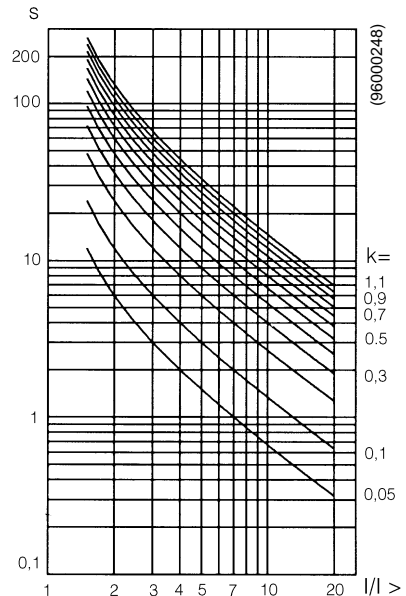


Fig. 5 Long time inverse

RXIDG

RXIDG is a single-phase time-overcurrent relay with a combined definite and inverse time relay function. The inverse time characteristic has been selected to give a selective tripping when used as earth fault protection in solidly earthed networks. The selectivity is ensured when the largest infeed is less than 80% of current on the faulty object. All objects are given similar primary sensitivity and selectivity is achieved without directional criteria.

This way of achieving selectivity at back-up tripping allows the possibility of having high sensitivity on earth fault protection relays, and selective tripping independent of service condition. To achieve this with any other method is difficult.

To allow use of a low setting but still achieve selectivity to distance protection for heavy close-up faults, a definite minimum time setting is available. The definite and inverse time characteristic for RXIDG is shown in Fig. 6.

RXIDG is provided with a fully isolated binary input, which is programmed by a programming switch on the front of the relay. When activated it will either Enable or Block

the relay. A second harmonic restraint relay, type RAISB, can be connected to prevent unwanted operation at transformer energizing. This is necessary when inrush currents have a magnitude and duration which can cause operation of RXIDG.

When external enable is not used, the switch shall be set to position Block. Then the relay will operate normally as long as the binary input is not activated

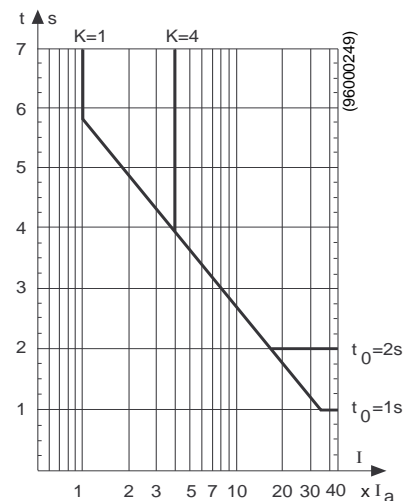


Fig. 6 RXIDG inverse time characteristic with definite minimum time

Design

The current relay assemblies with RXIDK are available in several variants for single-phase, two-phase, three-phase and three-phase plus earth overcurrent protection.

Assemblies with RXIDG are available with and without second harmonic restraint.

A short circuiting connector, type RTXK, is delivered with each current relay. In assemblies this connector is mounted on the rear of the terminal base and will automatically short-circuit current input when the relay is removed from the terminal base.

The RXIDK and RXIDG relays require a separate dc-dc converter for auxiliary supply (± 24 V). One RXTUG converter can supply up to nine relays.

Note: When RXIDK or RXIDG relay or the dc-dc converter RXTUG is plugged into or withdrawn from a terminal base, the auxiliary voltage supply must be interrupted. Neither is it allowed to open wiring on plus or minus supply with unit in service.

RXIDK measuring relay

The time-overcurrent relay, type RXIDK, is a static microprocessor based relay with a high set definite delayed stage and a low set, definite or inverse time, delayed stage. The relay consists mainly of an input current transformer (for isolation), filter circuits, microprocessor, HMI, LEDs for start and trip indications and three output units which provide separate change-over contacts for start, time and high set stage. The relay has also one binary input for enable, blocking or increasing of the low set stage operate value.

Start and time-overcurrent operate values are set on the scale marked I>. Operation occurs for a current equal to or larger than the product of set scale value and the selected scale constant (I_s). The scale constant is selected on the programming switch on the front of the relay.

The start function output is energized immediately after the measured current exceeds the set start current level.

For definite-time delayed operation the time overcurrent output operates after the set time delay.

For inverse-time operation, the operate time will depend of the time setting (constant k), (see Fig. 1, Fig. 2, Fig. 3, Fig. 4 and Fig. 5), and by how much the measured current magnitude exceeds the start current level setting (I>).

All current and time settings are settable with potentiometers on the front.

The relay is available with optional filters for either sharp measuring of fundamental frequencies (50-60 Hz) or third harmonics (150-180 Hz), or flat filter for suppressing frequency dependence 40-2000 Hz. The characteristics of the filters are shown in Fig. 7.

RXIDG measuring relay

The time-overcurrent relay type RXIDG is a static microprocessor based relay with one definite or inverse time, delayed stage. The relay consists mainly of an input current transformer (for isolation), filter circuits, microprocessor, HMI, LEDs for start and trip indications and three output units which provide change-over contacts for start and delay. The relay has also one binary input for enable or blocking of the function.

RXIDG has high sensitivity and a wide setting range. The basic current, I_a , is continuously adjustable between 15-650 mA. I_a is equal to the scale constant I_s , set on the programming switch, times the set scale value (0,75-3,25).

The I_a setting will define the current-time characteristic of RXIDG. The operating level of the relay is then steplessly adjustable $(1-4) \times I_a$ with the K setting knob.

The minimum operate time t_0 is continuously adjustable 1-2 seconds.

The inverse time delay can be disconnected by setting a switch t- t_0 on the front of the relay. When set to t_0 the operate time will be decided by t_0 .

Technical data

Below data is for measuring relays RXIDK and RXIDG. For data of total assemblies please also refer to catalogues for other included relays.

Time-overcurrent relay RXIDK 2H

Table 1: Current input

Rated current I_r	0,2 A or 1 A or 5 A
Scale constant I_s	(0,1 0,2 0,4 1,0) x I_r
Setting ranges 0,2 A Variant I > I >> 1 A Variant I > I >> 5 A Variant I > I >>	15-650 mA 0,02-8 A 0,075-3,25 A 0,1-40 A 0,375-16,25 A 0,5-200 A
Effective current range	(0,75-65) x I_s
Rated frequency f_r Frequency characteristics	50-60 Hz Filter options: 50-60 Hz, flat, (standard variant) see Fig. 7. 50-60 Hz, sharp see Fig. 8. 150-180 Hz, sharp see Fig. 9. 40-2000 Hz, flat see Fig. 10.
Frequency range	40-2000 Hz
Power consumption 0,2 A variant I = I_s = 20 mA I = I_s = 200 mA 1 A variant I = I_s = 0,1 A I = I_s = 1 A 5 A variant I = I_s = 0,5 A I = I_s = 5 A	0,03 mVA 1,2 mVA 0,5 mVA 50 mVA 1 mVA 100 mVA
Overload capacity for 0,2 A variant I_s = 20/40/80/200 mA continuously during 1 s 1 A variant continuously during 1 s 5 A variant continuously during 1 s	2/4/4/4 A 20 A 6 A 100 A 20 A 350 A

Table 2: Current functions, standard variant

Current function	Low set stage I>	High set stage I>>
Setting range	$(0,75-3,25) \times I_s$	$(1-40) \times I_s$ and ∞
Operate time, typical I = 0 => 1,3 x I > I = 0 => 3 x I > I = 0 => 10 x I >	35 ms 25 ms 20 ms	
Reset time, typical I = 1,3 => 0 x I > I = 3 => 0 x I > I = 10 => 0 x I >	25 ms 35 ms 45 ms	
Consistency of operate value	< 0,5%	
Reset ratio (typical) Consistency	95% < 1,5%	
"Cold load" activated	Operate value increases 40%	N.A
Transient over-reach L/R=10, 50 and 100 ms	< 5%	
Overshoot time	< 20 ms	
Recovery time at I = 3 x I >	< 40 ms	
Frequency dependence within frequency range 47,5 - 63,0 Hz	< 2,5%	
Operate value at 150 Hz	App. 1,5 x set op. value	
Influence of harmonics 100 / 120 Hz, 10% 150 / 180 Hz, 20% 250 / 300 Hz, 20%	< 3% < 6% < 4%	
Temperature dependence within range -5°C to +55°C	< 2%	

Table 3: Time function

Time function	Low set stage I>	High set stage I>>
Time delay	Inverse and definite time (Normal, Very, Extremely, Long time and RI inverse time)	Definite time
Setting range Definite time Inverse time	0,05-8,1 s k = 0,05-1,1	0,03-1,0 s -
Accuracy Definite time Inverse time	1% and ± 10 ms NI, VI, EI and LI 2x op. value 12,5% and ± 30 ms NI, VI, EI and LI 5x op. value 7,5% and ± 30 ms NI, VI, EI and LI 10x op. value 5% and ± 30 ms NI, VI, EI and LI 20x op. value 5% and ± 30 ms RI 1,0x op. value 12,5% and ± 30 ms 1,3x op. value 12,5% and ± 30 ms 1,5x op. value 5% and ± 30 ms 10x op. value 5% and ± 30 ms 20x op. value 5% and ± 30 ms	1% and ± 10 ms
Consistency	< 0,5%	

Technical data (cont'd)

Table 4: Filter options, deviation from technical data for RXIDK 2H, standard variant

	Filter options		
	50-60 Hz, sharp	150-180 Hz, sharp	40-2000 Hz, flat
Operate time (typical) = 0 => 1,3 x op. value = 0 => 2 x op. value = 0 => 10 x op. value	65 ms 55 ms 35 ms	45 ms 35 ms 25 ms	35 ms 25 ms 20 ms
Reset time (typical) = 1,3 => 0 x op. value = 2 => 0 x op. value = 10 => 0 x op. value	40 ms 50 ms 100 ms	30 ms 35 ms 55 ms	20 ms 25 ms 50 ms
Reset ratio (typical)	95%		
Recovery time at I = 3 x op. value	< 65 ms	< 45 ms	< 40 ms
Overshoot time	< 35 ms	< 25 ms	< 20 ms
Transient over-reach L/R = 10, 50 and 100 ms	< 2%	< 2%	< 20%
Frequency dependence within frequency range $\pm 5\%$	< 12%	< 20%	–
Influence of harmonics 50, 60 Hz, 100% 100, 120 Hz, 100% 150, 180 Hz, 100% 250, 300 Hz, 100%	– < 2% < 2% < 2%	< 1% < 4% – < 2%	– – – –

See also technical data common for RXIDK 2H, RXIDG 21H

Time overcurrent relay RXIDK 2H, 16 Hz

Table 5: Current input

Rated current I_r	1 A or 5 A
Scale constant I_s	(0,1 0,2 0,4 1,0) x I_r
Setting ranges 1 A Variant I > I >> 5A Variant I > I >>	0,075-3,25 A *) 0,075-3,25 A 0,1-40 A 0,075-40 A 0,375-16,25 A *) 0,375-16,25 A 0,5-200 A 0,375-200 A *) Alternative version 16 2/3 Hz
Effective current range	(0,75-65) x I_s
Rated frequency f_r Frequency characteristic Frequency range	16 2/3 Hz See Fig. 11. 15-100 Hz
Power consumption 1 A variant I = I_s = 0,1 A I = I_s = 1 A 5 A variant I = I_s = 0,5 A I = I_s = 5 A	0,5 mVA 50 mVA 1 mVA 100 mVA
Overload capacity 1 A variant continuously during 1 s 5 A variant continuously during 1 s	4 A 100 A 20 A 350 A

Table 6: Current functions

Current functions	Low set stage I>	High set stage I>>
Setting range	$(0,75-3,25) \times I_s$	$(1-40) \times I_s$ and ∞ *) $(0,75-40) \times I_s$ and ∞ *) Alternative version 16 2/3 Hz
Operate time, typical I = 0 => 1,3 x I > I = 0 => 2 x I > I = 0 => 10 x I >	80 ms 65 ms 45 ms	
Reset time, typical I = 1,3 => 0 x I > I = 3 => 0 x I > I = 10 => 0 x I >	55 ms 80 ms 100 ms	
Consistency of operate value	< 0,5%	
Reset ratio (typical) Consistency	95% < 1,5%	
"Cold load" activated	Operate value increases 40%	N.A
Overshoot time	< 50 ms	
Recovery time at I = 3 x I >	< 90 ms	
Frequency dependence within frequency range 15,00-18,33 Hz	< 2,0%	
Influence of harmonics: 33 1/3 Hz, 5% 50 Hz, 20% 83 1/3 Hz, 20%	< 2% < 3% < 3%	

Table 7: Time function

Time function	Low set stage I>	High set stage I>>
Time delay	Definite and inverse time (Normal, Very, Extremely, Long time and RI inverse time)	Definite time
Setting range Definite time Inverse time	0,05-8,1 s k = 0,05-1,1	0,06-1,0 s *) 0,06-5,0 s *) Alternative version 16 2/3 Hz
Accuracy Definite time Inverse time	1% and ± 30 ms NI, VI, EI and LI 2 x op. value 12,5% and ± 60 ms NI, VI, EI and LI 5 x op. value 7,5% and ± 60 ms NI, VI, EI and LI 10 x op. value 5% and ± 60 ms NI, VI, EI and LI 20 x op. value 5% and ± 60 ms RI 1,0 x op. value 12,5% and ± 60 ms 1,3 x op. value 12,5% and ± 60 ms 1,5 x op. value 5% and ± 60 ms 10 x op. value 5% and ± 60 ms 20 x op. value 5% and ± 60 ms	1% and ± 30 ms -
Consistency	< 0,5%	< 0,5%

See also technical data common for RXIDK 2H, RXIDG 21H

Technical data (cont'd)

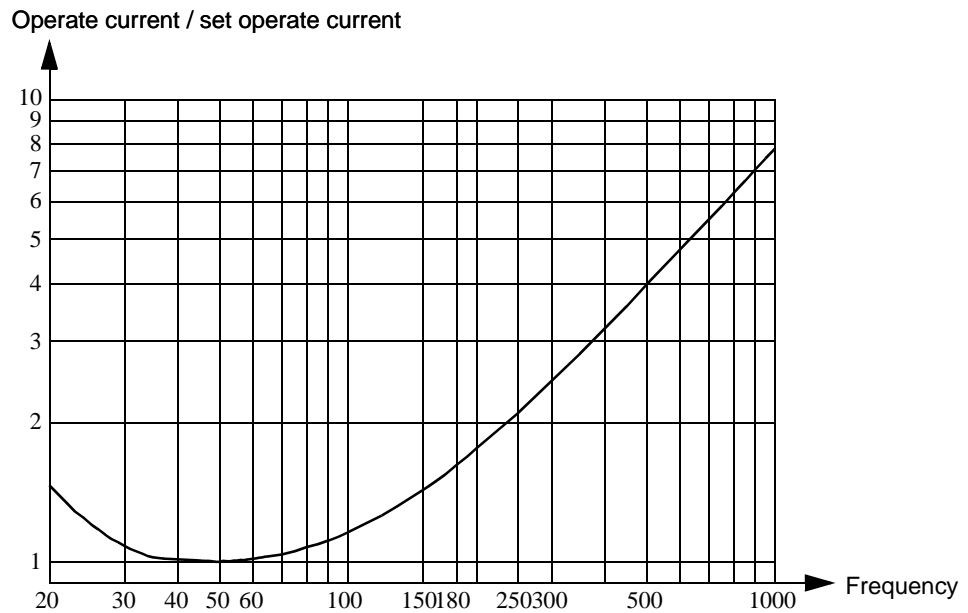


Fig. 7 Typical frequency characteristic for RXIDK 50-60 Hz, standard, valid for $I \leq 65 \times I_s$ (there is risk for contact chattering with frequency ≤ 30 Hz)

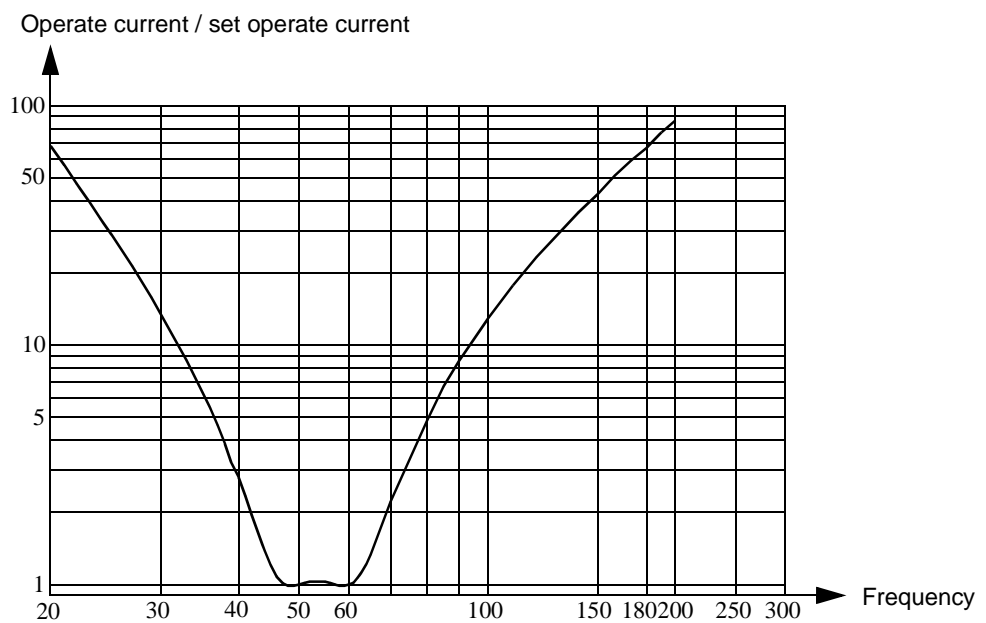


Fig. 8 Typical frequency characteristic for RXIDK 50-60 Hz, sharp, valid for $I \leq 65 \times I_s$ (there is risk for contact chattering with frequency ≤ 30 Hz)

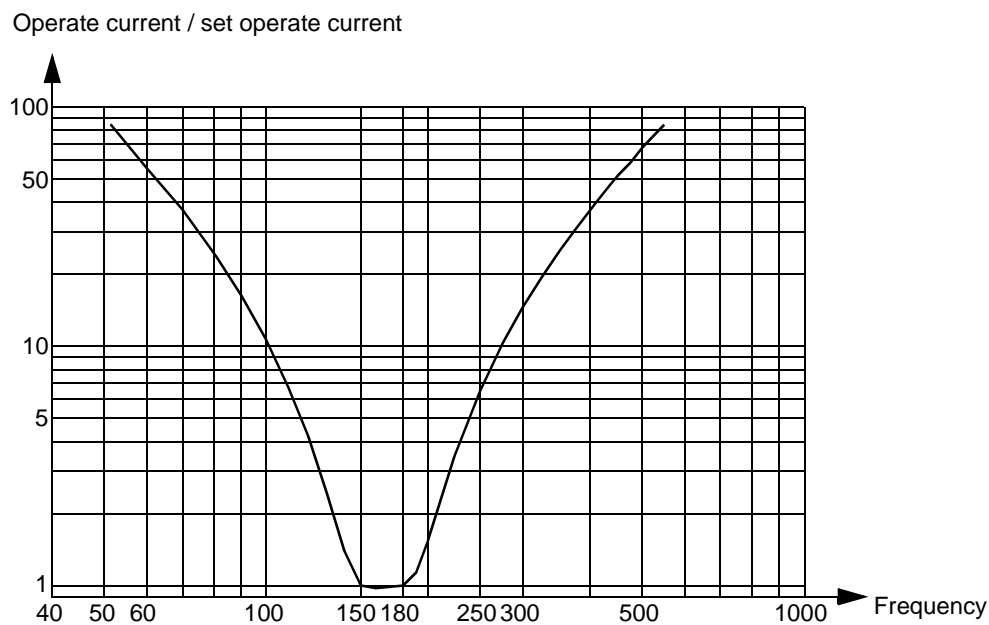


Fig. 9 Typical frequency characteristic for RXIDK 150-180 Hz, sharp, valid for $I \leq 65 \times I_s$ (there is risk for contact chattering with frequency ≤ 30 Hz)

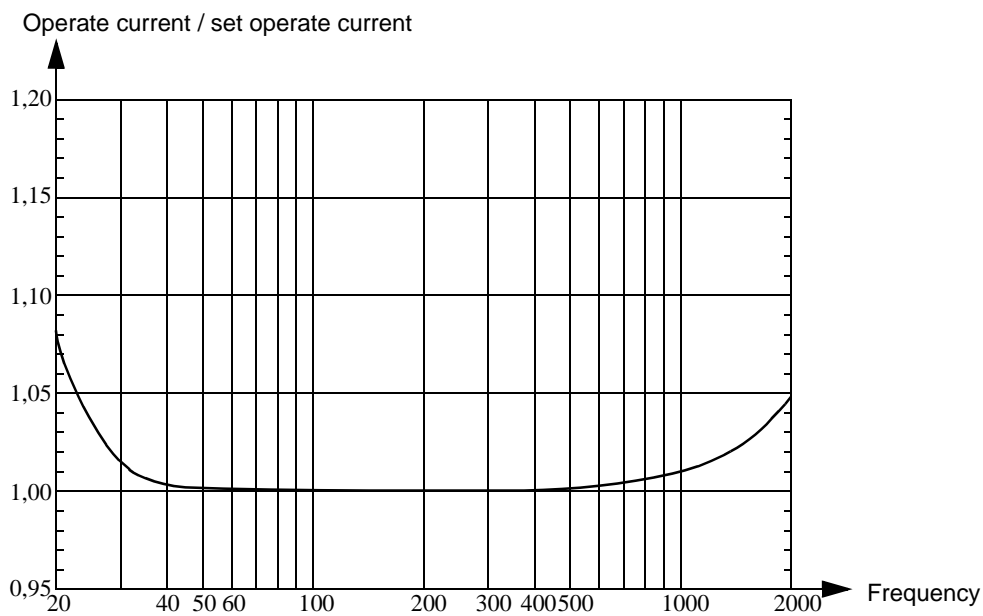


Fig. 10 Typical frequency characteristic for RXIDK 40-2000 Hz, valid for $I \leq 65 \times I_s$ (there is risk for contact chattering with frequency ≤ 30 Hz)

Technical data (cont'd)

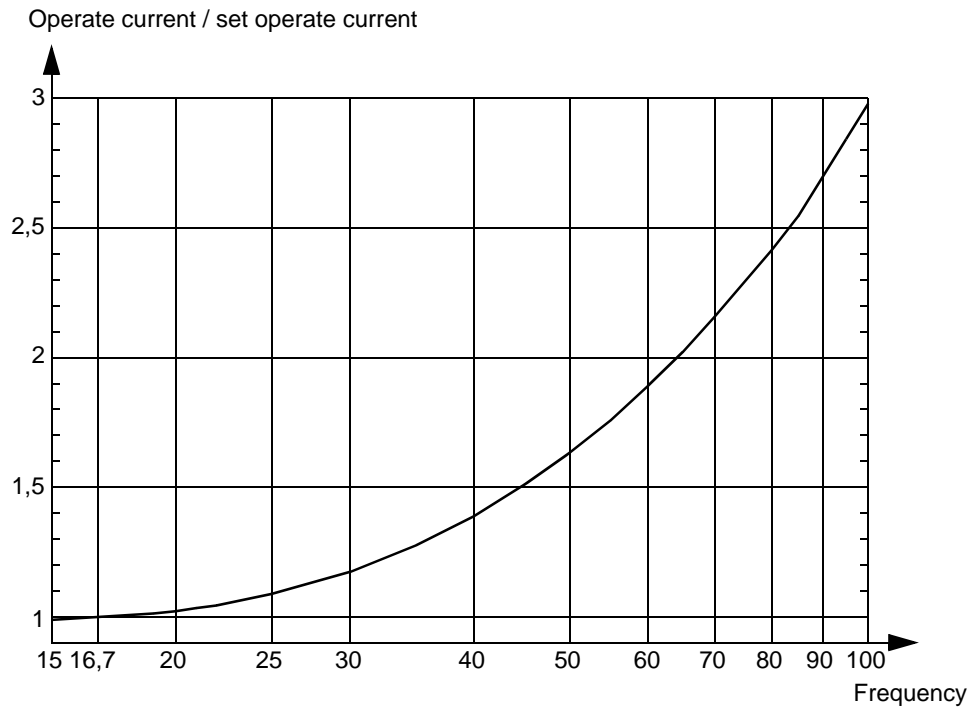


Fig. 11 Typical frequency characteristic for RXIDK 16 2/3 Hz, valid for $I \leq 65 \times I_s$
(there is risk for contact chattering with frequency ≤ 30 Hz)

Time-overcurrent relay RXIDG 21H

Table 8: Current input

Rated current I_r	0,2 A
Scale constant I_s	20, 40, 80 and 200 mA
Scale rang I_a $I >$	15-650 mA 15mA-2,60 A
Effective current range	$(0,75-100) \times I_s$
Rated frequency f_r Frequency characteristic Frequency range	50-60 Hz See Fig. 12. 40-1000 Hz
Power consumption $I = I_s = 20$ mA $I = I_s = 40$ mA $I = I_s = 80$ mA $I = I_s = 200$ mA	0,03 mVA 0,1 mVA 0,3 mVA 1,2 mVA
Overload capacity at $I_s = 20/40/80/200$ mA - continuously - during 1 s	2/4/4/4 A 20/40/80/80 A

Table 9: Start function

Operate value, $I >$	$K \times I_a$
Constant K	1-4
Basic current setting I_a	$(0,75-3,25) \times I_s$
Operate time, typical $I = 0 = > 1,3 \times I >$ $I = 0 = > 3 \times I >$ $I = 0 = > 20 \times I >$	35 ms 25 ms 20 ms
Reset time, typical $I = 1,3 = > 0 \times I >$ $I = 3 = > 0 \times I >$ $I = 20 = > 0 \times I >$	25 ms 35 ms 55 ms
Consistency of operate value	< 0,5%
Reset ratio (typical) Consistency	95% < 1,5%
Transient over-reach L/R = 10, 50 and 100 ms	< 5%
Overshoot time	< 20 ms
Recovery time at $I = 3 \times I >$	< 40 ms
Frequency dependence within frequency range 50 Hz, $\pm 5\%$ frequency range 60 Hz, $\pm 5\%$	< 0,5% < 1,0%
Operate value at 150 Hz	Approx. 1,5 x set op. value
Influence of harmonics 100 / 120 Hz, 10% 150 / 180 Hz, 20% 250 / 300 Hz, 20%	< 3% < 6% < 4%
Temperature dependence within range -5°C to +55°C	< 2%

Table 10: Time function

Time delay	Inverse time and definite time
Operate time for inverse time, Inv Accuracy	Formula: $= 5,8 - 1,35 \times \ln I/I_a$, at $t > t_0$, see Fig. 6. Overall: ± 100 ms
Setting range for definite time, Def. time Accuracy	$t_0 = 1,0-2,0$ s Overall: ± 50 ms

See also technical data common for RXIDK 2H, RXIDG 21H

Technical data (cont'd)

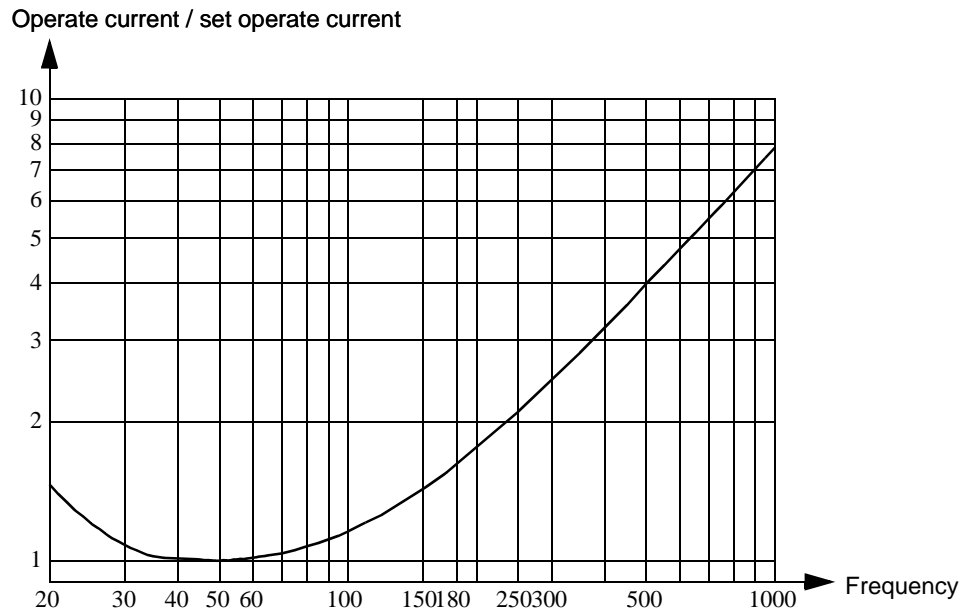


Fig. 12 Typical frequency characteristic for RXIDG 50-60 Hz, valid for valid for $I \leq 100 \times I_s$
(there is risk for contact chattering with frequency ≤ 30 Hz)

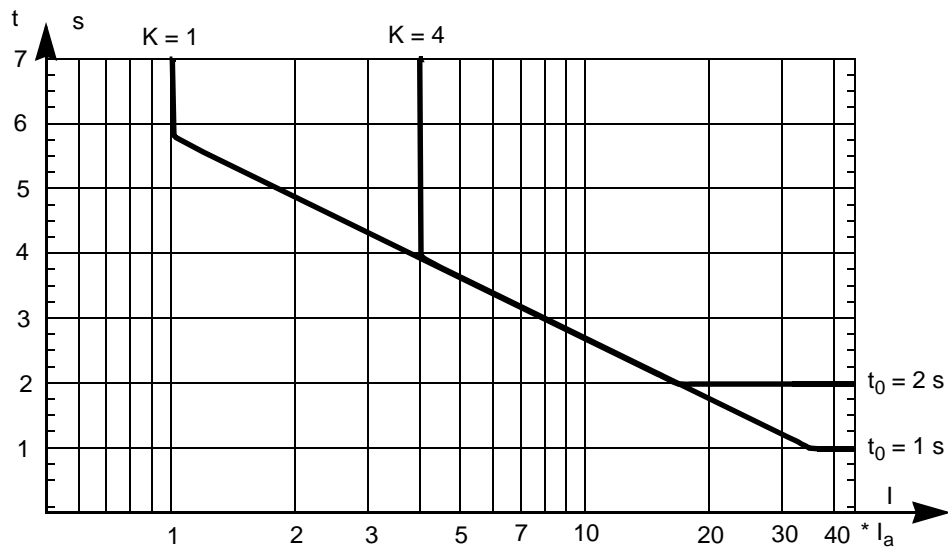


Fig. 13 Typical operate time for inverse characteristic with definite time.

Technical data common for RXIDK 2H and RXIDG 21H

Table 11: Auxiliary DC voltage supply

Measuring relays	RXIDK 2H		RXIDG 21H
	Standard	Other filters	
Auxiliary voltage EL for RXTUG 22H Auxiliary voltage to the relay	24-250 V DC, $\pm 20\%$ ± 24 V (from RXTUG 22H)		
Power consumption 24-250 V, before operation after operation without RXTUG 22H ± 24 V, before operation after operation	Max. 4,5 W Max. 6,0 W Max. 1,3 W Max. 3,0 W	Max. 5,5 W Max. 6,5 W Max. 2,0 W Max. 3,0 W	Max. 4,5 W Max. 6,0 W Max. 1,3 W Max. 3,0 W

Table 12: Binary inputs

Binary input voltage RL	48-60 V and 110-220 V DC, -20% to +10%
Power consumption 48-60 V 110-220 V	Max. 0,3 W Max. 1,5 W

Table 13: Output relays

Contacts	3 change-over
Maximum system voltage	250 v AC / DC
Current carrying capacity - continuous - during 1 s	5 A 15 A
Making capacity at inductive load with L/R >10 ms - during 200 ms - during 1 s	30 A 10 A
Breaking capacity - AC, max. 250 V, $\cos \varphi > 0,4$ - DC, with L/R < 40 ms, 48 V 110 V 220 V 250 V	8 A 1 A 0,4 A 0,2 A 0,15 A

Technical data (cont'd)

Table 14: Electromagnetic disturbance tests

All tests are done together with the DC/DC converter, RXTUG 22H

Test	Severity	Standard
Surge immunity test	1 and 2 kV, normal service 2 and 4 kV, destructive test	IEC 61000-4-5, class 3 IEC 61000-4-5, class 4
AC injection test	500 V, AC	SS 436 15 03, PL 4
Power frequency field immunity test	1000 A/m	IEC 61000-4-8
1 MHz burst test	2,5 kV	IEC 60255-22-1, class 3
Spark test	4-8 kV	SS 436 15 03, PL 4
Fast transient test	4 kV	IEC 60255-22-4, class 4
Electrostatic discharge test - In normal service with cover on	8 kV (contact) 15 kV (air) 8 kV, indirect application	IEC 60255-22-2, class 4 IEC 60255-22-2, class 4 IEC 61000-4-2, class 4
Radiated electromagnetic field test	10 V/m, 26-1000 MHz	IEC 61000-4-3, Level 3
Conducted electromagnetic test	10 V, 0,15-80 MHz	IEC 61000-4-6, Level 3
Interruptions in auxiliary voltage 110 VDC, no resetting for interruptions	2-200 ms < 40 ms	IEC 60255-11

Table 15: Electromagnetic emission tests

Test	Severity	Standard
Conducted	0,15-30 MHz, class A	EN 50081- 2
Radiated emission	30-1000 MHz, class A	EN 50081- 2

Table 16: Insulation tests

Test	Severity	Standard
Dielectric test - current circuit - other circuits - over open contact	2,5 kV AC, 1 min 2,0 kV AC, 1 min 1,0 kV AC, 1 min	IEC 60255-5
Impulse voltage test	5 kV, 1,2/50 μ s, 0,5 J	IEC 60255-5
Insulation resistance	> 100 M Ω at 500 V DC	IEC 60255-5

Table 17: Mechanical tests

Test	Severity	Standard
Vibration	Response: 2,0 g, 10-150-10 Hz Endurance: 1,0 g, 10-150-10 Hz, 20 sweeps	IEC 60255-21-1, class 2 IEC 60255-21-1, class 1
Shock	Response: 5 g, 11 ms, 3 pulses Withstand: 15 g, 11 ms, 3 pulses	IEC 60255-21-2, class 1
Bump	Withstand: 10 g, 16 ms, 1000 pulses	IEC 60255-21-2, class 1
Seismic	X axis: 3,0 g, 1-35-1 Hz Y axis: 3,0 g, 1-35-1 Hz Z axis: 2,0 g, 1-35-1 Hz	IEC 60255-21-3, class 2, extended (Method A)

Table 18: Temperature range

Storage	-20 °C to +70 °C
Permitted ambient temperature	-5 °C to +55 °C

Table 19: Weight and dimensions

Equipment	Weight	Height	Width
RXIDK 2H without RXTUG 22H	0,7 kg	4U	6C
RXIDG 21H without RXTUG 22H	0,7 kg	4U	6C

Diagrams

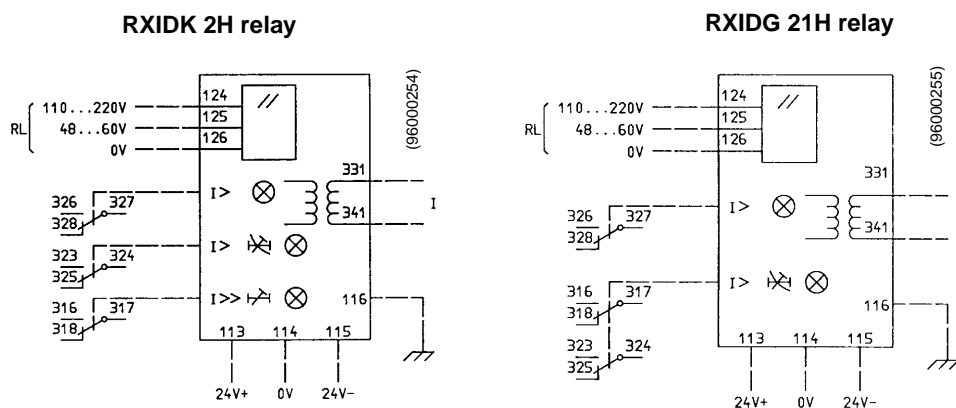


Fig. 14 Terminal diagram RXIDK and RXIDG

Diagrams (cont'd)

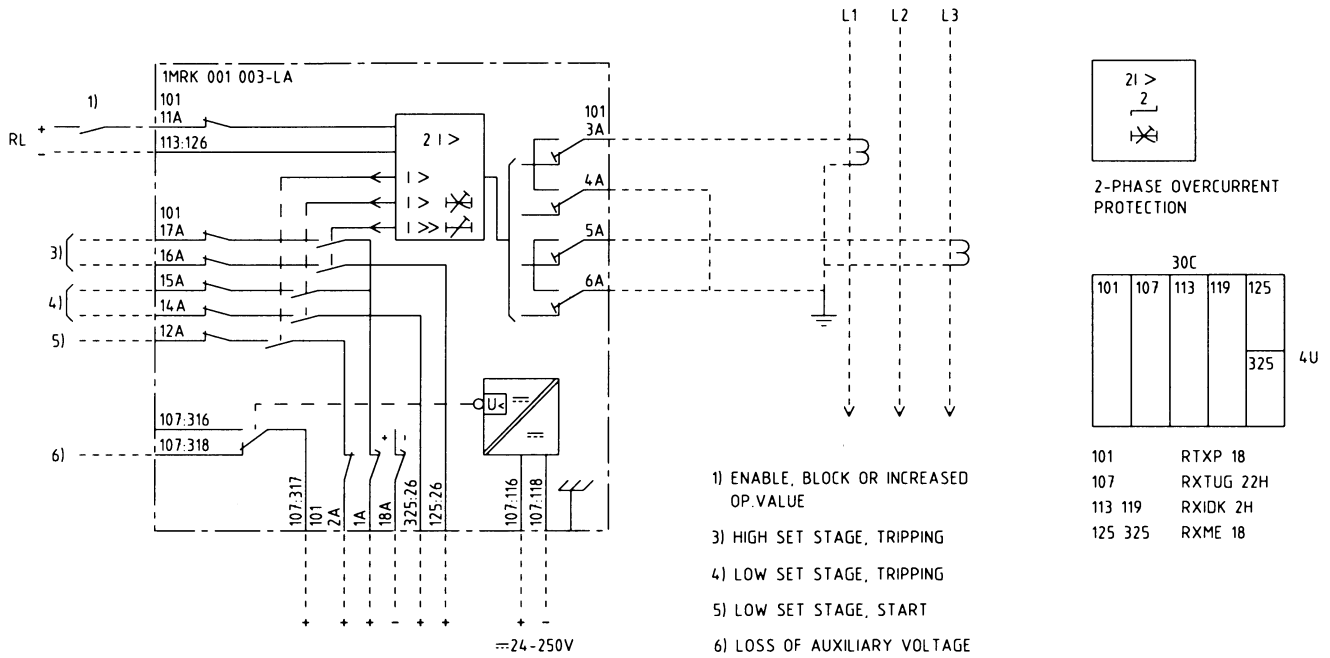


Fig. 15 Terminal diagram 1MRK 001 003-LAA

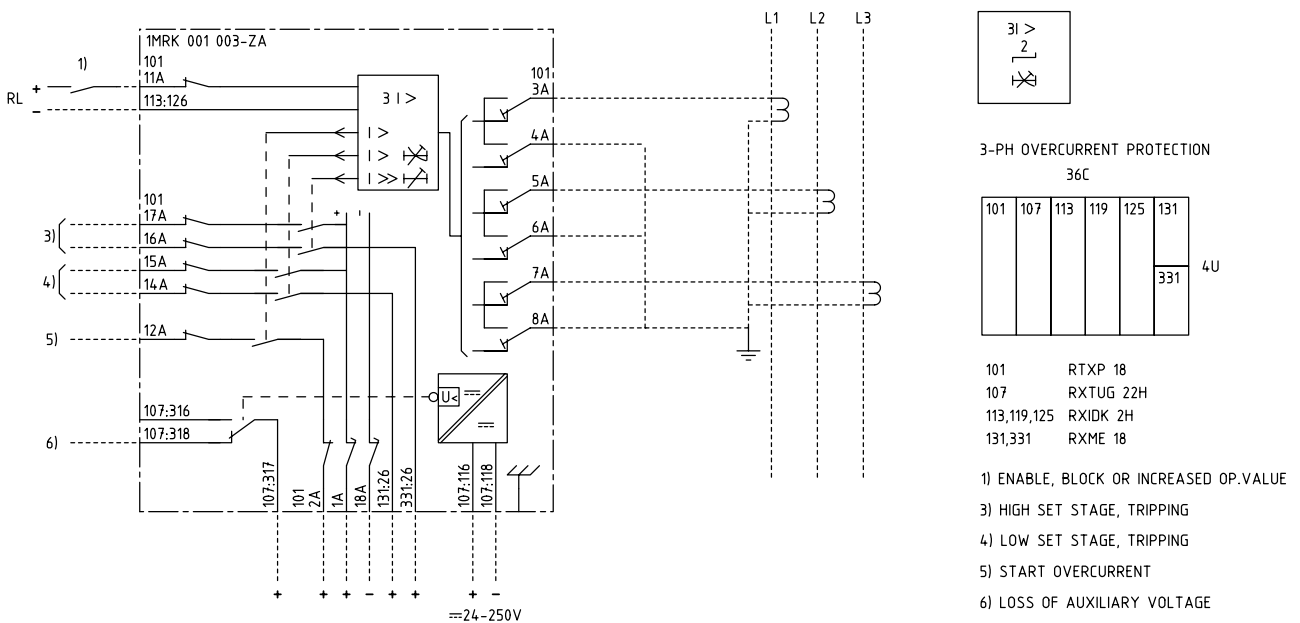


Fig. 16 Terminal diagram 1MRK 001 003-ZAA

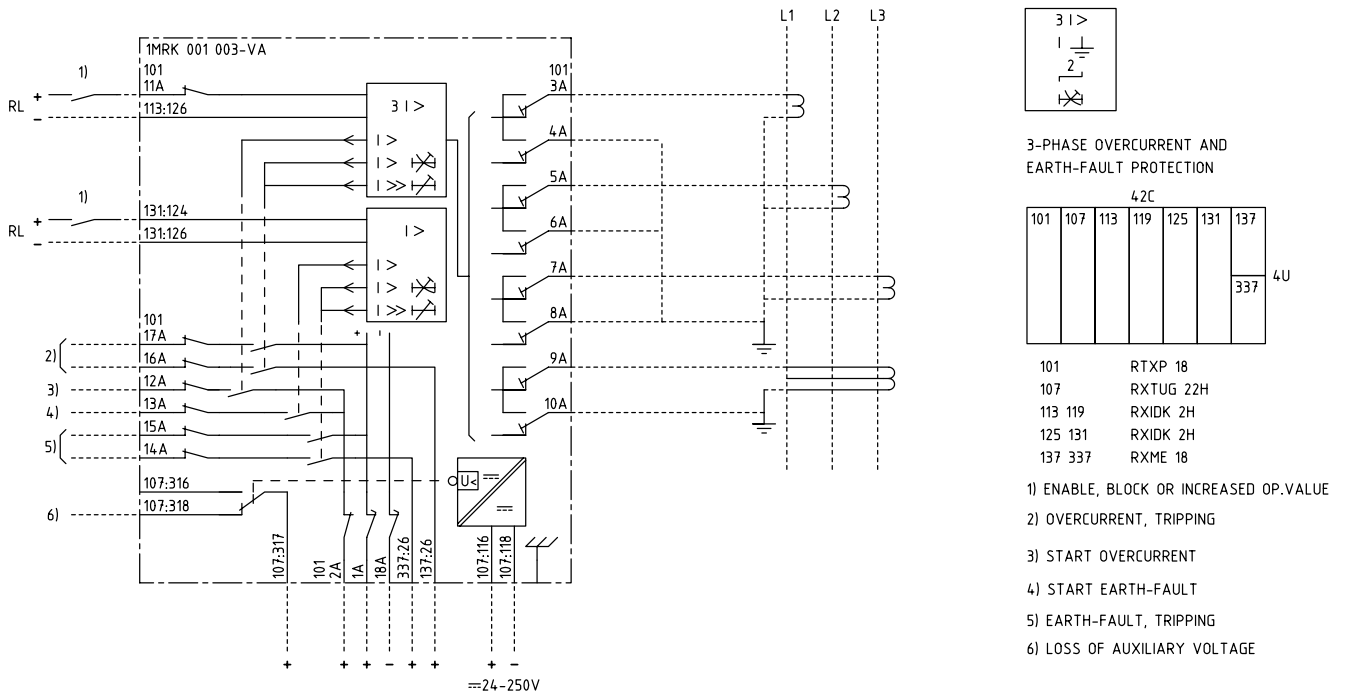


Fig. 17 Terminal diagram 1MRK 001 003-VAA

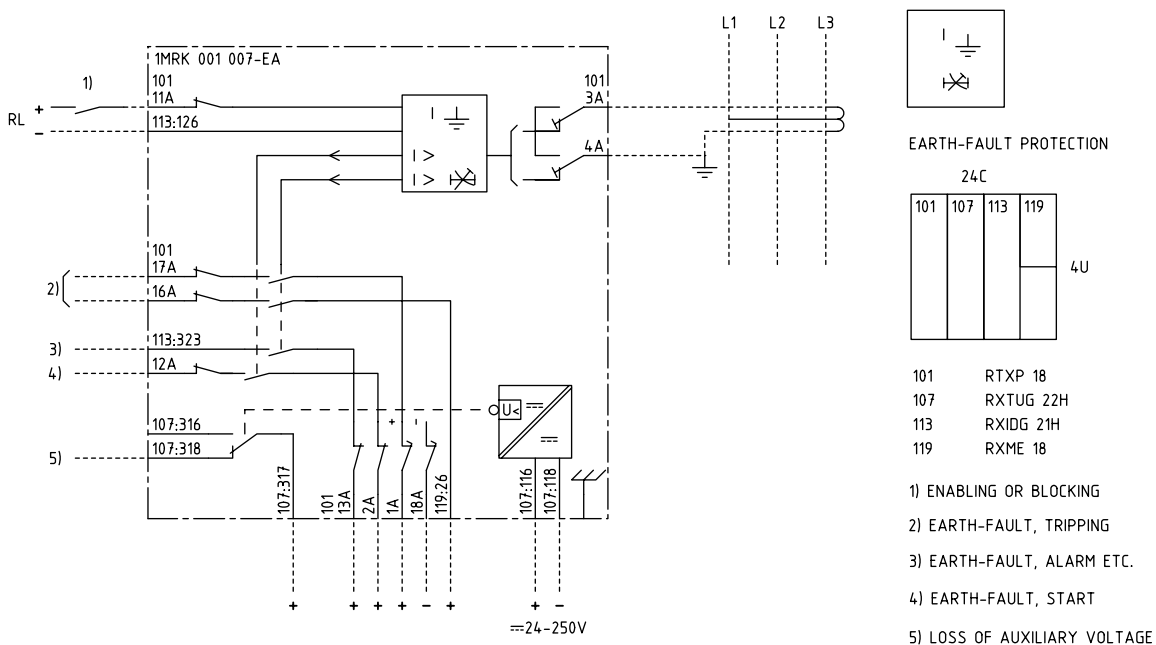


Fig. 18 Circuit diagram 1MRK 001 007-EAA

Protection assemblies

RAIDK and RAIDG

Protection assemblies are built up based upon time overcurrent relay RXIDK 2H and earth fault relay RXIDG 21H. Test device RXP 18 and dc/dc-converter RXTUG 22H can also be included for specific application requirements. Test device RXP 18 is a tool for relay testing.

DC/DC-converter RXTUG 22H can be used either separately for a single protection or to feed also other protections with up to 9 units of the same relay family. With RXTUG 22H all requirements concerning disturbance emission and immunity with this protection assembly will be met.

The assemblies have output contacts as specified for the relay RXIDK 2H and RXIDG 21H, which in most cases are fully sufficient.

Protections are normally available with output logic with heavy duty relay RXME 18 (RK 221 825-XX) with indicating flag and can upon request be completed with an output logic of free choice. Output relays are connected to separate auxiliary voltage.

The extremely flexible mounting system COMBIFLEX together with a modern CAD-system enables us to present a unique flexibility for designing assemblies upon the customers requests.

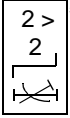

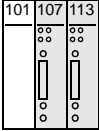
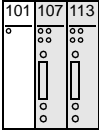
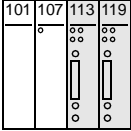
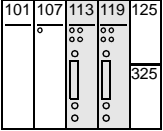
The interface voltage for enable or block impulses can be connected to either 48-60 V dc or 110-220 V dc by connecting the voltage circuit to separate terminals. At delivery all relays are connected for 110-220 V dc.

RAIDK

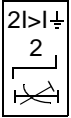

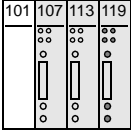
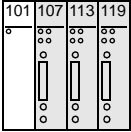
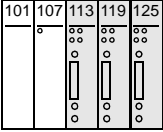
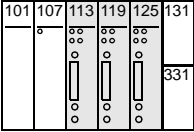
RAIDK 1 Single-phase overcurrent or earth fault protection

$[1 \Rightarrow 0]$	$[1 \Rightarrow 0]$				
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		Order No. Circuit diagram	Order No. Circuit diagram	Order No. Circuit diagram	Order No. Circuit diagram
Standard		1MRK 001 002-BS 1MRK 001 003-BA	1MRK 001 002-CS 1MRK 001 003-CA	1MRK 001 002-DS 1MRK 001 003-DA	1MRK 001 002-ES 1MRK 001 003-EA
Filter		1MRK 001 002-BA 1MRK 001 003-BA	1MRK 001 002-CA 1MRK 001 003-CA	1MRK 001 002-DA 1MRK 001 003-DA	1MRK 001 002-EA 1MRK 001 003-EA

RAIDK 2 Two-phase overcurrent protection

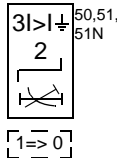
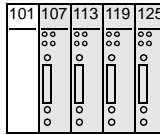
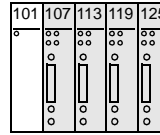
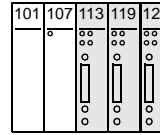
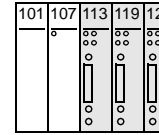
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Filter		1MRK 001 002-GS 1MRK 001 003-GA	1MRK 001 002-HS 1MRK 001 003-HA	1MRK 001 002-KS 1MRK 001 003-KA	1MRK 001 002-LS 1MRK 001 003-LA																														
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RAIDK 3 Three-phase overcurrent protection, two-phase and earth fault protection

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Filter		1MRK 001 002-NS 1MRK 001 003-NA	1MRK 001 002-YS 1MRK 001 003-YA	1MRK 001 002-PS 1MRK 001 003-PA	1MRK 001 002-ZS 1MRK 001 003-ZA																																						
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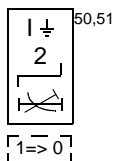
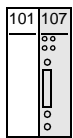
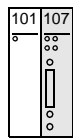
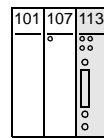
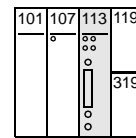
Protection assemblies (cont'd)

RAIDK 4 Three-phase overcurrent and earth fault protection

																																																			
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Filter	1MRK 001 002-SA 1MRK 001 003-SA	1MRK 001 002-TA 1MRK 001 003-TA	1MRK 001 002-UA 1MRK 001 003-UA	1MRK 001 002-VA 1MRK 001 003-VA																																															

RAIDG

RAIDG 1 Earth fault protection

																											
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Ordering

Specify RAIDK/RAIDG Protections

- Quantity
- Ordering number
- Code A, C, H, M
- Desired wording on the lower half of the test switch face plate max. 13 lines with 14 characters per line.

Specify RXIDK/RXIDG (loose relays)

- Quantity
- Ordering number

Overcurrent relay, standard 50-60 Hz

Type	Rated current I _r	Filter	Article No.	Code for phase	Code for earth fault
RXIDK 2H	0,2 A	50-60 Hz (standard)	1MRK 000 838-FA	<input type="checkbox"/> A11	<input type="checkbox"/> C11
RXIDK 2H	1 A	50-60 Hz (standard)	1MRK 000 838-AA	<input type="checkbox"/> A1	<input type="checkbox"/> C1
RXIDK 2H	5 A	50-60 Hz (standard)	1MRK 000 838-HA	<input type="checkbox"/> A6	<input type="checkbox"/> C6
RXIDG 2H	0,2 A	50-60 Hz (standard)	1MRK 000 839-AA		

Overcurrent relay, with optional filters

Type	Rated current I _r	Filter	Article No.	Code for phase	Code for earth fault
RXIDK 2H	0,2 A	50-60 Hz (sharp)	1MRK 000 838-GA	<input type="checkbox"/> A12	<input type="checkbox"/> C12
RXIDK 2H	0,2 A	150-180 Hz (sharp)	1MRK 000 838-PA	<input type="checkbox"/> A13	<input type="checkbox"/> C13
RXIDK 2H	0,2 A	40-2000 Hz (flat)	1MRK 000 838-RA	<input type="checkbox"/> A14	<input type="checkbox"/> C14
RXIDK 2H	0,2 A	16 2/3 Hz (flat)	1MRK 000 838-UA	<input type="checkbox"/> A17	<input type="checkbox"/> C17
RXIDK 2H	1 A	50-60 Hz (sharp)	1MRK 000 838-BA	<input type="checkbox"/> A2	<input type="checkbox"/> C2
RXIDK 2H	1 A	150-180 Hz (sharp)	1MRK 000 838-CA	<input type="checkbox"/> A3	<input type="checkbox"/> C3
RXIDK 2H	1 A	40-2000 Hz (flat)	1MRK 000 838-DA	<input type="checkbox"/> A4	<input type="checkbox"/> C4
RXIDK 2H	1 A	16 2/3 Hz (flat)	1MRK 000 838-EA	<input type="checkbox"/> A5	<input type="checkbox"/> C5
RXIDK 2H	5 A	50-60 Hz (sharp)	1MRK 000 838-KA	<input type="checkbox"/> A7	<input type="checkbox"/> C7
RXIDK 2H	5 A	150-180 Hz (sharp)	1MRK 000 838-LA	<input type="checkbox"/> A8	<input type="checkbox"/> C8
RXIDK 2H	5 A	40-2000 Hz (flat)	1MRK 000 838-MA	<input type="checkbox"/> A9	<input type="checkbox"/> C9
RXIDK 2H	5 A	16 2/3 Hz (flat)	1MRK 000 838-NA	<input type="checkbox"/> A10	<input type="checkbox"/> C10
RXIDK 2H	1 A	16 2/3 Hz (alternative version)	1MRK 000 838-SA	<input type="checkbox"/> A15	
RXIDK 2H	5 A	16 2/3 Hz (alternative version)	1MRK 000 838-TA	<input type="checkbox"/> A16	

Auxiliary voltage

For included auxiliary relays

	Code
24 V dc	<input type="checkbox"/> H5
48-55 V dc	<input type="checkbox"/> H6
110-125 V dc	<input type="checkbox"/> H7
220-250 V dc	<input type="checkbox"/> H8

Mounting alternatives	Size	Article No.	Code
Apparatus bars			<input type="checkbox"/> M10
Equipment frame without door	4U 19"	1MRK 000 137-GA	<input type="checkbox"/> M11
Equipment frame with door	4U 19"	1MRK 000 137-KA	<input type="checkbox"/> M12
RHGX 4	4U 12C	RK 927 001-AB	<input type="checkbox"/> M71
RHGX 8	4U 24C	RK 927 002-AB	<input type="checkbox"/> M72
RHGX 12	4U 36C	RK 927 003-AB	<input type="checkbox"/> M73
RHGX 20	4U 60C	RK 927 004-AB	<input type="checkbox"/> M74
RHGS 30	6U x 1/1 19" rack	1MRK 000 315-A	<input type="checkbox"/> M81
RHGS 12	6U x 1/2 19" rack	1MRK 000 315-B	<input type="checkbox"/> M82
RHGS 6	6U x 1/4 19" rack	1MRK 000 315-C	<input type="checkbox"/> M83

References

Auxiliary relays	1MRK 508 015-BEN
Time relays	1MRK 508 002-BEN
Current and voltage relays	1MRK 508 018-BEN
Connection and installation components in COMBIFLEX	1MRK 513 003-BEN
Relay accessories COMBIFLEX	1MRK 513 004-BEN
Test system COMBITEST	1MRK 512 001-BEN
User's Guide RXIDK	1MDU09024-EN

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