

R.C.B.O. Phase + Neutral / 1 module

Cat. N°(s): 4111 21 / 22 / 24 / 25 / 26 / 27 / 28 / 29 / 31 / 32 / 33 / 34



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1. DESCRIPTION - USE

Residual Current Circuit Breaker with Overload (RCBO) with positive contact indication for control, protection against short-circuits and overloads, and isolation of electrical circuits, protecting people from direct and indirect contact and protecting installations from insulation faults.

Symbol:



Technology:

- . Electronic Residual Current Circuit Breaker voltage dependent
- . Thermal-magnetic circuit breaker
- . Limiting device
- . Trip-Free mechanism

2. RANGE

Polarity:

- . 2 poles including 1 protected pole and 1 neutral pole

Width:

- . 1 module (17.8 mm)

Rated currents (In):

- . 6 / 10 / 16 / 20 / 25 / 32 A

Magnetic tripping curves:

- . C curve (between 5 and 10 In)

Type:

- . A

Sensitivity:

- . 10 mA
- . 30 mA

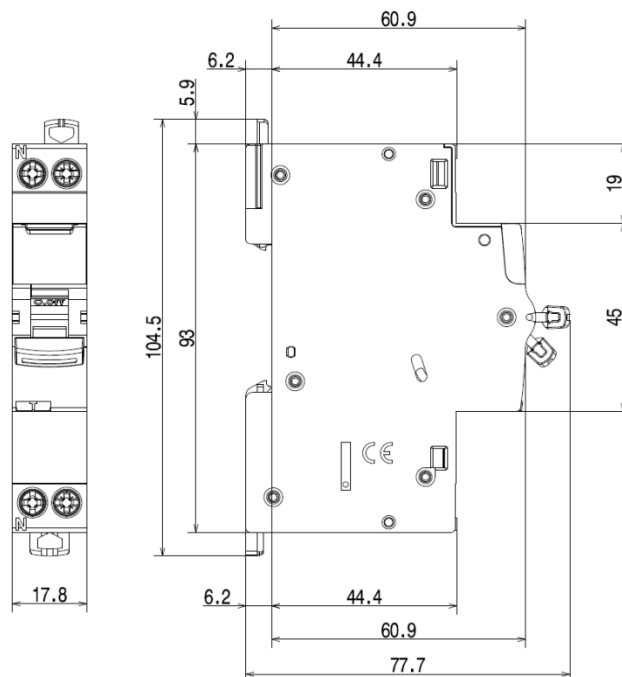
Rated voltage and frequency:

- . 240 V ~, 50/60Hz with standard tolerances

Breaking capacity:

- . Icn = 6000 A in accordance with IEC 61009-1 standard
- . Energy limitation class : 3

3. OVERALL DIMENSIONS



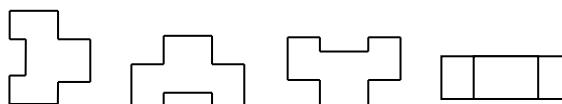
4. PREPARATION - CONNECTION

Mounting:

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

Operating position:

- . Vertical Horizontal Upside down On the side



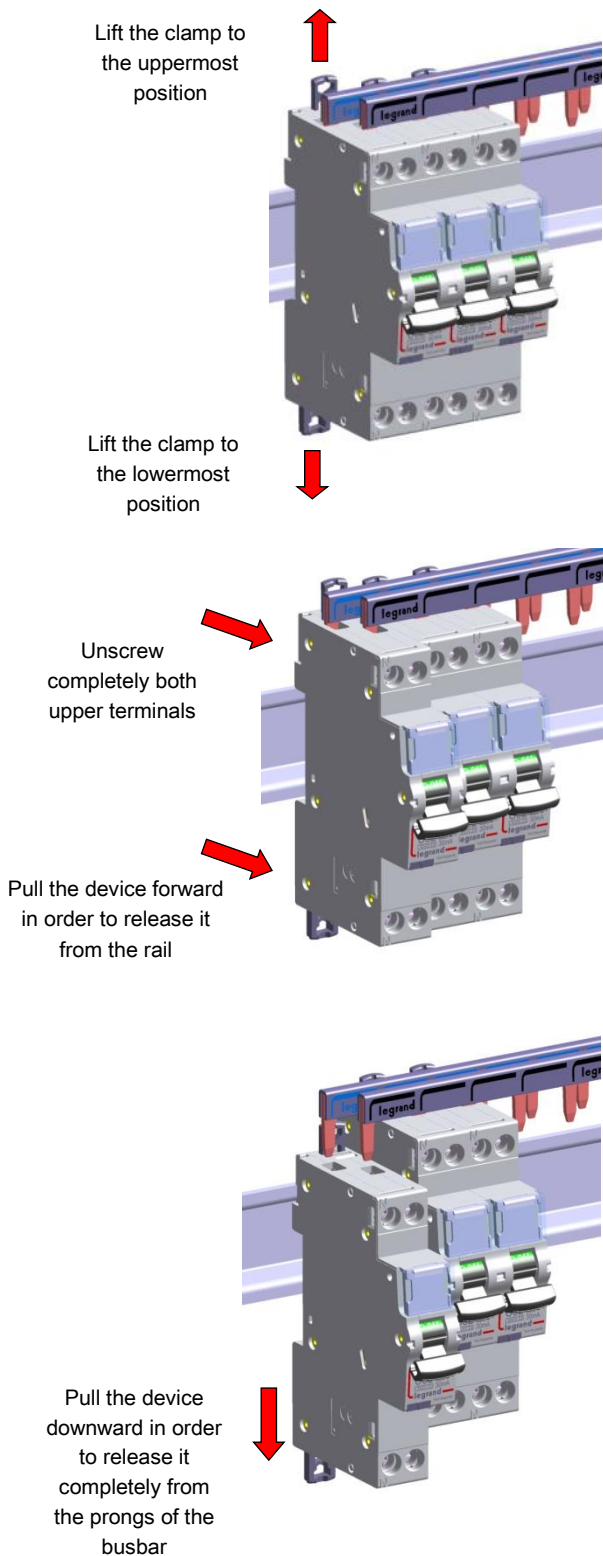
Power supply:

- . Either from the top or the bottom

4. PREPARATION - CONNECTION *(continued)*

Module maintenance:

- . The RCBO may be replaced without disconnecting the other products.



4. PREPARATION - CONNECTION *(continued)*

Connection:

- . Terminals protected against direct contact IP20, device wired
- . Cage terminals, with release and captive screws
- . Terminals fitted with shutters for guiding the cable in the proper position for connection
- . Alignment and spacing of the terminals permitting connection with the other products via prong supply busbars
- . Terminal depth: 14 mm at the top and 12.75 mm at the bottom
- . Screw head: mixed, slotted and Pozidriv no. 2
- . Stripping length of wire: 12 mm
- . Tightening torques:
 - Recommended: 1.6 to 2 Nm
 - Min.: 1.2 Nm
 - Max.: 2.8 Nm

Conductors type:

- . Copper cable
- . Cable cross-section

	Without ferrule	With ferrule
Rigid cable	1 x 0.75 to 16 mm ² 2 x 0.75 to 6 mm ²	-
Flexible cable	1 x 0.75 to 10 mm ² 2 x 0.75 to 4 mm ²	1 x 0.75 to 10 mm ²

- . Prong busbar, alone or with a 10 mm² flexible wire (without ferrule) or a connection terminal in the same terminal.

Recommended tools:

- . For the terminals, screwdriver with 5.5 mm blade or Pozidriv no. 2 screwdriver
- . For fastening on or removing from a DIN rail, 5.5 mm blade screwdriver or Pozidriv no. 2 screwdriver

Manual actuation of the R.C.B.O.:

- . Ergonomic 2 position handle
- . "O-OFF": Device open
- . "I-ON": Device closed

Contact status display:

- . By marking on the front side
 - "O-OFF" = contacts open
 - "I-ON" = contacts closed

Locking:

- . Padlocking possible in open and closed positions with padlock support (Cat. No. 4 063 03) and Ø5 mm padlock (Cat. No. 4 063 13) or Ø6 mm padlock (Cat. No. 0 227 97)

Sealing:

- . Possible in open or closed positions.

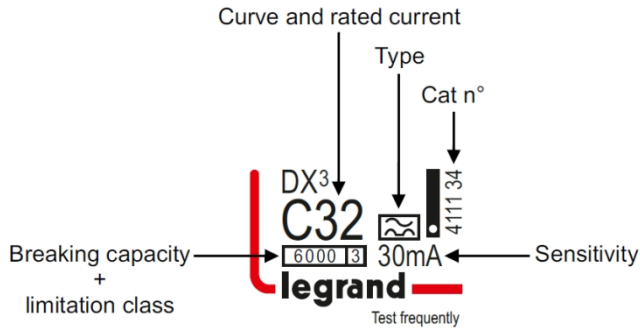
5. GENERAL CHARACTERISTICS

Neutral earthing system:

- . IT, TT, TN

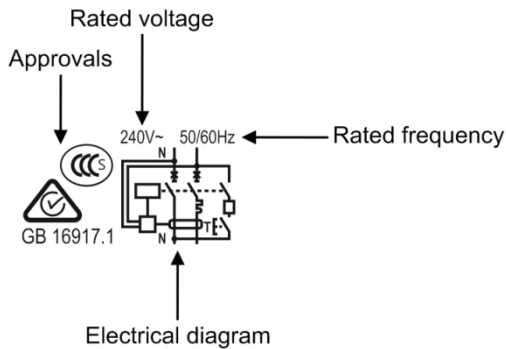
Marking on the front side:

- . By permanent ink pad printing



Marking on the upper panel:

- . By permanent ink pad printing



Voltage:

- . Maximum operating voltage : $U_{max} = 250\text{ V}$
- . Minimum operating voltage : $U_{min} = 50\text{ V}$

Breaking capacity:

Standard	Breaking capacity	Voltage between poles	Breaking capacity
IEC 61009-1	Ics	240 V	6 kA
	Icn		6 kA

Isolation distance:

- . The distance between the contacts is greater than 5.5 mm with the handle in the open position.
- . The RCBO is suitable for isolation in accordance with standard IEC 61009-1.

Insulation voltage:

- . $U_i = 250\text{ V}$

Rated impulse-withstand voltage:

- . $U_{imp} = 4\text{ kV}$

Performance at $I_{\Delta m}$:

- . 4.5 kA

Resistance of the insulation against an impulse voltage:

- . 6.2 kV $1.2/50$ a.c. peak

5. GENERAL CHARACTERISTICS (continued)

Degree of pollution:

- . 2 in accordance with IEC 61009-1 (dwelling)

Dielectric strength:

- . 2000 V

Insulation test:

- . Only to be performed in the bottom terminals and with the device switched off

Protection degree:

- . Terminals protected against direct contact. Class of protection against solid objects and liquids (wired device): IP20 in accordance with standards IEC 60529
- . Front panel protected against direct contact: IP40
- . Class II in relation to metallic conductive parts
- . Class of protection against mechanical impacts IK02 in accordance with standard IEC 62262.

Higher heating potential:

- . The heating potential is assessed at: 1.46 MJ

Closing and opening force via the handle:

- . 2 N on opening
- . 9 N on closing

Mechanical endurance:

- . 20,000 operations as per IEC 61009-1

Electrical endurance:

- . 10,000 operations with load ($I_n \times \cos \phi 0.9$) as per IEC 61009-1

Sinusoidal vibration resistance in accordance with IEC 60068.2.6:

- . Axes: x – y – z
- . Frequency: 10 to 55 Hz
- . Acceleration: 3g ($1g = 9.81m.s^{-2}$)

Resistance to mechanical shock:

- . As per IEC 61009-1: 9.13.1 Mechanical shock

Ambient temperatures:

- . Operation: from - 25°C to + 60°C (-25°C according to EN 61009-1)
- . Storage: from - 25°C to + 70°C

Frequency:

- . Operation at 50/60Hz

Packaged volume:

Packaging	Volume (dm ³)
Per 1	0.26

Product weight:

- . 0.125 kg

5. GENERAL CHARACTERISTICS *(continued)***Derating of RCBOs function of the number of devices placed side by side:**

When several RCBOs are installed side by side and operate simultaneously, the heat dissipation of each pole is limited. This results in an increased operating temperature for the circuit breakers which may cause false tripping. Applying the following coefficients to the operating currents is recommended by the IEC 60439-1.

Number of RCBOs side by side	Coefficient
2 - 3	0.9
4 - 5	0.8
6 - 9	0.7
≥ 10	0.6

In order to avoid having to use these coefficients there must be good ventilation and the devices must be kept apart using the spacing elements Cat. No. 4 063 07 (0.5 module).

Derating of RCBOs in the event of use with fluorescent tubes:

Electronic or ferromagnetic ballasts provide a high inrush current for a very short time. These currents are liable to cause tripping of the circuit breakers.

The maximum number of ballasts per RCBO stated by the lamp and ballast manufacturers in their catalogues should be taken into account during installation.

Impact of height:

	≤2,000 m	3,000 m	4,000 m	5,000 m
Dielectric strength	2,000 V	1,750 V	1,500 V	1,250 V
Maximum operating voltage	240 V	240 V	240 V	240 V

Power dissipated in W for the phase pole at In:

. RCBOs in In/Un

Rated current	6 A	10 A	16 A	20 A	25 A	32 A
Power (W) Phase pole	2.9	1.9	3.2	4	2.7	3.5
Power (W) Neutral pole	0.4	0.6	1.1	1.4	1.5	1.9

Derating of RCBOs depending on the ambient temperature:

. The nominal characteristics of a circuit breaker are modified depending on the ambient temperature which prevails in the cabinet or enclosure where the RCBO is located.

. Reference temperature: 30°C in accordance with standard IEC 61009-1.

In (A)	- 25 °C	- 10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C	70 °C
6	7.5	7.2	6.9	6.6	6.3	6	5.7	5.4	5.1	4.8
10	12.5	12	11.5	11	10.5	10	9.5	9	8.5	8
16	20	19.2	18.4	17.6	16.8	16	15.2	14.4	13.6	12.8
20	25	24	23	22	21	20	19	18	17	16
25	31	30	28.7	27.5	26.2	25	23.7	22.5	21.2	20
32	40	38	36.8	35.2	33.6	32	30.4	28.8	27.2	25.6

6. COMPLIANCE AND APPROVALS

In accordance with standard:

- . IEC 61009-1 & IEC 61009-2-2
- . GB16917.1

Usage in special conditions:

- . Category C in accordance with the classification defined in Appendix Q of standard IEC/EN 60947-1.
- . Category C = Environment subject to temperature (-25°C to +70°C), humidity.

Respect for the environment – Compliance with European Union Directives:

- . Compliance with Directive 2002/95/EC of 27/01/03 known as "RoHS" which provides for a restriction on the use of dangerous substances such as lead, mercury, cadmium, hexavalent chromium and polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) brominated flame retardants from 1st July 2006
- . Compliance with the Directive 91/338/EEC of 18/06/91 and decree 94-647 of 27/07/04

Plastic materials:

- . Halogen free plastic materials.
- . Labelling of parts compliant with ISO 11469 and ISO 1043.

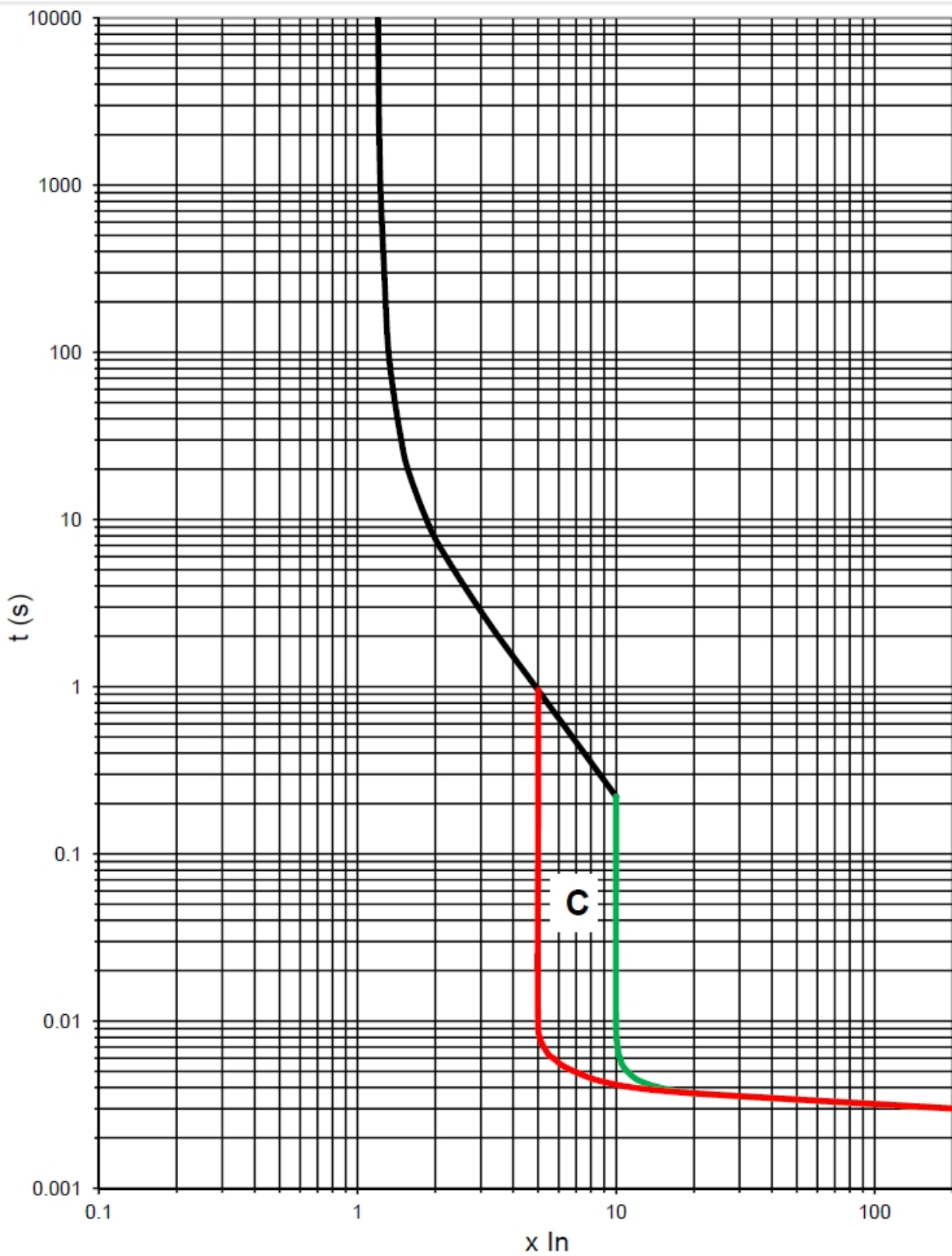
Packaging:

- . Design and manufacture of packaging compliant with decree 98-638 of 20/07/98 and Directive 94/62/EC

Approvals obtained:

7. CURVES

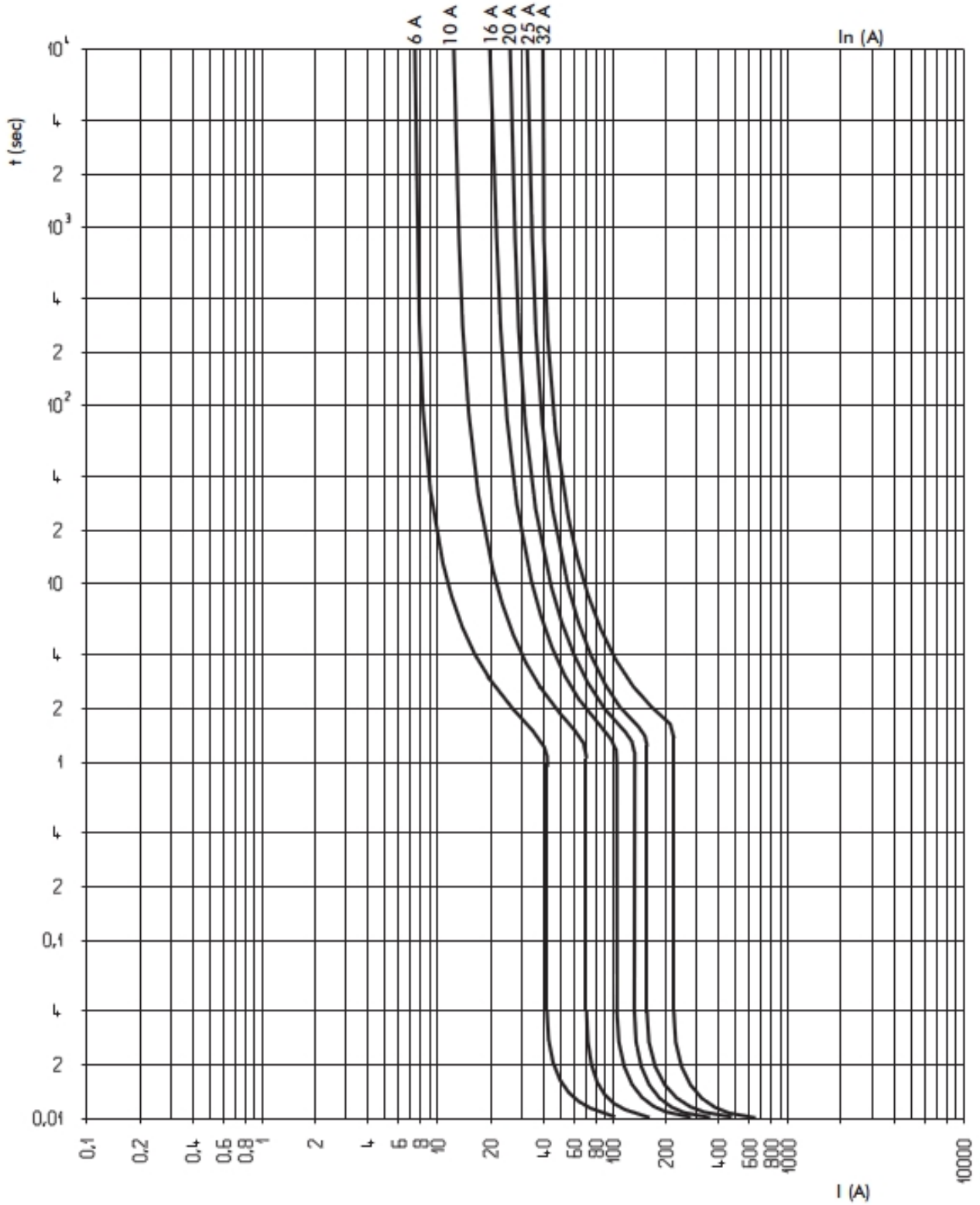
Thermal-magnetic tripping range typical of C curve RCBOs:



Thermal tripping at ambient temperature = 30°C
 I_n = RCBO rated current

7. CURVES (continued)

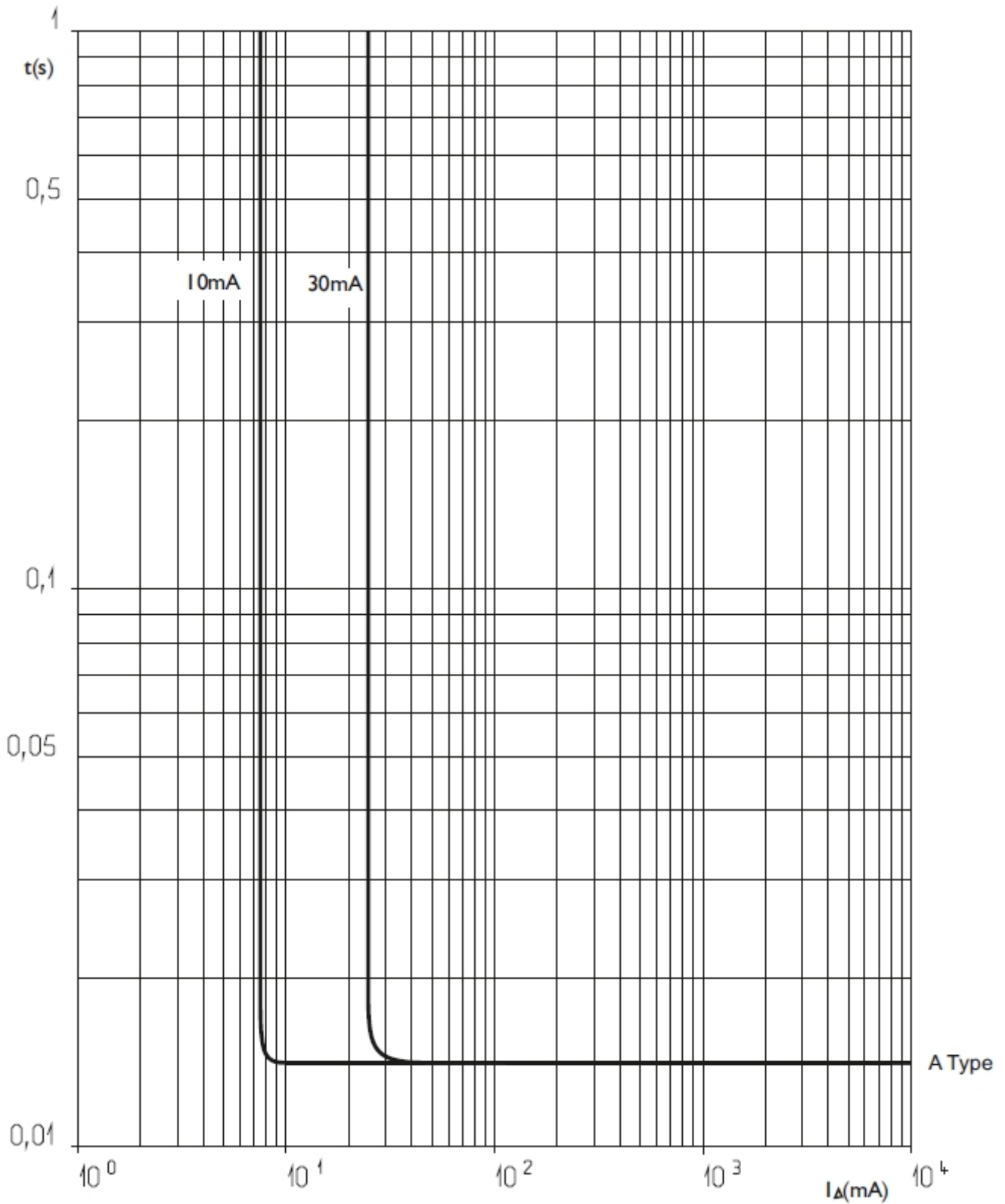
Average thermal-magnetic tripping curves range typical of C curve RCBOs:



7. CURVES (continued)

Tripping current curves:

. Tripping time curve depending on the value of the fault current:



8. AUXILIARIES AND ACCESSORIES**Wiring accessories:**

- . Supply busbar:
 - Single-pole universal supply busbar (Cat. No. 4 049 26 / 37)
- . Connection terminals (Cat. No. 4 049 05)
- . Sealable screw cover (Cat. No. 4 063 04)

Signalling auxiliaries:

- . Auxiliary contact (0.5 module, Cat. No. 4 062 58)
- . Fault signalling contact (0.5 module, Cat. No. 4 062 60)
- . Auxiliary contact that can be changed into fault signalling contact (0.5 module, Cat. No. 4 062 62)
- . Auxiliary contact + fault signalling contact that can be changed into 2 auxiliary contacts (1 module, Cat. No. 4 062 66)

Control auxiliaries:

- . Current shunt trip (1 module, Cat. No. 4 062 78)
- . Undervoltage release (1 module, Cat. No. 4 062 82)

Possible combinations of auxiliaries and RCBOs:

- . The auxiliaries are installed to the left of the RCBOs
- . Maximum number of auxiliaries = 3
- . Maximum number of signalling auxiliaries = 2
- . Maximum number of control auxiliaries = 1
- . Control auxiliary (Cat. Nos. 4 062 78 / 82) must mandatorily be placed to the left of the signalling auxiliaries (Cat. Nos. 4 062 58 /60 / 62 /66) where the auxiliaries from these 2 families are connected to the same RCBO

Locking options:

- . Via padlock 5 mm in diameter (Cat. No. 4 063 13) or padlock 6 mm in diameter (Cat. No. 0 227 97) and padlock support (Cat. No. 4 063 03)

9. SAFETY:

For your safety your electrical installation is equipped with residual current protection which must be tested periodically.

In the absence of any national regulations on the time period required for this, Legrand recommends that this test be carried out every month: press the "T" test button, the device should trip. If the device doesn't trip; please call an electrician immediately ; the safety level of your installation might have been reduced.

The presence of residual current protection does not remove the need to observe all the precautions associated with using electrical energy.