87045 LIMOGES Cedex
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RCD add-on module DX³ 63A - 125A with metering/measuring unit

Cat.Nos: 4 106 57 to 4 106 59

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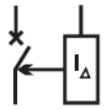
1. DESCRIPTION - USE

RCD add-on modules with metering/measuring unit for MCBs. DX³ ≤125A, 1,5 modules per pole width, breaking capacity 10000A/16kA, 25kA, 36kA or 50kA.
They protect people against direct and indirect electric shocks and installations against insulation faults. They enable, in addition, the measurement of the main electrical quantities (depending on the version: voltage, current, residual current, power, energy, frequency, power factor, THD, the history of causes of recent trips).

Symbol:



Technology:

. Electronic residual current operating.

2. RANGE

Number of poles:

. 4 poles.

Width:

. Four poles – 7,5 modules (7,5 x 17,8 mm = 133,5 mm).

Rated Currents, In:

. In 63A (cat. no 4 106 57):
. In125 A (cat. nos 4 106 58 / 59) :

Type:

. A-Hpi: sinusoidal AC fault currents with or without DC component and immunity against unwanted tripping (Hpi type are also A types).

Sensitivities and Tripping time:

. 30 mA instantaneous.
. Adjustable sensitivity: 300ma, 1A or 3A with instantaneous or delayed tripping of 300ms, 1s or 3s.

2. RANGE *(continued)*

Features:

. Basic functions common to all devices:
Remote report of the data

. Specific functions of the add-on module with metering unit (cat. N° 4 106 57 / 58):
Currents L1 L2 L3 N (in A)
Residual current (in mA or A)
Instantaneous total active power L1 L2 L3 (in W or kW)
Total energy consumption (in kWh)

. Specific functions of the add-on module with measuring unit (cat. N° 4 106 59):
Currents L1 L2 L3 N (in A)
Residual current (in mA or A)
Voltages
Powers
Energies
Frequency
THD
Power factor (cos φ)
Cause of last trip

Rated Voltage / Frequency:

. 230 / 400 V~, 50 Hz standard tolerances.
. 240 / 415 V~, 50 Hz standard tolerances.

Maximum operating voltage:

. 440 V ~, 50 Hz with standard tolerances.

Minimum operating voltage:

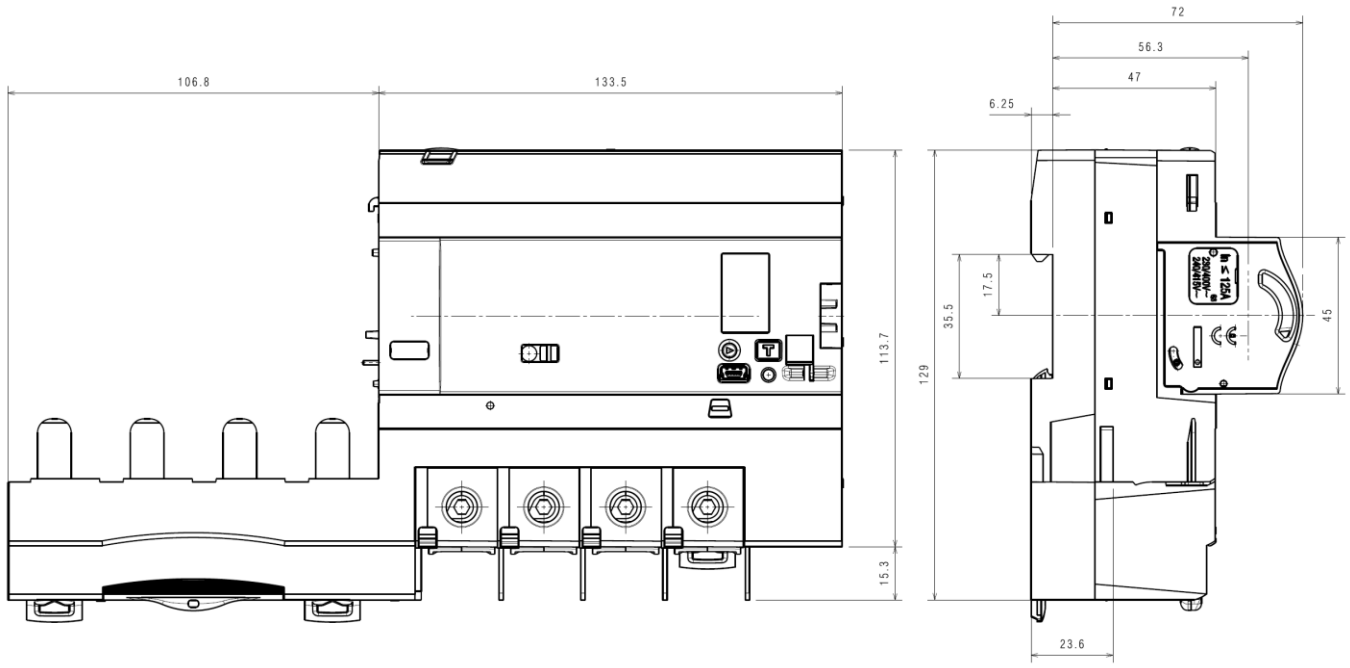
. 170 V ~, 50 Hz with standard tolerances.

2. RANGE *(continued)*

Compatibility with MCBs DX³:

	Breaking Capacity	Curve	4 106 57	4 106 58	4 106 59
DX³	10000A / 16kA	B, C, D	--	80A ≤ In ≤ 125A	80A ≤ In ≤ 125A
	25kA	B, C,	32A ≤ In ≤ 63A	32A ≤ In ≤ 125A	32A ≤ In ≤ 125A
	25kA	D, MA	12,5A ≤ In ≤ 63A	12,5A ≤ In ≤ 125A	12,5A ≤ In ≤ 125A
	36kA	C	10A ≤ In ≤ 63A	10A ≤ In ≤ 80A	10A ≤ In ≤ 80A
	50kA	B, C, D, MA	10A ≤ In ≤ 63A	10A ≤ In ≤ 63A	10A ≤ In ≤ 63A

3. OVERALL DIMENSIONS



4. FIXING - CONNECTION

Assembling:

. On the right side of the MCBs. DX³ ≤125A, 1.5 modules per pole width, breaking capacity 10000A/16kA, 25kA, 36kA or 50kA.. Associated to the circuit breaker by plastic clamps and tightening of connections in the downstream terminals of the MCB. Can be mounted on the right of the MCBs 1.5 modules per pole up to 63A breaking capacity 16kA, 25 kA and 50 kA, in this case the rated current of the add-on module is 63 A.

Mounting:

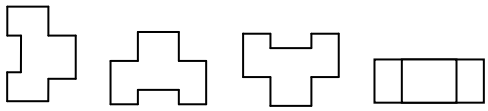
. On symmetrical IEC/EN 60715 rail or DIN 35 rail.

Power supply:

. From the top trough the associated MCB or from the bottom directly on the add-on module.

Operating position:

. Vertical Horizontal Upside down On the side



Screw terminals:

. Terminals protected against accidental contact (IP20).
. The screw terminals are separated by built-in shields.
. Cage terminals, with release and captive screw
. Add-on module In 63A:
Terminal depth: 19 mm.
Stripping length : 17 mm
Screw head: mixed, slotted and Pozidriv n°2.
Recommended tightening torque: 3 Nm.
. Add-on module In 125A:
Terminal depth: 19 mm.
Stripping length : 17 mm
Screw head: Allen screw 4 mm.
Recommended tightening torque: 5,5 Nm.

Connectable section:

63A
. In the power terminals

	Copper cable	
	Without ferrule	With ferrule
Rigid cable	**1 x 50 mm²**	**-**
Flexible cable	**1 x 35 mm²**	**1 x 35 mm²**

125A
. In the power terminals

	Copper cable	
	Without ferrule	With ferrule
Rigid cable	**1 x 70 mm²**	**-**
Flexible cable	**1 x 50 mm²**	**1 x 50 mm²**

4. FIXING - CONNECTION *(continued)*

125A
In the automatic terminals

	Copper cable	
	Without ferrule	With ferrule
Rigid cable	**0,75 mm² ÷ 2,5 mm²**	**-**
Flexible cable	**0,75 mm² ÷ 2,5 mm²**	**0,75 mm² ÷ 1,5 mm²**

Recommended tools:

. For fixing on the DIN rail: flat screwdriver 5.5 mm (from 4 to 6 mm).
. For the terminals 63A: Pozidriv n°2 screwdriver or flat screwdriver 5,5 mm (6,5 mm maxi).
. For the terminals 125A: Allen wrench 4 mm.

Manual actuation of the add-on module:

. By the 2-positions ergonomic handle of the associated MCB.
- I / ON : Closed circuit.
- O / OFF : Open circuit.

Contacts status display:

. By marking of the associated MCB. handle:
"O-Off" white on a green background = contacts opened.
"I-On" white on a red background = contacts closed.

Report of the contacts position:

. The MCB contacts position is available through the communication. Possible positions : Closed / Open / Manual or on short-circuit trip / trip caused by a residual current fault

Display of fault trip caused by a residual current:

. Yellow mechanical signaller into the window on front-side marking zone.

Signalling the state of the device:

. Signalling by bi colour LED:
- Green fixed: normal operation.
- Green flashing: settings in progress.
- Red fixed: value of the residual current (IΔ) exceeds 45% of the set value.
- Red flashing: value of the residual current (IΔ) exceeds 60% of the set value.
- Red / Green alternate flashing: Self-protection due to overheating.

Labelling:

. Circuit identification by insertion of a label in the label holder of the associated MCB.

Battery type:

. Lithium CR1616. Qty:2

Battery voltage:

. 3 V d.c.

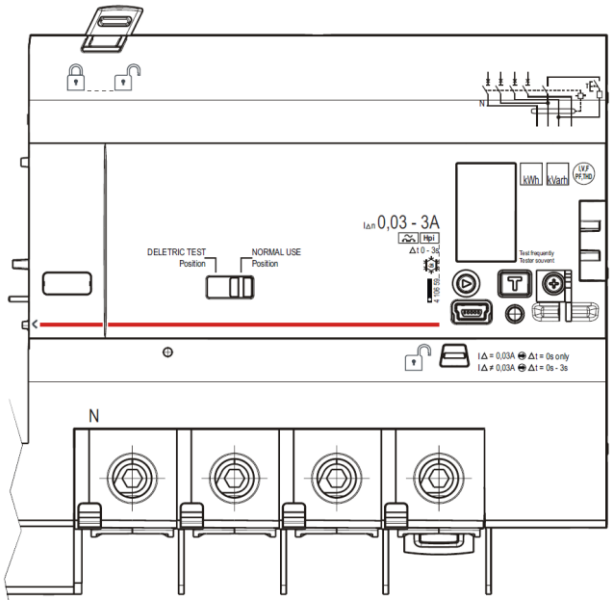
Battery current:

. 50 mAh.

5. GENERAL CHARACTERISTICS

Front face marking:

. By permanent ink pad printing.



"Test" key operating voltages:

U min	**170 V ~**
U max	**440 V ~**

Residual breaking capacity IΔm:

. In accordance with standard IEC/EN 61009-1 and IEC/EN 60947-2 (IΔm: short-circuit to ground)

IΔm = 60% of Icu of the associated MCB.

Neutral system:

. IT – TT – TN.

Insulation rated voltage:

. Ui = 500 V according to IEC/EN 61009-1 and IEC/EN 60947-2.

Pollution degree:

. 3.

Dielectric strength:

. 2500 V.

Impulse-withstand rated voltage:

. Uimp = 6 kV (wave 1.2 / 50 µs).

Operation at different frequencies respect to the nominal frequency:

. The only operating frequency is the nominal frequency.

5. GENERAL CHARACTERISTICS *(continued)*

Protection against unwanted tripping:

. Damped recurrent wave – 0.5 µs/100kHz : 200A for all sensitivity.

. Wavw 8/20 µs:

Sensitivity	30 mA	300 mA	1 A	3 A
Corrent	**3000 A**	**5000 A**	**5000 A**	**5000 A**

Protection class:

. Protection index of terminals against solid and liquid bodies (wired device): IP 20 (in accordance with standards IEC/EN 60529 and NF C 20-010).

. Protection index of the front face against direct contacts: IP 40 (in accordance with standards IEC/EN 60529 and NF C 20-010).

. Class II compared to conductive parts.

. Protection index against mechanical shocks: IK 01 (accordance with standards IEC / EN 50102 et NF C 20-015).

Mechanical and electrical endurance (associated to a MCB)

. 20000 operations without load

. 10000 operations with load.

. 1000 tripping operations by the Test key.

. 1000 tripping operations for fault residual current.

Power dissipated and impedance per pole at In:

In≤63A

	Four-Pole	
In	Z(mΩ)	P(W)
6	0.55	0.02
10	0.55	0.06
16	0.55	0.14
20	0.55	0.22
25	0.55	0.34
32	0.55	0.56
40	0.55	0.88
50	0.55	1.38
63	0.55	2.18

In≤125A

	Four-Pole	
In	Z(mΩ)	P(W)
80 A	**0.245**	**1.57**
100 A	**0.245**	**2.45**
125 A	**0.245**	**3.83**

Note: to obtain total power dissipated by the assembly Add-on module + MCB, these powers should be added to those of the associated MCB.

5. GENERAL CHARACTERISTICS *(continued)*

Consumption:
. Max. 1 VA.

Plastics:
. Polycarbonate parts.

Resistance to abnormal heat and to fire:
. Fire retardant and self-extinguishing materials.
. Heat and fire resistant according to EN 61009, glow-wire test at 960°C for external parts made of insulating material necessary to retain in position current-carrying parts and parts of protective circuit (650°C for all other external parts made of insulating material).

Calorific value:

	Four-pole
MJ	**8,53**

Volume and quantity when packed:
. Four poles 4,6 dm³ per device.

Average weight per device:
. Four pole 63A: 0,7 kg
. Four pole 125A: 1 kg

Ambient operating temperature:
. Min. = -25°C. Max. = +60°C

Ambient storage temperature:
. Min. = -40°C. Max. = +70°C

Specific use:
. Appropriate to be used in humid environment and polluted by chlorine (pool-type)

Derating according ambient temperature:
. Reference temperature: 40 °C in accordance with standard IEC/EN 60947-2.
. No derating of the add-on module depending on the ambient temperature between - 25 ° C and +40 ° C.
. Derating between + 40 °C to + 76 °C :

Temperature	40 °C	50 °C	60 °C
% of In	**100 %**	**95 %**	**90 %**

Resistance to sinusoidal vibrations:
. According to IEC 60068-2-35.
. Axis : x, y, z.
. Frequency range: 5÷100 Hz ; duration 90 minutes
. Displacement (5÷13,2 Hz) : 1mm.
. Acceleration (13,2÷100 Hz) : 0,7g (g=9,81 m/s²)

5. GENERAL CHARACTERISTICS *(continued)*

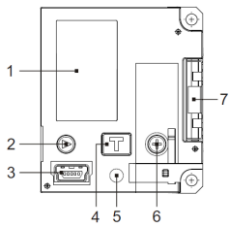
Influence of the altitude :

	2000 m	3000 m	4000 m	5000 m
Dielectric strength	**3000 V**	**2500 V**	**2000 V**	**1500 V**
Max operating voltage	**400 V**	**400 V**	**400 V**	**400 V**
Derating at 40°C	**none**	**none**	**none**	**none**

Measured quantities and measurement accuracy class:
. Currents (accuracy class 1) :
phase: I_1, I_2, I_3 ;
neutral: I_N.
. Voltage (accuracy class 0,5) :
phase/phase: U_{12}, U_{23}, U_{31} ;
phase/neutral: V_{1N}, V_{2N}, V_{3N}.
. Frequency (accuracy 0,1%)
. Power:
instantaneous total active power;
instantaneous total reactive power.
. Power factor (cos φ).
. Energy :
total active energy, positive and negative (accuracy class 1);
total reactive energy, positive and negative (accuracy class 2).
. THD :
THD of Voltages: V_1, V_2, V_3;
THD of currents: I_1, I_2, I_3, I_N.

Historical:
. Historical of causes of recent trips :
trip due to residual current fault (value of the residual current)
overheating (temperature value)
trip by test key

Display card:
. The display is the user interface. It consist of:
1. Backlight LCD display;
2. Navigation key;
3. USB Port;
4. RCD Test key;
5. Bi-colour LED;
6. Setting key;
7. Battery compartment



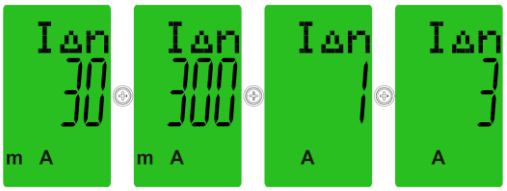
5. GENERAL CHARACTERISTICS *(continued)*

Programming pages:

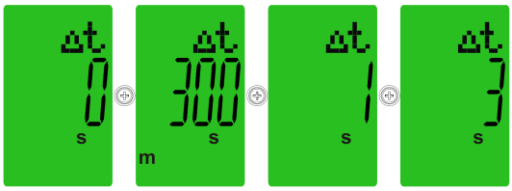
. The settings are implemented by pressing the key .

. The adjustable parameters are the values of the residual current and the tripping time:

Rated residual current (possible settings 30mA, 300mA, 1A, 3A):



Tripping time (possible settings 0s, 300ms, 1s, 3s) :

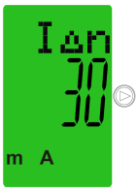


Display pages:

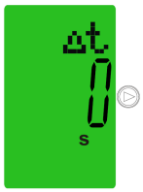
. The display of the pages is realised via the navigation button ; (According to the version "metering unit" or "measuring unit" some pages are not available).

. Display of set parameters:

Rated residual current (set value)



Tripping time (set value)

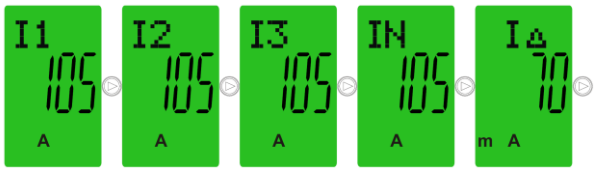


5. GENERAL CHARACTERISTICS *(continued)*

Display pages - Measured quantities:

. Display of measured quantities:

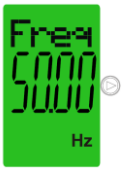
Current (phases / neutral / residual current)



Phase Voltages

Power (active and reactive) and Power Factor

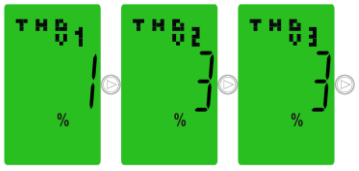
Frequency



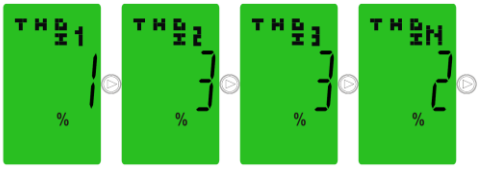
Active energy (positive and negative)

Reactive energy (positive and negative)

THD of the Phase Voltages



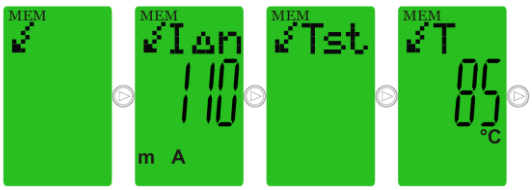
THD of Currents (phase and neutral)



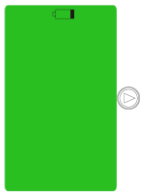
5. GENERAL CHARACTERISTICS *(continued)*

Display pages - Measured quantities *(continued)*:

. Historical of causes of recent trips :
no tripping
trip due to residual current fault (value of the residual current)
trip by test key
overheating (temperature value)

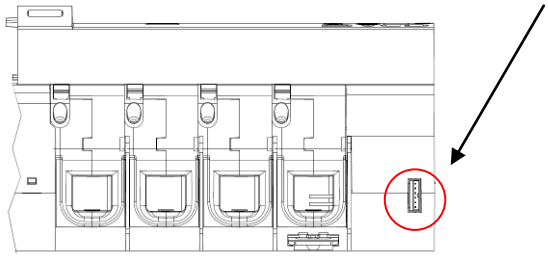


. Exhausted batteries (the symbol  appears on all pages):



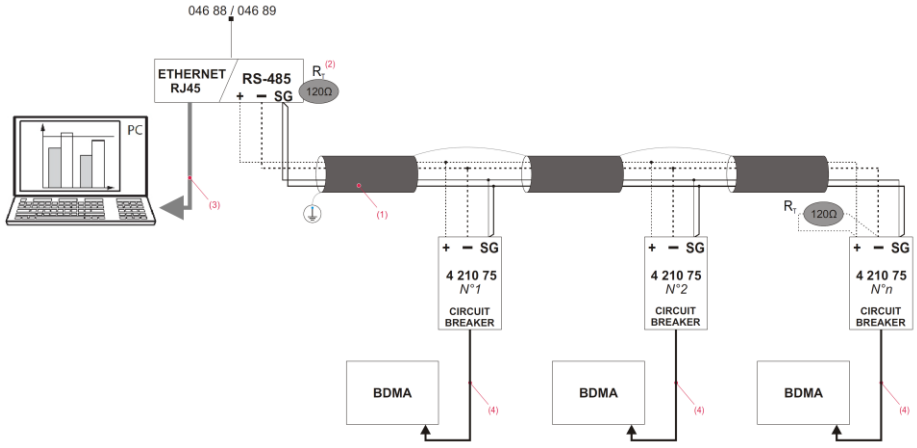
Integration of the add-on module in the remote display and monitoring system:

. The communication port is located on the lower side of the device.



The port enables the integration of the device in the monitoring system via the RS485 communication interface (ref 4 210 75) and the Gateway RS485/IP.

Wiring diagram:



(1)RS485:
Prescribed use of Cable Belden 9842 (or equivalent) for a maximum bus length of 1000m or category 6 Cable (FTP or UTP) for a maximum length of 50m;
(2)Termination Resistor RT integrated.
(3)Ethernet:
Category 6 Cable (FTP or UTP).
(4)Cable supplied with the module 4 210 75.

6. COMPLIACE AND APPROVALS

In accordance with standards:

. IEC/EN 61009-1.
. IEC/EN 60947-2.
. IEC 60051
. IEC 61557-12.
. IEC 62053
. Compliance with Directives 2014/35/UE (LVC), subsequent modifications and additions.
. Compliance with Directives 2014/30/UE (EMC), subsequent modifications and additions.

Environment respect – Compliance with CEE directives:

. Compliance with Directive 2011/65/UE called "RoHS" provides the banishment of hazardous substances, subsequent modifications and additions.
. Compliance with Directives 91/338/CEE of 18/06/91 and decree 94-647, subsequent modifications and additions.

Plastic materials :

. Halogen-free plastic materials.
. Marking of parts according to ISO 11469 and ISO 1043.

Packaging:

. Design and manufacture of packaging in accordance with decree 98-638 and Directive 94/62/EC, subsequent modifications and additions.

Compliance with IEC 61557-12

PMD Characteristics		
Type of characteristic	**Specification values**	**Other complementary characteristics**
Power quality assessment function	-	-
Classification of PMD	DD	-
Temperature	K55	-
Humidity + Altitude	Conditions standards	-
Active power or active energy function performance class	1	-

6. COMPLIACE AND APPROVALS *(continued)*

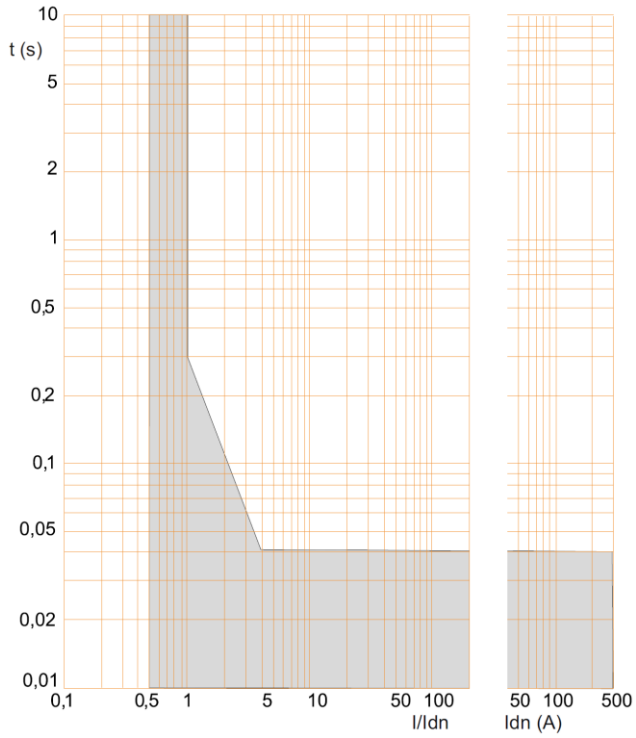
Compliance with IEC 61557-12

Symbol for functions	Measurement range	Function performance class according to IEC 61557-12	Other complementary characteristics
	63 A 125 A		**63 A 125 A**
P	0,0125…75 kW 0.025…150 kW	1	Ib=20 A, Imax=75A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
Q_A, Q_V	0,0125…75 kvar 0,025…150 kvar	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
S_A, S_V	-	-	-
E_a	0…9999 MWh	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
E_{rA}, E_{rV}	0…9999 Mvarh	1	Ib=20A, Imax=75A Ib=40A, Imax=150A UN=400V, fN=50Hz
E_{apA}, E_{apV}	-	-	-
f	45…65 Hz	0.1	-
I	1,25…75 A 2,5…150 A	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
I_N, I_{Nc}	1,25…75 A 2,5…150 A	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
U	88…550 V	0.5	-
P_{FA}, P_{FV}	-	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A UN=400 V, fN=50 Hz
P_{st}, P_{lt}	-	-	-
U_{dip}	-	-	-
U_{swl}	-	-	-
U_{tr}	-	-	-
U_{int}	-	-	-
U_{nba}	-	-	-
U_{nb}	-	-	-
U_h	-	-	-
THD_u	-	-	-
$THD\text{-}R_u$	88…550 V	0.5	-
I_h	-	-	-
THD_i	1,25…75 A 2,5…150 A	1	Ib=20 A, Imax=75 A Ib=40 A, Imax=150 A
$THD\text{-}R_i$	-	-	-
Msv	-	-	-

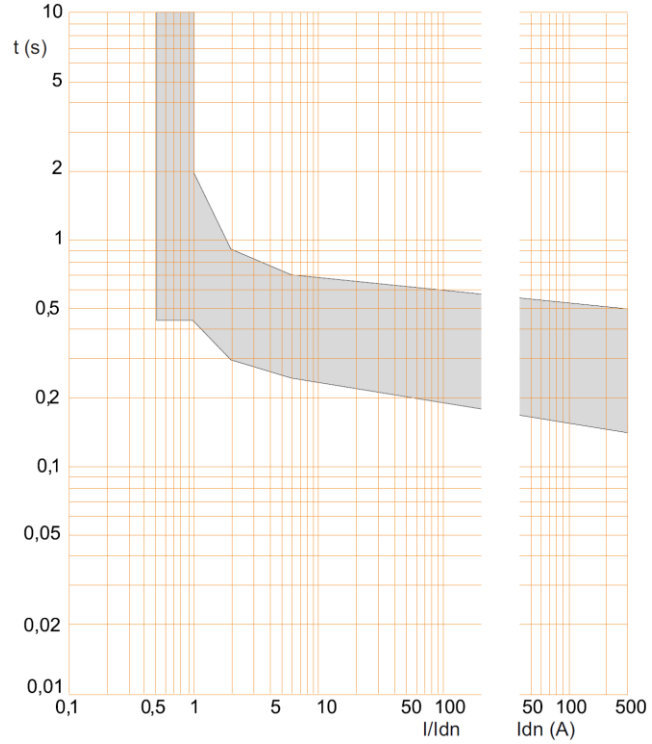
7. CURVES

Residual current operating characteristic

. Average tripping time depending on the intensity of the fault current.
. Sensitivities 30mA, 300mA, 1000mA and 3000mA instantaneous.

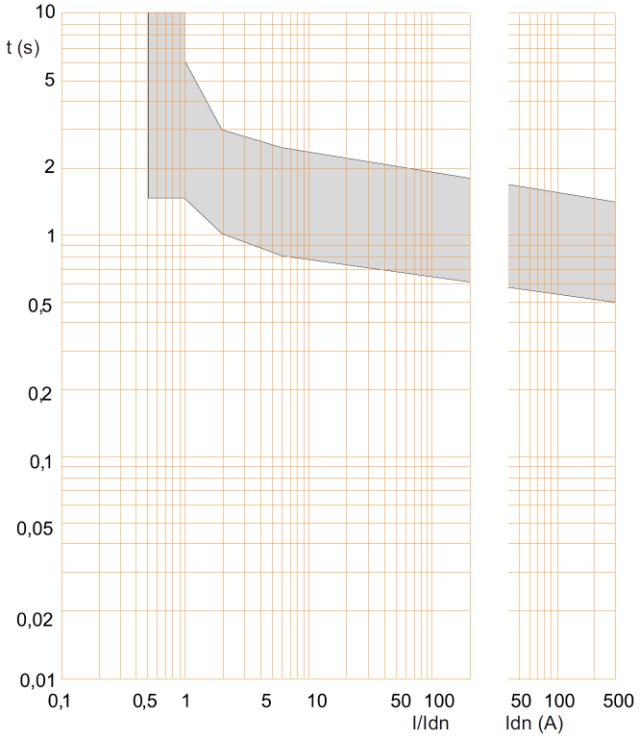


. Sensitivities 300mA, 1000mA and 3000mA with a time delay of 300ms.

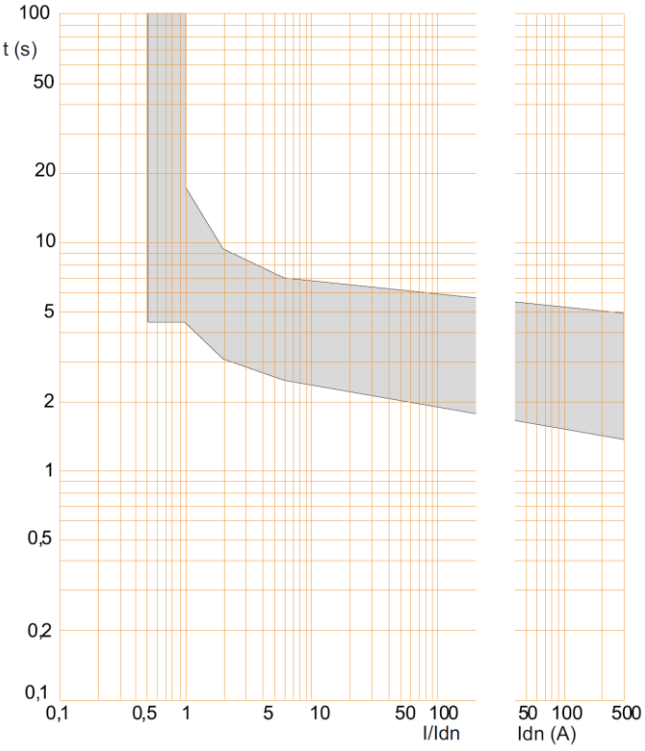


7. CURVES *(continued)*

. Sensitivities 300mA, 1000mA and 3000mA with a time delay of 1s.



. Sensitivities 300mA, 1000mA and 3000mA with a time delay of 3s.



8. AUXILIARIES AND ACCESSORIES

Installation software:

. XL Pro³.

Wiring accessories:

. Terminal for Aluminium cable 95mm²(406311).
. Terminal for Aluminium cable 50mm²(406310).