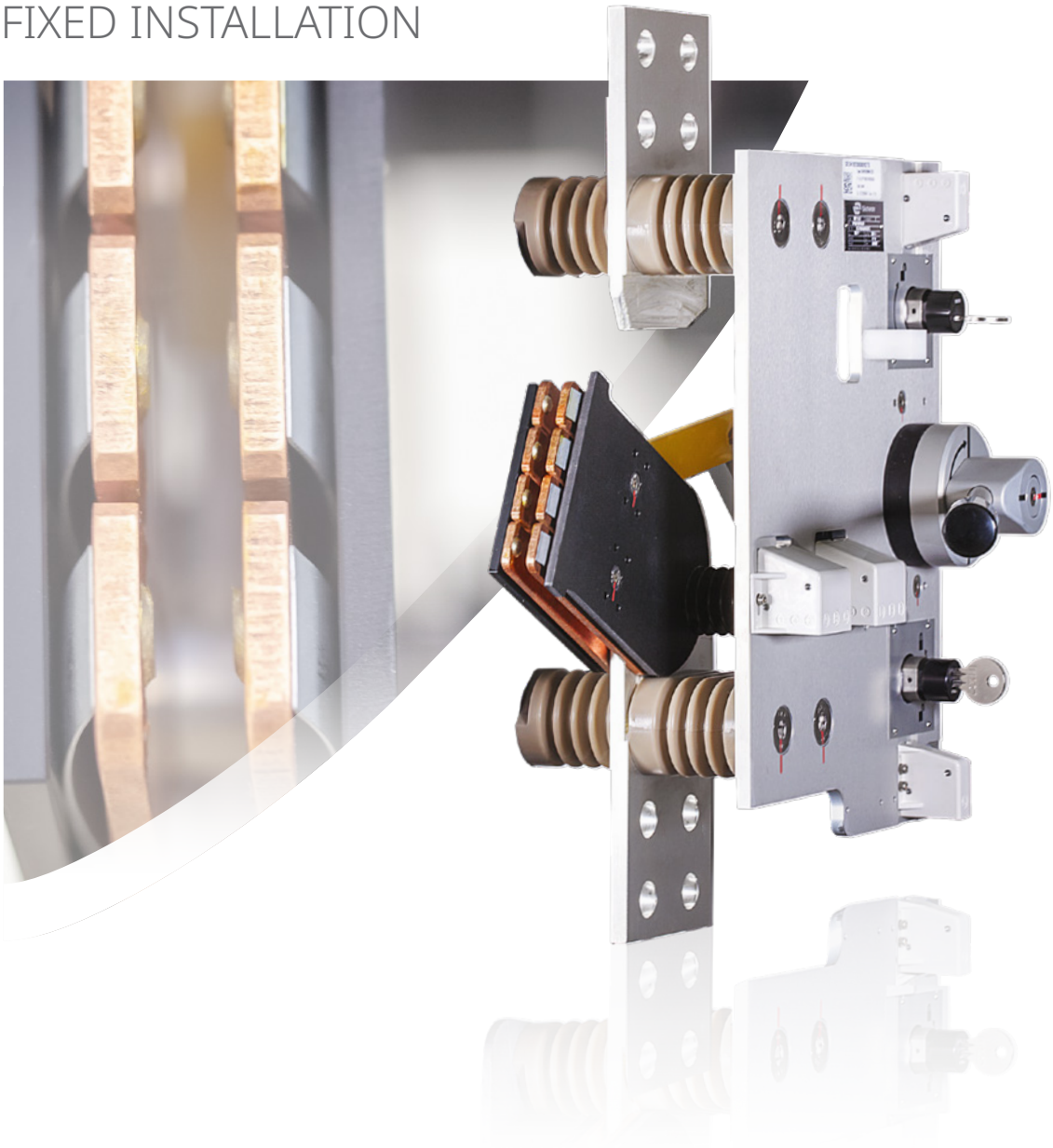
ELECTRICAL
SAFETY
SOLUTIONS

Sécheron

DISCONNECTOR

Type **SWS36.xx**

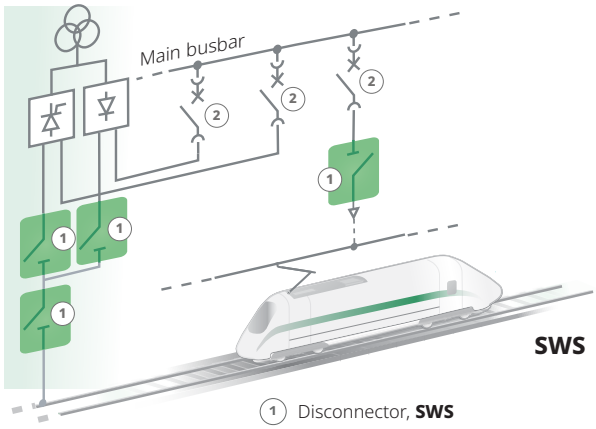
FIXED INSTALLATION



GENERAL INFORMATION

The **SW** off-load disconnector is a complete range designed to cover all the applications to be met in DC traction power substations and other industrial applications. Its modular concept enables to build single pole or double pole **SWS** disconnectors, for rated operational voltage 3,600 V and rated insulation voltage from 2,000 to max. 6,300 A. Installed inside cubicles, the **SW** disconnector can be operated either manually or electrically, and the customer can select among standard options safety interlockings made via key locks and/or electromagnets. The severe testing procedures applied for the type testing as well as for the serial testing make the **SW** disconnector a safe component with a unique design and a high level of reliability.

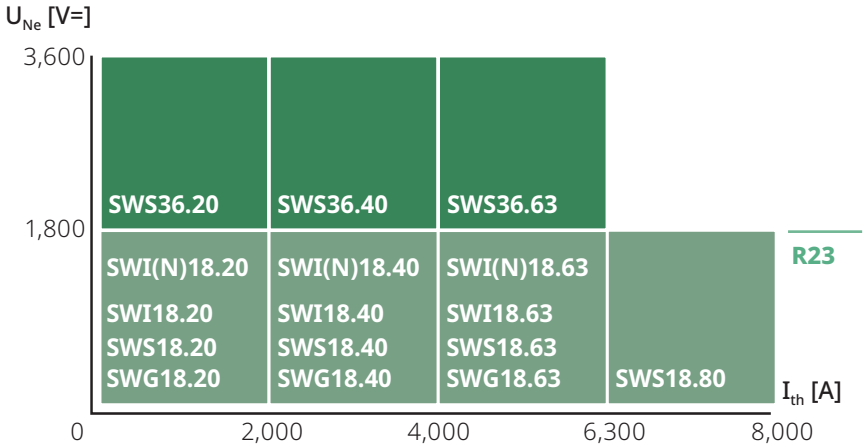
APPLICATIONS, TYPICAL EXAMPLES



1 Disconnector, **SWS**
2 DC circuit breaker, **UR**

PRODUCT RANGE

SWS
Disconnector



The selection of the appropriate current rating is function of the load cycle. Please refer to Overload capacity table page 5.

All products are available in 1 pole or 2 poles, except the following one which are only available in one pole: **SWS18.80, SWI(N)**

The **SWx.18 R23** range is availble in the brochure SA020600BEN.

The **SWI(N) R23** range is availble in the brochure SA020609BEN.

MAIN FEATURES

- Rated operational voltage 3,600 V_{DC}
- Conventional free-air thermal current from 2,000 A to 6,300 A
- Safe with a high rated insulation voltage 3,000 V_{DC} and 4,800 V_{DC}
- 1 or 2 pole versions
- Reference standards: EN 50123-1/-3

MAIN BENEFITS

- Compact size.
- High rated short-time withstand current value.
- Safe with the high voltage circuit separated from the low voltage circuit.
- Silver-plated high voltage connections.
- Optional locking of the main contacts available with either key and/or electromagnet.
- High mechanical durability: 20,000 cycles minimum.
- Self cleaning contacts.
- High modularity to cover all necessary variants and options.
- Simple design with reduced number of parts.

HIGH MODULARITY

The below figures show the basic configuration of SWS device (for a current of 2,000 A and a voltage of 1,800 V_{DC}).

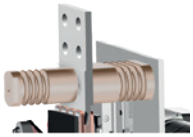
All these devices are also delivered in other configurations of current, voltage, operation and number of pole, thanks to a high industrialized modularity as shown below.

SELECTION OF OPERATION

SW. Manual

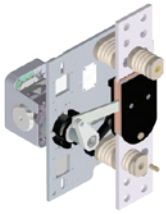
SW. Electric

SELECTION OF RATED VOLTAGE

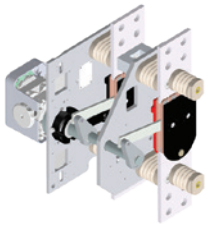


3,600 V

SELECTION OF POLE NUMBER

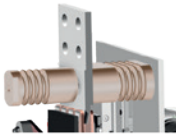


1 pole

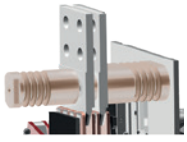


2 poles

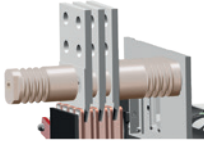
SELECTION OF RATED THERMAL CURRENT



2,000 A



4,000 A



6,300 A

DATA FOR PRODUCT SELECTION

	Symbol	Unit	SWS36.20	SWS36.40	SWS36.63
MAIN HIGH VOLTAGE CIRCUIT					
Rated operational voltage	U_{Ne}	[V_{DC}]		3,600	
Rated insulation voltage	U_{NM}	[V]		3,000 or 4,800	
Rated service current	I_{Ne}	[A]	2,000	4,000	6,300
Conventional free air thermal current (1)	I_{th}	[A]	2,000	4,000	6,300
Peak and rated short-time withstand current					
- for U_{Ne} 3,600 V	$\hat{I}_{Ncw}/I_{Ncw}/t/$	[kA]/[kA]/[s]		71/50/0.25	
Overvoltage category				OV4	
Rated power-frequency withstand voltage (2)					
- Pole - Pole	U_a	[kV]		22.2	
- Pole - Earth	U_a	[kV]		18.5	
Rated impulse withstand voltage (1.2/50 µs)					
- Pole - Pole	U_{Ni}	[kV]		48.0	
- Pole - Earth	U_{Ni}	[kV]		40.0	

(1) At Tamb = +40°C and tested with high voltage connections according to standard IEC/EN 60943. • (2) At 50 Hz and during 1 minute •

LOW VOLTAGE AUXILIARY CIRCUIT

Control circuit (motor and optional electromagnet lock)

Nominal voltage	U_n	[V_{DC}] [V_{AC}]	24, 48, 60, 110, 125, 220 127 (50/60 Hz), 230 (50/60 Hz)
Range of voltage			[0.8-1.1] U_n
Motor nominal closing/opening power:			
- DC only		[W]	125
- AC only		[W]	90
Mechanical switching time (3)	t_c	[S]	< 3 (SW.... with DC motor) < 5 (SW... with AC motor)
Electromagnet nominal power (DC and AC)		[W]	~14

(3) For motorized version, at nominal control voltage = Un and Tamb = +20°C.

Auxiliary contacts for main circuit and optional locks

Type of contacts (refer to definition page 10)			Changeover (CO)
Rated voltage		[V_{DC}] [V_{AC}]	24 to 220 230
Conventional thermal current	I_{th}	[A]	10
Maximum breaking capacity at 110 V_{DC} and t=5 ms		[A]	0.75
Minimum let-through current at 24 V_{DC} (4)		[mA]	10 (silver contacts)

(4) For a dry and clean environment.

Low voltage interface

Type of connection			Direct for auxiliary contact Terminal block for motor

Insulation

Rated power-frequency withstand voltage (5)	U_a	[kV_{rms}]	2

(5) At 50 Hz and during 1 minute.

OPERATING CONDITIONS

Installation			Indoors
Altitude		[m]	≤ 2,000
Working ambient temperature	T_{amb}	[°C]	- 25 to +40
Humidity			Class 5k2
Pollution degree			PD4
Minimum mechanical durability	N	Cycles	20,000

OVERLOAD CAPACITY

Application Duty Class - I_{Bd} [A] EN 50328 / IEC 62590		SW...20	SW...40	SW...63
	Class I	2,000	4,000	6,300
	Class V, VI, VII	2,000	3,000	4,200
	Class VIII	1,600	3,000	4,200

I_{Bd} : basic direct current

Class I	1 x I_{Bd}	continuously
Class V	a) 1 x I_{Bd} b) 1.5 x I_{Bd} c) 2.0 x I_{Bd}	continuously 2 hours - after a) 1 min - after a)
Class VI	a) 1 x I_{Bd} b) 1.5 x I_{Bd} c) 3.0 x I_{Bd}	continuously 2 hours - after a) 1 min - after a)
Class VII	a) 1 x I_{Bd} b) 1.5 x I_{Bd} c) 4.5 x I_{Bd}	continuously 2 hours - after a) 15 s - after a)
Class VIII	a) 1 x I_{Bd} b) 1.5 x I_{Bd} c) 2.0 x I_{Bd}	continuously 2 hours - after a) 1 min - after b)

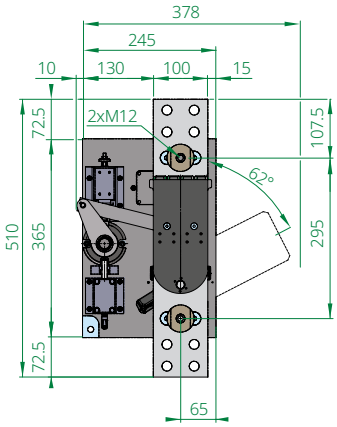
INFORMATION FOR PRODUCT INTEGRATION

MAIN DIMENSION

The DIN-ISO 2768-1 coarse tolerances are applied to these dimensions.
All dimensions are in mm.

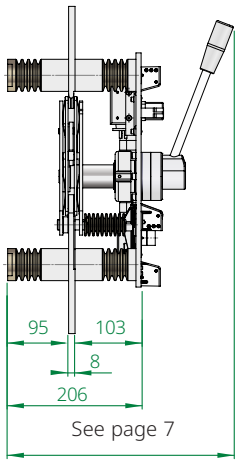
Note: Each SW can be equipped with manual or motorized (DC or AC) operation.

SWS36...



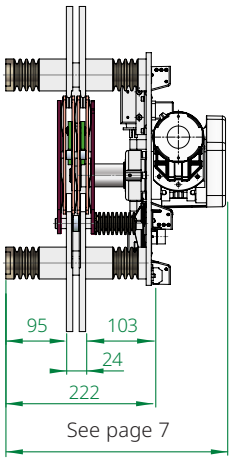
SWS36...
1-POLE
configurations

SWS36.20



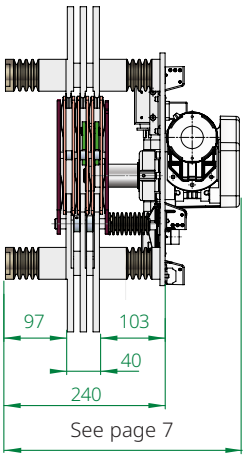
See page 7

SWS36.40



See page 7

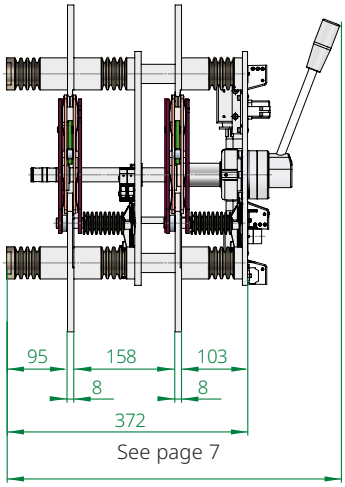
SWS36.63



See page 7

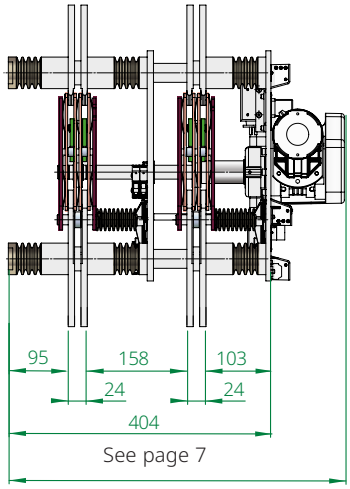
SWS36...
2-POLE
configurations

SWS36.20



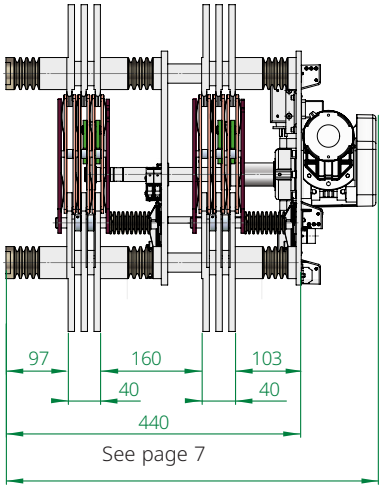
See page 7

SWS36.40



See page 7

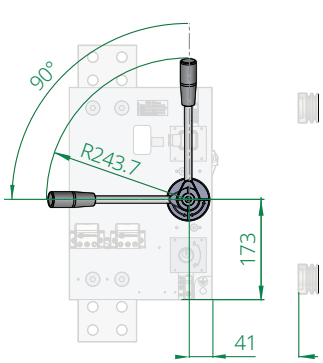
SWS36.63



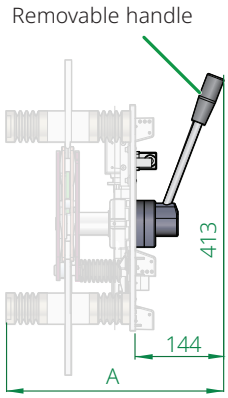
See page 7

OPERATION

MANUAL



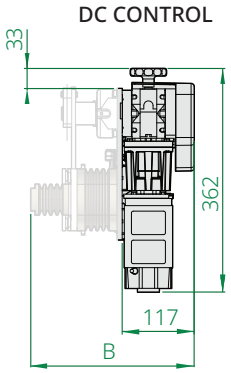
Front view



Side view

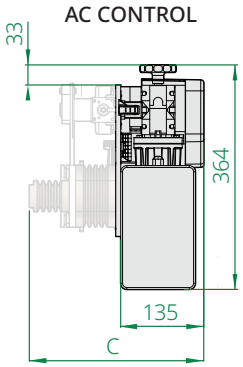
ELECTRIC

DC CONTROL



Top view

AC CONTROL



Top view

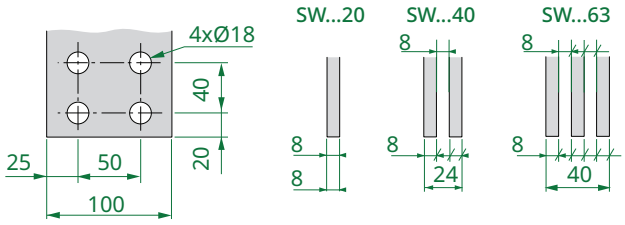
DIMENSIONS		A	B	C
SWS36.20	- 1 pole/2 poles	350/516	323/489	341/507
SWS36.40	- 1 pole/2 poles	366/548	339/521	357/539
SWS36.63	- 1 pole/2 poles	384/584	357/557	375/575

All dimensions are in mm

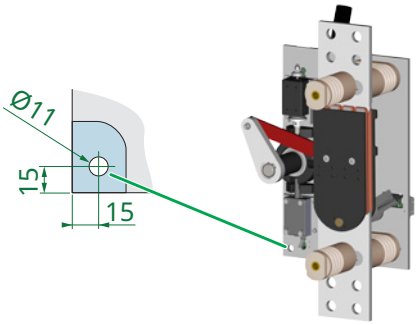
DETAILS OF T HE HIGH VOLTAGE CONNECTIONS

The busbars or cables must be mechanically fixed outside the SW disconnector, and their contact surface must be parallel to the HV connections:

FOR ALL DEVICES



DETAILS OF THE EARTH CONNECTION ON THE BASE PLATE



WEIGHTS

SWS	1 pole			2 poles	
	36.20	**36.40**	**36.63**	**36.20**	**36.63**
MA [kg]: ± 1 kg	12	16	20	22	*
MO [kg]: ± 1 kg	18	22	26	28	*

Additional info.
MA : manual operation
MO: electric operation

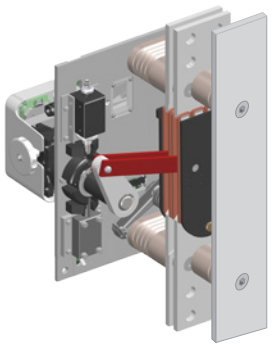
The given weight corresponds to the heaviest AC motor configuration.
For DC motor, weights are slightly lower.

Weight may be different depending on product configuration with options.

SW FIXATION

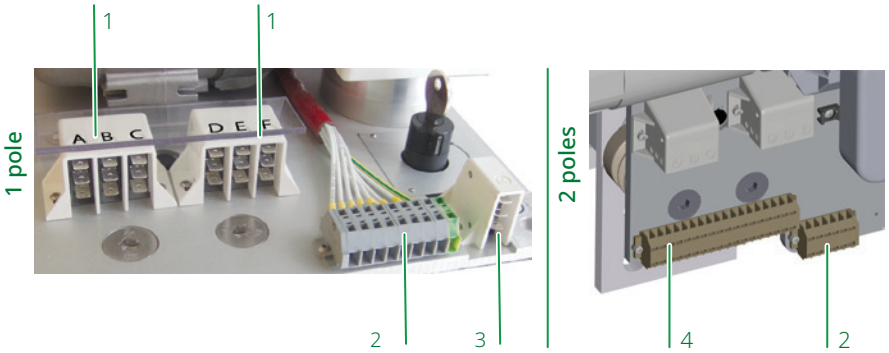
EXAMPLE OF EXECUTIONS

SWS



The SW series switches are fixed vertically as shown here by means of M12 screws.

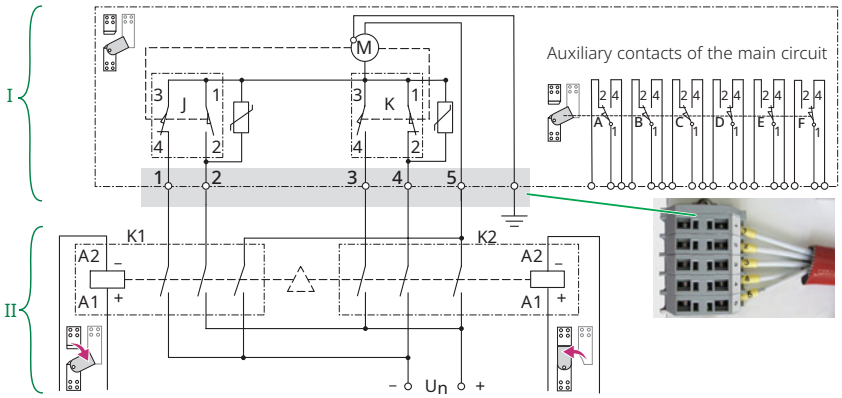
LOW VOLTAGE CONTROL AND INTERFACES



Legend of the schemes:

1. Direct connection (faston) on auxiliary switches for SW open/ close status (one pole version).
2. Terminal block for motor control only.
3. Direct connection (faston) on auxiliary switches for optional locks.
4. Terminal block to connect the auxiliary switches of each pole for SW open/close status (two poles version).

CONTROL DIAGRAM FOR DC VOLTAGE MOTOR



Control scheme valid for all SW...

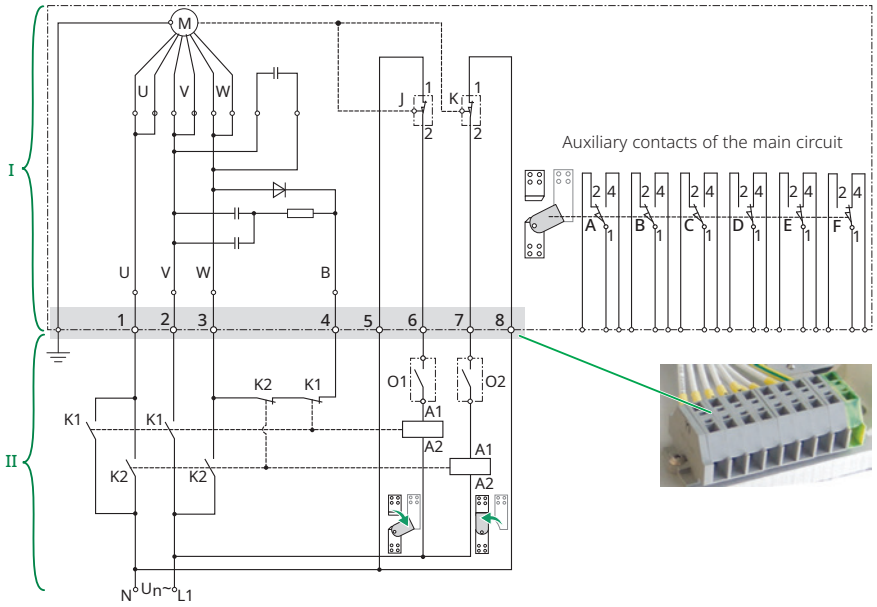
As the motor needs to be dynamically braked, make the external circuit (II) as shown on this diagram:

Legend of the schemes:

I. SW scope.

II. Customer scope.
Both contactors K1 and K2 must be mechanically interlocked to avoid them to be triggered at the same time; and each of them must have three NO contacts.

CONTROL DIAGRAM FOR AC VOLTAGE MOTOR



As the motor needs to be dynamically braked, make the external circuit (II) as shown on this diagram:

Legend of the schemes:

I. SW scope.

II. Customer scope.
Each of the K1 and K2 contactors must have two NO and one NC contacts.

This interface is for SWX only - it is a typical example. For other configuration please contat Sécheron.

LOCKING SYSTEMS

STANDARD

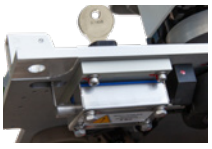
MANUAL LOCKING LEVER

Manually operated units having no lock (key or electromagnet) to lock **SW** in close position are equipped with manual locking lever.
A change-over auxiliary switch indicates the locking status of the lock system.

MANUAL
LOCKING LEVER
(FOR MANUAL
OPERATED DEVICE)

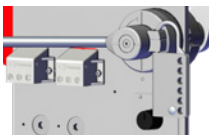
OPTIONAL (SUBJECT OF ADDITIONAL COSTS)

- Key lock system
- Keys can only be removed in locked positions. Key lock the moving contact in a defined position (open and/or closed).
- Key lock system is of Ronis type. For other type, please contact Sécheron.
- The electromagnet locks the moving contact in a defined position (open and/or closed).
- When the electromagnet is energized, the main contact is unlocked and can then be operated.
- A change-over auxiliary switch indicates the locking status of the lock system.
- SW with manual operation, can also be delivered with a simple padlock system enabling to lock the **SW** in OPEN position with up to 6 padlocks.
- A change-over auxiliary switch must be implemented in a control circuit for motor SW.



KEY LOCK SYSTEM

ELECTROMAGNET
LOCK SYSTEM



PADLOCK SYSTEM

MOVING CONTACT

LOCKED POSITION OF MOVING CONTACT

Closed position

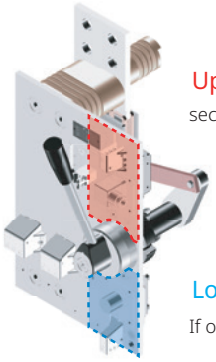
SWS

Open position

SWS

Positions of the key lock systems

The key and electromagnet locks systems are located in upper position or lower position on the main plate.



Upper position

second key location

Lower position

If only one key selected.

CONFIGURATION TABLE TO SELECT AND CODE THE LOCKING SYSTEM

As a complement to the below table, please note the following rules for your appropriate selection of lock configurations:

- **SW** with manual operation MUST be locked in both OPEN and CLOSED positions
- **SW** with electric operation cannot have key in upper position.

Key lock system		Electromagnet lock system		Designation code	
in Lower position	in Upper position	in Lower position	in Upper position	standard	option
-	-	-	-	0 (1)	-
	-	-	-	-	A (2)
	-	-	-	-	B (3)
	-	-	-	-	C
		-	-	-	D
	-	-		-	E
	-	-		-	F
	-	-		-	G
	-	-		-	H
-	-		-	-	I
	-	-		-	J
-	-		-	-	M
-	-		-	-	N
	-	-		-	P

These symbols show in which position the moving contact is locked:

in open position

in closed position

in closed and open positions

(1) (2) (3) For these configurations combined with a manual operation of the SW, the device will be automatically delivered with a manual locking lever as per the following rules:

- **(1)** in the lower position, locking the main contacts in both open and closed positions.
- **(2)** in the upper position, locking the main contacts in open position.
- **(3)** in lower position, locking the main contacts in closed position.

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 alphanumerical designation code with 13 characters when placing your order.
- For technical reasons some variants and options indicated in the designation code might not be combined.
- For other configurations not described in the brochure, please contact Secheron.
- The bold characters of the designation code define the device type.

Example of customer's choice:	**SW**	**S**	**36**	**40**	MO	1	J	B	1
Line:	10	11	12	13	14	15	16	17	18

DESIGNATION CODE*

(*) Options are subject to additional costs

Line	Description	Designation	standard	Options	Customer's choice
10	Product type	**SW**	**SW**		**SW**
11	Application	Disconnector	**S**		**S**
12	Rated operational voltage	3,600 V	**36**		**36**
13	Conventional free-air thermal current (1)	2,000 A	**20**		
		4,000 A	**40**		
		6,300 A	**63**		
14	Operation	Manual	MA		
		Electric	MO		
15	Number of pole	1 pole	1		
		2 poles	2		
16	Control voltage for electric operation and optional electromagnet locks				
	(Manual operation and without electromagnet lock) Not applicable		Z		
		24 V_{DC}	A		
		48 V_{DC}	C		
		60/64 V_{DC}	G		
		110 V_{DC}	E		
		125 V_{DC}	R		
		127 V_{AC} - 50/60 Hz	X		
		220 V_{DC}	J		
		230 V_{AC} - 50/60 Hz	T		
17	Locking of moving contacts (2)	No	Ø		
		One key lock locking the open position		B	
		One key lock locking both positions		C	
		One electromagnet locking both positions		I	
		Padlock system with up to 6 padlocks locking in the open position		Q	
		For other selection, refer to the codification table on page 11		...	
18	Cylinder and key delivery	(If no key lock selected in line 17) Not applicable	Z		
		Delivered with unique codification	6		
		For specific code, device will be delivered without cylinder and key, these should be ordered to RONIS supplier		1	

(1) The selection of the appropriate current rating is function of the load cycle. Check with Sécheron that your selection is consistent with the application load cycle. Please refer to overload capacity table page 5.

(2) For manual devices, all positions not locked with lock or EMAG will be locked by manual locking lever.

Signature:

Name:

Place and date:

Sécheron

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