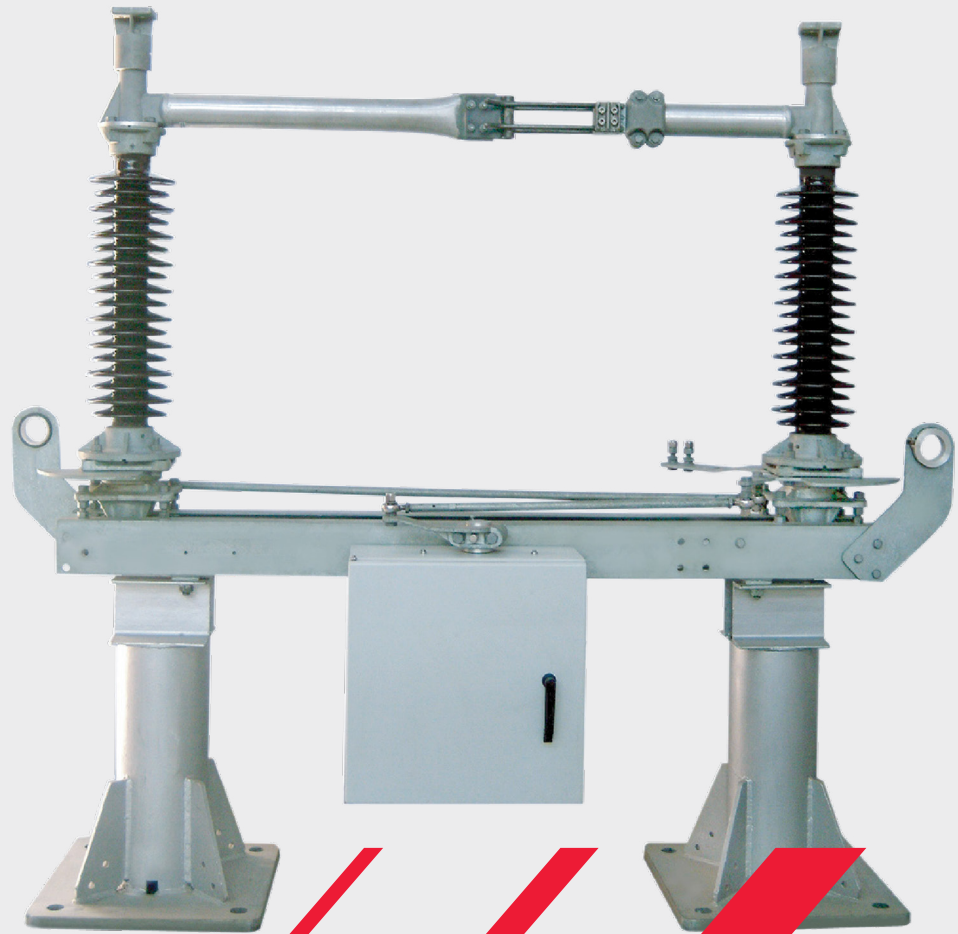




- Minimized contact resistance
- Easy and quick erection
- Low friction design for smooth operation
- Ice breaking capacity
- Strong rotary pedestals
- Minimal maintenance

HITACHI
Inspire the Next



Type SDF, up to 550 kV

Horizontal centre break disconnect

Hitachi Energy offers a wide range of reliable and energy efficient disconnectors to meet the requirements of different sites and network conditions.

The disconnectors range from 72.5 kV to 550 kV.

Hitachi Energy disconnectors are designed as per IEC 62271-102 and IEC 62271-1 standards.

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Disconnectors from Hitachi Energy

Hitachi Energy HV Disconnectors are in operation across the world in extreme and adverse conditions for decades, providing maintenance-free service with the highest benchmarks for operational reliability.

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.

Applications

A mechanical device for providing isolation of power equipment from the network, a disconnector is suitable for switching very small currents or where no significant change in voltage occurs across the terminals. The option of earthing sections of power systems can be made available by providing each disconnector pole with one or two earthing switches.

The horizontal centre break disconnectors type SDF are available for rated voltages up to 550kV.

Regulations

The SDF disconnectors are designed as per IEC 62271-102 and IEC 62271-1 standards. Other international regulations can be met on request. Type tests on the disconnectors are carried out by accredited testing laboratories in accordance with the latest regulations. Comprehensive electrical and mechanical routine tests are carried out on the poles and operating mechanism of each disconnector ensuring world-class quality.



Maximum reliability and minimal maintenance

Minimized contact resistance (energy efficient solution)

The current carrying aluminum conductors are welded to minimize joint resistance.

No external springs in contact fingers for maximum reliability

The contact fingers of the moving contacts of disconnecter type SDF are designed from special conducting material and without external springs for increased reliability.

Easy and quick erection

The current carrying conductors and rotary pedestals are designed for easy adjustment and alignment.

Low friction design for smooth operation (Corrosion-free electrical and mechanical joints)

Maintenance-free linkages with stainless steel rod-end bearings require less drive power for operation and provide smooth motion transmission without any disturbance in the settings.

Dead centre interlocking for reliability under extreme conditions

The dead centre interlocking of operating mechanisms ensure that there are no inadvertent changes in the open or close switching position even under extreme external conditions such as storms, earthquakes etc.

Superior design of mechanical interlock

The mechanical interlock between the earthing switch and main blade is designed in such a way that there is no scope for malfunction.

Ice breaking capacity

The disconnectors are capable of operating under severe ice conditions.

Strong rotary pedestals

This ensures that the deflection remains unchanged at high mechanical loads.

Suitable for a wide range of environmental conditions

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

Minimal maintenance

Superior material and lubricant used in the encapsulation of the pedestals makes the disconnectors practically maintenance-free.

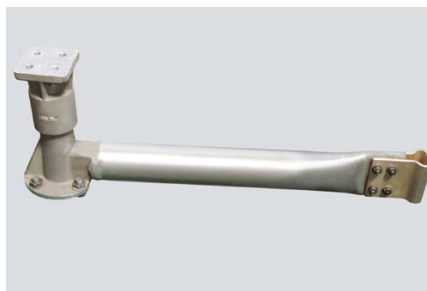
Design based on cutting-edge technology and experience

The horizontal center break disconnectors type SDF consist of a steel base frame with two rotary pedestals, insulators, current carrying conductors (current path) and driving mechanisms. Steel components are hot dip galvanized to protect against atmospheric influences.

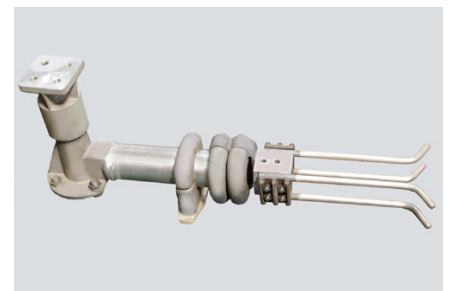
Each of the three phases of the disconnecter consists of two insulators mounted on maintenance free, sealed rotary pedestals which are carried by the steel base frame. The support post insulators carry the current paths consisting of two halves, with finger contacts and fist contacts. The current transfer takes place at the rotary heads of the two current paths via tulip-type contact fingers. The rotary heads can be turned 360° and therefore the installation of a pipe connection or the straining of connection cable is possible in any direction. Flat terminal plates can be provided as per DIN standard 46203, NEMA or any other standards..



01 Tulip contacts for 2500 A current path terminal head



01 Fist side current path rated for 1600 A



01 Finger side path rated for 1600 A with earthing fixed contact mounted

Technical data

Type SDF

Voltage		72.5 kV *	123 kV	145 kV	170 kV	245 kV	300 kV	362 kV	420 kV	550 kV
Type designation		SDF72.5	SDF123	SDF145	SDF170	SDF245	SDF300	SDF362	SDF420	SDF550
Rated voltage (U _r)	kV	72.5	123	145	170	245	300	362	420	550
Rated frequency (f _r)	Hz	50/60								
Rated normal current (I _r)	A	1600, 2500, 3150, 4000**								
Rated short-time withstand current, rated duration of short circuit (I _k , t _k)	kA, s	40/50/63, 1***								
Rated peak withstand current (I _p)	kAp	2.5x I _k (for 50 Hz) / 2.6x I _k (for 60 Hz)								

Basic insulation level

Power frequency withstand voltage for 1 minute

To earth and between poles	kV	140	230	275	325	460	395	450	520	620
Across the isolating distance	kV	160	265	315	375	530	435	520	610	800

Lightning impulse withstand voltage

To earth and between poles	kVp	325	550	650	750	1050	1050	1175	1425	1550
Across the isolating distance	kVp	375	650	750	860	1200	1050 (+170)	1175 (+205)	1425 (+240)	1550 (+315)

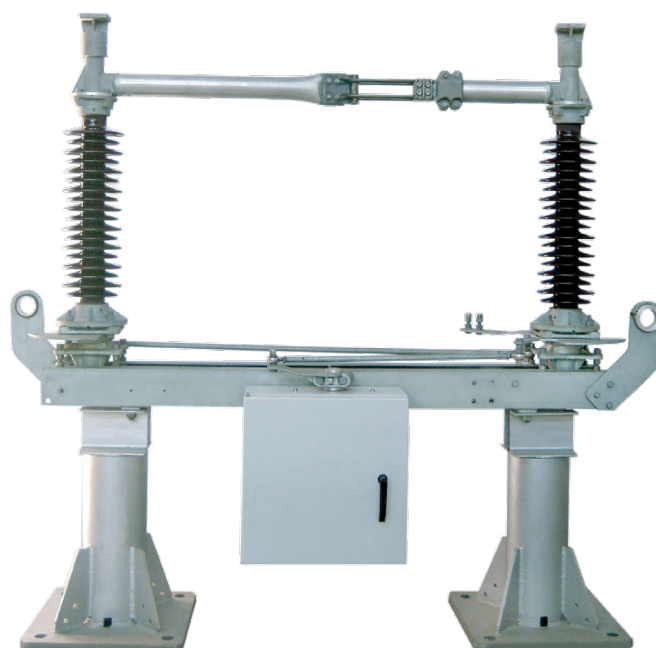
Switching impulse withstand voltage

To earth and between poles	kVp	-	-	-	-	-	850	950	1050	1175
Across the isolating distance	kVp	-	-	-	-	-	700 (+245)	800 (+295)	900 (+345)	900 (+450)

* 36 kV on demand

** Higher currents on request

*** 3s for 40 kA



01 72.5 kV SDF disconnecter

Mode of operation

The disconnecter and earthing switch are operated via independent operating mechanisms.

The operating energy from the operating mechanism of the disconnecters transmitted to one of the rotary pedestals of one phase. A diagonal rod connects both the rotary pedestals of each column ensuring simultaneous operation of both columns. The three phases of the disconnecter are connected by gang operating linkages for three phase operation. During opening and closing operation both the current paths rotate through an angle of 90°. The current paths will be at right angles to the base frame in open position.

Operating mechanism

All disconnecters can be supplied by manual or motor operated mechanism, as required by the customer. Each three-pole disconnecter or earthing switch group requires only one operating mechanism. The coupling rods between the individual poles can be continuously adapted.

Operating mechanisms contain auxiliary switches for control and signaling as well as provisions for electrical interlocks. Three phase operation is conducted via mechanical or electrical gang operation.

For maximum reliability the main contacts of the disconnecter and earthing switch pass through the dead center positions shortly before they reach the end positions. This prevents accidental opening or closing of the units due to external influences (e.g. short-circuits, storm, earthquake).

Interlocks

The disconnecter and earthing switch (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.

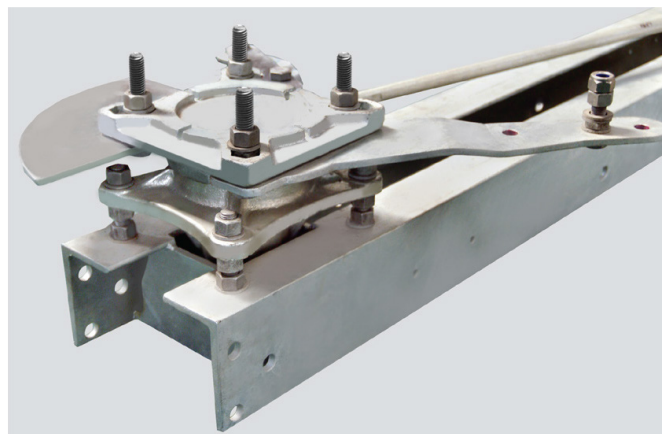
Earthing switch unit

The earthing switch unit, an optional assembly, consists of a hinged-type earthing switch fixed at the base frame. The unit can be mounted on either of the contact sides or on both sides as required.

In case of the earthing switch, the operating energy is transmitted to the earthing switch shaft. The tubular contact arm swings upwards when the unit is closing.



01 Linkages with spherical bearings



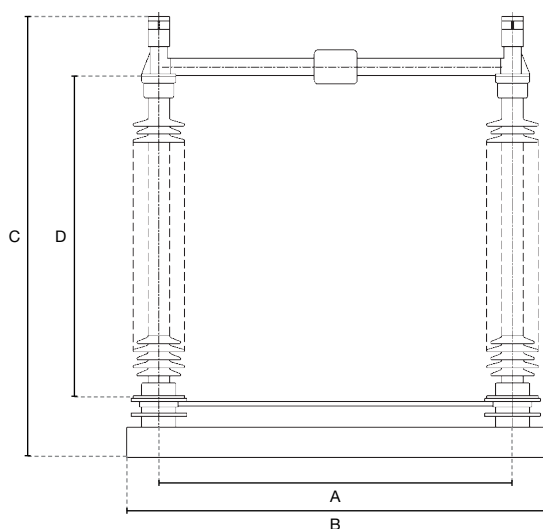
02 Bearing on frame assembly

Easy installation

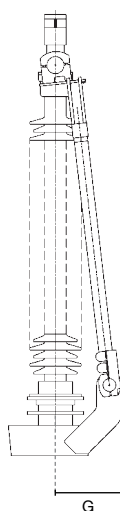
The disconnectors are delivered in following assemblies - lower part with rotary pedestals and operating rod, current path, support insulators and operating mechanism. As all mechanical adjustments are carried out in the factory, only mounting of the assemblies, installation of the coupling rods between the poles, connection of the high-tension

leads and the electrical connection leading to the operating mechanisms is required at the site.

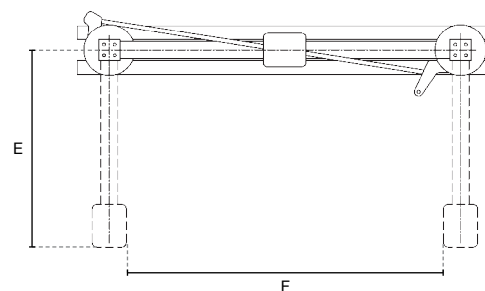
Stud bolts are provided to compensate rapidly and exactly any inaccuracies in insulator position caused due to tensile forces.



01 Earthing switch contact side



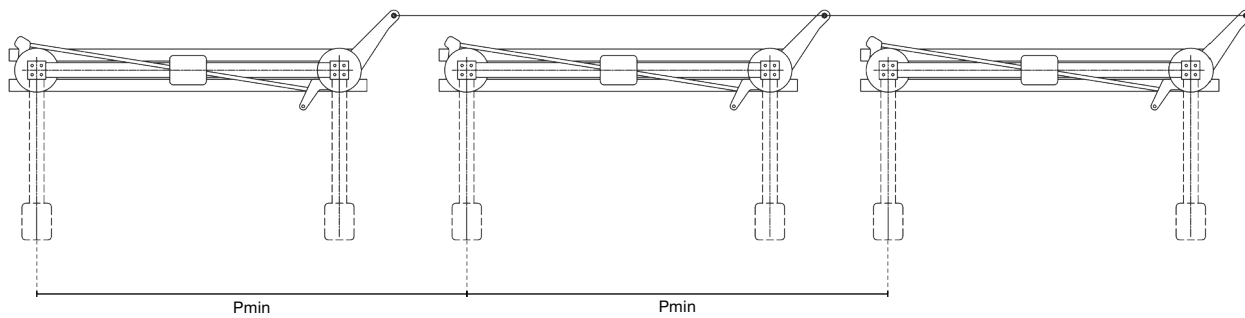
02 Earthing switch finger side



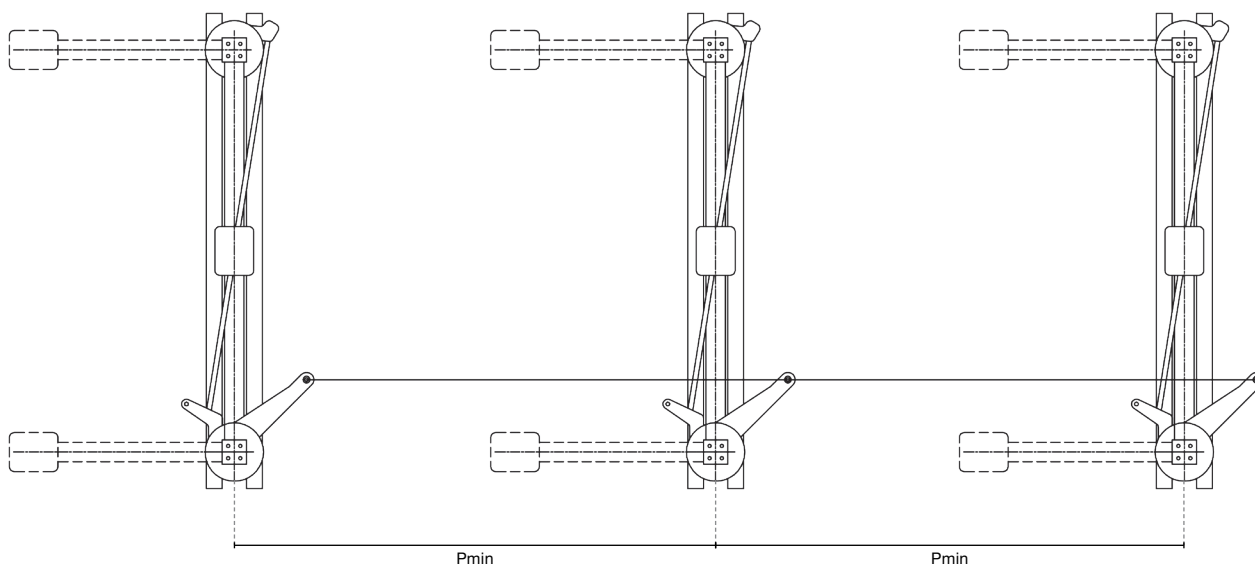
03 Top view

Main dimensions as in drawing (mm / inch)

Type		SDF72.5	SDF123	SDF145	SDF170	SDF245	SDF300	SDF362	SDF420	SDF550	
A	Support insulator distance (mm)	1000/ (394)	1400/ (551)	1650/ (650)	1830/ (720)	2620/ (1031)	2620/ (1031)	3200/ (1260)	3800/ (1496)	4200/ (1654)	
B	Base frame length (mm)	1300/ (512)	1300/ (512)	1950/ (768)	2130/ (839)	2920/ (1150)	2920/ (1150)	3500/ (1378)	4066/ (1601)	4466/ (1758)	
C	Disconnector height (mm)	1600 A	1325/ (522)	1775/ (699)	2055/ (809)	2255/ (888)	2855/ (1124)	3205/ (1262)	3255/ (1281)	-	-
		2500 A	1375/ (541)	1825/ (719)	2105/ (829)	2305/ (907)	2905/ (1144)	3255/ (1281)	3255/ (1281)	4090/ (1610)	-
		3150 A	1425/ (561)	1875/ (738)	2155/ (848)	2355/ (927)	2955/ (1163)	3305/ (1301)	3305/ (1301)	4140/ (1630)	4790/ (1886)
		4000 A	1425/ (561)	1875/ (738)	2155/ (848)	2355/ (927)	2955/ (1163)	3305/ (1301)	3305/ (1301)	4140/ (1630)	4790/ (1886)
D	Support insulator height	770/ (303)	1220/ (480)	1500/ (591)	1700/ (669)	2300/ (906)	2650/ (1043)	2650/ (1043)	3350/ (1319)	4000/ (1575)	
E	Disconnector width (open)	560/ (220)	760/ (299)	925/ (364)	1030/ (406)	1370/ (539)	1370/ (539)	1725/ (679)	2100/ (827)	2380/ (937)	
F	Disconnector width (open)	800/ (315)	1200/ (472)	1450/ (571)	1630/ (642)	2420/ (953)	2300/ (906)	2700/ (1063)	3385/ (1333)	3810/ (1500)	
G	Length of earthing switch attachment	450/ (177)	450/ (177)	450/ (177)	450/ (177)	450/ (177)	450/ (177)	450/ (177)	1050/ (413)	1050/ (413)	



04 Series installation



05 Parallel installation

Type	Installation (with or without earthing switch)	
	In series Pmin (mm)	In parallel Pmin (mm)
SDF72.5	1790/(705)	1270/(500)
SDF123	2700/(1063)	1970/(776)
SDF145	3150/(1240)	2330/(917)
SDF170	3530/(1390)	2640/(1039)
SDF245	4920/(1937)	3520/(1386)
SDF300	5350/(2106)	4070/(1602)
SDF360	6925/(2726)	4755/(1872)
SDF420	On request	-
SDF550 (on request)	On request	-

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