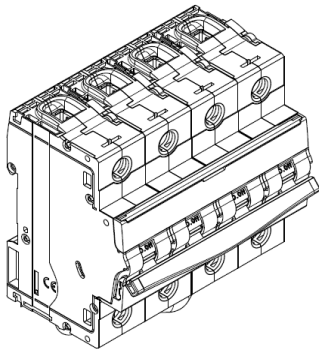


DX³ direct current MCB ≤ 20 A, 1000V (1,5 modules per pole)

Cat. N°(s) : 4 144 46 / 47 / 48 / 49

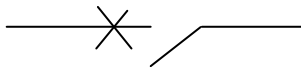


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1. DESCRIPTION - USE

. Thermo-magnetic circuit breaker with positive contact indication for control, protection and isolation of electrical supplied with direct current. This MCB is suitable for photovoltaic applications

Symbol:



Technology:

. Current limiting circuit-breaker
. 3 module per pole. (3 x 17,7 mm = 53,1 mm).

2. RANGE

N° of poles:

. 2P in 6 modules.

Rated currents::

. 10 A / 13 A / 16 A / 20 A.

Tripping characteristics and magnetic tripping calibrations:

. Curve C (between 5 and 10 In).

Thermal threshold:

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

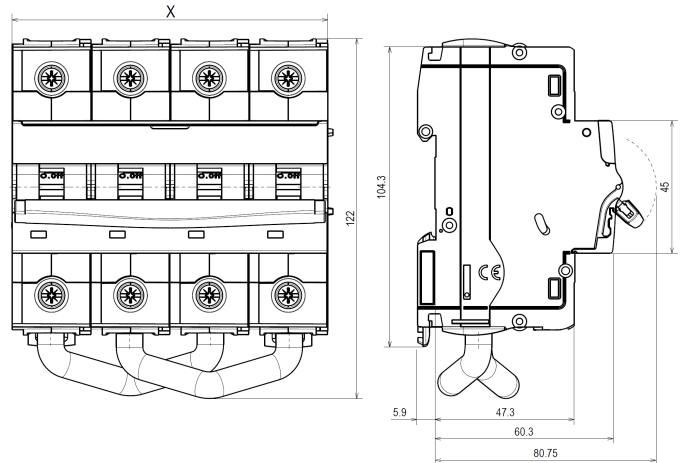
Rated Voltage:

. 1000 V dc. (direct current).

Breaking capacity:

. 1,5 kA according to IEC/EN/NF 60947-2.

3. OVERALL DIMENSIONS



N° of poles	"X" (mm)
2P	106.2 mm

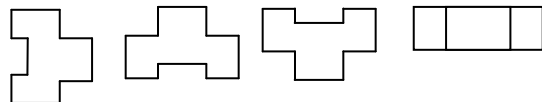
4. PREPARATION - CONNECTION

Fixation :

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

Operating positions:

. Vertical, Horizontal, backwards, on the side



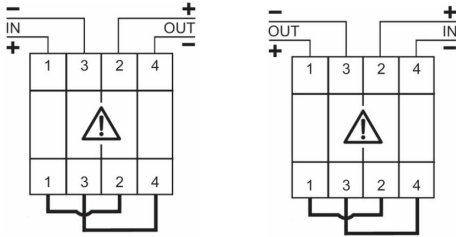
DX³ direct current MCB ≤ 20 A, 1000V (1,5 modules per pole)

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4. PREPARATION CONNECTION (continued):

Supply:

. Only from the top how is shown in the following wiring diagram:



Link cable:

. The MCB is delivered with the link cables wired.
 . Semi-rigid copper cable, 16mm²
 . Despite the precaution taken, the screws may have come loose during shipping. Please check them. Thank you.

Terminal depth:

. 19 mm.
 . Obligation to separate the terminals with the insulating shields integrated to the switch.

Stripping length recommended:

. 17 mm.

Screw head:

. Mixed, slotted and Pozidriv 2.

Tightening torque:

. Recommended: 3 Nm.
 . Mini : 2,5 Nm. Maxi : 3,5 Nm.

Tools required:

. For the terminals: Pozidriv n°2 or flat screwdriver 5,5 mm (6 mm maximum).
 . For fixing: flat screwdriver 5,5 mm (6 mm maximum).

Connectable section:

	Copper cables	
	Without ferrule	Without ferrule
Rigid cable	1 x 1,5 mm ² to 50 mm ² 2 x 1,5 mm ² to 16 mm ²	-
Flexible cable	1 x 1,5 mm ² to 32 mm ² 2 x 1,5 mm ² to 10 mm ²	1 x 1,5 mm ² to 35 mm ²

Actuation of the circuit-breaker:

. By the 2-position ergonomic handle:
 I / ON: Closed circuit.
 0 / OFF: Opened circuit.

Display of contact state:

. By handle mark:
 "O-Off" white on a black background = contacts opened.
 "I-On" white on a black background = contacts closed.
 . By mechanical indicator on front face:
 Green = contacts opened.
 Red = contacts closed.

4. PREPARATION CONNECTION (continued):

Sealing:

. Possible in "Open" position (OFF) or "Close" position (ON).

Lockout:


. By 5 mm padlock (cat. N° 406313) or 6 mm padlock (cat. N° 227 97) with padlock support (cat. N° 044 42).

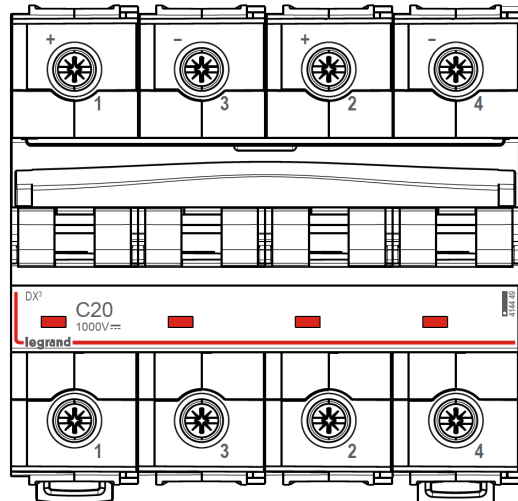
Consignment:

. Only in "Open" mode (OFF) with, for example, a 2,4mm wide colring.

5. GENERAL CHARACTERISTICS:

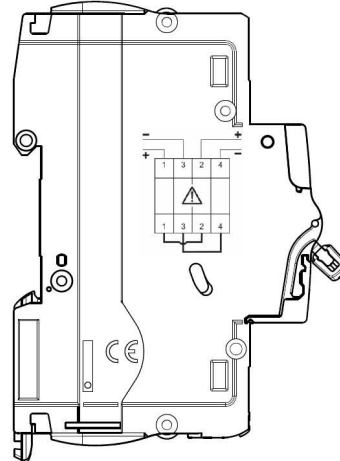
Front face marking:

. By permanent pad printing
 - Trade name : DX³
 - Breaking curve
 - Rated current (in A)
 - Icu in kA extreme breaking capacity according to IEC/EN 60947-2
 - Legrand reference code and Logo 
 - Mark: Legrand.



Left side marking :

. By laser:
 - wiring diagram.



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5. GENERAL CHARACTERISTICS (continued):

Breaking capacity:

- . I_{cu}: 1,5 kA according to IEC/EN/NF 60947-2.
- . I_{cs}: 100% of I_{cu} according to IEC/EN/NF 60947-2.

Minimum operating voltage:

- . 12 V d.c. per pole.

Pulse rated voltage:

- . U_{imp} = 8 kV

Insulation rated voltage:

- . U_i = 1200 V

Time constant of short circuit tests in DC:

- . 1ms

Isolating distance:

- . The distance between the contacts is greater than 12mm with the handle in the open position
- . The DC circuit breaker DX³ is appropriate for the isolation according to IEC / EN 60947-2

Load to close and to open a MCB by the handle:

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

Mechanical endurance:

- . 20 000 operations without load
- . 10 000 operations with load
- . 2 000 operations with under I_n, 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 device:

- . 0,584 kg.

Volume when packed:

	Volume (dm ³)
Double pole	1,14 dm ³

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).

5. GENERAL CHARACTERISTICS (continued):

Pollution degree:

- . 3.

Dielectric strength:

- . 2500V.

Resistance to sinusoidal vibrations:

- . According to IEC 60068-2-6.
- . 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 per pole (W) :

Circuit breakers curve C

I _n	10 A	13 A	16 A	20 A
2P	1,1	1,3	2,75	4,72

- . Impedance per pole (Ω) = $\frac{P \text{ dissipated}}{I_n^2}$

Derating of circuit-breakers according to ambient temperature :

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

I _n (A)	Ambient temperature / I _n				
	- 25°C	- 10°C	0°C	10°C	20°C
6	8.2	7.5	7.0	6.6	6.4
13	18.2	16.3	15.0	14.3	13.9
16	21.9	20.0	18.7	18.0	17.3
20	27.7	25.0	23.2	22.4	21.6

I _n (A)	Ambient temperature / I _n				
	30°C	40°C	50°C	60°C	70°C
6	6.2	6.0	5.8	5.6	5.4
13	13.4	13.0	12.6	12.1	11.7
16	16.6	16.0	15.4	14.7	14.1
20	20.8	20.0	19.2	18.4	17.6

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

Packaging:

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

Plastic materials :

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

7. AUXILIARIES AND ACCESSORIES

Wiring accessories:

- . Sealable screw cover (cat n° 4 063 06).
- . Sealable terminal cover (cat n° 4 063 12).

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 84).

Possible combinations of m.c.b and auxiliaries:

- . Auxiliaries are clipped on the left of the m.c.b.
- . Maximum number of auxiliaries for one circuit-breaker: 3.
- . Two signalling auxiliaries max. (cat. n° 4 062 58 / 60 / 62 / 66).
- . Only one control auxiliary (cat. n° 4 062 76 / 78 / 80 / 82 / 84).
- . If signalling and control auxiliaries are associated on the same circuit breaker, the command auxiliary must be placed to the left of the signal auxiliary (ref. 4 062 5x / 6x).