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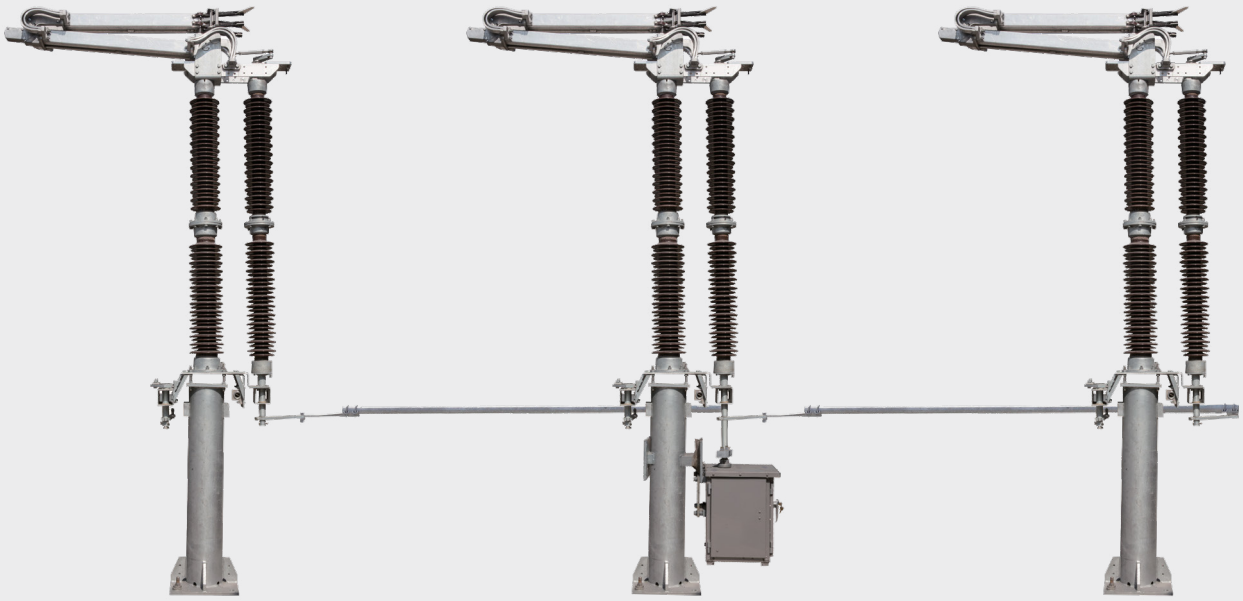

Type DSSP, up to 300 kV

Semi-pantograph disconnector

Hitachi Energy

Hitachi Energy disconnectors have been in service across the world for over decades providing maintenance-free service with the highest records of operation reliability. The worldwide experience, often under severe climatic conditions, is applied for continual product improvement.

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Maximum reliability and minimal maintenance

Hitachi Energy is a global technology leader that is advancing a sustainable energy future for all. We serve customers in the utility, industry and infrastructure sectors with innovative solutions and services across the value chain. Together with customers and partners, we pioneer technologies and enable the digital transformation required to accelerate the energy transition towards a carbon-neutral future. We are advancing the world's energy system to become more sustainable, flexible and secure whilst balancing social, environmental and economic value. Hitachi Energy has a proven track record and unparalleled installed base in more than 140 countries. Headquartered in Switzerland, we employ around 38,000 people in 90 countries and generate business volumes of approximately $10 billion USD.

Hitachi Energy is a leader in high-voltage technology, offering a wide range of high-voltage products up to 1,200-kilovolt (kV) helping enhance the safety, reliability and efficiency of power networks while minimizing environmental impact. Our technology leadership continues to facilitate innovations in areas such as ultra-high-voltage power transmission, enabling smart grids and enhancing eco-efficiency.

Designed based on cutting-edge technology and experience
The semi-pantograph disconnector consists of three poles. Each pole consists of the hot-dip galvanized steel structure base, one support insulator, one rotating insulator, the live base, one current path including two articulated arms, the pantograph mechanism, and the contact system. The disconnnectors can be equipped with insulators in accordance with IEC, ANSI or DIN specification and with one earthing switch.

Excellent current carrying capability
Each pole is equipped with a double U-shape aluminium arms. The open structure,having good heat ventilation, is designed to provide the high continuous current carrying capability and ensures reliable performance under operation.

Minimized contact resistance
Contacts are made of copper with silver plated surface to prevent oxidation. Multiple point contact provides reliable electrical connection with lower resistance which ensures minimum energy loss.

Reliable operation
The specific contact force is provided by the contact system and remains unchanged during the entire lifetime. Large contact zone ensures the moving contact catching the fixed contact with the displacement of busbar by various service conditions.

Smooth operation
Most of the linkage of rods and cranks is self-lubricating which makes the disconnectors close and open process smoothly.

Optimized semi-pantograph mechanism
The rotation of insulator is transferred to pantograph movement by mechanism between upper arm and lower arm. The rod-end ball bearings are used for driving movement smoothly and safely.

Easy Installation
The modular design concept is applied to the whole switch construction as complete as possible for easy alignment and adjustment.

Minimal maintenance
Graphite material is used for the disconnector arcing contacts, which have long service life and provide no contamination. In addition, all the steel components are hot-dip galvanized to protect against atmospheric influences. These features make the disconnector require minimum maintenance.

Interlocking for reliability under extreme conditions
In both end positions of the disconnector, the rotary arm is switched beyond the dead center point. The switch position cannot be changed by external forces even under extreme condition such as storms, earthquake etc.

Superior design of mechanical interlock
The superior design of mechanical interlock between the earthing switch and disconnector is employed so that there is no scope for malfunction.

Ice breaking capacity
The disconnectors are capable of operating under sever ice conditions.

Suitable for wide range of environmental conditions
The disconnectors can operate in a wide range of temperatures as well as under polluted environmental condition.

All steel components are hot-dip galvanized which enables the protection against atmospheric influences.

01 Frame

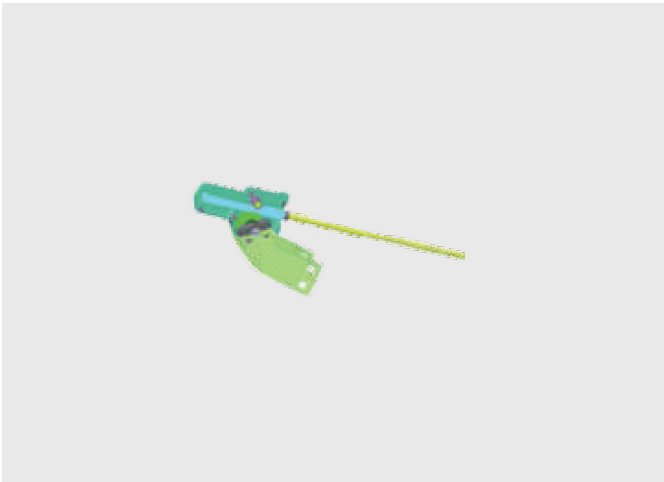
02 Live base mechanism: The dead center position component integrated in the live base, which ensure disconnector keeping at open position when maintenance & repair performed.
This functionality refer to safety.

03 Upper arm with moving contact

04 Lower arm with balance spring

Upper arm and lower arm employ the open structure having good ventilation,which avoid the over-heat happened for long term operation perspective.

05 Fixed contact: Fix contact of copper with silver plated which minimize resistance result in minimum energy loss and reliable operation as well.

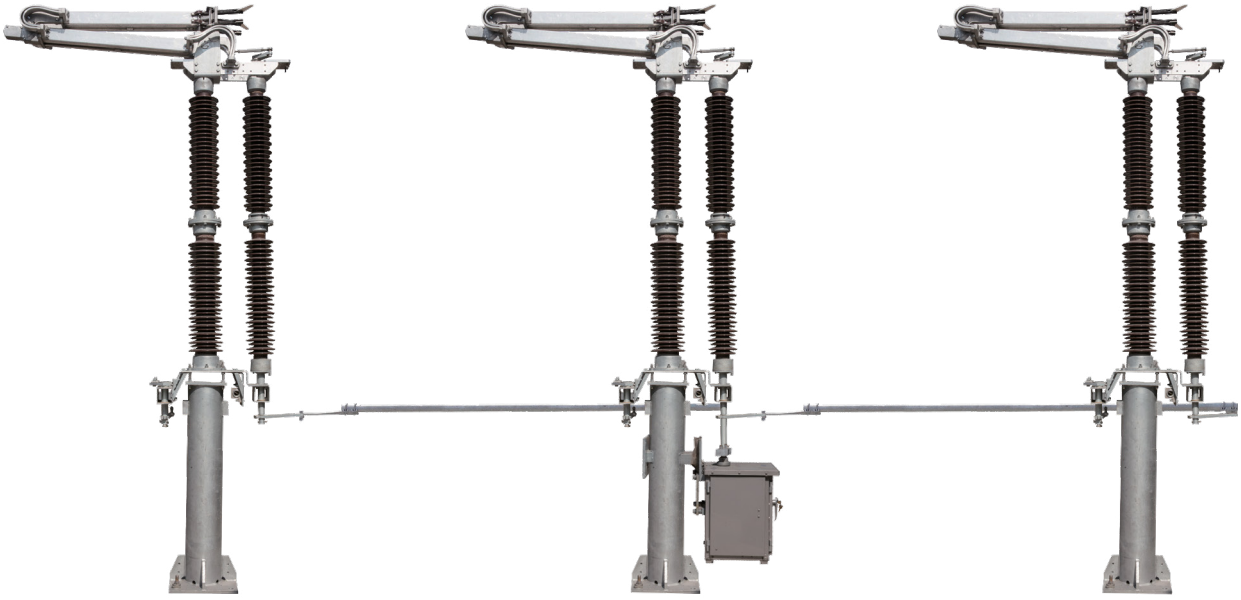


06 Rack and pinion mechanism: The rack and pinion are in housing and used for driving pantograph movement. The housing design avoid corrosion for long-term operation and also refer to reliability.

Technical data

DSSP

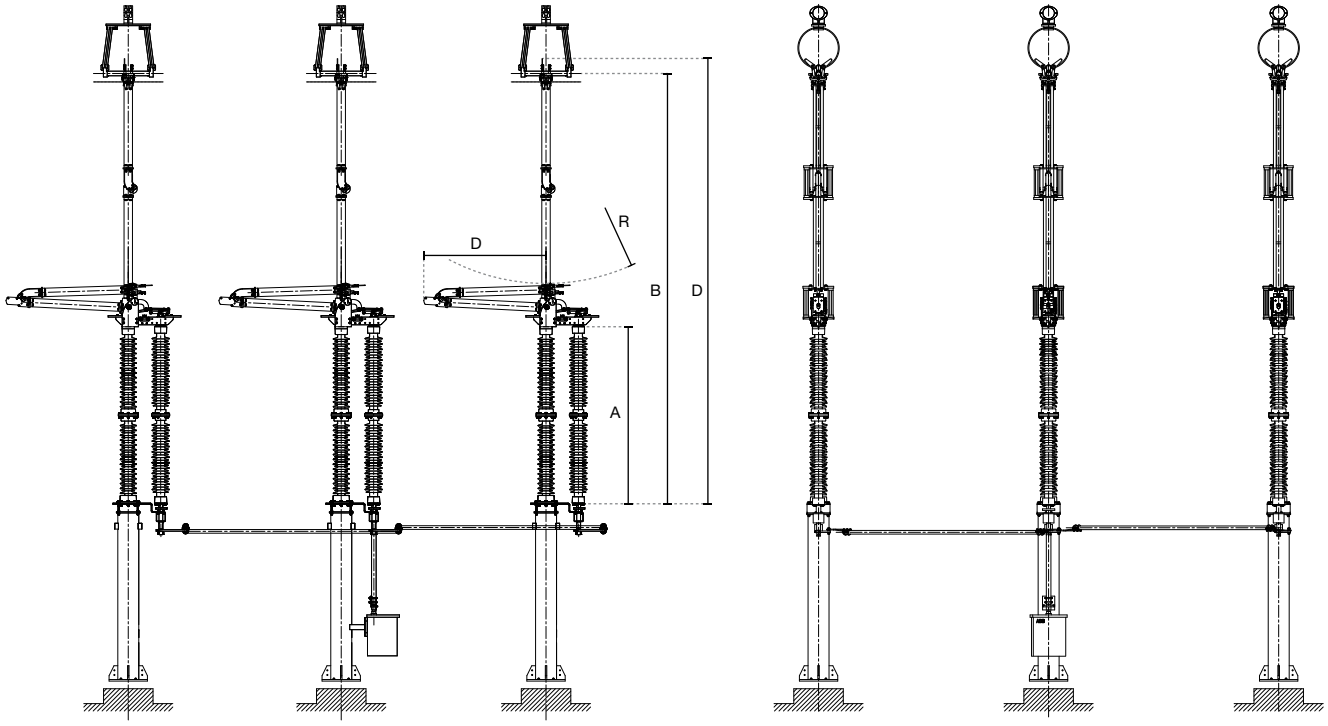
Rated voltage (U_r)	kV	123	145	170	245	300
Rated frequency (f_r)	Hz	50/60	50/60	50/60	50/60	50/60
Rated normal current (I_r)	A	≤3150	≤3150	≤3150	≤3150	≤4000
Rated short-withstand current, rated duration of short circuit (I_k, t_k)	kA/s	40/3	40/3	40/3	50/3	50/3
Rated peak withstand current (I_p)	kAp	100	100	104	125	125
Rated power frequency withstand voltage for 1 minute						
To earth and between poles	kV	230	275	325	460	460
Across the isolating distance	kV	265	315	375	530	606
Rated lightning impulse withstand voltage (1.2/50 µs)						
To earth and between poles	kV_p	550	650	750	1050	1050
Across the isolating distance	kV_p	630	750	860	1200	1250
Rated switching impulse withstand voltage						
To earth and between poles	kV	-	-	-	-	850
Across the isolating distance	kV	-	-	-	-	700 (+245)



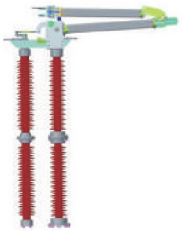
01 3 pole operated Semi-pantograph disconnector at 300 kV

Main dimensions

DSSP



Semi-pantograph Disconnector – DSSP



Rated voltage (kV)	Outline dimensions (mm)				
	A	B	C	D	R
123	1220	1635	1650	2100	1850
145	1500	1915	1650	2100	1850
170	1700	2115	1650	2100	1850
245	2300	2785	2950	3380	2550
300	2900	3385	2950	3380	2550

Mode of operation

The disconnectors and earthing switches are operated via independent operating mechanisms. The three phases of the disconnector are connected by the coupling rods.

Hitachi Energy disconnectors and earthing switches are designed and tested in accordance with the latest IEC specifications. All modules are pre-assembled and adjusted in factory as complete as possible, so it can be installed and adjusted at site easily. Hitachi Energy provide a clear installation instructions and assembly drawings.

The disconnectors and earthing switches supplied by Hitachi Energy are designed so as to ensure that they are virtually maintenance free. However, to warrant a long and trouble-free service period, we advise that a visual inspection of the contacts and bearing points can be carried out at regular intervals. If the equipment cannot be inspected periodically, it is recommended to open and close the switches whenever it is possible to do so, in order to clean the contacts and free the moving parts.

Operating mechanism

- The disconnectors and/or earthing switches can be single-pole or three-pole operated by means of a motor-operated mechanism or a manually operated mechanism. Customers can choose motor drive or manual drive according to the actual working situation of disconnector
- Operating mechanisms contain auxiliary switches for control and signaling as well as provisions for electrical interlocks
- Hitachi Energy disconnector operating mechanism has excellent water proof, sand prevention and rust protection performance
- The output shaft of the operating mechanism has good sealing ability with the house of operating mechanism

Interlocks

The disconnectors and earthing switches (when supplied) are mechanically interlocked. In operating mechanisms a blocking magnet can be installed as an additional interlocking facility, which in disconnected condition makes operation of the operating mechanism impossible.

01 Motor mechanism

02 Manual mechanism

Earthing switches

The earthing switch unit, an optional assembly, can be mounted on the base as required

Single-Motion

Rated voltage / kV	72.5~300
Rated current / A	630
Short circuit ratings	40~50 kA/3 s, 100~125 kA peak

The use of earthing switches ensure absolute safety by grounding and discharging all high-voltage components in a circuit or switchgear.

- Hitachi Energy free-standing earthing switches are available for all voltage levels up to 550 kV
- Suitable built-on earthing switches are available for all types of Hitachi Energy disconnectors
- According to the requirements, built-on earthing switches can be arranged laterally or in inboard arrangement with respect to the position of the main current path of the disconnector as needed
- Optionally, all earthing switches can be designed for switching induced inductive and capacitive currents according to IEC 62271-102, Class A or Class B

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