

## VARIMETER RCM Residual Current Monitor IL 5882, SL 5882, IR 5882



0239971



IL 5882



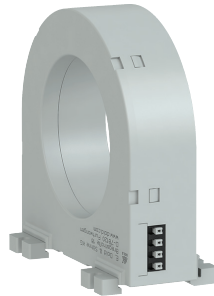
IR 5882  
with internal residual current transf.



ND 5016/024



ND 5016/035



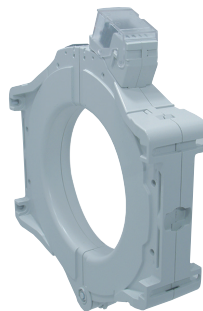
ND 5016/070



Split current transf.  
ND 5014/050



Split current transf.  
ND 5014/080



Split current transf.  
ND 5014/120

### Your advantages

- Preventive fire and system protection
- Increasing the availability of plants by early fault detection
- As option with external or internal residual current transformer
- Protection against manipulation by sealable transparent cover over setting switches

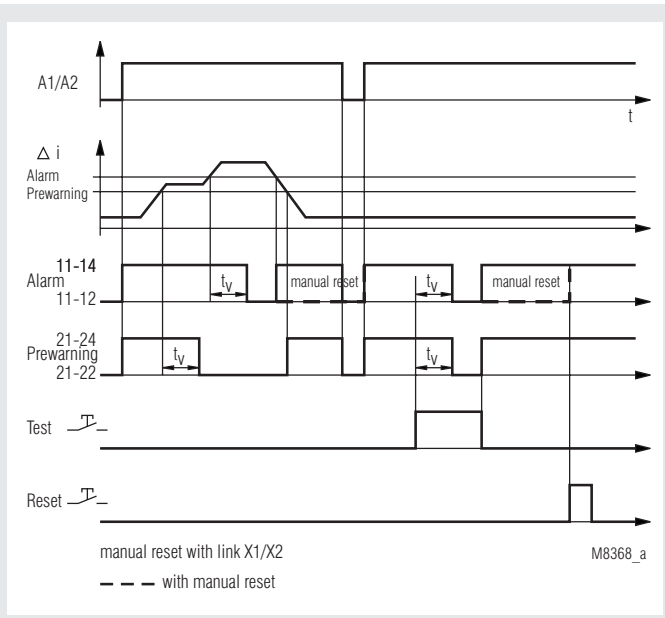
### Features

- According to IEC/EN 62020
- for AC and pulsating DC currents Type A to IEC/TR 60755
- 9 tripping values from 10 mA to 10 A or from 10 mA ... 30 A
- Frequency range 20 ... 2000 Hz
- Selection of manual or automatic reset
- With prewarning
- With test and reset button
- Broken wire detection
- Short reaction time
- With adjustable delay  $t_v$
- De-energized on trip
- LED indication for auxiliary supply and state of contact
- 2 x 1 changeover contact
- Devices available in 3 enclosure versions:
  - IL 5882: 63 mm deep with terminals near to the bottom to be mounted in consumer units or industrial distribution systems according to DIN 43 880
    - width 35 mm
    - for connection of external residual current transformer, e. g. ND 5016, ND 5019 or split current transformer ND 5014
  - SL 5882: 100 mm deep with terminals near to the top to be mounted in cabinets with mounting plate and cable ducts
    - width 35 mm
    - for connection of external residual current transformer, e. g. ND 5016, ND 5019 or split current transformer ND 5014
  - IR 5882: 63 mm deep with terminals near to the bottom to be mounted in consumer units or industrial distribution systems according to DIN 43 880
    - width 105 mm
    - with internal residual current transformer

### Approvals and Markings



### Function Diagram



### Application

Detection of insulation faults in grounded voltage systems. The residual current relay is used to maintain electrical plants before faults occur. Decrease in insulation can be detected and indicated early without interruption of operation.

## Function

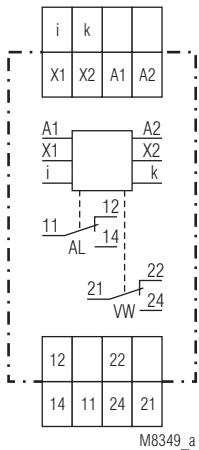
The function of the IL/SL 5882 and IR 5882 can be compared to a fault current circuit breaker unit. It detects and indicates residual currents, but does not disconnect.

The measurement is done by an external residual current transformer e.g. ND 5016 which is connected via terminals i and k to the IL/SL 5882. At the device IR 5882 the residual current transformer is integrated. All conductors of the voltage system to be monitored are run through the CT except the ground wire. In a fault free voltage system the sum of all current is 0 and the CT induces no secondary voltage. If due to an insulation fault a fault current flows to ground, the current difference in the CT creates a measuring current, which is detected and measured by the IL/SL 5882 or IR5882. A broken wire in the sensing circuit would disable the measurement, therefore a special circuit detects broken wire and forces the unit to trip.

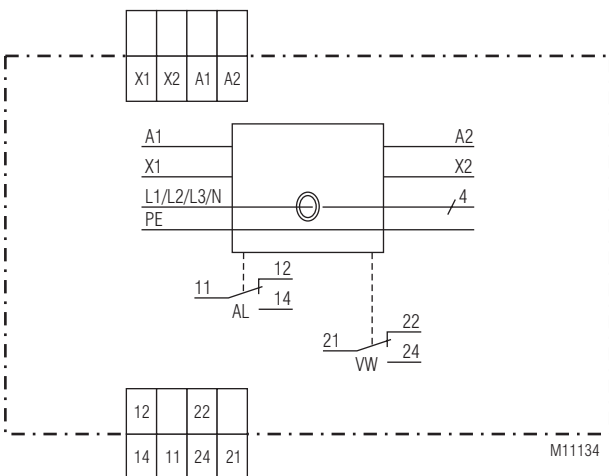
The unit has 2 x 1 changeover contacts. Contact 11-12-14 for alarm (AL) and 21-22-24 for prewarning (VW). Prewarning is detected at 70 % of the selected alarm value. With external bridge X1-X2 the alarm is stored and has to be reset by pressing the reset button or by disconnecting the auxiliary supply. Without bridge X1-X2 the unit works with auto-reset and the fault is not stored. With the button "Test" a fault can be simulated (Alarm). Each contact is delayed with an adjustable time delay  $t_v$  (same delay time for alarm and pre-warning).

To avoid unauthorised adjustment of the potentiometers the unit has a transparent cover that could be sealed with laquer. Two holes above the push buttons allow activation of test and reset.

## Circuit Diagrams



IL /SL 5882



IR 5882

## Connection terminals

Terminal designation	Signal description
A1, A2	Auxiliary voltage
i, k (only at IL/SL 5882)	Conn. f. external current transformer ND5016, ND5019 ; terminals i, k
X1, X2	control input X1/X2 bridged: with manual reset of alarm X1/X2 not bridged: without manual reset of alarm (Hysteresis function)
11, 12, 14	1. C/O contact (Alarm)
21, 22, 24	1. C/O contact (Pre-warning)

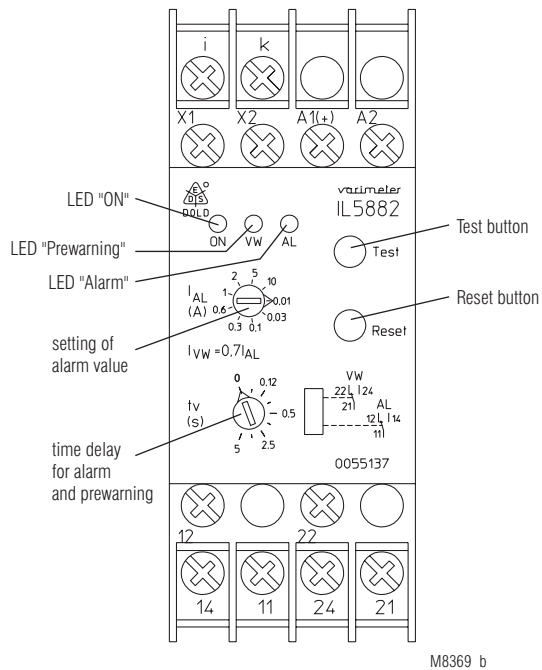
## Indication

green LED "ON": on, when supply connected  
red LEDs "VW", "AL": on, when insulation failure (prewarning and alarm)

## Note

If time is set to 0 and a pulsating fault current is flowing (e.g. 1-way rectified) the output relay may flicker because of the short reaction time. By increasing the time delay this effect can be avoided.

## Setting



## Technical Data

### Input

<b>Auxiliary voltage <math>U_H</math>:</b>	AC/DC 12 V, AC/DC 24 ... 230 V
<b>Voltage range:</b>	
AC:	0.8 ... 1.1 $U_N$
DC:	0.9 ... 1.25 $U_N$
<b>Nominal frequency <math>U_H</math>:</b>	50 ... 400 Hz
<b>Nominal consumption</b>	
AC 230 V:	4 VA
AC 24 V:	1.6 VA
DC 24 V:	1 W
<b>Measuring value adjustable via rotational switch:</b>	AC 0.01; 0.03 A; 0.1 A; 0.3 A; 0.6 A 1 A; 2 A; 5 A; 10 A or AC 0.01 A, 0.03 A; 0.1 A; 0.3 A; 0.6 A 1 A; 2 A; 7 A; 30 A
<b>Frequency range:</b>	20 Hz ... 2 kHz at failure current < 50 Hz and the function "auto reset", a time delay must be adjusted, so that the relay does not buzz before switching approx. 4% of trip value, fixed
<b>Hysteresis:</b>	$\leq 0$ ... -30 %
<b>Accuracy:</b>	$\leq \pm 1$ %
<b>Repeat accuracy:</b>	$\leq \pm 0.05$ % / K
<b>Temperature drift:</b>	10 ... 40 ms
<b>Reaction time:</b>	0 ... 5 s adjustable (logarithmic scale in order to allow also short time delay to be adjusted without problems)
<b>Response delay <math>t_v</math>:</b>	

### Output

<b>Contacts:</b>	IL / SL / IR 5882.38: 1 changeover contact for Prewarning, 1 changeover contact for Alarm	
<b>Thermal current <math>I_{th}</math>:</b>	5 A	
<b>Switching capacity to AC 15:</b>		
NO contact:	3 A / AC 230 V	IEC/EN 60947-5-1
NC contact:	1 A / AC 230 V	IEC/EN 60947-5-1
<b>to DC 13:</b>		
NO contact:	2 A / DC 24 V	IEC/EN 60947-5-1
NC contact:	1 A / DC 24 V	IEC/EN 60947-5-1
<b>Electrical life to AC 15 at 1 A, AC 230 V:</b>	3 x 10 <sup>5</sup> switching cycles	EN 60947-5-1
<b>Short circuit strength max. fuse rating:</b>	4 A gG / gL	EN 60947-5-1
<b>Mechanical life:</b>	$\geq 10^8$ switching cycles	

### General Data

<b>Operating mode:</b>	Continuous	
<b>Temperature range</b>		
Operation:	- 20 ... + 60°C	
Storage:	- 25 ... + 70°C	
<b>Altitude:</b>	< 2000 m	
<b>Clearance and creepage distances</b>		
rated impulse voltage / pollution degree		
supply / contacts:	4 kV / 2	IEC 60664-1
supply / Measuring Circuit:	corresponding to CT	
<b>EMC</b>		
Surge voltages:	class 3 (5 kV / 0.5 J)	DIN VDE0435-303
HF-interference:	class 3 (2.5 kV)	DIN VDE0435-303
Electrostatic discharge:	8 kV (air)	IEC/EN 61 000-4-2
HF irradiation	IEC/EN 61000-4-3, EN 50121-3-2	
80 MHz ... 1 GHz:	20 V / m	
1 GHz ... 2,7 GHz:	10 V / m	
Fast transients:	4 kV (class 4)	IEC/EN 61000-4-4
Surge voltages:	1 kV (class 3)	IEC/EN 61000-4-5
HF wire guided:	10 V	IEC/EN 61000-4-6
Interference suppression:	Limit value class B	EN 55011
<b>Degree of protection:</b>		
Housing:	IP 40	IEC/EN 60529
Terminals:	IP 20	IEC/EN 60529
<b>Housing:</b>	Thermoplastic with V0-behaviour according UL subject 94	

## Technical Data

<b>Vibration resistance:</b>	Amplitude 0.35 mm frequency 10 ... 55 Hz IEC/EN 60068-2-6 20 / 060 / 03 IEC/EN 60068-1 EN 50005
<b>Climate resistance:</b>	
<b>Terminal designation:</b>	
<b>Wire connection:</b>	2 x 2.5 mm <sup>2</sup> solid or 2 x 1.5 mm <sup>2</sup> stranded wire with sleeve DIN 46228-1/-2/-3/-4
<b>Wire fixing:</b>	Flat terminals with self-lifting clamping piece IEC/EN 60999-1
<b>Fixing torque:</b>	0.8 Nm
<b>Mounting:</b>	DIN rail IEC/EN 60715
<b>Weight</b>	
IL 5882:	approx. 125 g
SL 5882:	approx. 150 g
IR 5882:	approx. 300 g

### Dimensions

<b>Width x height x depth:</b>	
IL 5882:	35 x 90 x 63 mm
SL 5882:	35 x 90 x 100 mm
IR 5882:	105 x 90 x 63 mm (inner diameter current transformer: 21.5 mm or 28 mm)

### Standard Types

IL 5882.38 AC/DC 24 ... 230 V 50 / 60 Hz 10 A 5 s	
Article number:	0055138
• De-energized on trip	
• Auxiliary voltage $U_H$ :	AC/DC 24 ... 230 V
• Measuring range:	10 A
• Response delay $t_v$ :	5 s
• Width:	35 mm

SL 5882.38 AC/DC 24 ... 230 V 50 / 60 Hz 10 A 5 s	
Article number:	0055515
• De-energized on trip	
• Auxiliary voltage $U_H$ :	AC/DC 24 ... 230 V
• Measuring range:	10 A
• Response delay $t_v$ :	5 s
• Width:	35 mm

IR 5882.38 AC/DC 24 ... 230 V 50 / 60 Hz 10 A 5 s	
Article number:	0066743
• Internal residual current transformer ( $\varnothing$ 28 mm)	
• De-energized on trip	
• Auxiliary voltage $U_H$ :	AC/DC 24 ... 230 V
• Measuring range:	10 A
• Response delay $t_v$ :	5 s
• Width:	105 mm

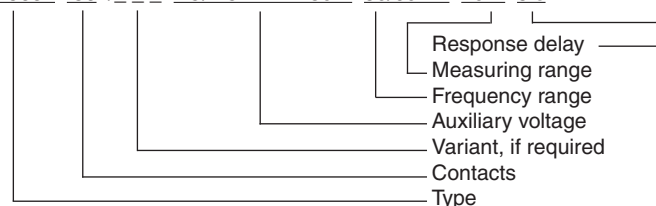
ND 5016/024	
Article number:	0066009
• Residual current transformer for IL/SL 5882	
• Diameter:	24 mm
• DIN-rail mounting:	waagrecht oder senkrecht
• Screw mounting:	M4

### Variant

IL 5882.12/002:	with 2 changeover contacts for alarm and no pre-warning
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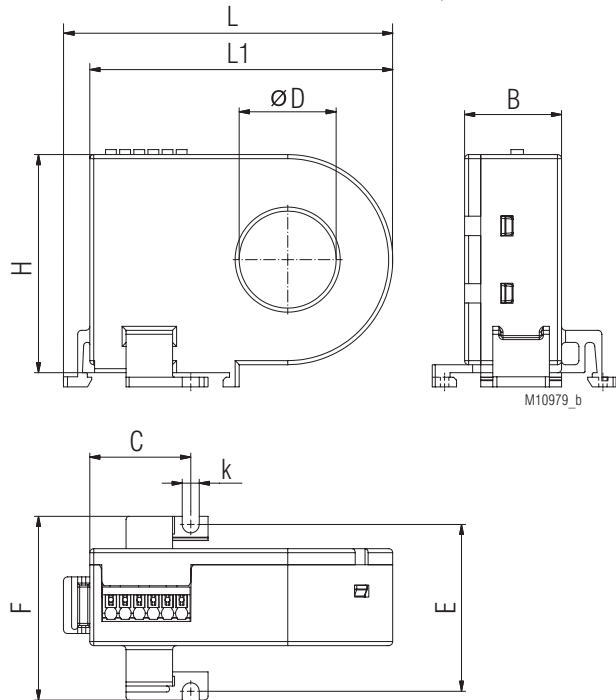
### Ordering example for variant

IL 5882 .38 / \_ \_ \_ AC/DC 24 ... 230 V 50/60 Hz 10 A 5 s



## Accessories

### Residual Current Transformer ND 5016/024, ND 5016/035



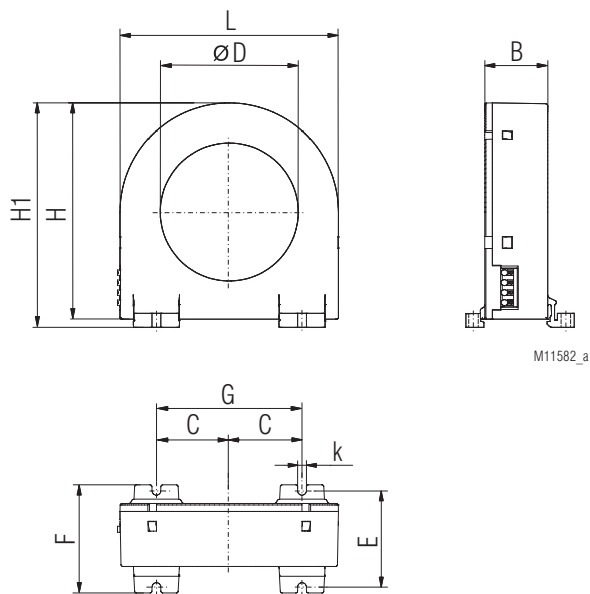
for DIN rail mounting or screw mounting

ND 5016/024	øD	L	L1	B	H	C	E	F	k
Dimension/mm	24	82	75	24	54	25	42*	46	4,2
Weight / g	approx. 80								
Article number	0066009								

ND 5016/035	øD	L	L1	B	H	C	E	F	k
Dimension/mm	35	88	81	24	67	25	42*	46	4,2
Weight / g	approx. 90								
Article number	0067064								

\*) Drill tolerance for screw mounting:  $\pm 0.5$  mm

### Residual Current Transformer ND 5016/070



for DIN rail mounting or screw mounting

ND 5016/070	øD	L	H	H1	B	C	F	k	E	G
Dimension/mm	70	111	110	115	32	37	55	4,2	50*	74*
Weight / g	approx. 220									
Article number	0067065									

\*) Drill tolerance for screw mounting:  $\pm 0.5$  mm

### Technical Data Residual Current Transformer ND 5016, ND 5019

#### Ambient temperature

ND 5016: - 20 ... + 60°C / 253 K ... 333 K  
 ND 5019: - 10 ... + 50°C / 263 K ... 323 K

#### Inflammability class:

V0 according to UL94

#### Nominal insulation voltage

acc. to IEC 60 664-1: AC 630 V

#### Rated impulse voltage /

pollution degree: 6 kV/3

#### Voltage test acc. to

IEC/EN 60 255: AC 3 kV

Transformation ratio: 500 /1

#### Length of connection wires

##### Type of wire:

Single wire: up to 1 m  
 Single wire Twisted pair: up to 10 m  
 Screened wire;  
 screen on terminal k: up to 25 m

##### Wire cross section

ND 5016: 0.2 ... 1.5 mm<sup>2</sup>  
 ND 5019: 0.75 mm<sup>2</sup>

##### Stripping length:

8 mm

##### Wire fixing

ND 5016: Terminals with spring connection and direct (Push in) technology  
 ND 5019: Box terminals

##### Screw connection:

ND 5016: M3 or M4  
 ND 5019: M5  
 Fixing torque: 0.8 Nm

##### DIN rail mounting:

ND 5016/024, /035: integrated clips for vertical and horizontal mounting

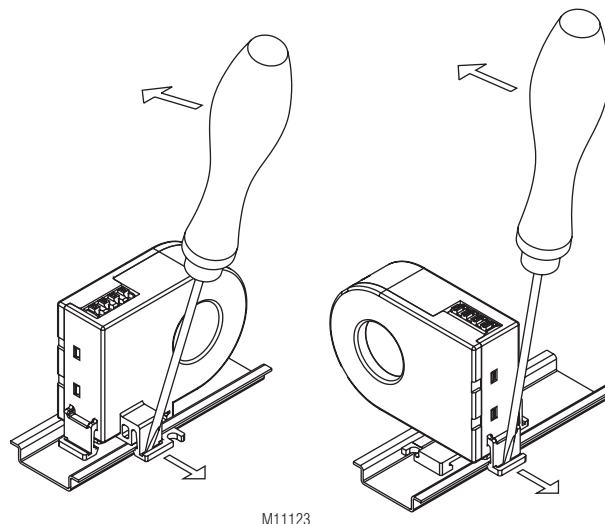
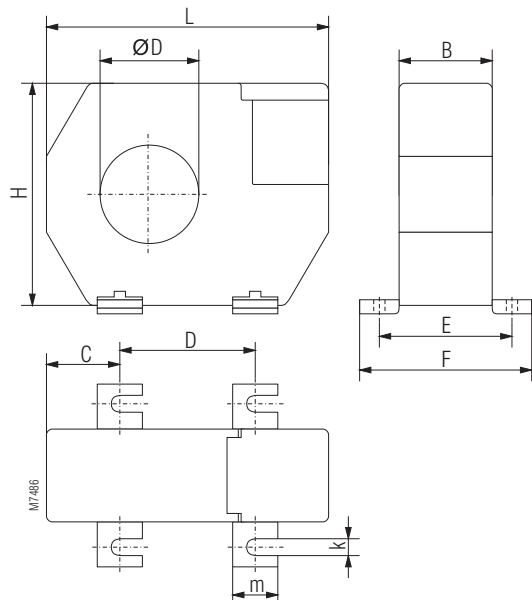
ND 5016/070: integrated clips for horizontal mounting  
 ND 5019: using mounting adapter ET 5018

### 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.

Residual Current Transformer ND 5019



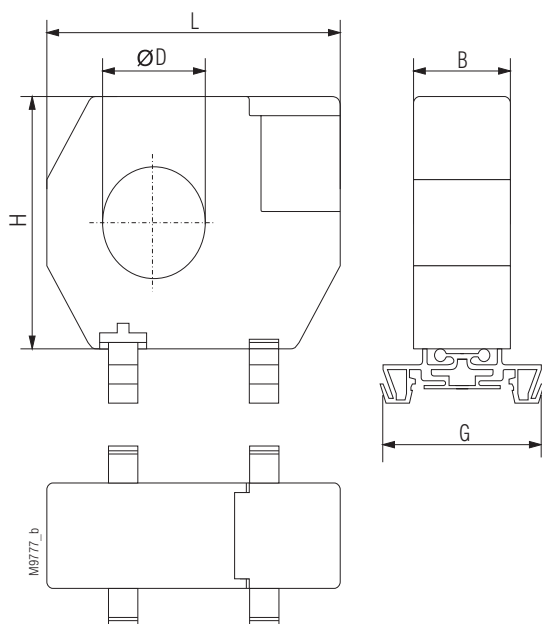
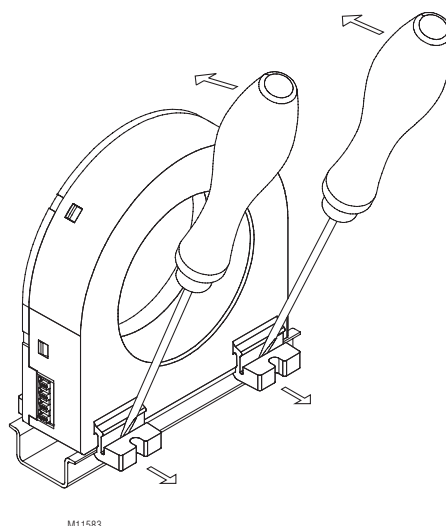
for Screw connection

Dimensions in mm	
	ND 5019/105
øD	105
L	170
B	33
H	146
C	38
D	94
E	46
F	61
k	6,5
m	16

Weight	
	ND 5019/105
kg	0,5
Art-Nr.	0055118

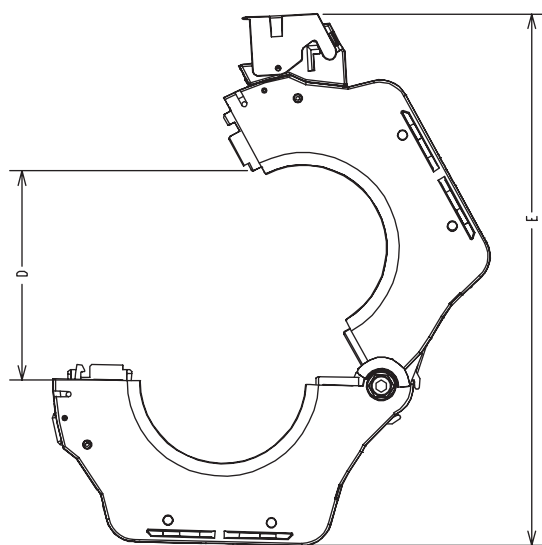
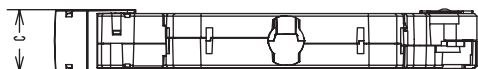
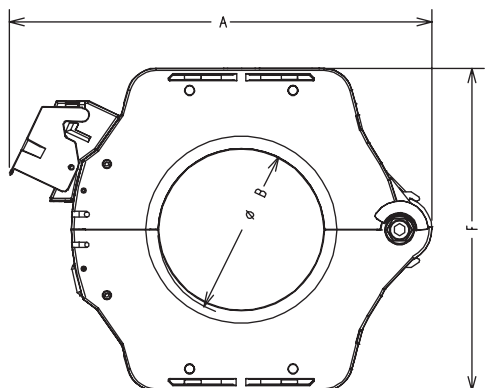
The residual current transformer ND 5019/105 can also be mounted on DIN-rail. To do this the metal screw fixings have to be removed and have to be replaced by 2 mounting clips (ET5018: art.no. 0058754; set with 2 pcs)

Disassembling ND 5016/070

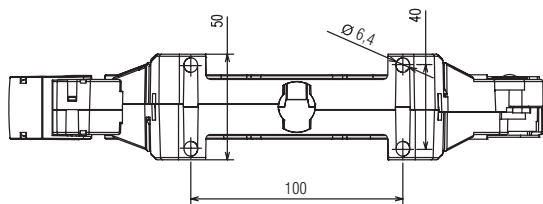


## Dimensions

Residual current monitor ND 5014/050, ND 5014/080, ND 5014/120



M12059



ND 5014/050	A	B	C	D	E	F
Dimension/mm	160	49	30	77	200	116
Weight / g	approx. 380					
Article number	0068614					

ND 5014/080	A	B	C	D	E	F
Dimension/mm	204	79	30	108	260	156
Weight / g	approx. 850					
Article number	0068613					

ND 5014/120	A	B	C	D	E	F
Dimension/mm	252	119	30	149	328	204
Weight / g	approx. 1500					
Article number	0068565					

\*) Drill tolerance for screw mounting:  $\pm 0.5$  mm

## Technical Data Residual Current Monitor ND 5014

Ambient temperature: - 40 ... + 80°C / 233 K ... 353 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  
 Rated impuls voltage / pollution degree: 8 kV / 3

**Rated transformation ratio:** 500 / 1  
 Rated primary current: 10 A  
 Nominal load: 50 mVA  
 Accuracy: Class 3

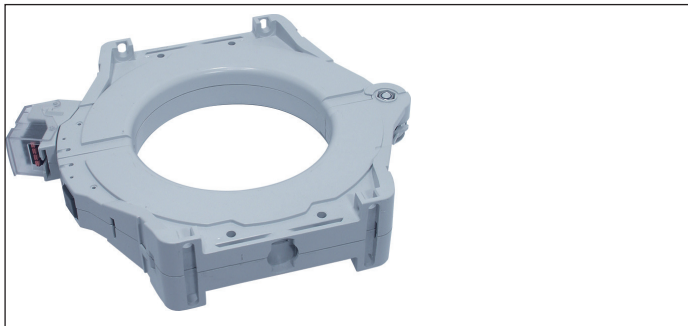
### Wire connection

Wire cross section: 0.2 ... 2.5 mm<sup>2</sup> rigid /  
 0.2 ... 2.5 mm<sup>2</sup> flexible / AWG 24 ... 12  
 Stripping length: 6 mm  
 Wire fixing: Terminals with spring connection and  
 direct (Push in) technology  
 Actuating force: 40 N max.

### Mounting

DIN rail mounting: vertical and horizontal mounting  
 on enclosed socket  
 ND 5014/120: screw fastening also possible

## Mounting - Screw fixing at ND 5014/120



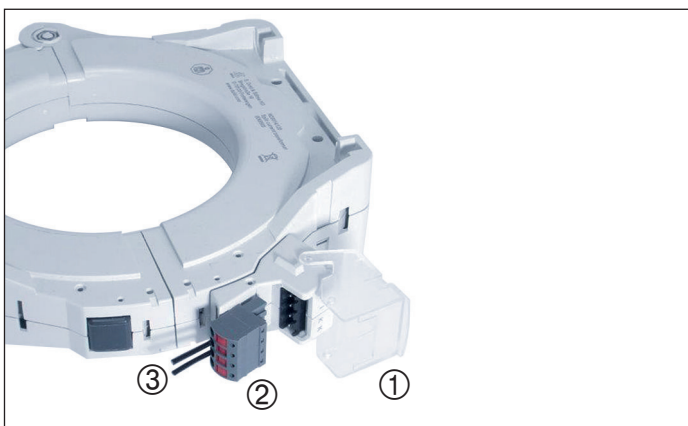
Screws are not included in the delivery !

## Mounting instructions for screw fixing

To high forces applied during installation can damage the transformer on the mounting foot.

The mounting foot is only designed to fix the transformer. Forces that are applied to the CT by the conductors can only be supported within limitations. When installing the CT, the conductors should be lead free through the transformer and should later stay in that position.

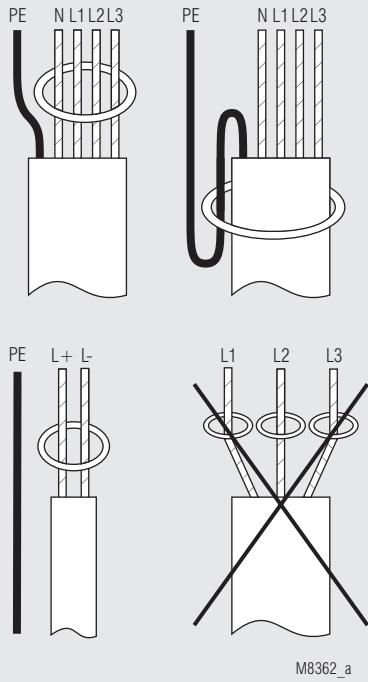
## Wiring Information Residual Current Monitor



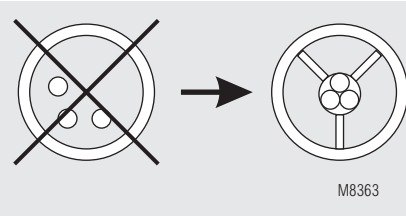
- ① The hinged cover protects the push-in terminal block and avoids unintended disconnection of the wiring
- ② The push-in terminal block provides easy mounting
- ③ Stripping length: 10 mm  
Connecting capacity: 0.2 ... 2.5 mm<sup>2</sup>

For further details see separate data sheet ND 5014

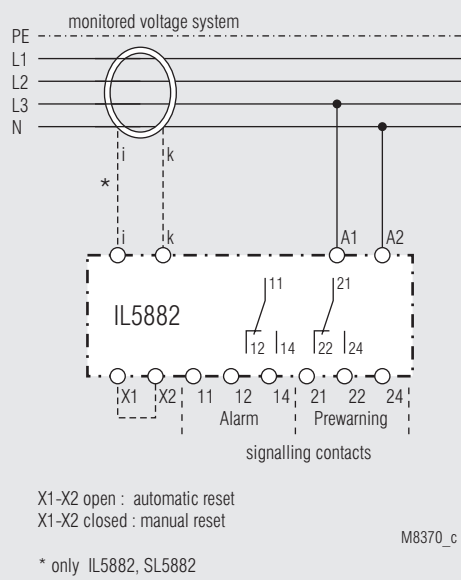
### Installation of Wires



### To Avoid Interference with High Starting Currents



### Connection Example



#### Attention:

As the auxiliary supply has no galvanic separation, the secondary circuit of the CT must not be connected to ground. A ground connection will lead to a damage of the unit!