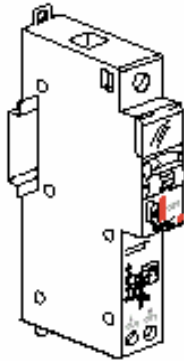


## R.C.B.O. SP / 1 module

Cat. N°(s) : 6064 00 – 6064 01 – 6064 02 – 6064 03 –  
6064 04 – 6064 05 – 6064 10 – 6064 11 – 6064 12 –  
6064 13 – 6064 14 – 6064 15

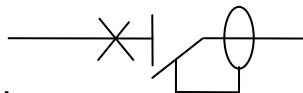


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### 1. DESCRIPTION - USE

R.C.B.O. with positive contact indication for control and protection of electrical circuits and protection of people against direct and indirect contacts and of installations against insulation faults.

#### Symbol :



#### Technology :

- . Limiting device
- . Trip-Free mechanism
- . Thermo-magnetic circuit breaker

### 2. RANGE

#### Product range :

- . Single phase (thermal-magnetic protection) + solid neutral – 1 module (1 x 17.5 mm)

#### Rated breaking capacity :

- . 10 000 A according to EN/IEC 61009-1

#### Rated current :

- . 10 / 16 / 20 / 25 / 32 / 45 A

#### Magnetic tripping curves :

- . C (between 5 and 10 In)

#### Type :

- . AC (Residual sinusoidal alternating current)

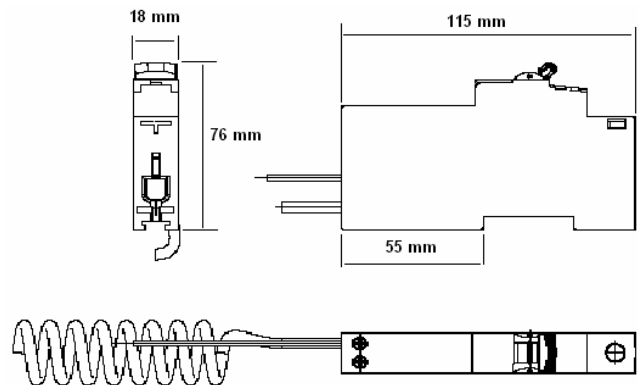
#### Sensitivity :

- . 30 mA

#### Rated voltage / Frequency :

- . 240 V ~ / 50/60 Hz with standard tolerances

### 3. OVERALL DIMENSIONS



### 4. PREPARATION AND CONNECTION

#### Fixing :

- . On symmetrical rail EN 60.715 or DIN 35

#### Supply :

- . See diagram on the device (supply on top, load on lower side).
- . Phase supply by terminal or plug-in.
- . cat. N° 6064 1x : blue neutral lead and white earth lead
- . cat. N° 6064 0x : black neutral lead and green/yellow earth lead

#### Connection :

- . Terminals protected against touching (IP 20)
- . Terminals with release type, captive screw
- . Terminal depth : upstream = 14 mm and downstream = 14 mm
- . Screw head : mixed, slotted and Pozidriv n° 2
- . Recommended tightening torque :
  - 2 Nm upper side
  - 1.2 Nm lower side

## 4. PREPARATION AND CONNECTION *(continued)*

### Type of wire :

. Copper cable, for top terminals

	Without ferrule	With ferrule
Rigid cables	1 x 0.75 mm <sup>2</sup> to 35 mm <sup>2</sup> 2 x 0.75 mm <sup>2</sup> to 16 mm <sup>2</sup>	-
Flexible cables	1 x 0.75 mm <sup>2</sup> to 25 mm <sup>2</sup> 2 x 0.75 mm <sup>2</sup> to 10 mm <sup>2</sup>	1 x 0.75 mm <sup>2</sup> to 25 mm <sup>2</sup>

. Copper cable, for bottom terminals

	Without ferrule	With ferrule
Rigid cables	1 x 0.75 mm <sup>2</sup> to 16 mm <sup>2</sup> 2 x 0.75 mm <sup>2</sup> to 6 mm <sup>2</sup>	-
Flexible cables	1 x 0.75 mm <sup>2</sup> to 10 mm <sup>2</sup> 2 x 0.75 mm <sup>2</sup> to 4 mm <sup>2</sup>	1 x 0.75 mm <sup>2</sup> to 10 mm <sup>2</sup>

### Sealing :

. Possible in open "OFF" or close "ON" position

### Locking possibility :

. By 5 mm padlock (cat. N° 044 43) or 6 mm padlock (cat. N° 227 97) with padlock support (cat. N° 044 42)

### 2 position ergonomic operating handle :

. I / ON : closed circuit  
. O / OFF : opened circuit

### Display of contacts state :

. By marking of the handle :  
- O-OFF in white on green background = contact opened  
- I-ON in white on red background = contact closed

### Tools required :

. For upper terminals : screwdriver 5.5 to 6.5 mm  
. For lower terminals : screwdriver 4 to 5.5 mm  
. For fixing : screwdriver 6 mm maxi, 5.5 mm recommended

### Operating positions :

. Vertical, horizontal, flat

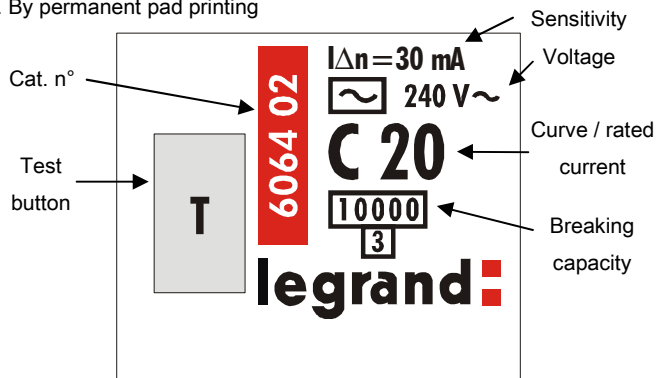
### Labelling :

. Circuit marking on front (with label holder)  
. With label design software  
. With electronic title printer ribbon  
. With plates of symbols

## 5. GENERAL CHARACTERISTICS

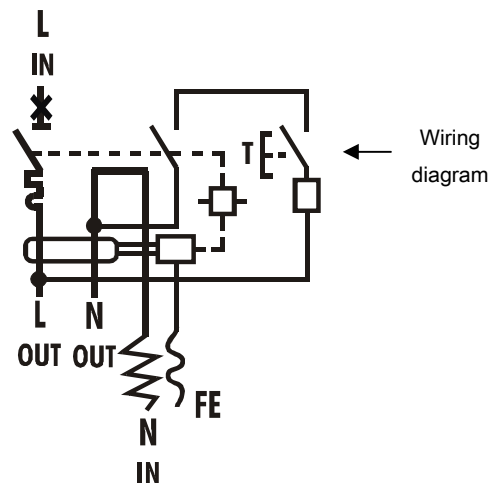
### Front face marking :

. By permanent pad printing



**BS EN 61009-1**  
**IEC 61009-1**

Relevant  
Standard



Wiring  
diagram

**L**      **N**  
**OUT**    **OUT**

Marking of  
terminals

## 5. GENERAL CHARACTERISTICS *(continued)*

### Earth :

- . 450 Ohms max

### In case of Earth failure :

- . RCBO doesn't trip but magnetic, thermal and residual current remain able to make RCBO trip if necessary

### In case of Neutral failure :

- . RCBO trips

### Rated voltage limits for operation :

- . From 110 V up to 253 V, this RCBO and its test function fully operate

### Breaking capacity :

Standards / Breaking capacity		Voltage	1P
EN 61009-1	Icn	240 ~	10 kA

### Limitation class :

- . 3 up to 32 A

### Residual breaking capacity :

- . According to EN 61009-1 § 9.12.11.4d (I<sub>Δm</sub> : earth short circuit) :  
I<sub>Δm</sub> = 6 kA

### Insulation voltage :

- . U<sub>i</sub> = 500 V according to EN 61009-1

### Electric network type :

- . TN

### Protection against unwanted tripping :

- . 250 A peak, following surge current impulse 8 / 20 μs
- . 200 A ring wave 10 μs

### Mechanical endurance :

- . 20 000 operations without load
- . 10 000 operations with load (under I<sub>n</sub> x Cos φ 0,9)
- . 1 000 residual current tripping operations by "test"
- . 1 000 residual current tripping operations by residual current

### Stress on the handle :

- . For opening : 0.3 Nm
- . For closing : 0.5 Nm

### Dielectric strength :

- . 2 500 V

### Dissipated power :

- . Power dissipated by R.C.B.O. in Watts

Pole	Sensitivity	Rated current					
		10 A	16 A	20 A	25 A	32 A	45 A
1P	30 mA	1.1	1.5	1.7	2.4	3.1	4

$$Z(\text{in } \Omega) \text{ per pole} = P. \text{ dissipated} \\ (\text{Rated Current})^2$$

## 5. GENERAL CHARACTERISTICS *(continued)*

### Enclosure material :

- . Polyester / glass for enclosure
- . Characteristics of these materials :  
Self extinguishing, heat and fire resistant according to EN 61009-1,  
glow wire fireproof at 960°C (850 °C for the label-holder, 750°C for handle)

### Average weight :

- . 0.260 kg par device

### Ambient operating temperature :

- . Minimum = - 5°C
- . Maximum = + 55°C

### Ambient storage temperature :

- . Minimum = - 40°C
- . Maximum = + 70°C

### Operation at 400 Hz :

- . The magnetic threshold increases by 45%

### Protection degree :

- . Ingress protection against liquid and solid bodies IP 20 according to IEC 529, EN 60529, NF C 20-010 standards
- . Protection index against mechanical shocks IK 02 according to EN 50102, NF C 20-015 standards

### Resistance to sinusoidal vibrations (according to IEC 68.2.6) :

- . Axis : x, y, z
- . Frequency : 10 to 55 Hz
- . Acceleration : 3 g (1 g = 9,81 m.s<sup>-2</sup>)

## 5. GENERAL CHARACTERISTICS *(continued)*

### Derating for use with fluorescent lights :

. Number of lights per phase :

- Non compensated lights : power factor 0.6 – Compensated lights : power factor 0.85

		Distribution : Single phase 230 V Rated current of type C circuit-breaker					
Types of lights	Tube power	10A	16A	20A	25A	32A	45A
Mono non compensated	18 W	49	78	98	122	157	196
	36 W	24	39	49	61	78	98
	58 W	15	24	30	38	48	60
Mono compensated	18 W	70	112	140	175	225	281
	36 W	35	56	70	87	112	140
	58 W	21	34	43	54	69	87
Duo compensated	2 x 18 W	35	56	70	87	112	140
	2 x 36 W	17	28	35	43	56	70
	2 x 58 W	10	17	21	27	34	43

- Non compensated lights : power factor 0.5

		Distribution : Single phase 230 V - Three-phase+N 400 V between phases Rated current of type C circuit-breaker					
Types of lights	Tube power	10A	16A	20A	25A	32A	45A
Mono non compensated	18 W	41	65	81	101	131	163
	36 W	20	32	41	51	65	81
	58 W	12	20	25	31	40	50

		Distribution three-phase 230 V between phases - $U = 230 \sqrt{3}$ Rated current of type C circuit-breaker					
Types of lights	Tube power	10A	16A	20A	25A	32A	45A
Mono non compensated	18 W	23	37	46	58	75	94
	36 W	11	18	23	29	37	46
	58 W	6	11	14	17	23	23

## 5. GENERAL CHARACTERISTICS *(continued)*

### Derating table for use with metallic iodide lights : mercury, sodium

. Number of lights per phase :

- Compensated lights : power factor 0.85 – Number of lights

Tube power	Distribution : Single phase 230 V - Three-phase+N 400 V between phases					
	Rated current of type C circuit-breaker					
	10A	16A	20A	25A	32A	45A
75 W	13	21	26	32	42	52
150 W	7	10	13	16	21	26
200 W	5	8	10	12	16	20
250 W	4	6	8	10	12	16
360 W	3	4	6	7	8	12
420 W	2	3	4	5	6	8
1000 W	1	1	2	2	3	4

### Other lights :

- . Halogen 230 V and Extra Low Voltage : no derating
- . Fluorecent with electronic ballast : derating of 20 % of rated current
- . No derating for lights with integrated ballast

### Derating r.c.b.o.'s according to ambient temperature

A standardised circuit breaker is adjusted to operate at  $I_n$  at an ambient temperature of 30°C.

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

$I_n$	Ambient Temperature / $I_n$									
	-25°C	-10°C	0°C	10°C	20°C	30°C	40°C	50°C	60°C	70°C
10 A	12.5	11.5	11.1	10.7	10.3	10	9.7	9.3	9.0	8.7
16 A	20.0	18.7	18.0	17.3	16.6	16	15.4	14.7	14.1	13.5
20 A	25.0	23.2	22.4	21.6	20.8	20	19.2	18.4	17.6	16.8
25 A	31.5	29.5	28.3	27.2	26.0	25	24.0	22.7	21.7	20.7
32 A	41.0	37.8	36.5	34.9	33.3	32	30.7	29.1	27.8	26.5
45 A	57.6	54.0	51.8	49.5	47.3	45	42.8	40.5	38.3	36.0

Reference temperature : 30 °C

Current : Average value in Ampere

## 5. GENERAL CHARACTERISTICS *(continued)*

### BACK-UP PROTECTION OF R.C.B.O.'s

In three-phase network (+N) 230/400 V according to IEC 60947.2

		m.c.b. upstream			
		DX-h Lexic 10000 A Courbes B, C			
r.c.b.o. downstream		≤ 20 A	25 A	32 A	40 – 63 A
DX 10 000 A Curve C	≤ 20 A	25 kA	20 kA	15 kA	12.5 kA
	25 A	-	20 kA	15 kA	12.5 kA
	32 A	-	-	-	12.5 kA
	45 A	-	-	-	12.5 kA

		Fuse upstream	
		Type gG	
r.c.b.o. downstream		20 – 50 A	63 – 125 A
DX 10 000 A Curve C	≤ 20 A	100 kA	100 kA
	25 A	100 kA	100 kA
	32 A	100 kA	100 kA
	45 A	100 kA	100 kA

		m.c.b. upstream	
		DPX 125	DPX 400
DX 10 000 A Curve C	≤ 20 A	35 kA	50 kA
	25 A	35 kA	50 kA
	32 A	35 kA	50 kA
	45 A	35 kA	50 kA

5. GENERAL CHARACTERISTICS (continued)

SELECTIVITY

Selectivity limit in ampere

r.c.b.o. downstream		m.c.b. upstream								
		Curve B								
		DX 6000 A / 10 kA Lexic – DX-h 10000 A / 25 kA Lexic								
		10 A	13 A	16 A	20 A	25 A	32 A	40 A	50 A	63 A
DX 10 000 A Curve C	10 A					100	128	160	200	252
	16 A							160	200	252
	20 A								200	252
	25 A									252
	32 A									
	45 A									

r.c.b.o. downstream		m.c.b. upstream											
		Curve C											
		DX 6000 A Lexic – DX-h 10000 A Lexic											
		10 A	13 A	16 A	20 A	25 A	32 A	40 A	50 A	63 A	80 A	100 A	125 A
DX 10 000 A Curve C	10 A		90	120	150	187	240	300	375	472	1150	1450	1800
	16 A				150	187	240	300	375	472	950	1200	1500
	20 A					187	240	300	375	472	900	1100	1400
	25 A						240	300	375	472	850	1000	1300
	32 A							300	375	472	750	950	1200
	45 A								375	472	650	800	1000

r.c.b.o. downstream		m.c.b. upstream											
		Curve D											
		DX 6000 A Lexic											
		10 A	13 A	16 A	20 A	25 A	32 A	40 A	50 A	63 A	80 A	100 A	125 A
DX 10 000 A Curve C	10 A		156	192	240	300	384	480	600	756	1750	2150	2700
	16 A				240	300	384	480	600	756	1400	1800	2200
	20 A					300	384	480	600	756	1350	1650	2100
	25 A						384	480	600	756	1300	1500	2000
	32 A							480	600	756	1100	1450	1800
	45 A								600	756	950	1200	1500

## 5. GENERAL CHARACTERISTICS *(continued)*

### SELECTIVITY *(continued)*

m.c.b. downstream		m.c.c.b. upstream										
		DPX 125				DPX 160		DPX 250				DPX 400 à 1600
		40 A	63 A	100 A	125 A	100 A	160 A	63 A	100 A	160 A	250 A	250 A
DX 10 000 A Curve C	10 A	5000	5000	7500	7500	7000	T	5000	T	T	T	T
	16 A	4000	4000	6000	6000	6000	T	4000	T	T	T	T
	20 A	3000	3000	5000	5000	5000	T	4000	8000	T	T	T
	25 A	3000	3000	4500	4500	4000	8500	3000	6000	8500	T	T
	32 A		2000	4000	4000	3500	7000	2000	5000	7000	T	T
	45 A		2000	3000	3000	2500	6000	2000	4000	6000	T	T

r.c.b.o. downstream		Fuse upstream									
		Type gG									
		25 A	32 A	40 A	50 A	63 A	80 A	100 A	125 A	160 A	
DX 10 000 A Curve C	10 A			1600	2200	3200	3600	7000	T	T	
	16 A			1400	1800	2600	3000	56000	8000	T	
	20 A			1200	1500	2200	2500	4600	6300	T	
	25 A				1300	2000	2200	4100	5500	8000	
	32 A				1200	1700	1900	3500	4500	7000	
	45 A						1700	3000	4000	5000	

r.c.b.o. downstream		Fuse upstream									
		Type AM									
		25 A	32 A	40 A	50 A	63 A	80 A	100 A	125 A	160 A	
DX 10 000 A Curve C	10 A		1100	1700	2500	5000	7800	T	T	T	
	16 A		1000	1400	2100	4000	6000	9000	T	T	
	20 A			1300	1800	3400	5100	7000	T	T	
	25 A			1100	1600	3000	4500	6000	9300	T	
	32 A				1300	2400	3800	5000	7700	T	
	45 A					2100	3100	4200	6400	8000	

## 6. CONFORMITIES AND APPROVALS

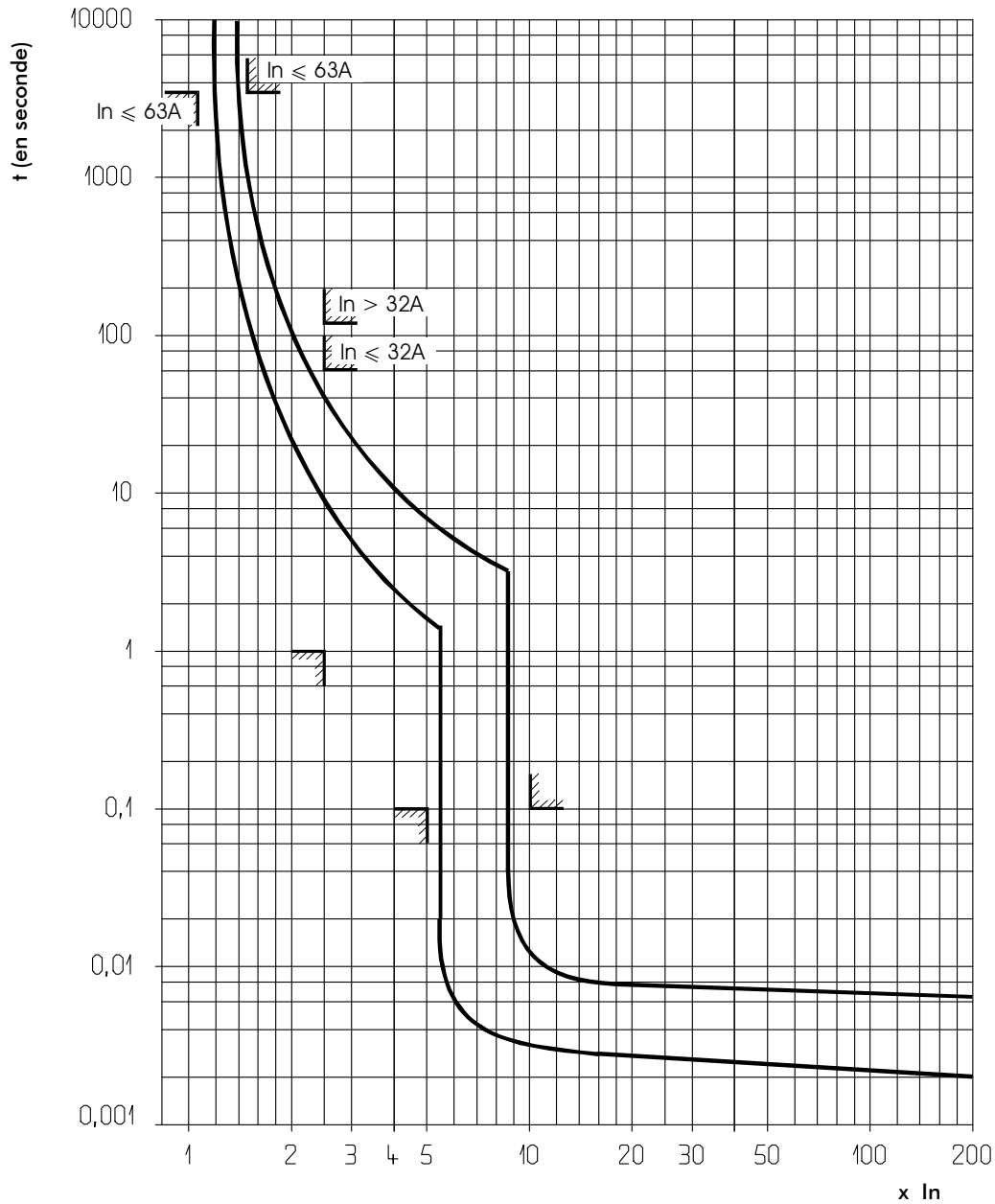
### Compliance with standards :

. IEC 61009-1



7. CURVES

Magneto-thermal tripping zone : R.C.B.O.'s DX, curve C



Thermal tripping at ambient temperature = 30°C  
 $I_n$  = Rated Current

