

CONTACTORS

Type **BMS...08** for Permanent Magnet Synchronous Motors

RAIL VEHICLES

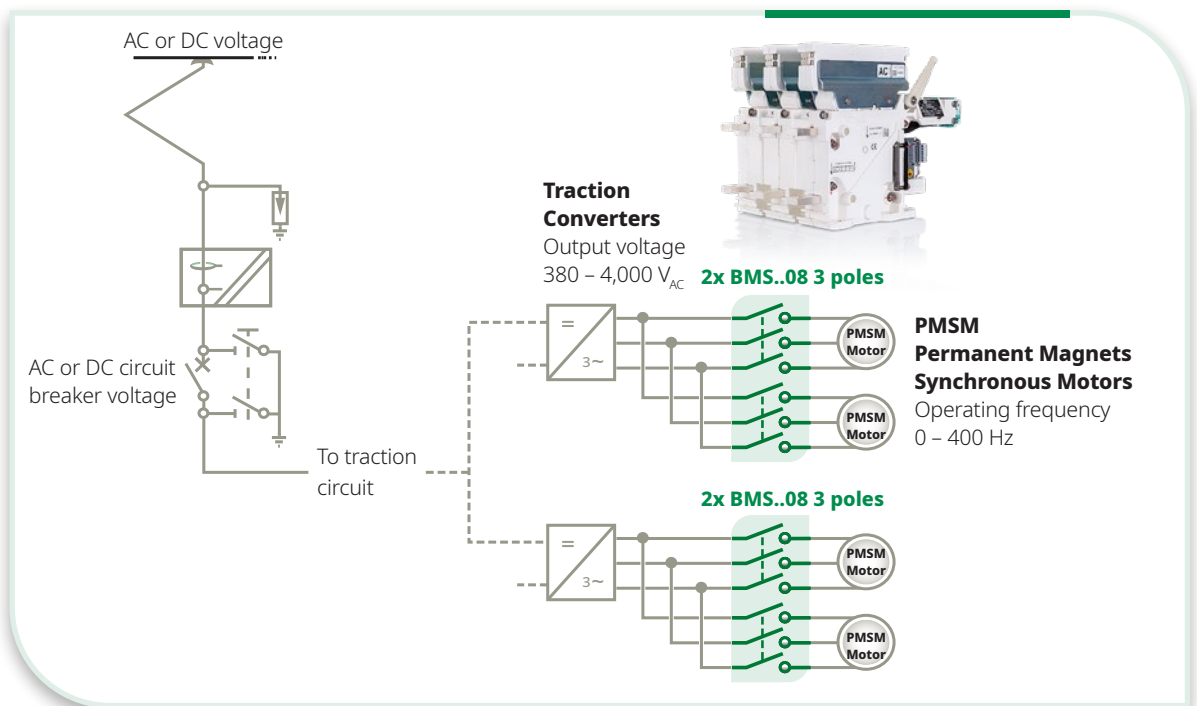


GENERAL INFORMATION

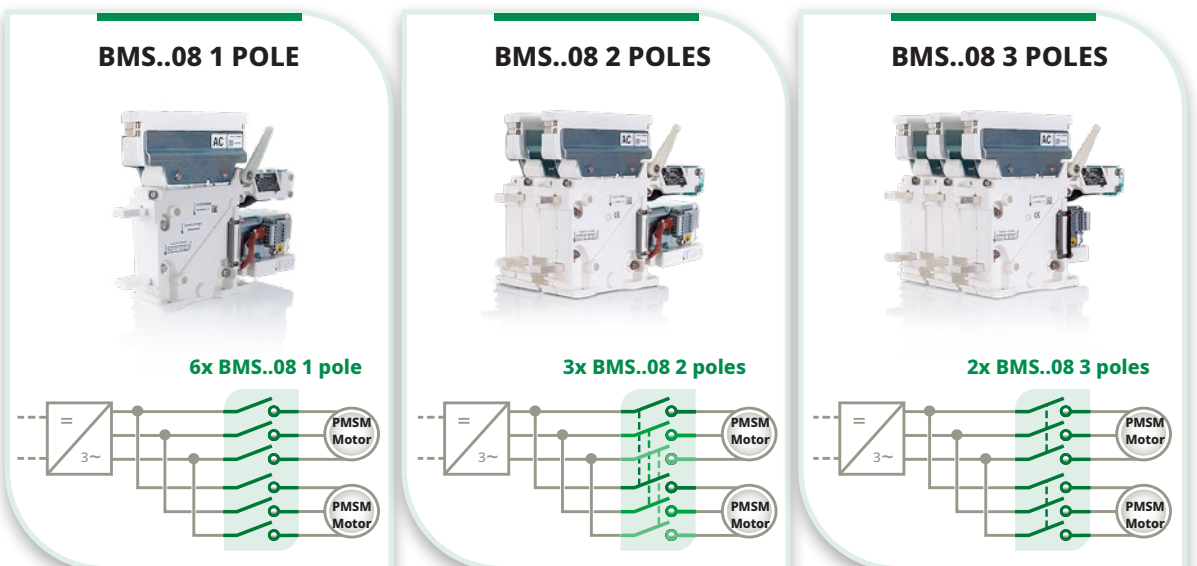
The **BMS** contactor, with more than one hundred and fifty thousands units in operation worldwide, is a contactor valued by the car builders and operators of electric traction vehicles for its strong performance level and its extremely high reliability. With its high modularity, the BMS offers variants and options that enable our customers to find the most appropriate version to fit their applications. For rolling stock equipped with Permanent Magnets

Synchronous Motors (PMSM motors), the BMS...08 contactor series offers a large range of configurations to connect and isolate the traction inverters and the PMSM motors, for voltage up to 4,000 V_{rms} and frequencies from 0 to 400 Hz, and currents up to 800 A (@50 Hz) or 400 A(@400 Hz). Its heavy duty class, high breaking capacity, combined with a high insulation class and robust EMC performances, make the BMS...08 the best market choice for this type of application.

APPLICATIONS, TYPICAL EXAMPLES



Based on the vehicle's safety and failure modes analysis, the most preferred contactor's configuration will be selected among the following possibilities.



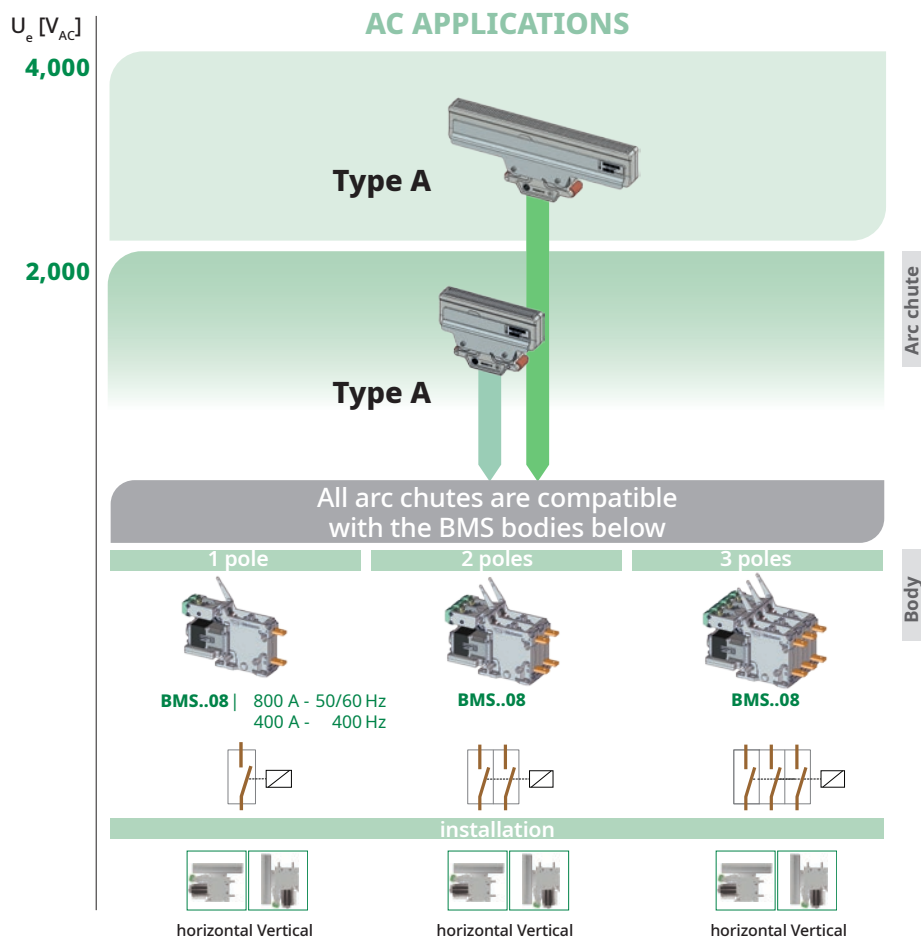
MAIN FEATURES

- Normally open and bi-directional contactor.
- Rated voltage 2,000 V_{rms} (BMS09.08) or 4,000 V_{rms} (BMS18.08).
- Conventional free air thermal current 800 A @ 50 Hz & 400 A @ 400 Hz.
- Low voltage control coil protection against surges.
- Suitable for ambient temperature from -40°C to +70°C.
- Reference standards IEC/EN 60077-2, IEC/EN 61373, EN 45545, EN 50567.

MAIN BENEFITS

- ✓ 1-pole configuration or 2-pole and 3-pole with mechanical link between poles
- ✓ High rated insulation voltage up to 4,800 V_{rms}.
- ✓ Operating frequency up to 400 Hz.
- ✓ High making & breaking performances.
- ✓ Also efficient to interrupt currents at 0 Hz for voltage up to 1,800 V.
- ✓ Very compact size and extremely low weight.
- ✓ High mechanical and electrical durability.
- ✓ Horizontal and vertical mounting.
- ✓ Low maintenance requirements with easy access to the main contacts.
- ✓ BMS design worldwide service proven.

CONTACTOR CONFIGURATIONS



DATA FOR PRODUCT SELECTION

	Symbol	Unit	BMS 09.08	BMS 18.08
MAIN HIGH VOLTAGE CIRCUIT				
Arc chute type			A	
Component category			A2	
Type of main contact			Normally Open	
Number of poles			1, 2, 3 (2-pole/3-pole version have mechanically linked poles)	
Rated operational voltage	U_e/U_r	[V]	2,000	4,000
Rated frequency	f/f_r	[Hz]	0 to 400	
Rated insulation voltage	U_{Nm}	[V]	4,800	
Conventional free air thermal current ⁽¹⁾	I_{th}	[A]		
- 16.7, 25, 50/60 Hz			800	
- 250 Hz			600	
- 400 Hz			400	
Rated operational current/operational frequency (from 50 Hz up to 400 Hz)	I_e/I_r	[A]	800 / C3	
Rated short-time withstand current	$\hat{I}_{cw/t}$	[kA]/[ms]	10/100	
Peak short-time withstand current	\hat{I}_{cw}	[kA]	10	
Maximum breaking & making capacity				
- $\cos \Phi = 0.8$ (16.7, 25 & 50 Hz)		[A]	4,200 ⁽²⁾	4,200 ⁽²⁾
Rated power-frequency withstand voltage (50 Hz/1min)				
- Between main contacts (open)	U_{50}/U_a	[kV]	11,5	
- Main circuit (closed) to earth	U_{50}/U_a	[kV]	11,5	
Rated impulse withstand voltage	U_{Ni}	[kV]	25	

⁽¹⁾ At $T_{amb} = +40^\circ\text{C}$ for AC voltage up to 50 Hz and tested with HV connections with current density 1,7A/mm². For higher frequency, please contact Sécheron.

⁽²⁾ For higher values, please contact Sécheron.

LOW VOLTAGE CIRCUIT

Control circuit

Nominal supply voltage ⁽³⁾	U_n	[V _{DC}]	24 to 110	
Nominal control voltage ⁽³⁾	U_{EF}	[V _{DC}]	24 to 110	
Range of voltage			[0.7 - 1.25] U_n	
Nominal closing power ⁽³⁾⁽⁴⁾	P_c	[W]	$\leq 37, \leq 60, \leq 80, \leq 250, \leq 400$	
Nominal holding power ⁽³⁾⁽⁴⁾	P_h	[W]	$\leq 4, \leq 6, \leq 10, \leq 37$	
Mechanical closing time ⁽⁴⁾	t_{cc}	[ms]	100 to 130	
Mechanical opening time ⁽⁴⁾	t_{co}	[ms]	50 to 70	

⁽³⁾ For detailed values based on BMS configuration, please refer to page 9 • ⁽⁴⁾ At U_n and $T_{amb} = +20^\circ\text{C}$.

Control circuit

Type of contacts			Potential free (PF)	
Rated voltage		[V _{DC}]	24 to 110	
Conventional thermal current	I_{th}	[A]	10	
Utilization category according to EN60947				
- AC-15 230 V _{AC}			1.0 A	
- DC-13 110 V _{DC}			0.5 A	
Minimum let-through current at 24 V _{DC} ⁽⁵⁾		[mA]	≥ 10 (silver contacts) or $4 \leq I < 10$ (gold contacts)	

⁽⁵⁾ For a dry and clean environment.

Low voltage interface

Control circuits			Wago terminal	
Auxiliary switches			Direct on switches	

Insulation

Rated power-frequency withstand voltage (50 Hz / 1min)				
- LV circuit to earth	U_{50}/U_a	[kV]	1.5	

OPERATING CONDITIONS

Installation			Indoor	
Altitude		[m]	$\leq 2,000$	
Working ambient temperature	T_{amb}	[°C]	- 40 to + 70	
Humidity			95% at + 40°C	
Pollution degree			PD3 ⁽⁶⁾	
Minimum mechanical durability	N	Cycles	2 millions (1- & 2-pole versions) / 1 million (3-pole version)	

⁽⁶⁾ PD3 (at $U_i/U_{Nm} = 3,600$ V), PD2 (at $U_i/U_{Nm} = 4,800$ V)

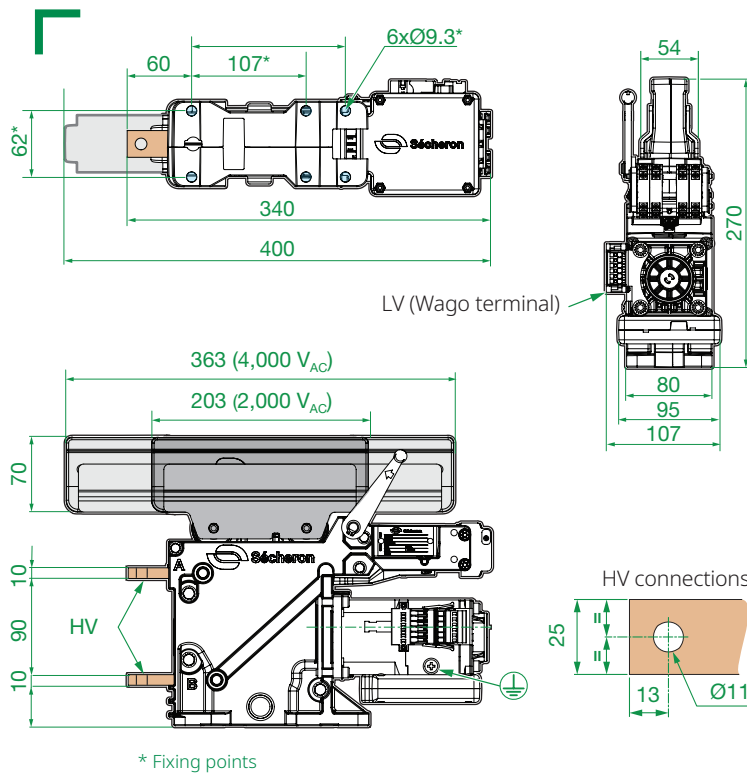
PRODUCT INTEGRATION

MAIN DIMENSIONS

HV connections	M10 screws
Earth connections	M6 screws, thread length 8 mm
LV Connections	BMS control: Wago terminal BMS auxiliary switches: M3 screws
Fixing points	M8 screws

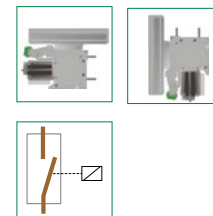
Dimensions without tolerances are indicative. All dimensions are in mm. The maximum allowed flatness deviation of the support frame is 0.5 mm.

/// BMS09.08 / BMS18.08 ARC CHUTE TYPE A

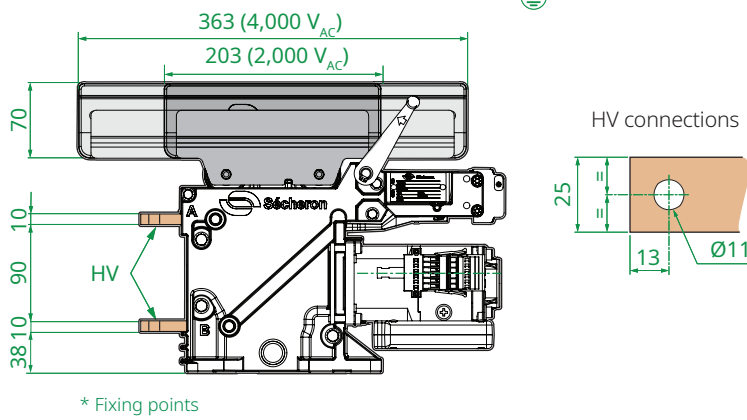
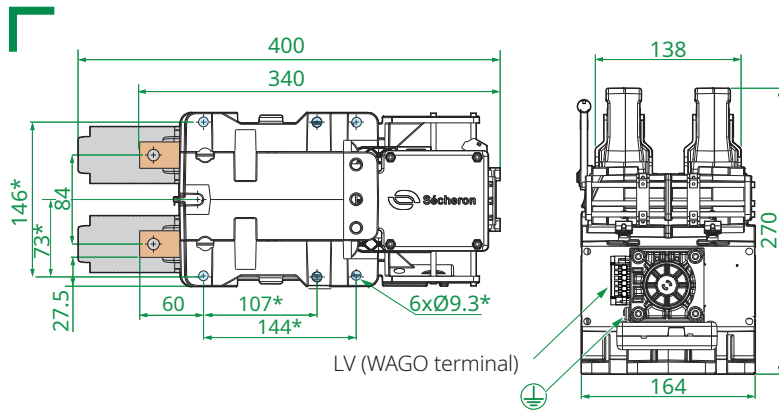


BMS..08

1-POLE
Horizontal/vertical
installation

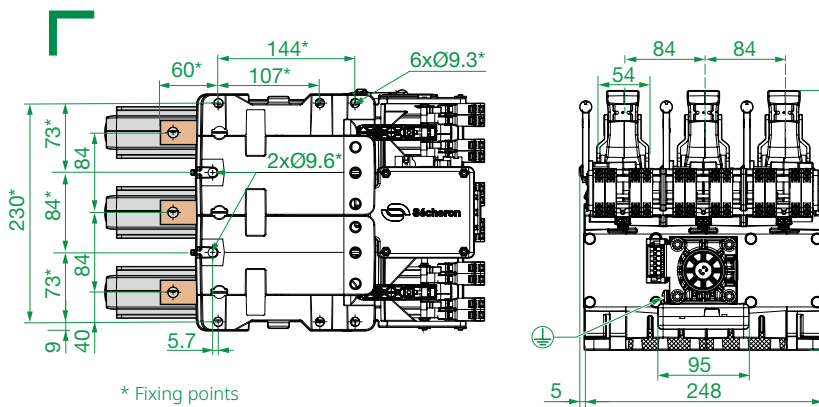
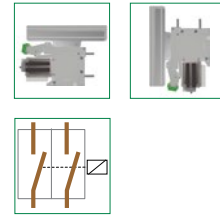


BMS09.08 / BMS18.08
ARC CHUTE TYPE A



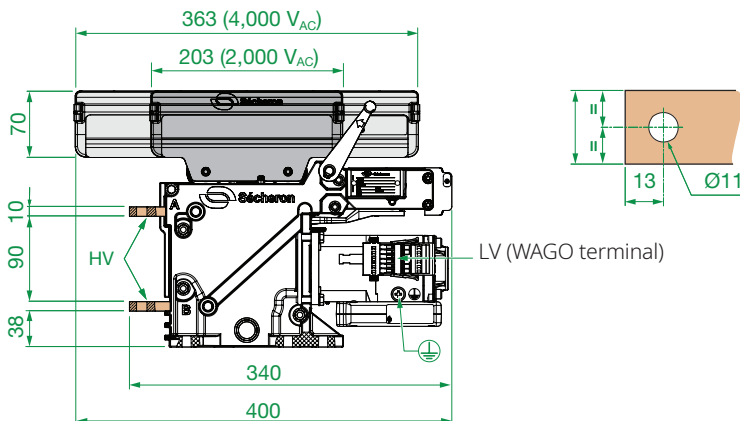
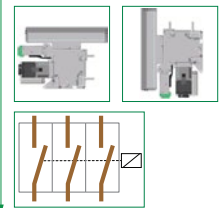
* Fixing points

BMS..08
2-POLES SYNCHRONIZED
 Horizontal/vertical
 installation



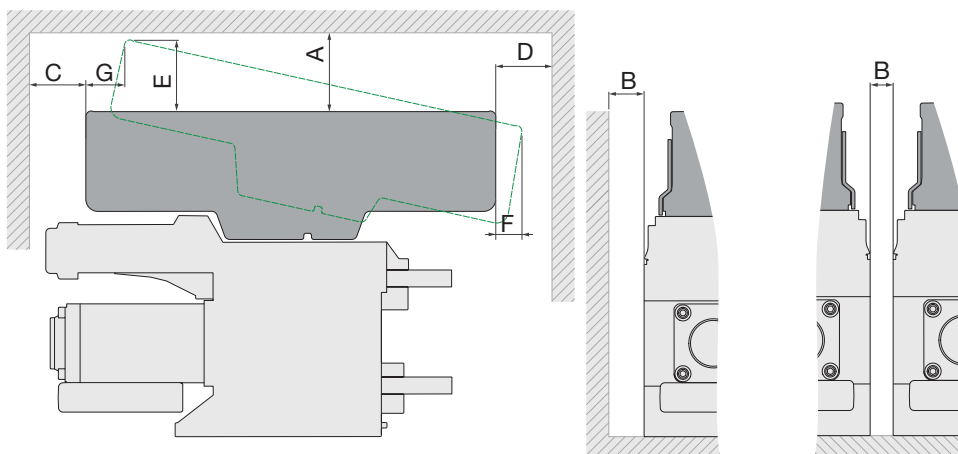
* Fixing points

BMS..08
3-POLES SYNCHRONIZED
 Horizontal/vertical
 installation



INSULATION DISTANCES AND WEIGHTS

BMS contactors have been homologated according to IEC 60077-2 with the following insulation distances.



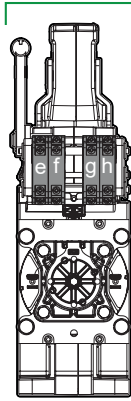
Contactor type	Breaking current	Arc chute type	Insulating distance [mm]								Arc chute removal distance [mm]		
			To earthed wall				To insulating wall				E	F	G
			A	B	C	D	A	B	C	D			
BMS09.08	≤ 800 A	A	75	10	75	75	40	10	40	40	70	30	35
	> 800 A		○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	75	10	75	75			
BMS18.08	≤ 800 A	A	75	10	75	75	40	10	40	40	90	20	40
	> 800 A		○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	○ ⁽¹⁾	75	10	75	75			

⁽¹⁾ Distances on request according to your application

Contactor type	Weight: ± 1 kg [kg]		
	pole		
	1	2	3
BMS09.08 A	9	15	21
BMS18.08 A	10	17	25

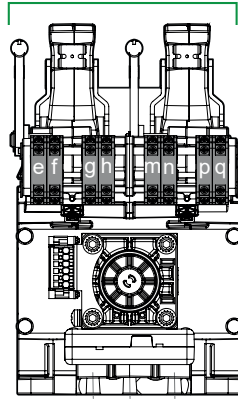
AUXILIARY CONTACTS CONFIGURATION

BMS..08



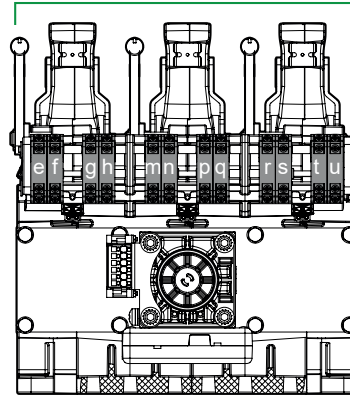
1 POLE

BMS..08

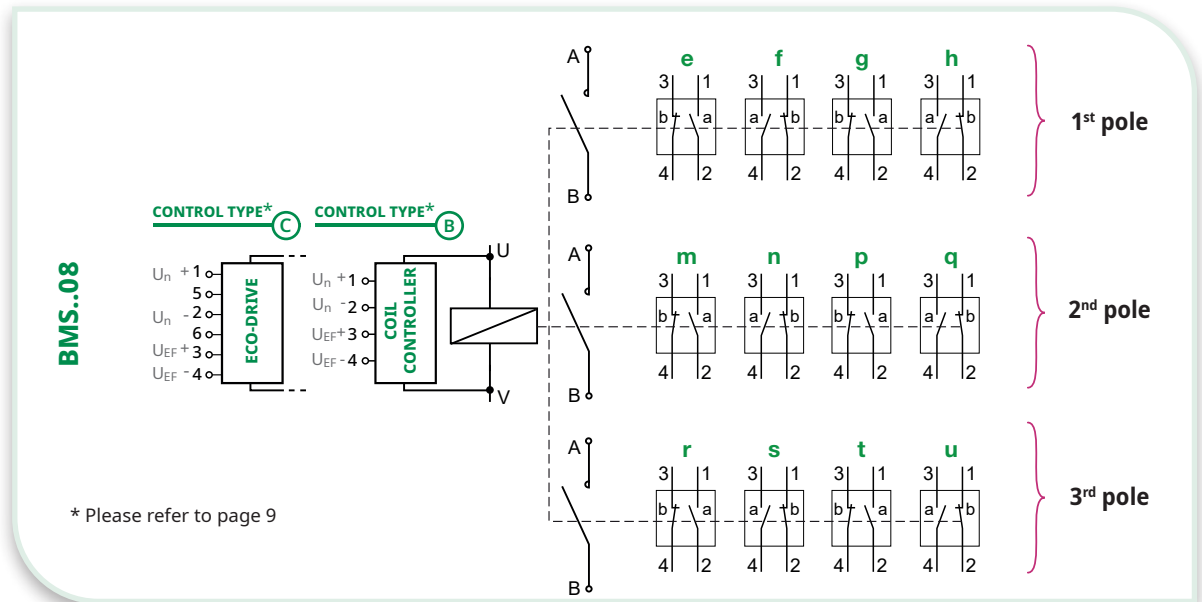


2 POLES

BMS..08



3 POLES



AUXILIARY SWITCH SWITCH POSITION PER POLE

Function of the selected quantity of poles and of auxiliary switches per BMS's pole, the location of the switches will be as follows:

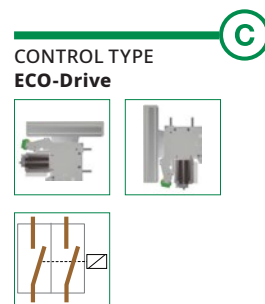
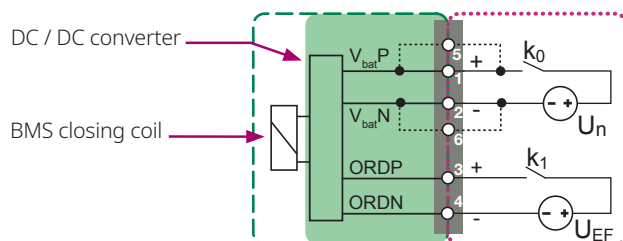
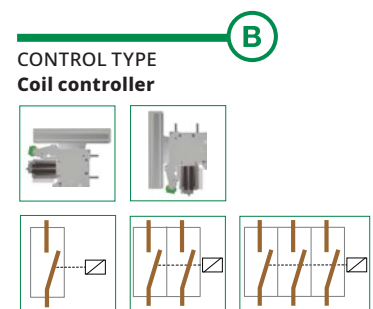
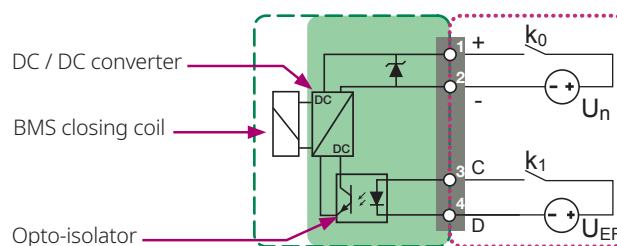
BMS

	1 st pole	2 nd pole	3 rd pole
1 switch / pole	g	p	t
2 switches / pole	f g	n p	s t
3 switches / pole	e f g	m n p	r s t

LOW VOLTAGE CONTROL DIAGRAM

BMS CONFIGURATION ⁽¹⁾		Nominal supply voltage ⁽²⁾ U_n [V _{DC}]	Nominal control voltage ⁽²⁾ U_{EF} [V _{DC}]	Closing power (P_c) / Holding power (P_h) [W] / [W]	Control type
BMS..08 horizontal / vertical installation	1 pole	[24-36], [48-110]	[24-110]	≤ 60 / ≤ 4	(B)
BMS..08 horizontal / vertical installation	2 poles	[24-36]	[24-110]	≤ 250 / ≤ 6	(C)
		[48-110]			(B)
BMS..08 horizontal / vertical installation	3 poles	[72-110]	[24-110]	≤ 400 / ≤ 10	(B)

⁽¹⁾ For details refer to pages 5 & 6. • ⁽²⁾ Control voltage U_{EF} and supply voltage U_n can be different. •

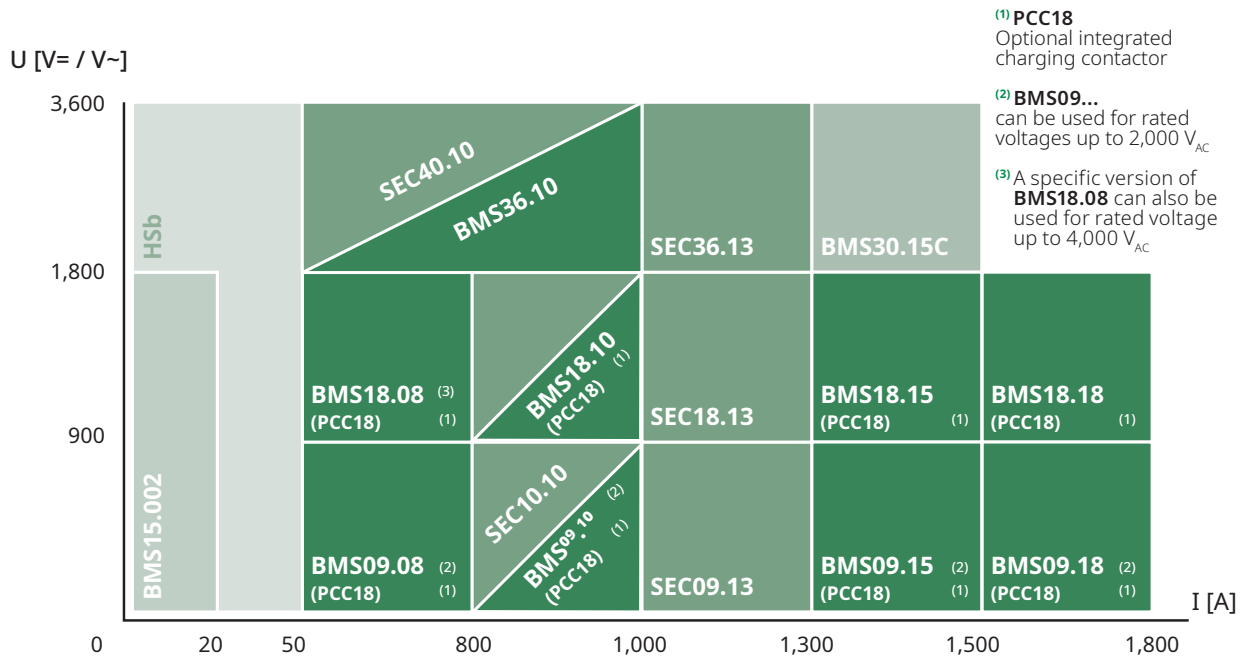


--- Sécheron's scope
..... Customer's scope

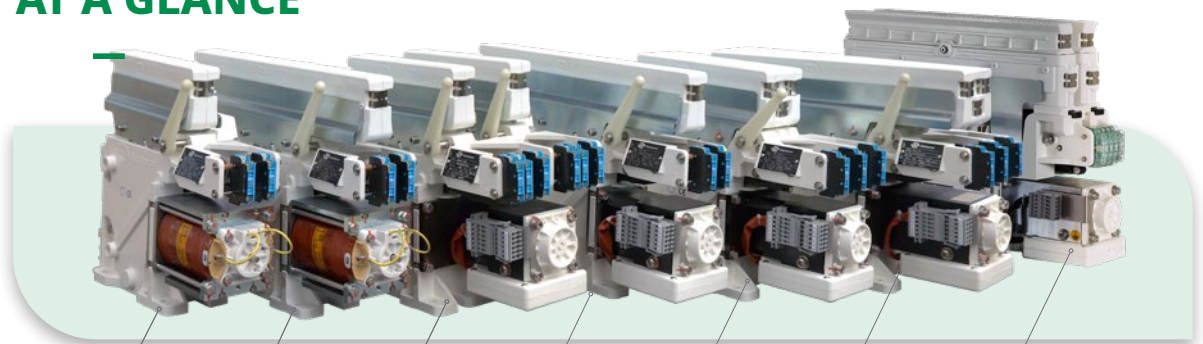
Low voltage interface
Coil controller

U_n : DC power supply
 U_{EF} : Control voltage
 k_0 : Supply relay
 k_1 : Control relay

SECHERON CONTACTORS RANGE



AT A GLANCE



BMS 09.08

1 pole
Arc chute
Type A

BMS 18.08

1 pole
Arc chute
Type A

BMS 09.08

2 poles
Arc chute
Type A

BMS 18.10

1 pole
Arc chute
Type A

BMS 09.15

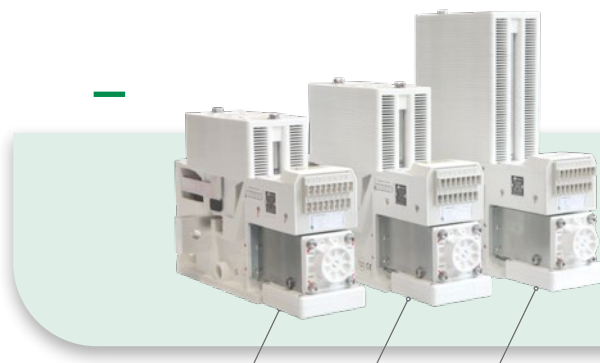
1 pole
Arc chute
Type A

BMS 18.18

1 pole
Arc chute
Type A

BMS 36.10

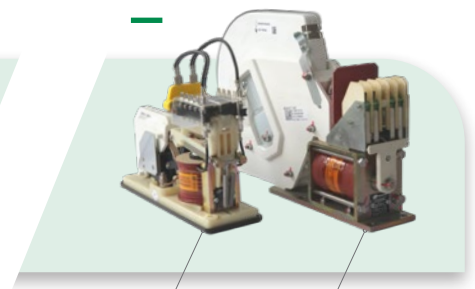
1 pole



**SEC10.10/
SEC09.13**

**SEC20.10/
SEC18.13**

**SEC40.10/
SEC36.13**



BMS15.00Z

HSB

BMS REFERENCE BROCHURES



BMS..08/BMS..10 Type

ROLLING STOCK
(Line/separation contactors, ...).

FIXED INSTALLATION
(depot feeder contactor...).



BMS..15/BMS..18 Type

ROLLING STOCK
(Line/separation contactors, ...).

FIXED INSTALLATION
(depot feeder contactor..).



BMS..08 PMSM Type

ROLLING STOCK
(Line/separation contactors, ...).

FIXED INSTALLATION
(depot feeder contactor...).



BMS36.10 Type

ROLLING STOCK
(Line/separation contactors, ...).

FIXED INSTALLATION
(depot feeder contactor..).



SEC Type

ROLLING STOCK
(Line/separation contactors, PM motor,...).

FIXED INSTALLATION
(depot feeder contactor, ...).



BMS30.15C Type

ROLLING STOCK
(Line/separation contactors, ...).

FIXED INSTALLATION
(depot feeder contactor, ...).



HS Type

ROLLING STOCK
(Pre-charging, Heating, HVAC, ...).

FIXED INSTALLATION
(Line testing, ...).



BMS15.002 Type

ROLLING STOCK
(Pre-charging, Heating, HVAC, ...).

FIXED INSTALLATION
(Line testing, ...).

DESIGNATION CODE FOR ORDERING

- Be sure to establish the designation code from the latest version of our brochure by downloading it from the website: www.secheron.com.
- Be careful to write down the complete alphanumeric designation code with 17 characters when placing your order.
- For technical reasons some variants and options indicated in the designation code might not be combined, therefore validate your configuration with Sécheron before ordering.
- For other configurations not described in the brochure, please contact Sécheron.

Example of customer's choice:	BMS	18	08	A	3	S	∅	E	A	Z	V	A	A
Line:	10	11	12	13	14	15	16	17	18	19	20	21	22

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

DESIGNATION CODE

Line	Description	Designation		Customer's choice
		Standard	Options	
10	Product type	BMS	BMS	BMS
11	Rated operational voltage	2,000 V _{AC} 4,000 V _{AC}	09 18	
12	Rated conventional free air thermal current	800 A @ 50/60 Hz (400 A @ 400 Hz)	08	08
13	Arc chute type	Type A	A	A
14	Number of poles	1 pole 2 poles 3 poles	1 2 3	
15	Poles mechanical synchronization	(1 pole) Not applicable (2 & 3 poles) Synchronized	Z S	
16	Spare digit		∅	∅
17	Nominal supply voltage ⁽¹⁾	1 pole 2 poles 3 poles	24-36 V _{DC} 48-110 V _{DC} 24-36 V _{DC} 48-110 V _{DC} 72-110 V _{DC}	Y T 5 T U
18	Auxiliary contacts BMS - per pole	1a + 1b - (switch PF) - silver type 1a + 1b - (switch PF) - gold type 2a + 2b - (switch PF) - silver type 2a + 2b - (switch PF) - gold type 3a + 3b - (switch PF) - silver type 3a + 3b - (switch PF) - gold type 4a + 4b - (switch PF) - silver type 4a + 4b - (switch PF) - gold type	A	C E H K M O P
19	Spare digit		Z	Z
20	Installation configuration	Horizontal & Vertical	V	V
21	Application type	(Alternating Current) AC	A	A
22	Opening BMS arc chute	Arc chute lever	A	A

Signature:

Name:

Place and date:

⁽¹⁾ For the available control voltage in function of the BMS configuration, refer to table page 9.



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