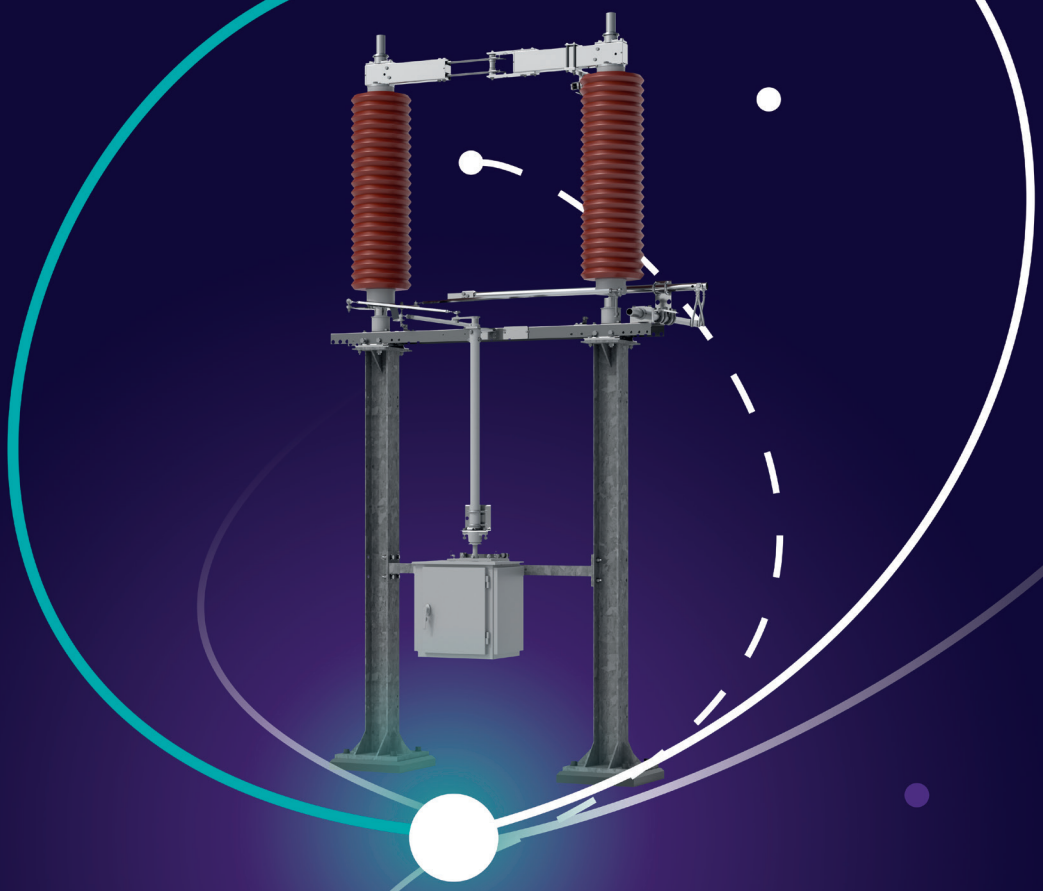
SIEMENS energy

Disconnectors and earthing switches

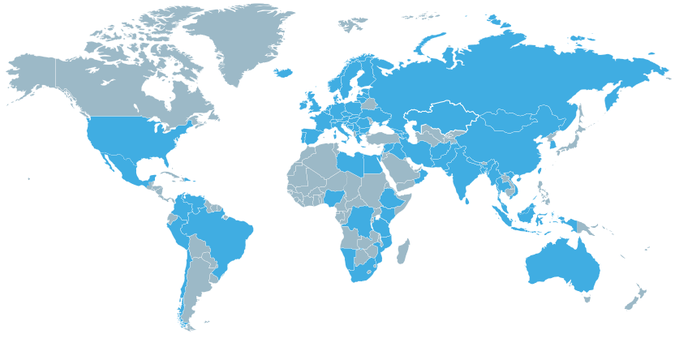


Disconnectors and earthing switches

Siemens Energy has a business unity specialized in manufacturing high-voltage disconnectors and earthing switches.

Through personalized service, we offer our customers optimized solutions both technically and economically, developed from an extensive high-voltage disconnectors portfolio and associated services.

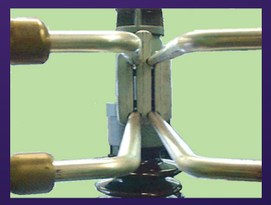
Our products have passed the most rigorous tests and their quality is assured by ISO 9001, factors that guarantee its full functionality along decades.



123,000 disconnectors delivered to over 110 countries worldwide

Siemens Energy block / finger contact system

- No pressing springs -> self-producing of contact force
- Graphite-silver coating -> dry-lubrication, no lubrication
- Each contact finger has two contact points on the contact block
- Long-term maintenance-free operation
- Increase of contact force under short-circuit conditions
- High dynamic/termal stability when fault currents occur



Choose from a comprehensive portfolio

- State-of-the-art technology tested according to latest international standards (IEC, ANSI, GOST, ...) and in-house expertise
- Voltage level from 40.5 kV up to 1200 kV, rated current up to 5000 A, rated short-circuit current up to 80 kA, ambient temperature - 60 ... + 55°C
- Long-term operational experience with special applications and designs.
  E.g.: high and low temperature, special design for test laboratories, HVDC applications, combined designs with surge arresters, etc.
- Excellent and certified quality management according to international quality, environmental, health and safety standards

Benefit from a strong customer orientation and service

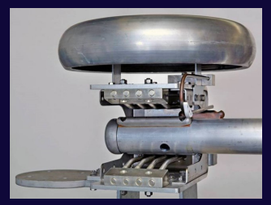
- From one source: installation, commissioning, maintenance, training for all our products and solutions, technical support and product consulting
- Delivery of pre-assembled and pre-adjusted disconnector poles and components ensures easy erection and commissioning; no special tools necessary, only standard tools are to be used
- Usage of maintenance-free components, joints and rotating units (greased for life, protected against wash out, dry-lubricated contact)
- Our worldwide production network, presence in more than 90 countries across the globe as well as our 24-h-service hotline keep us close to our customers for constant availability & quick trouble shooting and reduces efforts for transportation (good for CO_2 balance)
- Our technical support covers the entire service life of our disconnectors, and our products are fully recyclable at the end of their lifecycle

Arc restrictors – bus transfer contacts

Arc restrictors can be supplied for all types of Siemens Energy disconnectors. With this accessory, disconnectors are capable of maneuver the induced currents during busbar transferences. During the switching operation from bus 1 to bus 2, the existing potential difference causes an electrical arc between the disconnector contacts.

The B annex of the IEC 62271-102 describe the maneuver loads that appears under a busbar transference without interruption.

Our arc restrictors for bars transfer have successfully passed type tests with more than 100 operational cycles of establishment and interruption of current.



3DN0

Fig. 01 free-standing earthing switch

The use of earthing switches (Fig.01) ensures absolute de-energization of high-voltage components in a circuit or switchgear.

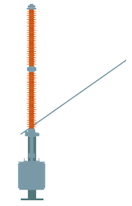
Free-standing earthing switches are available for all voltage levels up to 550 kV.

Suitable built-on earthing switches are available for all disconnector types from the Siemens Energy scope of supply.

According to the system operator's requirements, built-on earthing switches can be arranged laterally or in an integrated arrangement depending on the position of the main current path of the disconnector.

If required, all earthing switches can be designed for switching-induced inductive and capacitive currents in accordance with IEC 62271-102, Class A or Class B of super Class B.

Technical data



Design		Earthing switch (add-on / stand-alone)									
Rated voltage	**[kV]**	40.5	72.5	123	145	170	245	300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min									
To earth and between phases	**[kV]**	80	140	230	275	325	460	395	450	520	740
Across the isolating distance	**[kV]**	-	-	-	-	-	-	-	-	-	-
Rated lightning impulse withstand voltage		1.2 / 50 µs									
To earth and between phases	**[kV]**	185	325	550	650	750	1050	1050	1175	1425	1675
Across the isolating distance	**[kV]**	-	-	-	-	-	-	-	-	-	-
Rated switching impulse withstand voltage		250 / 2500 µs									
To earth and between phases	**[kV]**	-	-	-	-	-	-	850	950	1050	1300
Across the isolating distance	**[kV]**	-	-	-	-	-	-	-	-	-	-
Rated normal current up to	**[A]**	1000									
Rated peak withstand current up to	**[kA]**	160/164									
Rated short-time withstand current up to	**[kA]**	63									
Rated duration of short-circuit	**[s]**	1/3									
Icing class	**[mm]**	10/20									
Temperature range	**[°C]**	-55 ... +55									
Operating mechanism type		motor/manual operation									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz									
Maintenance	**[years]**	25									

All values in accordance with IEC; other values on request

3DN1

Application and design of the disconnector

The center-break is the most frequently used disconnector type worldwide.

Its design is characterized by two rotatable insulators mounted on the switch base. The current path opening to the side creates a bigger phase distance than with other disconnector types.

Thanks to its convenient design, the center-break is particularly versatile and can be applied in parallel, diagonal or in-line arrangements.

Fig. 02 Center-break disconnector

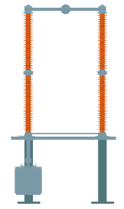
Key features

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GOST R and GB/DL standards

Technical structure

The total weight of our new center-break disconnector (Fig. 02) has been reduced considerably through the use of fewer steel parts, especially in the base frame, thus reducing installation effort and transport costs. At the same time, our 3DN1 is capable of withstanding very high terminal and mechanical loads and has supreme seismic capabilities. Corrosion-free components, such as hot-dip galvanized steel parts, ensure a particularly long service life.
The 3DN1 is designed for ambient temperatures from - 55 up to + 55 °C and has a high short-circuit capability, and excellent ice breaking behavior.

Technical data



Design		Center-break disconnector (DBF series or CR series)									
Rated voltage	**[kV]**	40.5	72.5	123	145	170	245	300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min									
To earth and between phases	**[kV]**	80	140	230	275	325	460	395	450	520	620
Across the isolating distance	**[kV]**	90	160	265	315	375	530	435	520	610	800
Rated lightning impulse withstand voltage		1.2 / 50 µs									
To earth and between phases	**[kV]**	185	325	550	650	750	1050	1050	1175	1425	1550
Across the isolating distance	**[kV]**	215	375	630	750	860	1200	1050 (+170)	1175 (+205)	1425 (+240)	1550 (+315)
Rated switching impulse withstand voltage		250 / 2500 µs									
To earth and between phases	**[kV]**	-	-	-	-	-	-	850	950	1050	1175
Across the isolating distance	**[kV]**	-	-	-	-	-	-	700 (+245)	800 (+295)	900 (+345)	900 (+450)
Rated normal current up to	**[A]**	4000									
Rated peak withstand current up to	**[kA]**	160									
Rated short-time withstand current up to	**[kA]**	63									
Rated duration of short-circuit	**[s]**	1/3									
Icing class	**[mm]**	10/20									
Temperature range	**[°C]**	-55 ... +55									
Operating mechanism type		motor/manual operation									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz									
Maintenance	**[years]**	25									

All values in accordance with IEC; other values on request

3DN2

Application and design of the disconnector

The double-side break disconnector features three support insulators.

The one in the center is mounted on a rotating unit and carries the current path. The outer support insulators carry the fixed contacts.

The double-side break disconnector is mainly applied in substations with limited phase distance and in those where vertical opening of the current path is not possible due to limited spatial conditions.

Fig. 03 Double-side break disconnector

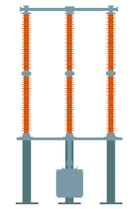
Key features

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GOST R and GB/DL standards

Technical structure

The double-side break disconnector (Fig. 03) can be customized to your sub-structure and is delivered pre-adjusted to ensure easy assembly and set-up. Thanks to its high contact force, these series ensure excellent ice-breaking and short-circuit behavior. Additionally, it is extremely reliable. The self-interlocked and position ensures safe operation even during failure or movement and makes these series applicable also in indoor installations. Poles are mounted on a hot-dip galvanized steel base that withstands high mechanical loads and relates to an extremely long service lifetime. This ensures a high quality disconnector that will serve you for decades.

Technical data



Design		Double-side break disconnector (ZBF series or DR series)									
Rated voltage	**[kV]**	40.5	72.5	123	145	170	245	300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min									
To earth and between phases	**[kV]**	80	140	230	275	325	460	395	450	520	620
Across the isolating distance	**[kV]**	90	160	265	315	375	530	435	520	610	800
Rated lightning impulse withstand voltage		1.2 / 50 µs									
To earth and between phases	**[kV]**	185	325	550	650	750	1050	1050	1175	1425	1550
Across the isolating distance	**[kV]**	215	375	630	750	860	1200	1050 (+170)	1175 (+205)	1425 (+240)	1550 (+315)
Rated switching impulse withstand voltage		250 / 2500 µs									
To earth and between phases	**[kV]**	-	-	-	-	-	-	850	950	1050	1175
Across the isolating distance	**[kV]**	-	-	-	-	-	-	700 (+245)	800 (+295)	900 (+345)	900 (+450)
Rated normal current up to	**[A]**	5000									
Rated peak withstand current up to	**[kA]**	160									
Rated short-time withstand current up to	**[kA]**	63									
Rated duration of short-circuit	**[s]**	1/3									
Icing class	**[mm]**	10/20									
Temperature range	**[°C]**	-55 ... +55									
Operating mechanism type		motor/manual operation									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz									
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz									
Maintenance	**[years]**	25									

All values in accordance with IEC; other values on request

3DN3

Application and design of the disconnector

The pantograph disconnectors PRF2 & PRL2 are characterized by their typical scissor design:

By using vertical rather than horizontal disconnection, the pantograph allows for diagonal arrangement and space-saving substation design.

The scissors provide a highly flexible contact zone. The pantograph disconnector is applicable for both rigid busbar and flexible cable busbar connections.

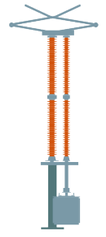
Fig. 04 Pantograph disconnector

Key features

- Spherical contacts for optimal and non-sensitive contact and high reliability
- Easy set-up due to pre-adjusted subassemblies from the factory
- Optional bus transfer current capability of 1600 A
- Maintenance-free
- Exceeding the IEC and meeting GOST R and GB/DL standards

Technical structure

Thanks to its structure, the pantograph disconnector (Fig. 04) requires the smallest footprint. The high-contact force allows for excellent ice-breaking and short-circuits behavior. The pantograph series disconnectors have an extremely long life-time due to corrosion-free material such as hot-dip galvanized steel parts and weather-proof aluminum alloys. The self-interlocked end position ensures reliable and safe operation even during failure or movement, e.g. in case of an earthquake. Reduction of casting parts in the contact system lead to a reduced weight compared to the previous design for easier handling.



Technical data

Design		Pantograph disconnector (PRF & PRL series or PR series)								
Rated voltage	**[kV]**	123	126	145	170	245	252/300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min								
To earth and between phases	**[kV]**	230	230	275	325	460	395	450	520	740
Across the isolating distance	**[kV]**	265	230 (+70)	315	375	530	435	520	610	740 (+318)
Rated lightning impulse withstand voltage		1.2 / 50 µs								
To earth and between phases	**[kV]**	550	550	650	750	1050	1050	1175	1425	1675
Across the isolating distance	**[kV]**	630	550 (+103)	750	860	1200	1050 (+170)	1175 (+205)	1425 (+240)	1675 (+315)
Rated switching impulse withstand voltage		250 / 2500 µs								
To earth and between phases	**[kV]**	-	-	-	-	-	850	950	1050	1300
Across the isolating distance	**[kV]**	-	-	-	-	-	700 (+245)	800 (+295)	900 (+345)	1175 (+450)
Rated normal current up to	**[A]**	5000								
Rated peak withstand current up to	**[kA]**	160								
Rated short-time withstand current up to	**[kA]**	63								
Rated duration of short-circuit	**[s]**	1/3								
Icing class	**[mm]**	10/20								
Temperature range	**[°C]**	-55 ... +55								
Operating mechanism type		motor/manual operation								
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz								
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz								
Maintenance	**[years]**	25								

All values in accordance with IEC; other values on request

3DN4

Application and design of the disconnector

The vertical-break disconnector requires three insulating columns, where two of them are fixed (support the fixed contacts) and one rotative (which turn the movable contacts).

Due to its vertical opening, this disconnector allows a small distance between phases, the vertical-break disconnector is mainly applied in substations with limited phase distances.

High disconnection visibility is proof of its safety.

Fig. 05 Vertical-break disconnector

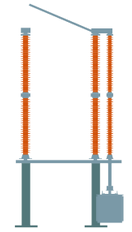
Key features

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- The locking system with double kinematics assures an excellent contact
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GOST R and GB/DL standards

Technical structure

The current path of vertical-break disconnector (Fig. 05) performs two movements.
This locks the current path in the short-circuit-proof closed position and prevents the current path from switching to open position under external forces. The ample distance between support insulator and rotating insulator ensures dielectric strength of the parallel insulation even in saline fog conditions. The installation and commissioning on site is quick and easy, as the movable part of the current path is one single subassembly that is pre-adjusted and routine-tested at the factory.

Technical data



Design		Vertical-break disconnector (HBF series)								
Rated voltage	**[kV]**	72.5	123	145	170	245	300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min								
To earth and between phases	**[kV]**	140	230	275	325	460	395	450	520	620
Across the isolating distance	**[kV]**	160	265	315	375	530	435	520	610	800
Rated lightning impulse withstand voltage		1.2 / 50 µs								
To earth and between phases	**[kV]**	325	550	650	750	1050	1050	1175	1425	1550
Across the isolating distance	**[kV]**	375	630	750	860	1200	1050 (+170)	1175 (+205)	1425 (+240)	1550 (+315)
Rated switching impulse withstand voltage		250 / 2500 µs								
To earth and between phases	**[kV]**	-	-	-	-	-	850	950	1050	1175
Across the isolating distance	**[kV]**	-	-	-	-	-	700 (+245)	800 (+295)	900 (+345)	900 (+450)
Rated normal current up to	**[A]**	5000								
Rated peak withstand current up to	**[kA]**	160								
Rated short-time withstand current up to	**[kA]**	63								
Rated duration of short-circuit	**[s]**	1/3								
Icing class	**[mm]**	10/20								
Temperature range	**[°C]**	-55 ... +55								
Operating mechanism type		motor/manual operation								
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz								
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz								
Maintenance	**[years]**	25								

All values in accordance with IEC; other values on request

3DN5

Application and design of the disconnector

Thanks to its small space requirements in both vertical and horizontal direction, the knee-type disconnector is mainly applied in substations with limited phase distances.

The knee joint in the main current path reduces the space for vertical opening and the phase distance between the poles.

High disconnection visibility is proof of its safety.

Fig. 06 Knee-type disconnector

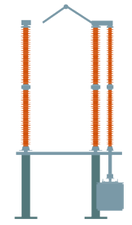
Key features

- Robust design and simple assembly
- Pre-adjusted subassemblies from the factory
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GB & DL standards

Technical structure

The knee-type enhanced kinematic chain of the current path is easily adjustable, lubrication free, and extremely reliable in case of failure. The self-interlocked end position is now even closer to the main current path, ensuring a reliable and safe operation even during failure or movement, e.g. in case of an earthquake. This disconnector type (Fig. 06) has maintenance-free contacts which guarantee that conductivity is maintained even in rough conditions and for an extremely long service lifetime. Moreover, the knee-type is very easy to handle: The modular design ensures easy assembly on site, and a low operation moment allows for manual operation with reduced effort. In particular, the double-knee-type disconnector allows for a compact substation design.

Technical data



Design		Knee-type disconnector (GBF series or KR series)						
Rated voltage	**[kV]**	123	126	245	252/300	362	420	550
Rated power-frequency withstand voltage		50 Hz / 1 min						
To earth and between phases	**[kV]**	230	230	460	395	450	520	740
Across the isolating distance	**[kV]**	265	230 (+70)	530	435	520	610	740 (+318)
Rated lightning impulse withstand voltage		1.2 / 50 µs						
To earth and between phases	**[kV]**	550	550	1050	1050	1175	1425	1675
Across the isolating distance	**[kV]**	630	550 (+103)	1200	1050 (+170)	1175 (+205)	1425 (+240)	1675 (+315)
Rated switching impulse withstand voltage		250 / 2500 µs						
To earth and between phases	**[kV]**	-	-	-	-	950	1050	1300
Across the isolating distance	**[kV]**	-	-	-	-	800 (+295)	900 (+345)	1175 (+450)
Rated normal current up to	**[A]**	4000						
Rated peak withstand current up to	**[kA]**	160						
Rated short-time withstand current up to	**[kA]**	63						
Rated duration of short-circuit	**[s]**	1/3						
Icing class	**[mm]**	10/20						
Temperature range	**[°C]**	-55 ... +55						
Operating mechanism type		motor/manual operation						
Control voltage	**[V, DC] [V, AC]**	60/110/125/220 220...230,1~,50/60 Hz						
Control voltage	**[V, DC] [V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz						
Maintenance	**[years]**	25						

All values in accordance with IEC; other values on request

3DN7

Application and design of the disconnector

At voltage levels below 145 kV the center-break disconnector is almost not applicable due to the limited insulator distances.

At least the contact system has to be positioned (no-arm).

The V-type can be used to advantage in such applications.

Also wall and ceiling installations are possible.

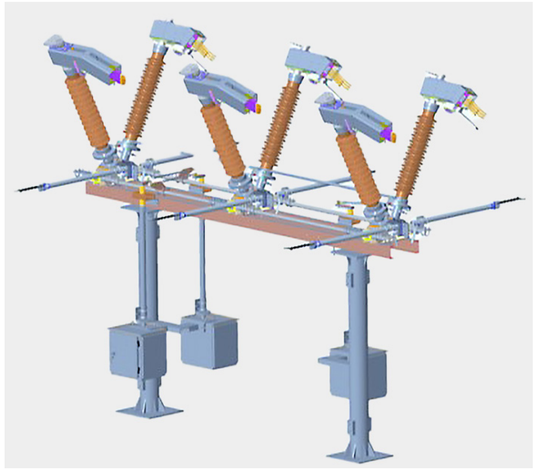


Fig. 07 V-type disconnector

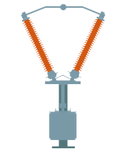
Key features

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- Easy set-up due to pre-adjusted subassemblies from the factory
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GB/DL standards

Technical structure

The V-type disconnector (Fig. 07) is derived from the “traditional” center-break type (3DN1) and owns the main construction features and operating principle of our center-break disconnector design. This disconnector type is applied only up to 145 kV. This type is a very compact and economic solution, virtually adaptable to any possible substation layout; the base frame, “space saving” and robust, allows the installation of the three poles on a single horizontal member, supported by one or two vertical columns. The application of add-on earthing switches shall be in parallel to the disconnector.

Technical data



Design		V-type disconnector (VR series)			
Rated voltage	**[kV]**	72.5	123	126	145
Rated power-frequency withstand voltage		50 Hz / 1 min			
To earth and between phases	**[kV]**	140	230	230	275
Across the isolating distance	**[kV]**	160	265	230 (+70)	315
Rated lightning impulse withstand voltage		1.2 / 50 µs			
To earth and between phases	**[kV]**	325	550	550	650
Across the isolating distance	**[kV]**	375	630	550 (+103)	750
Rated switching impulse withstand voltage		250 / 2500 µs			
To earth and between phases	**[kV]**	-	-	-	-
Across the isolating distance	**[kV]**	-	-	-	-
Rated normal current up to	**[A]**	3150			
Rated peak withstand current up to	**[kA]**	125			
Rated short-time withstand current up to	**[kA]**	50			
Rated duration of short-circuit	**[s]**	1/3			
Icing class	**[mm]**	10/20			
Temperature range	**[°C]**	-55 ... +55			
Operating mechanism type		motor/manual operation			
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz			
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz			
Maintenance	**[years]**	25			

All values in accordance with IEC; other values on request

3DN8

Application and design of the disconnector

The 40.5 kV side-break disconnector also called SR0 series can functionally replace the center-break disconnector.

Its design is characterized by one rotatable insulator and one fixed insulator mounted on the switch base.

The moving arm opening to the side creates a bigger phase distance than with other disconnector types.

Fig. 08 Side-break disconnector

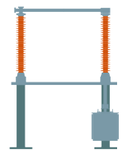
Key features

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- Easy set-up due to pre-adjusted subassemblies from the factory
- Maintenance-free
- Exceeding the IEC and meeting GB/DL standards

Technical structure

The side-break disconnector (Fig. 08) can be customized to your sub-structure and is delivered pre-adjusted to ensure easy assembly and set-up. Thanks to its high contact force, the SR0 series ensures excellent ice-breaking and short-circuit behavior. Additionally, it is extremely reliable. The self-interlocked end position ensures safe operation even during failure or movement. Poles are mounted on a hot-dip galvanized steel base that withstands high mechanical loads and relates to an extremely long service lifetime.
This ensures a high quality disconnector that will serve you for decades.

Technical data



Design		Side-break disconnector (SR0)
Rated voltage	[kV]	40.5
Rated power-frequency withstand voltage		50 Hz / 1 min
To earth and between phases	[kV]	80
Across the isolating distance	[kV]	90
Rated lightning impulse withstand voltage		1.2 / 50 µs
To earth and between phases	[kV]	185
Across the isolating distance	[kV]	215
Rated switching impulse withstand voltage		250 / 2500 µs
To earth and between phases	[kV]	-
Across the isolating distance	[kV]	-
Rated normal current up to	[A]	2000
Rated peak withstand current up to	[kA]	100
Rated short-time withstand current up to	[kA]	40
Rated duration of short-circuit	[s]	1/3
Icing class	[mm]	10/20
Temperature range	[°C]	-55 ... +55
Operating mechanism type		motor/manual operation
Control voltage	[V, DC] [V, AC]	60/110/125/220 220...230,1~,50/60 Hz
Control voltage	[V, DC] [V, AC]	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz
Maintenance	[years]	25

All values in accordance with IEC; other values on request

3DN9

Application and design of the disconnector

The semi-pantograph disconnector (also called YR type disconnector) is characterized by its typical semi-scissor design.

By using vertical rather than horizontal disconnection, the semi-pantograph allows for diagonal arrangement and space-saving substation design.

The semi-pantograph provides a less flexible contact zone, therefore is applicable for rigid busbar connections especially.

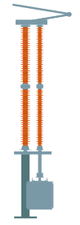
Fig. 09 Semi-pantograph disconnector

Key features

- The fixed contact bar is pressed by a clamp operated by a spring mechanism that guarantees the equally controlled mechanical load and a perfect performance for the rated current and short circuit current
- Easy set-up due to pre-adjusted subassemblies from the factory
- The arm is balanced by a spring housed inside its lower half, to ensure a smooth low energy demanding motion
- Optional bus transfer current capability of 1600 A
- Exceeding the IEC and meeting GB/DL standards

Technical structure

Thanks to its structure, the semi-pantograph disconnector (Fig. 09) (YR series) is the disconnector that requires the smallest footprint. The semi-pantograph has a very long life-time due to corrosion-free material such as hot-dip galvanized steel parts and weather-proof aluminum alloys. The self-interlocked end position ensures reliable and safe operation even during failure or movement, e.g. in case of an earthquake.



Technical data

Design		Semi-pantograph disconnector (YR series)				
Rated voltage	**[kV]**	123	126	245	252	550
Rated power-frequency withstand voltage				50 Hz / 1 min		
To earth and between phases	**[kV]**	230	230	460	460	740
Across the isolating distance	**[kV]**	265	230 (+70)	530	460 (+146)	740 (+318)
Rated lightning impulse withstand voltage				1.2 / 50 µs		
To earth and between phases	**[kV]**	550	550	1050	1050	1675
Across the isolating distance	**[kV]**	630	550 (+103)	1200	1050 (+206)	1675 (+315)
Rated switching impulse withstand voltage				250 / 2500 µs		
To earth and between phases	**[kV]**	-	-	-	-	1300
Across the isolating distance	**[kV]**	-	-	-	-	1175 (+450)
Rated normal current up to	**[A]**	4000				
Rated peak withstand current up to	**[kA]**	160				
Rated short-time withstand current up to	**[kA]**	63				
Rated duration of short-circuit	**[s]**	1/3				
Icing class	**[mm]**	10				
Temperature range	**[°C]**	-50 ... +50				
Operating mechanism type		motor/manual operation				
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 220...230,1~,50/60 Hz				
Control voltage	**[V, DC]** **[V, AC]**	60/110/125/220 110/125/220,1~, 50/60 Hz 220/380/415,3~, 50/60 Hz				
Maintenance	**[years]**	25				

All values in accordance with IEC; other values on request

3DV6/7
Motor drive

For high-voltage disconnectors

Technical features

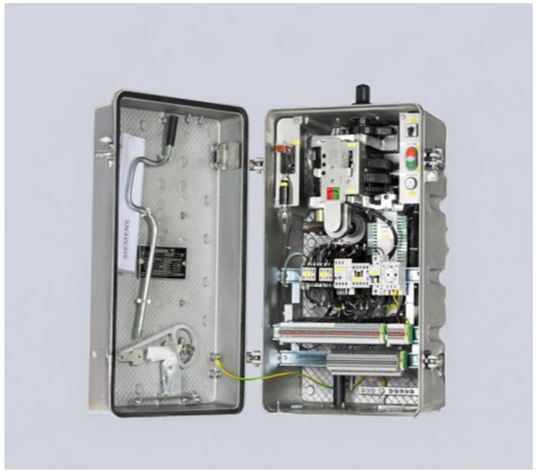
The motor operating mechanisms consist of aluminum casted housing with door, a gear unit with motor and electrical equipment as well as an auxiliary switch.

The motor operating mechanism can also be operated manually.

For this purpose a hand crank is inserted into an opening, easily accessible from the ground. The opening is secured by a swivel-mounted shutter. Opening the shutter automatically interrupts the motor and control circuit, protecting the site personnel against inadvertent operation of the high-voltage switchgear by remote control. The electric motor brake makes manual operation by a hand crank easier.

The motor operating mechanism is protected against condensation water by a heating resistor and air circulation inside the housing.

The auxiliary switches consist of creepage proof and arc-resistant moulded plastic discs. Putting one on the other they build closed interrupting chambers. The self-cleaning contacts consist of silver-plated contact knives and contact-bridges fitted with solid silver elements. They are able to carry and switch very small signalling currents as well as higher inductive direct currents.



3DV6 type motor drive

Auxiliary switch

Design		Motor drive			
	[kV]	60	110/125	220/230	250
Rated motor voltage	**[V, DC]** **[V, AC]**	AC 127/230 V; 50/60 Hz 3AC 127/220/230/380/415 V; 50/60 Hz			
Rated control voltage	**[V, DC]** **[V, AC]**	60	110-125	220-230	250
		AC 127/230 V; 50/60 Hz			
Rated consumer voltage*	**[V, DC]** **[V, AC]**	110-125	220-230		250
		AC 127 / 230 V; 50 / 60 Hz			
Rated nominal torque	**[Nm]**	600 and 800			
Operational time	**[s]**	< 15			
Temperature range	**[°C]**	-60 ... +55			
Auxiliary contacts*		10 normal open / 10 normal close / 4 early made / 4 late break / 1 wipping			
Auxiliary switching capability		Class 2 according to IEC 62271-102			
Protection class		IP 55			
Maintenance period		free			

* Other values are available upon request.

Main features

- Easy commissioning and assembly due to pre-adjusted delivery
- Encapsulated worm drive provides for maintenance-free operation and safety for staff
- Proven auxiliary switch for highest reliability
- Standard RAL 9006, also available in other colors
- Low noise level
- Designed according to EN 62771-100
- Exceeding the IEC and meeting GOST R and GB standards

3DV8
Motor drive (smart design)

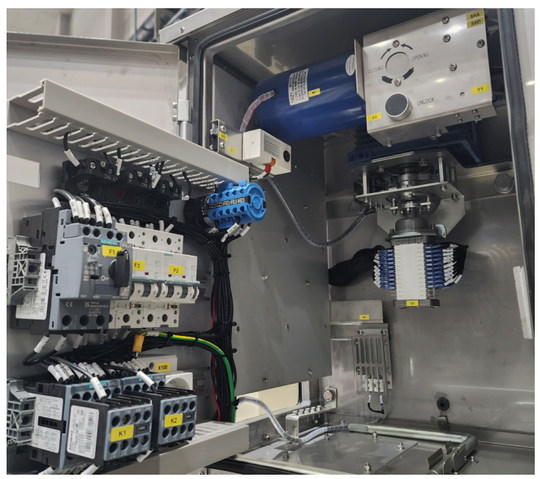
For high-voltage disconnectors

Technical features

The motor drive consists of stainless-steel housing, the gear unit with motor and the electrical components with auxiliary switch.

The auxiliary switch is considered as the most reliable in the market. It is form-fit connected to the gear unit and allows for safe substation operation. Besides, it assures wide space for cables and connections, while also being protected against condensation.

Easy to operate, it can also be safely operated manually with little effort using a hand crank (<50 rotations only).



Design		Motor drive			
	[kV]	60	110/125	220/230	250
Rated motor voltage	[V, DC] [V, AC]	AC 127/230 V; 50/60 Hz 3AC 127/220/230/380/415 V; 50/60 Hz			
Rated control voltage	[V, DC] [V, AC]	60	110-125	220-230	250
		AC 127/230 V; 50/60 Hz			
Rated consumer voltage*	[V, DC] [V, AC]	110-125	220-230		250
		AC 127 / 230 V; 50 / 60 Hz			
Rated nominal torque	[Nm]	600 and 800			
Operational time	[s]	< 15			
Temperature range	[°C]	-55 ... +55			
Auxiliary contacts*		10 normal open / 10 normal close / 4 early made / 4 late break / 1 wipping			
Auxiliary switching capability		Class 2 according to IEC 62271-102			
Protection class		IP 55			
Maintenance period		free			

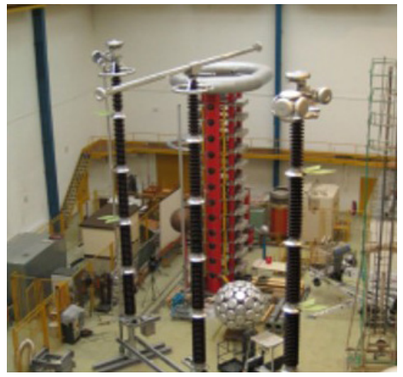
* Other values are available upon request.

Main features

- Easy commissioning and assembly due to pre-adjusted delivery
- Encapsulated worm drive provides for maintenance-free operation and safety for staff
- Proven auxiliary switch for highest reliability
- Standard RAL 9006, also available in other colors
- Low noise level
- Designed according to EN 62771-100
- Exceeding the IEC and meeting GOST R and GB standards

HVDC project overview

Customized products with the shortest delivery times from our global production network.



Project Gui Guang

Double-side-break disconnector

6400 MW, bipolar

DC 515 kV

Project Yun Guang

Double-side-break disconnector

5000 MW, bipolar

DC 824 kV

Project Ballia-Bhiwadi

Vertical-break disconnector

DC 512 kV / 256 kV

Project Cahora Bassa

Pantograph disconnector

DC 600 kV

SHVC Hangzhou factory

SHVC Hangzhou factory was founded in 1995 with a registered capital of 30 million US dollars. It possesses leading global research and development technology and production capabilities for high-voltage circuit breakers, semi-encapsulated compact switchgear, and disconnector switches. It has the highest-level testing center in the Chinese power industry and has always worked hand in hand with local customers and abroad, dedicated to the development of the global energy system.

Regular business providing:

- AC live tank (LT) circuit breakers with voltage levels ranging from 72.5 kV to 550 kV, 800 kV, and 1100 kV
- AC dead tank (DT) circuit breakers with voltage levels ranging from 72.5 kV to 550 kV
- AC semi-encapsulated combined compact switchgear (DTC dead tank compact) with voltage levels ranging from 72.5 kV to 252 kV, and breaking capacities up to 40/50/63 kA
- DC switches with voltage levels up to ±800 kV
- AC disconnector switches (DS) and earthing switches (ES) with voltage levels ranging from 72.5 kV to 550 kV

Siemens Energy is the main manufacturer of disconnectors and high-voltages earthing switches in China, counting on the experience of more than 100 years, inherited from Siemens. We have the most modern production facilities, enriched by a high skilled and qualified team that assures the quality and safety of our products. Our processes match high productivity and sustainability, being completely aligned with the high Siemens Energy brand.

At the same time, in accordance with our global sustainability commitment, SHVC specializes in Siemens Energy environmentally friendly Blue series circuit breakers that operate completely without SF_6 or any other F-gases and have no toxic emissions.

Published by

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