

## Introduction

COMBIFLEX-system is based upon plug-in units mounted in 19" equipment frame or relay casings for flush- semi-flush or wall-

mounting. There are also possibilities to mount relay sockets into specific customer applications.

## Protection assemblies

Function	Relay	Relay Protection	Protection	Protection Function	Way of mounting	Buyer's Guide No.
3I>IN	RXIDK 4	Start, I>, I>>, IN>, IN>>	RAIDK 400	L1/2/3,N	B/F/S/X	1MRK 509 035
I>t	RXIDK 2H	Start, I>t, I>>	RAIDK	L1/2/3,N	B/F/S/X	1MRK 509 002
IN	RXIDG	Start, IN>	RAIDG	N,L1+N,L1/2+N	B/F/S/X	1MRK 509 002
Insc>	RXIIK 4	Start, Alarm, Insc>	RAIIK 400	Insc	B/F/S/X	1MRK 509 045
U $\geq$	RXEDK	Start, U $\geq$ (1, 2)	RAEDK	L1/2/3	B/F/S/X	1MRK 509 004
			RAGEK	95% + 100%	B/F/S/X	1MRK 509 004
$\frac{I}{I}$	RXVK	Start, $\frac{I}{I}$ (1, 2)	RAVK	L1/2/3	B/F/S/X	1MRK 509 003
$\frac{I}{I}$	RXPKD	Start, $\frac{I}{I}$ (1, 2)	RAPDK	L1/2/3	B/F/S/X	1MRK 509 007
f	RXFK	Start, f (1, 2)	RAFK	2,4,6 steps	B/F/S/X	1MRK 509 009
Z<	RXZK	Start, $\frac{I}{I}$ Z< (1, 2)	RAZK	L1/2/3	B/F/S/X	1MRK 509 006
V/Hz	RXLK	Start, V/Hz (1, 2)	RALK	L1	B/F/S/X	1MRK 509 008
I	RXIG	I>	RAIG	L1/2/3	B/F/S/X	1MRK 509 010
I	RXIB	I>	RAICA	L1/2/3	B/F/S/X	1MRK 508 018
U	RXEG	U>	RAEG	L1/2/3	B/F/S/X	1MRK 509 011
P<	RXPPK	Start, $\frac{I}{I}$ (1, 2)	RAPPK	L1/2/3	B/F/S/X	1MRK 509 042
U>	RXEDA	Start, U>	RAEDA	L1/2/3,N	B/F/S/X	1MRK 509 044
Iu>	RXISK	Start, Iu>, I>>	RAISK	L1/2/3	B/F/S/X	1MRK 509 031

B = Apparatus bars  
F = Equipment frame, 60C  
S = RHGS 1/1, 60C  
X = RHGX 20, 60C

## Current relays

### RXIG 2, RAIG

1MRK 509 010-BEN

Three versions available. RXIG 21 with straight frequency characteristic. RXIG 22 which has reduced sensitivity to higher frequencies. RXIG 28 with extra low ac power consumption.

High reset ratio enables a setting close to maximum service values.

Low transient overreach i.e. relay is insensitive to dc component in fault current (RXIG 21 and 22)

### RXIB, RAICA

1MRK 508 018-BEN

Short operating time (< 15 ms) and resetting time (< 11 ms).

### RXIDK 2H, RAIDK

1MRK 509 002-BEN

Two variants with wide setting ranges. Low set stage programmable for six different time characteristics.

Current relays (cont'd)	<p>Reset ratio 95% enables a setting close to maximum service values. Recovery time &lt; 40 ms enables small time steps between time selective protection. Low transient over-reach i.e. the relay is insensitive to dc component in fault current.</p>	<p>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 &lt; 80% of current on faulty object.</p>
	<p><b>RXIDG 2H, RAIDG</b> 1MRK 509 002-BEN Pioneering method for selective sensitive earth fault protection in solidly earthed systems.</p>	<p><b>RXIDK 4, RAIDK 400</b> 1MRK 509 035-BEN Three-phase time overcurrent and earth-fault relay with built-in HMI and wide setting ranges. 5 independent output relays selectable for start and trip output. Easy selectable setting parameters through the HMI.</p>
<b>Voltage restrained over-current relay</b>	<p><b>RXISK, RAISK</b> 1MRK 509 033-BEN Voltage restrained overcurrent relay is used as back-up phase short-circuit protection for generator.</p>	<p>Two variant with the rated current 1 A and 5 A. Settable voltage restraint 50 V to 200 V.  Five inverse time characteristics and definite time delay 50 ms - 8,1 s.</p>
<b>Voltage relays</b>	<p><b>RXEG 2 with assemblies</b> 1MRK 509 011-BEN Over- and undervoltage relay with high reset ratio enables a setting close to maximum service values.</p> <p><b>RXEDK 2, RAEDK</b> 1MRK509004-BEN Time over/under voltage relay with three variants with wide setting ranges in two measuring stages. The two measuring stages are switchable for over- and undervoltage function. High reset ratio for overvoltage and low reset ratio for undervoltage function enables a setting close to maximum service values</p>	<p><b>RXEDA, RAEDA</b> 1MRK 509 044-BEN 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. No auxiliary voltage is required. Setting time range 0 - 10 s definite time.</p>
<b>Directional relays</b>	<p><b>RXPKD 2H, RAPDK</b> 1MRK 509 007-BEN Directional overcurrent relay for use as short circuit or earth fault protection. The relay is available in main two variants with settable characteristic angle and different time functions.</p>	<p><b>RXPG 4</b> 1MRK 509 016-BEN Directional relay measuring transients to be used in resonansearched systems. Correct directional measurement without using neutral resistor.</p>
<b>Thermal relay</b>	<p><b>RXVK 2H, RAVK</b> 1MRK 509 003-BEN Thermal overcurrent relay with the same time constants for heating and cooling to be used</p>	<p>for motors, generators, transformers, cables and filter reactors.</p>
<b>Impedance relay</b>	<p><b>RXZK 2H, RAZK</b> 1MRK 509 006-BEN Impedance measuring relay for use as out-of-step relay for synchronous machines or as a</p>	<p>voltage dependent time overcurrent relay. The relay is available in two variants with settable characteristic angle 0-120°.</p>

<b>Frequency relay</b>	<p><b>RXFK 2H, RAFK</b> 1MRK 509 009-BEN Over/underfrequency relay with two measuring steps. The relay is available in two variants with setting steps 10 or 25 mHz giving a</p>	<p>setting range of <math>\pm 4</math> and <math>\pm 10</math> Hz respectively. The relay can be used for protection of all kinds of generators, motors and in load shedding programs.</p>
<b>Over excitation relay (V/Hz)</b>	<p><b>RXLK 2H, RALK</b> 1MRK 509 008-BEN Overexcitation relay using the V/Hz measuring principle. The relay is used for protection</p>	<p>of transformers and has wide setting ranges with different inverse- or definite-time characteristics.</p>
<b>Negative sequence current relay</b>	<p><b>RXIIK 4, RAIK 400</b> 1MRK 509 045-BEN Negative sequence overcurrent relay with built-in HMI and wide setting ranges.</p>	<p>5 independent output relays selectable for start and trip output. Easy selectable setting parameters through the HMI.</p>
<b>Reverse power relay</b>	<p><b>RXPPK, RAPPK</b> 1MRK 509 042-BEN Directional current relay is used to detect reverse power or low forward power to prevent damage the prime mover.</p>	<p>Two variants with wide setting ranges. Two time functions <math>t_1</math> and <math>t_2</math>. Trip <math>t_2</math> is supported by a time-hold function with the setting 0 or 5 s.</p>
<b>Time relay</b>	<p><b>RXKA 1</b> 1MRK 508 005-BEN Time relay with pick-up and drop-out functions and setting range 0,1 - 320 s. One change over contacts.</p> <p><b>RXKL 1</b> 1MRK 508 002-BEN Time relay with pick-up delay with continuous and pulse function and setting range 20 ms to 99 H. Supply voltage 24 - 250 V dc and 100-240 V ac.</p>	<p><b>RXKM 1</b> 1MRK 508 002-BEN Time relay with pick-up and drop-out delay with continuous and pulse function and setting range 20 ms to 99 H. Continuous and summation time measuring and indication of start, elapsed time and operation. Supply voltage 24 - 250 V dc and 100-240 V ac.</p>
<b>Auxiliary relays</b>	<p><b>RXMB 1, RXMC 1</b> 1MRK 508 006-BEN High speed operation, down to 4 ms and contacts for heavy or medium duty operation. Low power consumption. RXMB 1 replaces all variants of RXMA 1 and RXMM 1.</p> <p><b>RXMA 2</b> 1MRK 508 015-BEN Auxiliary relay with twin contacts.</p> <p><b>RXME 1</b> 1MRK 508 015-BEN Auxiliary relay with heavy-duty bridge contacts.</p>	<p><b>RXMH 2</b> 1MRK 508 015-BEN Auxiliary relay with heavy-duty bridge contacts.</p> <p><b>RXMS 1</b> 1MRK 508 015-BEN Auxiliary relay with twin contacts with extremely short operating time.</p> <p><b>RXMT 1</b> 1MRK 508 015-BEN Auxiliary relay with single dry reed contacts</p>

**Auxiliary flag and  
indicating relays**

**RXME 18**  
1MRK 508 015-BEN  
Auxiliary relay with heavy-duty bridge  
contacts.

**RXSF 1**  
1MRK 508 015-BEN  
Auxiliary relay with twin contacts.

**RXSGA 1**  
1MRK 513 004-BEN  
LED indicator to be used for phase indication  
and indicating instantaneous or delayed  
operation.

**Throw-over  
relays**

**RXMD 1**  
1MRK 508 017-BEN  
High speed operation, down to 4 ms and  
contacts for heavy or medium duty operation.  
Low power consumption.

**RXMVB 2, RXMVB 4**  
1MRK 508 016-BEN  
Throw-over relay with two stable latched  
positions and heavy duty contacts.

**DC-DC  
converter**

**RXTUG 22H**  
1MRK 513 001-BEN  
Dc/dc-converter with input voltages  
24-250 V dc and selectable outputs  $\pm 12$  V,  
 $\pm 18$  V or  $\pm 24$  V dc.

Galvanically separated inputs and outputs.  
Can be loaded with up to 15 W.

**Mounting  
components**

**RX2, RX4, RX2H**  
1MRK 513 003-BEN  
Terminal base

**RTXI**  
1MRK 513 003-BEN  
Current connector

**RTXK**  
1MRK 513 003-BEN  
Short-circuiting connector

**RTXG**  
1MRK 513 003-BEN  
Socket connector

**RTXC**  
1MRK 513 003-BEN  
Branch and cross connector

**RTXCB**  
1MRK 513 003-BEN  
Branch connector

**RTXR, RTXRB**  
1MRK 513 003-BEN  
Connecting devices

**RTXL**  
1MRK 513 003-BEN  
Connecting devices

**Relay system  
components**

**RTXE**  
1MRK 513 004-BEN  
Component block

**RXTMA 1**  
1MRK 513 004-BEN  
Resistance unit

**RXTMB 1**  
1MRK 513 004-BEN  
Potentiometer

**RXTCA 1**  
1MRK 513 004-BEN  
Capacitance unit

**RXTCB 1**  
1MRK 513 004-BEN  
Impulse storage device

**RXTCC 1**  
1MRK 513 004-BEN  
Capacitance unit

**RXTDA 1**  
1MRK 513 004-BEN  
Diode units

**RXTLA 1**  
1MRK 513 004-BEN  
Rectifier units

**RXTNF 11/12**  
1MRK 513 004-BEN  
Counters

**RXTNT 11/12**  
1MRK 513 004-BEN  
Push button units

**COMBITEST**

**RTXH 8, RTXP 8**  
1MRK 512 002-BEN  
Test unit and handle

**RTXH 18, RTXP 18**  
1MRK 512 002-BEN  
Test unit and handle

**RTXH 24, RTXP 24**  
1MRK 512 002-BEN  
Test unit and handle

**RTXF 18/24**  
1MRK 512 002-BEN  
Block-plug handle

**RTXB**  
1MRK 512 002-BEN  
Blocking devices

**Block-plug**  
1MRK 512 002-BEN  
RTXM Ammeter test plug

**SVERKER**  
1MRK 512 002-BEN  
Test equipment

**FREJA**  
1MRK 512 003-BEN  
Test equipment

**Relay casings**

**RHGS**  
1MRK 514 001-BEN  
1/4 (6U, 15C)  
1/2 (6U, 30C)  
1/1 (6U, 60C)

Relay cases for flush-, semiflush or wall mounting

**RHGX**  
1MRK 514 001-BEN  
4 (4U, 12C)  
8 (4U, 24C)  
12 (4U, 36C)  
20 (4U, 60C)

Relay cases for flush- or semiflush panel mounting

**Panel bases**

**RXZ**  
1MRK 514 001-BEN  
21 2 one-seat relays  
41 4 one-seat relays

Front-connected panel bases to be used in applications where surface mounting is preferred.  
Panel bases can be supplied with or without terminal board.

**Terminal board bases**

Relay sockets with clamps to be mounted directly on terminal bars

1MRK 514 001-BEN

**19" equipment frames**

To be used for cubicle mounting or panel mounting of plug-in units.

Equipment frame 4U, 60C (7" x 19")  
1MRK 514 001-BEN

Equipment frame 8U, 60C (14" x 19")  
1MRK 514 001-BEN

Equipment frame 12U, 60C (21" x 19")  
1MRK 514 001-BEN

**Relay and control Cubicles**

**VSH**  
1MRK 514 002-BEN

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