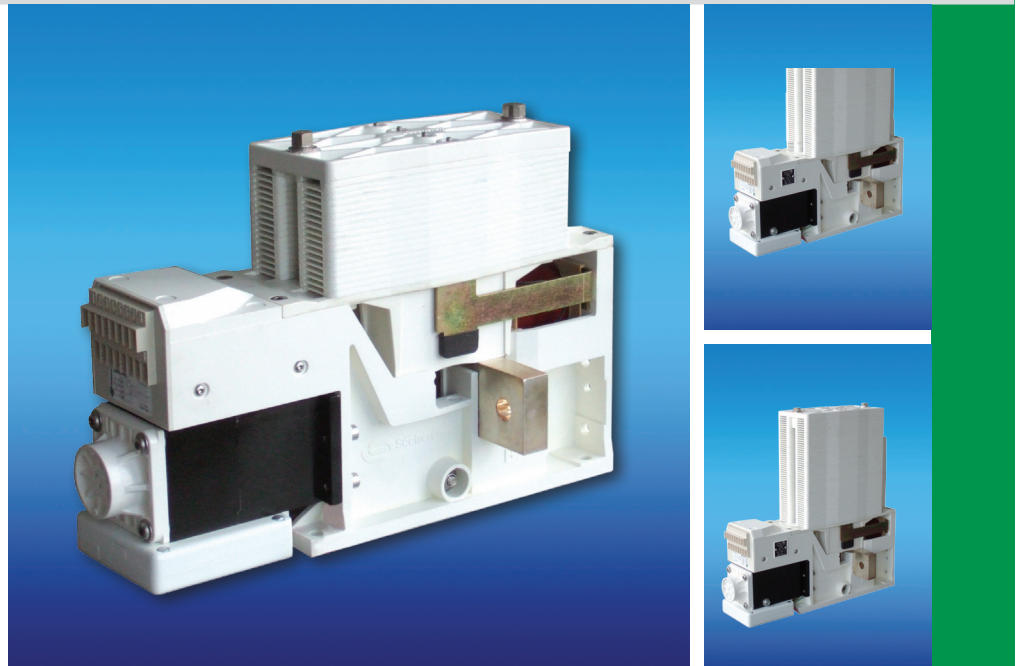


COMPONENTS

Contactor range
Type SEC



General information

The **SEC** contactor is a high duty class component, designed to withstand the most severe applications in terms of environment and required performances for rail mobility or fixed installations. Combining high electrical and mechanical endurance, efficient low current bi-directional

blow-out device, and a smart control unit making the **SEC** operation independent from both ambient temperature and control voltage, the **SEC** is a unique contactor to be used almost regardless of the service conditions.

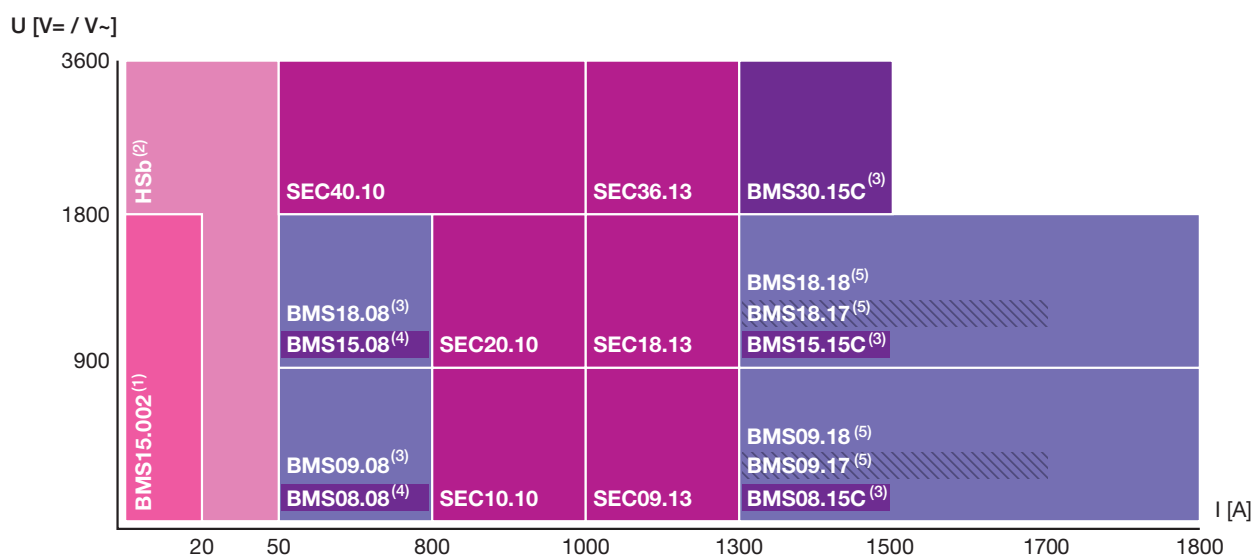
Applications

Electric traction vehicles: locomotives, trains, EMUs and tramways / light rail vehicles.
Fixed installation: DC traction substations and other industrial fields.

Main features

- Rated operational voltage 900 V to 4000 V (DC and AC)
- Rated free air thermal current 1000 A or 1300 A
- High insulation level (overvoltage category OV3)
- Operational frequency category C3 for 1000 A and C2 for 1300 A with a minimum mechanical durability of 2'000'000 operations
- Efficient blow-out circuit for low current interruptions
- Reduced power consumption thanks to a coil controller that controls the closing and opening operations
- Closing and opening performances independent from both control voltage level and ambient temperature
- Horizontal or vertical mounting
- Double pair of main contacts allowing a longer life time
- Low maintenance requirements and easy access to the main contacts for replacement
- Reference standards: IEC60077-1 /-2 , IEC61373, EN50121-3-2, NF F16-101 /-102

Product range



(1) Not covered by this document. Refer to the brochure DW 6048e-12.94 Contactor Type BMS 15.002 for Traction and Industry

(2) Not covered by this document. Refer to the brochure DW 6047e-12.94 Contactors Type HS for Traction and Industry

(3) Not covered by this document. Refer to the brochure SGS202168BEN Contactors range Type BMS09.08 / BMS18.08

(4) Not covered by this document. Refer to the brochure DW 6046a-E-09.96 Contactors Type BMS and BPS for Traction and Industry

(5) Not covered by this document. Refer to the brochure SGS202454BEN High Power Contactor Type BMS..17 / BMS..18

Data for product selection

Technical data

	Symbol	Unit	SEC10.10	SEC20.10	SEC40.10	SEC09.13	SEC18.13	SEC36.13
MAIN HIGH VOLTAGE CIRCUIT								
Rated operational voltage (16.7, 50/60 Hz)	U_e	$[V_{DC}]$	1000	2000	4000	900	1800	3600
		$[V_{AC}]$	1000	2000	4000	900	1800	3600
Rated insulation voltage	U_i	$[V_{DC/AC}]$	2000	2000	4000	2000	2000	4000
Conventional free air thermal current ⁽¹⁾	I_{th}	[A]	1000	1000	1000	1300	1300	1300
Rated operational current ⁽²⁾	I_e	[A]	1000	1000	1000	1300	1300	1300
Making capacity	I_{mc}	[A]	4000	3000	2500	2500	2000	2000
Maximum breaking capacity	I_{bc}	[A]	4000	3000	2500	2500	2000	2000
		$[A_{rms}]$	2800	2100	1800	1800	1400	1400
Breaking overvoltage	\dot{U}_c	[V]	≤ 2000	≤ 3500	≤ 7000	≤ 2000	≤ 3500	≤ 7000
Overvoltage category			OV3	OV3	OV3	OV3	OV3	OV3
Rated short-time withstand current	I_{cw}/t	[kA]/[ms]	10/100	10/100	10/100	10/100	10/100	10/100
Rated power-frequency withstand voltage ⁽⁴⁾	U_{50}	[kV _{rms}]	4.7 / 6.0	4.7 / 6.0	7.9 / 10	4.7 / 6.0	4.7 / 6.0	7.9 / 10

⁽¹⁾ At $T_{amb} = +40^\circ\text{C}$ and tested with size of high voltage cable connections per terminal:

2x240mm² for SEC XX.10 and 3x240mm² for SEC XX.13

⁽²⁾ Operational frequency: C3 for 1000 A and C2 for 1300 A

⁽³⁾ $\cos \Phi = 0.8$ (16.7, 25 & 50/60 Hz)

⁽⁴⁾ Pole-pole / main circuit-earth at 50 Hz and during 1 minute

LOW VOLTAGE AUXILIARY CIRCUIT

Control circuit

Nominal voltage	U_n	$[V_{DC}]$	[24 - 37.5] or [48 - 110]
Range of voltage			[0.7 - 1.25] U_n
Nominal closing power ⁽⁵⁾	P_c	[W]	≤ 60 (duration ≤ 0.5 s)
Nominal holding power ⁽⁵⁾	P_h	[W]	≤ 4
Input control voltage	U_{ef}	$[V_{DC}]$	24 to 110
Input control current		[mA]	10 (24 V_{DC}) to 2 (110 V_{DC})

⁽⁵⁾ At U_n and $T_{amb} = +20^\circ\text{C}$

Auxiliary contacts

Type of contacts		Potential free (PF)	
Rated voltage	$[V_{DC}]$	24 to 110	
Conventional thermal current	I_{th}	[A]	10
Switching categories according to EN60947 (silver contacts)			-AC-15 230 V_{AC} 1.0 A
			-DC-13 110 V_{DC} 0.5A
Minimum let-through current at 24 V_{DC} ⁽⁶⁾		[mA]	≥10 (silver contacts) or 4 ≤ I < 10 (gold contacts)

⁽⁶⁾ For a dry and clean environment

Low voltage interface

Type of connection		Terminal block or AMP 18 pins connector
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Insulation

Rated power-frequency withstand voltage ⁽⁷⁾	U_{50}	[kV _{rms}]	1.5
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⁽⁷⁾ At 50 Hz and during 1 minute

OPERATING CONDITIONS

Installation		Indoors	
Altitude		<1400	
Working ambient temperature ⁽⁸⁾	T_{amb}	[°C]	-40 to +70
Humidity		Class 5K2	
Pollution degree		PD3	
Minimum mechanical durability	N	[Cycles]	2'000'000

⁽⁸⁾ For ambient temperature lower than -40 °C please contact Secheron

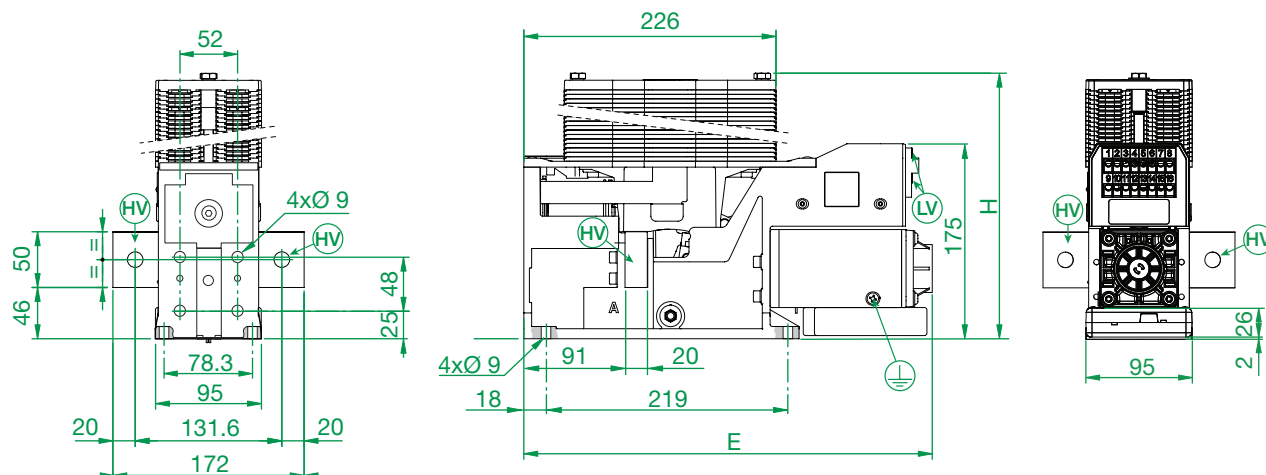
Information for product integration

Main Dimensions

Dimensions without tolerances are indicative. All dimensions are in mm. The maximum allowed flatness deviation of the support frame is 0.5 mm.

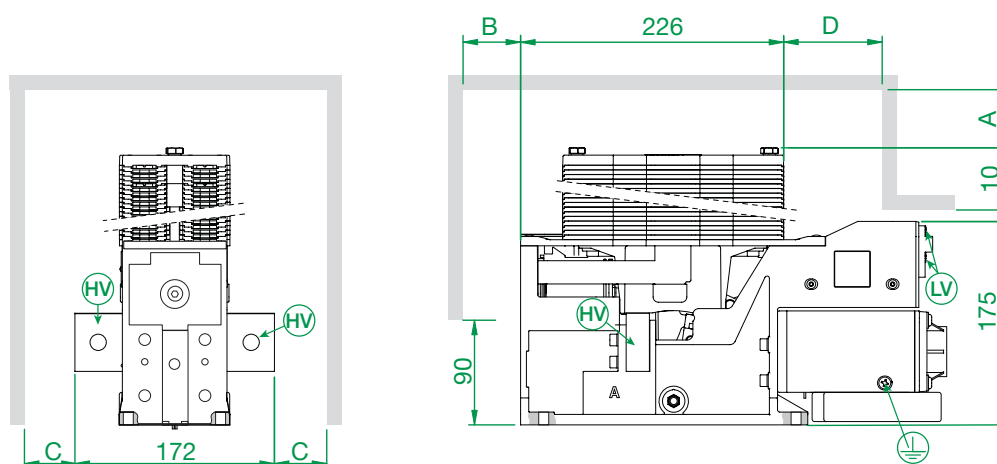
HV connections : M12 screws
 Earth connection : M6 screw
 LV connections : M3 screws (terminal block)
 or AMP connector (option)

High voltage lateral connections



	SEC10.10 SEC09.13	SEC20.10 SEC18.13	SEC40.10 SEC36.13
E	366	366	371
H	239	275	375

Insulation distances and weights



	SEC10.10 SEC09.13	SEC20.10 SEC18.13	SEC40.10 SEC36.13
A	30 ⁽¹⁾ / 50 ⁽²⁾	30 ⁽¹⁾ / 50 ⁽²⁾	30 ⁽¹⁾ / 50 ⁽²⁾
B ⁽³⁾	50 ⁽¹⁾ / 100 ⁽²⁾	50 ⁽¹⁾ / 100 ⁽²⁾	100 ⁽¹⁾ / 200 ⁽²⁾
C	20 ⁽¹⁾ / 30 ⁽²⁾	20 ⁽¹⁾ / 50 ⁽²⁾	50 ⁽¹⁾ / 80 ⁽²⁾
D	50 ⁽¹⁾ / 100 ⁽²⁾	50 ⁽¹⁾ / 100 ⁽²⁾	100 ⁽¹⁾ / 200 ⁽²⁾
Weight	11 kg	12.5 kg	16 kg

(1) Clearance against insulating wall.

(2) Clearance against earth.

(3) For breaking current $\leq 2\text{kA}$ ($\leq 1\text{kA}$ for SEC40.10 and SEC36.13). For higher breaking conditions please contact Sécheron.

Low voltage control scheme

The two following different modes can be used to control the SEC.

Note! Isolated or non-isolated control mode is to be determined when ordering. Please refer to codification page 8. In case the customer needs to have the full electrical compatibility with former coil controller version, the "Non-isolated control input" version must be ordered.

Required data for K_0 and K_1 control relays:

K_0 relay's data:

U_n [VDC]	\hat{I}_{pl} [A]	\hat{I}_h [A]	I_{sb} [mA]	I_{pk} [mA]
24 - 36	4.5	0.85	<30	<500
48 - 110	2.5	0.45		

K_1 relay's data

U_n [VDC]	I [mA]
24	~10
110	2

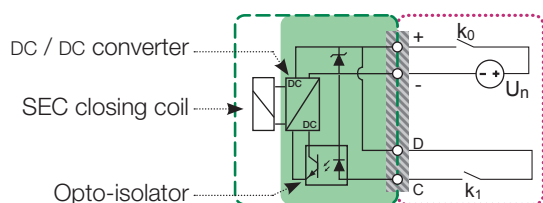
Legend

- - - - : Sécheron's scope
- : Customer's scope
- : Low voltage interface
- : Coil controller
- U_n : DC power supply
- U_{EF} : Control voltage ⁽¹⁾
- k_0 : Supply relay
- k_1 : Control relay

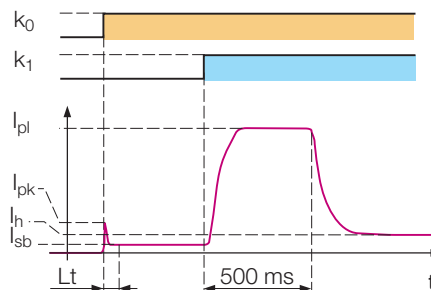
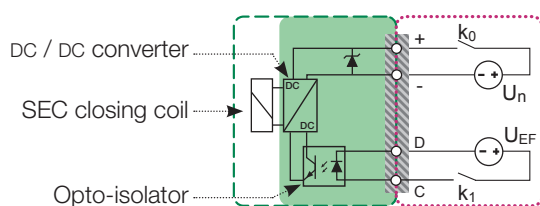
⁽¹⁾ Control voltage (U_{EF}) can be different from supply voltage (U_n).

Indirect mode

Non-isolated control input



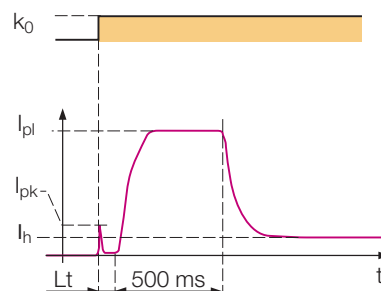
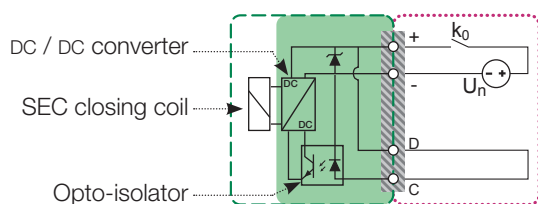
Isolated control input



Lt : Loading time ($\leq 70ms$)

Direct mode

Non-isolated control input



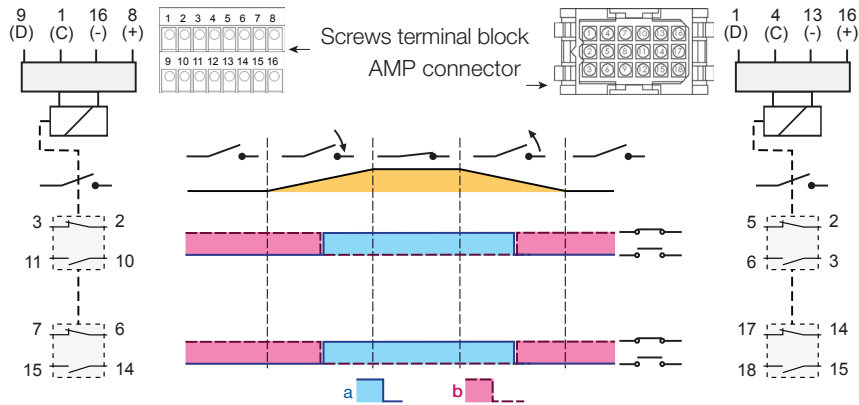
Lt : Loading time ($\leq 70ms$)

Low voltage wiring diagrams

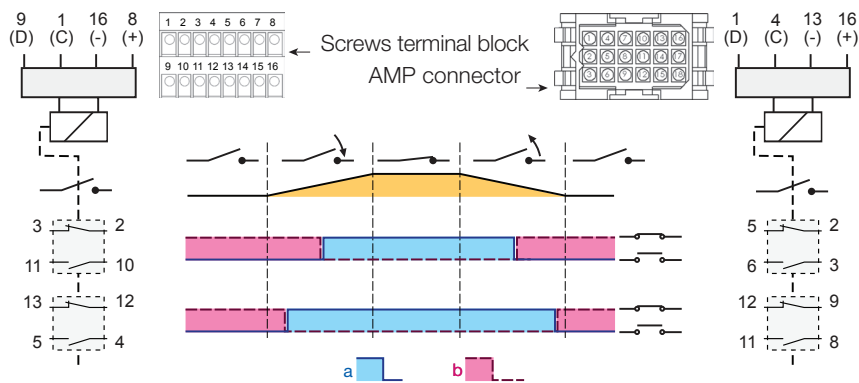
Legend of the schemes:



Wiring diagram with 2a + 2b auxiliary switches (Configuration 1) - Standard

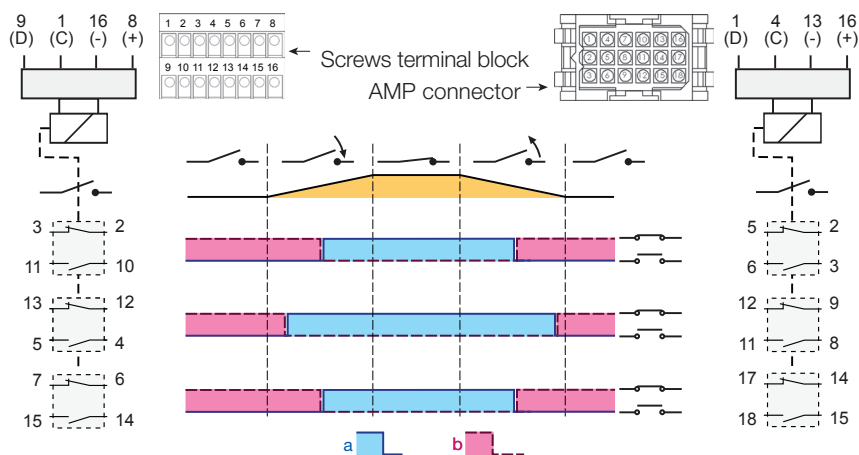


Wiring diagram with 2a + 2b auxiliary switches (Configuration 2) - Option



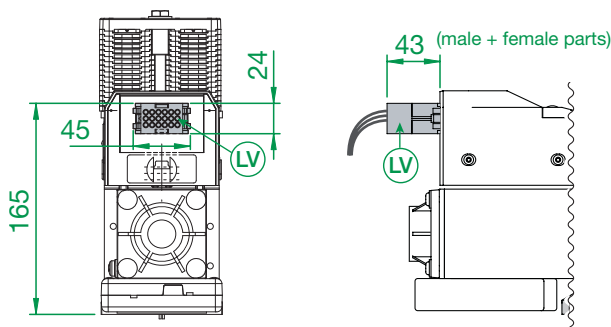
Note! Difference between configuration 1 & 2 relates to the switching offset time between auxiliary switches.

Wiring diagram with 3a + 3b auxiliary switches - Option



Options (subject to additional costs)

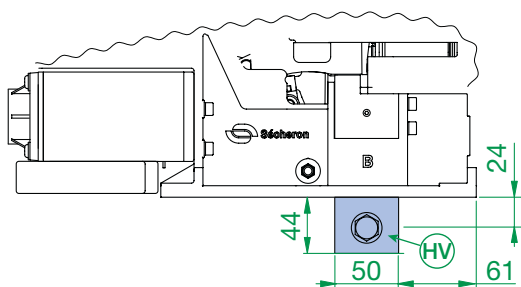
Low voltage AMP connector



The low voltage AMP mobile connector can be ordered separately.

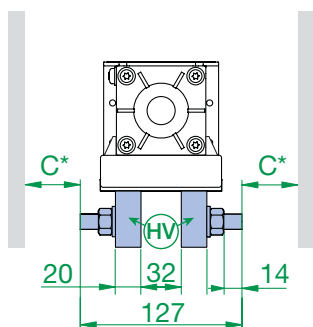
Mobile connector	
Type	Secheron's number
AMP connector 18 pins for 0.5 mm ²	SG201013R1
AMP connector 18 pins for 1.5 mm ²	SG201013R2

High voltage bottom connections



- HV connections : M12 screws
- Earth connection : M6 screw
- LV connections : M3 screws (terminal block)
or AMP connector (option)

Insulation distances and weights



	SEC 10.10 SEC 09.13	SEC 20.10 SEC 18.13	SEC 40.10 SEC 36.13
C	20 ⁽¹⁾ / 30 ⁽²⁾	20 ⁽¹⁾ / 50 ⁽²⁾	50 ⁽¹⁾ / 80 ⁽²⁾
Weight	12 kg	13.5 kg	17 kg

⁽¹⁾ Clearance against insulating wall.

⁽²⁾ Clearance against earth.

For higher breaking conditions please contact Sécheron.

Designation code for ordering

Designation code information

- Be sure to establish the designation code from our latest version of the brochure by downloading it from our website "www.secheron.com".
- Be careful to write down the complete alphanumeric designation code with 12 characters when placing your order.
- For technical reasons some variants and options indicated in the designation code might not be combined.
- The bold part of this designation code defines the device type, and the complete designation defines the identification number of the product, as displayed on the identification plate attached to the product.

Example of customer's choice:	SEC	10	10	01	S	1	0
Line:	10	11	12	13	14	15	16

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

Line	Description	Designation	Standard	Options	Customer's choice
10	Product type	SEC	SEC		SEC
11	Rated operational voltage	1000 V 2000 V 4000 V 900 V 1800 V 3600 V	10 20 40 09 18 36		
12	Rated thermal current (at $T_{amb} = +40^{\circ}\text{C}$)	(1000, 2000 and 4000 V) 1000 A (900, 1800 and 3600 V) 1300 A	10 13		
13	High voltage connections	Lateral Bottom with screws	01	02	
14	Nominal control voltage - control input type	24 to 37.5 V _{DC} - Isolated 48 to 110 V _{DC} - Isolated 24 to 37.5 V _{DC} - Non-isolated 48 to 110 V _{DC} - Non-isolated	P S	L M	
15	Auxiliary contacts	2a + 2b - (switch PF) - silver type - Configuration 1 2a + 2b - (switch PF) - gold type - Configuration 1 2a + 2b - (switch PF) - silver type - Configuration 2 2a + 2b - (switch PF) - gold type - Configuration 2 3a + 3b - (switch PF) - silver type 3a + 3b - (switch PF) - gold type	1	4 2 6 3 5	
16	Low voltage interface	Screw terminal block AMP 18 pins connector	0	1	

The low voltage connector must be ordered separately (refer to above description):

- None
- AMP connector 18 jacks for 0.5 mm² SG201013R1
- AMP connector 18 jacks for 1.5 mm² SG201013R2

Place and date:

Name:

Signature:



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