87045 LIMOGES Cedex
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DX³ MCB 36kA, 80A (1,5 modules per pole)

Cat. N°(s) : 4 100 15, 4 100 28, 4 100 41

CONTENTS PAGES

1. DESCRIPTION - USE

Thermal-magnetic circuit breaker (MCB) with positive contact indication for control, protection against short- circuits and overloads, and isolation of electrical circuits.

Symbol:

Technology:
. Current limiting device.
. 1,5 module (26,7 mm) per pole.
. Trip free mechanism.

2. RANGE

Number of Poles:
. 2P / 3P / 4P.

Rated current In:
. 80A C curve.

Tripping characteristics and magnetic tripping calibrations:
. C curve (between 5 and 10 In).

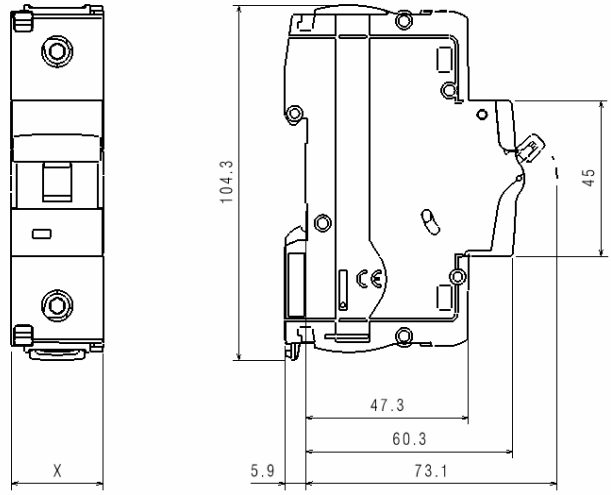
Thermal threshold:
. Non operating current (Inf): 1,05 In.
. Operating current (If): 1,3 In.

Rated Voltage / Frequency:
. 230 / 400 V ~, 50 / 60 Hz with standard tolerances.
. 240 / 415 V ~, 50 / 60 Hz with standard tolerances.
. 125 V per pole in direct current.

Maximum operating voltage:
. 500 V ~, 50 / 60 Hz with derating of breaking capacity.

Breaking capacity:
. 36 kA according to IEC/EN/NF 60947-2 standard

3. OVERALL DIMENSIONS

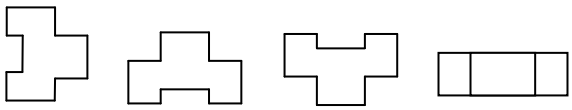


N° of poles	"X" (mm)
2P	**53,4 mm**
3P	**80,1 mm**
4P	**106,8 mm**

4. PREPARATION - CONNECTION

Fixing:
. On symmetric rail EN/IEC 60715 or DIN 35.

Operating position:
. Vertical Horizontal Upside down On the side



Supply:
. Either from the top or the bottom

4. PREPARATION – CONNECTION *(continued)*

Supply:
. From the top or from the bottom.

Terminal depth:
. 19 mm.
. It is possible to separate the terminals by retractable insulation shields.

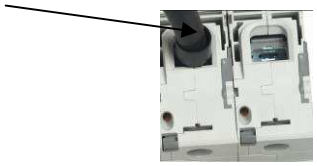
Stripping length recommended:
. 17 mm for main terminals.
. 10 mm for automatic terminals.

Screw head:
. Allen screw.

Tightening torque:
. Recommended: 5.5 Nm.
. Mini 4.5 Nm
. Maxi 6 Nm.

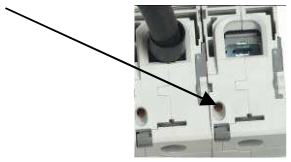
Tools required:
. For terminals: Allen wrench 4 mm.
. For fixing: flat screwdriver 5,5 mm (6 mm maximum).

Connectable section:
. For main terminals:



	Copper cable	
	Without ferrule	Without ferrule
Rigid cable	**6 mm² to 70 mm²**	**-**
Flexible cable	**6 mm² to 50 mm²**	**6 mm² to 50 mm²**

. For automatic terminals:



	Copper cable	
	Without ferrule	Without ferrule
Rigid cable	**0.75 mm² to 2.5 mm²**	**-**
Flexible cable	**0.75 mm² to 2.5 mm²**	**0.75 mm² to 1.5 mm²**

Manual actuation of the MCB:
. Ergonomic 2 position handle:
0 / OFF: Device open.
I / ON: Device closed.

4. PREPARATION – CONNECTION *(continued)*

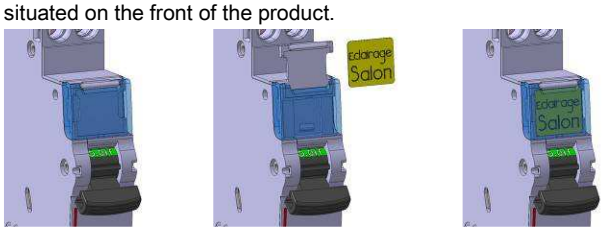
Contact status display:
. By marking of the associated m.c.b. handle:
"O-Off" white on a green background = contacts opened.
"I-On" white on a red background = contacts closed.
. By mechanical indicator on front face:
Green = contacts opened.
Red = contacts closed.

Sealing:
. Possible in ″Open″ position (OFF) or ″Close″ position (ON).

Lockout::
. By 5 mm padlock (cat. n° 4 063 13) or 6 mm padlock (cat. n° 0 227 97) with padlock support (cat. n° 4 063 03) in "Open" position

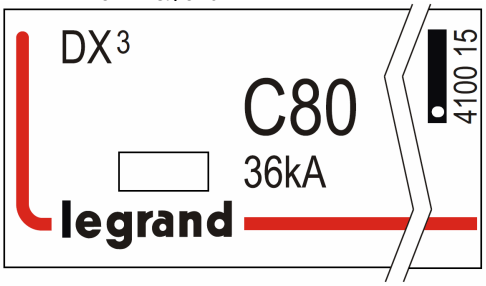
Consignment:
. On site padlocking system, possible only open circuit - 0 / OFF handle position - with 1,5mm² stripped wire for example or 2,4mm wide Colring.

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



5. GENERAL CHARACTERISTICS

Front side marking:
. By permanent ink pad printing showing:
-Trade name: DX³
- Breaking curve
- Rated current (in A)
- Icu in kA, Breaking capacity according to IEC/ EN 60947-2 standard (25kA)
- Catalogue number and logo
- Mark: Legrand



5. GENERAL CHARACTERISTICS *(continued)*

Breaking capacity:

Alternate current 50/60Hz, single-phase or three-phase network, according to IEC 60947-2.

Un		2P	3P / 4P
110 V~	Icu	**100 kA**	**-**
230 V~		**72 kA**	**72 kA**
400 V~		**36 kA**	**36 kA**
440 V~		**25 kA**	**25 kA**
500 V~		**12,5kA**	**12,5kA**

110 V~	Ics	**75% d'Icu**	**75% d'Icu**
230 V~			
400 V~			

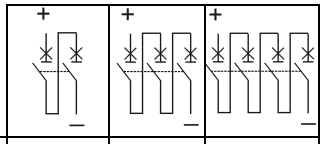
Short-circuit breaking capacity of only one pole:

. In three-phase network 220 / 380 V~ to 240 / 415 V~
- for TN neutral system, Icn1 = 36 kA (under 220 to 240 V~)
- for IT neutral system, Iit = 9 kA (under 380 to 415 V~)

. In three-phase network 110 / 220 V~ to 120 / 240 V~
- for TN neutral system, Icn1 = 72 kA (under 110 to 127 V~)
- for IT neutral system, Iit = 18 kA (under 220 to 240 V~)

Short-circuit breaking capacity in DC current:

. Direct current according IEC 60947-2



Un		2P	3P	4P
24 ÷ 48 V d.c.	Icu	**36 kA**	**-**	**-**
110 V d.c.		**36 kA**	**36 kA**	**-**
230 V d.c.		**-**	**-**	**36 kA**

24 ÷ 48 V d.c.	Ics	**36 kA**	**-**	**-**
110 V d.c.		**36 kA**	**36 kA**	**-**
230 V d.c.		**-**	**-**	**36 kA**

M inimum operating voltage :

. 12 V a.c. / d.c. per pole.

Pulse rated voltage:

. Uimp = 6 kV (wave 1.5 / 50 µs).

Insulation rated voltage:

. Ui = 500 V.

Pollution degree::

. 3.

Dielectric strength:

. 2500 V.

5. GENERAL CHARACTERISTICS *(continued)*

Operation at 400Hz:

. The magnetic thresholds increase by 45%.

Load to close and open of a pole trough the handle:

. 0,17 Nm per pole to close.
. 0,09 Nm per pole to open.

Mechanical endurance according to IEC 60947-2 :

. 20 000 operations without load
. 10 000 operations with load (under In x Cos φ=0.9)
. 2 000 operations with load (under In in DC current)

Enclosure material:

. Polyester.
. Characteristics of this material: self extinguishing, heat and fire resistant according to EN 60898-1, 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).

Average weight per pole:

. 0,220 kg.

Volume when packed:

	Volume (dm³)
Double pole	**0,63**
Triple / Four pole	**1,14**

Ambient operating temperature:

. Min. = -25°C. Max. = +70°C

Ambient storage temperature:

. Min. = -40°C. Max. = +70°C

Protection class:

. Protection index of terminals against solid and liquid bodies:
IP 20 (according to IEC 529, EN 60529 et NF C 20-010).
. Protection index of the box against solid and liquid bodies:
IP 40 (according to IEC 529, EN 60529 et NF C 20-010).
. Protection index against mechanical shocks:
IK 02 (according to EN 50102 et NF C 20-015).

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)

Labelling:

. Identification of the circuit by insertion of a label in the label holder.

Power dissipated and impedance per device at In (in W) :

. mcb C curve

In	80 A
2P to 4P	**8,8**

. Impedance per pole (Ω) = $\frac{\text{Power dissipated}}{In^2}$

5. GENERAL CHARACTERISTICS *(continued)*

Derating of circuit-breakers according to ambient temperature :

. The nominal characteristics of a circuit breaker are modified according to the ambient temperature inside the cabinet or the enclosure where the circuit breaker is located.

. Reference temperature: 40°C according IEC/EN 60947-2.

	Ambient Temperature / In									
In (A)	-25°C	-10°C	0°C	10°C	20°C	30°C	**40°C**	50°C	60°C	70°C
80	**102**	**97**	**94**	**91**	**88**	**84**	**80**	**76**	**72**	**69**

Derating of MCB for use with fluorescent lights:

Ferromagnetic and electronic ballasts have a high inrush current for a short time. These currents can cause the tripping of circuit breakers. At the time of the installation, it should take into account the maximum number of ballasts per circuit breaker that the manufacturers of lamps and ballasts indicate in their catalogues.

Influence of the altitude:

	≤2000 m	3000 m	4000 m	5000 m
Dielectric holding	**3000 V**	**2500 V**	**2000 V**	**1500 V**
Max operational Voltage	**400 V**	**400 V**	**400 V**	**400 V**
Derating at 40°C	**none**	**none**	**none**	**none**

Derating of MCBs function of the number of devices side by side:

When several MCBs are juxtaposed and operate simultaneously, the thermal evacuation of the poles is limited. This results in an increase in operating temperature of the circuit breakers which can cause unwanted tripping. It is recommended to apply the following coefficients to the rated currents.

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 given by the recommendation of IEC 60439-1, NF C 63421 and EN 60439-1 standards.
To avoid to have to use these coefficients, it is necessary to allow a good ventilation and to separate the devices with 0.5 module spacing elements (cat. N° 4 063 07).

5. CARACTÉRISTIQUES GÉNÉRALES *(suite)*

Back-up protection between modular circuit-breakers and fuses in three-phase network (+ neutal) 400 / 415 V~ according to IEC/EN 60947-2:

For TT or TN neutral system in 230/400 V network, to know the breaking capacity of the combination of a double pole breaker (connected between phase and neutral under 230V) downstream of a triple-pole circuit-breaker, take the values shown in Tables 230/400V.

		Fuse upstream			
		gG type		aM type	
m.c.b. downstream		125A	160A	125A	160A
DX³ 36kA C curve	80A	**100kA**	**100kA**	**100kA**	**100kA**

All these values are also valid for circuit breakers associated to differential blocks.
According to the curves and ratings of circuit breakers, attention to the magnetic threshold and to the size of upstream circuit breakers which must necessarily be higher.

MCB's back-up protection in three-phase network (+ neutal) 400 / 415 V~ according to IEC/EN 60947-2:

For TT or TN neutral system in 230/400 V network, to know the breaking capacity of the combination of a double pole breaker (connected between phase and neutral under 230V) downstream of a triple-pole circuit-breaker, take the values shown in Tables 230/400V.

		m.c.c.b. upstream									
		DPX³ 160 / DPX³ 160 + diff.			DPX 250ER			DPX³250 / DPX³250+diff.			
		50kA			50kA			70kA			
m.c.b. downstream		100A	125A	160A	100A	160A	250A	100A	160A	200A	250A
DX³ 36kA C curve	80A	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**	**50kA**

		m.c.c.b. upstream							
		DPXH / L 250			DPXH / DPXL 630MT				
		70 – 100kA			70 – 100kA				
m.c.b. downstream		100	160	250	250A	320A	400A	500A	630A
DX³ 36kA C curve	80A	**50kA**	**50kA**	**50kA**	**36kA**	**36kA**	**36kA**	**36kA**	**36kA**

All these values are also valid for circuit breakers associated to differential blocks.
According to the curves and ratings of circuit breakers, attention to the magnetic threshold and to the size of upstream circuit breakers which must necessarily be higher.

5. GENERAL CHARACTERISTICS *(continued):*

Back-up protection between modular circuit-breakers and fuses in three-phase network (+ neutal) 230 / 240 V~ according to IEC/EN 60947-2:

		Fuse upstream			
		gG type		aM type	
m.c.b. downstream		125A	160A	125A	160A
DX³ 36kA C curve	80A	**100kA**	**100kA**	**100kA**	**100kA**

All these values are also valid for circuit breakers associated to differential blocks.
According to the curves and ratings of circuit breakers, attention to the magnetic threshold and to the size of upstream circuit breakers which must necessarily be higher.

MCB's back-up protection in three phase network (+ neutal) 230 / 240 V~ according to IEC/EN 60947-2:

		m.c.c.b. upstream											
		DPX³250 / DPX³250+diff.				DPXH - L 250			DPXH / DPXL 630MT				
		70kA				70 – 100kA			70 – 100kA				
m.c.b. downstream		100A	160A	200A	250A	100	160	250	250A	320A	400A	500A	630A
DX³ 36kA C curve	80A	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**	**75kA**

All these values are also valid for circuit breakers associated to differential blocks.
According to the curves and ratings of circuit breakers, attention to the magnetic threshold and to the size of upstream circuit breakers which must necessarily be higher.

Selectivity between two levels of protection

. The downstream circuit breaker must always have a magnetic threshold and a rated current lower than those of the upstream protection.
. Selectivity is indicated total (T) if there is selectivity up to the value of breaking capacity (according to IEC / EN 60947-2) of the downstream circuit breaker.

Selectivity between MCB and MCCB upstream:

. Selectivity limit at 400V~: values in Ampere.

		m.c.c.b. upstream									
		DPX³160E / B / N DPX³160E / B / N + diff.		DPX 250ER		DPX 250H / L		DPX³ 250 DPX³ 250 + diff.			
		16 - 25 - 50kA		50kA		70 - 100kA		70kA			
m.c.b. downstream		125A	160A	160A	250A	160A	250A	100A	160A	200A	250A
DX³ 36kA C curve	80A	**5000**	**6000**	**5000**	**5000**	**8000**	**T**	**4000**	**T**	**T**	**T**

		m.c.c.b. upstream				
		DPXH / DPXL 630MT				
		70 – 100kA				
m.c.b. downstream		250A	320A	400A	500A	630A
DX³ 36kA C curve	80A	**T**	**T**	**T**	**T**	**T**

5. GENERAL CHARACTERISTICS *(continued):*

Selectivity between modular circuit breakers and fuses:

. Selectivity limit at 400V~: values in Ampere.

		Fuse. upstream					
		aM type			gG type		
m.c.b. downstream		100A	125A	160A	100A	125A	160A
DX³ 36kA C curves	80A	**3000**	**6000**	**8000**	**3000**	**3000**	**4000**

6. CONFORMITIES AND APPROVALS

Compliance to standards:

. Standard reference: IEC/EN 60947-2.
. CEE guidelines : 73/23/CEE + 93/68/CEE
. Legrand circuit-breakers can be used under the conditions of use as defined by IEC / EN 60947.
. The performance of circuit breakers can be influenced by particular climates: hot dry, cold dry, hot humid, salt fog atmosphere

Classification according to Annex Q (standard IEC/EN 60947-1) :

. Category C with a range test temperature -25 °C / +70 °C
. salt fog atmosphere according IEC 60068-2-52

Respect of the environment – Compliance with CEE directives:

. Compliance with Directive 2002/95/EC of 27/01/03 called "RoHS" which provides for the banning of hazardous substances such as lead, mercury, cadmium, hexavalent chromium, brominated flame retardants polybrominated biphenyls (PBBs) and polybrominated diphenyl ethers (PBDEs) from 1st July 2006
. Compliance with Directive 91/338/CEE of 18/06/91 and Decree 94-647 of 27/07/04

Plastic materials :

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

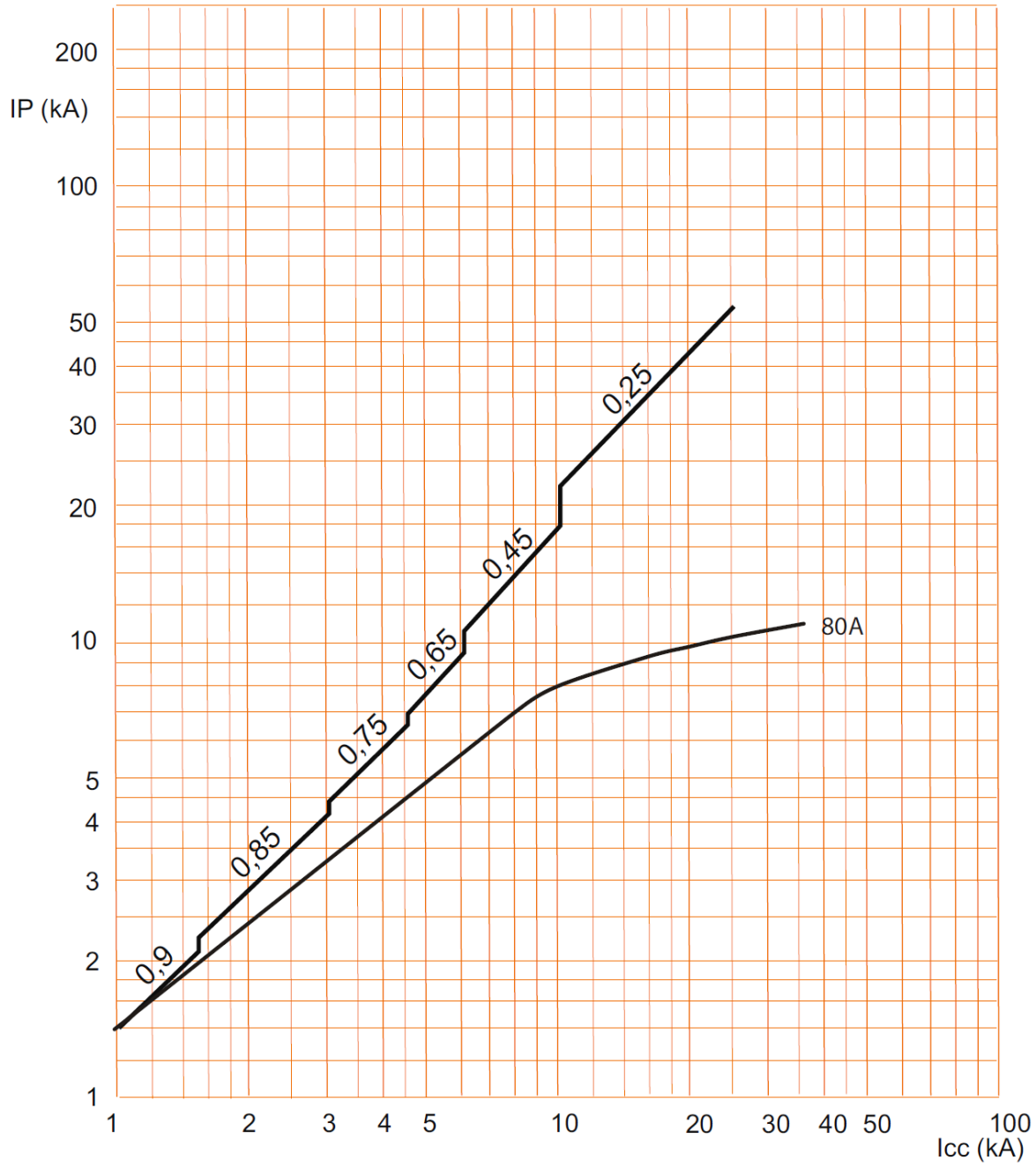
Packaging:

. Design and manufacture of packaging in accordance with Decree 98-638 of 07.20.98 and Directive 94/62/EC

7. CURVES

Current limiting curve:

. C curve



. Icc = Square value of symmetric component of the short circuit current (kA).

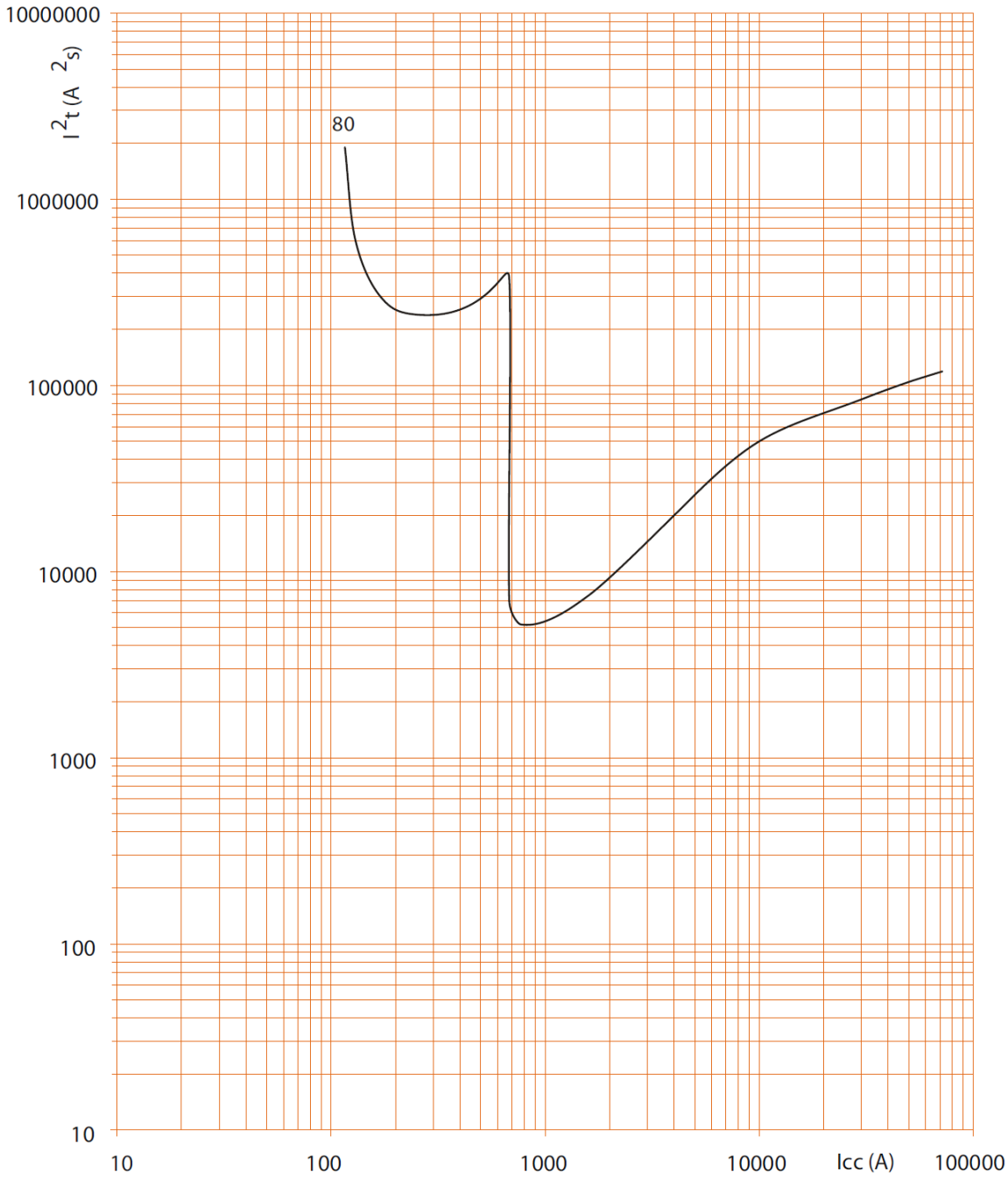
. IP = Max peak value (kA)

7. CURVES *(continued)*

Operating characteristic of circuit breakers C curve:

7. CURVES *(continued)*

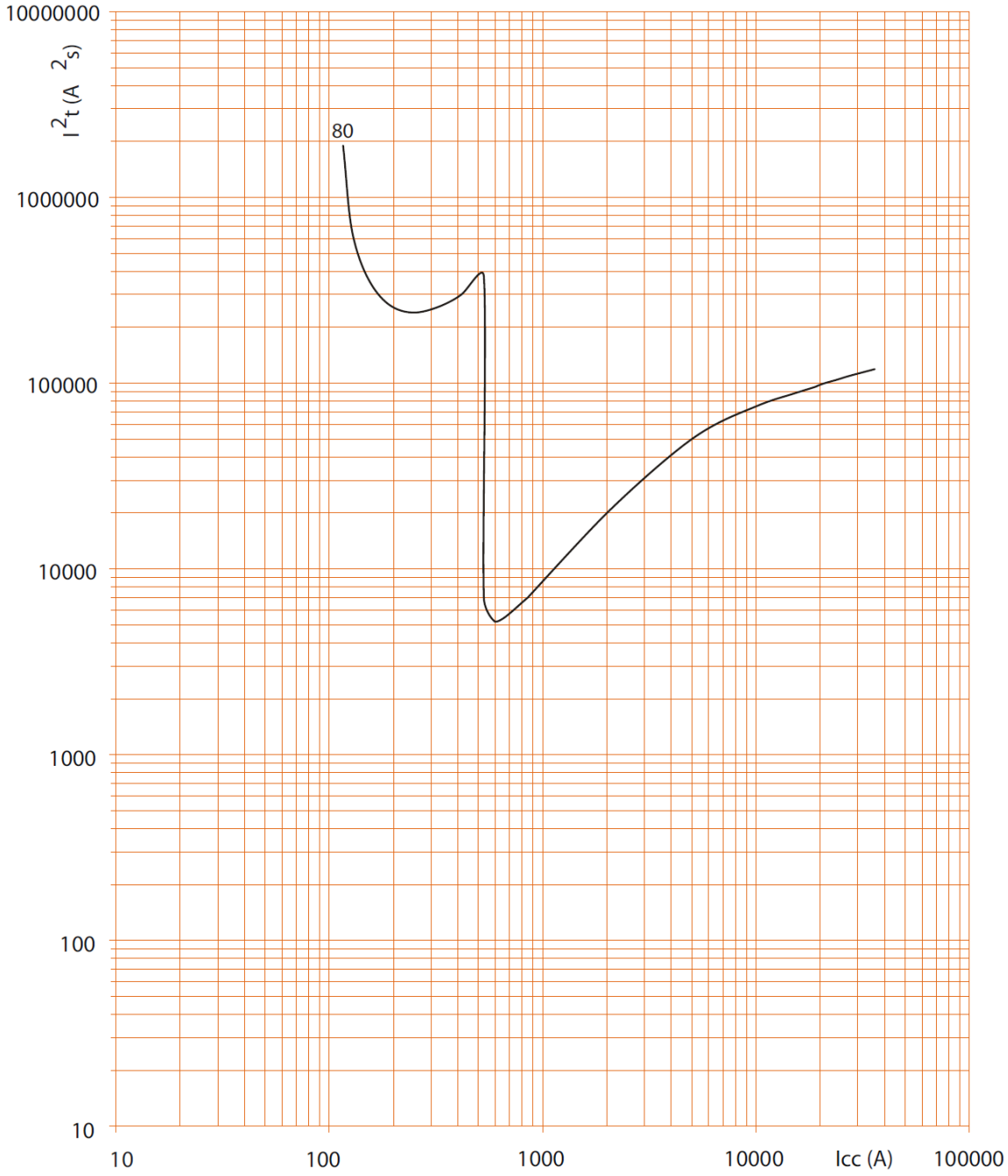
Thermal energy limiting curves of circuit breakers C curve, 2P (230V~ / 50Hz) :



. Icc = Square value of symmetric component of the short circuit current (kA).
. I²t = Thermal energy limited (A²s).

7. CURVES *(continued)*

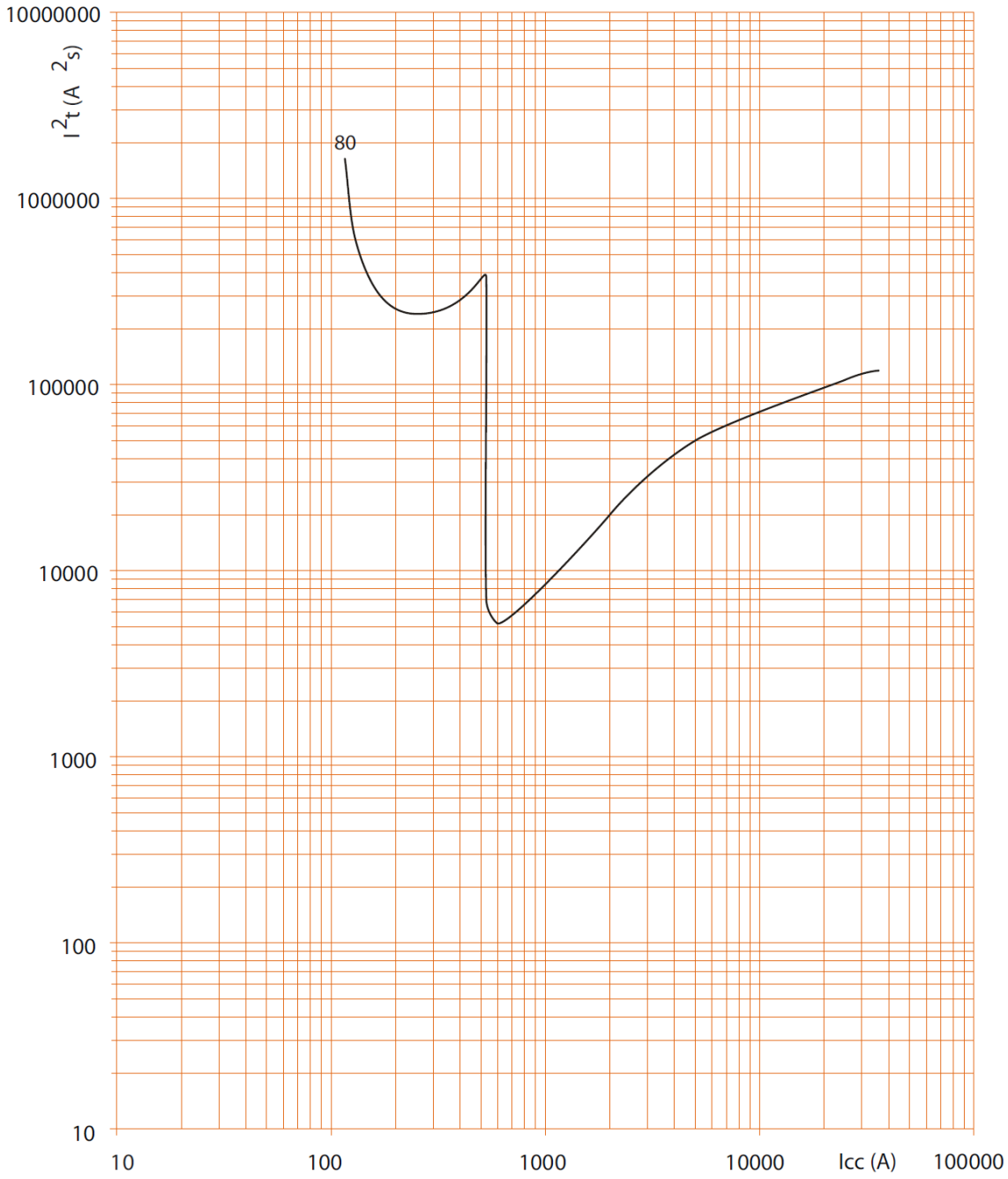
Thermal energy limiting curves of circuit breakers C curve, 2P (400V~ / 50Hz) :



. Icc = Square value of symmetric component of the short circuit current (kA).
. I²t = Thermal energy limited (A²s).

7. CURVES *(continued)*

Thermal energy limiting curves of circuit breakers C curve, 3P / 4P (400V~ / 50Hz) :



. Icc = Square value of symmetric component of the short circuit current (kA).
. I²t = Thermal energy limited (A²s).

8. AUXILIARIES AND ACCESSORIES

Add-on modules 125 A :

	Add on module		
mcb	2P	3P	4P
2P	X	-	-
3P	-	X	-
4P	-	-	X

Wiring accessories:

. Sealable screw cover (cat n° 4 063 06).
. Insulating shields (cat n° 4 063 12)
. Aluminium terminal 95 mm² max (cat. n° 4 063 11)

Signal auxiliaries:

. Auxiliary contact (½ module – cat n° 4 062 58).
. Fault signalling changeover switch (½ module – cat n° 4 062 60).
. Auxiliary contact modifiable in default signal (½ module – cat n° 4 062 62).
. Auxiliary contact + fault signalling switch - can be modified to 2 auxiliary contacts (1 module - cat n° 4 062 66).

Control auxiliaries:

. Shunt releases (1 module - cat n°. 4 062 76 / 78).
. Under voltage release (1 module - cat n° 4 062 80 / 82).
. Autonomous shunt trip for NC push-button (1 module - cat n°. 4 062 87).

Possible combinations of auxiliaries and MCBs:

. The auxiliaries are installed to the left of the MCBs
. 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 (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 MCB.

Sealing:

. Possible in ″Open″ mode (OFF) or ″Close″ mode (ON).

Locking options:

. By padlock (cat. n° 4 063 13 or 0 227 97), whit padlock support (cat. n° 4 063 03)

Installation software:

. XL PRO³