

VARIMETER RCM

Residual Current Monitor, Type B for AC and DC Systems
RN 5883



0272374

RN 5883

ND 5015/035

ND 5015/070*

* on request

Product Description

The AC/DC sensitive residual current monitor RN 5883 allows an early detection of insulation faults and detects differential currents with AC as well as DC components in grounded voltage systems (type B). The measurement takes place via an external current transformer.

Contrary to an RCD the residual current monitor RN 5883 does not disconnect the mains when detecting a fault but only indicates it. Besides the easy to read LED chain indicating the actual current several LEDs display operation, pre-alarm and alarm. The 4 measuring ranges cover 10 to 3 A. Additional features are broken wire detection, test function and adjustable pre-alarm.

The residual current monitor RN 5883 provides early information for precise and cost effective maintenance before the plant stops.

Your Advantage

- Preventive fire and system protection
- Increasing the availability of plants by early fault detection
- Universal usage at AC/DC mains

Features

- According to IEC/EN 62 020, VDE 0663
- For AC and DC systems Type B, according to IEC/TR 60755
- To detect earth faults in grounded voltage systems
- 4 setting ranges from 10 mA to 3 A
- Manual reset, with alarm and pre-warning
- With adjustable switching delay
- Energized or de-energized on trip
- LED indicator for operation, pre-alarm and alarm
- With test function
- LED-chain indicates fault current
- As option with analogue output
- Broken wire detection
- Protection against manipulation by sealable transparent cover over setting switches
- Width: 52.5 mm

Approvals and Markings

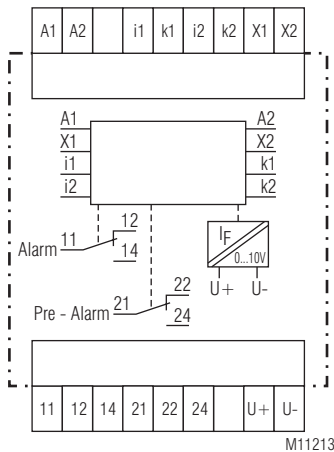


1) RN 5883 Variant /61; 2) ND 5015

Application

The residual current monitor type B is designed to monitor DC systems and AC systems up to 250 Hz.

Circuit Diagram



M11213

Indication

- green LED „ON“: On, when auxiliary supply connected
- yellow LED „Pre-Alarm“: Flashes during time delay t_v
On, when pre-alarm active
- red LED „Alarm“: Flashes during time delay t_v
On, when alarm active
- yellow and red LED: Flashes on broken wire or extremely high input signal
- yellow LED-chain: LED chain indicates fault current in % of adjusted alarm value

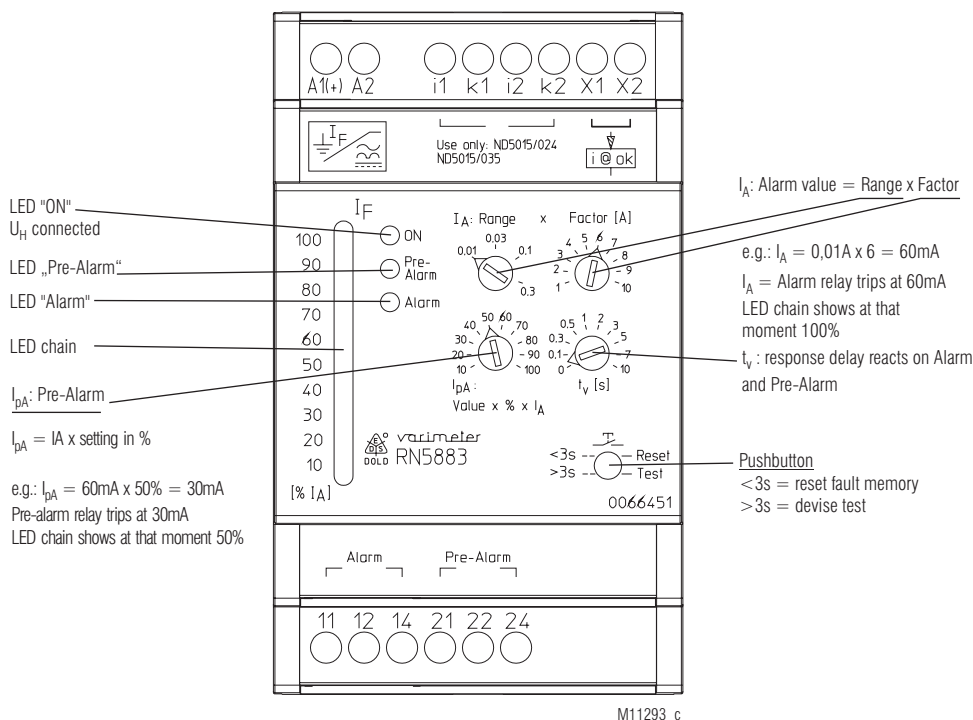
Connection Terminals

| Terminal designation | Signal designation |
|----------------------|--|
| A1, A2 | Auxiliary voltage U_H |
| i1, k1, i2, k2 | Connection of an external residual current transformer |
| X1, X2 | Parameterization input energized or de-energized on trip |
| 11, 12, 14 | Contacts alarm signal |
| 21, 22, 24 | Contacts pre-alarm signal |
| U-, U+ | Analogue output (option) |

Notes

The devices measure AC and DC current (AC / DC sensitive). Due to the measurement principle they also detect magnetic fields in the next to the current transformer. When planning a panel with AC/DC sensitive residual current monitors please make sure that no components are placed next to the CT that create a magnetic field, e.g. contactors, transformers etc. If an influence is detected, also a rotation of the CT by 90° could positively reduce the influence.

Set-up and Adjustment Facilities



It is of advantage to keep the range small and the Factor high.
 Example: Setting 300 mA: Range 0,1 x Factor 3 = 300 mA

Function

The Measuring circuit includes an external residual current transformer. All conductors of a voltage system are fed through the transformer except the ground wire. In a healthy system the sum of all flowing currents is zero, so that no voltage is induced in the CT. If an earth fault occurs, sourcing a current flowing to ground, the current difference induces a current in the CT that is detected by the RN 5883.

If an earth fault occurs, sourcing a current flowing to ground, the current difference induces a current in the CT that is detected by the RP 5883.

On broken sensor wires and broken CT coils the unit goes into alarm state and the LEDs for pre-alarm (yellow) and alarm (red) flashes.

The unit has 2 changeover output contacts. One for alarm 11, 12, 14 and 21, 22, 24 and one for pre-alarm.

4 Setting Ranges can be selected from 10 mA to 3 A. The fine adjustment is made via potentiometer „Factor“
 Measuring range = Range x Factor.
 The alarm relay switches at 100 % of the adjusted response value.

The pre-alarm can be set in 10% steps between 10 and 100% of the alarm value.

Potentiometer t_v sets the switching delay between 0 and 10 seconds. The delay reacts on pre-alarm and alarm.

The different CT sizes require a correct adaption of the residual current monitor. 3 models are available:

| Type | Suitable residual current transformer | Frequeny range |
|-------------------|---|----------------------|
| RN 5883.12/61 | ND 5015/024 ND 5015/035 | DC + AC up to 250 Hz |
| RN 5883.12/010/61 | ND 5015/070 (on request) | DC + AC up to 180 Hz |
| RN 5883.12/020 | ND 5018/105 ND 5018/140 ND 5018/210 | DC + AC up to 60 Hz |

An external link on X1-X2 allows the change between energized and de-energized on trip. A change of the function will only be valid after interruption of the supply voltage.

Terminal X1 / X2: external link = De-energized on trip,
 open = Energized on trip

De-energized on trip: In the case of groundfault or missing auxiliary supply the relays are de-energized, the NC contacts 11/12; 21/22 are closed

In fault free state the relays are energized, the NO contacts 11/14; 21/24 are closed

Energized on trip: In the case of groundfault the relays are energized, the NO contacts 11/14; 21/24 are closed
 in fault free state the relays are de-energized, the NC contacts 11/12; 21/22 are closed

If an adjusted value is reached on the measuring input (alarm or pre-warning) at the standard type RN 5883 the signal is stored. Reset is made by pressing the button „Test/Reset“ for < 3 s or by disconnecting the auxiliary supply (approx. 30 s).

If the „Test/Reset“ button is pressed for > 3 s, a test of the unit is made. The time delays run, the pre-warning and alarm is activated.

An LED chain shows the fault current between 10 and 100 % of the adjusted alarm value.

An analogue output 0 ... 10 V indicates also the fault current. 10 V corresponds to 100 % of the adjusted alarm value.

| Technical Data | |
|--|---|
| Input | |
| Auxiliary voltage U_H: | AC/DC 24 ... 80 V, AC/DC 80 ... 230 V |
| Voltage range | |
| at $U_H = AC/DC 24 \dots 80 V$: | DC 19 ... 110 V, AC 19 ... 90 V, |
| at $U_H = AC/DC 80 \dots 230 V$: | DC 64 ... 300 V, AC 64 ... 265 V |
| Nominal frequency U_H: | AC 50 / 60 Hz |
| Nominal consumption | |
| at AC: | 5 VA |
| at DC: | 2.5 W |
| Measuring range: | 10 ... 100 mA, 30 ... 300 mA, 100 ... 1000 mA, 300 ... 3000 mA (3 ... 30 mA on request) |
| Measuring range fine adjustment: | 1 ... 10 |
| Überlastbarkeit: | with overload protection |
| Alarm: | 100 % of the adjusted measuring range |
| Pre-alarm: | 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 % of the adjusted alarm value |
| Frequency range: | DC and AC to 250 Hz |
| Repeat accuracy: | $\leq \pm 3 \%$ |
| Temperature drift: | $\leq \pm 0.1 \%$ / K |
| Reaction time: | 200 ms |
| Switching delay | |
| Pre-alarm / alarm: | 0 ... 10 s |

| Output | |
|--|---|
| Contacts: | 1 changeover contact for pre-alarm, 1 changeover contact for alarm |
| Thermal current I_{th} | |
| up to 30 °C: | 5 A |
| up to 40 °C: | 4 A |
| up to 60 °C: | 2 A |
| Switching capacity | |
| at AC 15: | |
| NO contact: | 3 A / AC 230 V IEC/EN 60 947-5-1 |
| NC contact: | 1 A / AC 230 V IEC/EN 60 947-5-1 |
| Electrical life | |
| to AC 15 at 1 A, AC 230 V: | 3 x 10 ⁶ switch. cycl. IEC/EN 60 947-5-1 |
| Short circuit strength | |
| max. fuse rating: | 4 A gL IEC/EN 60 947-5-1 |
| Mechanical life: | $\geq 10^8$ switching cycles |

| Analogue Output (option) | |
|--|---|
| Terminal U_+ / U_-: | 0 ... 10 V; 5 mA variant RN 5883/_ _ 1 |

| General Data | |
|---|--|
| Operating mode: | Continuous |
| Temperature range: | - 40 ... + 60°C - 20 ... + 60°C (variant /_1_ and /_2_) |
| Insulation coordination according to IEC 60664-1: | |
| RN 5883 connected with current transformer ND 5015, ND 5018 | |
| Rated impuls voltage / pollution degree: | |
| Auxiliary voltage / Meas. circuit: | 6 kV / 2 |
| Auxiliary voltage / Contacts: | 6 kV / 2 |
| Auxiliary voltage / Analoge output: | 6 kV / 2 |
| Contacts / Analoge output: | 6 kV / 2 |
| Meas. circuit / Analoge output: | 6 kV / 2 |
| Contacts 11,12,14 / 21, 22, 24: | 4 kV / 2 |
| EMC | |
| Surge voltages: | Class 3 (5 kV / 0.5 J) DIN VDE 0435-303 |
| Electrostatic discharge: | 8 kV (air) IEC/EN 61 000-4-2 |
| HF irradiation: | 10 V / m (class 3) IEC/EN 61 000-4-3 |
| HF-wire guided: | 10 V (class 3) IEC/EN 61 000-4-6 |
| Fast transients: | 2 kV (class 3) IEC/EN 61 000-4-4 |
| Surge voltages: | 1 kV class 3 IEC/EN 61 000-4-5 |
| Interference suppression: | Limit value class B EN 55 011 |
| Degree of protection | |
| Housing: | IP 40 IEC/EN 60 529 |
| Terminals: | IP 20 IEC/EN 60 529 |
| Housing: | Thermoplastic with V0-behaviour according UL subject 94 |

| Technical Data | |
|------------------------------|---|
| Vibration resistance: | Amplitude 0.35 mm frequency 10 ... 55 Hz IEC/EN 60 068-2-6 20 / 60 / 03 IEC/EN 60 068-1 |
| Climate resistance: | |
| Terminal designation: | EN 50 005 |
| Wire connection: | DIN 46 228-1/-2/-3/-4 |
| Fixed screw terminals | |
| Cross section: | 0.5 ... 4 mm ² (AWG 20 - 10) solid or 0.5 ... 4 mm ² (AWG 20 - 10) stranded wire without ferrules 0.5 ... 2.5 mm ² (AWG 20 - 10) stranded wire with ferrules |
| Stripping length: | 6.5 mm |
| Fixing torque: | 0.5 Nm |
| Wire fixing: | Cross-head screw / M3 box terminals |
| Mounting: | DIN rail IEC/EN 60 715 |
| Weight: | approx. 160 g |

| Dimensions | |
|--------------------------------|-------------------|
| Width x height x depth: | 52.5 x 90 x 71 mm |

UL-Data RN 5883

These devices only monitor residual currents and are not intended to be used as Ground Fault Circuit Interrupter (GFCI) in accordance with UL1053 / UL943.

These devices have been investigated to be used with external differential current transformers manufactured by E. Dold & Söhne KG, Cat. Nos. ND5015/024/61 or ND5015/035/61.

| | |
|---|--|
| Supply voltage U_N: | AC/DC 24-80V single or double phase 50/60 Hz; AC/DC 80-230V single or double phase 50/60 Hz |
|---|--|

| | |
|----------------------------------|---|
| Switching capacity relays | |
| Ambient temperature 30°C: | 5A, 250Vac G.P. 250 Vac, 2A pilot duty 250 Vac, 1/2hp |

| | |
|---------------------------|---|
| Ambient temperature 40°C: | 4A, 250Vac G.P. 250 Vac, 2A pilot duty 250 Vac, 1/2hp |
|---------------------------|---|

| | |
|---------------------------|-----------------|
| Ambient temperature 60°C: | 2A, 250Vac G.P. |
|---------------------------|-----------------|

| | |
|---|---------------|
| Analogue output (only at variant/_1): | 0 .. 10V, 5mA |
|---|---------------|

| | |
|---------------------------|--------------------|
| Max. measuring frequency: | DC, AC (0 – 250Hz) |
|---------------------------|--------------------|

| | |
|-------------------------|---|
| Wire connection: | AWG 20 - 12 60°C / 75°C copper conductors only |
|-------------------------|---|



Technical data that is not stated in the UL-Data, can be found in the technical data section.

Standard Type

RN 5883.12/61 AC/DC 80 ... 230 V 50 / 60 Hz
 Article number: 0066451
 • For residual current transformer ND 5015/024 and ND 5018/035
 • Alarm und Pre-alarm
 • Energized or de-energized on trip
 • Without analogue output
 • Auxiliary voltage U_H : AC/DC 80 ... 230 V
 • Width: 52.5 mm

ND 5015/035/61
 Article number: 0066841
 • Residual current transformer for RN 5883
 • Diameter: 35 mm
 • DIN-Rail mounting: horizontal or vertical
 • Screw mounting: M4

Variants

For residual current transformer ND5015/024 und ND5015/035:

RN 5883.12/001/61: With analogue output 0 ... 10 V
 RN 5883.12/800/61: Fixed values, without analogue output
 RN 5883.12/802/61: Fixed values, without analogue output;
 with bridge on X1/X2:
 - Alarm: Energized on trip
 - Pre-alarm: De-energized on trip
 without bridge:
 - Alarm: De-energized on trip
 - Pre-alarm: Energized on trip

Für residual current transformer ND5015/070:

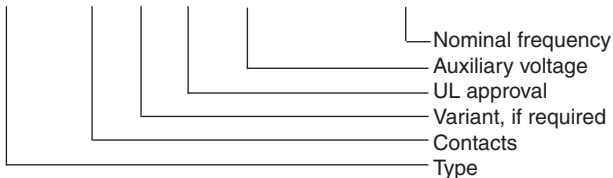
RN 5883.12/011/61: with analogue output 0 ... 10 V

For residual current transformer ND5018/105, ND5018/140, ND5018/210:

RN 5883.12/021: with analogue output 0 ... 10 V

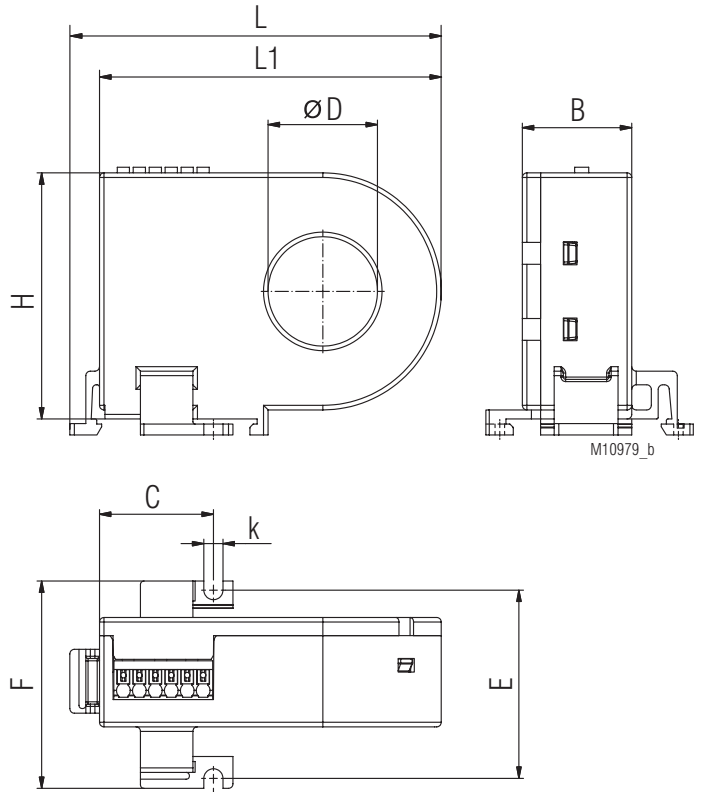
Ordering example for variants

RN 5883 .12 / _ _ _ /61 AC/DC 80 ... 230 V 50 / 60 Hz



Accessories

Residual Current Monitor ND 5015/024, ND 5015/035



for DIN rail mounting or screw mounting

| ND 5015/024 | øD | L | L1 | B | H | C | E | F | k |
|---------------|------------|----|----|----|----|----|----|----|-----|
| Dimensions/mm | 24 | 82 | 75 | 24 | 54 | 25 | 42 | 46 | 4.2 |
| Weight / g | approx. 80 | | | | | | | | |

| ND 5015/035 | øD | L | L1 | B | H | C | E | F | k |
|---------------|------------|----|----|----|----|----|----|----|-----|
| Dimensions/mm | 35 | 88 | 81 | 24 | 67 | 25 | 42 | 46 | 4.2 |
| Weight / g | approx. 90 | | | | | | | | |

Technical Data Residual Current Monitor ND 5015, ND 5018

Ambient temperature: - 40 ... + 60°C / 233 K ... 333 K
Inflammability class: V0 according to UL94

Insulation coordination according to IEC 61869-1

Highest rated operating voltage U_m : AC 720 V
 Rated impulse voltage: 3 kV

Length of connection wires

Type of wire to CT, e.g.

Single wire: up to 1 m
 Single wire twisted pair (pair 1: i1 - k1; pair 2: i2 - k2): up to 10 m
 Screened wire; screen one end grounded to PE: up to 25 m
 Wire cross section: 0.2 ... 1.5 mm²
 Stripping length: 8 mm

ND 5015:

Wire fixing: Terminals with spring connection and direct (Push in) technology

Actuation power: 40 N max.
 DIN rail mounting: integrated clips for vertical and horizontal mounting

ND 5018:

Wire fixing: Flat terminals with self-lifting clamping piece
 Screw fastening: (only at ND 5018/105, ND 5018/140, ND 5018/210) M 5
 DIN rail mounting: using mounting adapter ET 5018

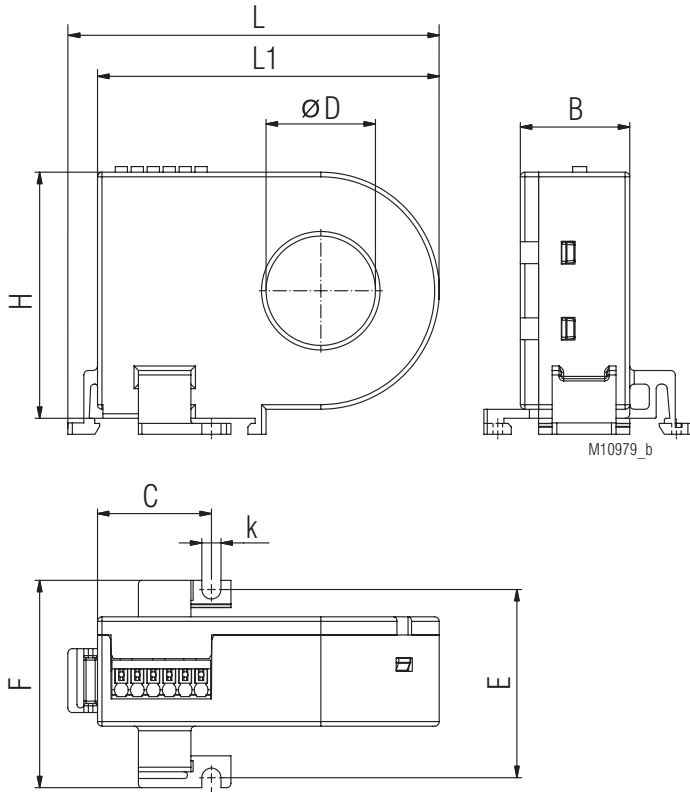
UL-Daten ND 5015

Wire connection: AWG 24 - 16
 60°C / 75°C copper conductors only



Technical data that is not stated in the UL-Data, can be found in the technical data section.

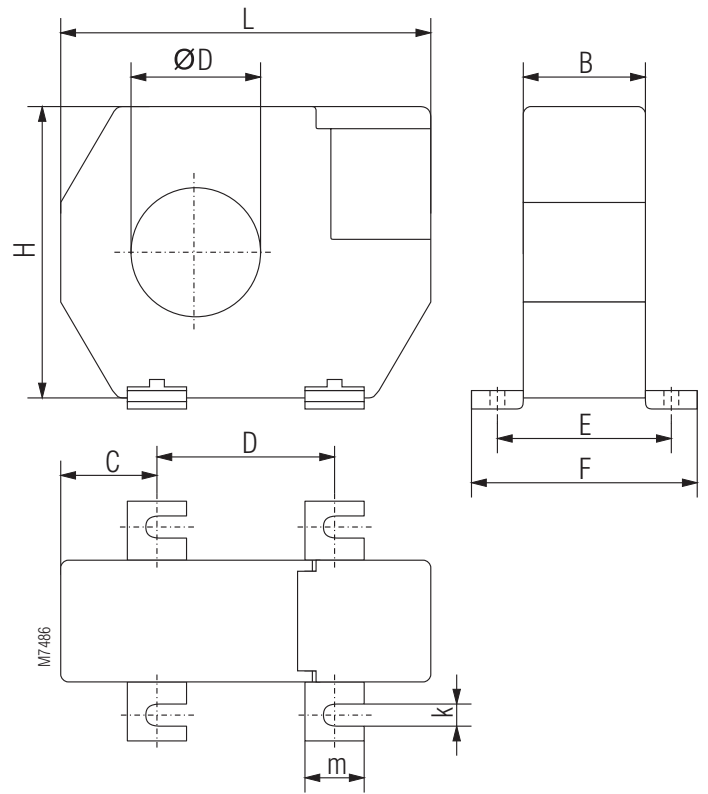
Residual Current Monitor ND 5015/070



for DIN rail mounting or screw mounting

| | | | | | | | | | |
|---------------|-----------------|-----|-----|-----|----|----|----|-----|----|
| ND 5015/070 | $\varnothing D$ | L | H | H1 | B | C | F | k | E |
| Dimensions/mm | 70 | 111 | 110 | 115 | 32 | 37 | 55 | 4,2 | 50 |
| Weight / g | approx. 220 | | | | | | | | |

Residual Current Monitor ND 5018/105, ND 5018/140, ND 5018/210,

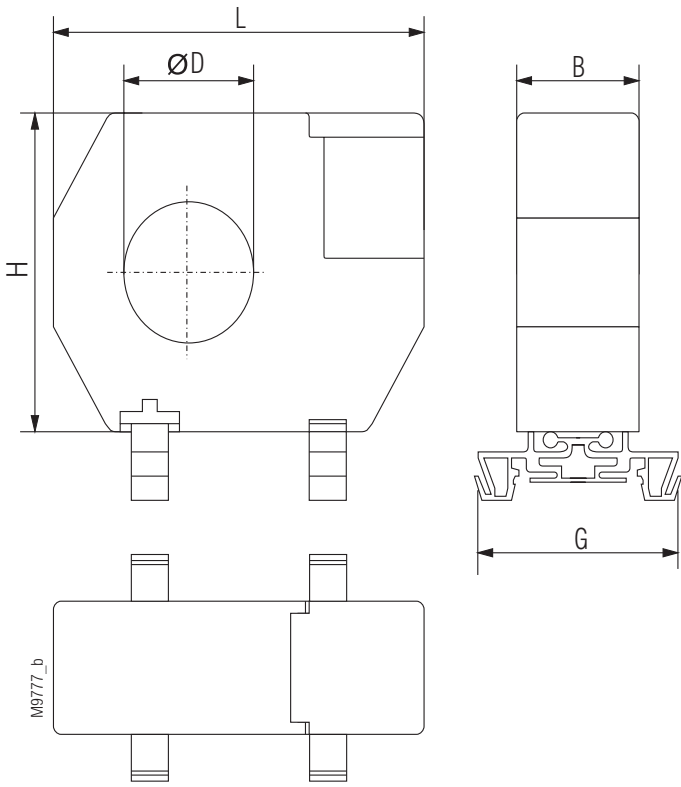


for screw mounting

| | | | | | | | | | | |
|---------------|-----------------|-----|----|-----|------|-----|----|----|-----|----|
| ND 5018/105 | $\varnothing D$ | L | B | H | C | D | E | F | k | m |
| Dimensions/mm | 105 | 170 | 33 | 146 | 38 | 94 | 46 | 61 | 6.5 | 16 |
| Weight / g | 530 | | | | | | | | | |
| ND 5018/140 | $\varnothing D$ | L | B | H | C | D | E | F | k | m |
| Dimensions/mm | 140 | 220 | 33 | 196 | 48.5 | 123 | 46 | 61 | 6.5 | 16 |
| Weight / g | 1250 | | | | | | | | | |
| ND 5018/210 | $\varnothing D$ | L | B | H | C | D | E | F | k | m |
| Dimensions/mm | 210 | 299 | 33 | 284 | 69 | 161 | 46 | 61 | 6.5 | 16 |
| Weight / g | 2100 | | | | | | | | | |

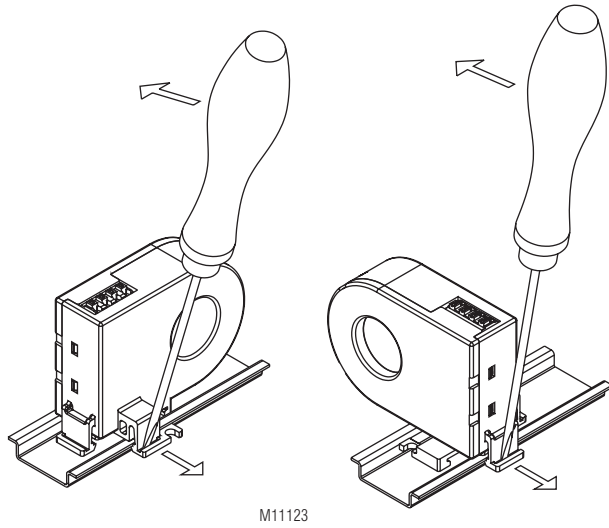
The residual current transformer ND 5018/105 can also be mounted on DIN-rail. To do this the metal screw fixings have to be removed and have to be replaced by 2 mounting clips (ET5018: art.no. 0058754; set with 2 pcs)

Residual Current Monitor ND 5018/105

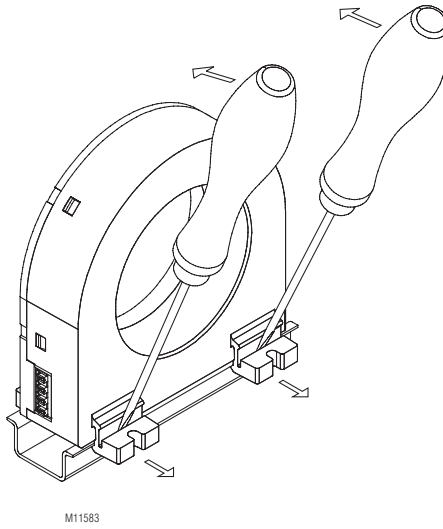


for DIN rail mounting

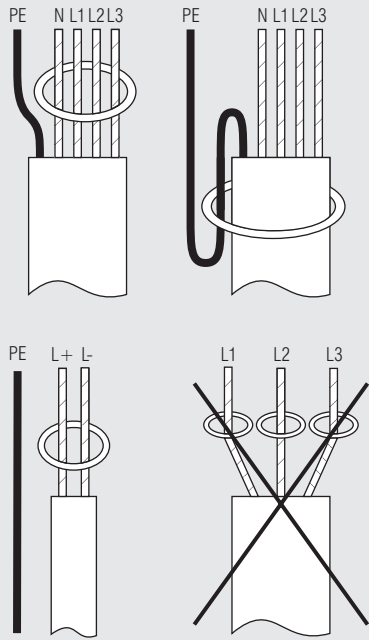
| ND 5018/105 | øD | L | B | H | G |
|---------------|-----|-----|----|-----|----|
| Dimensions/mm | 105 | 170 | 33 | 146 | 55 |
| Weight / g | 530 | | | | |



Disassembling Residual Current Monitor ND 5015/070

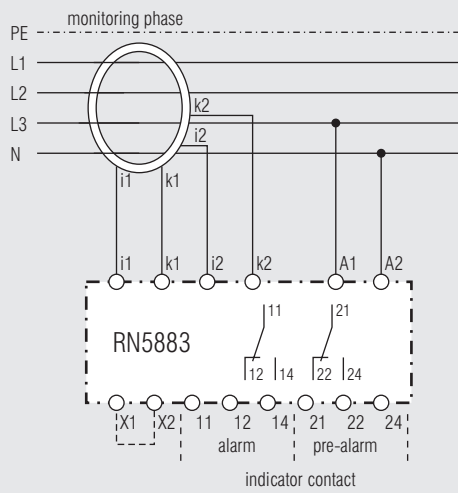


Installation of Wires



M8362_a

Connection Example



X1-X2 open : operating current
 X1-X2 bridged : de-energized

M11294

