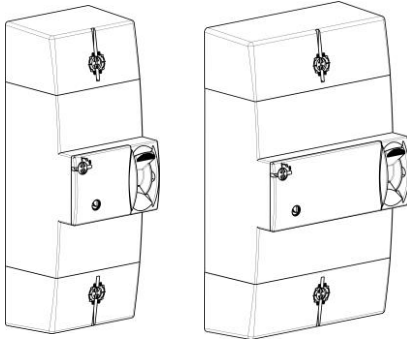


## Incomer circuit breaker

Cat. N°(s): 4 011 53, 4 011 55, 4 011 57, 4 011 59, 4 011 62, 4 011 64, 4 011 66, 4 011 67, 4 011 68, 4 011 69, 4 011 70



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### 1. DESCRIPTION - USE

#### General description :

- BACO incomer circuit breakers and residual current circuit breakers 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 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 :

- Incomer MCBs and RCBOs 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 :

- Incomer MCBs and RCBOs 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  $I_r$  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)

#### Product's reference :

Number of poles	Rated current (A)	RCBOs 500mA	MCBs (without earth leakage protection)
2	5 - 15	4 011 53	4 011 66
2	10 - 30	4 011 55	4 011 67
2	15 - 45	4 011 57	-
2	30 - 60	4 011 59	4 011 68
4	10 - 30	4 011 62	4 011 69
4	30 - 60	4 011 64	4 011 70

#### Polarity :

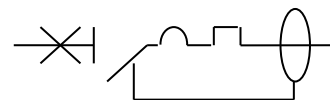
- . 2 poles : 2 poles disconnected with 1 protected pole (phase)
- . 4 poles : 4 poles disconnected with 3 poles protected (phases)

#### Symbol :

- . Circuit breaker:



- . Residual current circuit breaker:



## 1. DESCRIPTION – USE (continued)

### Technology :

- Limiting device
- Simultaneous control of all the poles at the closing and opening

## 2. RANGE

### Rated current In :

- 2 poles : from 5A to 60A according to references
- 4 poles : from 10A to 60A according to references

### Threshold tripping :

- See curves pages 5 and 6

### Sensitivity – Operating time of residual current circuit breakers:

- 500 mA instantaneous

### Rated voltage and frequency :

- 2 poles : 230 / 250 V~ 50 Hz
- 4 poles : 400 / 440 V~ 50 Hz

### Maximum operating voltage :

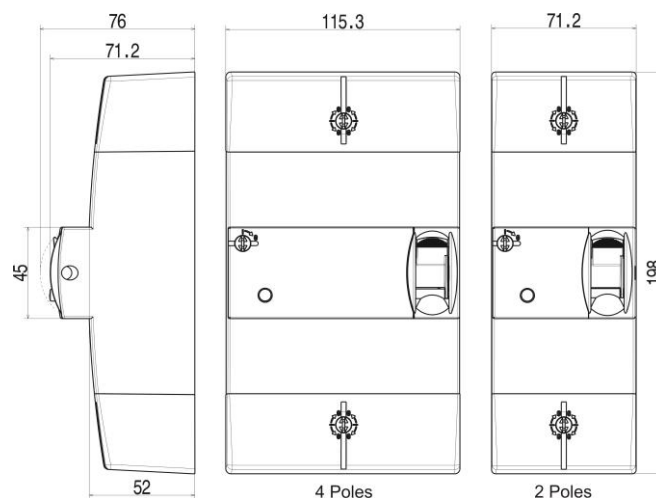
- 2 poles : 250 V~
- 4 poles : 440 V~

### Breaking capacity :

- in accordance with NF C 62-411

Number of poles	2	2	2	2	4	4
Max rated current	15A	30A	45A	60A	30A	60A
<b>Breaking capacity:</b>						
- rms value	2 000A	2 000A	2 000A	2 400A	2 000A	2 400A
- peak value	3000A	3000A	3000A	3600A	3000A	3600A
- cos ~	0,7	0,7	0,7	0,7	0,7	0,7
<b>Coupled fuse</b>	AD45	AD45	AD45	AD60	AD45	AD60
<b>Backup breaking capacity</b>						
Mcb : AD	20 000A	20 000A	20 000A	20 000A	20 000A	20 000A
<b>couple fuse</b>						
<b>Thermal stress</b>	5 600 A <sup>2</sup> s	40 000 A <sup>2</sup> s	40 000 A <sup>2</sup> s	57 500 A <sup>2</sup> s	40 000 A <sup>2</sup> s	57 500 A <sup>2</sup> s

## 3. OVERALL DIMENSIONS



## 4. PREPARATION - CONNECTION

### Mounting:

- On 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 mm<sup>2</sup> rigid wires, massive or stranded
  - 1 to 16 mm<sup>2</sup> 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

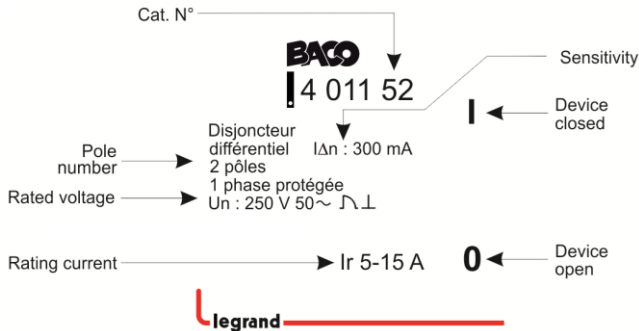
### Manual actuation of the device :

- . 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

### Residual breaking capacity :

- . 10 I<sub>n</sub> 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 :

- . U<sub>i</sub> = 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 poles and mass

### 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 :

- . Tested with 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 protection (depending on model) :

- sensitivity 500 mA AC type without delay

### Corrosion withstand:

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

### Packaged volume :

	Volume (dm <sup>3</sup> )		Packaging
	2 poles	4 poles	
For all ratings	1.01	1.60	by 1

### Product weight :

Catalogue numbers	Description	Weight (kg)
4 011 53	DG2 05 15 500 LEGRAND EX 00	<b>0,547</b>
4 011 55	DG2 10 30 500 LEGRAND EX 00	<b>0,546</b>
4 011 57	DG2 15 45 500 LEGRAND EX 00	<b>0,554</b>
4 011 59	DG2 30 60 500 LEGRAND EX 00	<b>0,548</b>
4 011 62	DG4 10 30 500 LEGRAND EX 00	<b>0,912</b>
4 011 64	DG4 30 60 500 LEGRAND EX 00	<b>0,919</b>
4 011 66	DG2 05 15 000 LEGRAND EX 00	<b>0,525</b>
4 011 67	DG2 10 30 000 LEGRAND EX 00	<b>0,534</b>
4 011 68	DG2 30 60 000 LEGRAND EX 00	<b>0,554</b>
4 011 69	DG4 10 30 000 LEGRAND EX 00	<b>0,898</b>
4 011 70	DG4 30 60 000 LEGRAND EX 00	<b>0,896</b>

## 5. GENERAL CHARACTERISTICS (continued)

### Higher heating potential:

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

### 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

### 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 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:

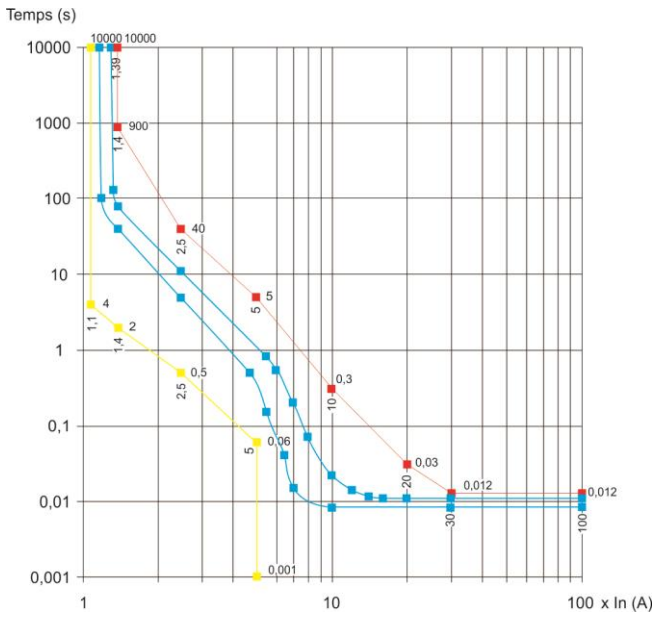
- Halogen free plastic materials
- Labelling of parts compliant with ISO 11469 and ISO 1043.

### Packaging:

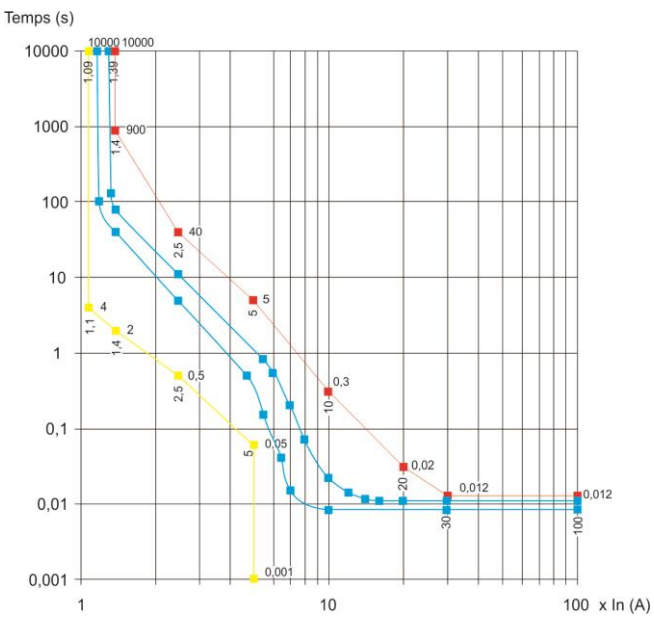
- Design and manufacture of packaging compliant with decree 98-638 of 20/07/98 and Directive 94/62/EC

## 7. CURVES

Overload tripping time :  
 . 2 poles 15A, 30A and 45A

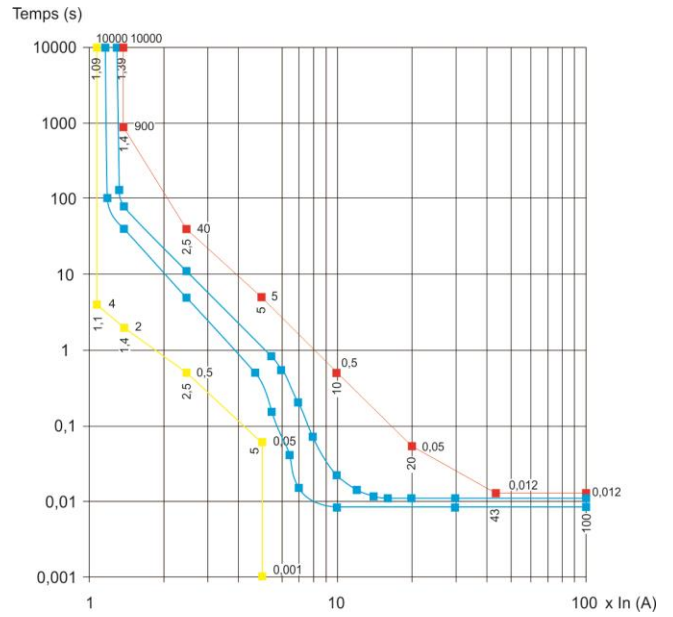


. 2 poles 60A

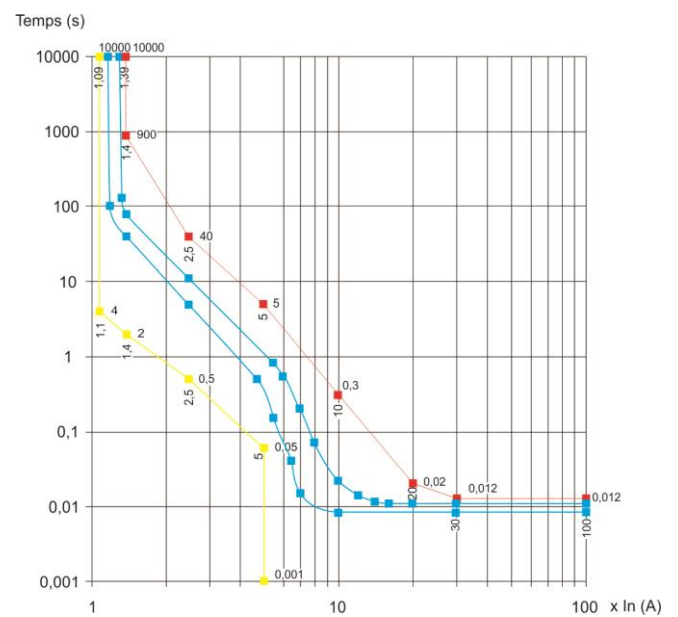


## 7. CURVES (continued)

Overload tripping time :  
 . 4 poles 30A

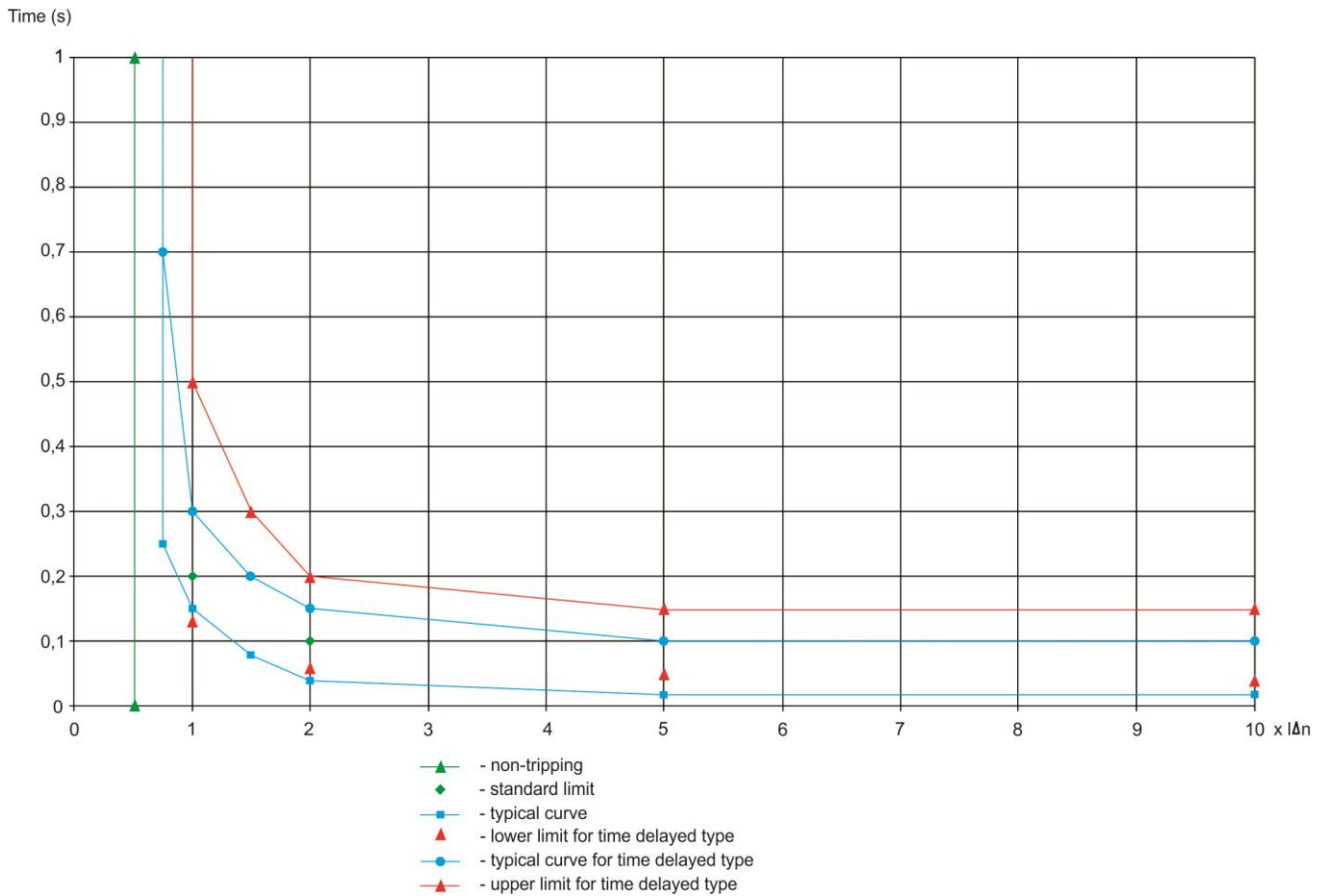


. 4 poles 60A



## 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<sup>3</sup>

## 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