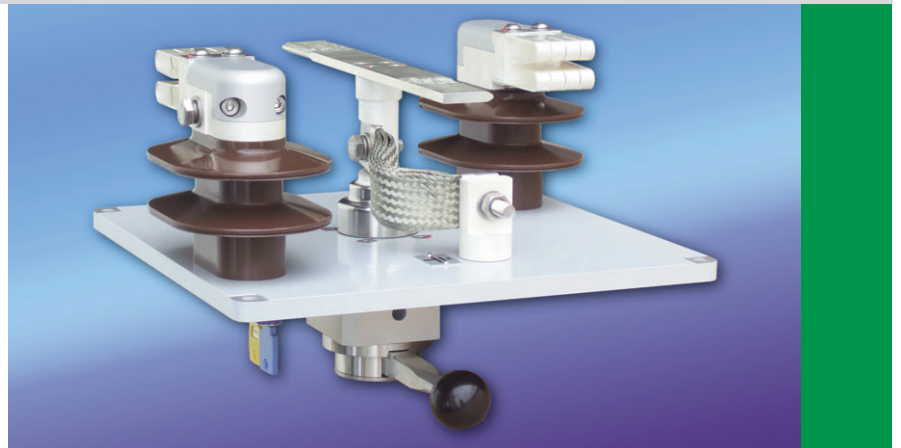


Earthing Switch for rolling stock  
Type **BTE 03.04**



With the **BTE 03.04**, Secheron offers a complete range of safety switches designed to earth multiple circuit points operating under voltages with a rated insulation voltage up to 4800 Volts.

The **BTE 03.04** is a combination of twin poles that are simultaneously switched either manually or electrically. The safety position of the manually operated switch is secured through a system of master and slave keys, which mechanically interlocks the **BTE 03.04** with the other upstream and downstream safety devices.

For the electrically operated version, integrated auxiliary switches will enable the car builder to manage electrically the earthing safety interlocks.

The **BTE 03.04-** is suitable for vehicle's indoor mounting, while the **BTE 03.04R** is particularly adapted to outdoor roof mounting.

Its compact dimensions associated with severe testing procedures, make the **BTE 03.04** the ideal solution to earth the high voltage circuits of your traction vehicles.

## Applications

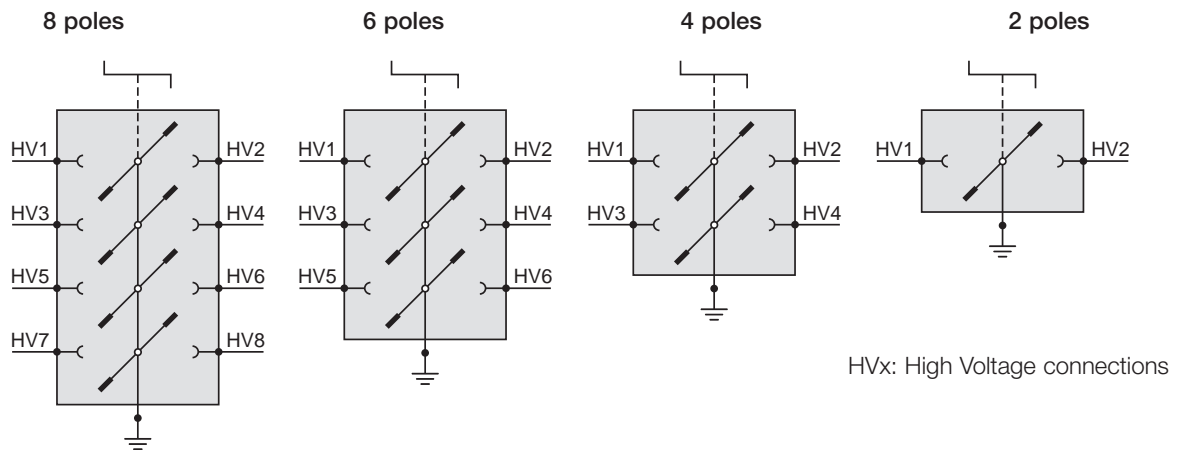
Earthing of traction circuits on locomotives, trains and EMUs running on ac and/or dc networks.

## Main features

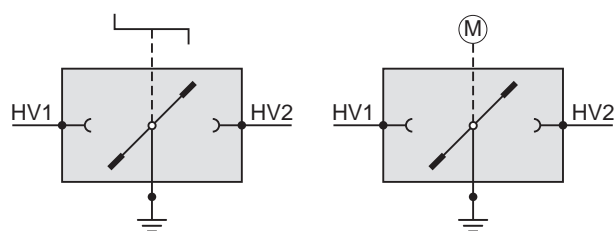
- Insulation voltage up to 4800 Vac/Vdc
- High rated short-time withstand current
- Safety device with interlockings
- Indoor or outdoor mounting
- Minimum maintenance requirements
- Reference standards: IEC60077-1 /-2; IEC61373; NF F16-101 /-102

## Schematic representation

### Indoor mounting (BTE 03.04-)



### Outdoor mounting (BTE 03.04R)



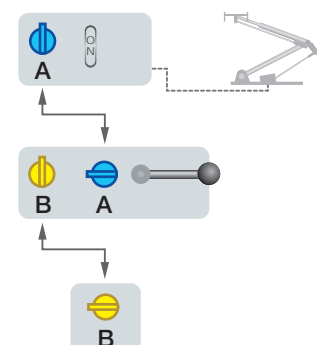
HVx: high voltage connections

### Example of keys interlocking

Pneumatic interlocking valve type **BSV**

**BTE 03.04**

Doors locks



## Technical data

	Symbol	Unit	BTE 03.04-	BTE 03.04R
<b>MAIN HIGH VOLTAGE CIRCUIT</b>				
Rated insulation voltage	$U_i$	[kVac/dc]	4.8	4.8
Number of poles			2,4,6,8	2
Peak and rated short-time withstand current				
- ac	$\hat{I}_{cw}/I_{cw}/t$	[kA]/[kA]/[s]	63/25/1	63/25/1
- dc	$\hat{I}_{cw}/I_{cw}/t$	[kA]/[kA]/[s]	63/44/0.25	63/44/0.25
Overvoltage category				
- Pole-pole			OV3	OV4
- Pole-earth			OV4	OV4
Rated power-frequency withstand voltage <sup>(1)</sup>	$U_{50}$	[kV <sub>rms</sub> ]	11.6	18.5
Rated impulse withstand voltage (1.2 / 50 $\mu$ s)				
- Pole-pole	$U_{imp}$	[kV]	30	40
- Pole-earth	$U_{imp}$	[kV]	40	40

(1) At 50 Hz during 1 minute

## LOW VOLTAGE AUXILIARY CIRCUIT

### Control circuit

Type of operation			Manual	Manual or electric
Electric version				
- Nominal voltage	$U_n$	[Vdc]	-	24,36,48/50,72,110
- Range of voltage			-	[0.7 - 1.25] $U_n$
- Control power <sup>(2)</sup>	P	[W]	-	125
- Commutation time <sup>(2)</sup>		[s]	-	$\leq 3$

(2) At  $U_n$  and  $T_{amb} = +20^\circ\text{C}$

### Auxiliary contacts

Type of contacts (refer to definition page 7)			Change-over	Change-over
Rated voltage		[Vdc]	24 to 110	24 to 110
Conventional thermal current	$I_{th}$	[A]	10	10
Maximum breaking capacity at 110 Vdc and $\tau=5$ ms		[A]	0.75	0.75
Minimum let-through current at 24 Vdc <sup>(3)</sup>		[mA]	10 (silver contacts) 4 (gold contacts)	10 (silver contacts) 4 (gold contacts)

(3) For clean and dry environment

### Low voltage interface

Type of connection <sup>(4)</sup>			Direct	Direct
- Manual version			-	Wagoline
- Electric version			-	Wagoline

(4) Refer to page 7 for mobile connector informations

### Insulation

Rated power-frequency withstand voltage <sup>(5)</sup>	$U_{50}$	[kV <sub>rms</sub> ]	1.5	1.5
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(5) At 50 Hz during 1 minute

## OPERATING CONDITIONS

Installation			Indoors	Outdoors
Altitude		[m]	<1400	<1400
Working ambient temperature	$T_{amb}$	[°C]	-40 to +70 -50 to +70 (in option)	-40 to +70 -50 to +70 (in option)
Humidity			Class 5K2	Class 5K2
Pollution degree			PD3	PD4
Minimum mechanical durability	N	Cycles	$\geq 20'000$	$\geq 20'000$
Protection index:				
- HV part			IP00	IP00
- LV part			IP00	IP00; IP3x <sup>(6)</sup> (option)
- Tightness between upper and lower part when installed			IP00	IP65 <sup>(7)</sup>

(6) With optional LV protection cover (for motorized version only)

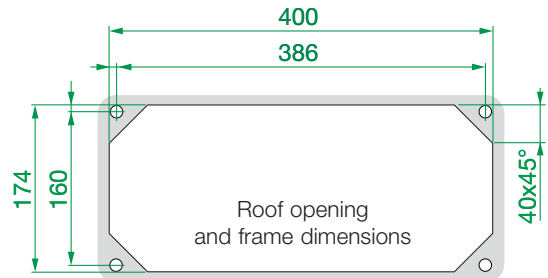
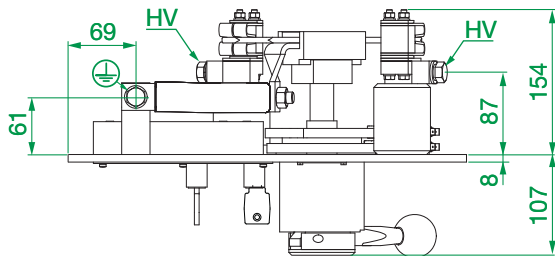
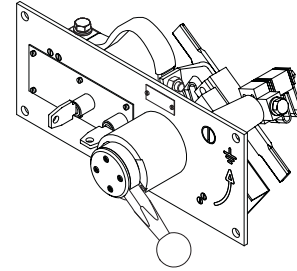
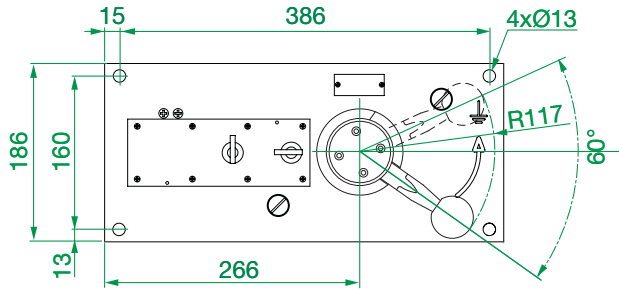
(7) Delivered with an O-ring seal

## Main dimensions (standard version)

The DIN-ISO 2768-1 coarse tolerances are applied to these dimensions. All dimensions are in mm.  
 The maximum allowed flatness deviation of the support frame is 1 mm.  
 HV and earth connections: M12 screws

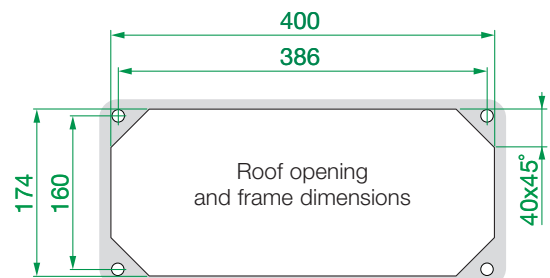
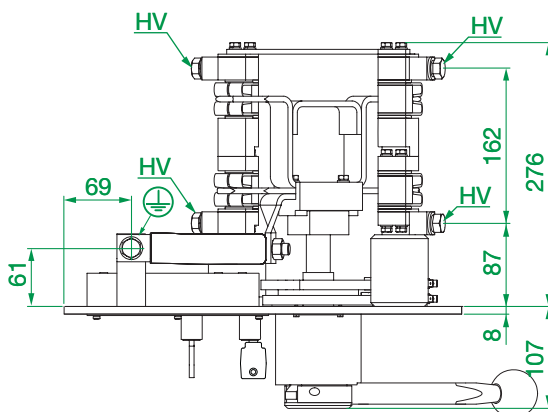
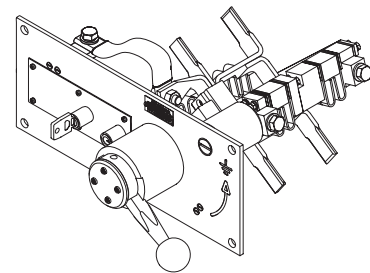
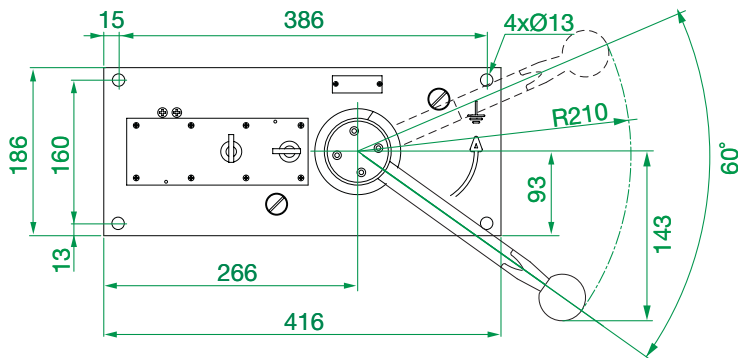
### 2 poles indoor version BTE 03.04- (manual version)

Weight:  $11 \pm 0.5$  kg



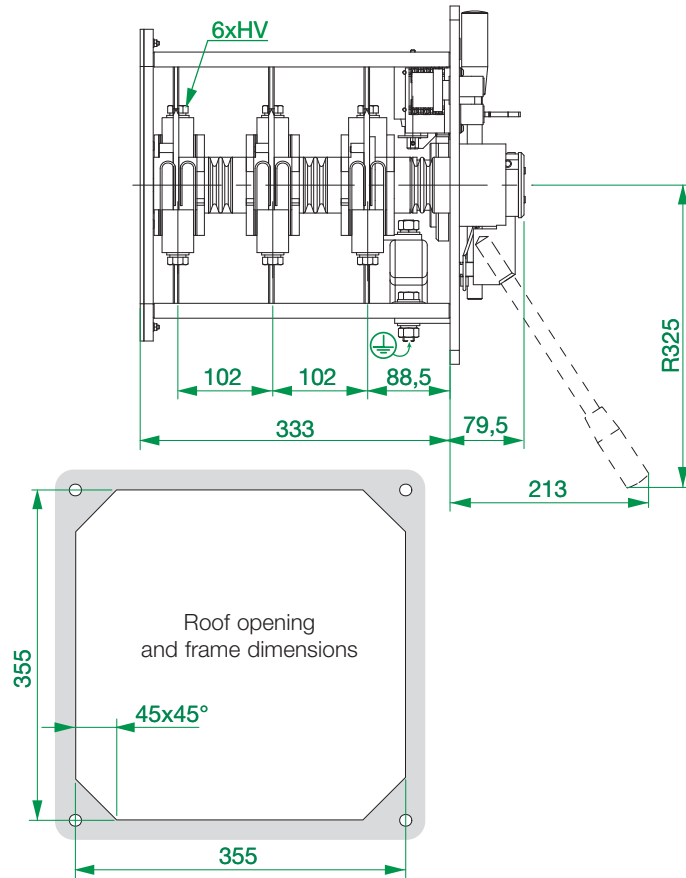
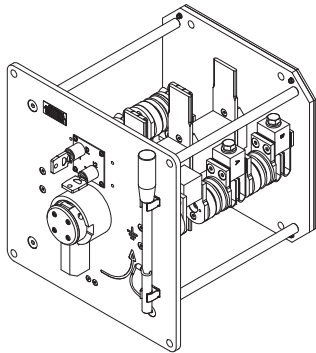
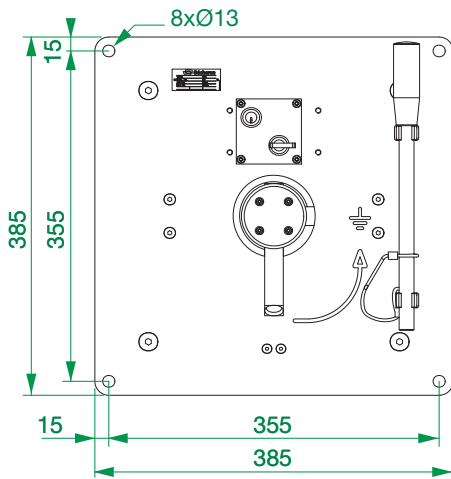
### 4 poles indoor version BTE 03.04- (manual version)

Weight:  $12 \pm 0.5$  kg



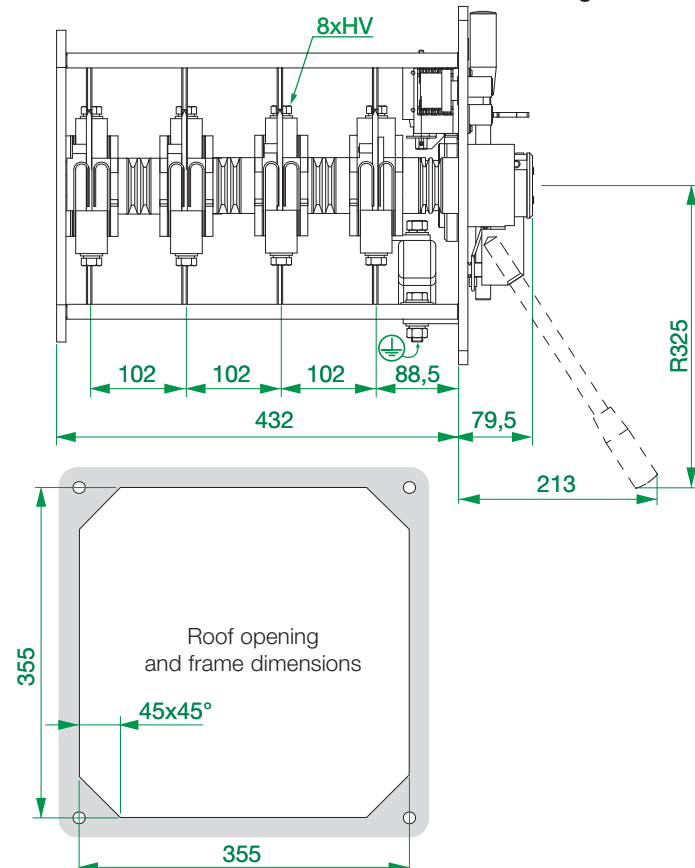
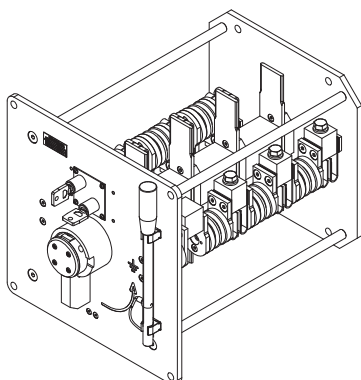
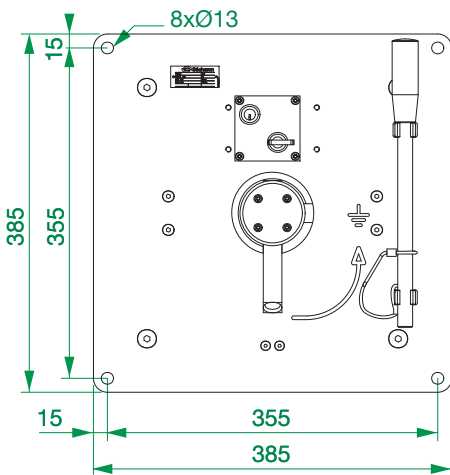
6 poles indoor version BTE 03.04- (manual version)

Weight: 23 ± 1 kg



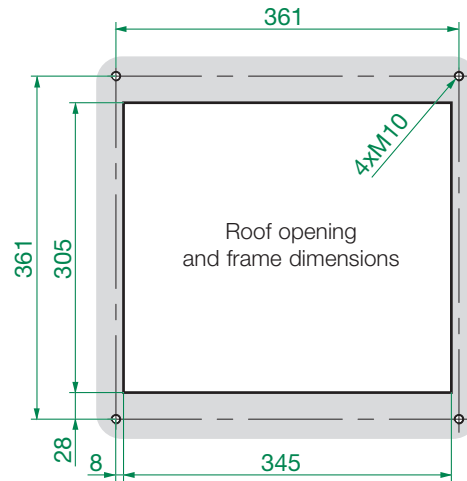
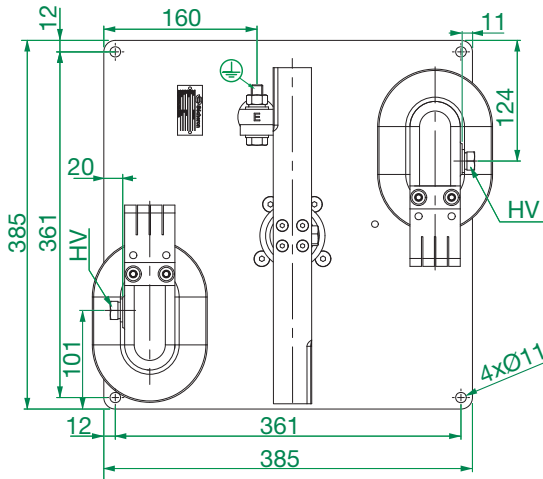
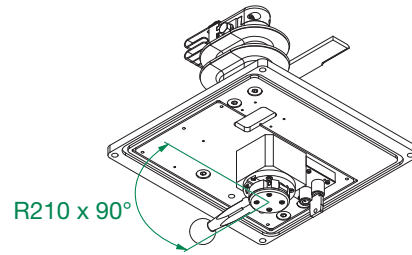
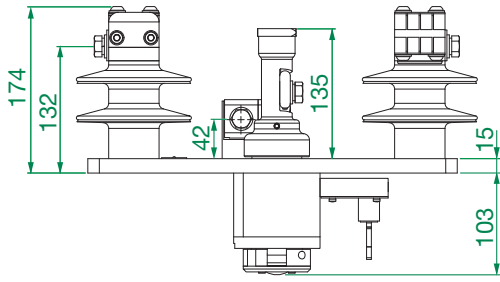
8 poles indoor version BTE 03.04- (manual version)

Weight: 28.5 ± 1 kg



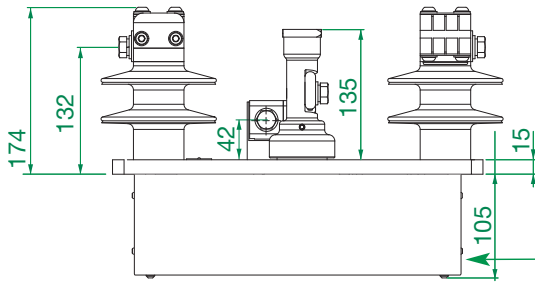
2 poles outdoor version BTE 03.04R (manual version)

Weight:  $17 \pm 0.5$  kg

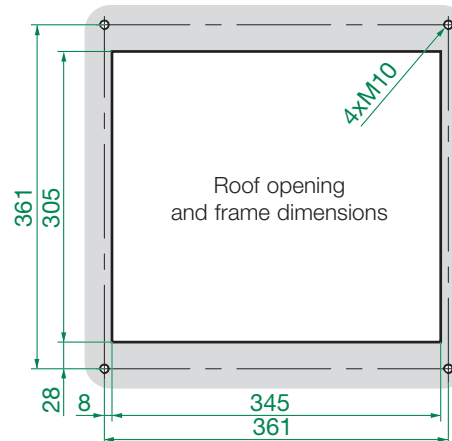
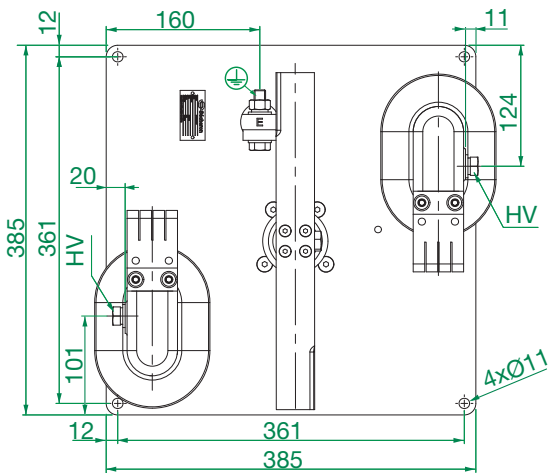
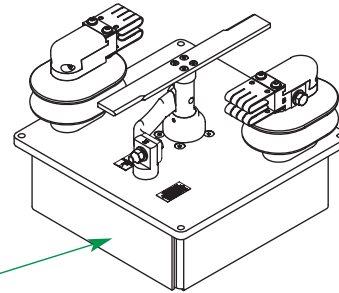


2 poles outdoor version BTE 03.04R (electric version)

Weight:  $19 \pm 1$  kg



Optional low voltage protecting cover



## Control equipment for optional electric version



Two integrated interlocked contactors control the moving knife operation.

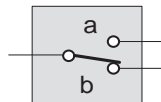
## Designation code for interlocking keys

Different colors are available for keys and locks

Master key	None	1 blue + ...			1 yellow + ...				1 green + ...			
Slave key	-	1 yellow	2 yellow	3 yellow	1 green	2 green	3 green	4 green	1 black	2 black	3 black	4 black
Code	Z	B	C	D	H	I	J	K	N	P	Q	R

## Definition of the auxiliary switches



Change-over switch  
Type: CO



The contact "a" corresponds to a NO (Normally Open) contact.  
The contact "b" corresponds to a NC (Normally Close) contact.

## Part numbers for separately ordered item

### LV mobile connectors for BTE 03.04R electric version only

Auxiliary switches		Fixed connector type	Mobile connector					
			Type	Number of pin		Cable gland	Cable entry	Secheron's number
Number	Type	Size 2.5 mm <sup>2</sup>		Size 1.5 mm <sup>2</sup>				
Electric version								
2a + 2b	CO	Harting HAN 24 DD	Harting HAN 24 DD	7	7	M28		SP1850005R00003
4a + 4b	CO	Harting HAN 24 DD	Harting HAN 24 DD	7	13	M28		SP1850005R00004

The above references are given considering that all the auxiliary contacts are wired, and with an external wire diameter of 3.7 mm (for 2.5mm<sup>2</sup> section) and 2.9 mm (for 1.5 mm<sup>2</sup> section). If the conditions are different from these, the above references may change. In such case please inform Sécheron accordingly.

## Designation code informations

- Be sure to establish the designation code from the latest version of our brochure by downloading it from the website: [www.secheron.com](http://www.secheron.com).
- Be careful to write down the 16 digits for the type designation code when placing your order.
- It could be, for technical reasons, that some configurations of variants and options indicated in the designation code cannot be combined.
- For other configurations not described in the brochure, please contact Secheron.

**Designation code (options are subject to additional costs) - Order form**

Line	Description	Designation	Standard	Options	Customer's choice
10	Product type	BTE0304	<b>BTE0304</b>		BTE0304
11	Installation	Indoors Outdoors	- R		
12	Number of poles	2 (Only BTE03.04-) 4 (Only BTE03.04-) 6 (Only BTE03.04-) 8	2 4 6 8		
13	Operation	Manual (BTE03.04R only) Electric	M	E	
14	Control voltage (electric operation only)	(Manual operation) Not applicable 24 Vdc 36 Vdc 48 Vdc 72 Vdc 110 Vdc	Z A B C D E		
15	Key configuration (1)	(Electric operation) Not applicable 1 blue +1 yellow 1 blue +2 yellow 1 blue +3 yellow 1 blue +4 yellow 1 yellow +1 green 1 yellow +2 green 1 yellow +3 green 1 yellow +4 green	Z	B C D E H I J K	
16	Key and lock codification	(Electric operation) Not applicable No Yes (1 code per unit)	Z 0	1	
17	Auxiliary contacts (2)	(Manual operation only) None 2a+2b - (switch CO) - silver type 2a+2b - (switch CO) - gold type 4a+4b - (switch CO) - silver type (3) 4a+4b - (switch CO) - gold type (3)	0 1 2 3 4		
18	Low voltage protecting cover (3)	(BTE03.04- or BTE03.04R manual version) Not applicable No Yes (Electric operation) IP3x	Z 0	1	
19	Ambient temperature range	-40°C to +70°C -50°C to +70°C	1	2	

- (1) Refer to page 7 for other key colors codification  
 (2) Refer to page 7 for the definition of the auxiliary switches  
 (3) For BTE 03.04R electric version only

The low voltage mobile connector must be ordered separately (refer to page 7):  SP1850005R00003  
 SP1850005R00004

<b>Example of customer's choice:</b>	<b>BTE0304</b>	R	2	E	A	Z	Z	3	1	1
Line:	10	11	12	13	14	15	16	17	18	19

The bold characters of the designation code define the device type.

Place and date:	Signature:
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