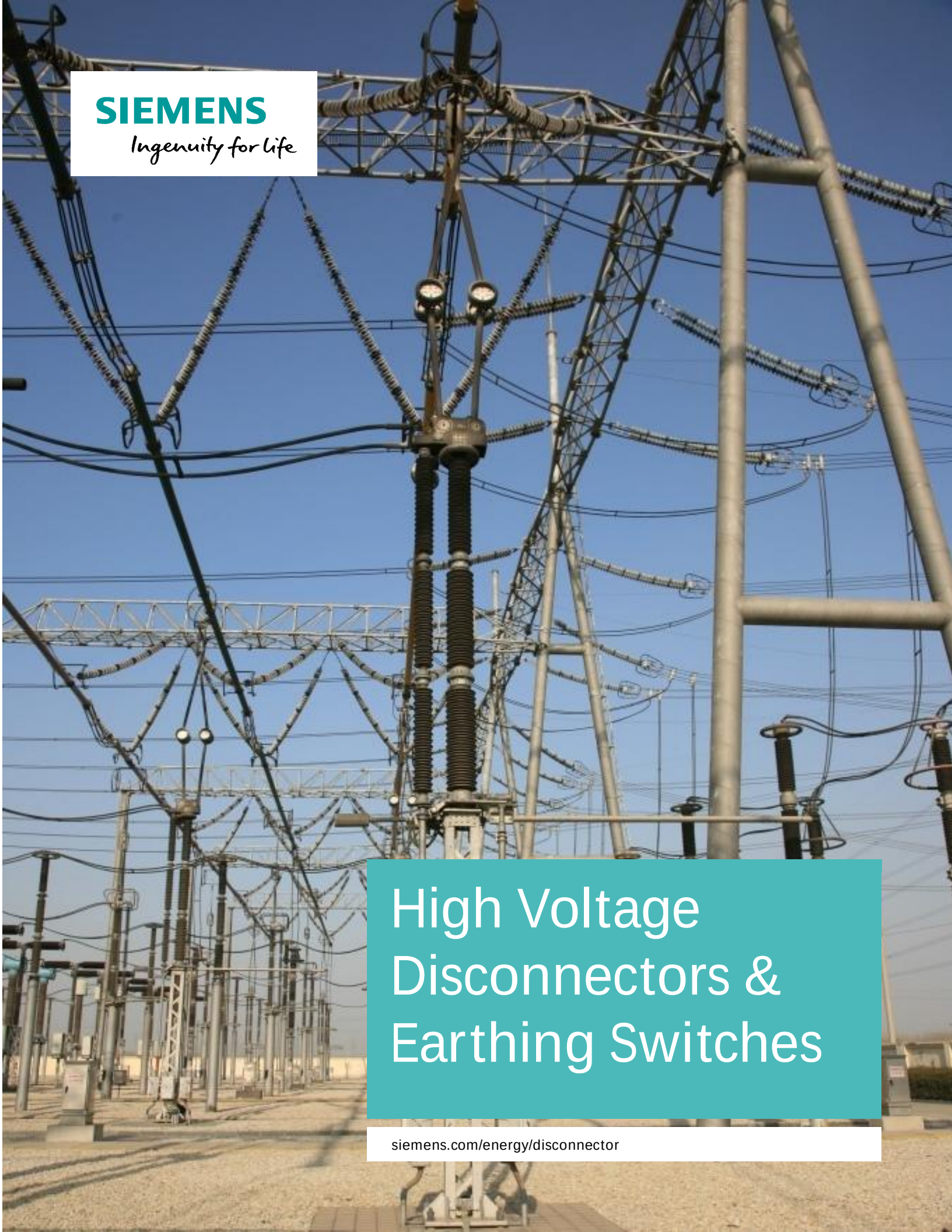
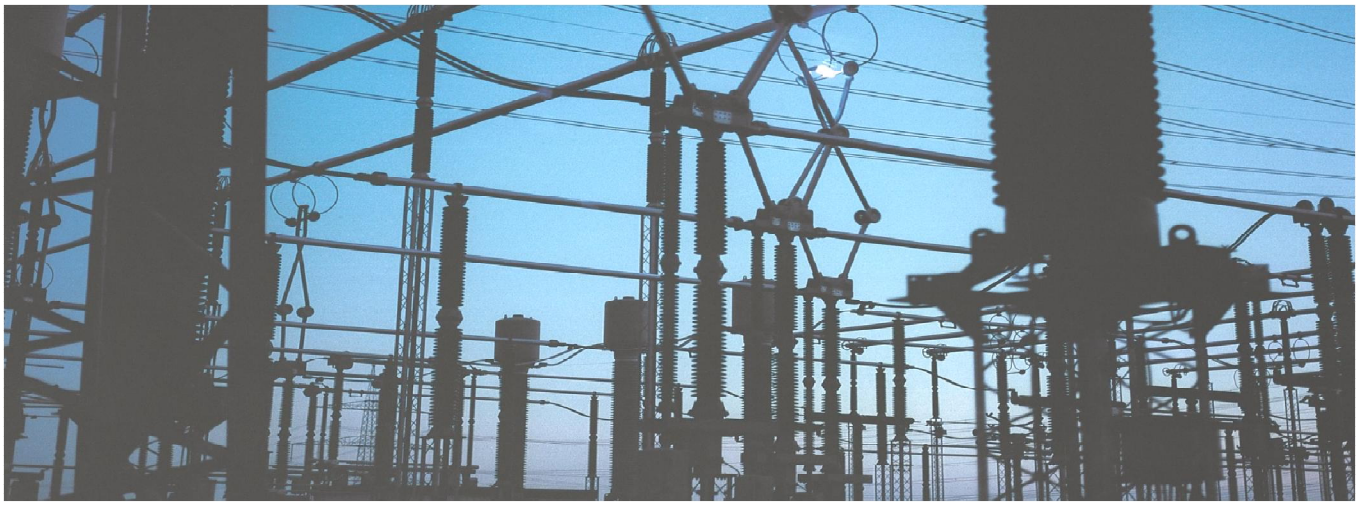


High Voltage Disconnectors & Earthing Switches

siemens.com/energy/disconnector



Since 2002, Siemens High Voltage Circuit Breaker Co., Ltd, Hangzhou (SHVC) has delivered more than 35,000 sets of disconnectors & earthing switches, as well as related components. Based on the “genetic code” of the proven Siemens disconnectors, the portfolio has now been enhanced and harmonized to respond even better to varied customer needs and make it easier for you to select the right product. All Siemens disconnectors are delivered pre-adjusted and are therefore easy to assemble on site. You will benefit from reduced set-up time and outage cost.

SHVC

Customer-specific solutions

SHVC offers competitive solutions for different customer needs and can satisfy various technical requirements, from 36kV up to 550kV. Whether you are looking for a cost – effective standard solutions or a highly customized product, you will find the right disconnectors with us.

Our products offer suitable solutions for every substation layout – outdoor and indoor, even within limited space.

Disconnectors designed for your needs.

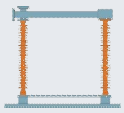
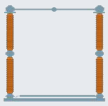
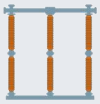
Proven quality that serves you a lifetime

Modern manufacturing technologies and investments in our production line ensure sustained product and process quality in accordance with the high standards of Siemens. Our disconnectors fulfill all requirements of different international and national standards like IEC, GOST R and GB, and are proven in extensive type tests. Compliant even with the most stringent environmental requirements, Siemens disconnectors reach a service lifetime of a minimum of 40 years.

Long-term partnership

Siemens is not just a supplier of high voltage products, but a long-term, reliable partner. Decades of experience and our presence in more than 190 countries worldwide ensure our competence and global availability. Knowing your business, we can provide the best technical solutions for any special requirements and support you in finding the ideal product type, configuration and accessories.

urrently Available Disconnector & Earthing Switch Types of SHVC by June 2016

Description	side break	center break	double break	knee type	panto-graph	semi-panto	stand-alone ES
(kV)							
36.5/40.5	SR0						
72.5		3DN1072	DR0				
100							
123/126		3DN1123			PR1		BR1N
145		3DN1145					
170		3DN1170					
245/252		3DN1245	DR2	KR2N	PR2N	YR2	BR2N
300		3DN1300					
362/363		3DN1362					
420		3DN1420					
550		3DN1550	DR3	KR5N	PR5	YR5	BR5N
800							

Side Break Disconnectors: SR0 Series		
Rated voltage	[kV]	40.5
Rated normal current	[A]	1250, 1600, 2000
Rated peak withstand current	[kA]	100
Rated short-time withstand current	[kA-s]	40-4
Ice coating class	[mm]	10 / 20
Temperature range	[°C]	-55 / +55
Operating mechanism type		Motor or manual operation
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.
Motor voltage		
Maintenance period		25 years

Application and design of the disconnector

The side break SR0 series can functionally replace the center break DS. Its design is characterized by one rotable insulator & 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.

Key features:

- Cylindrical self-resilient contact fingers with AgC coating for optimal, spring-free contact: dry-lubrication, self-cleansing & high reliability
- Maintenance-free
- Easy set-up due to pre-adjusted in factory
- Designed according to IEC, GB & DL standards

Technical structure

The SR0 series 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 you receive a high quality disconnector that will serve you for decades.

Center Break Disconnectors: 3DN1 Series

Rated voltage	[kV]	72.5	123	145	170	245	300	362	420	550
Rated normal current	[A]	1250/ 3150	1250, 1600, 2000, 2500, 3150, 4000							
Rated peak withstand current	[kA]	65/ 104	65, 82, 104, 130					65, 82, 104, 130, 164		
Rated short-time withstand current	[kA-s]	25-3/ 40-3	25-3, 31.5-3, 40-3, 50-3					25-3, 31.5-3, 40-3, 50-3, 63-3		
Ice coating class	[mm]	10 / 20								
Temperature range	[°C]	-55 / +55								
Operating mechanism type		Motor or manual operation								
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.								
Motor voltage										
Maintenance period		25 years								

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.

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 in factory
- Bus transfer current switching capability of 1600 A (optional)
- Designed according to IEC 62271-102 standard
- Exceeding the IEC and meeting GOST R and GB/DL
- Available in various colors

Technical structure

The total weight of our new center break disconnector 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 temperature limits from -55 up to +55°C and has a high short-circuit capability, and excellent ice breaking behavior.

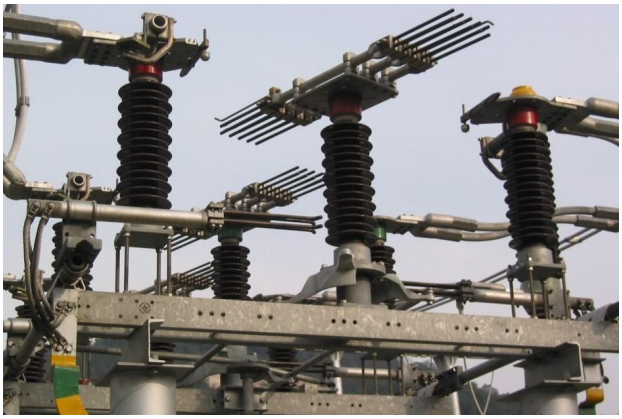
Double Break Disconnectors: DR Series				
Rated voltage	[kV]	72.5	245/252	420/550
Rated normal current	[A]	2500, 3150, 4000		5000
Rated peak withstand current	[kA]	104	125	160
Rated short-time withstand current	[kA-s]	40-1	50-3	63-3
Icing class (optional)	[mm]	10 / 20		
Temperature range	[°C]	-60 / +55		
Operating mechanism type		Motor or manual operation		
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.		
Motor voltage				
Maintenance period		25 years		

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 is mainly applied in substations with limited phase distances and in those where vertical opening of the current path is not possible due to limited spatial conditions

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 in the factory
- Maintenance and lubrication free up to 25 years
- Short-circuit currents up to 63 kA-3 s
- Designed according to GB & DL standards



Technical structure

The DR series 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 DR 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 and makes the DR 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 you receive a high quality disconnector that will serve you for decades.

Knee Type Disconnectors: KR Series			
Rated voltage	[kV]	245/252	420/550
Rated normal current	[A]	3150, 4000	5000
Rated peak withstand current	[kA]	125	160
Rated short-time withstand current	[kA-s]	50kA-3	63-3
Icing class (optional)	[mm]	10 / 20	
Temperature range	[°C]	-50 / +55	
Operating mechanism type		Motor or manual operation	
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.	
Motor voltage			
Maintenance period		25 years	

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.

Key features:

- Robust design and simple assembly
- Pre-adjusted in factory
- Nominal currents up to 4000A
- Short-circuit currents up to 63 kA-3 s
- Load switching capability of 1600 A optional
- Designed according to IEC, 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. Our knee-type disconnector 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.

Pantograph Disconnectors: PR Series				
Rated voltage	[kV]	123/126	245/252	420/550
Rated normal current	[A]	3150	2500, 3150, 4000	4000, 5000
Rated peak withstand current	[kA]	125	125	160
Rated short-time withstand current	[kA-s]	50-3	50-3	63-3
Icing class (optional)	[mm]	10 / 20		
Temperature range	[°C]	-60 / +55		
Operating mechanism type		Motor or manual operation		
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.		
Motorvoltage				
Maintenance period		25 years		

Application and design of the disconnector

The pantograph disconnector PR is characterized by its typical scissor design: By using vertical rather than horizontal disconnection, the pantograph allows for diagonal arrangement and space-saving plant design. The scissors provide a highly flexible contact zone. The pantograph is applicable for both rigid and flexible busbar connections.

Key features:

- Spherical contacts for optimal and non-sensitive contact and high reliability
- Easy set-up due to pre-adjusted in the factory
- Maintenance-free
- Bus transfer current switching capability of 1600 A (optional)
- Designed according to GB & DL standards

Technical structure

Thanks to its structure, the pantograph is the disconnector that requires the smallest footprint. The high-contact force allows for excellent ice-breaking and short-circuits behavior. The PR series 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. This makes the PR series easier to handle and relieves both basement and busbar.

Semi-pantograph Disconnectors: YR Series			
Rated voltage	[kV]	245/252	550
Rated normal current	[A]	4000	4000
Rated peak withstand current	[kA]	125	160
Rated short-time withstand current	[kA-s]	50-3	63-3
Icing class (optional)	[mm]	10 / 20	
Temperature range	[°C]	-50 / +55	
Operating mechanism type		Motor or manual operation	
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.	
Motorvoltage			
Maintenance period		25 years	

Application and design of the disconnector

The semi-pantograph disconnector YR is characterized by its typical semi-scissor design: By using vertical rather than horizontal disconnection, the semi-panto allows for diagonal arrangement and space-saving plant design. The semi-panto provides a less flexible contact zone, therefore is applicable for rigid busbar connections especially.

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 in factory
- Short circuit currents up to 63 kA - 3s
- Bus transfer current switching capability of 1600 A (optional)
- Designed according to GB & DL standards

Technical structure

Thanks to its structure, the semi-pantograph YR series is the disconnector that requires the smallest footprint. The YR 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.

Sand-alone Earthing Switches: BR Series					
Rated voltage	[kV]	72.5	123/126	245/252	550
Rated normal current	[A]	1000			
Rated peak withstand current	[kA]	125			160
Rated short-time withstand current	[kA-s]	40-3, 50-1	50-3		63-3
Icing class (optional)	[mm]	10 / 20			
Temperature range	[°C]	-50 / +55			
Operating mechanism type		Motor or manual operation			
Control voltage		Different variants of motor drives are available. Detailed information can be found in the respective product flyers.			
Motorvoltage					
Maintenance period		25 years			

Application and design of the disconnector

The stand-alone earthing switch BR series is characterized by its vertical break design. It is mainly used for the grounding of the busbar in a substation. Depending on the space limitations, the earthing blade can be either in parallel or vertical position with the busbar when at open position.

Key features:

- Robust construction which can withstand the same level of short circuit current as the main blade
- Easy set-up due to pre-adjusted in factory
- Maintenance-free
- Short circuit currents up to 63 kA - 3s
- Switching induced current as per IEC 62271-102 Annex C (optional)
- Designed according to GB & DL standards

Technical structure

The stand-alone earthing switch BR series has the simplest design and robust construction, therefore, allows for excellent ice-breaking and short-circuits behavior. It has a very long life time due to corrosion-free material such as hot-dip galvanized steel parts and weather-proof aluminum alloys.

Motor Drive & Manual Drive				
Rated motor voltage	[V] DC	110	125	220
	[V] AC	AC 230V; 50 / 60 Hz 3AC 230 / 380; 50 / 60 Hz		
Rated control voltage	[V] DC	110	125	220
	[V] AC	AC 230 V; 50 / 60 Hz		
Rated nominal torque	[Nm]	600 and 800		
Rated starting torque	[Nm]	870 to 2200		
Operational time	[s]	< 15		
Temperature range	[°C]	-60 / +55		
Auxiliary contacts**		10 normal open / 10 normal close 4 early make / 4 late break / 1 wiping		
Auxiliary switching capability		Class 2 according to IEC 62271-102		
Protection class		IP55		
Maintenance period		Free		

Key features

- Housed worm drive provides for maintenance-free operation and safety for staff
- Proven auxiliary switch for highest reliability
- Standard RAL 9006, available also in other colors
- Low noise level
- Designed according to EN 62771-100
- Overachieving IEC and covering GOST R and GB

Technical feature

The motor drive consists of the galvanized housing, the gear unit with motor and the electrical components with auxiliary switch. The auxiliary switch is considered as the most reliable one on the market. It is form-fit connected to the gear unit and allows for safe substation operation. The motor drive can also be operated manually with a hand crank with little effort (<50 rotations only)
The manual drive consists of a galvanized housing with a hand rod and some mechanical & electrical components assembled within.

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