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Direct current MCB DX³ 16kA, up to 63 A (1 module per pole)

Cat N°(s) : 4 095 59 to 4 095 74



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1. DESCRIPTION - USE

. Thermo-magnetic circuit breaker (MCB) for control, disconnection and protection of electrical circuits supplied in DC current, against overcurrents

Symbol:



Technology:

. Current limiting circuit-breaker
. 1 module per pole. Each pole is 17,7 mm width

2. RANGE

Polarity:

. 2P.

Rated currents, In:

. 0,5 / 1 / 1,6 / 2 / 3 / 4 / 6 / 8 / 10 / 16 / 20 / 25 / 32 / 40 / 50 / 63A.

Tripping characteristics and magnetic tripping calibrations:

. Curve C (between 5 to 7 In).

Thermal threshold:

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

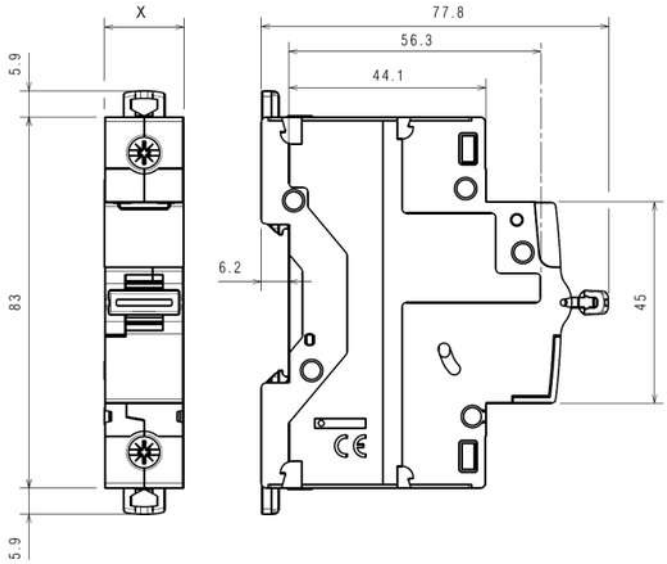
Rated Voltage:

. 250Vd.c. (direct current).

Breaking capacity:

. 16 kA at 250Vd.c.(direct current) according to IEC/EN60947-2.
. 12,5 kA at 320Vd.c.(direct current) according to IEC/EN60947-2.
. 10 kA at 440Vd.c.(direct current) according to IEC/EN60947-2.
. 6 kA at 500Vd.c.(direct current) according to IEC/EN60947-2.

3. OVERALL DIMENSIONS



	X
2P	**35.4mm**

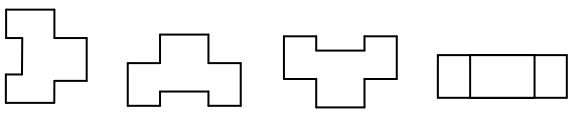
4. PREPARATION - CONNECTION

Fixing:

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

Operating positions:

. Vertical Horizontal Upside down On the side

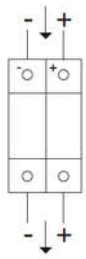


DX³ direct current MCB up to 63 A, 16kA (1 module per pole)

Cat N°(s) : 4 095 59 to 4 095 74

4. PREPARATION – CONNECTION *(continued)*:

Power supply:
. Only from the top how is shown in the wiring diagram on left side of the device.



Connection:
The location of the terminals allows supplying by traditional HX³ pin busbar.

Terminal depth :
. 14 mm

Stripping length recommended:
. 11 mm

Screw head:
. Mixed, slotted and Pozidriv 2.

Recommended tightening torque:
. Recommended: 2.5 Nm.
. Mini : 2 Nm. Maxi : 3 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	With ferrule
Rigid cable	**1 x 1,5 mm² to 35 mm²** **2 x 1,5 mm² to 16 mm²**	-
Flexible cable	**1 x 1,5 mm² to 25 mm²** **2 x 1,5 mm² to 10 mm²**	**1 x 1,5 mm² to 25 mm²**

Manual actuation of the MCB:
. Ergonomic 2-position handle
. "O-OFF": Device open
. "I-ON": Device closed

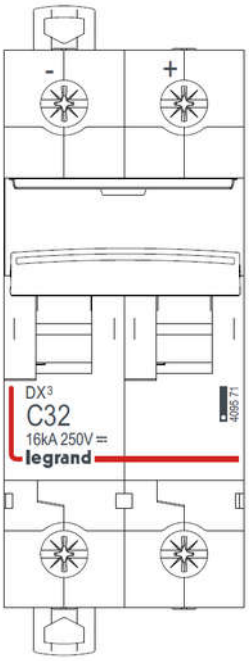
Contact status display:
. By marking of the handle:
"O-Off" white on a green background = contacts opened.
"I-On" white on a red background = contacts closed.

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

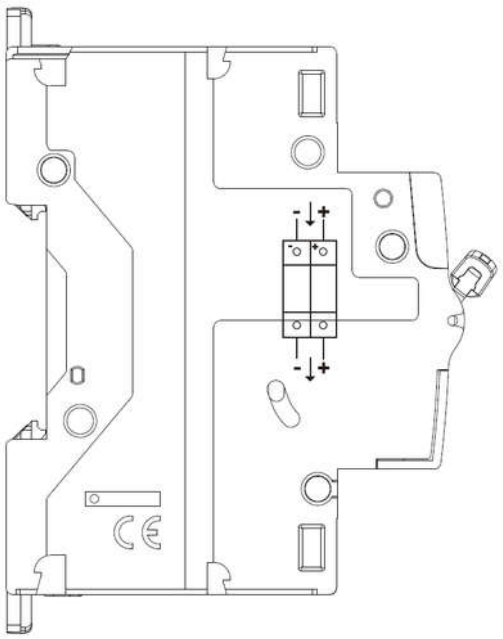
Locking:
. By 5 mm padlock (cat. N° 4 063 13) or 6 mm padlock (cat. N° 227 97) with padlock support (cat. N° 044 42) in "Open" position (OFF).

5. GENERAL CHARACTERISTICS:

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



Left side marking:
. By permanent ink pad printing:
- wiring diagram.



5. GENERAL CHARACTERISTICS *(continued)*:

Short-circuit breaking capacity:

. Direct Current according to: IEC 60947-2

Un		2P
250 V	Icu	**16 kA**
320 V		**12,5 kA**
440 V		**10 kA**
500 V		**6 kA**

Limits of use in terms of voltage:

. According to the operating voltage of the system there is a limitation of the range of usable rated currents

Un	Range of available currents
250 V	**0,5 ÷ 63A**
320 V	**0,5 ÷ 63A**
440 V	**0,5 ÷ 25A**
500 V	**0,5 ÷ 16A**

Minimum operating voltage:

. 12 V d.c. per pole.

Pulse rated voltage:

. Uimp = 4 kV

Insulation rated voltage:

. Ui = 500 V

Pollution degree :

. 2 according IEC/EN 60898-1.

Electric strength:

. 2500 V

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

. 0,5 Nm per pole to close.
. 0,3 Nm per pole to open.

Mechanical endurance:

. 20000 operations without load.
. 2000 operations under 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).

5. GENERAL CHARACTERISTICS *(continued)*:

Average weight per pole:

. 0,150 kg.

Volume when packed:

	Volume (dm³)
Double pole	**0,334**

Ambient operating temperature:

. Min. = -25°C. Max. = +60°C

Ambient storage temperature:

. Min. = -40°C. Max. = +60°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).

Sinusoidal vibration resistance in accordance with IEC 60068.2.6:

. 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)

Recognition:

. Recognition of the circuits by label in the "label holder" on the front-side of m.c.b.

Power dissipated per pole (W) :

. Circuit breakers curve C

In	0,5A	1A	2A	3A	4A	6A	10A
2P	**1,7**	**2**	**2**	**2**	**2**	**1,1**	**1,8**

In	16A	20A	25A	32A	40A	50A	63A
2P	**2**	**2,2**	**2,7**	**3,2**	**4**	**4,5**	**5,5**

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

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
0.5	**0.64**	**0.62**	**0.6**	**0.57**	**0.55**	**0.52**	**0.5**	**0.47**	**0.42**	**0.40**
1	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**	**1**	**0.9**	**0.8**	**0.7**
1.5	**2.0**	**1.9**	**1.8**	**1.7**	**1.7**	**1.6**	**1.5**	**1.5**	**1.4**	**1.4**
2	**3.0**	**2.8**	**2.6**	**2.5**	**2.3**	**2.2**	**2**	**2**	**1.9**	**1.8**
3	**4.1**	**3.8**	**3.6**	**3.5**	**3.3**	**3.2**	**3.0**	**2.9**	**2.8**	**2.7**
3.5	**4.9**	**4.5**	**4.2**	**4.0**	**3.9**	**3.7**	**3.5**	**3.4**	**3.3**	**3.2**
5	**7.0**	**6.4**	**6.0**	**5.8**	**5.5**	**5.3**	**5.0**	**4.8**	**4.7**	**4.5**
6	**8.2**	**7.5**	**7.0**	**6.6**	**6.4**	**6.2**	**6.0**	**5.8**	**5.6**	**5.4**
10	**14.0**	**12.5**	**11.5**	**11.1**	**10.7**	**10.3**	**10.0**	**9.7**	**9.3**	**9.0**
16	**21.9**	**20.0**	**18.7**	**18.0**	**17.3**	**16.6**	**16.0**	**15.4**	**14.7**	**14.1**
20	**27.7**	**25.0**	**23.2**	**22.4**	**21.6**	**20.8**	**20.0**	**19.2**	**18.4**	**17.6**
25	**34.5**	**31.5**	**29.5**	**28.3**	**27.2**	**26.0**	**25.0**	**24.0**	**22.7**	**21.7**
32	**45.8**	**41.0**	**37.8**	**36.5**	**34.9**	**33.3**	**32.0**	**30.7**	**29.1**	**27.8**
40	**55.5**	**51.0**	**48.0**	**46.0**	**44.0**	**42.0**	**40.0**	**38.0**	**36.0**	**34.0**
50	**70.0**	**64.0**	**60.0**	**57.5**	**55.0**	**52.5**	**50.0**	**47.5**	**45.0**	**42.5**
63	**88.1**	**80.6**	**75.6**	**72.5**	**69.9**	**66.1**	**63.0**	**59.8**	**56.1**	**52.9**

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	**400V**	**400 V**	**400 V**	**400 V**
Derating at 30°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).

6. CONFORMITIES AND APPROVALS

In accordance with standards:

. IEC/EN 60898-1 with 10000A breaking capacity
. IEC/EN 60947-2 with 16 kA breaking capacity
. 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 to standard IEC 60068-2-52

Environment respect – 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

Approvals obtained:

. France : NF for ratings up to 32A including.
. Certification LOVAG for ratings up to 32A including.

7. AUXILIARIES AND ACCESSORIES

Coupling with RCDs add-on modules:
. It is imperative to not associate any RCD add-on module to the circuit-breaker for direct currents.

Wiring accessories:
. Pin busbar HX³ traditional.
. Sealable screw cover (cat n° 4 063 04).
. Insulating shields (cat n° 4 063 05)
. Dispatcher row HX³.

Signalling auxiliaries - fork busbar adapted:
. Auxiliary contact (½ module – cat n° 4 062 50).
. Fault signalling changeover switch (½ module – cat n° 4 062 52).
. Auxiliary contact modifiable in default signal (½ module – cat n° 4 062 56).
. Auxiliary contact + fault signalling switch - can be modified to 2 auxiliary contacts (1 module - cat n° 4 062 64).

Signalling auxiliaries - prong busbar adapted:
. 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).
. Overvoltage release POP (1 module - cat n° 4 062 86)
. Autonomous shunt trip for NC push-button (1 module - cat n°. 4 062 84 / 87).

Motor driven control modules
. Motor driven control module (1 module – cat n° 4 062 91)
. Motor driven control module with automatic resetting integrated (2 modules – cat n° 4 062 93 / 95)

Possible combinations of m.c.b and auxiliaries:
. Only the association of an MCB with signal auxiliaries guarantees the functionality of the “Great Dispatcher” DIN rail clamp.
. 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 50 /52 /56 /64).
. Only one control auxiliary (cat. n° 4 062 76 / 78 / 80 / 82 / 84 / 86 /87).
. One remote motor driven remote control
. 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

Front external rotary handle
. Black handle (cat n° 4 063 19)
. Yellow and red handle (cat n° 4 063 20)

Supply Invertor
. Manual supply invertor for 2P devices (cat. n° 4 063 14)

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 (OFF).

Installation software:
. XL PRO³