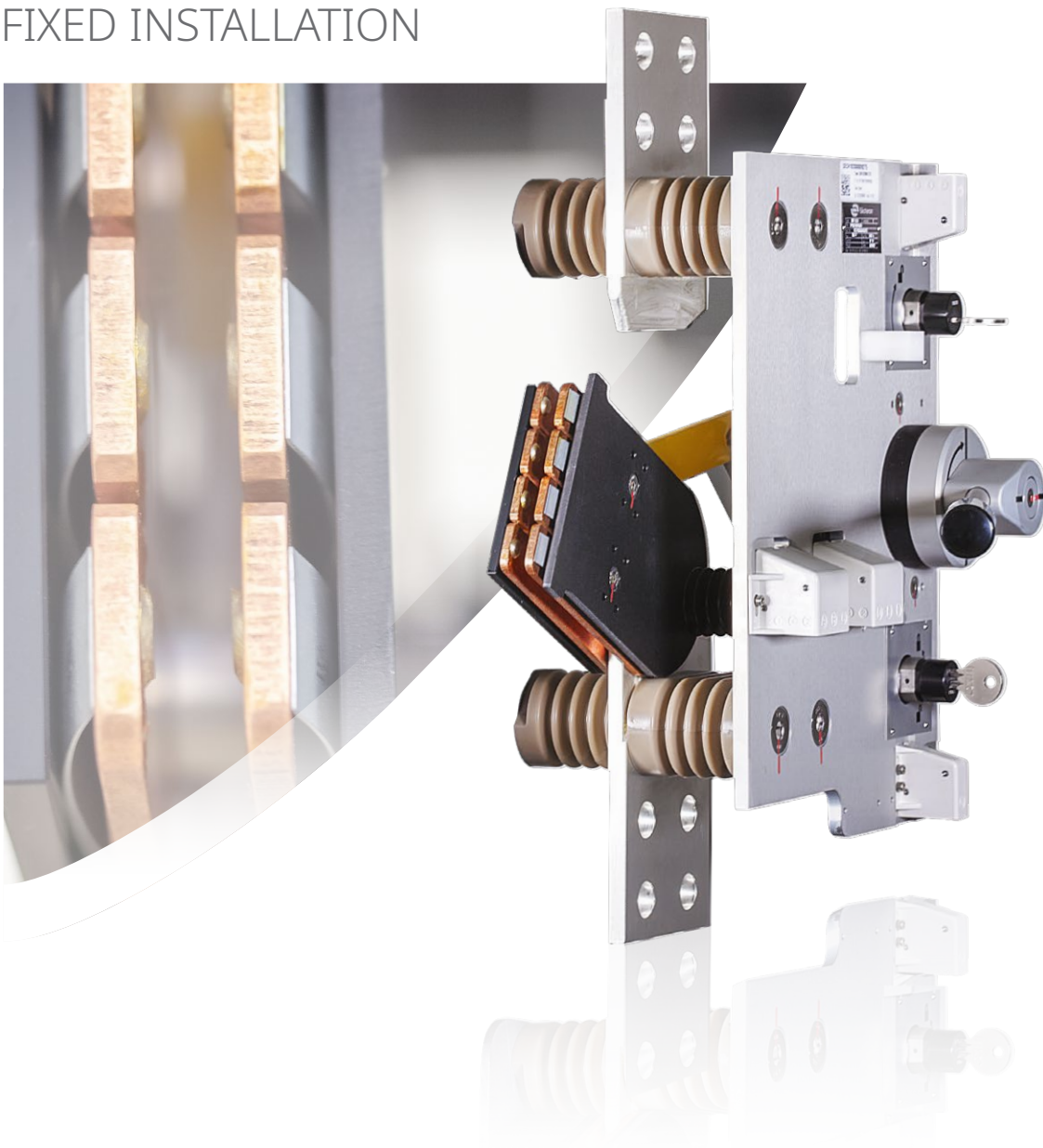


OFF-LOAD SWITCH

Type **SW**

FIXED INSTALLATION

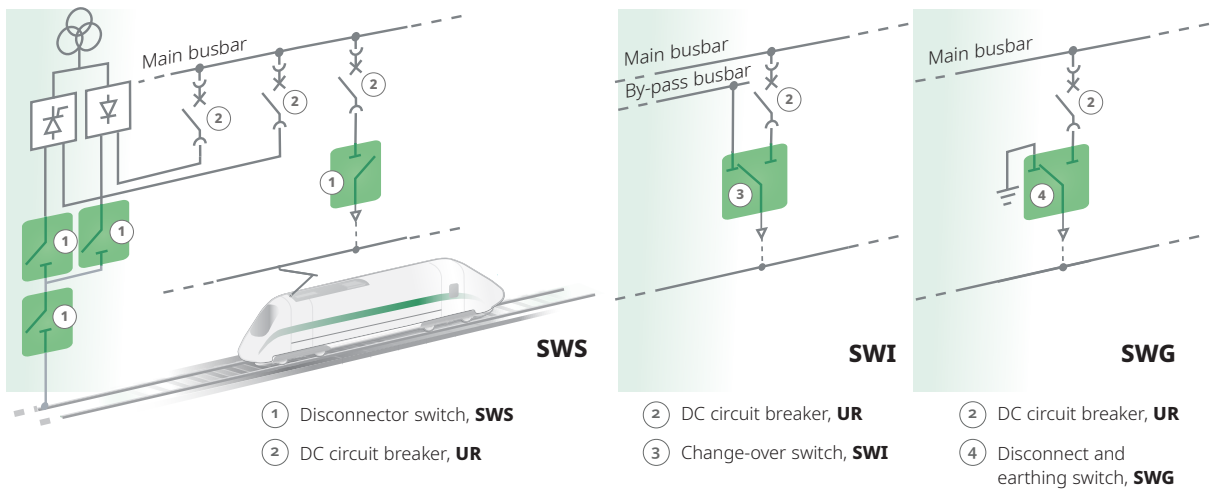


GENERAL INFORMATION

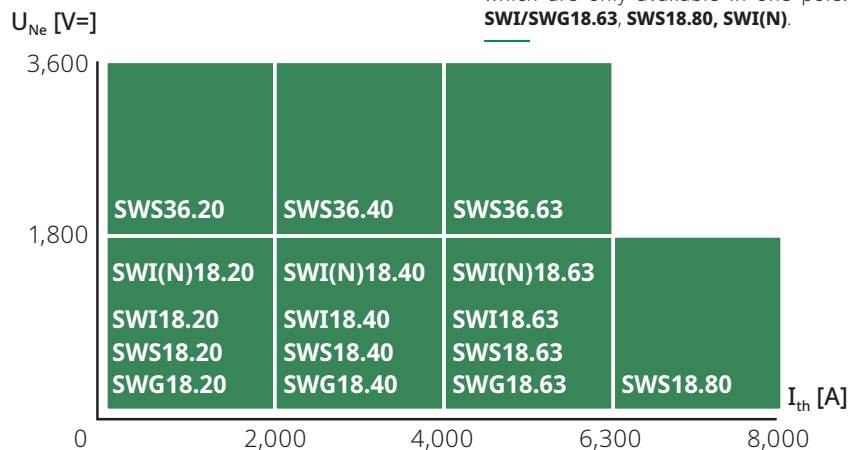
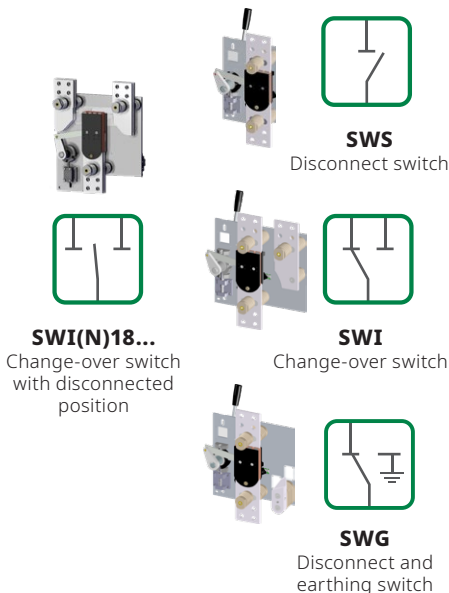
The **SW** off-load switch is a complete range designed to cover all the applications to be met in DC traction power substations and other industrial applications. Its modular concept enables to build single pole or double pole **SWS** disconnect switches, **SWI** change-over switches or **SWG** disconnect and earthing switches, for insulation voltages 3,000 V_{DC/AC} or 4,800 V_{DC/AC} and rated thermal currents from 2,000 to 8,000 A.

Installed inside cubicles, the **SW** switch 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** switch a safe component with a unique design and a high level of reliability.

APPLICATIONS, TYPICAL EXAMPLES



PRODUCT RANGE



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

MAIN FEATURES

- Rated operational voltage 1,800 V_{DC} and 3,600 V_{DC}
- Conventional free-air thermal current from 2,000 A to 8,000 A
- Safe with a high rated insulation voltage 3,000 V_{DC} and 4,800 V_{DC}
- 1 or 2 pole versions
- Specific version with 3 positions, SWI(N)18...
- Reference standards: EN 50123-1/-3

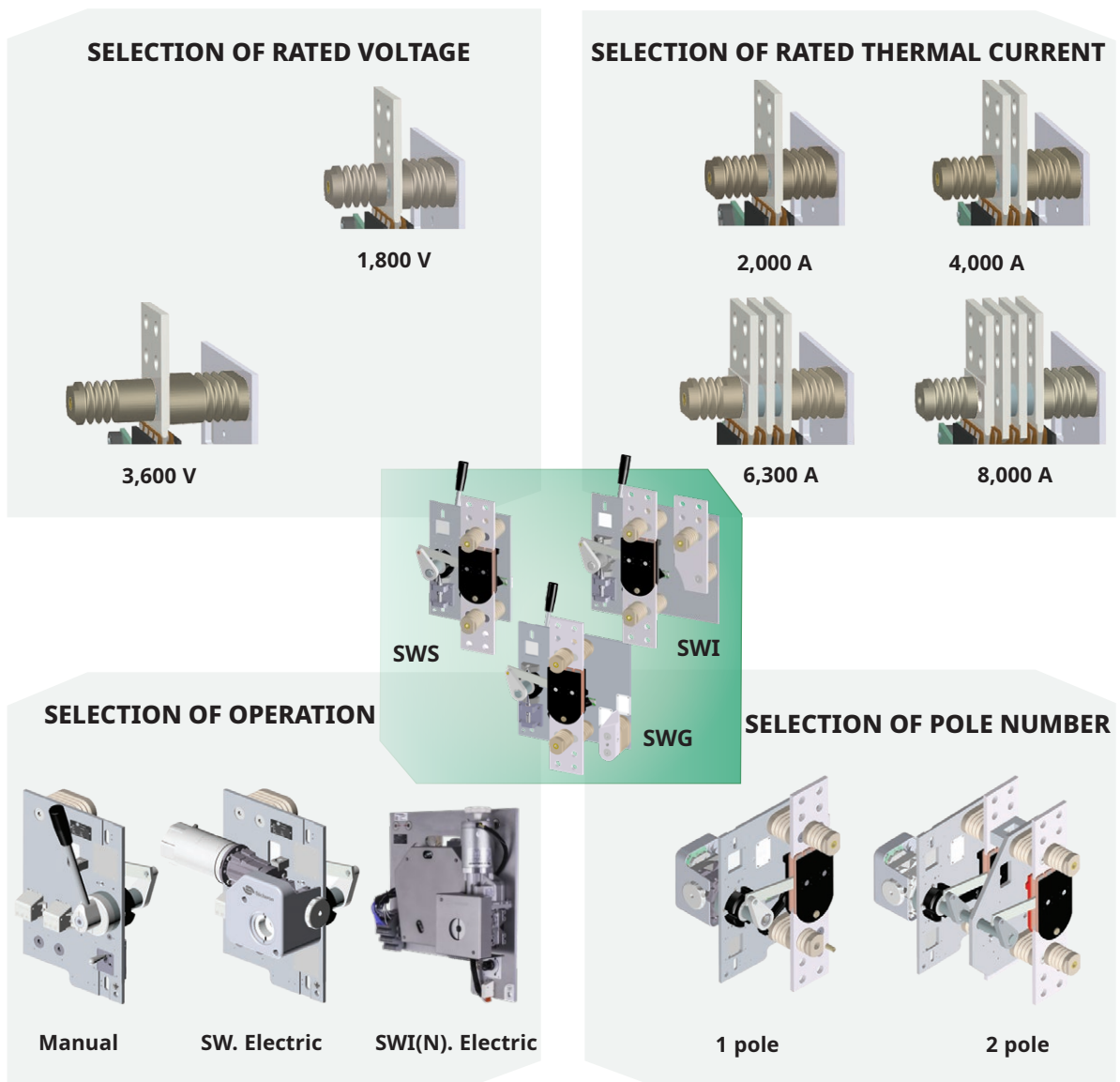
MAIN BENEFITS

- ✓ 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 each SWS, SWI and SWG 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.



DATA FOR PRODUCT SELECTION

	Symbol	Unit	SW...20	SW...40	SW...63	SW...80
MAIN HIGH VOLTAGE CIRCUIT						
Rated operational voltage	U_{Ne}	[V _{DC}]	1,800 or 3,600		1,800	1,800
- SWS			1,800		1,800	-
- SWI and SWG					1,800	-
Rated insulation voltage	U_{Nm}	[V]	3,000 or 4,800		3,000	3,000
- SWS			3,000		3,000	-
- SWI and SWG					3,000	-
Rated service current	I_{Ne}	[A]	2,000	4,000	6,300	8,000
Conventional free air thermal current ⁽¹⁾	I_{th}	[A]	2,000	4,000	6,300	8,000
Peak and rated short-time withstand current ⁽²⁾			OV4		OV4	
- for U_{Ne} 1,800 V	$\hat{I}_{NCW}/I_{NCW}/t$	[kA]/[kA]/[s]	178/125/0.25 ⁽³⁾		178/125/0.25 ⁽³⁾	
- for U_{Ne} 3,600 V	$\hat{I}_{NCW}/I_{NCW}/t$	[kA]/[kA]/[s]	101/71/0.25		-	-
Overvoltage category			OV4		OV4	
Peak and rated short-time withstand current ⁽⁴⁾						
- Pole - Pole	U_a	[kV]	11.0 ⁽⁵⁾ / 22.2 ⁽⁶⁾		11.0 ⁽⁶⁾	
- Pole - Earth	U_a	[kV]	9.2 ⁽⁵⁾ / 18.5 ⁽⁶⁾		9.2 ⁽⁶⁾	
Rated impulse withstand voltage (1.2/50 μ s)						
- Pole - Pole	U_{Ni}	[kV]	24.0 ⁽⁵⁾ / 48.0 ⁽⁶⁾		24.0 ⁽⁶⁾	
- Pole - Earth	U_{Ni}	[kV]	20.0 ⁽⁵⁾ / 40.0 ⁽⁶⁾		20.0 ⁽⁶⁾	
⁽¹⁾ At Tamb = +40°C and tested with high voltage connections according to standard IEC/EN 60943. • ⁽²⁾ For specific values of the SWG earthing pole, refer to the figure and table of the page 5 • ⁽³⁾ 105/75/0.25 for the specific version SWI(N)18... • ⁽⁴⁾ At 50 Hz and during 1 minute • ⁽⁵⁾ For U_{Ne} = 1,800 V _{DC} • ⁽⁶⁾ For U_{Ne} = 3,600 V _{DC} •						
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) (for all SW...except SWI(N))			
Range of voltage			[0.8-1.1] U_n			
Motor nominal closing/opening power:						
- DC only		[W]	125 (120 to 110 V _{DC})			
- AC only		[W]	90 (for all SW...except SWI(N))			
Mechanical switching time ⁽⁷⁾	t_c	[S]	< 3 (SW... with DC motor) < 5 (SW... with AC motor)			
Electromagnet nominal power (DC and AC)		[W]	~14			
⁽⁷⁾ For motorized version, at nominal control voltage = U_n and Tamb = +20°C. For SWI(N), switching time from left or right position to intermediate one and vice and versa.						
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} ⁽⁸⁾		[mA]	10 (silver contacts)			
⁽⁸⁾ 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 ⁽⁹⁾	U_a	[kV _{rms}]	2			
⁽⁹⁾ 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

		SWG...20	SWG...40	SWG...63	SWG...80
Application Duty Class - I_{Bd} [A] EN 50328 / IEC 62590	Class I	2,000	4,000	3,000	8,000
	Class V, VI, VII	2,000	3,000	4,200	—
	Class VIII	1,600	3,000	4,200	—

I_{Bd} : basic direct current

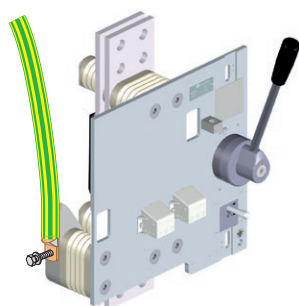
Class I	$1 \times I_{Bd}$	continuously
Class V	a) $1 \times I_{Bd}$	continuously
	b) $1.5 \times I_{Bd}$	2 hours - after a)
	c) $2.0 \times I_{Bd}$	1 min - after a)
Class VI	a) $1 \times I_{Bd}$	continuously
	b) $1.5 \times I_{Bd}$	2 hours - after a)
	c) $3.0 \times I_{Bd}$	1 min - after a)
Class VII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

PEAK AND RATED SHORT-TIME WITHSTAND CURRENTS OF THE SWG EARTHING POLE

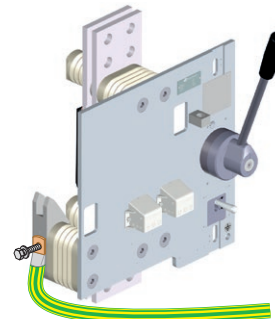
The earth connection can be a cable or a flexible braid according to the current value.

The values of the peak and rated short-time withstand currents are depending on the position/orientation of the earth connection.

CONNECTION OF EARTH CABLE (UPWARDS)



CONNECTION OF EARTH CABLE (DOWNWARDS)



VALUES OF THE PEAK AND RATED SHORT-TIME WITHSTAND CURRENTS

	Symbol	Unit	SWG..20	SWG..40	SWG..63
Earth connection (Upwards)	I_{Ncwe}	[kA]	14	28	28
	\hat{I}_{Ncwe}	[kA]	20	40	40
	t	[s]	0.25	0.25	0.25
Earth connection (Downwards)	I_{Ncwe}	[kA]	14	14	28
	\hat{I}_{Ncwe}	[kA]	20	20	40
	t	[s]	0.25	0.25	0.25

I_{Ncwe} : rated short-time withstand current
 \hat{I}_{Ncwe} : peak short-time withstand current
 t: short-time current duration

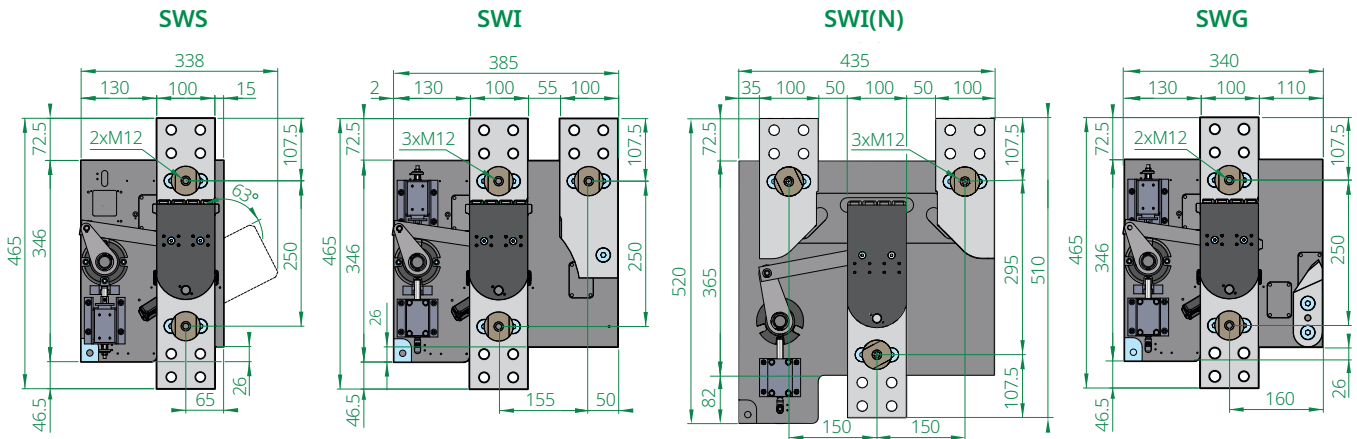
INFORMATION FOR PRODUCT INTEGRATION

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.

SW.18...



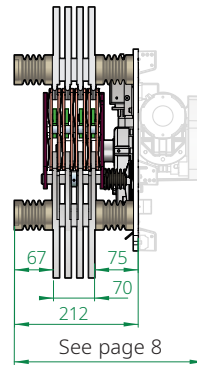
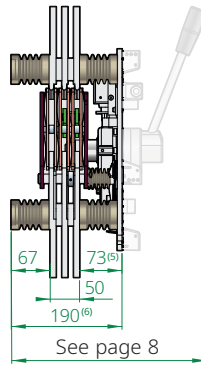
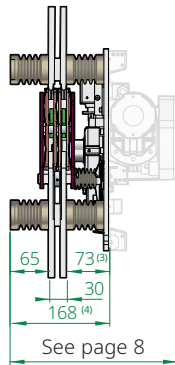
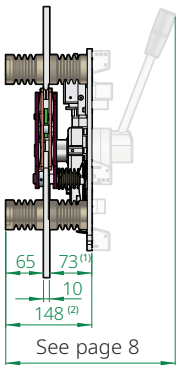
SW.18.20

SW.18.40

SW.18.63

SW.18.80

SW.18...
1-POLE
configurations



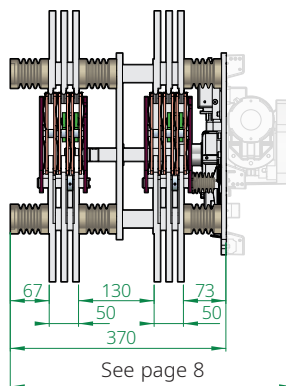
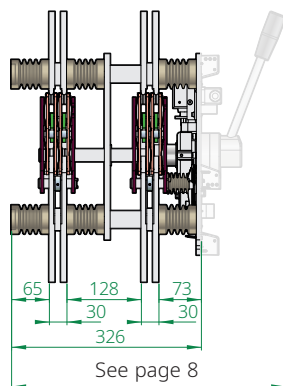
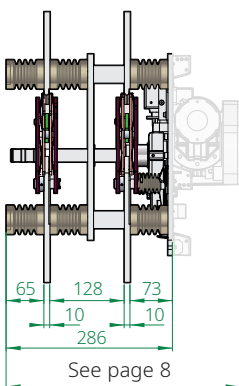
- (1) 75 for SWI(N)18.20.
- (2) 150 for SWI(N)18.20.
- (3) 75 for SWI(N)18.40.
- (4) 170 for SWI(N)18.40.
- (5) 75 for SWI(N)18.63.
- (6) 193 for SWI(N)18.63.

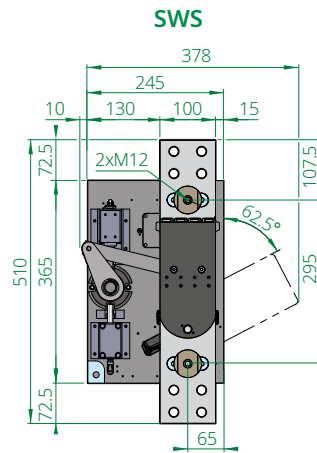
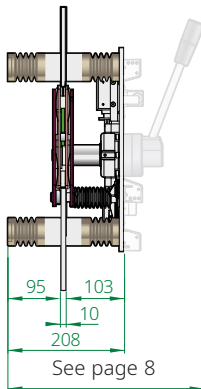
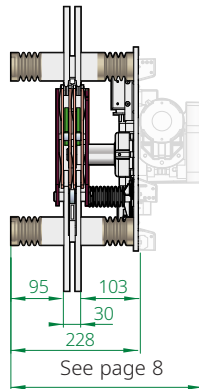
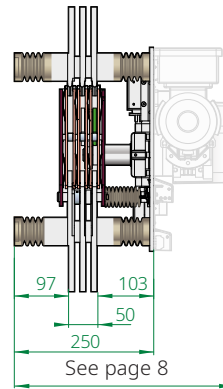
SW.18.20

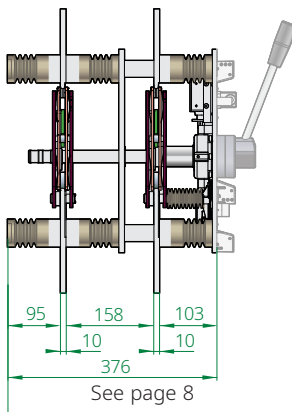
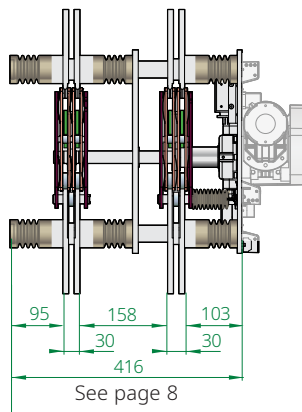
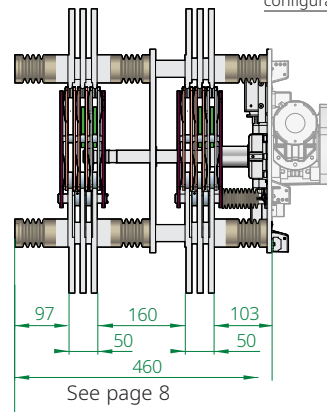
SW.18.40

SW.18.63

SW.18...
2-POLE
configurations

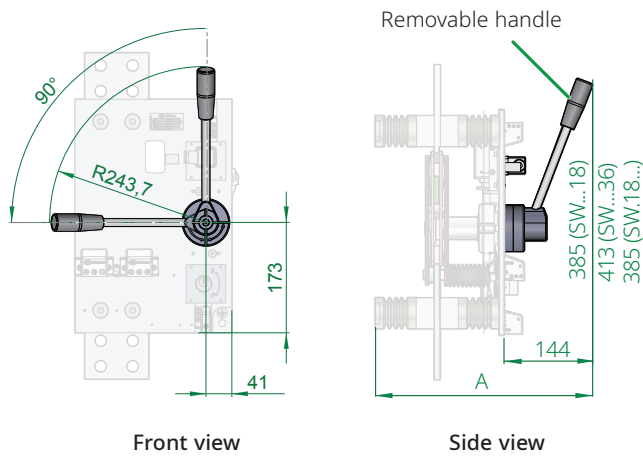


SWS36...

SWS36.20

SWS36.40

SWS36.63

SWS36...
 1-POLE
 configurations

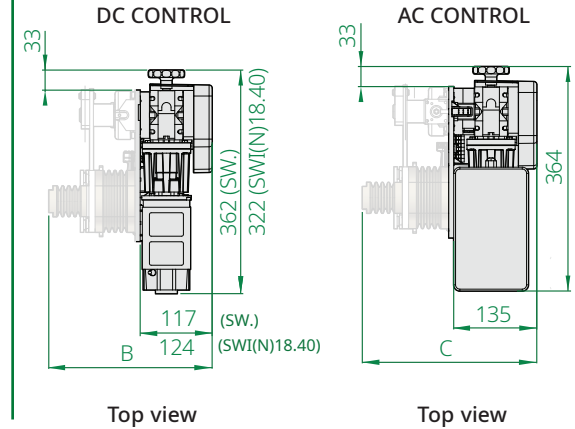
SW.18.20

SW.18.40

SW.18.63

SWS36...
 2-POLE
 configurations

OPERATION

MANUAL



ELECTRIC

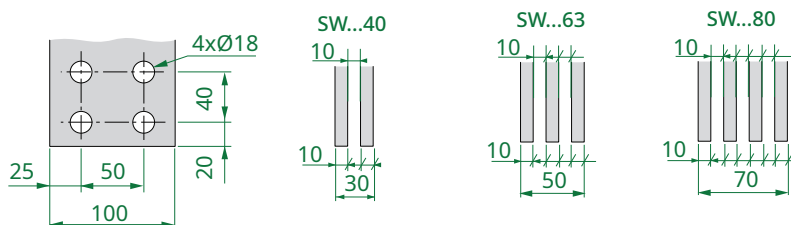


DIMENSIONS		A	B	C
SW.18.20	- 1 pole/2 pole	292/430	265/403	283/421
SWI(N)18.20	- 1 pole	Not applicable	274	Not applicable
SW.18.40	- 1 pole/2 pole	312/470	285/443	303/461
SWI(N)18.40	- 1 pole	Not applicable	294	Not applicable
SW.18.63	- 1 pole/2 pole	334/515	307/488	325/506
SW.18.80	- 1 pole	357	330	348
SWI(N)18.63	- 1 pole	Not applicable	316	Not applicable
SWS36.20	- 1 pole/2 pole	352/520	325/493	343/511
SWS36.40	- 1 pole/2 pole	372/560	345/533	363/551
SWS36.63	- 1 pole/2 pole	394/605	367/578	385/596

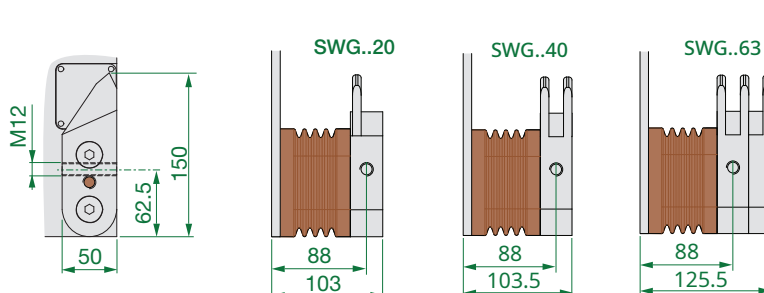
All dimensions are in mm

DETAILS OF THE 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:

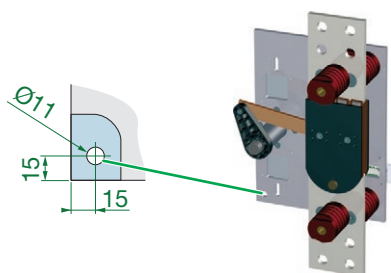


FOR ALL DEVICES



SWG EARTHING POLE

DETAILS OF THE EARTH CONNECTION ON THE BASE PLATE



WEIGHTS

SWS	1 pole							2 poles					
	18.20	18.40	18.63	18.80	36.20	36.40	36.63	18.20	18.40	18.63	36.20	36.40	36.63
MA [kg]: ± 1 kg	10	14	18	22	12	16	20	18	26	34	22	30	*
MO [kg]: ± 1 kg	16	20	24	28	18	22	26	24	30	40	28	36	*

SWI	1 pole			2 poles	
	18.20	18.40	18.63	18.20	18.40
MA [kg]: ± 1 kg	15	21	27	25	37
MO [kg]: ± 1 kg	21	27	33	31	43

SWI(N)	1 pole		
	18.20	18.40	18.63
	-	-	-
	22	28	34

* On request

SWG	1 pole			2 poles	
	18.20	18.40	18.63	18.20	18.40
MA [kg]: ± 1 kg	12	18	24	23	35
MO [kg]: ± 1 kg	18	24	30	29	41

Additional info.

MA: manual operation
MO: electric operation

The given weight corresponds to the heaviest AC motor configuration.

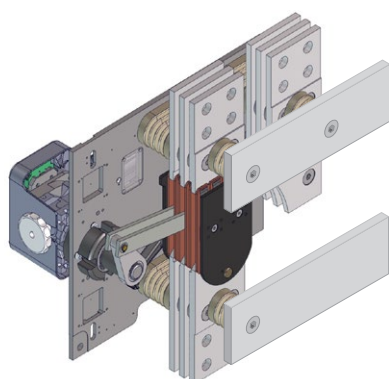
For DC motor, weights are slightly lower.

Weight may be different depending on product configuration with options.

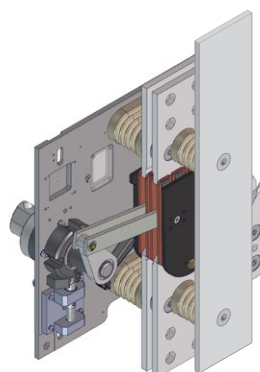
SW FIXATION

EXAMPLE OF EXECUTIONS

SWI

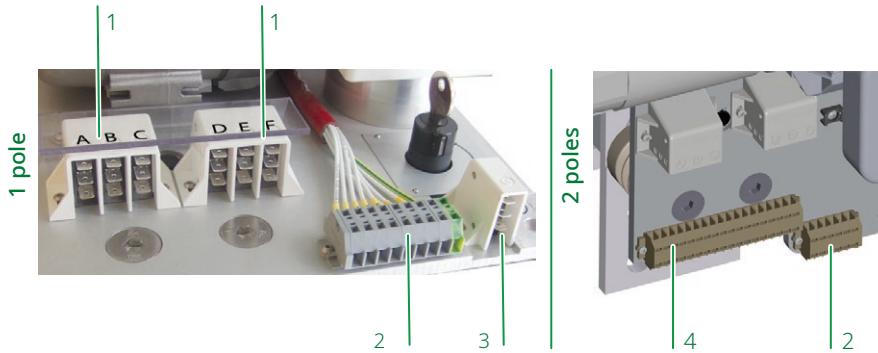


SWS-SWG



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

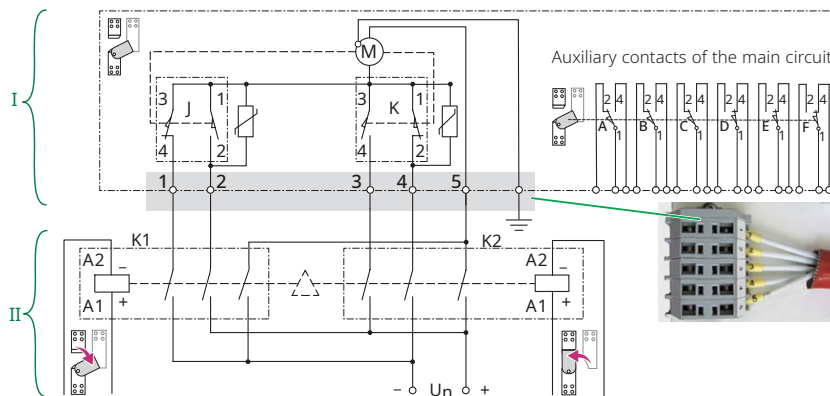
LOW VOLTAGE CONTROL AND INTERFACES



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



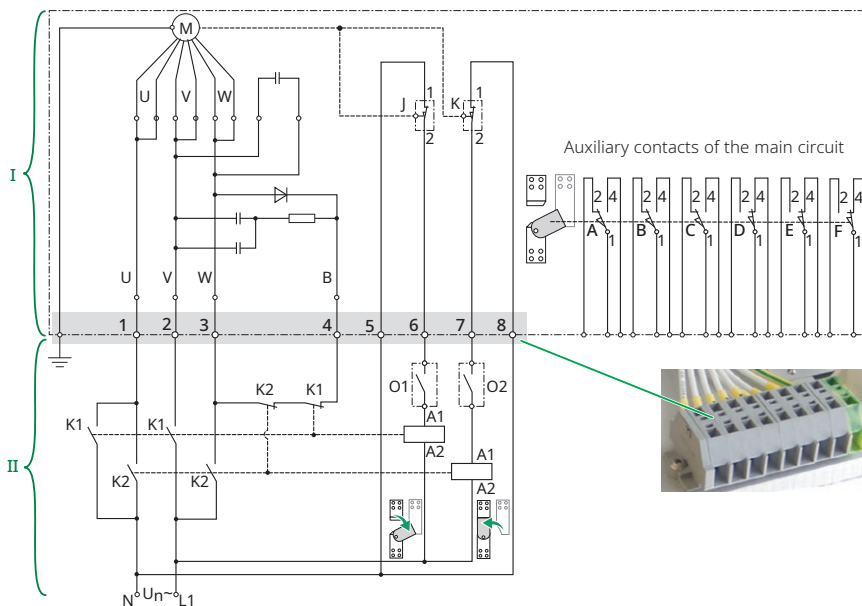
Control scheme valid for all SW... except SWI(N)18.40 which scheme is available on request.

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.
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:

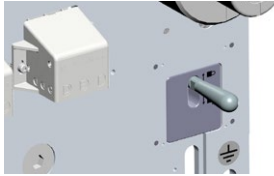
Legend of the schemes:

- I. SW scope.
Each of the K1 and K2 contactors must have two NO and one NC contacts.

LOCKING SYSTEMS

STANDARD

MANUAL LOCKING LEVER (FOR MANUAL OPERATED DEVICE)



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.

OPTIONAL

(SUBJECT OF ADDITIONAL COSTS)

KEY LOCK SYSTEM



Keys can only be removed in locked positions (open and/or closed) of the moving contact.

A change-over auxiliary switch indicates the locking status of the lock system.

Key lock system is of Ronis type. For other type, please contact Sécheron.

ELECTROMAGNET LOCK SYSTEM

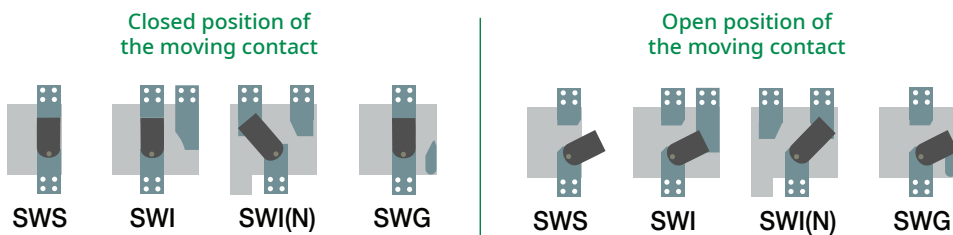


The electromagnet locks the moving contact in a defined position (open and/or closed).

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.

LOCKED POSITIONS OF MOVING CONTACT

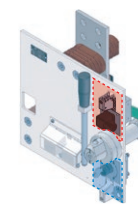


POSITIONS OF THE LOCK SYSTEMS ON THE SW

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

If only one lock system is selected, it will be always located in the **lower position**.

If a second lock system is selected, it will be located in the **upper position**.



Upper position

Lower position

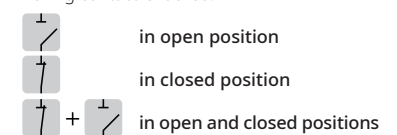
The configuration table hereunder allows you to choose which device position you want to lock and which

type of lock you wish, then it gives you the relative designation code and lock localization on front plate.

CONFIGURATIONS

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
	-	-	-	-	B ⁽¹⁾
	-	-	-	-	C
		-	-	-	D
	-	-		-	E
	-	-		-	F
	-	-		-	G
	-	-		-	H
-	-		-	-	I

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



⁽¹⁾ For this configuration combined with a manual operation of the SW, the device will be automatically delivered with a manual locking lever.

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 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	I	18	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	Disconnect switch Change-over switch Change-over switch with neutral position ⁽¹⁾ Disconnect and earthing switch	S I I(N) G		
12	Rated operational voltage	1,800 V 3,600 V	18 36		
13	Conventional free-air thermal current ⁽²⁾	2,000 A 4,000 A 6,300 A (For 1,800 V only) 8,000 A	20 40 63 80		
14	Operation	Manual Electric	MA MO		
15	Number of pole	1 pole 2 poles	1 2		
16	Control voltage for electric operation and optional electromagnet locks (Manual operation and without electromagnet lock) Not applicable	24 V _{DC} 48 V _{DC} 60/64 V _{DC} 110 V _{DC} 125 V _{DC} 127 V _{AC} - 50/60 Hz 220 V _{DC} 230 V _{AC} - 50/60 Hz	Z A C G E R X J T		
17	Locking of moving contacts	No ⁽³⁾ One key lock locking the open position One key lock locking both positions One electromagnet locking both positions For other selection, refer to the codification table on page 11	∅	B C I ...	
18	Key codification	(If no key lock selected in line 17) Not applicable No Yes	Z ∅	1	

⁽¹⁾ Available only in version SWI(N)18.40 MO 1-pole/SWI(N)18.20 MO 1-pole, SWI(N)18.63 MO 1-pole.

⁽²⁾ 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.

⁽³⁾ For this configuration combined with the selection of MA code line 14, the device will be automatically delivered with a manual locking lever.



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Signature:

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