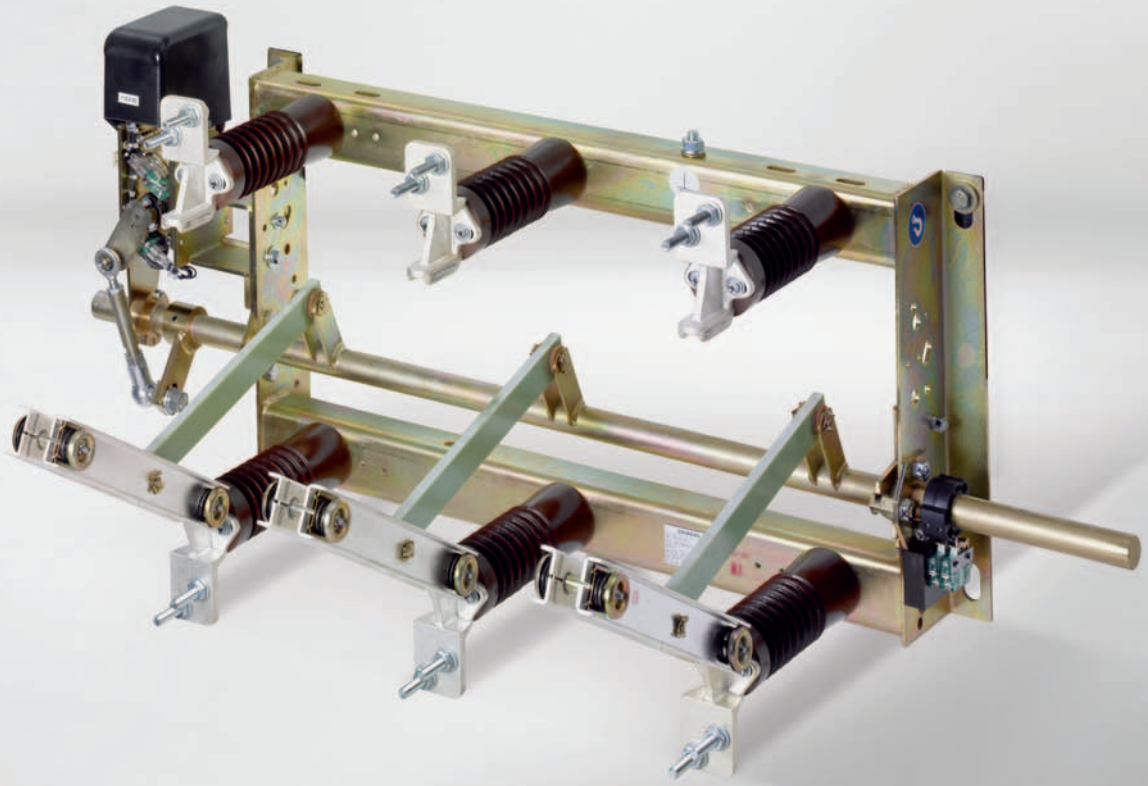


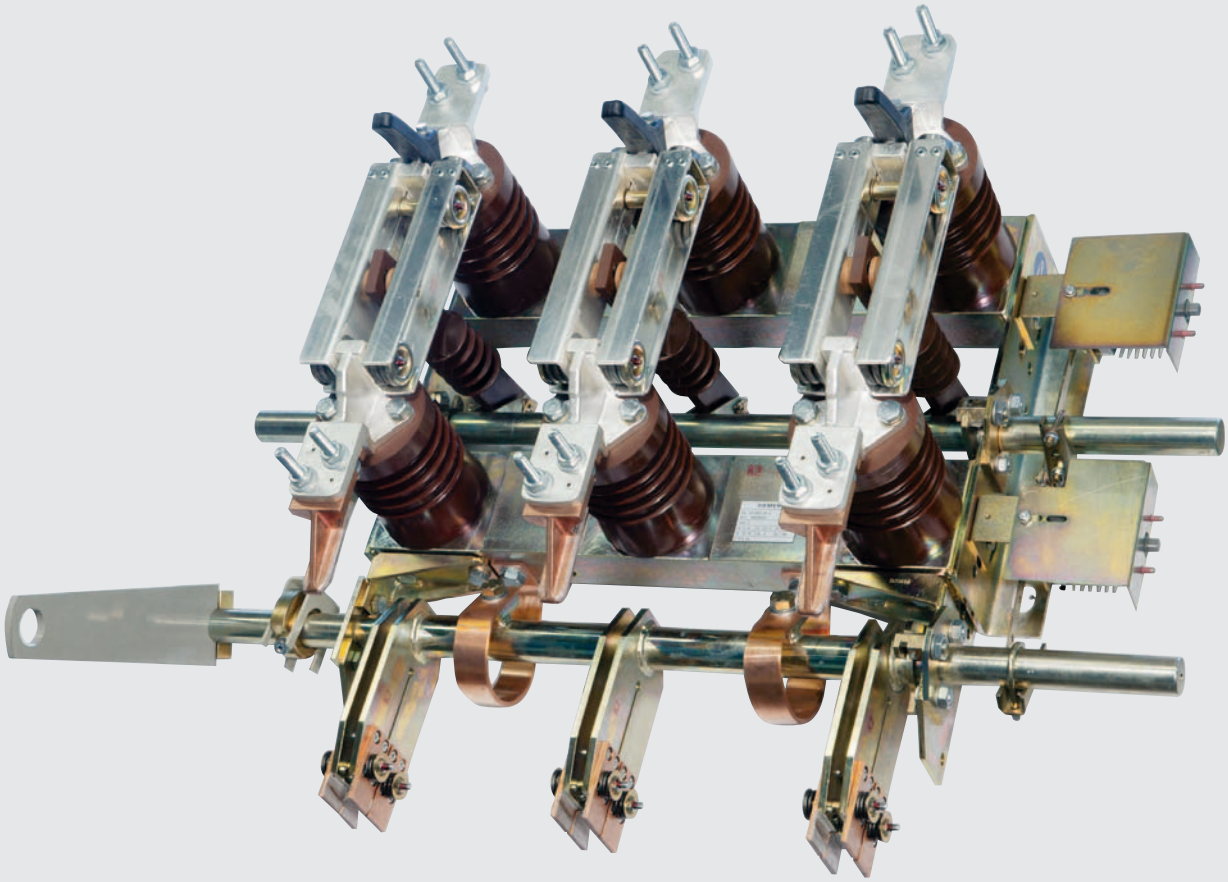
3D Disconnectors and Earthing Switches

Medium-Voltage Equipment
Selection and Ordering Data

Catalog HG 11.31 · 2008

Answers for energy.

SIEMENS



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3D Disconnectors and Earthing Switches

Medium-Voltage Equipment
Catalog HG 11.31 · 2008

Invalid: Catalog HG 11.31 · 1997

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R-HG11-173.tif


R-HG11-174.tif

Industrial application: Refinery

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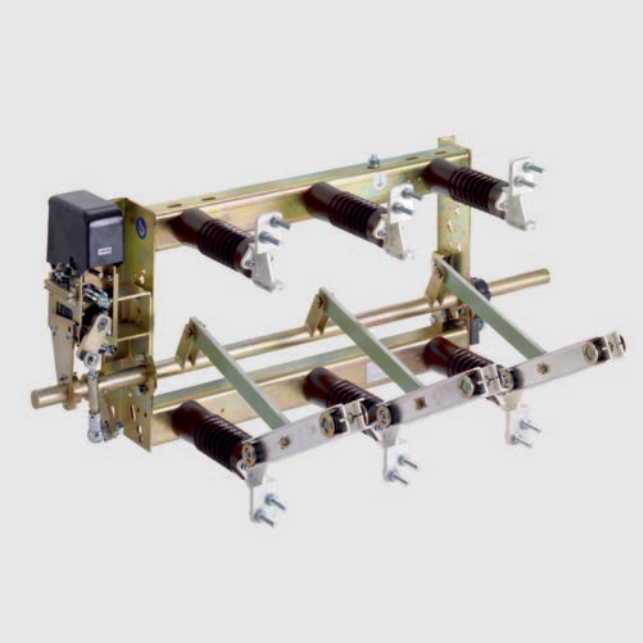
1

Disconnectors and earthing switches – The Securing

1

Disconnectors and earthing switches are used to protect personnel while working on operational equipment and must therefore be very reliable and operationally safe – even under adverse climatic conditions. Disconnectors and earthing switches are often offered as a combination of both.

3DA/3DC disconnectors – The Open



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Disconnectors have to isolate downstream operational equipment – i.e., de-energised equipment – from the connected circuits. Thus they establish a visible isolating distance in air towards downstream operational equipment.

3DD/3DE earthing switches – The Solid

R-HG11-228.eps

The task of an earthing switch is to earth de-energised parts of the switchgear and – in the case of multi-pole earthing switches – to short-circuit them at the same time.

Application

Disconnectors and earthing switches are suitable for indoor installations up to 36 kV. Due to their cast-resin ribbed insulators, the disconnectors and earthing switches can also be used with high air humidity and occasional condensation, e.g., in tropical areas.

The devices are protected against corrosion. Steel parts are either galvanised and yellow-passivated, or electrostatically coated with epoxy-resin powder over a phosphate layer.

The switching devices can be installed in any position with horizontal shaft. Designs for installation with the shaft in vertical position are also available.

Endurance

Normally, disconnectors and earthing switches are operated very rarely. Therefore they are not designed for a high number of operating cycles. The mechanical endurance and the contact endurance are:

– 5,000 operating cycles for the disconnector

– 1,000 operating cycles for the earthing switch.

Functions of the switching devices

3DA/3DC disconnectors have the following functions:

– Opening or closing circuits when either negligibly small currents have to be switched off/on or when there is no significant voltage difference between the circuits to be disconnected or connected.

– Establishing an isolating distance between the terminals of each pole in the open position.

The task of 3DD/3DE earthing switches is to earth de-energised parts of the switchgear and – in the case of multi-pole earthing switches – to short-circuit them at the same time.

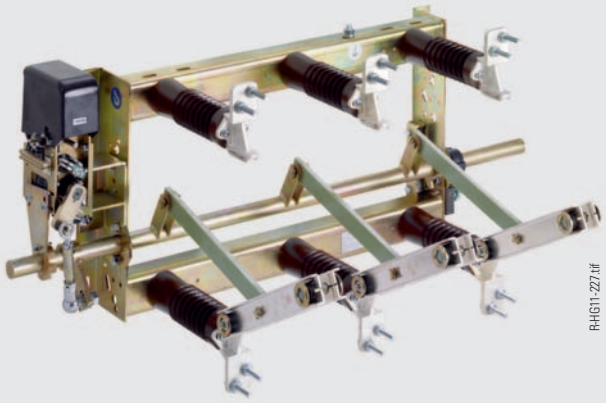
Short-circuit capability

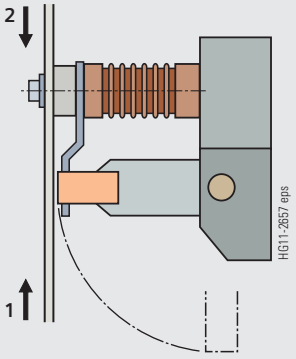
The short-circuit capability of closed disconnectors and earthing switches is tested according to VDE. Due to the loopless circuit, the disconnectors need not be interlocked against being opened by short-circuit forces.

Earthing switches built on disconnectors or used as independent devices have to be interlocked in presence of peak withstand currents above 50 kA if the earthing switch is installed with the peak withstand current flowing through the earthing switch in direction 2 according to the drawing shown on the right. In this direction, strong opening forces are effective.

Sufficient interlocking is guaranteed for motor operating mechanisms as well as for self-blocking manual operating mechanisms (e.g., spherical joint mechanism).

For earthing switches built on a disconnector, the mechanical interlock between the disconnector and the earthing switch is a simple means to exclude the disadvantages of the energy direction with opening force effect.

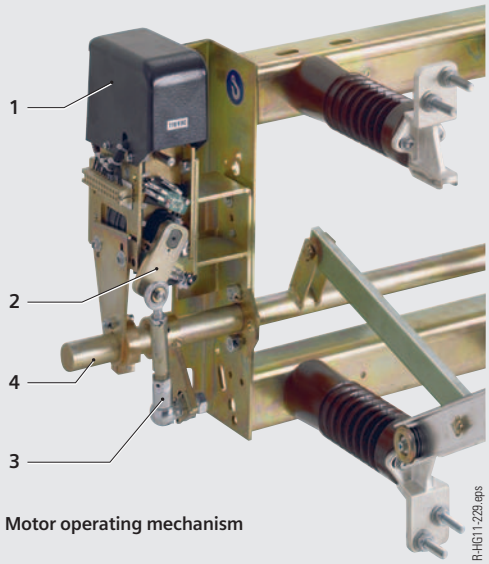




1 Energy direction produces no or small opening forces; permissible without interlock up to the rated peak withstand current

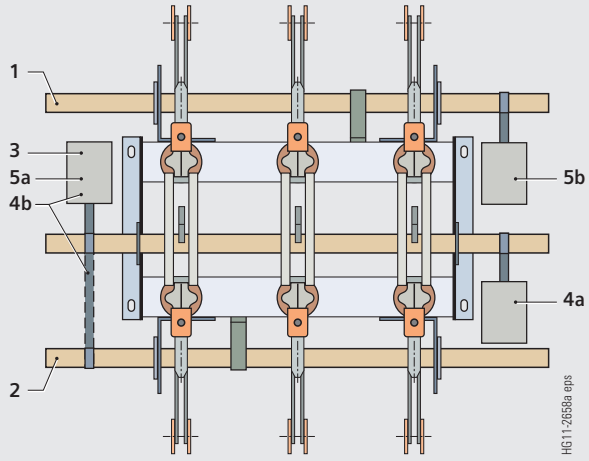
2 Energy direction produces strong opening forces; permissible without interlock up to a peak value of 50 kA

1



Motor operating mechanism

1 Motor operating mechanism with cover
2 Crank
3 Drive rod
4 Operating shaft



Position of the motor operating mechanism

Earthing switch

1 Mounted on the opening side (EO)
2 Mounted on the pivot point (EP)

The motor operating mechanism is built on as follows:

3 Disconnector without earthing switch
(motor operating mechanism top-left)
4 Disconnector with earthing switch on the pivot point
4a (motor operating mechanism for disconnector bottom-right)
4b (motor operating mechanism for earthing switch top-left with extended drive rod)
5 Disconnector with earthing switch on the opening side
5a (motor operating mechanism for disconnector top-left)
5b (motor operating mechanism for earthing switch top-right)

Motor operating mechanism

The motor operating mechanism – provided for disconnectors and earthing switches type 3D – mainly consists of a DC compound-wound motor, degree of protection IP00, which drives the eccentric shaft of a free-wheeling mechanism via a single-step spur gearing. The free-wheeling mechanism makes the crank (2) rotate counter-clockwise. The crank is linked with the drive lever through a short drive rod, and the drive lever is connected with the operating shaft (4).

A 180° turn of the crank produces a switching angle of 90° at the operating shaft. In the end positions of the switching device, the drive motor is de-energised via built-in position switches. If an AC motor operating mechanism is required, a rectifier is installed additionally.

The time from initiation of the command until reaching the end position or arrival of the feedback (total operating time) is 3 s as a maximum at the lowest value of the operating voltage.

Auxiliary mechanism for motor operating mechanism

If the auxiliary voltage fails, the motor operating mechanism can be emergency-operated. The auxiliary mechanisms provided for this purpose (for dimensions see page 39) are fixed-mounted in the switchgear panel and required for each motor operating mechanism.

The simplest design consists of a straight shaft running horizontally from the eccentric shaft (pin for emergency operation) of the motor operating mechanism to the front of the switchgear panel. There it is guided in a bearing plate, and ends with an operating pin. The switching operation is performed by means of an auxiliary crank, which is only required once for the switchgear assembly.

If the direct way to the panel front is not possible, the straight shaft can be equipped with a spherical joint at the motor operating mechanism. This built-on system enables deflecting the shaft by max. 10° to all directions. Another design is provided for motor operating mechanisms that are hard to access. This operating mechanism is designed with a flexible shaft, which is also operated with the auxiliary crank. For disconnectors and earthing switches in open switchgear panels, a complete auxiliary mechanism 3CX6 is recommended as crank.

Manual operating mechanisms

Instead of being operated by a motor, the operating shaft can also be actuated manually.

Operation by means of a switching rod depends on the mounting position and the accessibility. Switching rods are made of glass-fibre reinforced polyester tube and can be used in switchgear with rated voltages above 1 kV. These switching rods are used to actuate the switching rod lever (available as an accessory) mounted on the operating shaft.

Switching rod levers made of insulating material are always used where the necessary minimum distances are not reached. For fixing in the end positions, an elastic latch is always provided for switching rod actuation (see interlocks).

Interlocks

Latch

For disconnectors and earthing switches a latch can be supplied, which latches tight in the end positions in an elastic way. Such a latch must be provided when these switching devices are operated manually with a switching rod.

Mechanical interlocking

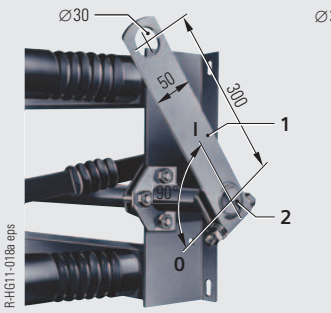
Disconnectors with built-on earthing switch can be equipped with a mechanical interlock if the earthing switch is actuated by means of a switching rod.

Power-operated switching devices must be interlocked with the means belonging to the operating mechanism, i.e., actuation must be prevented. For this purpose, the part without power operating mechanism requires an auxiliary switch.

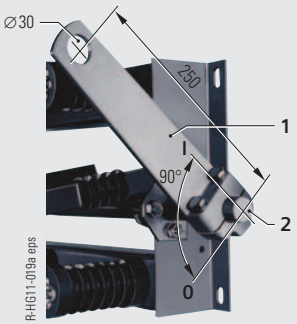
If neither the disconnector nor the earthing switch are power-operated, mechanical interlocking is possible in connection with an electromechanical lockout. The electromechanical lockout is then mounted on the disconnector.

Electromechanical lockout

Electromechanical lockout devices can be installed on all disconnectors and earthing switches without power operating mechanism. The lockout devices block the switching devices in the end positions when the solenoid is not excited. In the intermediate position (faulty position) the lockout is not effective. The magnet coils are suitable for continuous operation.

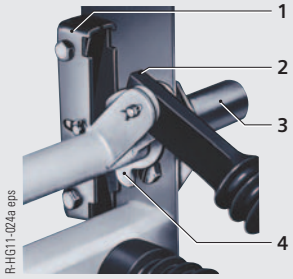


Switching rod lever made of metal



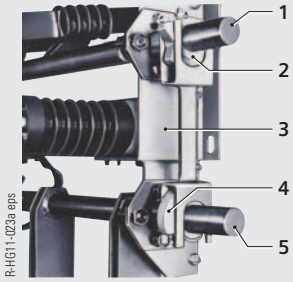
made of insulating material

1 Switching rod lever
2 Operating shaft



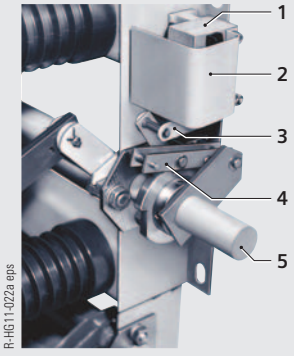
Latch for disconnector fixed on the base frame

1 Latch
2 Insulating coupling
3 Operating shaft
4 Switching angle limiter



Mechanical interlock between disconnector and built-on earthing switch

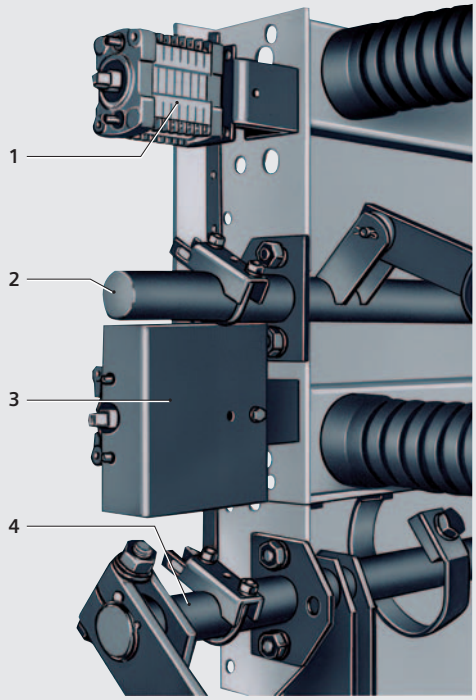
1 Operating shaft
2 Upper blocking disc
3 Double actuation
4 Lower blocking disc
5 Earthing switch shaft



Built-on electromechanical lockout

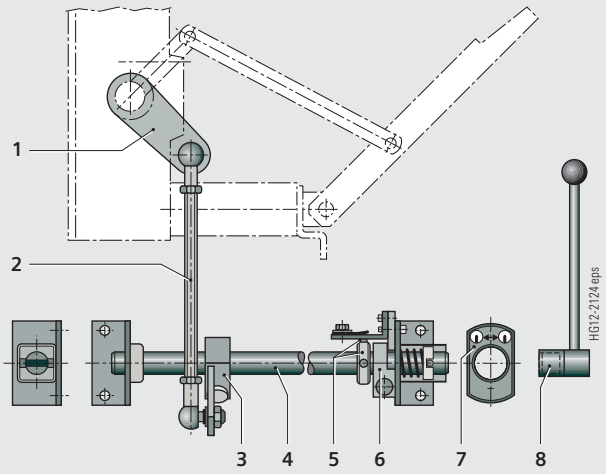
1 Magnet core
2 Cover
3 Magnet armature
4 Blocking lever
5 Operating shaft

1



Auxiliary switch for disconnector and built-on earthing switch

1 Auxiliary switch of disconnector
2 Disconnector shaft
3 Auxiliary switch of built-on earthing switch with cover
4 Earthing switch shaft



Spherical joint mechanism 3DX2

1 Operating shaft lever
2 Switching rod (threaded rod with spherical joints M12 on both sides)
3 Lever on the drive shaft
4 Drive shaft: steel shaft with 25 mm ∅, or insulating shaft with 30 mm ∅
5 Latch (only for disconnector and earthing switch)
6 90° stop CLOSE-OPEN
7 Indication label
– black for switch-disconnector and disconnector
– red for earthing switch and make-proof earthing switch
8 Operating lever for spherical joint mechanism 3DX2

Interlocks for motor operating mechanisms

Via switchgear interlocking system

For operation in connection with a switchgear interlocking device 8TJ2, a poled relay is required to prevent maloperation. Interlocks on the disconnector can be omitted.

For operation in connection with a switchgear interlocking device 8TK, no other auxiliary contactors are required.

Via auxiliary contactor

With an auxiliary contactor (with or without command execution) and pushbuttons, additional protective measures must be taken against impermissible switching operations.

Via changeover switch

The simplest possibility of control is a changeover switch. However, adequate protective measures against impermissible switching operations must be taken here as well.

Auxiliary switch

Disconnectors and earthing switches can be equipped with auxiliary switches with 2 NO + 2 NC or 6 NO + 6 NC contacts. If there is a motor operating mechanism available, the auxiliary switch is located on the side opposite of the motor. The rated current is 10 A.

Spherical joint mechanism

Disconnectors can also be operated through a spherical joint mechanism. The rotary movement is transmitted from the front side of a switchgear panel to the switching device via levers and rods.
Spherical joint mechanisms are also available for make-proof earthing switches.

Standards

The disconnectors and earthing switches conform to the following standards and recommendations:

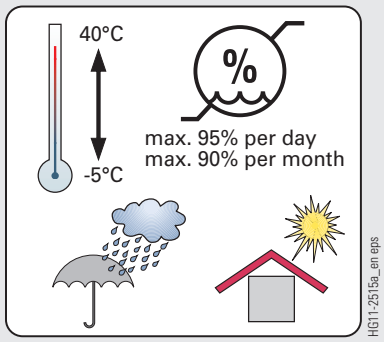
- DIN VDE 0670 Part 2
- DIN VDE 0111 Part 1
- IEC 129
- IEC 62271-1 (former IEC 60694)

1

Ambient conditions

The disconnectors and earthing switches are designed for the normal operating conditions defined in the standards.

Condensation can occasionally occur under the ambient conditions shown opposite.



Dielectric strength

The dielectric strength of air insulation decreases with increasing altitude due to low air density. According to IEC 62271-1, the values of the rated lightning impulse withstand voltage and the rated short-duration power-frequency withstand voltage specified in the chapter "Technical Data" apply to a site altitude of 1000 m above sea level. For an altitude above 1000 m, the insulation level must be corrected according to the opposite diagram.

The characteristic shown applies to both rated withstand voltages.

To select the devices, the following applies:

$U \geq U_0 \times K_a$

U Rated withstand voltage under reference atmosphere

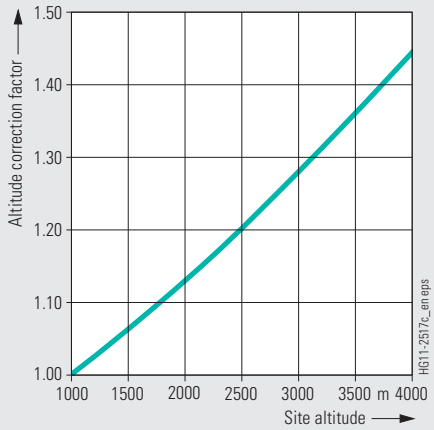
U_0 Rated withstand voltage requested for the place of installation

K_a Altitude correction factor according to the opposite diagram

Example

For a requested rated lightning impulse withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of 90 kV under reference atmosphere is required as a minimum:

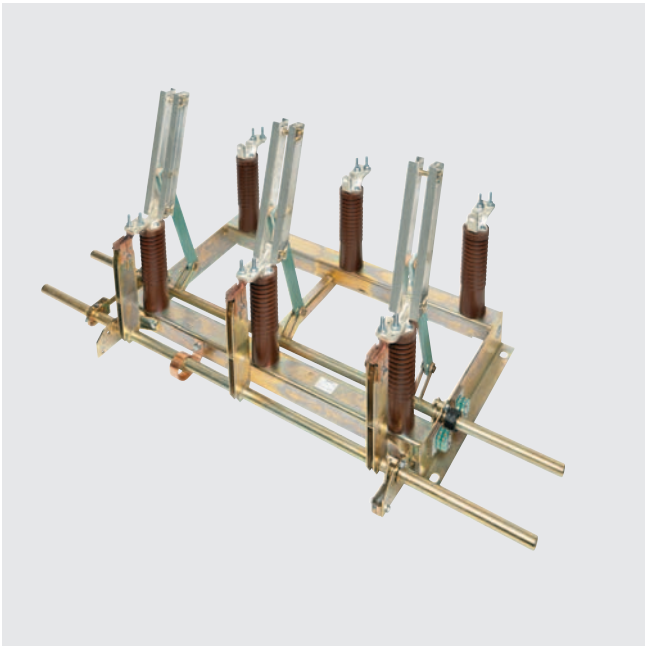
90 kV ≥ 75 kV x 1.2



1

Product range overview

Rated voltage	Rated short-time withstand current	Rated normal current (A)					
kV	kA	Without	630	1250	1600	2500	3000
12	20	▲	■				
	31.5	▲	■	■	■	■	
	50	▲		■	■	■	■
	63	▲		■	■	■	■
24	20	○/▲	●/■				
	31.5	○/▲		●/■	●/■	■	
36	20	▲	■				
	31.5	▲		■	●	■	■
		● 3DA	■ 3DC	○ 3DD	▲ 3DE		



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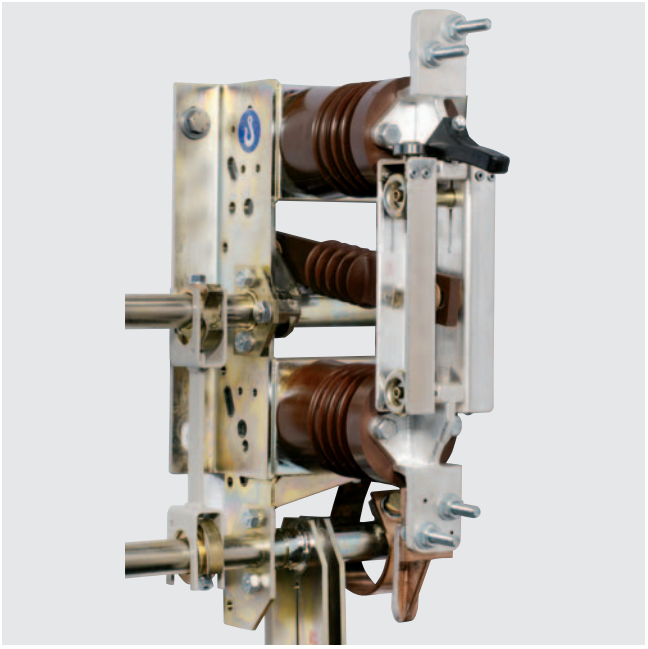
Disconnector with earthing switch mounted on the pivot point



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3DA disconnector

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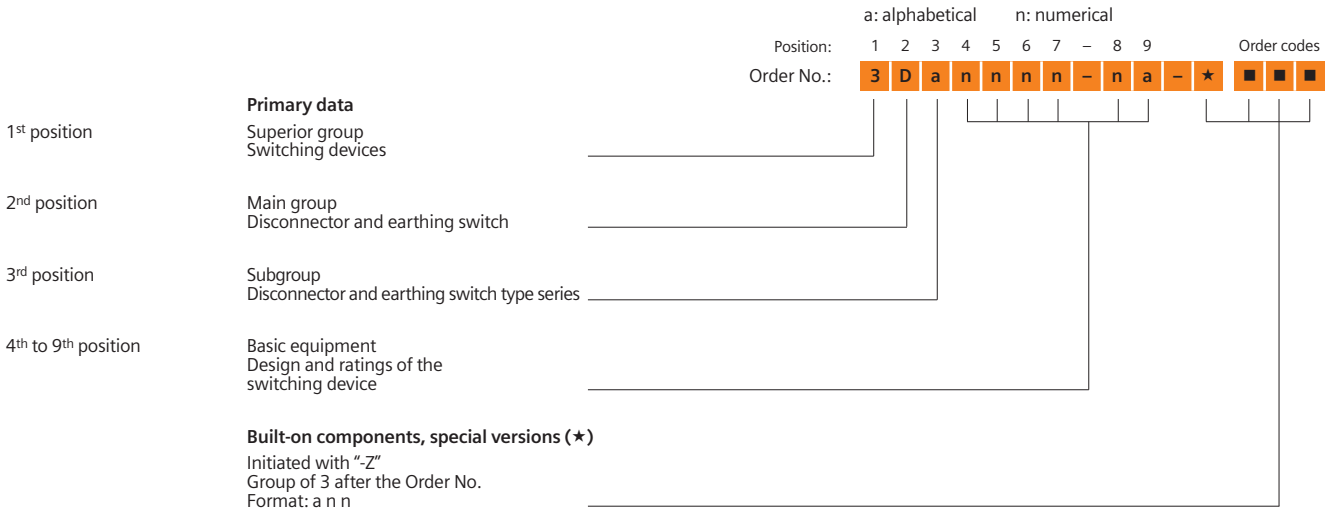
2

Order number structure

The disconnectors and earthing switches are described by a 9-digit order number. The positions 10 to 16, which are provided for the usual 16-digit order number, are not required. These 9 characters describe the primary data of the switching devices. Built-on components such as motors, interlocks, auxiliary switches, etc. are ordered by means of order codes.

Built-on components and special versions (★)

For built-on components and special versions, "**-Z**" is added to the order number and a descriptive order code follows. If several built-on components and special versions are required, the suffix "**-Z**" is listed only once. If a requested special version is not in the catalog and can therefore not be ordered via order code, it has to be identified with **Y 9 9** after consultation. The agreement hereto is made directly between your responsible sales partner and the order processing department in the Switchgear Factory Berlin.



Configuration example

In order to simplify the selection of the correct order number for the requested type of switching device, you will find a configuration example on each page of the chapter "Equipment Selection". For the selection of the built-on components, always the last example of the primary part was taken over and continued, so that at the end of the equipment selection (pages 20 and 24) a completely configured switching device results as an example.

On the foldout page we offer a configuring aid. Here you can fill in the order number you have determined for your switching device.

Example for Order No.:	3	D	C	1	0	1	4	–	2	G					
Order codes:															

12 kV

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Built-on earthing switch [1]	Position:	1	2	3	4	5	6	7	–	8	9	–	★	Order codes		
									Order No.:	3	D	■	■	■	■	■	–	■	■	–	★	■	■	■
12	75	28	**630**	20	50	3	**210**	without		3	D	C	1	0	1	2	–	2	G					
								EP		3	D	C	1	0	2	2	–	2	G					
								EO		3	D	C	1	0	3	2	–	2	G					
				31.5	80 [2]	3	**210**	without		3	D	C	1	0	1	2	–	2	L					
								EP		3	D	C	1	0	2	2	–	2	L					
								EO		3	D	C	1	0	3	2	–	2	L					
			1250	31.5	80 [3]	3	**210**	without		3	D	C	1	0	1	2	–	3	N					
								EP		3	D	C	1	0	2	2	–	3	N					
								EO		3	D	C	1	0	3	2	–	3	N					
				50	125	3	**210**	without		3	D	C	1	0	1	2	–	3	S					
								EP		3	D	C	1	0	2	2	–	3	S					
								EO		3	D	C	1	0	3	2	–	3	S					
				63	160	3	**210**	without		3	D	C	1	0	1	2	–	3	U					
								EP		3	D	C	1	0	2	2	–	3	U					
								EO		3	D	C	1	0	3	2	–	3	U					
			1600	31.5	80 [3]	3	**210**	without		3	D	C	1	0	1	2	–	4	C					
								EP		3	D	C	1	0	2	2	–	4	C					
								EO		3	D	C	1	0	3	2	–	4	C					
				50	125	3	**210**	without		3	D	C	1	0	1	2	–	4	G					
								EP		3	D	C	1	0	2	2	–	4	G					
								EO		3	D	C	1	0	3	2	–	4	G					
				63	160	3	**210**	without		3	D	C	1	0	1	2	–	4	J					
								EP		3	D	C	1	0	2	2	–	4	J					
								EO		3	D	C	1	0	3	2	–	4	J					
			2500	31.5	80	3	**210**	without		3	D	C	1	0	1	2	–	5	E					
								EP		3	D	C	1	0	2	2	–	5	E					
								EO		3	D	C	1	0	3	2	–	5	E					
				50	125	3	**210**	without		3	D	C	1	0	1	2	–	5	J					
								EP		3	D	C	1	0	2	2	–	5	J					
								EO		3	D	C	1	0	3	2	–	5	J					
				63	160	3	**210**	without		3	D	C	1	0	1	2	–	5	L					
								EP		3	D	C	1	0	2	2	–	5	L					
								EO		3	D	C	1	0	3	2	–	5	L					
			3000	50	125	3	**230**	without		3	D	C	1	0	1	2	–	6	J					
								EP		3	D	C	1	0	2	2	–	6	J					
								EO		3	D	C	1	0	3	2	–	6	J					
				63	160	3	**230**	without		3	D	C	1	0	1	2	–	6	L					
								EP		3	D	C	1	0	2	2	–	6	L					
								EO		3	D	C	1	0	3	2	–	6	L					

1) EP = with earthing switch mounted on the pivot point; EO = with earthing switch mounted on the opening side
2) Disconnectors without earthing switches can also be used for 87 kA if the connecting bars are supported at a distance of 100 mm from the post insulators of the disconnector
3) Can also be used for 87 kA

Configuration example

Disconnector, **3-pole**
Rated voltage U_r = **12 kV**
Rated normal current I_r = **2500 A**
Rated short-time withstand current I_{th} = **50 kA**
Pole-centre distance **210 mm**
Earthing switch mounted on the opening side of the disconnector **EO**

3	D	C										
			1	0	3	2	–	5	J			

Example for Order No.:	3	D	C	1	0	3	2	–	5	J					
Order codes:															

See page 19

2

2

24 kV

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Built-on earthing switch [1]	Position: 1 2 3 4 5 6 7 – 8 9 – ★	Order codes ■ ■ ■
									Order No.:	
24	125	50	**630**	20	50	1	–	without	3 D A 1 0 1 4 – 2 G	
								EP	3 D A 1 0 2 4 – 2 G	
								EO	3 D A 1 0 3 4 – 2 G	
						3	**275**	without	3 D C 1 0 1 4 – 2 G	
								EP	3 D C 1 0 2 4 – 2 G	
								EO	3 D C 1 0 3 4 – 2 G	
			1250	31.5	80	1	–	without	3 D A 1 0 1 4 – 3 N	
								EP	3 D A 1 0 2 4 – 3 N	
								EO	3 D A 1 0 3 4 – 3 N	
						3	**275**	without	3 D C 1 0 1 4 – 3 N	
								EP	3 D C 1 0 2 4 – 3 N	
								EO	3 D C 1 0 3 4 – 3 N	
			1600	31.5	80	1	–	without	3 D A 1 0 1 4 – 4 C	
								EP	3 D A 1 0 2 4 – 4 C	
								EO	3 D A 1 0 3 4 – 4 C	
						3	**275**	without	3 D C 1 0 1 4 – 4 C	
								EP	3 D C 1 0 2 4 – 4 C	
								EO	3 D C 1 0 3 4 – 4 C	
			2500	31.5	80	3	**300**	without	3 D C 1 0 1 4 – 5 E	
								EP	3 D C 1 0 2 4 – 5 E	
								EO	3 D C 1 0 3 4 – 5 E	

36 kV

50/60 Hz

U_r kV	U_p kV	U_d kV	I_r A	I_{th} kA	I_{dyn} kA		mm	
36	170	70	**630**	20	50	3	**400**	without	3 D C 1 0 1 6 – 2 G	
								EP	3 D C 1 0 2 6 – 2 G	
								EO	3 D C 1 0 3 6 – 2 G	
			1250	31.5	80	3	**400**	without	3 D C 1 0 1 6 – 3 N	
								EP	3 D C 1 0 2 6 – 3 N	
								EO	3 D C 1 0 3 6 – 3 N	
			1600	31.5	80	1	–	without	3 D A 1 0 1 6 – 4 C	
								EP	3 D A 1 0 2 6 – 4 C	
								EO	3 D A 1 0 3 6 – 4 C	
			2500	31.5	80	3	**400**	without	3 D C 1 0 1 6 – 5 E	
								EP	3 D C 1 0 2 6 – 5 E	
								EO	3 D C 1 0 3 6 – 5 E	
			3000	31.5	80	3	**420**	without	3 D C 1 0 1 6 – 6 E	
								EP	3 D C 1 0 2 6 – 6 E	
								EO	3 D C 1 0 3 6 – 6 E	

See page 19

1) EP = with earthing switch mounted on the pivot point; EO = with earthing switch mounted on the opening side

Configuration example

Disconnector, **1-pole** — 3 D A

Rated voltage U_r = **36 kV**

Rated normal current I_r = **1600 A**

Rated short-time withstand current I_{th} = **31.5 kA**

Earthing switch mounted on the pivot point of the disconnector **EP** — 1 0 2 6 – 4 C

Example for Order No.: 3 D A 1 0 2 6 – 4 C

Order codes:

12 kV for switchgear panels with a panel width of 650 mm

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Built-on earthing switch [1]	Position: 1 2 3 4 5 6 7 – 8 9 – ★	Order codes ■ ■ ■
									Order No.: 3 D ■ ■ ■ ■ ■ – ■ ■ – ★	
12	60	28	**630**	20	50	3	**150**	without	**3 D C 1 0 4 1 – 2 G**	
								EP	**3 D C 1 0 5 1 – 2 G**	
								EO	**3 D C 1 0 6 1 – 2 G**	
				31.5	80 [2]	3	**150**	without	**3 D C 1 0 4 1 – 2 L**	
								EP	**3 D C 1 0 5 1 – 2 L**	
								EO	**3 D C 1 0 6 1 – 2 L**	
			1250	31.5	80 [3]	3	**150**	without	**3 D C 1 0 4 1 – 3 N**	
								EP	**3 D C 1 0 5 1 – 3 N**	
								EO	**3 D C 1 0 6 1 – 3 N**	

1) EP = with earthing switch mounted on the pivot point; EO = with earthing switch mounted on the opening side

2) Disconnectors without earthing switches can also be used for 87 kA if the connecting bars are supported at a distance of 100 mm from the post insulators of the disconnector

3) Can also be used for 87 kA

See page 19

Configuration example
Disconnector, **3-pole**
For switchgear panels with a panel width of **650 mm**
Rated voltage U_r = **12 kV**
Rated normal current I_r = **1250 A**
Rated short-time withstand current I_{th} = **31.5 kA**
Pole-centre distance **150 mm**
Without built-on earthing switch

Example for Order No.: **3 D C 1 0 4 1 – 3 N**
Order codes:

2

12 kV for switchgear panels with a panel width of 900 mm

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Built-on earthing switch [1]	Order No.	Order codes
12	75	28	**630**	20	50	3	**210**	without	3DC1072–2G	
								EP	3DC1082–2G	
								EO	3DC1092–2G	
				31.5	80 [2]	3	**210**	without	3DC1072–2L	
								EP	3DC1082–2L	
								EO	3DC1092–2L	
			1250	31.5	80 [3]	3	**210**	without	3DC1072–3N	
								EP	3DC1082–3N	
								EO	3DC1092–3N	
				50	125	3	**210**	without	3DC1072–3S	
								EP	3DC1082–3S	
								EO	3DC1092–3S	
			1600	31.5	80 [3]	3	**210**	without	3DC1072–4C	
								EP	3DC1082–4C	
								EO	3DC1092–4C	
				50	125	3	**210**	without	3DC1072–4G	
								EP	3DC1082–4G	
								EO	3DC1092–4G	
			2500	31.5	80 [3]	3	**210**	without	3DC1072–5E	
								EP	3DC1082–5E	
								EO	3DC1092–5E	
				50	125	3	**210**	without	3DC1072–5J	
								EP	3DC1082–5J	
								EO	3DC1092–5J	

24 kV for switchgear panels with a panel width of 900 mm

50/60 Hz

U_r kV	U_p kV	U_d kV	I_r A	I_{th} kA	I_{dyn} kA		mm		Order No.	Order codes
24	95	50	**630**	20	50	3	**210**	without	3DC1073–2G	
								EP	3DC1083–2G	
								EO	3DC1093–2G	
			1250	31.5	80	3	**210**	without	3DC1073–3N	
								EP	3DC1083–3N	
								EO	3DC1093–3N	

1) EP = with earthing switch mounted on the pivot point; EO = with earthing switch mounted on the opening side

2) Disconnectors without earthing switches can also be used for 87 kA if the connecting bars are supported at a distance of 100 mm from the post insulators of the disconnector

3) Can also be used for 87 kA

Configuration example

Disconnector, **3-pole**
For switchgear panels with a panel width of **900 mm**
Rated voltage U_r **= 12 kV**
Rated normal current I_r **= 2500 A**
Rated short-time withstand current I_{th} **= 50 kA**
Pole-centre distance **210 mm**
Earthing switch mounted on the pivot point of the disconnector **EP**

Position:	1	2	3	4	5	6	7	–	8	9		
Order No.:	3	D	C	1	0	8	2	–	5	J		
Example for Order No.:	3	D	C	1	0	8	2	–	5	J		
Order codes:												

See page 19

Disconnector with motor operating mechanism

Position:	1	2	3	4	5	6	7	–	8	9			Order codes		
Order No.:	3	D	■	■	■	■	■	–	■	■	–	★	■	■	■

Number of motors	Rated voltage of motor				
One motor for disconnector	60 V DC		–	Z	A 0 3
	110 V DC		–	Z	A 0 4
	220 V DC		–	Z	A 0 6
	230 V AC	50/60 Hz	–	Z	A 1 6
One motor each for disconnector	60 V DC		–	Z	A 2 3
and earthing switch	110 V DC		–	Z	A 2 4
	220 V DC		–	Z	A 2 6
	230 V AC	50/60 Hz	–	Z	A 3 6

Disconnector with latch for switching rod actuation [1)]

Disconnector design	Number of latches			
Disconnector without built-on earthing switch	1 latch	–	Z	B 3 1
Disconnector with built-on earthing switch	One latch each for disconnector and earthing switch	–	Z	B 3 2

1) Switching rod and switching rod lever as accessories

Disconnector with electromechanical lockout (manual operation only)

Disconnector design	Rated voltage of lockout device				
Without earthing switch (manual operation)	24 V DC		–	Z	C 0 1
	60 V DC		–	Z	C 0 3
	110 V DC		–	Z	C 0 4
	220 V DC		–	Z	C 0 6
	100/110 V AC	50/60 Hz	–	Z	C 0 7
	230 V AC	50/60 Hz	–	Z	C 0 8
With built-on earthing switch (manual operation)	24 V DC		–	Z	C 2 1
	60 V DC		–	Z	C 2 3
	110 V DC		–	Z	C 2 4
	220 V DC		–	Z	C 2 6
	100/110 V AC	50/60 Hz	–	Z	C 2 7
	230 V AC	50/60 Hz	–	Z	C 2 8

Configuration example
Disconnector, **3-pole**
(U_r = **12 kV**, I_r = **2500 A**, I_{th} = **50 kA**, pole-centre distance **210 mm**,
earthing switch mounted on the pivot point of the disconnector **EP**)
With one motor operating mechanism each for disconnector and earthing switch **60 V DC**

	3	D	C												
				1	0	8	2	–	5	J					
											–	Z	A	2	3
Example for Order No.:	3	D	C	1	0	8	2	–	5	J	–	Z			
Order codes:	A	2	3												

Disconnector with built-on auxiliary switch

Position:	1	2	3	4	5	6	7	–	8	9			Order codes		
Order No.:	3	D	■	■	■	■	■	–	■	■	–	★	■	■	■

Disconnector design	Auxiliary switch for disconnector	Auxiliary switch for earthing switch				
Without earthing switch	2 NO + 2 NC	–	–	Z	E	0	2
	6 NO + 6 NC	–	–	Z	E	0	6
With built-on earthing switch	2 NO + 2 NC	2 NO + 2 NC	–	Z	E	2	2
	6 NO + 6 NC	2 NO + 2 NC	–	Z	E	2	6

Disconnector with mechanical interlock

Disconnector design	Option					
With built-on earthing switch	Arrangement between disconnector and earthing switch (only possible if disconnector or earthing switch is operated with switching rod)	–	Z	F	0	0

Special versions

Options					
Other pole-centre distance – If disconnectors are required with a larger pole-centre distance than specified in the selection tables, these versions are available within the scope of the general pole-centre distances (210, 275 and 400 mm). Specify distance in mm additionally in clear text.	–	Z	Y	0	1
Other length of operating shaft – Disconnectors for general switchgear construction (3DC101, 3DC102 and 3DC103) are available with extended or shortened operating shaft. Specify length in mm additionally in clear text.	–	Z	Y	0	2
Vertically arranged operating shaft – Special version for installation of the switching device in vertical position.	–	Z	Y	0	3

Configuration example

Disconnector, **3-pole**	3	D	C														
(U_r = **12 kV**, I_r = **2500 A**, I_{th} = **50 kA**, pole-centre distance **210 mm**,																	
earthing switch mounted on the pivot point of the disconnector **EP**)				1	0	8	2	–	5	J							
With one motor operating mechanism each for disconnector and earthing switch **60 V DC**											–	Z	A	2	3		
Auxiliary switch **2 NO + 2 NC** for disconnector and earthing switch											–	Z	E	2	2		
Example for Order No.:	3	D	C	1	0	8	2	–	5	J	–	Z					
Order codes:	A	2	3	+	E	2	2										

12 kV

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Position:	1	2	3	4	5	6	7	–	8	9		Order codes
							Order No.:	3	D	■	■	■	■	■	–	■	■	– ★	■ ■ ■
12	75	28	20	50	3	**210**		3	D	E	1	0	1	2	–	0	J		
			31.5	80	3	**210**		3	D	E	1	0	1	2	–	0	N		
			50	125	3	**210**		3	D	E	1	0	1	2	–	0	S		
			63	160	3	**210**		3	D	E	1	0	1	2	–	0	U		

24 kV

50/60 Hz

U_r kV	U_p kV	U_d kV	I_{th} kA	I_{dyn} kA		mm													
24	125	50	20	50	1	–		3	D	D	1	0	1	4	–	0	J		
					3	**275**		3	D	E	1	0	1	4	–	0	J		
			31.5	80	1	–		3	D	D	1	0	1	4	–	0	N		
					3	**275**		3	D	E	1	0	1	4	–	0	N		

36 kV

50/60 Hz

U_r kV	U_p kV	U_d kV	I_{th} kA	I_{dyn} kA		mm													
36	170	70	20	50	3	**400**		3	D	E	1	0	1	6	–	0	J		
			31.5	80	3	**400**		3	D	E	1	0	1	6	–	0	N		

See page 23

Configuration example
Earthing switch, **1-pole**
Rated voltage U_r = **24 kV**
Rated short-time withstand current I_{th} = **31.5 kA**

								3	D	D									
											1	0	1	4	–	0	N		
Example for Order No.:								3	D	D	1	0	1	4	–	0	N		
Order codes:																			

Equipment Selection

Selection of earthing switches for switchgear panels with a panel width of 650 mm and 900 mm

2

12 kV for switchgear panels with a panel width of 650 mm

50/60 Hz

Rated voltage U_r kV	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Number of poles	Pole-centre distance mm	Position:	1	2	3	4	5	6	7	–	8	9		Order codes		
							Order No.:	3	D	■	■	■	■	■	–	■	■	– ★	■	■	■
																		See page 23			
12	60	28	20	50	3	**150**		3	D	E	1	0	4	1	–	0	J				
			31.5	80	3	**150**		3	D	E	1	0	4	1	–	0	N				

12 kV for switchgear panels with a panel width of 900 mm

50/60 Hz

U_r kV	U_p kV	U_d kV	I_{th} kA	I_{dyn} kA		mm															
12	75	28	20	50	3	**210**		3	D	E	1	0	7	2	–	0	J				
			31.5	80	3	**210**		3	D	E	1	0	7	2	–	0	N				
			50	125	3	**210**		3	D	E	1	0	7	2	–	0	S				

24 kV for switchgear panels with a panel width of 900 mm

50/60 Hz

U_r kV	U_p kV	U_d kV	I_{th} kA	I_{dyn} kA		mm															
24	95	50	20	50	3	**210**		3	D	E	1	0	7	3	–	0	J				
			31.5	80	3	**210**		3	D	E	1	0	7	3	–	0	N				

Configuration example
Earthing switch, **3-pole**
Rated voltage U_r = **24 kV**
Rated short-time withstand current I_{th} = **20 kA**
Pole-centre distance **210 mm**

								3	D	E											
											1	0	7	3	–	0	J				
Example for Order No.:								3	D	E	1	0	7	3	–	0	J				
Order codes:																					

Earthing switch with motor operating mechanism

Position:	1	2	3	4	5	6	7	–	8	9			Order codes		
Order No.:	3	D	■	■	■	■	■	–	■	■	–	★	■	■	■
Rated voltage of motor															
60 V DC											–	Z	A	0	3
110 V DC											–	Z	A	0	4
220 V DC											–	Z	A	0	6
230 V AC, 50/60 Hz											–	Z	A	1	6

Earthing switch with latch for switching rod actuation (manual operation) [1]

Option															
With one latch											–	Z	B	3	3

1) Switching rod lever and switching rod as accessories

Earthing switch with electromechanical lockout (manual operation only)

Rated voltage of lockout device															
24 V DC											–	Z	C	1	1
60 V DC											–	Z	C	1	3
110 V DC											–	Z	C	1	4
220 V DC											–	Z	C	1	6
100/110 V AC, 50/60 Hz											–	Z	C	1	7
230 V AC, 50/60 Hz											–	Z	C	1	8

Configuration example

Earthing switch, **3-pole**
Rated voltage U_r = **24 kV**
Rated short-time withstand current I_{th} = **20 kA**
Pole-centre distance **210 mm**
With one latch for switching rod actuation
With electromechanical lockout, rated voltage **24 V DC**

	3	D	E												
				1	0	7	3	–	0	J					
											–	Z	B	3	3
											–	Z	C	1	1
Example for Order No.:	3	D	E	1	0	7	3	–	0	J	–	Z			
Order codes:	B	3	3	+	C	1	1								

Equipment Selection

Built-on components for earthing switches and special versions

Earthing switch with built-on auxiliary switch

Option	Position: 1 2 3 4 5 6 7 – 8 9											Order codes		
	Order No.:	3	D	■	■	■	■	■	–	■	■	–	★	■	■	■
Auxiliary switch 2 NO + 2 NC												–	Z	E	1	2

Special versions

Options																
Other pole-centre distance – If earthing switches are required with a larger pole-centre distance than specified in the selection tables, these versions are available within the scope of the general pole-centre distances (210, 275 and 400 mm). Specify distance in mm additionally in clear text.												–	Z	Y	0	1
Other length of operating shaft – Earthing switches for general switchgear construction (3DE101) are available with extended or shortened operating shaft. Specify length in mm additionally in clear text.												–	Z	Y	0	2
Vertically arranged operating shaft – Special version for installation of the switching device in vertical position.												–	Z	Y	0	3

Configuration example

Earthing switch, **3-pole**	3	D	E													
Rated voltage U_r = **24 kV**																
Rated short-time withstand current I_{th} = **20 kA**																
Pole-centre distance **210 mm**				1	0	7	3	–	0	J						
With one latch for switching rod actuation												–	Z	B	3	3
With electromechanical lockout, rated voltage **24 V DC**												–	Z	C	1	1
With auxiliary switch **2 NO + 2 NC**												–	Z	E	1	2
Example for Order No.:	3	D	E	1	0	7	3	–	0	J	–	Z				
Order codes:	B	3	3	+	C	1	1	+	E	1	2					

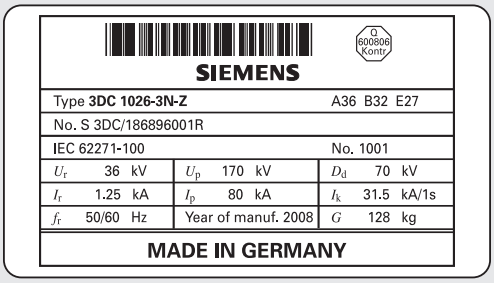
Accessories and spare parts

The order numbers are applicable to disconnectors and earthing switches of current manufacture. When built-on components or spare parts are being ordered for existing disconnectors and earthing switches, always quote the type designation, serial number and the year of manufacture of the switching device to be sure to get the correct delivery.

Spare parts must only be replaced by instructed personnel.

Designation	Remarks		Order No.
Auxiliary mechanism	For motor operating mechanism 3DX11 (fixed-mounted in the panel)		
	For "straight shaft"		**3DX4 101-0A**
	For "articulated shaft"		**3DX4 101-0B**
	For "flexible shaft"	1000 mm	**3DX4 102-0A**
		2500 mm	**3DX4 102-0B**
		5000 mm	**3DX4 102-0C**
Auxiliary crank	For fixed-mounted auxiliary mechanisms		**3DX4 100-0B**
Auxiliary mechanism as crank	For motor operating mechanism 3DX11 (only required once per switchgear)		
	With 45° swinging angle		**3CX6 012**
	With 90° swinging angle		**3CX6 013**
Adapter unit	Is required additionally for auxiliary mechanisms 3CX6		**3CX6 014**
Switching rod	To operate the switching rod lever		
	Up to 36 kV	1025 mm	**PFS: 364035-005**
		2000 mm	**PFS: 364035-035**
		3000 mm	**PFS: 364035-037**
Switching rod lever	For operation via switching rod		
		Made of metal	**3DX4 210**
		Made of insulating material	**3DX4 220**

Data on the rating plate

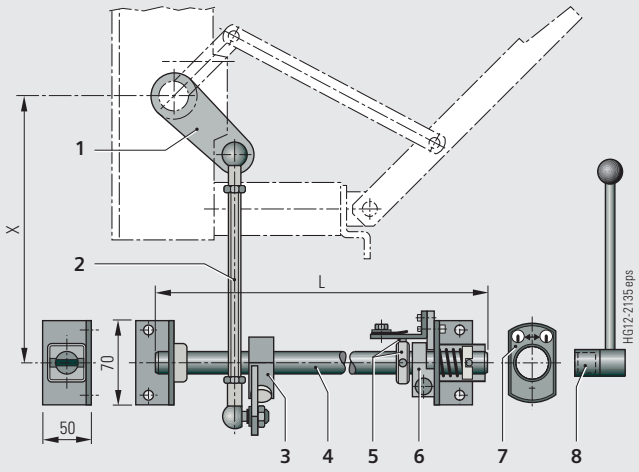


Note:
For any query regarding spare parts, subsequent deliveries, etc. the following four details are necessary:
– **Type** designation
– Serial **No.**
– **Design code**
– **Year of manufacture**

Designation	Remarks		Order No.
Spherical joint mechanism for disconnectors (data of widths X and L in clear text)			
	For disconnector	For recommended panel width	
	3DC	600 – 750 mm	**3DX2011 X =... L =...**
	3DC	800 – 1000 mm	**3DX2012 X =... L =...**
	3DC	800 – 900 mm	**3DX2011 X =... L =...**
	3DC	900 – 1100 mm	**3DX2012 X =... L =...**
	3DC	800 – 900 mm	**3DX2011 X =... L =...**
	3DC	900 – 1000 mm	**3DX2012 X =... L =...**
	3DC		**3DX2012 X =... L =...**
Spherical joint mechanism for make-proof earthing switch (data of widths X and L in clear text)			
	For disconnector	For recommended panel width	
	3DC	600 – 750 mm	**3DX2013 X =... L =...**
	3DC	800 – 1000 mm	**3DX2014 X =... L =...**
	3DC	800 – 900 mm	**3DX2013 X =... L =...**
	3DC	900 – 1100 mm	**3DX2014 X =... L =...**
	3DC	800 – 900 mm	**3DX2013 X =... L =...**
	3DC	900 – 1000 mm	**3DX2014 X =... L =...**
	3DC		**3DX2014 X =... L =...**
Accessories for spherical joint mechanism	Operating lever for disconnector		**3DX2081**
	Operating lever for make-proof earthing switch		**3DX2082**
	Interlocking between disconnector and make-proof earthing switch		**3DX2072**
	Additive blocking solenoid with data of operating voltage		**3DX2071-Z**
	Bearing for shaft extension		**3DX2901**
	Setting lever for switchgear		**3DX2902**
	Dowel pin for shaft extension		**3DX2903**

2

Spherical joint mechanism 3DX2



Spherical joint mechanism 3DX2

1 Operating shaft lever

2 Switching rod (threaded rod with spherical joints M12 on both sides)

3 Lever on the drive shaft

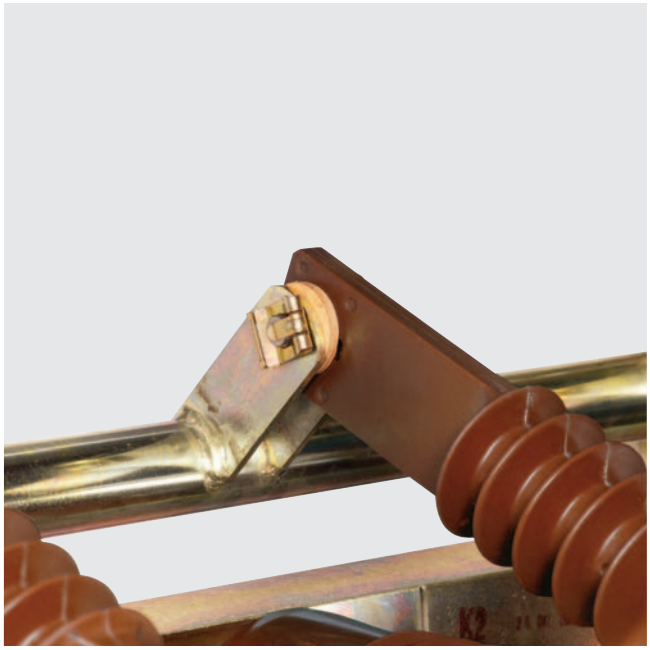
4 Drive shaft: steel shaft with 25 mm Ø, or insulating shaft with 30 mm Ø

5 Latch (only for disconnector and earthing switch)

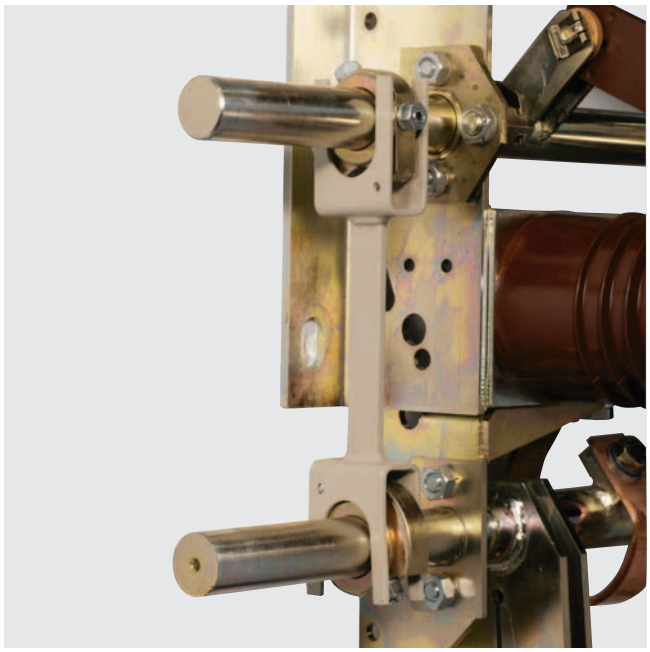
6 90° stop CLOSE-OPEN

7 Indication label
– black for switch-disconnector and disconnector
– red for earthing switch and make-proof earthing switch

8 Operating lever for spherical joint mechanism 3DX2



Operating shaft and post insulator



Mechanical interlock

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3

12 kV 50/60 Hz Order No.	Number of poles	Pole-centre distance mm	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Built-in post insulators	Failing load of built-in post insulators N	Weight (without built-on components) kg	Detailed dimension drawing for disconnector (can be ordered)	Catalog dimension drawings (see page 31)
3DC1 012-2G	3	210	630	20	50	75	28	3DY 1221	5000	20.5	106 95300 007	1
3DC1 012-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	20.5	106 95300 007	1
3DC1 012-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	27.5	106 95300 007	1
3DC1 012-3S	3	210	1250	50	125	75	28	3DY 1222	16000	48	106 95300 008	2
3DC1 012-3U	3	210	1250	63	160	75	28	3DY 1224	25000	56	106 95300 008	2
3DC1 012-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	27.5	106 95300 007	1
3DC1 012-4G	3	210	1600	50	125	75	28	3DY 1223	16000	48	106 95300 008	2
3DC1 012-4J	3	210	1600	63	160	75	28	3DY 1224	25000	56	106 95300 008	2
3DC1 012-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	64	106 95300 009	3
3DC1 012-5J	3	210	2500	50	125	75	28	3DY 1223	16000	65	106 95300 009	3
3DC1 012-5L	3	210	2500	63	160	75	28	3DY 1224	25000	72	106 95300 009	3
3DC1 012-6J	3	230	3000	50	125	75	28	3DY 1223	16000	68	106 95300 010	4
3DC1 012-6L	3	230	3000	63	160	75	28	3DY 1224	25000	76	106 95300 010	4
3DC1 022-2G	3	210	630	20	50	75	28	3DY 1221	5000	30	106 95300 007	1e
3DC1 022-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	30	106 95300 007	1e
3DC1 022-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	36.5	106 95300 007	1e
3DC1 022-3S	3	210	1250	50	125	75	28	3DY 1222	16000	62	106 95300 008	2e
3DC1 022-3U	3	210	1250	63	160	75	28	3DY 1224	25000	70	106 95300 008	2e
3DC1 022-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	36.5	106 95300 007	1e
3DC1 022-4G	3	210	1600	50	125	75	28	3DY 1223	16000	62	106 95300 008	2e
3DC1 022-4J	3	210	1600	63	160	75	28	3DY 1224	25000	70	106 95300 008	2e
3DC1 022-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	78	106 95300 009	3e
3DC1 022-5J	3	210	2500	50	125	75	28	3DY 1223	16000	80	106 95300 009	3e
3DC1 022-5L	3	210	2500	63	160	75	28	3DY 1224	25000	88	106 95300 009	3e
3DC1 022-6J	3	230	3000	50	125	75	28	3DY 1223	16000	83	106 95300 010	4e
3DC1 022-6L	3	230	3000	63	160	75	28	3DY 1224	25000	91	106 95300 010	4e
3DC1 032-2G	3	210	630	20	50	75	28	3DY 1221	5000	30	106 95300 007	1e
3DC1 032-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	30	106 95300 007	1e
3DC1 032-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	36.5	106 95300 007	1e
3DC1 032-3S	3	210	1250	50	125	75	28	3DY 1222	16000	62	106 95300 008	2e
3DC1 032-3U	3	210	1250	63	160	75	28	3DY 1224	25000	70	106 95300 008	2e
3DC1 032-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	36.5	106 95300 007	1e
3DC1 032-4G	3	210	1600	50	125	75	28	3DY 1223	16000	62	106 95300 008	2e
3DC1 032-4J	3	210	1600	63	160	75	28	3DY 1224	25000	70	106 95300 008	2e
3DC1 032-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	78	106 95300 009	3e
3DC1 032-5J	3	210	2500	50	125	75	28	3DY 1223	16000	80	106 95300 009	3e

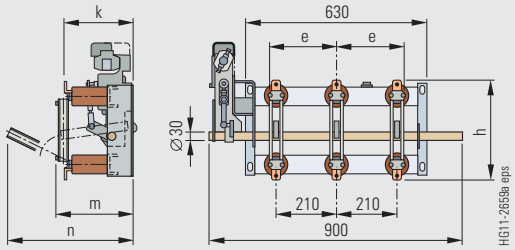
12 kV 50/60 Hz Order No.	Number of poles	Pole-centre distance mm	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Built-in post insulators	Failing load of built-in post insulators N	Weight (without built-on components) kg	Detailed dimension drawing for disconnector (can be ordered)	Catalog dim. drawings (see pages 31 and 32)
3DC1 032-5L	3	210	2500	63	160	75	28	3DY 1224	25000	88	106 95300 009	3e
3DC1 032-6J	3	230	3000	50	125	75	28	3DY 1223	16000	83	106 95300 010	4e
3DC1 032-6L	3	230	3000	63	160	75	28	3DY 1224	25000	91	106 95300 010	4e
3DC1 041-2G	3	150	630	20	50	60	28	3DY 1221	5000	19	106 95300 003	5
3DC1 041-2L	3	150	630	31.5	80	60	28	3DY 1222	5000	19	106 95300 003	5
3DC1 041-3N	3	150	1250	31.5	80	60	28	3DY 2023	10000	25.5	106 95300 003	5
3DC1 051-2G	3	150	630	20	50	60	28	3DY 1221	5000	28	106 95300 003	5e
3DC1 051-2L	3	150	630	31.5	80	60	28	3DY 1222	5000	28	106 95300 003	5e
3DC1 051-3N	3	150	1250	31.5	80	60	28	3DY 2023	10000	34.5	106 95300 003	5e
3DC1 061-2G	3	150	630	20	50	60	28	3DY 1221	5000	28	106 95300 003	5e
3DC1 061-2L	3	150	630	31.5	80	60	28	3DY 1222	5000	28	106 95300 003	5e
3DC1 061-3N	3	150	1250	31.5	80	60	28	3DY 2023	10000	34.5	106 95300 003	5e
3DC1 072-2G	3	210	630	20	50	75	28	3DY 1221	5000	20	106 95300 004	6
3DC1 072-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	20	106 95300 004	6
3DC1 072-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	26.5	106 95300 004	6
3DC1 072-3S	3	210	1250	50	125	75	28	3DY 1223	16000	47	106 95300 005	7
3DC1 072-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	27	106 95300 004	6
3DC1 072-4G	3	210	1600	50	125	75	28	3DY 1223	16000	47	106 95300 005	7
3DC1 072-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	63	106 95300 006	8
3DC1 072-5J	3	210	2500	50	125	75	28	3DY 1223	16000	64	106 95300 006	8
3DC1 082-2G	3	210	630	20	50	75	28	3DY 1221	5000	29	106 95300 004	6e
3DC1 082-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	29	106 95300 004	6e
3DC1 082-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	35.5	106 95300 004	6e
3DC1 082-3S	3	210	1250	50	125	75	28	3DY 1223	16000	61	106 95300 005	7e
3DC1 082-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	36	106 95300 004	6e
3DC1 082-4G	3	210	1600	50	125	75	28	3DY 1223	16000	61	106 95300 005	7e
3DC1 082-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	77	106 95300 006	8e
3DC1 082-5J	3	210	2500	50	125	75	28	3DY 1223	16000	79	106 95300 006	8e
3DC1 092-2G	3	210	630	20	50	75	28	3DY 1221	5000	29	106 95300 004	6e
3DC1 092-2L	3	210	630	31.5	80	75	28	3DY 1221	5000	29	106 95300 004	6e
3DC1 092-3N	3	210	1250	31.5	80	75	28	3DY 1222	10000	35.5	106 95300 004	6e
3DC1 092-3S	3	210	1250	50	125	75	28	3DY 1223	16000	61	106 95300 005	7e
3DC1 092-4C	3	210	1600	31.5	80	75	28	3DY 1222	10000	36	106 95300 004	6e
3DC1 092-4G	3	210	1600	50	125	75	28	3DY 1223	16000	61	106 95300 005	7e
3DC1 092-5E	3	210	2500	31.5	80	75	28	3DY 1223	16000	77	106 95300 006	8e
3DC1 092-5J	3	210	2500	50	125	75	28	3DY 1223	16000	79	106 95300 006	8e

Technical Data

Electrical data, dimensions and weights of disconnectors

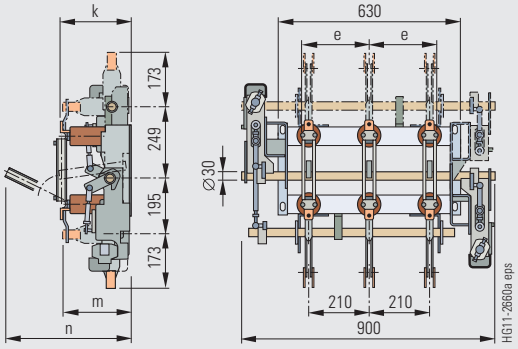
24 kV 50/60 Hz Order No.	Number of poles	Pole-centre distance mm	Rated normal current I_r A	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Built-in post insulators	Failing load of built-in post insulators N	Weight (without built-on components) kg	Detailed dimension drawing for disconnector (can be ordered)	Catalog dim. drawings (see pages 33 to 35)
3DA1 014-2G	1	–	630	20	50	125	50	3DY 1224	5000	12.5	106 95300 019	9
3DA1 014-3N	1	–	1250	31.5	80	125	50	3DY 1224	5000	14	106 95300 019	9
3DA1 014-4C	1	–	1600	31.5	80	125	50	3DY 1224	5000	14	106 95300 019	9
3DA1 024-2G	1	–	630	20	50	125	50	3DY 1224	5000	16.5	106 95300 019	9e
3DA1 024-3N	1	–	1250	31.5	80	125	50	3DY 1224	5000	18.5	106 95300 019	9e
3DA1 024-4C	1	–	1600	31.5	80	125	50	3DY 1224	5000	18.5	106 95300 019	9e
3DA1 034-2G	1	–	630	20	50	125	50	3DY 1224	5000	16.5	106 95300 019	9e
3DA1 034-3N	1	–	1250	31.5	80	125	50	3DY 1224	5000	18.5	106 95300 019	9e
3DA1 034-4C	1	–	1600	31.5	80	125	50	3DY 1224	5000	18.5	106 95300 019	9e
3DC1 014-2G	3	275	630	20	50	125	50	3DY 1224	5000	31.5	106 95300 012	10
3DC1 014-3N	3	275	1250	31.5	80	125	50	3DY 1225	5000	36	106 95300 012	10
3DC1 014-4C	3	275	1600	31.5	80	125	50	3DY 1225	5000	36	106 95300 012	10
3DC1 014-5E	3	300	2500	31.5	80	125	50	3DY 1225	10000	66	106 95300 013	11
3DC1 024-2G	3	275	630	20	50	125	50	3DY 1224	5000	43.5	106 95300 012	10e
3DC1 024-3N	3	275	1250	31.5	80	125	50	3DY 1225	5000	48.5	106 95300 012	10e
3DC1 024-4C	3	275	1600	31.5	80	125	50	3DY 1225	5000	48.5	106 95300 012	10e
3DC1 024-5E	3	300	2500	31.5	80	125	50	3DY 1225	10000	82	106 95300 013	11e
3DC1 034-2G	3	275	630	20	50	125	50	3DY 1224	5000	43.5	106 95300 012	10e
3DC1 034-3N	3	275	1250	31.5	80	125	50	3DY 1225	5000	48.5	106 95300 012	10e
3DC1 034-4C	3	275	1600	31.5	80	125	50	3DY 1225	5000	48.5	106 95300 012	10e
3DC1 034-5E	3	300	2500	31.5	80	125	50	3DY 1225	10000	82	106 95300 012	11e
3DC1 073-2G	3	210	630	20	50	95	50	3DY 1225	5000	27.5	106 95300 011	12
3DC1 073-3N	3	210	1250	31.5	80	95	50	3DY 1225	5000	32	106 95300 011	12
3DC1 083-2G	3	210	630	20	50	95	50	3DY 1225	5000	37.5	106 95300 011	12e
3DC1 083-3N	3	210	1250	31.5	80	95	50	3DY 1225	5000	42.5	106 95300 011	12e
3DC1 093-2G	3	210	630	20	50	95	50	3DY 1225	5000	37.5	106 95300 011	12e
3DC1 093-3N	3	210	1250	31.5	80	95	50	3DY 1225	5000	42.5	106 95300 011	12e
36 kV 50/60 Hz		mm	I_r A	I_{th} kA	I_{dyn} kA	U_p kV	U_d kV		N	kg		
3DA1 016-4C	1	–	1600	31.5	80	170	70	3DY 1227	5000	26	106 95300 029	13
3DA1 026-4C	1	–	1600	31.5	80	170	70	3DY 1227	5000	32	106 95300 029	13e
3DA1 036-4C	1	–	1600	31.5	80	170	70	3DY 1227	5000	32	106 95300 029	13e
3DC1 016-2G	3	400	630	20	50	170	70	3DY 1227	5000	53.5	106 95300 014	14
3DC1 016-3N	3	400	1250	31.5	80	170	70	3DY 1227	5000	58	106 95300 014	14
3DC1 016-5E	3	400	2500	31.5	80	170	70	3DY 1228	10000	100	106 95300 015	15
3DC1 016-6E	3	420	3000	31.5	80	170	70	3DY 1228	10000	107	106 95300 016	16
3DC1 026-2G	3	400	630	20	50	170	70	3DY 1227	5000	69.5	106 95300 014	14e
3DC1 026-3N	3	400	1250	31.5	80	170	70	3DY 1227	5000	74	106 95300 014	14e
3DC1 026-5E	3	400	2500	31.5	80	170	70	3DY 1228	10000	122	106 95300 015	15e
3DC1 026-6E	3	420	3000	31.5	80	170	70	3DY 1228	10000	130	106 95300 016	16e
3DC1 036-2G	3	400	630	20	50	170	70	3DY 1227	5000	69.5	106 95300 014	14e
3DC1 036-3N	3	400	1250	31.5	80	170	70	3DY 1227	5000	74	106 95300 014	14e
3DC1 036-5E	3	400	2500	31.5	80	170	70	3DY 1228	10000	122	106 95300 015	15e
3DC1 036-6E	3	420	3000	31.5	80	170	70	3DY 1228	10000	130	106 95300 016	16e

Dimension drawings (shown: 12 kV disconnectors with motor operating mechanism)

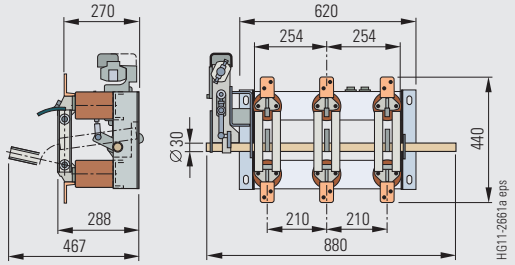


Dimension drawing 1

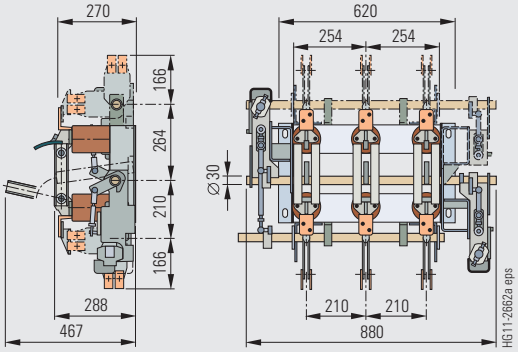
Order No.	e	h	k	m	n	Dim. drawing
3DC 10.2–2G	238	370	242	270	445	1/1e
3DC 10.2–2L	238	370	242	270	445	1/1e
3DC 10.2–3N	245	414	256	284	444	1/1e
3DC 10.2–4C	254	414	256	284	444	1/1e



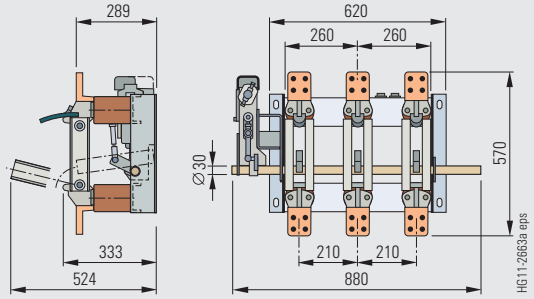
Dimension drawing 1e



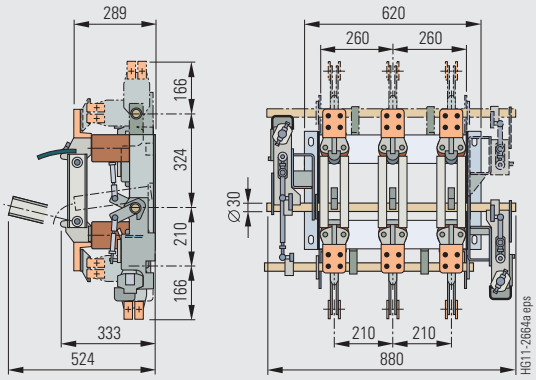
Dimension drawing 2



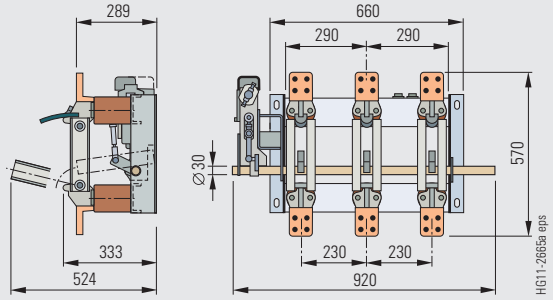
Dimension drawing 2e



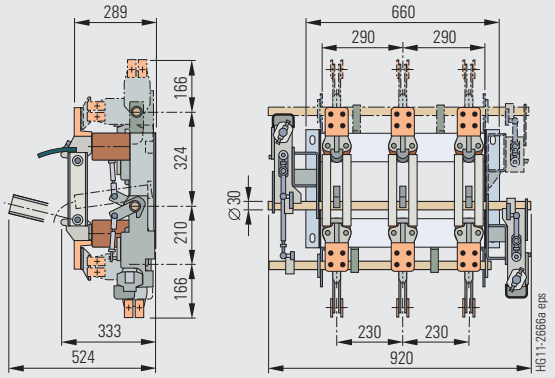
Dimension drawing 3



Dimension drawing 3e



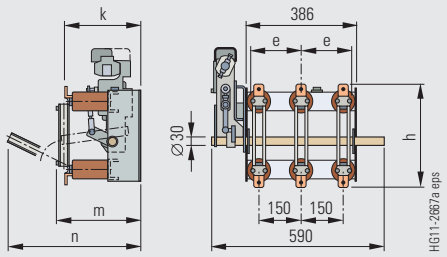
Dimension drawing 4



Dimension drawing 4e

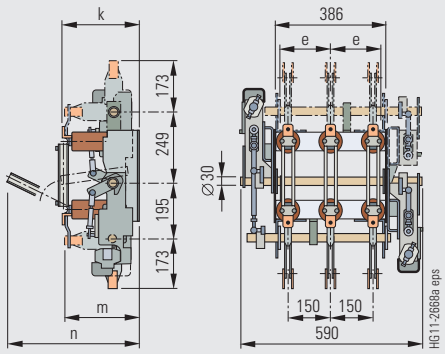
3

Dimension drawings (shown: 12 kV disconnectors with motor operating mechanism and auxiliary switch)

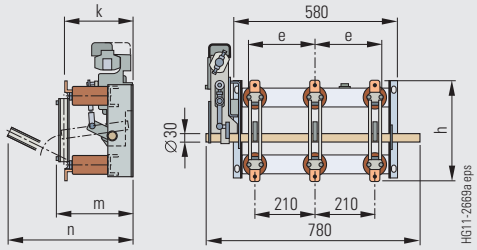


Dimension drawing 5

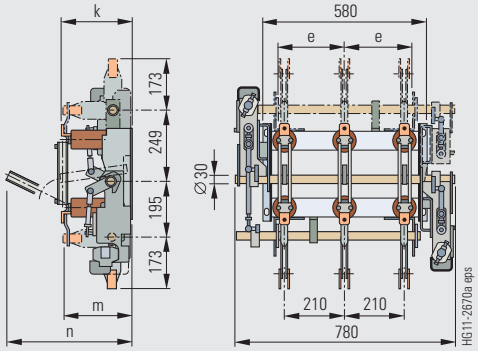
Order No.	e	h	k	m	n	Dim. drawing
3DC 10.1–2G	178	370	268	296	471	5/5e
3DC 10.1–2L	178	370	268	296	471	5/5e
3DC 10.1–3N	185	414	282	310	470	5/5e
3DC 10.2–2G	238	370	242	270	445	6/6e
3DC 10.2–2L	238	370	242	270	445	6/6e
3DC 10.2–3N	245	414	256	284	444	6/6e
3DC 10.2–4C	254	414	256	284	444	6/6e



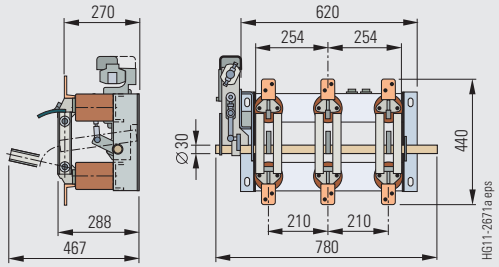
Dimension drawing 5e



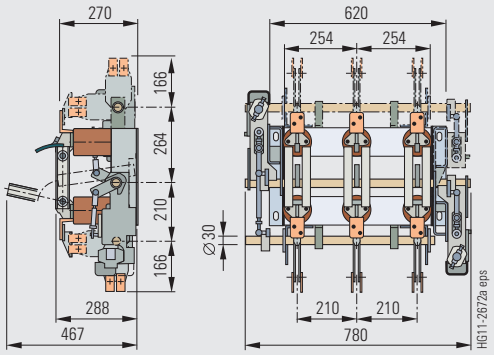
Dimension drawing 6



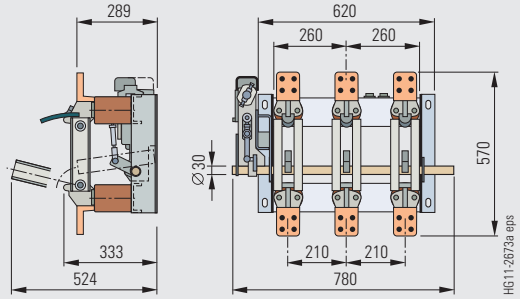
Dimension drawing 6e



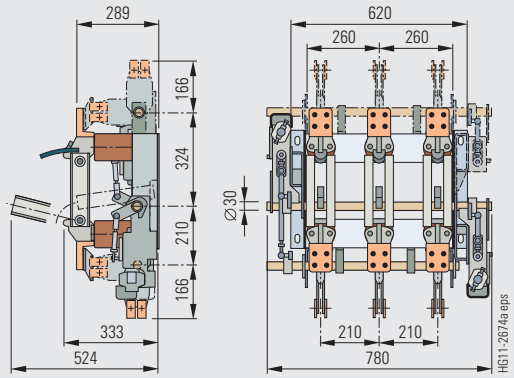
Dimension drawing 7



Dimension drawing 7e

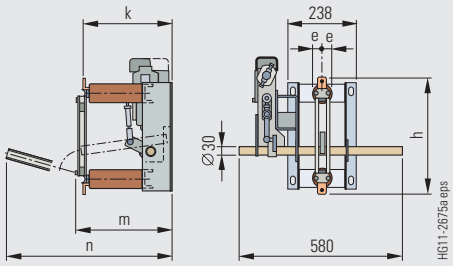


Dimension drawing 8



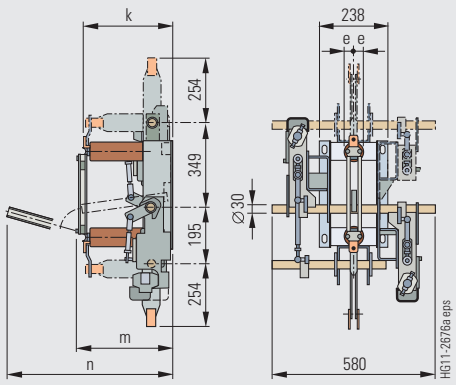
Dimension drawing 8e

Dimension drawings (shown: 24 kV disconnectors with motor operating mechanism and auxiliary switch)

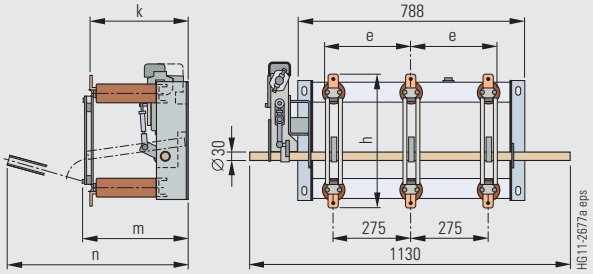


Dimension drawing 9

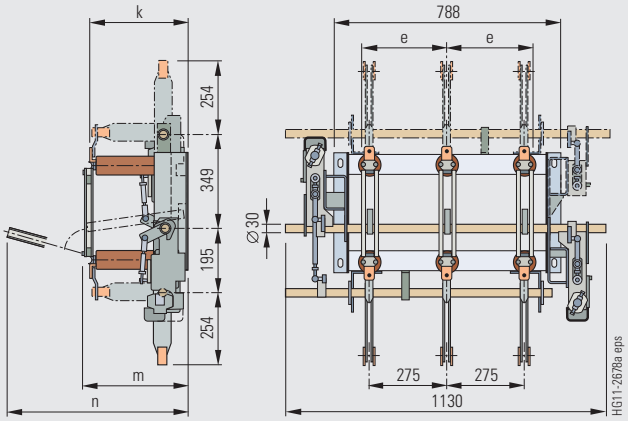
Order No.	e	h	k	m	n	Dim. drawing
3DA 10.4–2G	28	470	338	366	637	9/9e
3DA 10.4–3N	35	514	352	380	639	9/9e
3DA 10.4–4C	44	514	352	380	639	9/9e
3DC 10.4–2G	303	470	338	366	637	10/10e
3DC 10.4–3N	310	514	352	380	639	10/10e
3DC 10.4–4C	319	514	352	380	639	10/10e



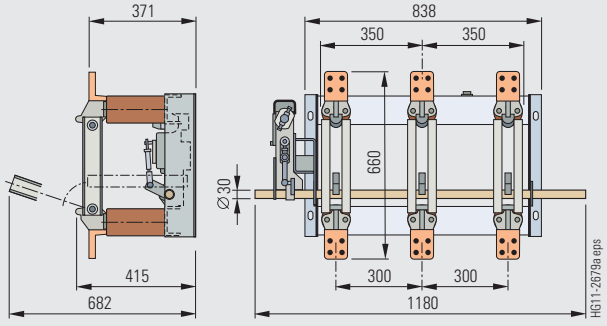
Dimension drawing 9e



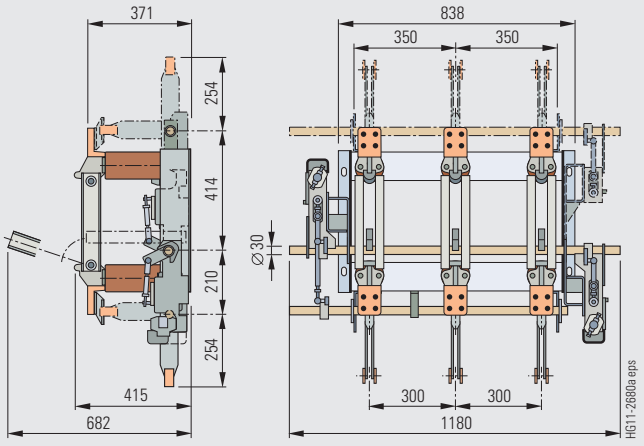
Dimension drawing 10



Dimension drawing 10e



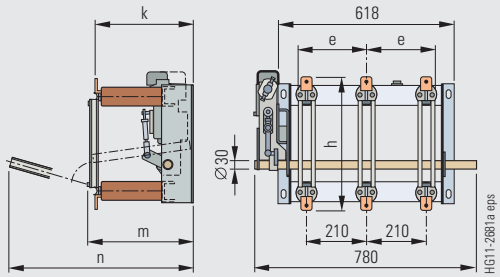
Dimension drawing 11



Dimension drawing 11e

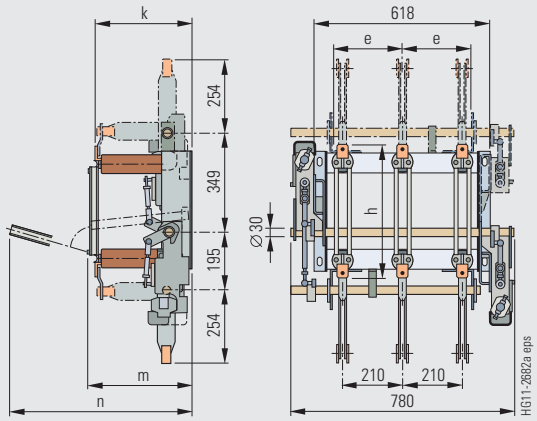
3

Dimension drawings (shown: 24 kV/36 kV disconnectors with motor operating mechanism and auxiliary switch)

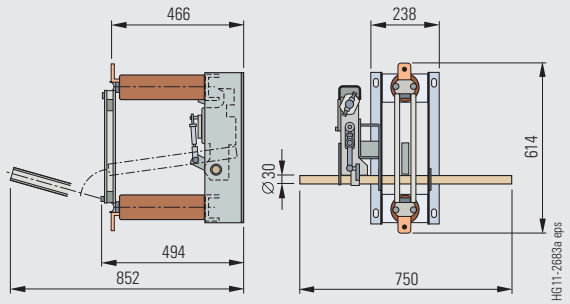


Dimension drawing 12

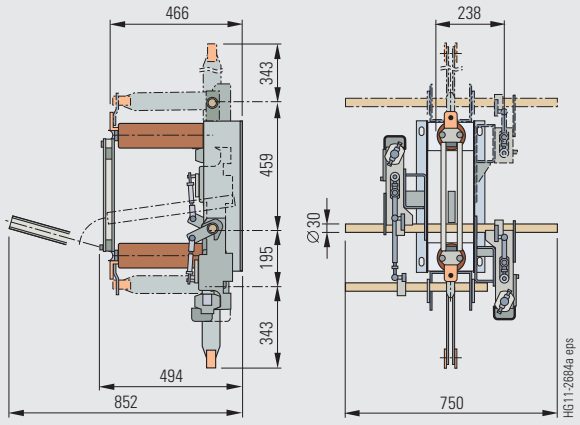
Order No.	e	h	k	m	n
3DC 10.3–2G	238	470	338	366	637
3DC 10.3–3N	245	514	352	380	639



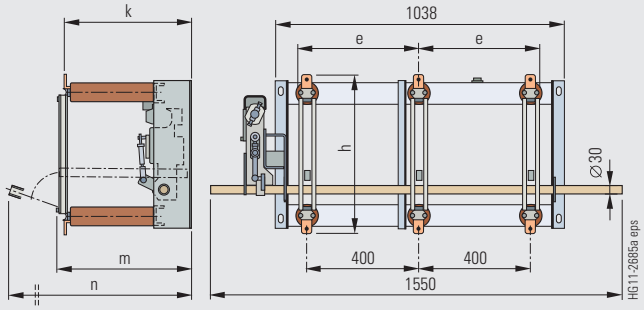
Dimension drawing 12e



Dimension drawing 13

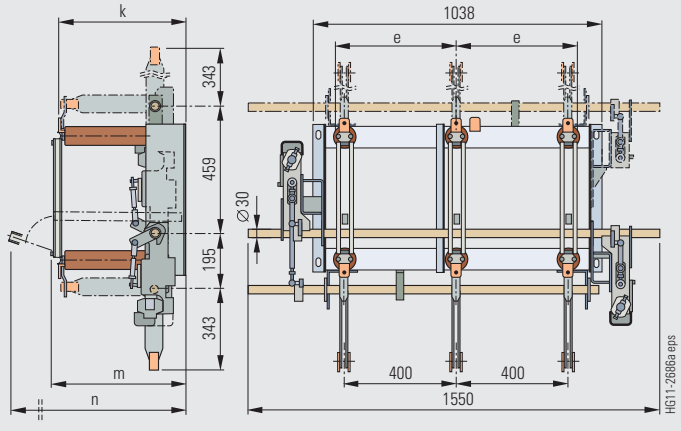


Dimension drawing 13e



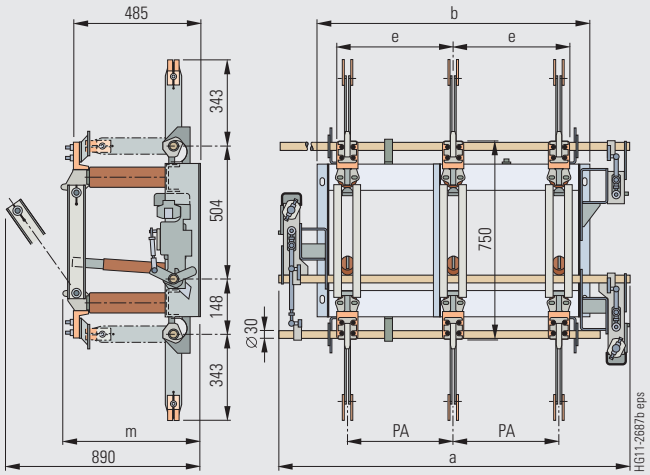
Dimension drawing 14

Order No.	e	h	k	m	n
3DC 10.6–2G	431	570	452	480	842
3DC 10.6–3N	438	614	466	494	852

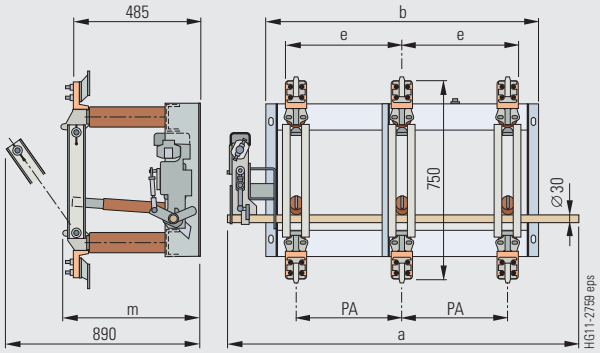


Dimension drawing 14e

Dimension drawings (shown: disconnectors with motor operating mechanism and auxiliary switch)

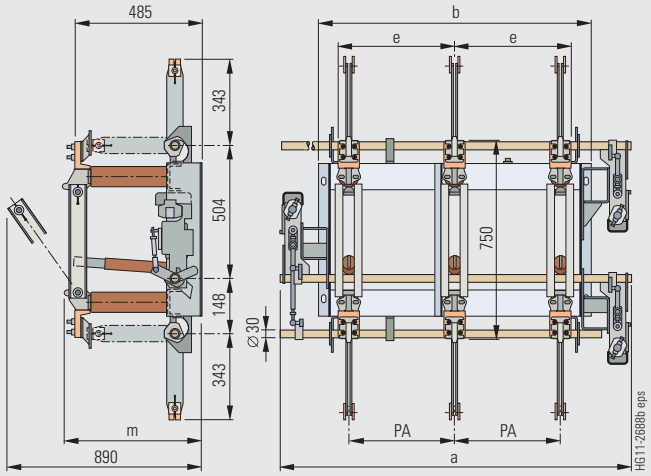


Dimension drawing 15

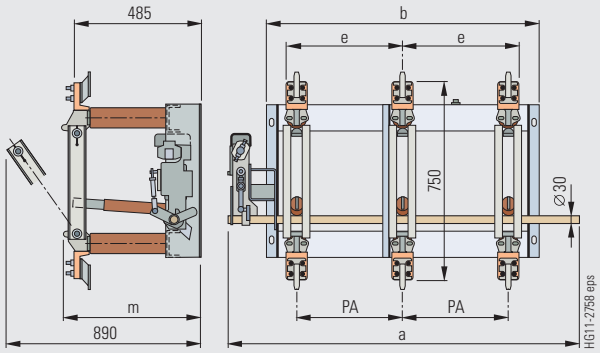


Dimension drawing 15e

Order No.	e	h	k	m	n
3DC10.6–5E	400	1550	1038	450	529
3DC10.6–6E	450	1650	1138	500	507



Dimension drawing 16



Dimension drawing 16e

3

Technical Data

Electrical data, dimensions and weights of earthing switches

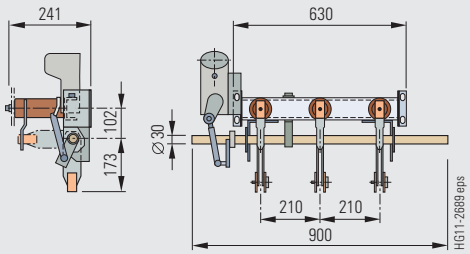
12 kV 50/60 Hz Order No.	Number of poles	Pole-centre distance mm	Rated short-time withstand current I_{th} kA	Rated peak withstand current I_{dyn} kA	Rated lightning impulse withstand voltage U_p kV	Rated short-duration power-frequency withstand voltage U_d kV	Built-in post insulators	Failing load of built-in post insulators N	Weight (without built-on components) kg	Detailed dimension drawing for earthing switch with manual operating mechanism (can be ordered)	Detailed dimension drawing for earthing switch with motor operating mechanism (can be ordered)	Catalog dimension drawings (see page 37)
3DE1 012-0J	3	210	20	50	75	28	3FA1 110-7	5000	13.5	552-5162.9	552-5247.9	17
3DE1 012-0N	3	210	31.5	80	75	28	3FA1 110-7	5000	13.5	552-5162.9	552-5247.9	17
3DE1 012-0S	3	210	60	125	75	28	3FA1 111-8	16000	32	552-5183.9	552-5248.9	18
3DE1 012-0U	3	210	63	160	75	28	3FA1 112-0	25000	38	552-5183.9	552-5248.9	18
3DE1 041-0J	3	150	20	50	60	28	3FA1 110-7	5000	11	552-5145.9	552-5244.9	19
3DE1 041-0N	3	150	31.5	80	60	28	3FA1 110-7	5000	11	552-5145.9	552-5244.9	19
3DE1 072-0J	3	210	20	50	75	28	3FA1 110-7	5000	12.5	552-5136.9	552-5245.9	20
3DE1 072-0N	3	210	31.5	80	75	28	3FA1 110-7	5000	12.5	552-5136.9	552-5245.9	20
3DE1 072-0S	3	210	50	125	75	28	3FA1 111-8	16000	31.5	552-5210 .9	552-5246.9	21

3

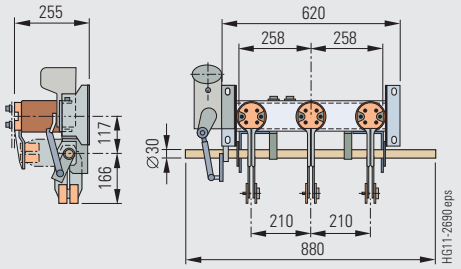
24 kV 50/60 Hz		mm	I_{th} kA	I_{dyn} kA	U_p kV	U_d kV		N	kg			
3DD1 014-0J	1	–	20	50	125	50	3FA1 170-7	5000	7	552-5154.9	552-5252.9	22
3DD1 014-0N	1	–	31.5	80	125	50	3FA1 170-7	5000	7	552-5154.9	552-5252.9	22
3DE1 014-0J	3	275	20	50	125	50	3FA1 170-7	5000	20	552-5139.9	552-5250.9	23
3DE1 014-0N	3	275	31.5	80	125	50	3FA1 170-7	5000	20	552-5139.9	552-5250.9	23
3DE1 073-0J	3	210	20	50	95	50	3FA1 170-7	5000	19	552-5148.9	552-5249.9	24
3DE1 073-0N	3	210	31.5	80	94	50	3FA1 170-7	5000	19	552-5148.9	552-5249.9	24

36 kV 50/60 Hz		mm	I_{th} kA	I_{dyn} kA	U_p kV	U_d kV		N	kg			
3DE1 016-0J	3	400	20	50	170	70	3FA1 230-7	5000	31	552-5142.9	552-5251.9	25
3DE1 016-0N	3	400	31.5	80	170	70	3FA1 230-7	5000	31	552-5142.9	552-5251.9	25

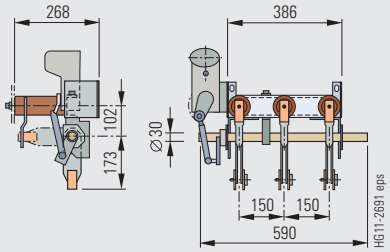
Dimension drawings (shown: earthing switches with motor operating mechanism and auxiliary switch)



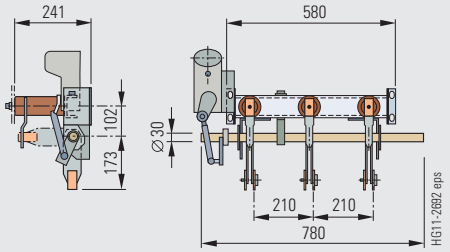
Dimension drawing 17



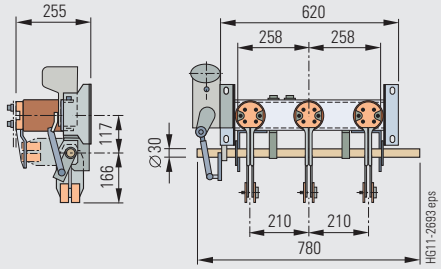
Dimension drawing 18



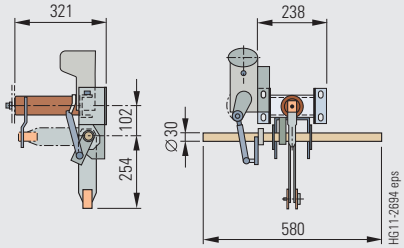
Dimension drawing 19



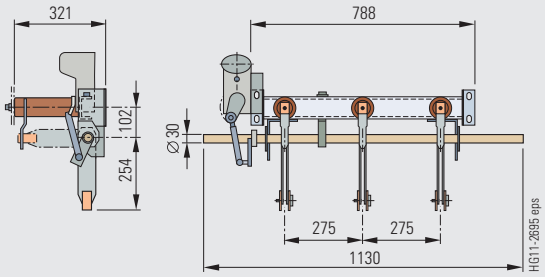
Dimension drawing 20



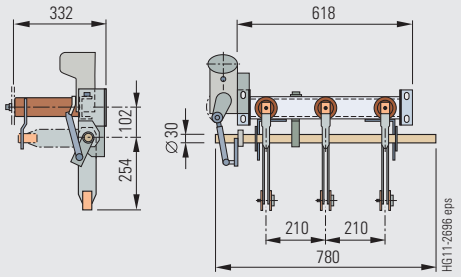
Dimension drawing 21



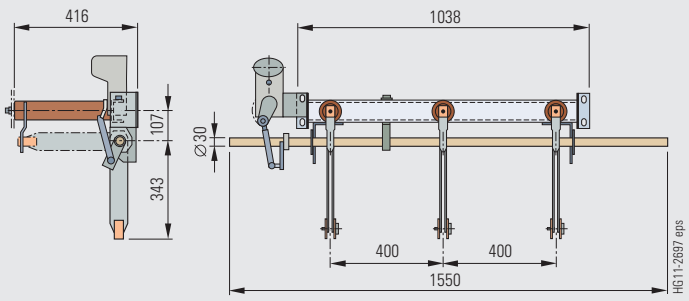
Dimension drawing 22



Dimension drawing 23



Dimension drawing 24



Dimension drawing 25

3

Data of motor operating mechanism 3DX11

Switching device	Torque [1]		Switching angle at max. torque	
	Disconnector	Earthing switch	Disconnector	Earthing switch
	Nm	Nm	Degrees	Degrees
Three-pole [1] disconnectors with earthing switches				
3DC1 0.1-2G	60	80	76	78
3DC1 0.1-2L	60	80	76	78
3DC1 0.1-3N	90	80	81	77
3DC1 0.2-2G	60	80	76	78
3DC1 0.2-2L	60	80	76	78
3DC1 0.2-3N	90	80	81	77
3DC1 0.2-3S	130	140	79 [2]	79
3DC1 0.2-3U	130	140	79 [2]	79
3DC1 0.2-4C	90	80	81	77
3DC1 0.2-4G	130	140	79 [2]	79
3DC1 0.2-4J	130	140	79 [2]	79
3DC1 0.2-5E	95	95	66	64
3DC1 0.2-5J	150	140	80 [2]	74
3DC1 0.2-5L	150	140	80 [2]	74
3DC1 0.2-6J	150	140	80 [2]	74
3DC1 0.2-6L	150	140	80 [2]	74
3DC1 0.3-2G	80	100	79	81
3DC1 0.3-3N	100	100	83	78
3DC1 0.4-2G	80	100	79	81
3DC1 0.4-3N	100	100	83	78
3DC1 0.4-4C	100	100	83	78
3DC1 0.4-5E	105	120	80	75
3DC1 0.6-2G	110	120	82	85
3DC1 0.6-3N	120	160	86	83
3DC1 0.6-5E	140	160	83	83
3DC1 0.6-6E	140	160	83	83
Three-pole [1] earthing switches				
3DE1 041-0J		80		75
3DE1 041-0N		80		75
3DE1 0.2-0J		80		75
3DE1 0.2-0N		80		75
3DE1 0.2-0S		140		76
3DE1 012-0U		140		76
3DE1 073-0J		100		79
3DE1 073-0N		100		79
3DE1 014-0J		100		79
3DE1 014-0N		100		79
3DE1 016-0J		120		84
3DE1 016-0N		160		84

1) Single-pole devices require max. 50 % of the specified torques for actuation

2) For opening

Rated voltage	Operating voltage		Power consumption		Recommended motor protection
	Max. value	Min. value	maximum		Rated current
	V	V	W	VA	A
60 V DC	69	45	100	–	2
110 V DC	127	83	100	–	2
220 V DC	265	173	100	–	2
230 V AC, 50/60 Hz	265	173	–	100	2

Data of electromechanical lockout

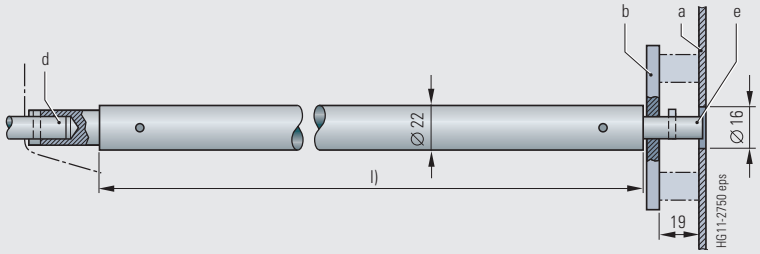
Rated voltage	Operating voltage		Power consumption	
	Max. value	Min. value	maximum	
	V	V	W	VA
24 V DC	27	21	15	–
60 V DC	66	51	15	–
110 V DC	121	97	15	–
220 V DC	242	193	15	–
100 V AC, 50/60 Hz	110	85	–	50
110 V AC, 50/60 Hz	121	97	–	50
230 V AC, 50/60 Hz	253	193	–	50

Breaking capacity of auxiliary switches

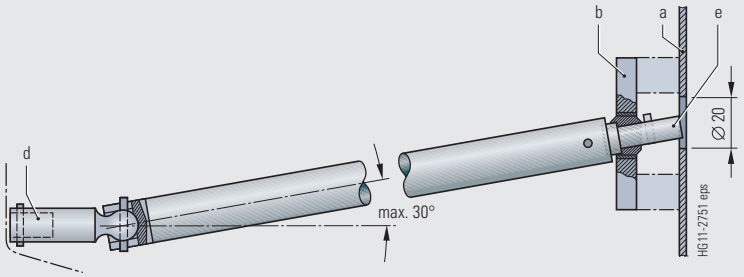
Rated voltage	Breaking capacity (A)	
AC voltage	10	
DC voltage	inductive [3]	resistive
24 V	10	10
48 V	7.5	10
60 V	6.5	6.5
110 V	3.5	5
220 V	1.5	2.5

3) $\tau = \frac{L}{R} = 20$ ms

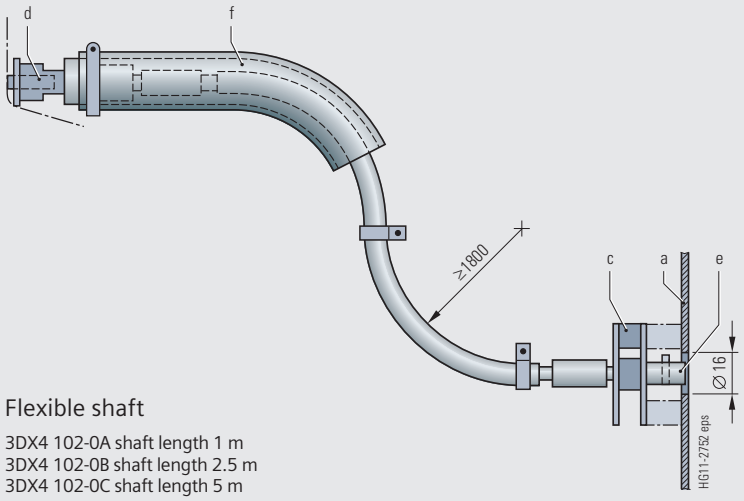
Dimensions for auxiliary mechanisms



Straight shaft 3DX4 101-0A



Articulated shaft 3DX4 101-0B



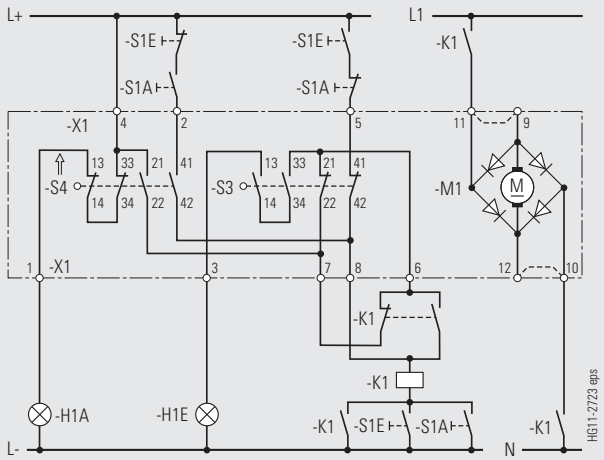
Flexible shaft

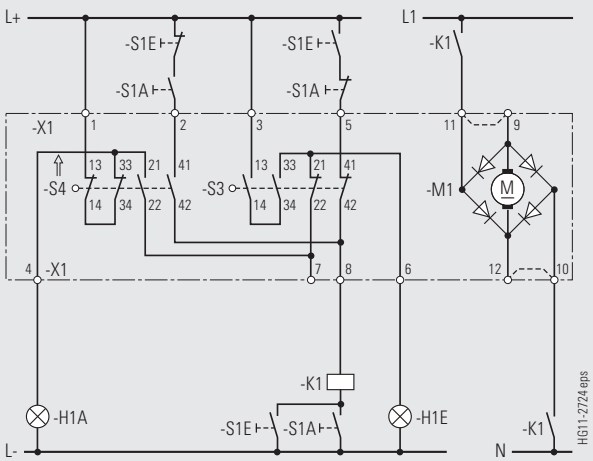
3DX4 102-0A shaft length 1 m
3DX4 102-0B shaft length 2.5 m
3DX4 102-0C shaft length 5 m

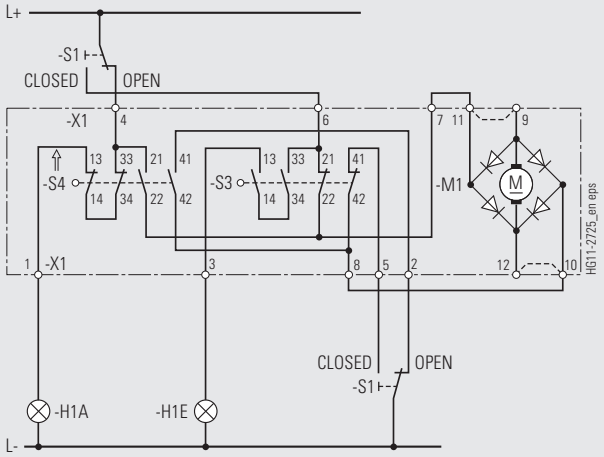
Legend

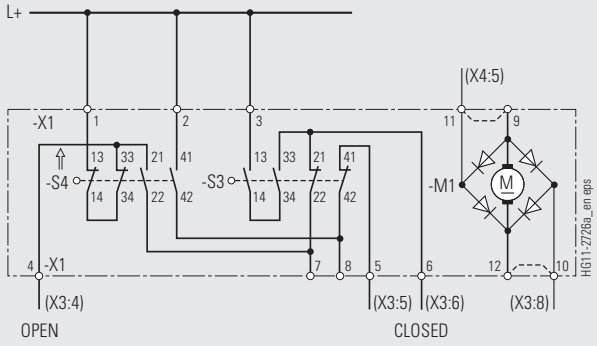
a Front plate of switchgear panel
b Bearing plate
c Bearing block
d Eccentric shaft (17.133) of the motor operating mechanism 3DX11
e Operating pin
f Insulating tube
l Shaft length 1m, to be shortened according to the panel depth

Control examples for motor operating mechanism 3DX11 (for "OPEN" position of disconnector and earthing switch)









Legend

H1A	Luminous indicator "OPEN"	M1	Motor	S3, S4	Position switches, 2 NO + 2 NC at the motor operating mechanism
H1E	Luminous indicator "CLOSED"	S1	Changeover switch, 2-pole	X1	Connection terminals at the motor operating mechanism
K1	Auxiliary contactor: 4 NO + 1 NC for control via auxiliary contactor with command execution; 2 NO for control via auxiliary contactor without command execution	S1A	"OPEN" pushbutton 2 NO + 1 NC	X3, X4	Connection terminals at the switchgear interlocking device 8TJ2
		S1E	"CLOSE" pushbutton NO + 1 NC		
		2			

R-HG11-181.tif

Brandenburg Gate, Berlin, Germany

R-HG11-180.tif

Switchgear Factory Berlin, Germany

Contents | Page

4

Annex
Inquiry form

Please copy, fill in and return to your Siemens partner.

Inquiry concerning

☐ 3DA/3DC disconnector
☐ 3DD/3DE earthing switch

Please

☐ Submit an offer
☐ Call us
☐ Visit us

Your address

Company

Dept.

Name

Street

Postal code/city

Phone

Fax

E-mail

Siemens AG

Dept.

Name

Street

Postal code/city

Fax

Technical data

				Other values
Rated voltage	☐ 12 kV	☐ 24 kV	☐ 36 kV	☐ ___ kV
Rated lightning impulse withstand voltage	☐ 60 kV ☐ 125 kV	☐ 75 kV ☐ 170 kV	☐ 95 kV	☐ ___ kV
Rated short-duration power-frequency withstand voltage	☐ 28 kV ☐ 70 kV	☐ 50 kV		☐ ___ kV
Rated normal current	☐ 630 A ☐ 2500 A	☐ 1250 A ☐ 3000 A	☐ 1600 A	☐ ___ A
Rated short-time withstand current	☐ 20 kA ☐ 50 kA	☐ 31.5 kA ☐ 63 kA		☐ ___ kA
Rated peak withstand current	☐ 50 kA ☐ 125 kA	☐ 80 kA ☐ 160 kA	☐ 87 kA	☐ ___ kA
Number of poles	☐ 1-pole	☐ 3-pole		

Built-on components

Disconnector with earthing switch	☐ Earthing switch mounted on pivot point ☐ Earthing switch mounted on opening side		
Motor operating mechanism for disconnector/earthing switch	☐ 60 V DC ☐ 220 V DC	☐ 110 V DC	☐ 230 V AC, 50/60 Hz
Electromechanical lockout	☐ 24 V DC ☐ 110 V DC	☐ 60 V DC ☐ 220 V DC	☐ 100/110 V AC, 50/60 Hz ☐ 230 V AC, 50/60 Hz
Auxiliary switch	☐ 2 NO + 2 NC	☐ 6 NO + 6 NC	
Auxiliary switch for built-on earthing switch	☐ 2 NO + 2 NC		
Mechanical interlocking	☐ Yes	☐ No	
Other pole-centre distance	☐ ___ mm		
Other length of operating shaft	☐ ___ mm		
Vertically arranged operating shaft	☐ Yes	☐ No	

Application and other requirements

☐ Please check off ___ Please fill in

You prefer to configure your disconnector or earthing switch on your own?
Please follow the steps for configuration and enter the order number in the configuration aid.

For configuration of your
3D disconnectors and earthing switches

Instruction for configuration of the 3D disconnectors and earthing switches

1st step: Definition of the primary part

Please specify the following ratings:	Possible options:
Rated voltage (U_r)	U_r: 12 kV to 36 kV
Rated lightning impulse withstand voltage (U_p)	U_p: 60 kV to 170 kV
Rated short-duration power-frequency withstand voltage (U_d)	U_d: 28 kV to 70 kV
Rated normal current (I_r)	I_r: 630 A to 3000 A
Rated short-time withstand current	20 kA to 63 kA
Rated peak withstand current	50 kA to 160 kA
Number of poles	Single-pole or three-pole
Pole-centre distance	210 mm to 420 mm for three-pole switching device

These ratings define the positions 3 to 9 of the order number.

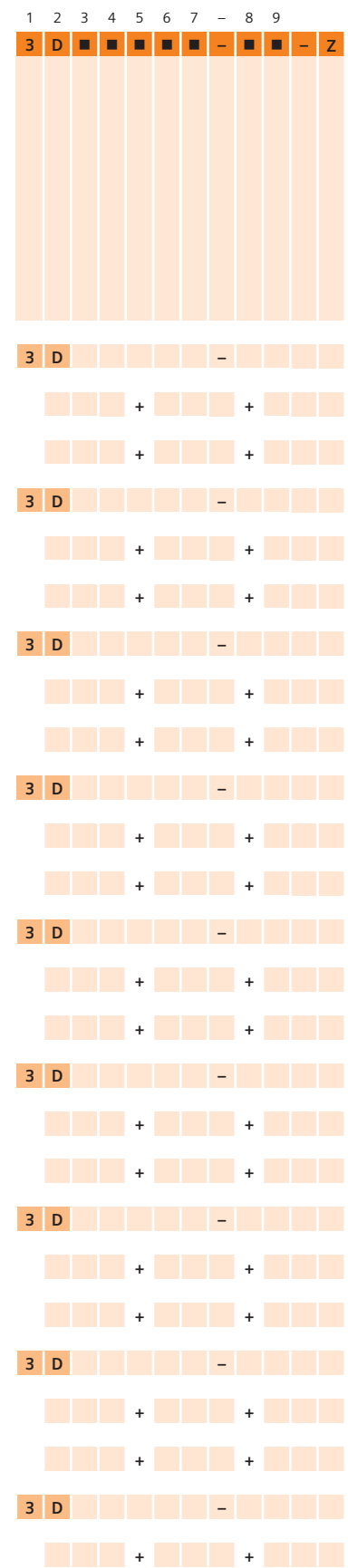
2nd step: Definition of the built-on components

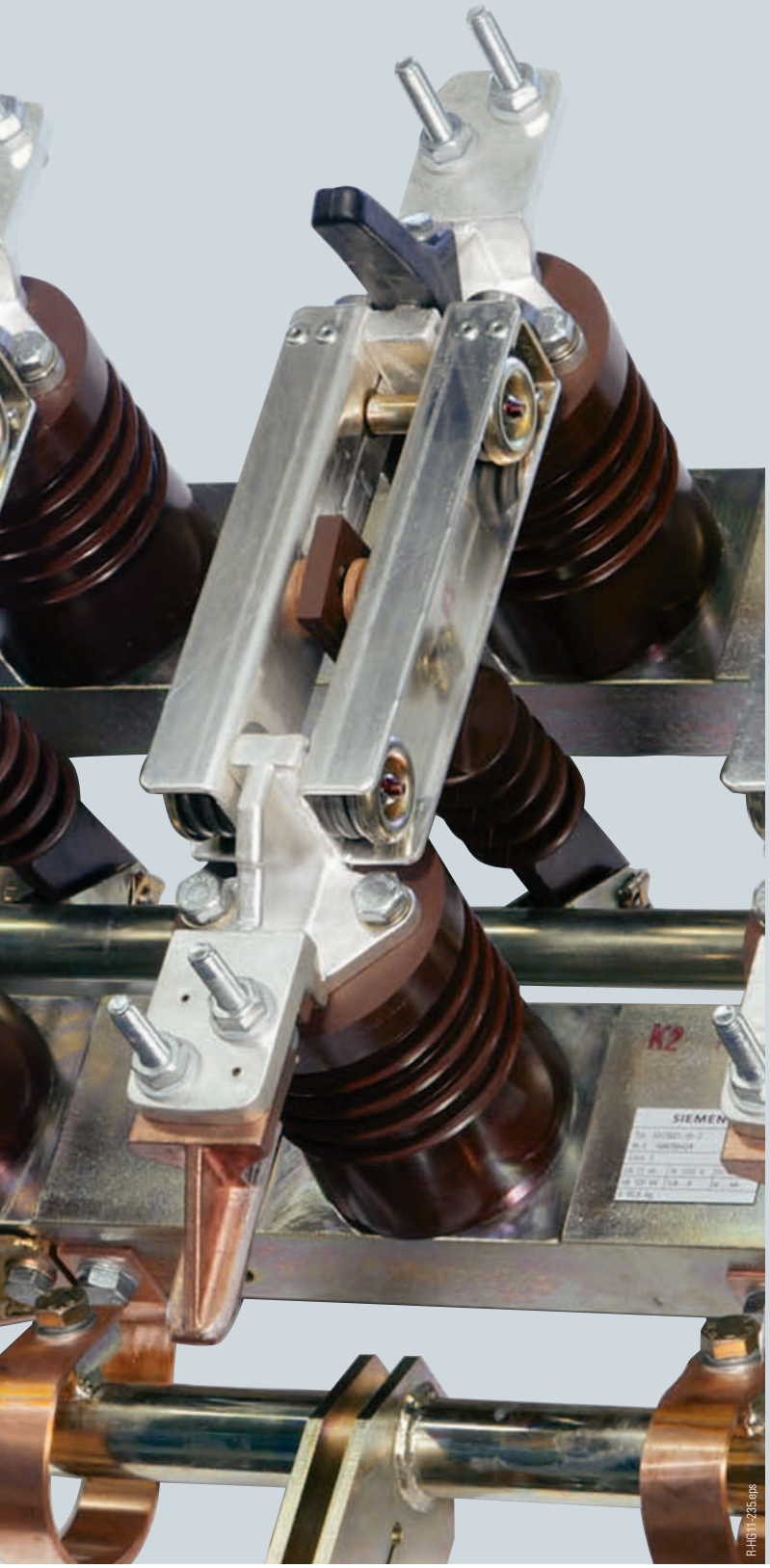
Please specify the following equipment features:	Possible options:
Earthing switch built on the disconnector	Earthing switch mounted on pivot point or on opening side
Type of operating mechanism	Manual operating mechanism, motor operating mechanism
Operating voltage of the motor operating mechanism	Operating voltages from 60 V DC to 230 V AC
Operating voltage of the electromechanical lockout	Operating voltages from 24 V DC to 230 V AC
Number of auxiliary switches	2 NO + 2 NC or 6 NO + 6 NC on the disconnector
Mechanical interlocking	Possible for built-on earthing switch

These equipment features are defined by additional data.

3rd step: Do you have any further requirements concerning the equipment?

Should you still need more options than the possible special equipment like pole-centre distances, other lengths of the operating shaft, vertical arrangement of the switching device, etc., please contact your responsible sales partner.





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Order No. E50001-K1511-A311-A2-7600
Printed in Germany
Dispo 31601
KG 10.08 1.0 46 En
6101/15460 480001

Printed on elementary chlorine-free bleached paper.

Responsible for

Technical contents:
Siemens AG, E D MV C I LM
Berlin

General editing:
Siemens AG, E CC MCC R
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