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Enedis incomer circuit breaker

Cat. N°(s) : 4 010 00, 4 010 02, 4 010 03, 4 010 05, 4 010 006, 4 010 07, 4 010 09, 4 010 51, 4 010 52, 4 010 10, 4 010 11, 4 010 12, 4 010 13, 4 010 14, 4 010 15

CONTENTS PAGE

1. DESCRIPTION - USE

General description:
- Enedis circuit breakers and residual current circuit breakers made for Enedis blue rate contract from 3 to 36 kVA :
. Switch off and isolate the whole installation
. Protect against overloads and short circuits
. Offer a rated current setting to limit the power according to the subscribed Enedis contract
. Protect people against indirect contacts and avoid risk of fire by checking the isolation level (Residual current version)
- Selective residual current devices guarantee a total discrimination with downstream 30mA residual current devices (NF C 15-100) and improve immunity against unwanted tripping due to atmospheric phenomena disturbances

Technology of the protection devices:
Enedis “incomer” circuit breakers and residual current circuit breakers have several protection functions:
- An oleo-magnetic tripping sub-assembly for overcurrent protection
- An electro-mechanical tripping sub-assembly (magnetic core in association with a sensitive relay) for earth leakage current protection

Device use:
Enedis “incomer” circuit breakers and residual current circuit breakers have several operating and adjustment settings :
- The operating handle is a trip free lever, with two steady ON and OFF positions marked with the symbols I and O.
- Phase rated current Ir is settable by moving a captive screw accessible under the current setting cover in the front side.
- Earth leakage current protection can be tested by the mean of the push-button marked “test” on the front side.

1. DESCRIPTION – USE *(continued)*

Products catalogue numbers:
. LEGRAND Catalogue numbers / Enedis catalogue numbers :

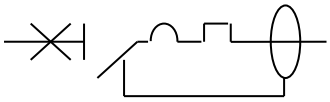
Number of poles	Rated current (A)	CBs with standard residual current protection	CBs with time delayed residual current protection	CBs (without residual current protection)
2	15 - 30 - 45	4 010 00 / 69 30 044	4 010 03 / 69 30 061	4 010 07 / 69 31 011
2	60	4 010 51 / 69 30 046	4 010 06 / 69 30 064	4 010 52 / 69 31 013
2	60 - 75 - 90	4 010 02 / 69 30 048	4 010 05 / 69 30 063	4 010 09 / 69 31 015
4	10 - 15 - 20 - 25 - 30	4 010 10 / 69 30 056	4 010 12 / 69 30 066	4 010 14 / 69 31 020
4	30 - 40 - 50 - 60	4 010 11 / 69 30 057	4 010 13 / 69 30 067	4 010 15 / 69 31 023

Polarity:
. 2 poles : 2 poles disconnected with 1 protected pole (phase)
. 4 poles : 4 poles disconnected with 3 poles protected (phases)

1. DESCRIPTION – USE *(continued)*

Symbol:
. Circuit breaker:

. Residual current circuit breaker:



Technology:
. Limiting device
. Simultaneous operation of all the poles at the closing and opening

2. RANGE

Rated current In:
. 2 poles: from 15 A to 90 A according to references
. 4 poles: from 10 A to 60 A according to references

Tripping thresholds:
. See curves pages 5 and 6

Sensitivity – Operating time of residual current circuit breakers:
. 500 mA instantaneous and selective

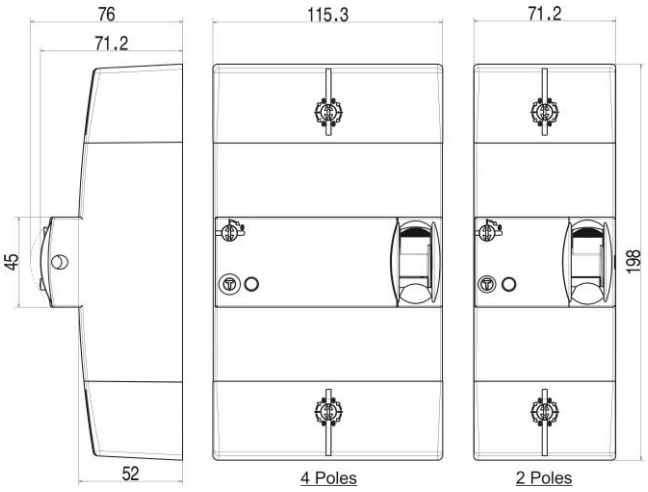
Rated voltage and frequency:
. 2 poles: 250 V~ / 50 Hz
. 4 poles: 440 V~ / 50 Hz

Maximum operating voltage:
. 2 poles: 250 V~
. 4 poles: 440 V~

Breaking capacity:
. in accordance with NF C 62-411

Number of poles	2	2	2	4	4
Max rated current	**45A**	**60A**	**90A**	**30A**	**60A**
Breaking capacity					
- rms value	2 000A	2 400A	2 400A	2 000A	2 400A
- peak value	3000A	3600A	3600A	3000A	3600A
- cos ϕ	0,7	0,7	0,7	0,7	0,7
Associated fuse	AD 45	AD 60	AD 90	AD 45	AD 60
Backup breaking capacity Baco circuit breaker + fuse	20 000A	20 000A	20 000A	20 000A	20 000A
Thermal stress	40 000 A^2s	57 500 A^2s	57 500 A^2s	40 000 A^2s	57 500 A^2s

3. OVERALL DIMENSIONS



4. PREPARATION - CONNECTION

Mounting:
. On Enedis control board, wood or plastic panel, with two Ø 4mm screws of 40mm mini length under head (not included).

Operation position:
. Vertical position exclusively.

Power supply:
. Top side

Connection:
. From 10° to 30° rotating terminals
. Terminal depths: from 14 to 17 mm
. Screw: Headless, 4mm CHC imprint
. Tightening torque:
- Standard: 2.5 N.m to 4 N.m
- Maxi: 6 N.m

. Max tensile force applicable on connected wire: 100N
. Terminals marking:
Not protected pole: on left, with blue cap, marked N
Protected poles: on right with grey cap

Conductor type:
. Copper cable
. Cable cross-section:
1 to 25 mm2 rigid wires, massive or stranded
1 to 16 mm2 flexible wires with ferrule

Recommended tools:
. Allen key 4mm

Locking:
. Padlocking in the open position with Ø 5 mm padlock (Cat. No. 4 063 13) or Ø 6 mm padlock (Cat. No. 227 97)

Sealing:
. Sealing with Ø 2 lead or plastic seals, on terminals screw cover and current setting protection screws.

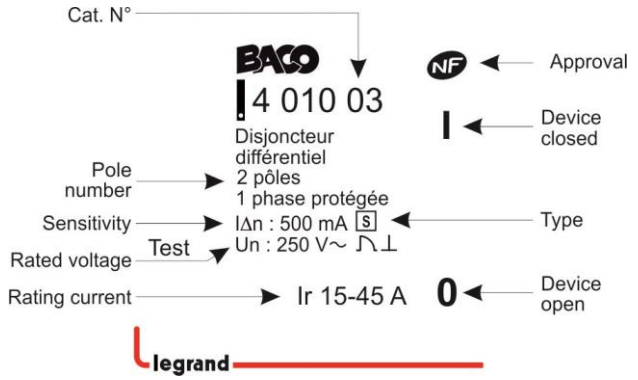
4. PREPARATION - CONNECTION *(continued)*

Contact status display :
. By marking of the rating current cover:
- « O » : in black = contacts open
- « I » : in black = contacts closed

Manual actuation of the device:
. Ergonomic 2-position handle:
- « O » : Device open
- « I » : Device closed

5. GENERAL CHARACTERISTICS

Marking on the front side:
. By permanent ink pad printing



Rated voltage:
. 250 V~ / 50 Hz between phase and neutral
. 440 V~ / 50 Hz between phases

Insulation resistance:
. 2 MΩ between poles
. 5 MΩ between open contacts of the same pole

Test operating voltages:
. According to NF C 62-411, between phase and neutral:
- U mini : 200 V~
- U maxi : 250 V~

Residual breaking capacity:
. 10 In with minimum value of 500A

Breaking capacity on 1 pole only (phase pole):
. According to Icn1 EN 60898-1: 4500 A

Isolation distance:
. The distance between the contacts is greater than 6 mm with the handle in the open position.

Insulation voltage:
. Ui = 4 kV

Dielectric strength:
. 2 kV between poles
. 2 kV between open contacts of the same pole
. 4 kV between active and accessible parts

Degree of pollution:
. 2

5. GENERAL CHARACTERISTICS *(continued)*

Rated impulse withstand voltage:
According to NF C 62-411:
. 6 kV between poles (wave 1,2 / 50 µs)
. 8 kV between active and accessible parts

Degree or class of protection:
. Class III

Plastic materials:
. Polycarbonate and P.B.T.

Operating temperature:
. From –20 °C to + 55 °C

Stocking temperature:
. From - 40°C to + 70°C

Mechanical endurance:
. 20,000 operations with no load

Electrical endurance:
. 4 000 operations according to NF C 62-411

DC operation:
. Cannot be used with DC

Operation at 400Hz frequency:
. Cannot be used with 400Hz

Resistance to tremors:
. In accordance with standard NF C 62-411

Voltage drop:
. According to NF C 62-411 : < 0,3 V

Electromagnetic compatibility (EMC):
EMC immunity depends on earth leakage protection type.
Immunity level for each type of perturbation is:

Type of perturbation	Standard	General type	Delayed type
Earth leakage current of capacitance	NF C 62-411	32mA	32 mA
8/20 ps current wave	NF EN 61 009-1	250 A	5 000A
HF inducted voltage	IEC 1000-4-6	3 V	3 V
Electrical fast transien/burst	IEC 1000-4-4	4 kV	4 kV
1,2/50 ps voltage shock wave	IEC 1000-4-5	Common mode : 5 kV differential mode : 4 kV	Common mode: 5 kV differential mode : 4 kV
Electromagnetic field	IEC 1000-4-3	3 V/m	10 V/m
Electrostatic surge	IEC 1000-4-2	8 kV in air 6 kV in contact	8 kV in air 6 kV in contact
Ring wave surge	IEC 61 543	200 A	200 A

5. GENERAL CHARACTERISTICS *(continued)*

Mechanical characteristics:
. Protection degree according to NF C 20 010: IP40
. Protection degree against shocks:
- NF C 20 010 degree 3
- NF C 62-411 § 3.19

Overload protection:
. The neutral pole is not protected.
. Phase poles are protected. Typical tripping time are listed in the annex

Residual current protection (depending on model):
. 2 types :
General type: sensitivity 500 mA AC type without delay
Selective type: sensitivity 500 mA delayed action

Corrosion withstand:
. According to NF C 62-411, 8 days in wet and hot conditions 57°C, 95% HR

Packaged volume:

	Volume (dm^3)		Packaging
For all ratings	2 poles	4 poles	by 1
	1.01	1.60	

Product weight:

Catalogue numbers	Description	Weight (kg)
4 010 00	DG2 15 45 500 LEGRAND F 00	**0,536**
4 010 51	DG2 60 500 LEGRAND F 00	**0,535**
4 010 02	DG2 60 90 500 LEGRAND F 00	**0,600**
4 010 03	DG2 15 45 500S LEGRAND F 00	**0,541**
4 010 06	DG2 60 500S LEGRAND F 00	**0,544**
4 010 05	DG2 60 90 500S LEGRAND F 00	**0,611**
4 010 07	DG2 15 45 000 LEGRAND F 00	**0,527**
4 010 52	DG2 60 000 LEGRAND F 00	**0,516**
4 010 09	DG2 60 90 000 LEGRAND F 00	**0,580**
4 010 10	DG4 10 30 500 LEGRAND F 00	**0,977**
4 010 11	DG4 30 60 500 LEGRAND F 00	**0,990**
4 010 12	DG4 10 30 500S LEGRAND F 00	**0,989**
4 010 13	DG4 30 60 500S LEGRAND F 00	**0,997**
4 010 14	DG4 10 30 000 LEGRAND F 00	**0,983**
4 010 15	DG4 30 60 000 LEGRAND F 00	**0,969**

Higher heating potential:
. The heat potential of a device is estimated at:
- 2 poles = 6.95 MJ
- 4 poles = 10.65 MJ

5. GENERAL CHARACTERISTICS *(continued)*

Enclosure heat and fire resistance:
. Used insulation materials resist to heat and fire according to their function in the product, if they support electrical parts or if they give external protection.

Type of part	Ball test	Heating finger	Incandescent wire	ITC progressing current	Oxygen index
Support active part	125°C	500°C	960°C	250 V	28
Enclosure part	125°C	300°C	960°C	175 V	25

. Classification V0, in accordance with standard UL94

Enclosure color:
. Ivory white RAL 9010

6. COMPLIANCE AND APPROVALS

Compliance with standards:
. NF C 62-411 (1988) + F1 (1997) et NF C 62-412 (1983) + A1 (1988)

Relevant standards:
Circuit breaker with residual current protection:
NF C 62-411 (1988): Circuit breaker with residual current protection for instrument control facilities first class:
NF EN 61 543 (1996): Residual current devices for domestic use and analogues - Electromagnetic compatibility.

Circuit breaker without residual current protection:
NF C 62-412 (1988): Breakers for switchboards special facilities first class.

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.

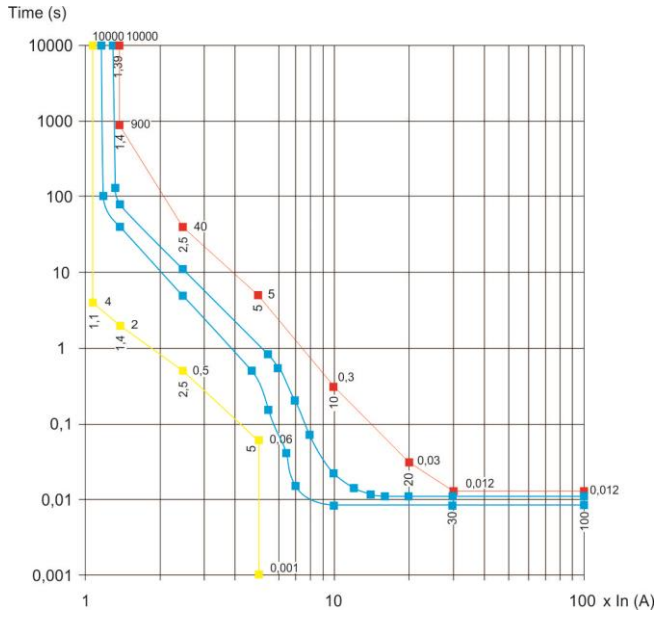
Packaging:
. Design and manufacturing of packaging compliant with decree 98-638 of 20/07/98 and Directive 94/62/EC

Approvals granted:

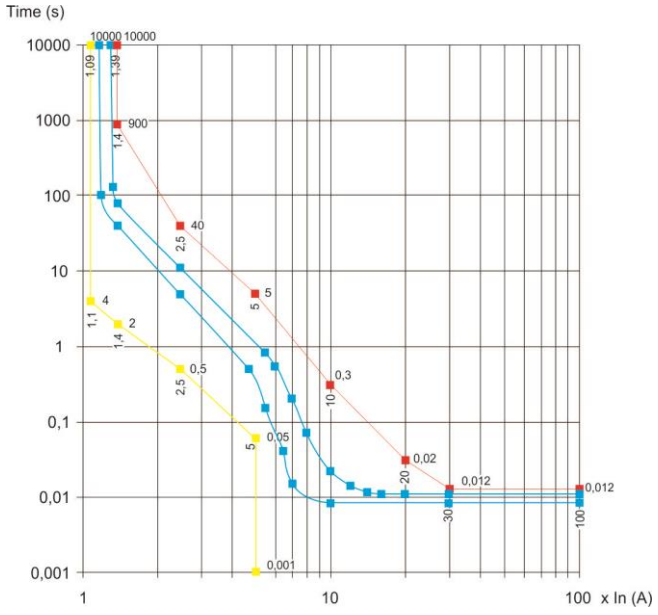
. France: NF

7. CURVES

Overload tripping time:
. 2 poles 45A

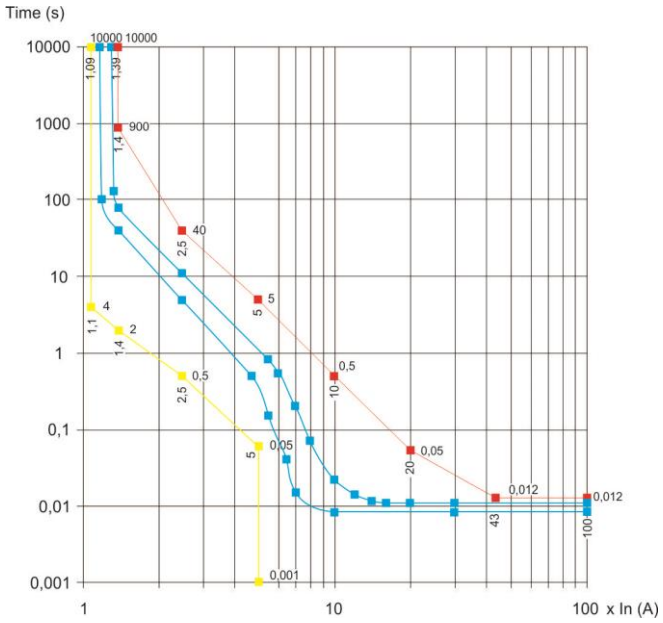


. 2 poles 60A and 90A

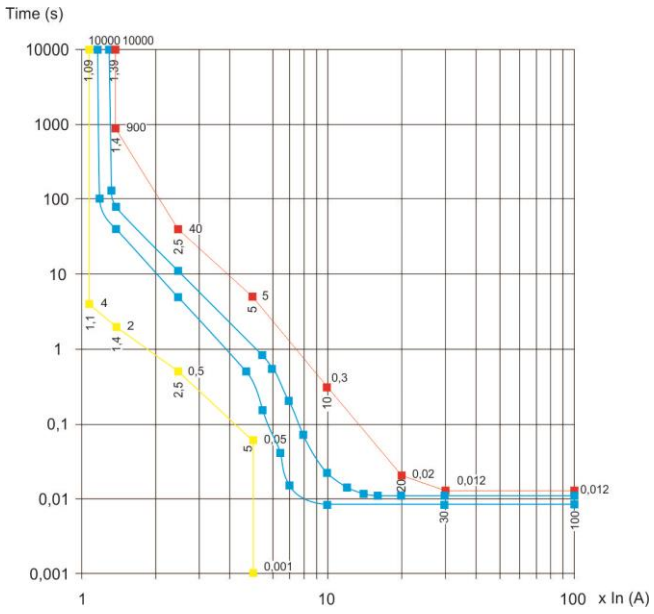


7. CURVES *(continued)*

Overload tripping time:
. 4 poles 30A

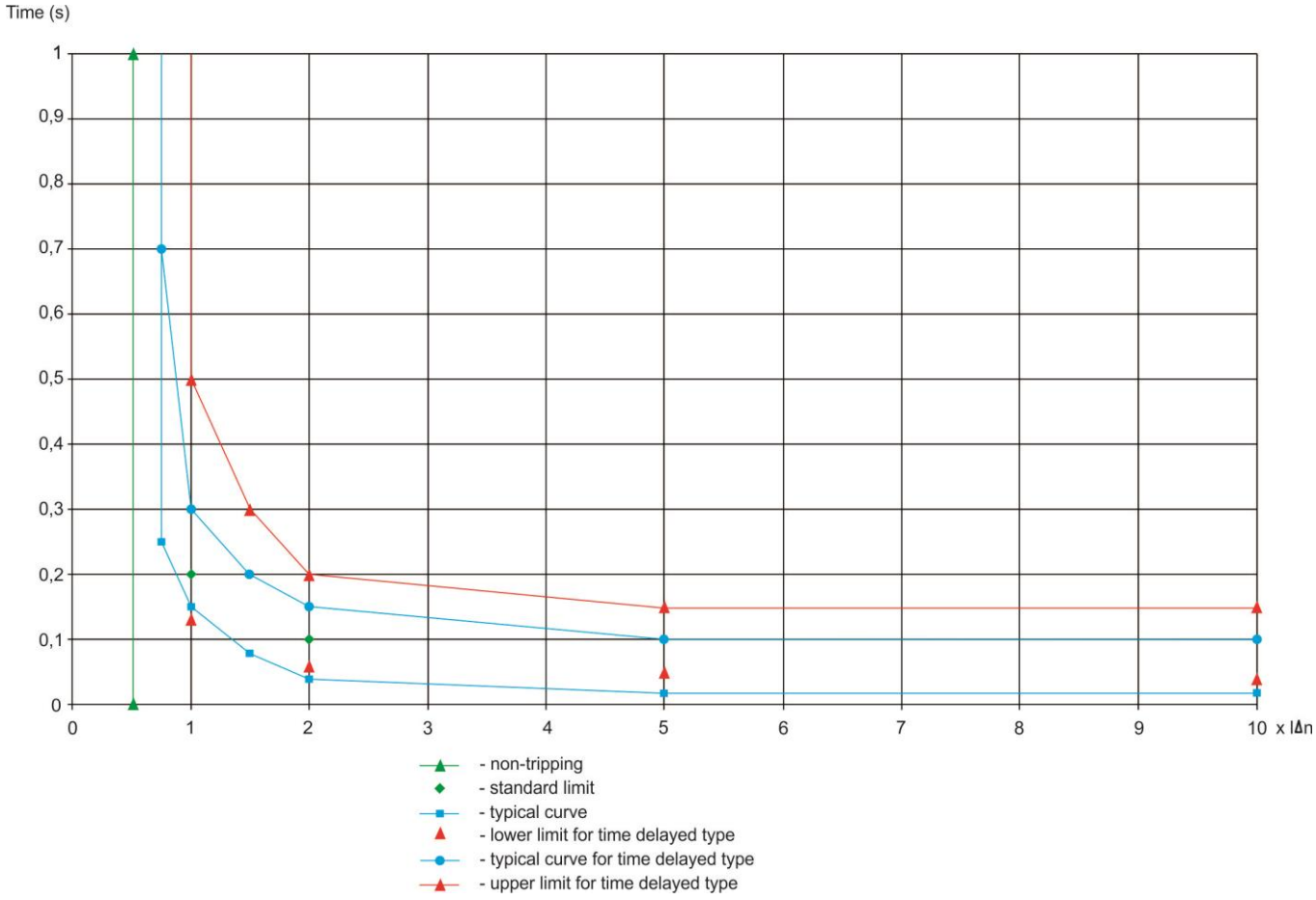


. 4 poles 60A



7. CURVES *(continued)*

Residual current protection tripping time:



8. AUXILIARIES AND ACCESSORIES

Locking options:
. Via padlock 5 mm in diameter (Cat. No. 4 063 13) or padlock 6 mm in diameter (Cat. No. 227 97)

Installation software:
. XL PRO^3

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 the safety level of your installation has been reduced. The presence of residual current protection does not remove the need to observe all the precautions associated with using electrical energy