

DX³ RCCBs - ID 2P up to 100 A

Cat. N° (s) : 411500, 01, 04, 05, 06, 07, 08, 14, 15, 16, 17, 24, 25, 26, 27, 28, 37, 43, 50, 54, 55, 56, 57, 69, 70, 71,72, 84, 90, 91, 92

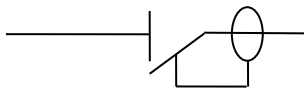


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1. DESCRIPTION – USE

RCCBs with positive contact indication for control, protection and isolation of electrical circuits, protecting people from direct and indirect contact and protecting installations from insulation faults.

Symbol:



Technology:

. Electromagnetic residual current function with current-sensing relay

2. RANGE

Polarity:

. 2-pole

Width:

. 2 modules (2 x 17.8 mm)

Nominal rating In:

. 16 / 25 / 40 / 63 / 80 / 100 A

Residual current types:

- . AC (sinusoidal differential alternating currents)
- . A (residual currents with a DC component)
- . AC-S and A-S (discriminating)
- . F (additional immunity to unwanted tripping and detection of high frequency fault currents).
F products are also A type.

Sensitivity:

. 10 / 30 / 100 / 300 mA

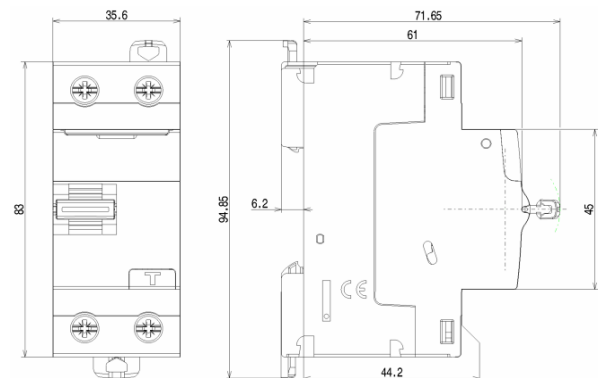
Nominal voltage and frequency:

. 230 V~ / 240 V~, 50 Hz with standard tolerances

Maximum operating voltage:

. 250 V ~, 50 Hz

3. OVERALL DIMENSIONS



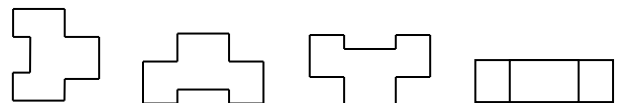
4. PREPARATION - CONNECTION

Mounting:

. On symmetrical rail EN 60715 or DIN 35 rail

Operating positions:

. Vertical Horizontal Upside down On the side



Power supply:

. From the top or the bottom

Connection:

. Inputs and outputs via screw terminals

Terminal arrangement:

- . Cage terminals, with disengageable and captive screws (fitted with flaps preventing a cable being placed under the terminal, with the terminal partly open or closed)
- . Terminals protected against direct finger contact IP20, wired

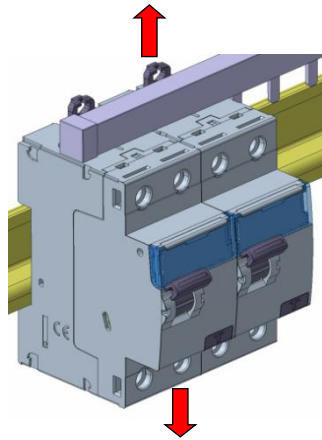
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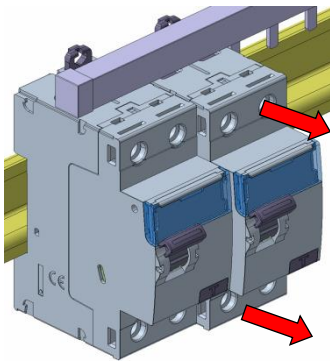
4. PREPARATION - CONNECTION *(continued)*

. A circuit breaker may be replaced in the middle of a row supplied with busbars without disconnecting the other products

Put the lugs in the unlocking position

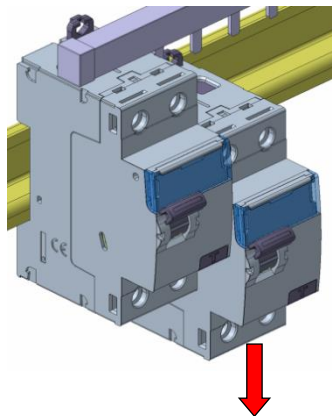


Put the latch clips in the unlocking position



Unscrew the four upper terminals completely

Pull the device forward in order to release it from the rail



Pull the device downward in order to release it completely from the prongs of the busbar

Connection:

- . Terminals protected against direct finger contact IP20, wired device
- . Cage terminals, with disengageable or captive screws
- . Terminals fitted with flaps preventing a cable being placed under the terminal, with the terminal partly open or closed
- . Alignment and spacing of the terminals permitting connection with the other products in the range via toothed supply busbars

4. PREPARATION - CONNECTION *(continued)*

Terminal arrangement: *(continued)*

- . Alignment and spacing of the terminals permitting shutters with the other products via toothed supply busbars
- . Terminal depth: 14 mm
- . Terminal capacity: 60 mm²
- . Screw head: mixed head, slotted head and Philips / Pozidriv no. 2
- . Tightening torques:
 - Minimum / Maximum: 1.2 Nm / 3.5 Nm
 - Recommended: 2.5 Nm

Conductor types:

- . Copper cables at the top and bottom of the product
- Cable cross-section:

	Without ferrule	With ferrule
Rigid cable	1 x 0.75 to 50 mm ² or 2 x 0.75 to 16 mm ²	/
Flexible cable	1 x 0.75 to 35 mm ² or 2 x 0.75 to 16 mm ²	1 x 0.75 to 25 mm ²

Required tools:

- . For the terminals:
 - 5.5 mm / 6.5 mm blade screwdriver recommended
 - Pozidriv n° 2 / Philips N° 2 screwdriver recommended
- . For the latching:
 - 5.5 mm blade screwdriver recommended / 6 mm maximum
 - Pozidriv n° 2 / Philips N° 2 screwdriver recommended

Device handling:

- . Manual action via ergonomic 2 position handle:
 - I-On, device closed O-Off, device open

Contact status display:

- . By marking of the handle:
 - I-On, in white on a red background: closed contacts
 - O-Off, in white on a green background: contacts open

Residual current trip display:

- . Handle at the bottom position, the residual current is released

Lockout:

- . Padlocks possible in the open or 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. 227 97)

Sealing:

- . Possible in the open or closed positions

Labelling:

- . Circuit identification by way of a label inserted in the label holder situated on the front of the product



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5. GENERAL CHARACTERISTICS

Neutral earthing system:

. IT, TT and TN

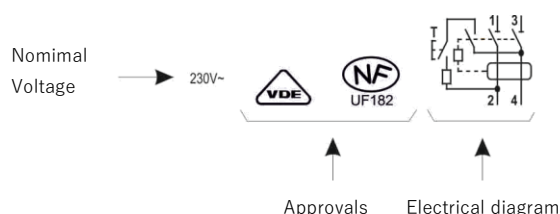
Marking:

. Marking on the "front side": (by permanent ink pad printing)



Marking on the upper panel:

. By permanent ink pad printing



Test operating voltage:

- . 10 mA all types : from 110 V to 250 V~
- . 30 mA, all types: from 180 V to 250 V~
- . 100 mA AC type : from 110 V to 250 V ~
- . 300 mA A / S type : from 110 V to 250 V~
- . 300 mA AC type : from 115 V to 250 V ~
- . 100 mA S type : from 120 V to 250 V ~

Rated conditional short-circuit current:

. I_{nc} = 10 kA, in accordance with EN/IEC 61008-1

Rated conditional short-circuit residual current:

. $I_{\Delta c}$ = 10 kA, in accordance with EN/IEC 61008-1

Rated residual breaking capacity:

. $I_{\Delta m}$ = 1000 A, in accordance with EN/IEC 61008-1

Rated breaking and making capacity:

In accordance with EN/IEC 61008-1,

- . I_n = 16 / 25 / 40 A : I_m = 500 A
- . I_n = 63 A : I_m = 630 A
- . I_n = 80 A : I_m = 800 A
- . I_n = 100 A : I_m = 1,000 A

Protection against overloads:

. The RCCB must be protected against overloads (either upstream or downstream) by a circuit breaker or a fuse which has a maximum of the same nominal current as the residual current switch

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5. GENERAL CHARACTERISTICS *(continued)*

Protection against short-circuits:

. The RCCB must be protected upstream against short circuits using a circuit breaker or a fuse. Its resistance to short circuits when associated with a Legrand circuit breaker or fuse is compliant with the values stated in the tables below:

. Association with a fuse:

Downstream	Upstream			
RCCB	gG or aM type fuse			
Rating	≤ 50 A	63 A	80 A	≥ 100 A
16 A to 100 A	100 kA	50 kA	15 kA	10 kA

. Association with a circuit breaker:

		Upstream circuit breaker			
		DX ³ 4500 / 6 kA P+N 1 mod	DX ³ 4500 / 6 kA 3P / 4P 3 mod	DX ³ 6000 / 10 kA P+N 1 mod	DX ³ 6000 / 10 kA
Downstream RCCB	Curves	C	C	B & C	B, C & D
	In	≤ 40 A	≤ 32 A	≤ 40 A	≤ 63 A
2P - 230 V~	16 A à 100 A	6 kA	10 kA	10 kA	16 kA

		Upstream circuit breaker				
		DX ³ 10000 / 16 kA P+N 1 mod	DX ³ 10000 / 16 kA	DX ³ 25 kA	DX ³ 36 kA	DX ³ 50 kA
Downstream RCCB	Curves	C	B, C & D	B, C & D	C	B, C & D
	In	≤ 20 A	≤ 125 A	≤ 125 A	≤ 80 A	≤ 63 A
2P - 230 V~	16 A à 100 A	16 kA	25 kA	36 kA	50 kA	70 kA

		Upstream circuit breaker			
		DPX ³ 160 / DPX ³ 160 + residual current			
		16 kA	25 kA	36 kA	50 kA
Downstream RCCB	In	≤ 160 A	≤ 160 A	≤ 160 A	≤ 160 A
	2P - 230 V~	16 A à 100 A	25 kA	36 kA	36 kA

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5. GENERAL CHARACTERISTICS *(continued)*

Protection against short circuits *(continued)*:

. Association with circuit breakers: case of a double fault, in IT system – Resistance to the Icc of a single pole

Downstream RCCB	Circuit breaker upstream		
	DNX ³ P+N 1 mod	DX ³ P+N 1 mod	DX ³ 3P / 4P 3 mod
	4500 A / 4,5 kA	4500 A / 6 kA	
At 230 V	4,5 kA	4,5 kA	4,5 kA
At 400 V	1,5 kA	1,5 kA	3 kA

Downstream RCCB	Circuit breaker upstream		
	DX ³ P+N 1 mod	DX ³ 3P / 4P 3 mod	DX ³ 1P / 2P / 3P / 4P
	6000 A / 10 kA		
At 230 V	4,5 kA	6 kA	10 kA
At 400 V	3 kA	3 kA	3 kA

Downstream RCCB	Circuit breaker upstream				
	DX ³ P+N 1 mod	DX ³ 1P / 2P / 3P / 4P	DX ³ 1P / 2P / 3P / 4P	DX ³ 1P / 2P / 3P / 4P	DX ³ 1P / 2P / 3P / 4P
	10000 A / 16 kA		25 kA	36 kA	36 kA
At 230 V	6 kA	16 kA	25 kA	36 kA	50 kA
At 400 V	3 kA	4 kA	6,25 kA	9 kA	12,5 kA

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5. GENERAL CHARACTERISTICS *(continued)*

Power dissipated by the device:

RCCB		Power dissipated by the device (In)				
In	Sensibilité	AC type	A type	AC-S type	A-S type	A-F type
16 A	10 mA	0,8 W	0,8 W			
25 A	10 mA	1,95 W	1,95 W			
25 A	30 mA	1,6 W	1,5 W			0,5 W
25 A	100 mA	0,5 W				
25 A	300 mA	0,5 W	0,5 W			
40 A	30 mA	4 W	4 W			1,2 W
40 A	100 mA	1,3 W				
40 A	300 mA	1,3 W	1,3 W			
63 A	30 mA	3,1 W	3,1 W			3 W
63 A	100 mA	3,1 W				
63 A	300 mA	3,1 W	3,1 W	3 W	3 W	
80 A	30 mA	5 W	5 W			
80 A	100 mA	5 W				
80 A	300 mA	5 W	5 W			
100 A	30 mA	7,5 W				
100 A	100 mA			7,5 W		
100 A	300 mA	7,5 W				

Temperature derating:

. Reference temperature: 30° C in accordance with standard IEC/EN 61008-1

In (A)	Ambient Temperature/In								
	- 25° C	- 10° C	0° C	10° C	20° C	30° C	40° C	50° C	60° C
16 A	16	16	16	16	16	16	16	16	16
25 A	25	25	25	25	25	25	25	25	25
40 A	40	40	40	40	40	40	40	25	25
63 A	63	63	63	63	63	63	63	40	40
80 A	80	80	80	80	80	80	80	63	63
100 A	100	100	100	100	100	100	100	80	80

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5. GENERAL CHARACTERISTICS (continued)

Weight per device:

Référence	Catalogue Number	Weight (kg)
411 500	16 A AC type 10 mA	0,18
411 501	25 A AC type 10mA	0,18
411 504	25 A AC type 30 mA	0,19
411 505	40 A AC type 30 mA	0,19
411 506	63 A AC type 30 mA	0,22
411 507	80 A AC type 30 mA	0,22
411 508	100 A AC type 30 mA	0,20
411 514	25 A AC type 100 mA	0,22
411 515	40 A AC type 100 mA	0,22
411 516	63 A AC type 100 mA	0,22
411 517	80 A AC type 100 mA	0,22
411 524	25 A AC type 300 mA	0,18
411 525	40 A AC type 300 mA	0,18
411 526	63 A AC type 300 mA	0,19
411 527	80 A AC type 300 mA	0,18
411 528	100 A AC type 300 mA	0,19
411 537	100 A AC-S type 100 mA	0,20
411 543	63 A AC-S type 300 mA	0,21
411 550	16 A A type 10 mA	0,19
411 554	25 A A type 30 mA	0,22
411 555	40 A A type 30 mA	0,22
411 556	63 A A type 30 mA	0,22
411 557	80 A A type 30 mA	0,21
411 569	25 A A type 300 mA	0,19
411 570	40 A A type 300 mA	0,19
411 571	63 A A type 300 mA	0,19
411 572	80 A A type 300 mA	0,19
411 584	63 A A-S type 300 mA	0,22
411 590	25 A F type 30 mA	0,21
411 591	40 A F type 30 mA	0,21
411 592	63 A F type 30 mA	0,21

5. GENERAL CHARACTERISTICS (continued)

Packaged volume and quantity:

	Volume (dm ³)	Packaging
For all catalogue numbers	0.35	per unit

Isolation distance: (distance between the contacts)

- . Handle in open position - O-Off:
- Greater than 4.5 mm

Rated insulation voltage:

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

Insulation resistance:

- . $2 \text{ M}\Omega$

Degree of pollution:

- . 2

Dielectric strength:

- . 2000 V - 50 Hz

Impulse withstand voltage:

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

Protection from false tripping:

- . $0.5 \mu\text{s}/100 \text{ kHz}$ damped recurring wave = 200 A
- . $8/20 \mu\text{s}$ wave:
 - A / AC type = 250 A
 - AC-S / A-S and F type = 3000 A

Protection classes:

- . Terminals protected against direct contact:
 - IP20 (wired device)
- . Front side protected against direct contact:
 - IP40
- . Class II in relation to metallic conductive parts
- . Protection against impacts:
 - IK04

Plastic materials used:

- . Parts made of polyamide and P.B.T.

Enclosure heat and fire resistance:

- . Resistance to incandescent wire tests at 960°C , in accordance with standard IEC/EN 61008-1
- . Classification V2, in accordance with standard UL94

Device's upper heating value:

- . Estimated heating value of a 25 or 40A 30mA AC device: 2.41 MJ

Handle opening and closing forces:

- . Force of 23 N for closing - (all ratings)
- . Force of 8 N for opening - (all ratings)

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5. GENERAL CHARACTERISTICS *(continued)*

Mechanical endurance:

- . Conforms to standard NF EN 61008-1
- . Tested with 20,000 operations with no load

Electrical endurance:

- . Conforms to standard NF EN 61008-1
- . Tested with 10,000 operations with load (at $\ln \times \cos \phi 0.9$)
- . Tested with 2,000 residual current trip operations using the test button or the fault current

Operating ambient temperature:

- . - 25° C / + 60° C

Storage temperature:

- . - 40°C / + 70°C

Specific use:

Appropriate to operate in humid atmosphere and polluted by a chlorinated environment (pool-type)

Derating of RCCBs function of the number of devices placed side by side:

When several RCCBs are installed side by side and operate simultaneously, the heat dissipation of one pole is limited. This results in an increased operating temperature for the RCCBs which may cause false tripping. Applying the following coefficients to the operating currents is recommended.

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

These values are provided by recommendation IEC 60439-1 and the standards NF C 63421 and EN 60439-1.

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).

Impact of height:

	2,000 m	3,000 m	4,000 m	5,000 m
Dielectric strength	2,000 V	2,000 V	2,000 V	1,500 V
Maximum operating voltage	400 V	400 V	400 V	400 V
Derating at 30°C	none	none	none	none

5. GENERAL CHARACTERISTICS *(continued)*

DC operation:

- . Cannot be used with DC

Operation at 400 Hz:

- . Cannot be used at 400 Hz

Operation at 60 Hz:

Can be used at 60Hz, except ratings 63A/80A, A and AC types, with sensitivity 30mA, which can be replaced by F types of equivalent ratings and sensitivity.

Resistance to sinusoidal vibrations: (in accordance with IEC 68.2.6)

- . Axes: x / y / z
- . Frequency: 10 to 55 Hz
- . Acceleration: 3 g (1 g = 9.81 m.s⁻²)

Resistance to tremors :

- . Conforms to standard NF EN 61008-1

6. COMPLIANCE AND APPROVALS

Reference product standards:

- . NF EN 61008-1 / IEC 61008-1
- . NF EN 62423 / IEC 62423 (F type)
- . EN/IEC 60 529 (IP)

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 27/07/94

Usage in special conditions:

- . Category C compliant (testing temperature of -25° C to +70° C, resistant to salt spray) in accordance with the classification defined in Appendix Q of standard IEC/EN 60947-1

Plastic materials:

- . Zero halogen plastic materials.
- . Labelling 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

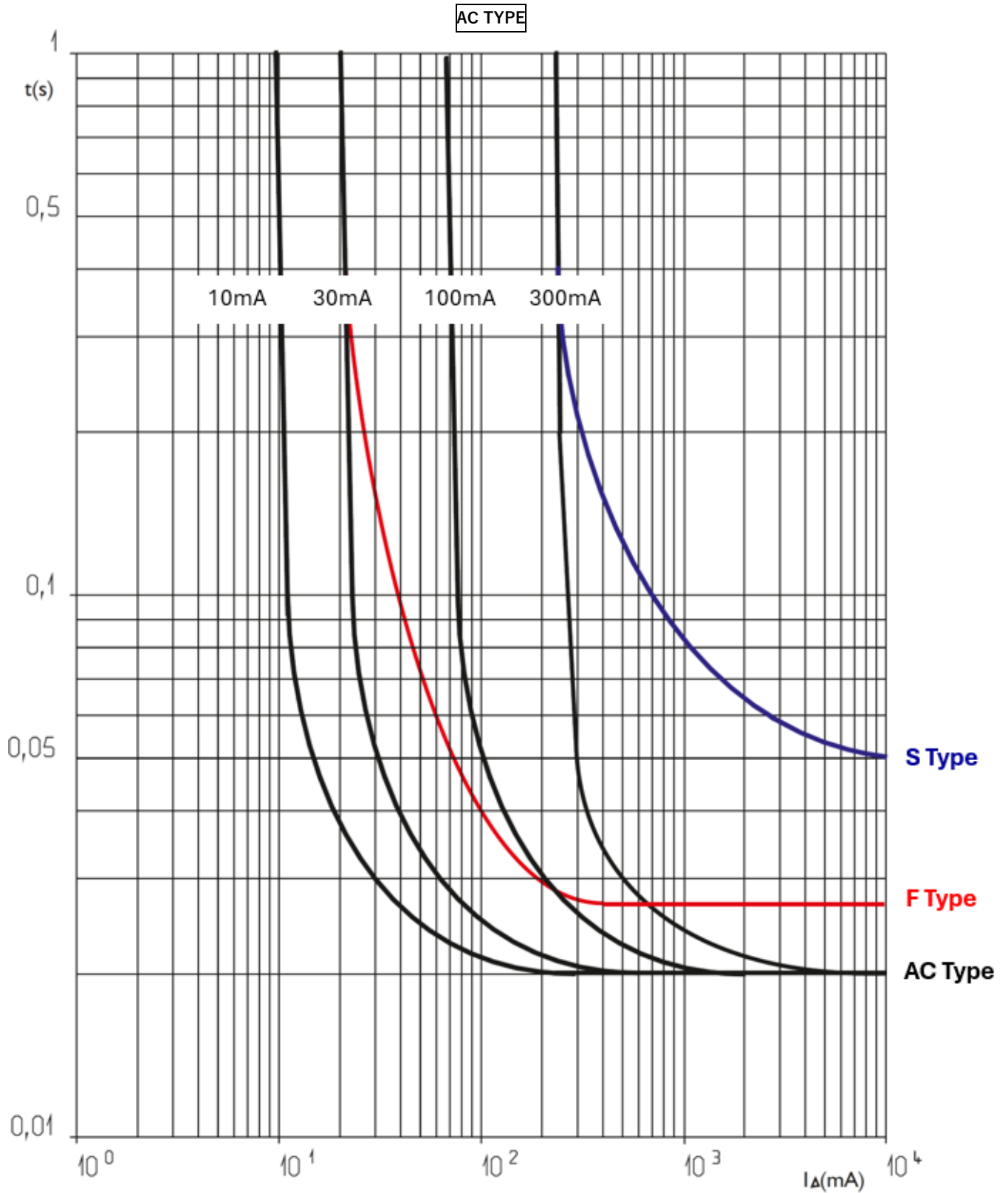
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7. CURVES

Tripping current curves:

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



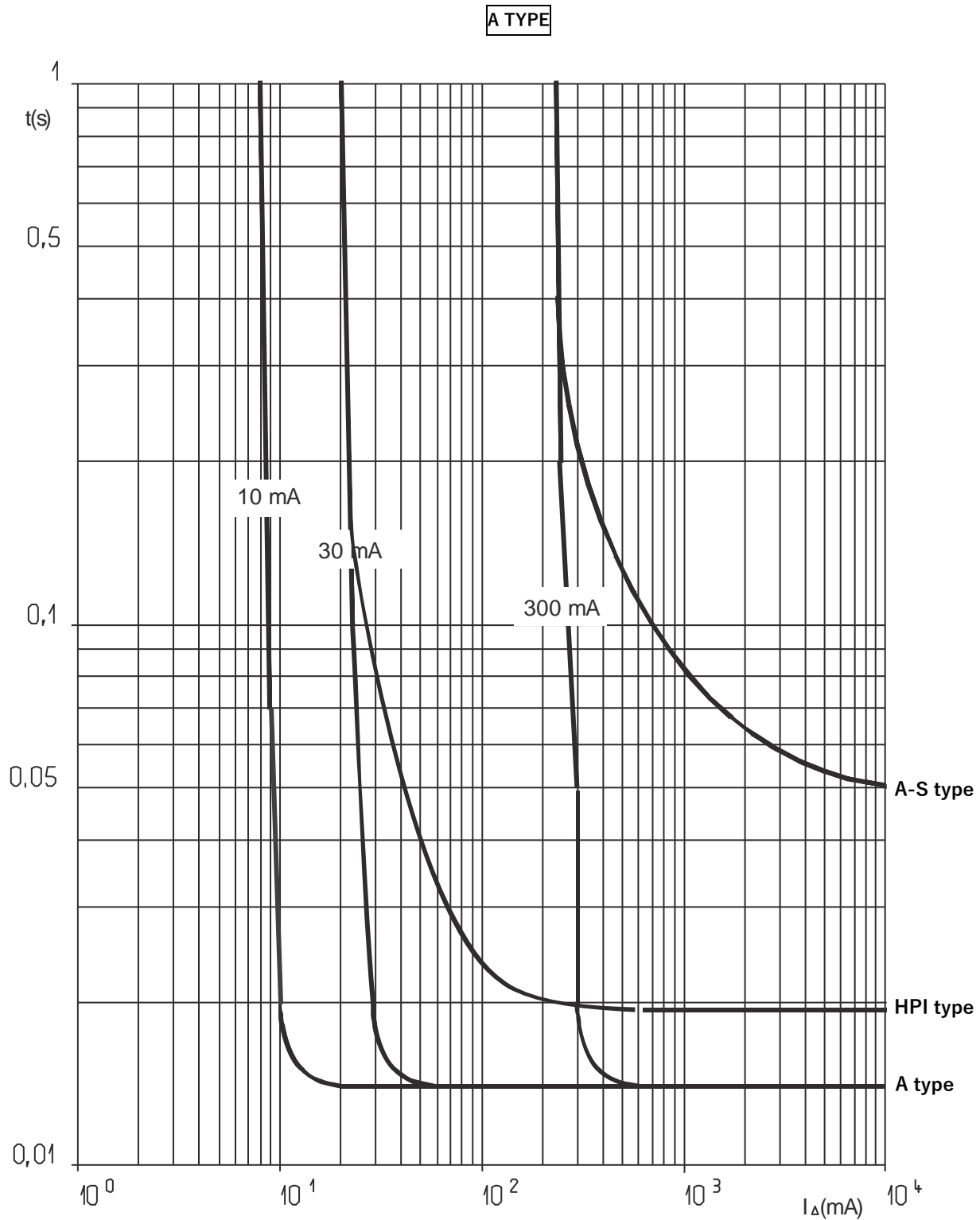
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7. CURVES (continued)

Tripping current curves:

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



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8. AUXILIARIES AND ACCESSORIES

Wiring accessories:

- . Sealable screw cover (Cat. No. 4 063 04)
- . Supply busbar:
 - HX³ 2-pole supply busbar
- . Terminal for aluminium cable with max. 50 mm² cross-section (Cat. No. 4 063 10)

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:

- . Shunt trip (1 module, Cat. No. 4 062 76, 2 78)
- . Undervoltage release (1 module, Cat. No. 4 062 80, 2 82)
- . Stand-alone release for N/C push-button (1.5 module, Cat. No. 4 062 87)

Motorised controls:

- . Motor-driven control (1 module, Cat. No. 4 062 91)
- . Motor-driven control with integrated automatic reset (2 modules, Cat. Nos. 4 062 93, 2 95)

Possible combinations of auxiliaries and RCCBs:

- . The auxiliaries are installed to the left of the RCCBs
- . Maximum number of auxiliaries = 3
- . Maximum number of 1 module signalling auxiliaries = 2
- . Maximum number of control auxiliaries (Cat. Nos. 4 062 76 to 4 062 87) = 1
- . The control auxiliary (trip Cat. Nos. 4 062 76 to 4 062 87) must mandatorily be placed to the left of the signalling auxiliaries (Cat. Nos. 4 062 58 to 4 062 66) where the auxiliaries from these 2 families are connected to the same RCCB

Sealing:

- . Possible in the open or closed positions

Lockout possibilities:

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

Installation software:

- . XL PRO³

9. SAFETY

- . For your safety your electrical installation is equipped with residual current protection and this 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. Please call an electrician immediately if this does not happen as your installation's safety level has been reduced
- . The presence of residual current protection does not remove the need to observe all the precautions associated with using electrical energy