

Features

RXEDA relay

- Microprocessor based time-overvoltage relay for DC and AC, single- or three-phase with or without neutral
- Setting voltage ranges: 20-300 V DC and 15-210 V AC 15-400 Hz
- Setting time range: 0-10 s definite time
- Two output change-over contacts; one for start and one for time function or both for time function
- Time function is indicated by a red LED
- High resetting ratio; >97%
- No auxiliary voltage required
- Suitable as a replacement for electro-mechanical relays

RAEDA protection

- DC time-overvoltage protection or AC 50-60 Hz three-phase time-overvoltage protection reconnectable for measuring line-to-line or line-to neutral voltage
- Can also be applied for AC 15-400 Hz single phase voltage measuring
- Can be used as a DC or AC single phase instantaneous undervoltage protection
- Test switch included as standard
- Variants with medium or heavy duty trip output contacts and hand reset flag
- Compact design

Application

The time-overvoltage protection RAEDA can be used in many different applications, such as:

Overvoltage protection

For generators overvoltage protection is used to detect failure in the voltage regulation. For transformers and transmission lines overvoltage protection is used to detect excessive voltages. For these applications the high resetting ratio is essential.

Neutral point voltage protection

Overvoltage protection is used to detect occurrence of earth-faults in not solidly earthed networks by detecting the neutral point voltage from broken delta connected secondary windings of phase transformers or from transformers connected between neutral and earth. The start function of the protection can be used to enable selective earth-fault current protections.

Application (cont'd)

Undervoltage protection

Single phase undervoltage protection is used to disconnect asynchronous motors at low system voltage to prevent problems with inrush at system voltage recovery. A separate time relay is needed to delay the tripping.

DC voltage protection

Both over- and undervoltage protections are used to detect abnormal battery voltages. For undervoltage operation a separate time relay is recommended.

Design

There are two variants of the voltage protection **RAEDA**. The one consists of a test switch RTXP 8, for simple secondary testing, and a time-overvoltage relay RXEDA 1. The other variant has in addition to that an auxiliary relay RXME 18, which has two heavy duty trip contacts and a red hand reset indicating flag.

The relay consists mainly of a rectifying input circuit, a microprocessor, two potentiometers and a 4-pole programming switch for setting of operate voltage, time delay and for choose of contact configuration, two electro-mechanical output relays, each with one change-over contact, and a red LED for indicating time function operation.

When the voltage protection is connected to the three phases and neutral according to alt. 1 in Fig. 2 or 3, it measures the phase to neutral voltages, and when the protection is connected only to the three phases according to alt. 2 in Fig. 4, it measures the phase to phase voltages.

Operation occurs for a voltage (one or more of the three at three-phase measuring) equal to or larger then the product of set scale value and selected scale constant. When the voltage (all three at three-phase measuring) decreases to 1-3% below set value the relay will reset.

The overvoltage relay **RXEDA 1** is a static microprocessor relay with one measuring stage and two output change-over contacts. The contacts can be programmed for start and time function respectively or time function for both.

The start function operates instantaneously and the time function operation is definite-time delayed according to set value on the time-scale. The delay is settable up to 10 seconds.

Technical data

Below data is for time-overvoltage relay RXEDA 1. Data for assemblies please also refer to catalogues for other included relays.

Table 1: Voltage input

Rated frequency	DC and AC 15 - 400 Hz
Scale constant k	20, 40 and 100 V DC and 15, 30 and 70 V AC
Scale range	(1-3) x k
Setting ranges	20-300 V DC and 15 - 210 V AC
Power consumption U = lowest / highest DC setting U = lowest / highest AC setting	0,4 / 2,5 W before operation, 0,7 / 3,1 W after operation 0,4 / 3,8 VA before operation, 0,6 / 4,4 VA after operation
Overload capacity continuously during 10 s	330 V DC or 230 V AC4 350 V DC or 250 V AC

Table 2: Start and time functions

	Start function	Time function
Time delay setting		0-10 s
Operate time, DC, typical U = 0 => > 1,1 x op. value	30 ms	30 ms + set delay
Operate time, 16,7 Hz, typical U = 0 => 1,1 x op. value	50 ms	50 ms + set delay
U = 0 => > 2 x op. value	35 ms	35 ms + set delay
Operate time, 50-60 Hz, typical U = 0 => 1,1 x op. value	35 ms	35 ms + set delay
U = 0 => > 2 x op. value	30 ms	30 ms + set delay
Resetting time U = 2 => 0 x op. value	< 40 ms	< 40 ms
Operate indication	–	Red LED
Consistency of the operate value	< 0,5% for DC, < 1% for AC	
Reset ratio	> 97%	
Recovery time	< 50 ms	
Overshoot time	< 25 ms	
Temperature dependence	< -0,08% / °C	
Frequency dependence within frequency range 16-100 Hz	< 1,5%	
frequency range 15-400 Hz	< 5%	
Influence of harmonics 150/180 Hz, 20%	< 16%	
250/300 Hz, 20%	< 16%	

Table 3: Output relays

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

Technical data (cont'd)

Table 4: Output relays

Contacts	2 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

Table 5: Electromagnetic immunity tests

Test	Severity	Standard
Surge test	1 and 2 kV, normal service 2 and 4 kV, withstand 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 magnetic field 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, 80 -1000 MHz	IEC 61000-4-3, level 3
Radiated pulse electromagnetic field test	10 V/m, 900 MHz	ENV 50204
Conducted electromagnetic field test	10 V, 0,15-80 MHz	IEC 61000-4-6, level 3

Table 6: Electromagnetic emission tests

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

Table 7: Insulation tests

Test	Severity	Standard
Dielectric test Circuit to circuit and circuit to earth Over open contact	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	> 1000 M Ω at 500 V DC	IEC 60255-5

Table 8: Mechanical tests

Test	Severity	Standard
Vibration tests	Response: 1,0 g, 10-150-10 Hz Endurance: 2 g, 10-150-10 Hz, 20 sweeps	IEC 60255-21-1, class 2 IEC 60255-21-1, class 2
Shock tests	Response: 5 g, 11 ms, 3 pulses Withstand: 15 g, 11 ms, 3 pulses	IEC 60255-21-2, class 1
Bump test	Withstand: 10 g, 16 ms, 1000 pulses	IEC 60255-21-2, class 1
Seismic tests	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 9: Temperature range

Operative range	-20 °C to +55 °C
Storage	-40 °C to +70 °C

Table 10: Weight and dimensions

Weight	250 g
Height	2U
Width	6C

Dimensions and mounting

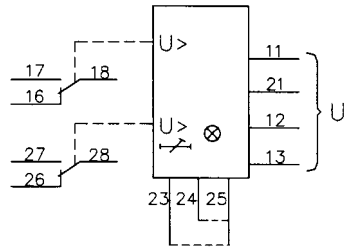
RXEDA 1 overvoltage relay occupies one COMBIFLEX seat (2U 6C). The relay is mounted on separately ordered COMBIFLEX bases. The assemblies are provided on apparatus bars for mounting on support frame in 4U, 19" equipment frame or in cases type RHGS or RHGX for panel flush or semiflush mounting.

RAEDA overvoltage protection can be delivered in the following mounting alternatives:

- on apparatus bars
- in equipment frame
- in cases RHGS or RHGX

For mounting details refer to COMBIFLEX catalogue.

Diagrams



(97000117)

The measured voltage shall be connected to the following terminals:

Measuring:	Terminals
DC	11 - 21
AC single phase	11 - 21
AC two-phase	11 - 21
AC three-phase without neutral	11 - 21 - 12
AC three-phase with neutral	11 - 21 - 12 - 13 (neutral)

Connect 24-25 at DC and AC 1Ø, 2Ø and 3Ø
Connect 23-25 at AC 3Ø +N

Fig. 1 Terminal diagram for RXEDA 1, 1MRK 000 421-AA

Observe that terminal 25 always must be connected to terminal 23 or 24, as indicated in the terminal diagram. A suitable short wire having two 10 A COMBIFLEX sockets is delivered together with the relay. This wire shall be connected to the rear of the relay terminal base.

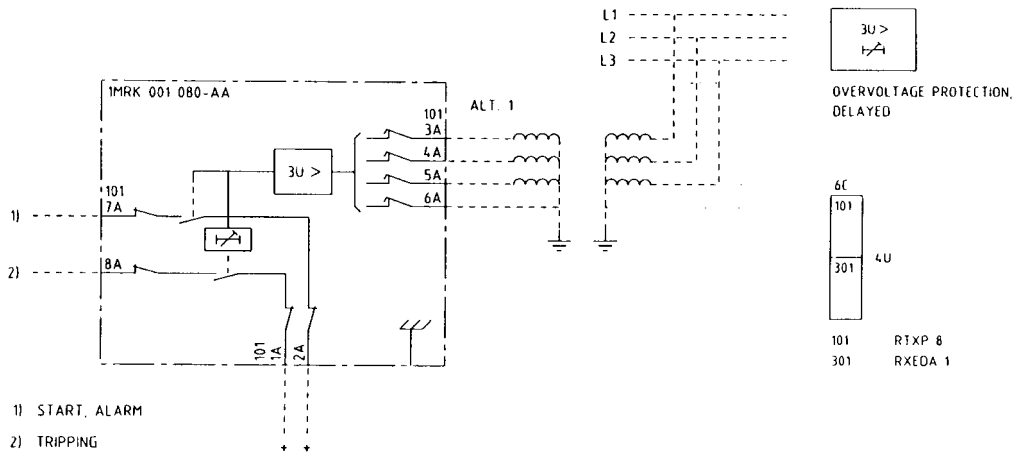


Fig. 2 Terminal diagram 1MRK 001 080-AAA for RAEDA, 1MRK 001 079-AA

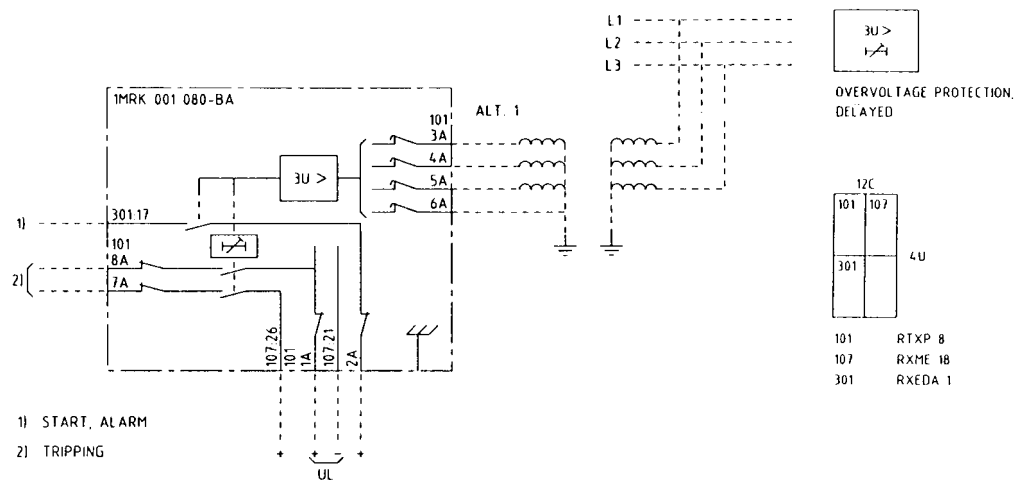
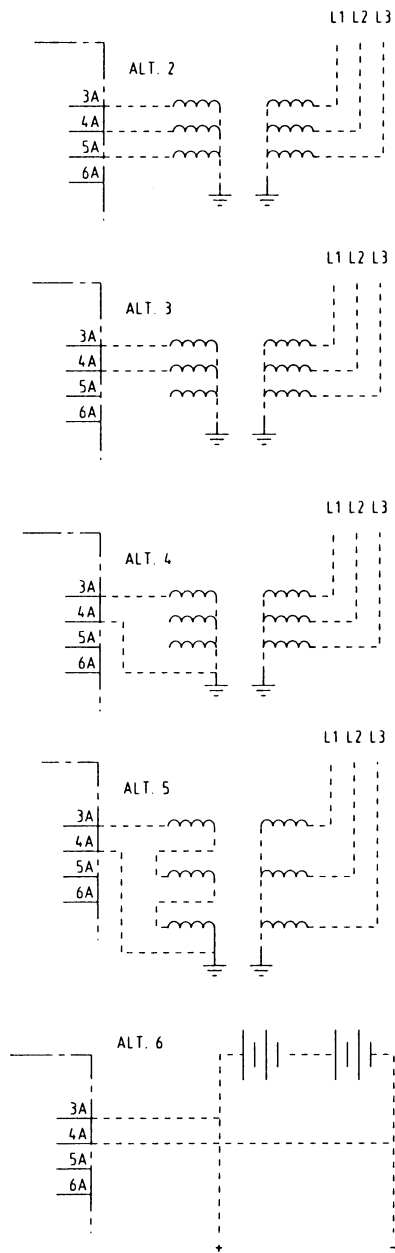


Fig. 3 Terminal diagram 1MRK 001 080-BAA for RAEDA, 1MRK 001 079-BA



(1mrk001080-baa.2)

Fig. 4 Alternate AC and DC measuring connections of RAEDA.

Ordering

Specify for **RAEDA** (protection):

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

Specify for **RXEDA 1** (loose relays):

- Quantity
- Ordering number

Ordering (cont'd)

Ordering number:

RAEDA, without auxiliary relay RXME 18	1MRK 001 079-AA
RAEDA, with auxiliary relay RXME 18	1MRK 001 079-BA
RXEDA 1	1MRK 001 421-AA

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

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
Parts in COMBIFLEX	1MRK 513 003-BEN
Plug-in COMBIFLEX	1MRK 513 004-BEN
Test system COMBITEST	1MRK 512 006-BEN

Manufacturer

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