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**FLUSH-MOUNT VERSION**  
R1D

- 1 operation threshold
- External toroidal transformer
- Adjustable tripping  $I\Delta n$  and delay time.



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**FLUSH-MOUNT VERSION**  
R2D

- 2 operation thresholds
  - External toroidal transformer
  - Configurable fail safe operation
  - Adjustable tripping  $I\Delta n$  and delay time.
- R3D
- 2 operation thresholds
  - External toroidal transformer
  - Configurable fail safe operation
  - Flag indicator
  - Adjustable tripping  $I\Delta n$  and delay time.



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**FLUSH-MOUNT VERSION**  
R4D

- 2 operation thresholds
- External toroidal transformer
- Configurable fail safe operation
- Fault current measurement
- Digital display
- Flag indicator
- Shunt tripping circuit
- Adjustable tripping  $I\Delta n$  and delay time.



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**MODULAR VERSION**  
RM1

- 1 operation threshold
- External toroidal transformer
- Fixed tripping  $I\Delta n$  and delay time.

RM

- 1 operation threshold
- External toroidal transformer
- Adjustable tripping  $I\Delta n$  and delay time.



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**MODULAR VERSION**  
RMT

- 1 operation threshold
- Incorporated toroidal transformer
- Adjustable tripping  $I\Delta n$  and delay time.



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**COMPACT INTERNAL PANEL VERSION**  
RC

- 1 operation threshold
- Incorporated toroidal transformer
- Adjustable tripping  $I\Delta n$  and delay time.



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**REMOTE CONTROL RESET DEVICE**

- Supply voltage:
  - RL48 = 24-48VAC/DC
  - RL415 = 110-125VAC/DC
  - 220-240VAC
  - 380-415VAC.



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**TOROIDAL CURRENT TRANSFORMERS**

- RT
- Not openable
  - 35mm to 210mm diameter.
- RTA
- Openable
  - 110mm and 210mm diameter.
- RX10
- External multiplier.

► *Modular, flush and internal panel mount version, with or without flag indicator, configurable prealarm indication and fail safe operation.*

► *Versions with automatic toroid connection control.*

► *Choice of supply voltage ranges*

► *Adjustable fault current  $I\Delta n$ .*

► *Adjustment and choice of tripping range both for fault current and delay time.*



PLANET - DIN

**Earth leakage relays**

	Sec.	PAGE
With 1 operation threshold .....	13-	2
With 2 operation thresholds .....	13-	3
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**Dimensions**

**Wiring diagrams**

**Technical characteristics**

### Relays with 1 operation threshold



R1D...

Order code	Supply voltage	Output relay	Qty per pkg	Wt
	[V]	n°	n°	[kg]
1 OPERATION THRESHOLD. Flush mount. External CT.				
<b>R1D 48</b>	24-48VAC/DC	1	1	0.180
<b>R1D 415</b>	110-240-415V ①	1	1	0.180

① Supply voltage:  
110-125VAC (50/60Hz)/DC  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).

#### General characteristics

- 1 output relay with 1 changeover contact
- Maximum power consumption: 5.5VA
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Flush mount 96x96mm housing with transparent cover
- Connection: screw terminals
- Degree of protection: IP20 terminals, IP40 on front with cover
- Operating temperature: -10 to +60°C
- Storage temperature: -20 to +80°C.

#### ADJUSTMENTS FOR R1D

- Configurable tripping set-point ( $I_{\Delta n}$ ): 0.025-0.25A  
0.25-2.5A  
2.5-25A  
25-250A (with external multiplier RX10)
- Configurable tripping delay time (t): 0.02-0.5s  
0.2-5s

#### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.



RM1...

Order code	Supply voltage	Output relay	Qty per pkg	Wt
	[V]	n°	n°	[kg]
1 OPERATION THRESHOLD. Modular, 35mm DIN (EN 50022) rail mounting. External CT. Fixed tripping set point and time.				
<b>RM1 48</b>	24-48VAC/DC	1	1	0.078
<b>RM1 415</b>	110-240-415V AC ①	1	1	0.078

① Supply voltage:  
110-125VAC (50/60Hz)/DC  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).

#### General characteristics

- 1 output relay with 1 changeover contact for RM1 and RM types
- 2 output relays each with 1 changeover contact for RMT type
- Configurable fail safe operation for RMT type only
- Maximum power consumption: 3VA
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Modular housing with transparent cover, suitable for 35mm DIN (EN 50022) rail mounting
- Connection: screw terminals
- Degree of protection: IP20 terminals, IP40 on front with cover
- Operating temperature: -10 to +60°C
- Storage temperature: -20 to +80°C.

#### SETTINGS FOR RM1

- Selectable tripping set point ( $I_{\Delta n}$ ): fixed 0.3 or 0.5A
- Selectable tripping time (t): fixed 0.02s or 0.5s

#### ADJUSTMENTS FOR RM AND RMT

- Configurable tripping set-point ( $I_{\Delta n}$ ): 0.025-0.25A  
0.25-2.5A  
2.5-25A  
25-250A (with external multiplier RX10 for RM only)
- Configurable tripping delay time (t): 0.02-0.5s  
0.2-5s

#### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.



31 RM...

Order code	Supply voltage	Output relay	Qty per pkg	Wt
	[V]	n°	n°	[kg]
1 OPERATION THRESHOLD. Modular, 35 mm DIN rail (EN 50022) mounting. Ø 28 mm incorporated CT. Configurable fail safe.				
<b>31 RM 48</b>	24-48VAC/DC	1	1	0,078
<b>31 RM 415</b>	110-240-415V ①	1	1	0,078

① Supply voltage:  
110-125VAC (50/60Hz) / DC  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).



31 RMT...

Order code	Supply voltage	Output relay	Qty per pkg	Wt
	[V]	n°	n°	[kg]
1 OPERATION THRESHOLD. Compact panel mount. CT incorporated.				
<b>31 RC<sup>⊙</sup> 48</b>	24-48VAC/DC	1	1	0.278
<b>31 RC<sup>⊙</sup> 415</b>	110-240-415V ①	1	1	0.278

① Supply voltage:  
110-125VAC (50/60Hz)/DC  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).

② Replace with the digit of the required diameter (35-60-80-110mm).

#### General characteristics

- 1 output relay with 1 changeover contact
- Maximum power consumption: 3VA
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Front TEST and RESET buttons
- Configurable automatic or manual resetting
- Compact housing for fixing on panel mounting plate
- Connection: screw terminals
- Degree of protection: IP20 terminals
- Operating temperature: -10 to +60°C
- Storage temperature: -20 to +80°C.

#### ADJUSTMENTS FOR RC

- Configurable tripping set-point ( $I_{\Delta n}$ ): 0.025-0.25A  
0.25-2.5A  
2.5-25A
- Configurable tripping delay time (t): 0.02-0.5s  
0.2-5s

#### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.



31 RC... 48



31 RC... 415

## Relays with 2 operation thresholds



**new**

R2D...



**new**

R3D...



**new**

R4D...

Ordering code	Power supply voltage	Output relay	Qty per pkg	Wt
	[V]	n°	n°	[kg]

2 OPERATION THRESHOLDS.  
Flush mount. External CT. Fail safe.

<b>R2D 48</b>	24-48VAC/DC	2	1	0.350
<b>R3D 48</b>		2	1	0.360
<b>R2D 415</b>	110-240-415V	2	1	0.350
<b>R3D 415</b>	①	2	1	0.360

2 OPERATION THRESHOLDS.  
Flush mount. External CT.  
Fault current measurement. Digital display. Fail safe.

<b>R4D 48</b>	24-48VAC/DC	2	1	0.440
<b>R4D 415</b>	110-240-415V①	2	1	0.440

① Supply voltage:  
110-125VAC (50/60Hz)  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).

### General characteristics

- 2 output relays each with changeover contact, configurable 2 tripping or 1 tripping and 1 alarm
- Configurable fail safe prealarm and operation
- Automatic toroid connection control
- Maximum power consumption: 5.5VA
- Green power LED indicator (ON)
- Red relay tripped LED indicator (TRIP)
- Red tripping prealarm LED indicator (ALARM)
- Front TEST button
- Manual resetting by front RESET button or remote contact closing
- Automatic resetting by remote contact closing or rear jumper connection
- Constant toroid-relay circuit control
- Flag indicator (TRIP MEMORY) (R3D-R4D only)
- Digital fault current measurement and display with configurable tripping value memory (R4D only)
- Shunt tripping circuit operating test (TCS) (R4D only)
- Flush mount 96x96mm housing with transparent cover
- Connection: screw terminals (removable for R4D only)
- Degree of protection: IP20 terminals, IP40 on front with cover
- Operating temperature: -10 to +60°C

### ADJUSTMENTS FOR R2D and R3D

- Configurable tripping set-point (I $\Delta$ n):
  - 0.025-0.25A
  - 0.25-2.5A
  - 2.5-25A
  - 25-250A (with external multiplier RX10)
- Prealarm set point fixed 70%
- Configurable tripping delay time (t): 0.02-0.5s, 0.2-5s

### ADJUSTMENTS FOR R4D

- Configurable tripping set-point (I $\Delta$ n):
  - 0.03-0.3A
  - 0.3-3A
  - 3-30A
  - 30-300A (with external multiplier RX10)
- Prealarm set point fixed 70%
- Configurable tripping delay time (t): 0.03-0.5s, 0.3-5s

### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.

## Remote control reset device



31 RL...

Order code	Supply voltage	Qty per pkg	Wt
	[V]	n°	[kg]

Manual reset.

<b>31 RL 48</b>	24-48VAC/DC	1	0.025
<b>31 RL 415</b>	110-240-415V ②	1	0.025

② Supply voltage:  
110-125VAC (50/60Hz) / DC  
220-240VAC (50/60Hz)  
380-415VAC (50/60Hz).

### General characteristics

Suitable for use with all LOVATO ELECTRIC earth leakage relays.

### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.

## Toroidal current transformers



31 RT...

31 RTA...

Order code	Diameter	Openable	Qty per pkg	Wt.
	[mm]		n°	[kg]

<b>31 RT 35</b>	35	No	1	0.133
<b>31 RT 60</b>	60	No	1	0.183
<b>31 RT 80</b>	80	No	1	0.364
<b>31 RT 110</b>	110	No	1	0.403
<b>31 RT 210</b>	210	No	1	1.600
<b>31 RTA 110</b>	110	Yes	1	0.455
<b>31 RTA 210</b>	210	Yes	1	1.712

### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.

## External multiplier

Order code	Description	Qty per pkg	Wt
		n°	[kg]

<b>31 RX 10</b>	Multiplier 10 fold	1	0.183
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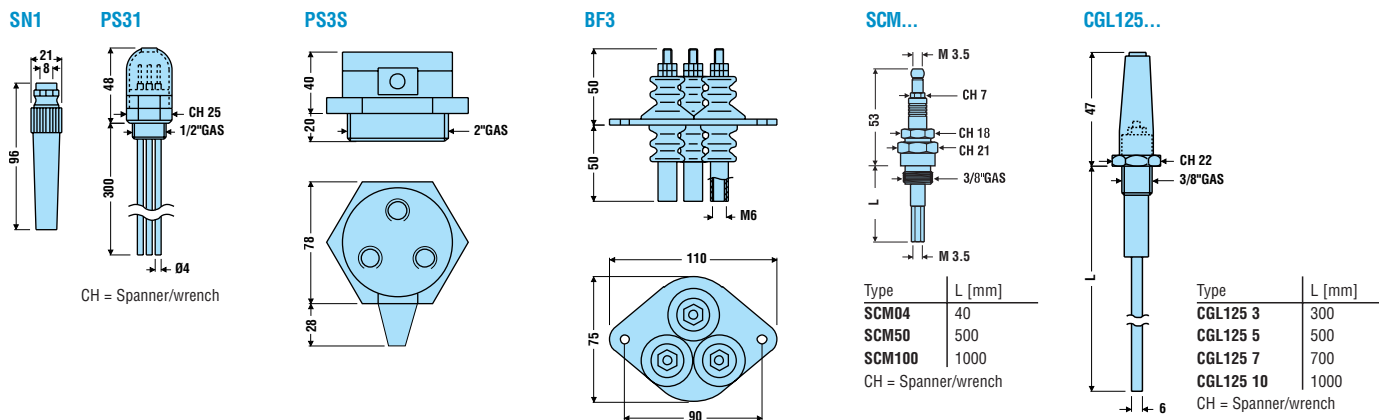
### General characteristics

- Dimensions: refer to RT35 toroidal transformer on page D-23.

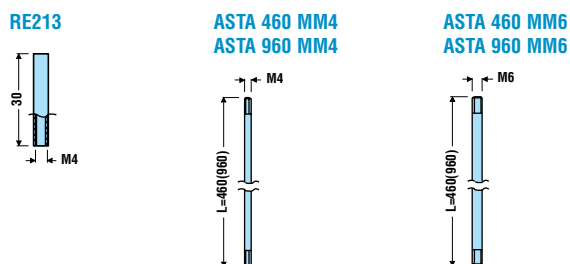
### Reference standards

Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755.

Electrodes and electrode holders for conductive liquids



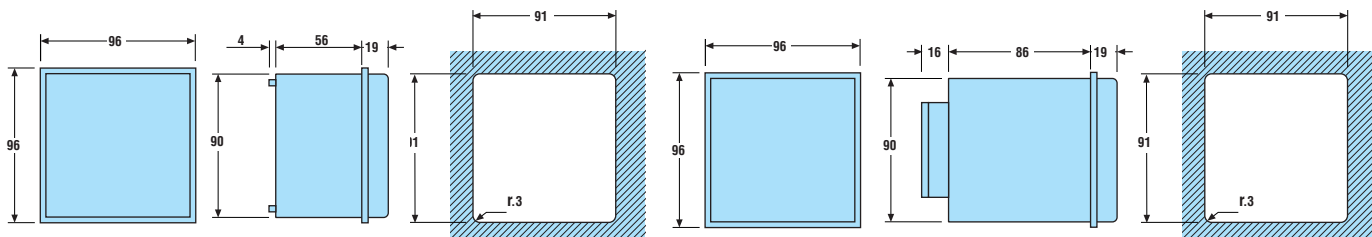
Rod probes



## Earth leakage relays

**R1D - R2D - R3D**

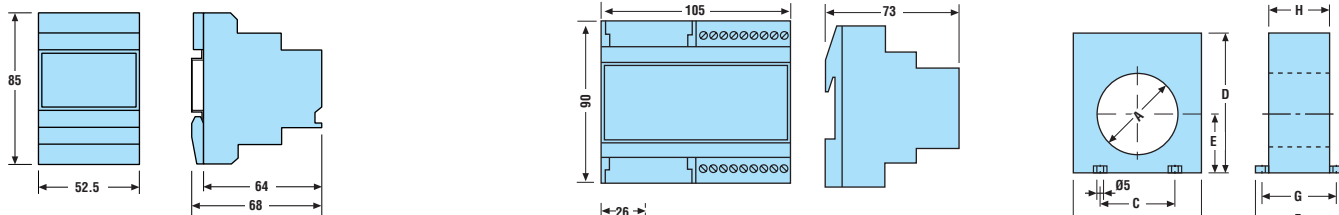
**R4D**



**RM1 - RM**

**RMT**

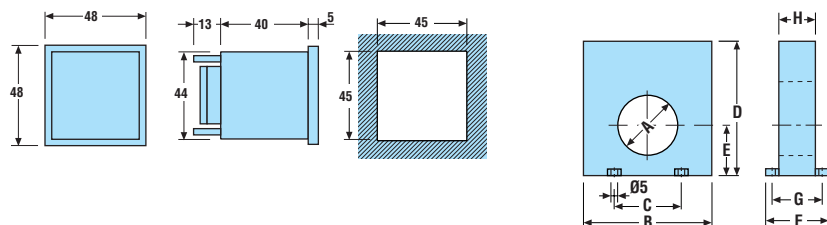
**RC**



Type	A	B	C	D	E	F	G	H
RC35	35	100	60	110	47	70	60	50
RC60	60	100	60	110	47	70	60	50
RC80	80	150	110	160	70	70	60	50
RC110	110	150	110	160	70	70	60	50

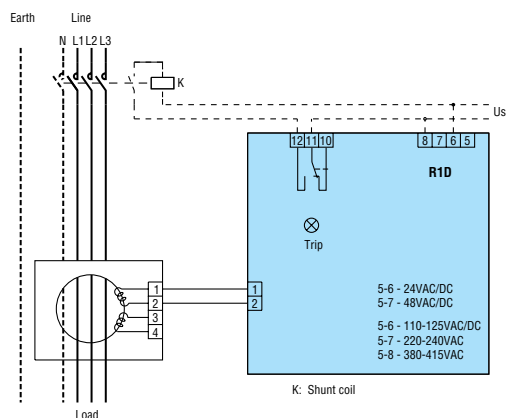
**RL**

**RT - RTA**

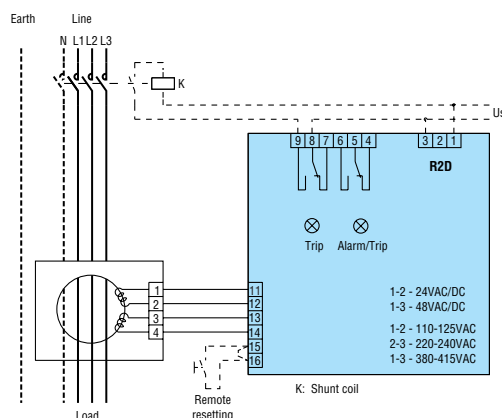


Type	A	B	C	D	E	F	G	H
RT35	35	100	60	110	47	50	43	30
RT60	60	100	60	110	47	50	43	30
RT80	80	150	110	160	70	50	43	30
RT110	110	150	110	160	70	50	43	30
RT210	210	300	240	300	150	135	105	40
RTA110	110	180	110	150	75	45	35	25
RTA210	210	300	240	300	150	135	105	40

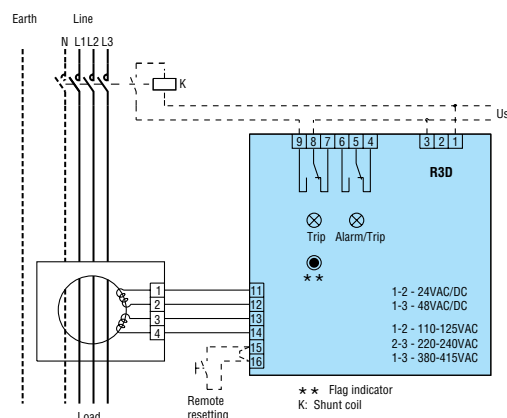
### R1D



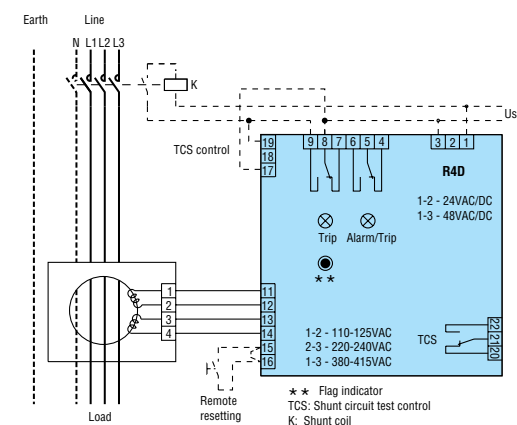
### R2D



### R3D

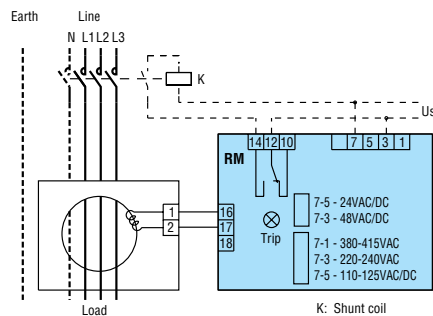


### R4D

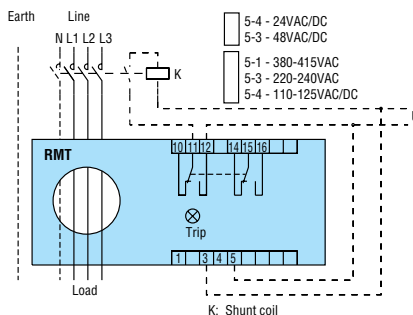


Type	Us	Us wiring	TCS wiring
R4D 48	24VAC/DC 48VAC/DC	1-2 1-3	17-18 17-19
R4D 415	110-125VAC 220-240VAC 380-415VAC	1-2 2-3 1-3	17-18 17-18 17-19

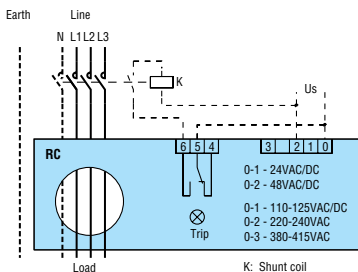
### RM - RM1



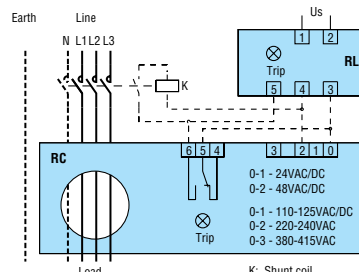
### RMT



### RC



### RC + RL



### Operational characteristics

TYPE	R1D <sup>①</sup>	R2D <sup>①</sup>	R3D <sup>①</sup>
DESCRIPTION	Flush mount with transparent cover 1 operating threshold	Flush mount with transparent cover 2 operating thresholds constant toroid-relay circuit control	
CONTROL CIRCUIT			
Toroidal transformer	External (see types given on page 13-3)	External (see types given on page 13-3)	External (see types given on page 13-3)
Adjustments			
Tripping set-point (I $\Delta$ ) (configurable)	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A (external multiplier)	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A (external multiplier)	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A (external multiplier)
Prealarm set-point	—	70% I $\Delta$ n (fixed)	70% I $\Delta$ n (fixed)
Tripping delay time (t)	0.02-0.5s (tx1) 0.2-5s (tx10)	0.02-0.5s (tx1) 0.2-5s (tx10)	0.02-0.5s (tx1) 0.2-5s (tx10)
Selection of multiplier for I $\Delta$ n and t	By dip switches	By dip switches	By dip switches
Resetting	Configurable automatic or manual by button on front <sup>②</sup>	Automatic by remote contact closing or rear jumper connection Manual by button on front or remote contact closing	
Shunt circuit control	—	—	—
AUXILIARY SUPPLY			
Auxiliary voltage (Us) (0.85 - 1.1 Us)	24/48VAC/DC		
	110-125VAC/DC 220-240/380-415VAC	110-125/220-240/380-415VAC	
Rated frequency	50-60Hz	50-60Hz	50-60Hz
Maximum power consumption	5.5VA	4.5VA	4.5VA
OUTPUT RELAYS			
State	Normally de-energised	Configurable normally de-energised or energised	Configurable normally de-energised or energised
Contact arrangement	1 changeover (trip)	2 changeovers (configurable: 2 trip or 1 trip and 1 alarm)	
Rated contact capacity I <sub>th</sub>	5A - 250VAC	5A - 250VAC	5A - 250VAC
Mechanical life	50 x 10 <sup>6</sup> cycles	50 x 10 <sup>6</sup> cycles	50 x 10 <sup>6</sup> cycles
Electrical life	3 x 10 <sup>5</sup> cycles	3 x 10 <sup>5</sup> cycles	3 x 10 <sup>5</sup> cycles
INDICATIONS			
Auxiliary voltage available (ON)	green LED	green LED	green LED
Relay tripping (TRIP)	red LED	red LED	red LED
Trip prealarm (ALARM)	—	red LED	red LED
Mechanical (TRIP MEMORY)	—	—	Flag indicator
Remote control reset	31 RL... see page 13-3	31 RL... see page 13-3	31 RL... see page 13-3
Shunt circuit tripping	—	—	—
INSULATION			
Insulation test	2.5kV for 1 minute	2.5kV for 1 minute	2.5kV for 1 minute
AMBIENT OPERATING CONDITIONS			
Operating temperature	-10 to +60°C	-10 to +60°C	-10 to +60°C
Storage temperature	-20 to +80°C	-20 to +80°C	-20 to +80°C
Relative humidity	≤90%	≤90%	≤90%
ENCLOSURE			
Material contenitore	self-extinguishing polycarbonate	self-extinguishing polycarbonate	self-extinguishing polycarbonate
Degree of protection	IP20 terminals, IP40 on front with cover	IP20 terminals, IP40 on front with cover	IP20 terminals, IP40 on front with cover
Reference standards	IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755	IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755	IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755

① Type A, sensitive to residual sinusoidal AC and pulsating DC currents.

② Remote resetting by removing power for more than 1 second.

R4D <sup>①</sup>	RM1... <sup>①</sup>	RM... <sup>①</sup>	RMT... <sup>①</sup>	RC... <sup>①</sup>
Flush mount with transparent cover 2 operating thresholds - constant toroid-relay circuit control	Modular with transparent cover 1 operating threshold	Modular with transparent cover 1 operating threshold	Modular with transparent cover 1 operating threshold	Compact 1 operating threshold
External (see types given on page 13-3)	External (see types given on page 13-3)	External (see types given on page 13-3)	Incorporated Ø 28 mm	Incorporated 35-60-80-110 mm standard diameter
0.03-0.3A (x0.1) 0.3-3A (x1) 3-30A (x10) 30-300A (external multiplier)	0.3A or 0.5A only	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A (external multiplier)	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A	0.025-0.25A (x0.1) 0.25-2.5A (x1) 2.5-25A (x10) 25-250A
70% $I_{\Delta n}$ (fisso)	—	—	—	—
0.03-0.5s (tx1) 0.3-5s (tx10)	0.02s o 0.5s	0.02-0.5s (tx1) 0.2-5s (tx10)	0.02-0.5s (tx1) 0.2-5s (tx10)	0.02-0.5s (tx1) 0.2-5s (tx10)
By dip switches	By dip switches	By dip switches	By dip switches	By dip switches
Automatic by remote contact closing or rear jumper. Manual by button on front or remote contact closing	Configurable A: Automatic or M: Manual by button on front	Configurable A: Automatic or M: Manual by button on front	Configurable A: Automatic or M: Manual by button on front	Configurable AUTO: Automatic or MAN: Manual by button on front
Yes	—	—	—	—
24/48VAC/DC	24/48VAC/DC			
110-125/220-240/380-415VAC	110-125VAC/DC 220-240/380-415VAC			
50/60Hz	50/60Hz			
5.5VA	3VA			
Configurable normally de-energised or energised	Normally de-energised	Normally de-energised	Configurable normally de-energised or energised	Normally de-energised
2 changeovers (configurable: 2 trip or 1 trip and 1 alarm)	1 changeover (trip)	1 changeover (trip)	2 changeovers (both trip)	1 changeover (trip)
5A - 250VAC	5A - 250VAC	5A - 250VAC	5A - 250VAC	5A - 250VAC
50x10 <sup>6</sup> cycles	50x10 <sup>6</sup> cycles	50x10 <sup>6</sup> cycles	50x10 <sup>6</sup> cycles	50x10 <sup>6</sup> cycles
3x10 <sup>5</sup> cycles	3x10 <sup>5</sup> cycles	3x10 <sup>5</sup> cycles	3x10 <sup>5</sup> cycles	3x10 <sup>5</sup> cycles
green LED	green LED	green LED	green LED	green LED
red LED	red LED	red LED	red LED	red LED
red LED	—	—	—	—
Flag indicator	—	—	—	—
31 RL... see page 13-3	31 RL... see page 13-3	31 RL... see page 13-3	31 RL... see page 13-3	31 RL... see page 13-3
red LED	—	—	—	—
2.5kV for 1 minute	2.5kV for 1 minute	2.5kV for 1 minute	2.5kV for 1 minute	2kV for 1 minute
-10 to +60°C	-10 to +60°C	-10 to +60°C	-10 to +60°C	-10 to +60°C
-20 to +80°C	-20 to +80°C	-20 to +80°C	-20 to +80°C	-20 to +80°C
≤90%	≤90%	≤90%	≤90%	≤90%
self-extinguishing polycarbonate	self-extinguishing polycarbonate			
IP20 terminals, IP40 on front with cover	IP20 terminals, per DIN 40050			
IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755	IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-6-3, IEC/TR 60755			

① Type A, sensitive to residual sinusoidal AC and pulsating DC currents.

② Digital display of fault current measurement and tripping value memory.