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

0272374

RN 5883 ND 5015/035 ND 5015/070

Your Advantage
- Preventive fire and system protection
- Increasing the availability of plants by early fault detection
- Universal usage at AC/DC mains
- Protection against manipulation by sealable transparent cover over setting switches

Features
- According to IEC/EN 62 020, VDE 0663
- For AC and DC systems Type B
- 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
- Width: 52.5 mm

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.

Approvals and Markings

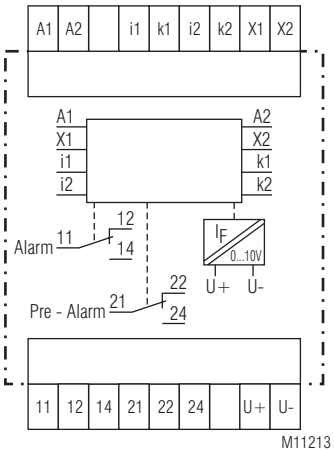
CE | 1) c UL us LISTED Canada / USA | 2) c TÜV us Canada / USA

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



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

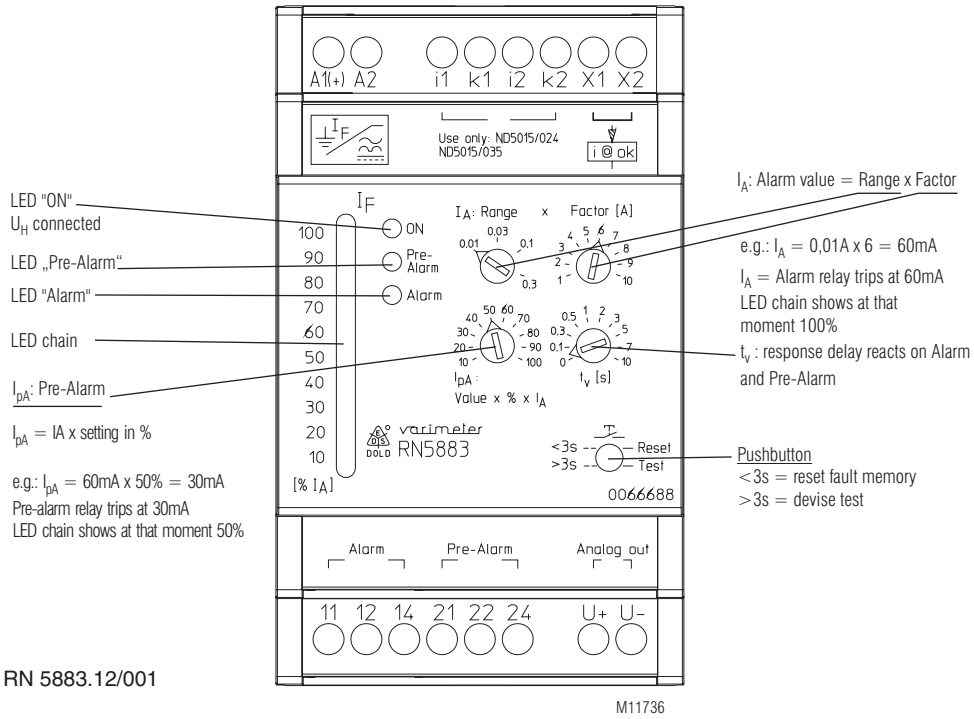
Terminal designation	Signal description
A1, A2	Auxiliary voltage U_H
i1, k1, i2, k2	Connection of an external residual current transformer
X1, X2	Parameterization input energized or de-energized on trip
11, 12, 14	Contacts alarm signal
21, 22, 24	Contacts pre-alarm signal
U-, U+	Analogue output (option)

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.

All Technical Data in this list relate to the state at the moment of edition. We reserve the rigth for technical improvements and changes at any time.

Set-up and Adjustment Facilities



RN 5883.12/001

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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 slected 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	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

Table 1

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 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 ... 80 V:	DC 19 ... 110 V, AC 19 ... 90 V,
at U_H = AC/DC 80 ... 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*) *) depending on the differential current transformer used. See „Function“ *Table 1*.
Repeat accuracy:	≤ ± 3 %
Temperature drift:	≤ ± 0.1 % / K
Reaction time:	300 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 10^5 switch. cycl.	IEC/EN 60 947-5-1
Short circuit strength		
max. fuse rating:	4 A gG / gL	IEC/EN 60 947-5-1
Mechanical life:	≥ 10^8 switching cycles	

Analogue Output (option)

Terminal U+ / U-:	0 ... 10 V; 5 mA variant RN 5883/_ _1 Screened wire; screen one end grounded at device to PE

General Data

Operating mode:	Continuous
Temperature range	
Operation:	- 40 ... + 60°C - 20 ... + 60°C (variant /_1_ and /_2_)
Storage:	- 40 ... + 70°C
Altitude:	< 2,000 m
Insulation coordination according to IEC 60664-1:	
RN 5883 cennected 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

Technical Data

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		
80 MHz ... 2,7 GHz:	20 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 30	IEC/EN 60 529
Terminals:	IP 20	IEC/EN 60 529
Housing:	Thermoplastic with V0-behaviour according UL subject 94	
Vibration resistance:	Amplitude 0.35 mm frequency 10 ... 55 Hz	IEC/EN 60 068-2-6
Climate resistance:	40 / 60 / 03	IEC/EN 60 068-1
Terminal designation:	EN 50 005	
Wire connection:		DIN 46 228-1/-2/-3/-4
Fixed screw terminals		
Cross section:	0.5 ... 4 mm² (AWG 20 - 10) solid or 0.5 ... 4 mm² (AWG 20 - 10) stranded wire without ferrules 0.5 ... 2.5 mm² (AWG 20 - 10) stranded wire with ferrules	
Stripping length:	6.5 mm	
Wire fixing:	Cross-head screw / M3 box terminals	
Fixing torque:	0.5 Nm	
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, ND5015/035/61 or ND5015/070/61.

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

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:

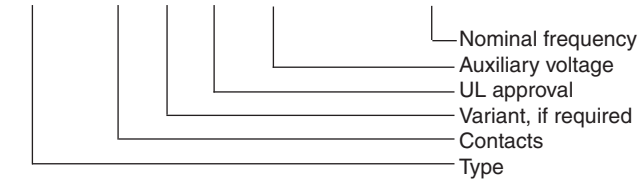
RN 5883.12/011/61: with analogue output 0 ... 10 V

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



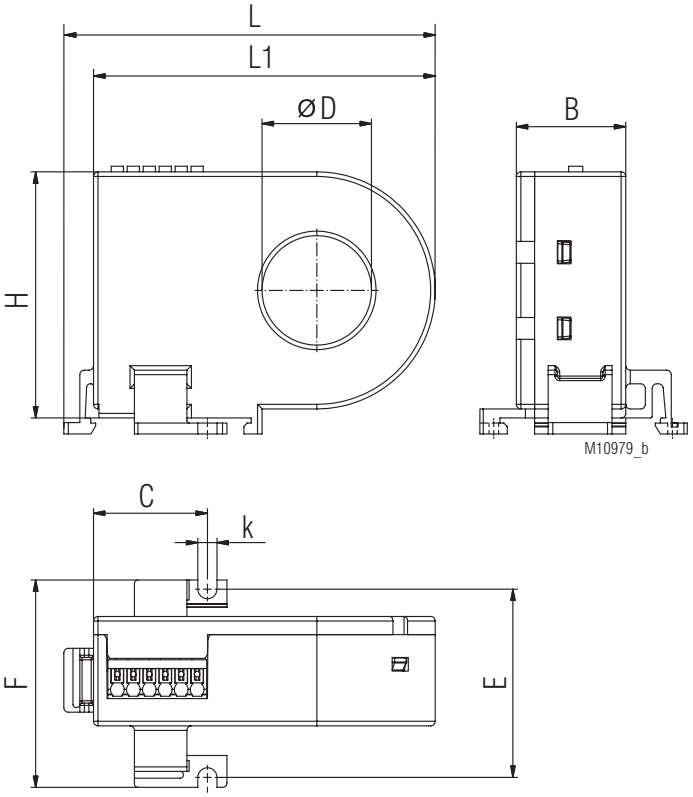
UL-Daten ND 5015

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.

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								

*) Drill tolerance for screw mounting: ± 0.5 mm

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

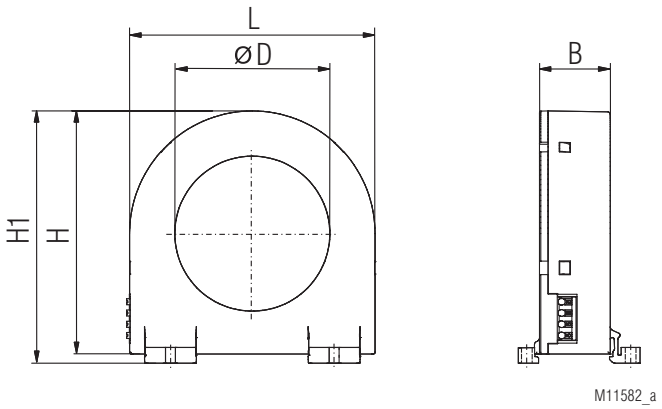
Highest rated operating voltage U_m: AC 720 V
Rated impulse voltage: 3 kV

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 at device 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
Screw fixing: M3 or M4
Fixing torque: max. 0.8 Nm

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

Residual Current Monitor ND 5015/070

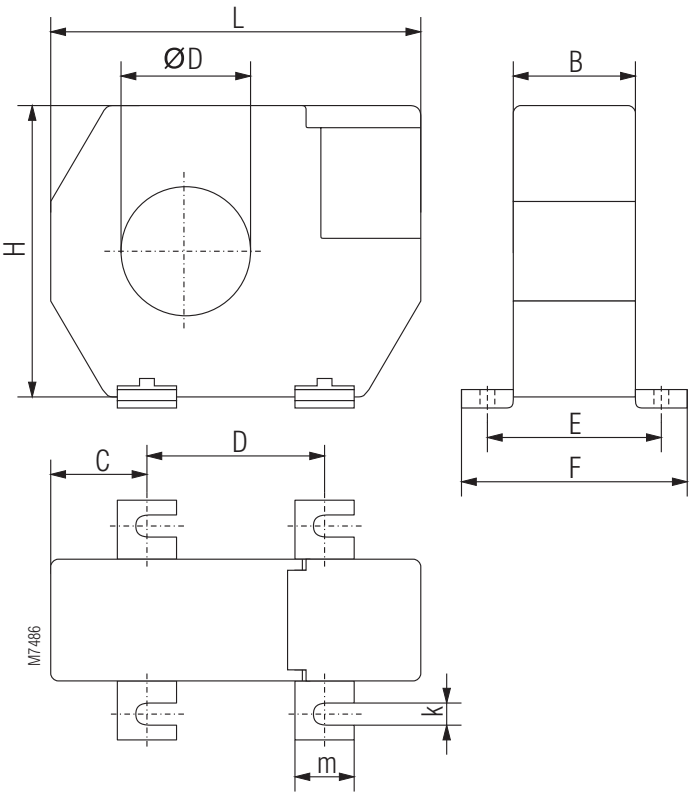


for DIN rail mounting or screw mounting

ND 5015/070	øD	L	H	H1	B	C	F	k	E	G
Dimensions/mm	70	111	110	115	32	37	55	4,2	50*	74*
Weight / g	approx. 220									

*) Drill tolerance for screw mounting: ± 0.5 mm

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



for screw mounting

ND 5018/105	øD	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	øD	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	øD	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									

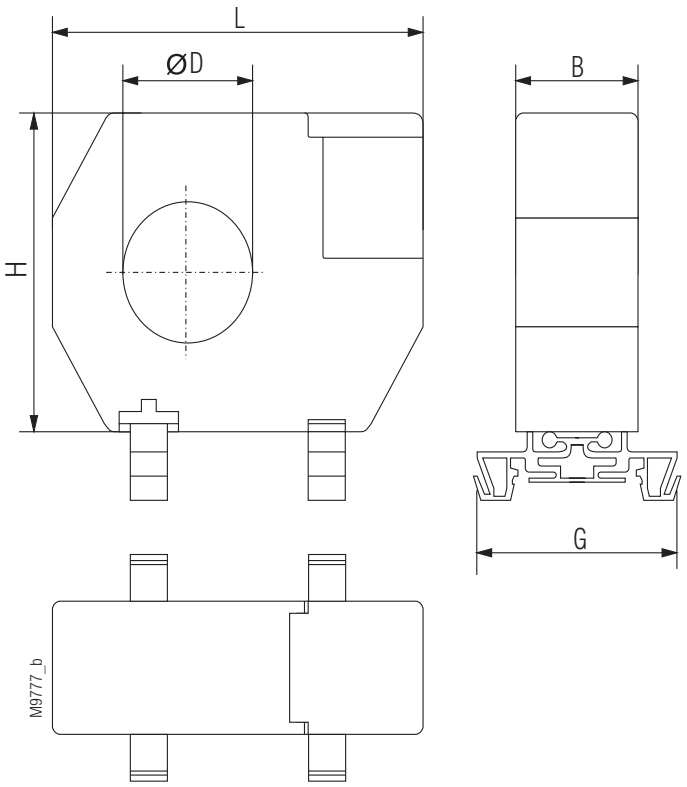
Mounting instructions for screw mounting

High forces when mounting may damage the current transformer fixtures. The fixing clips are designed to support the current transformer. Forces that are applied by the cable running through the current transformer can only be tolerated within limitations.
During installation and afterwards please make sure that the wires are led through the current transformer without applying pressure and remain stable in that position.

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)

Accessories

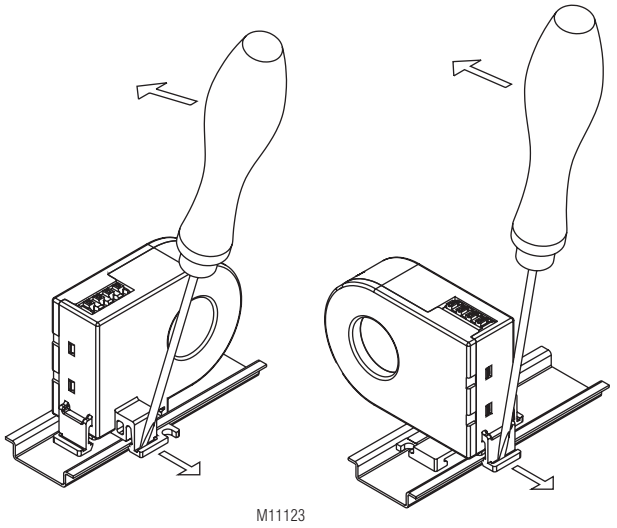
Residual Current Monitor ND 5018/105



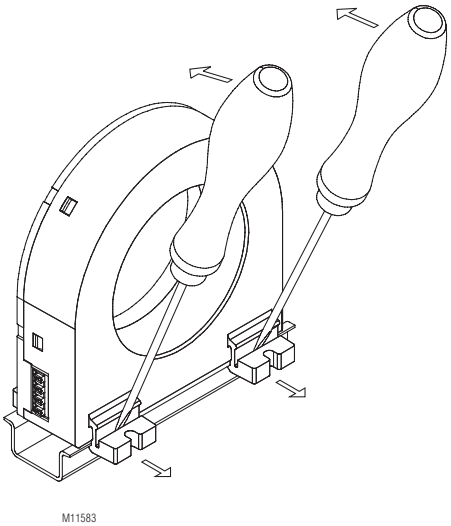
for DIN rail mounting

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

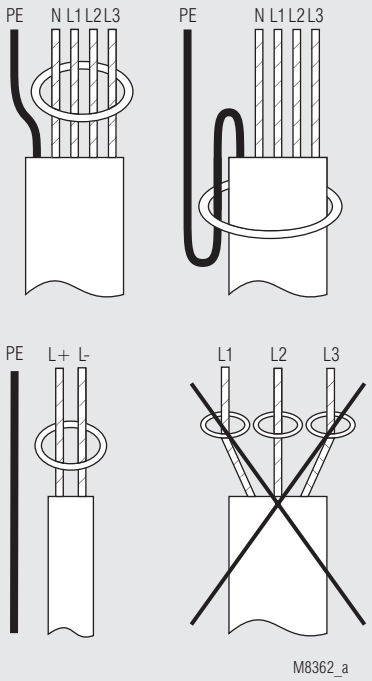
Disassembling Residual Current Monitor ND 5015/024 and /035



Disassembling Residual Current Monitor ND 5015/070



Installation of Wires



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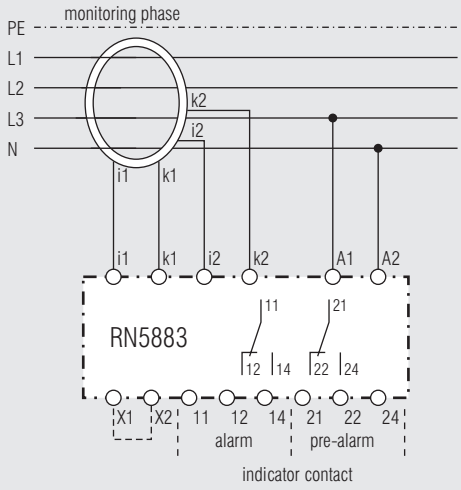
Connection Example



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

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