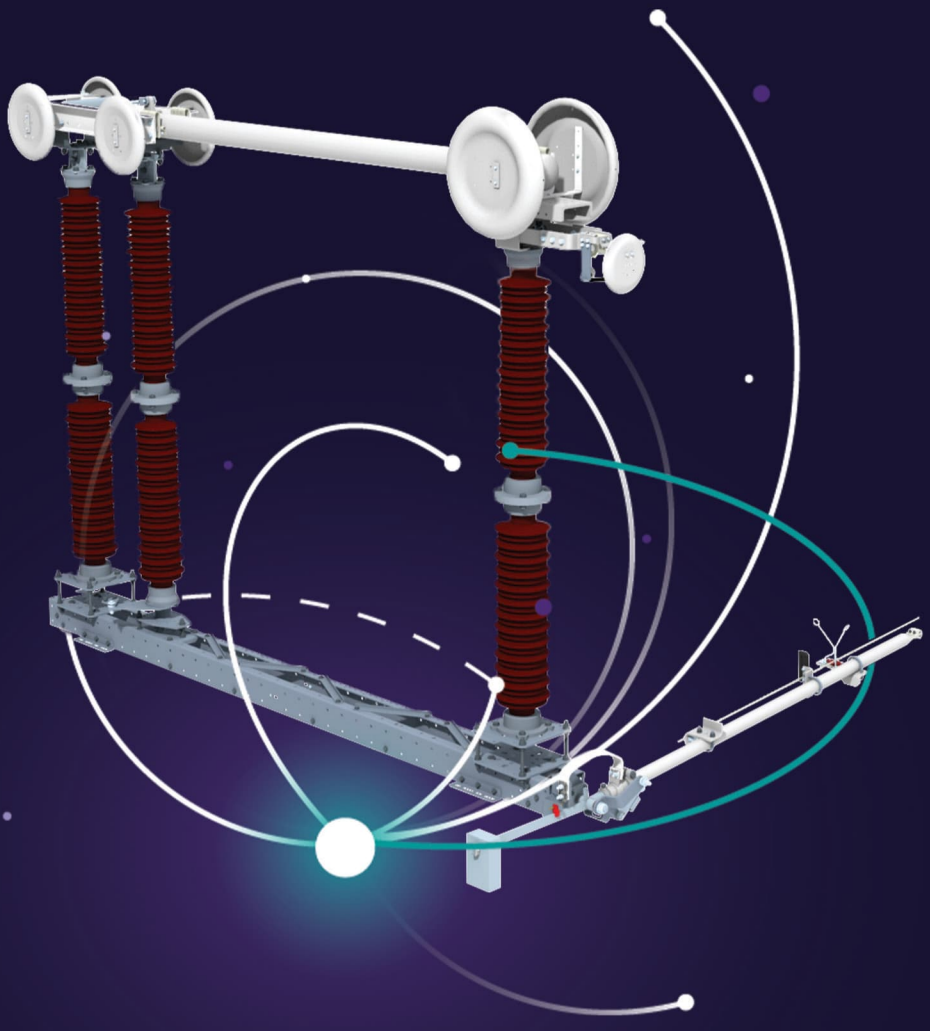
SIEMENS energy

Disconnectors & earthing switches



siemens-energy.com

About Siemens Energy

The Siemens Energy has a business unity specialized in high voltage disconnectors and earthing switches manufacturing for open air substations.

Through personalized service, we offer to our customersoptimized 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.

This is still proven given the varied applications already installed and fully functioning in Brazil and worldwide.

Our experience and performance

Siemens Energy is the main manufacturer of disconnectors and high voltages earthing switches in Brazil, counting on the experience of more than 80 years, inherited from SIEMENS.

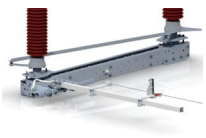
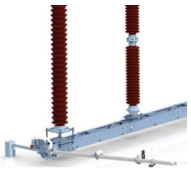
Our factories have the most modern production technologies, factor that added to a high skilled and qualified team assure the quality and safety of our products. At the same time, in according to the global sustainability commitment, the processes developed by the SIEMENS ENERGY match high productivity and sustainability, being completely aligned with the high Siemens brand.

And when the topic is performance, Siemens Energy disconnectors keep operational in Brazil and over the World. Our portfolio is filled with solutions capable of operating under extreme environment conditions. We have designed applications that can work under seismic activity, ice loads up to 20 mm and temperatures that range from -50 °C to 50 °C.

Our product strengths

- Subsets already assembled and presets from factory.
- For each disconnector, the moving part of main blade is individually tested.
- Easy assembly and commissioning on substation site: The assembly of our products is intuitive and has an instruction manual.
- Silver made contacts: a high conductive material and self lubrication, demanding less maintenance.
- Our technical assistance is permanent and agile, assuring the best solution for any problem.
- Our technical support is for all disconnector service life.
- Our products can be recycled by the end of its service life.

Voltage (kV)	Current (A)				
		EVL	DAL	RDA	BC
72,5	I_n I_s I_t (1s) I_n (3s)	3150	3150 40000	3150	3150
145	I_n I_s I_t (1s) I_n (3s)	3150	3150 40000	4000	3150
245	I_n I_s I_t (1s) I_n (3s)	5000	3150 40000	4000	3150
362	I_n I_s I_t (1s) I_n (3s)			4000	
550	I_n I_s I_t (1s) I_n (3s)	5000			
880	I_n I_s I_t (1s) I_n (3s)				

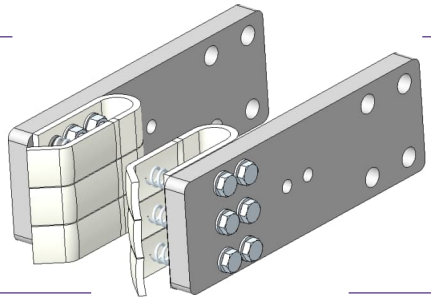
 EVR	 LAV	 LAH	 TC	 GTF
3150			Not applicable	Not applicable
3150	4000			
3150	4000	3150		
	3150	3150		
	5000	5000		
	4000			

Contact system

Contact force increases during short-circuit

Stable contact force throughout all the service life

Silver surface: better electrical conductivity and works as a lubricant



Maintenance free for 20 years
*under normal conditions of use

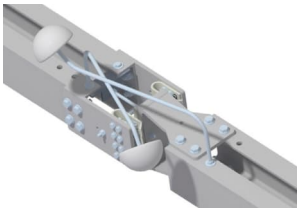
Few pieces

Resistant to a layer of ice up to 20 mm

Illustrative image taken from an assembly.
The shape of contacts may vary.

Arc restrictors

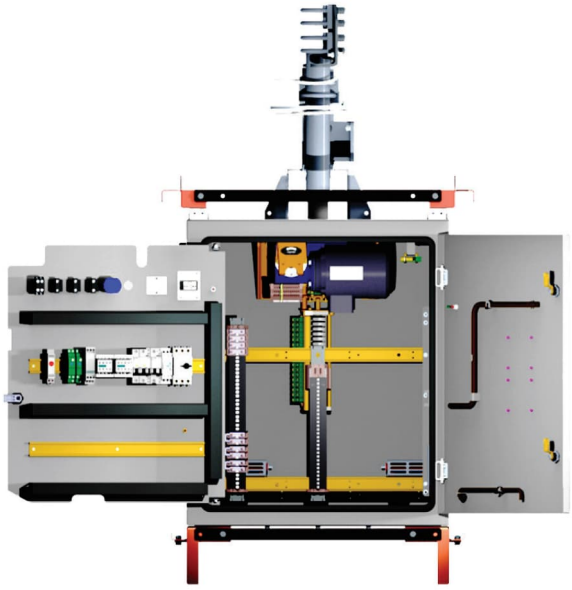
Arc restrictors can be supplied for all types of Siemens Energy disconnectors. With this accessory, disconnectors are capable of maneuver the induced currents during busbar transferences.During the switching operation from bus 1 to bus 2, the existing potential difference causes an electrical arc between 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 has type tests with more then 100 operational cycles of establishment and interruption of current.

3DV8 command

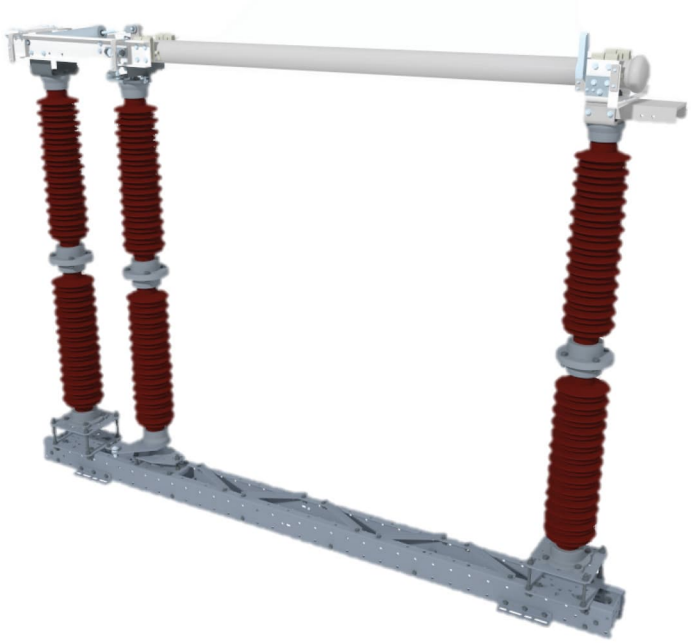
3DV8 command



Besides, it assures wide space for cables and connections, also having protection against condensation. Easy to use, it can also be safely manually operated.

Easy to assemble and to do maintenance, our exclusive 3DV8 command demands revision only after 1000 maneuvers.

EVL



EVL disconnector

Vertical Opening – EVL:

Disconnector requires three insulating columns, where two of them are fixed (support the fixed contacts) and one rotative (which turn the movable contacts).

Main characteristics

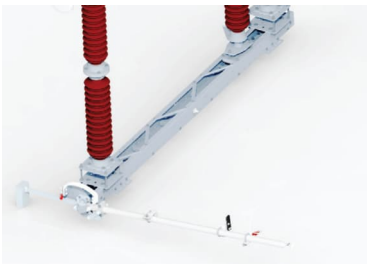
- Due to its vertical opening, the disconnector allows a small distance between phases.
- The locking system with double kinematics assures an excellent contact even with over 50kA short-circuit.
- Designed lifetime for over 30 years.

Adaptable to customers needs

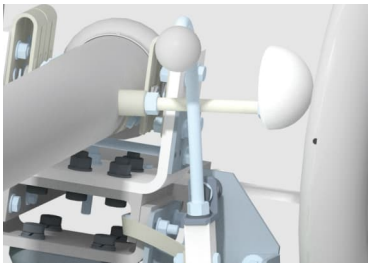
The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer



EVL

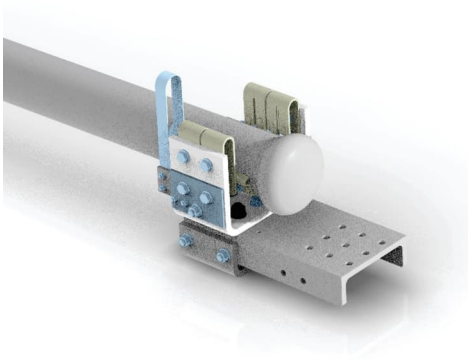
Mounting bases

Each pole from the EVL disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

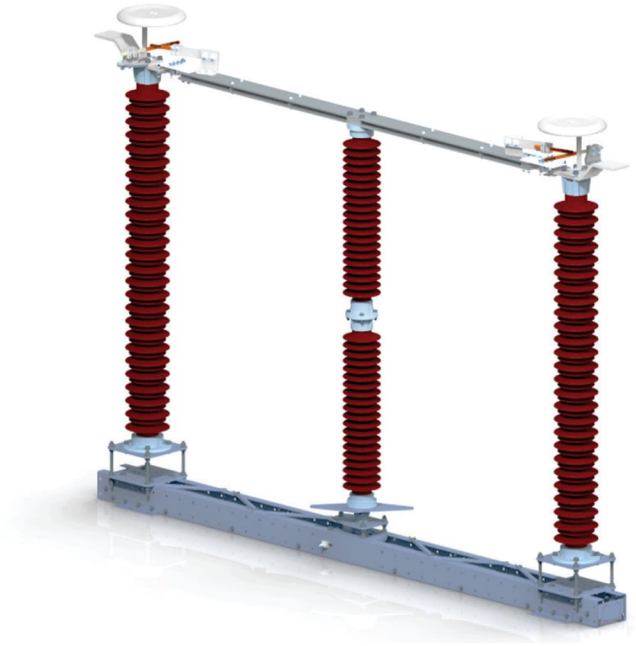
Contact system

The EVL disconnector contact occurs by a double kinematics system which assures more safety at the contact. During the closing, the first movement approach the contacts and the second lock them. The description of the movement is: after the first movement is done, the contact force is generated by the blade rotation around its own axis, only then, the blade is locked. This system requires low torques, which makes the movement smoother.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	Up to 3150	50	130
145	550 - 650	Up to 3150	50	130
245	950 - 1150	Up to 3150	50	130
550	1550 - 1800	Up to 5000	63	160

DAL



DAL disconnector

Double lateral opening – DAL:

It requires three insulating columns, being two lateral fixed and one rotative at the center. The central one supports the main blade, and the lateral ones supports the fixed contacts.

Main characteristics

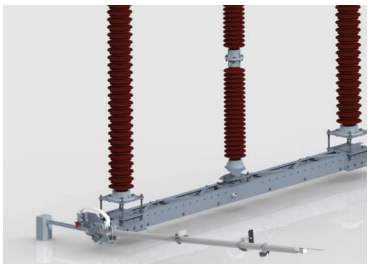
- Ideal for applications in substations where the space between phases is limited.
- Contact system built with few components, offering low electrical resistance during maneuvers.
- Designed lifetime for over 30 years.

Adaptable to customers needs

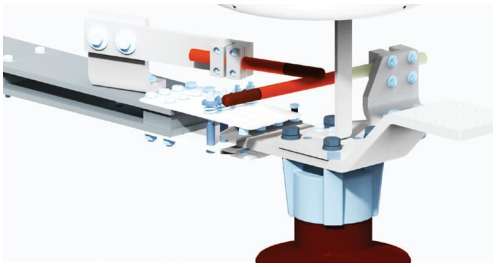
The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer



DAL

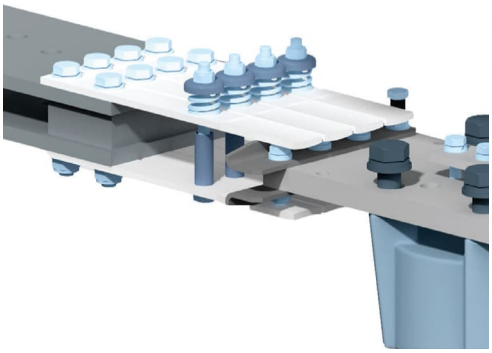
Mounting bases

Each pole from the DAL disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

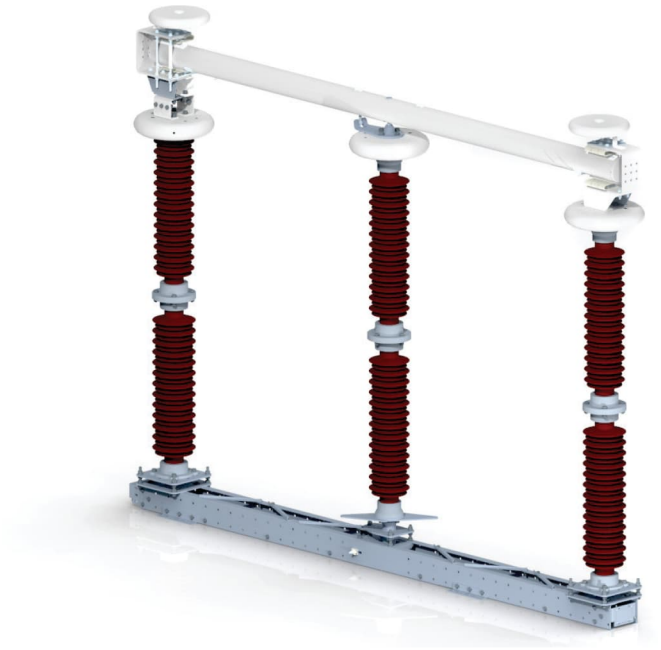
Contact system

The DAL disconnector main contact system requires a pair of contact fingers in each side of the main blade and the bus transfer is fixed directly at the terminal.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	Up to 3150	40	130
145	650	Up to 3150	40	130
245	950 - 1050	Up to 3150	40	130

RDA



RDA disconnector

Double lateral opening – RDA:

It requires three insulating columns, being two lateral fixed and one rotative at the center.

Main characteristics

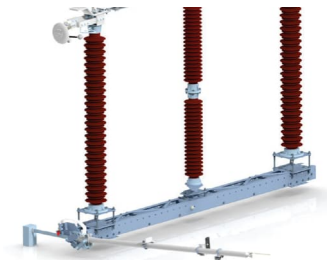
- Ideal for applications in substations where the vertical space between phases is limited.
- Main blade built with steel tubes (greater robustness of the living part).
- Contact system with double kinematics.
- High operating interval before decommissioning.

Adaptable to customers needs

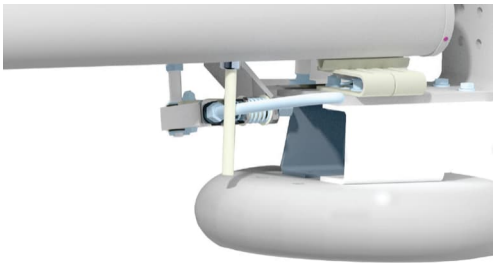
The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer



RDA

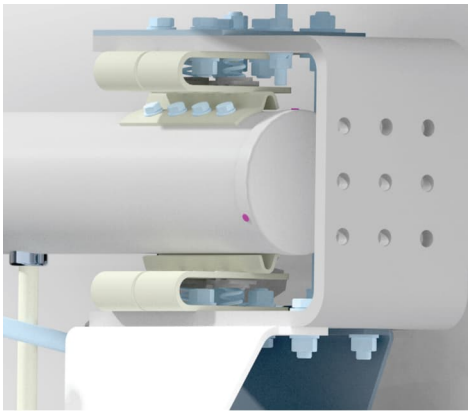
Mounting bases

Each pole from the RDA disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

Contact system

The opening and closing system of the RDA disconnector occurs with a double kinematics system, assuring more safety at the contact, even in short-circuit. During the closing, the first movement approach the contacts and the second lock them. Only after the locking is that the torsion spring is released, making the main blade to rotate and strongly grip the contacts.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	Up to 3150	50	130
145	650	Up to 4000	50	130
245	950 - 1050	Up to 4000	63	160
362	1175	Up to 4000	63	160

BC

BC disconnector

Central Opening – BC:

This disconnector requires two rotative insulating columns which supports the movable contacts. The closing is realized in the center of the opening.

Main characteristics

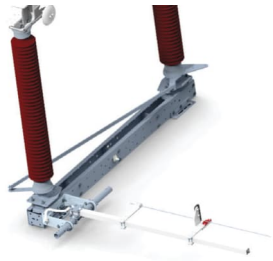
- Ideal for applications in substations where the vertical space between phases is limited.
- Main blade built of aluminium plate.
- Conducting electrical current in the joints through a bundle of tinned copper foils.
- High operating interval before decommissioning.

Adaptable to customers needs

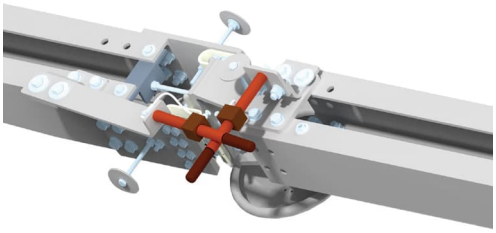
The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer



BC

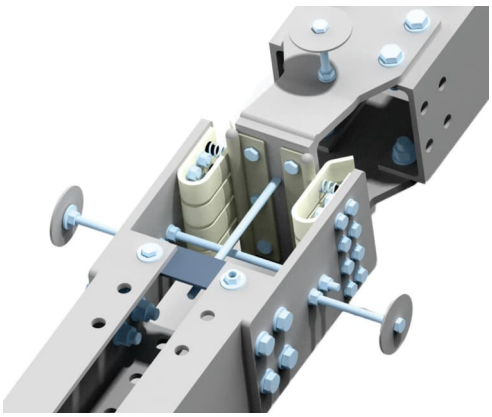
Mounting bases

Each pole from the BC disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

Contact system

The BC disconnector main contact system is of a “Reverse Loop” type, in which there is a set of contact fingers at one end of the active part, and a vertical contact attachment at the other.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	Up to 3150	40	104
145	650	Up to 3150	40	104
170	750	Up to 3150	40	104
245	950 - 1050	Up to 3150	40	104

EVR

EVR disconnector

Reverse Vertical Opening – EVR:

Disconnector ideal for uneven busbar. It requires two insulating columns, being one fixed and other rotative, which supports the main blade, and another fixed insulating column which is inverted.

Main characteristics

Ideal for uneven busbar.

The locking system assures contact even during

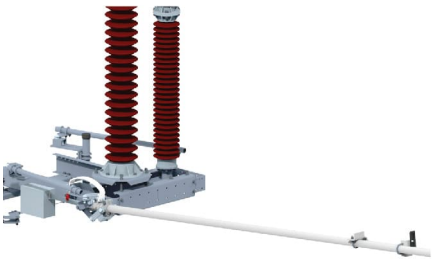
Can be directly connected to the busbar, dismissing the inverted insulating column.

Adaptable to customers needs

The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer

EVR

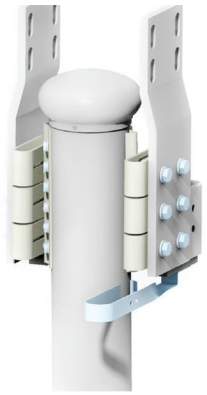
Mounting bases

Each pole from the EVR disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

Contact system

The contact system of the EVR disconnector consists of fingers that fit and are locked by a double kinematic system, ensuring the safety of the contact. During closing, the blade makes two movements: the first is to approach the fixed contact and the second is to rotate the blade. Thus, when reaching the fixed contact, the blade is locked and its adjustment is completed with the rotation, making the contacts become firmly locked.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	Up to 3150	40	104
145	550 - 650	Up to 3150	40	104
245	950 - 1050	Up to 3150	40	104

LAV

LAV disconnector

Semi-pantograph Opening – LAV:

Ideal disconnector for uneven busbar. It requires two insulating columns, one fixed and one rotating, which supports the main blade, and another fixed insulating column that is inverted or directly connected to busbar.

Main characteristics

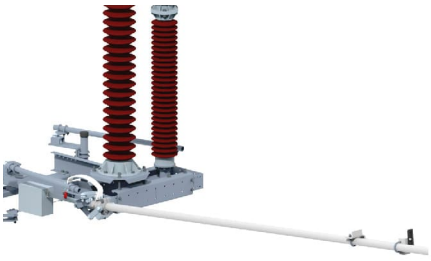
- It has lower space requirement in the horizontal direction.
- The clamp locking system ensures excellent contact even during short-circuits up to 40 kA.
- Fixed contact can be mounted directly on the busbar.

Adaptable to customers needs

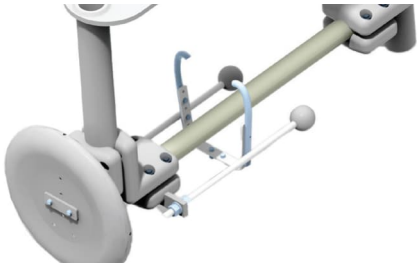
The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



Bus transfer



LAV

Mounting bases

Each pole from the LAV disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

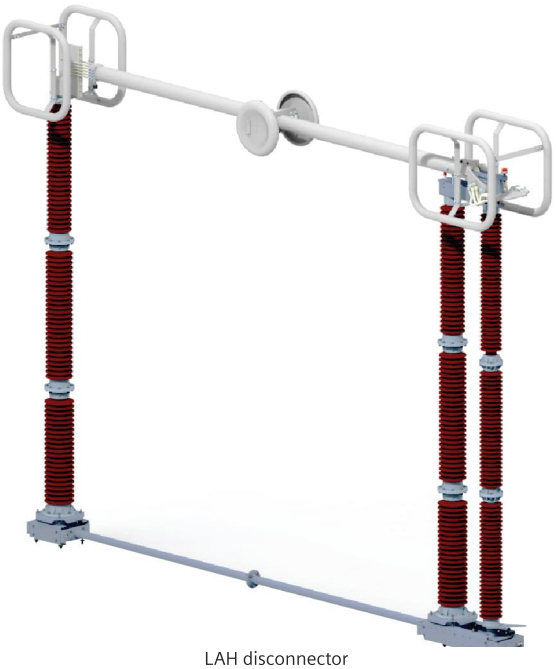
The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

Contact system

The contact system of the LAV disconnector is made up of clamps that lock firmly at the end of the movement. The clamps are spring-locked in a double kinematic system, ensuring contact safety. During closing, the first movement brings the contacts together and from a certain point close to the busbar the second movement starts to close the clamps, locking them firmly at the end.

Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
145	650	Up to 4000	40	104
245	950 - 1050	Up to 4000	50	130
362	1175	Up to 3150	50	130
550	1550	Up to 5000	50	130
800	2100	Up to 4000	50	130

LAH



LAH disconnector

Semi-Pantographic Opening – LAH:

It requires three insulating columns, being two fixed (which supports the main blade) and one rotative (movable contact).

Main characteristics

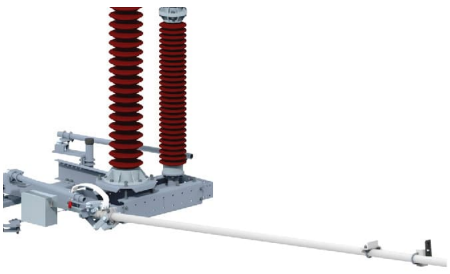
- Individual levelling by pole, assuring stability and perfect levelling of the set.
- The disconnector was designed considering all shorting, operating, and conductor efforts.
- Perfect balance of the main blade, assuring a complete, smooth and stable maneuver.

Adaptable to customers needs

The disconnector arrange can be side by side or aligned. It is also possible to adapt for higher nominal and short-circuit currents. Furthermore, the modular design allows future installations of the available attachments.

Available attachments

Earthing switch



LAH

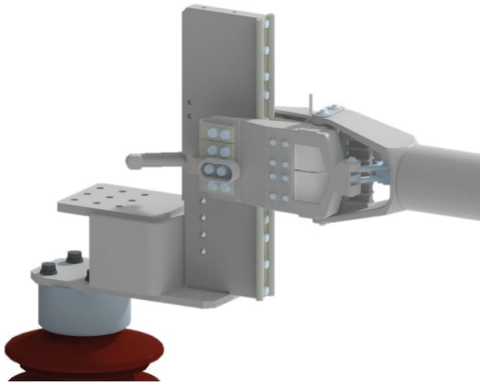
Mounting bases

Each pole from the LAH disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubricatio free.

The product package is optimized developed, reaffirming the Siemens Energy commitment wi th the preservation of the natural resources.

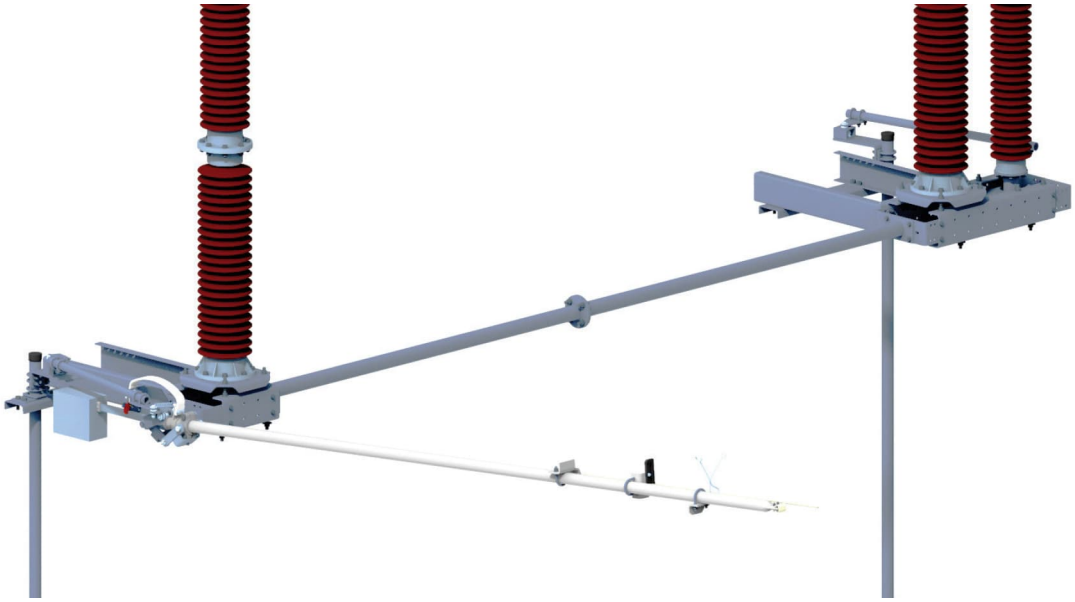
Contact system

The LAH disconnector contact system is made up of clamps that lock firmly at the end of the movement. The clamps are spring-locked in a double kinematic system, ensuring contact safety. During closing, the first movement brings the contacts together and from a certain point close to the fixed contact, the second movement starts to close the clamps, locking them firmly at the end.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Nominal current (A)	Withstand current of short duration -1s (kA)	Peak current (kA)
245	950 - 1050	Up to 3150	40	104
362	1175	Up to 3150	50	130
550	1550	Up to 5000	50	130

GTF



GTF disconnector

Earthing switch – GTF:

The earthing switch requires a command and a grounding blade, which can already be assembled or ordered later.

Main characteristics

- It is a modular component and fits to every product.
- It has a mechanical interlock system that prevents short-circuits.
- Counterweights are dimensioned at the factory.
- Designed lifetime for over 30 years.

Adaptable to customers needs

The earthing switch TC/GTF are adaptable to any project needs. They can be acquired along with the disconnector set or in a later purchase, not affecting the disconnector operation and/or the earthing blades.

GTF

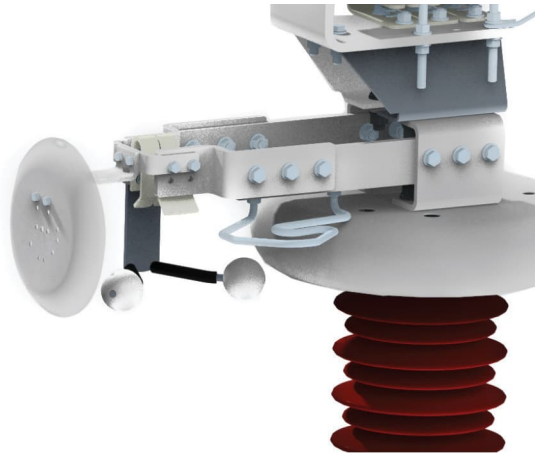
Mounting bases

Each pole from the GTF disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

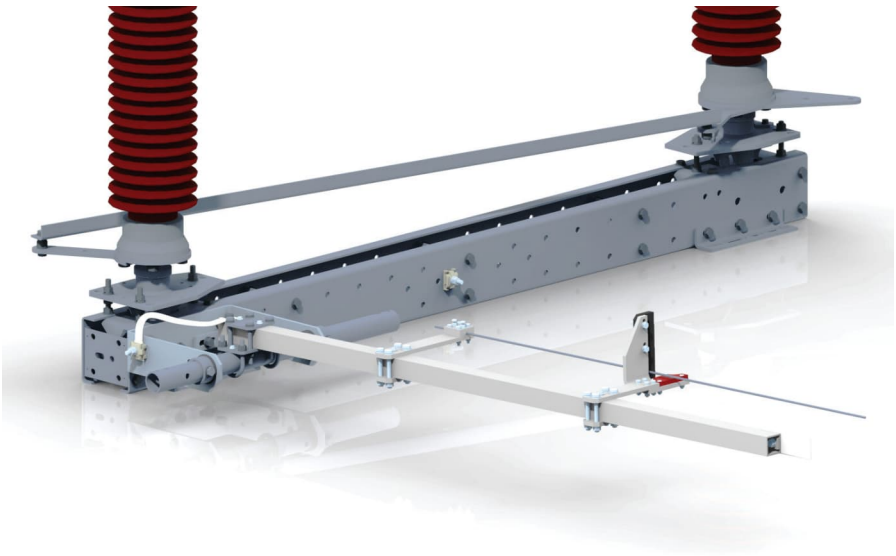
Contact system

The GTF disconnector contact system is supported by fingers that strongly fit together and are locked by a double kinematics system, assuring the contact safety. During the closing, the first movement lead the fingers to the contact, and the second shifts the blade up, fixing it in its contact.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Withstand current of short duration -1s (kA)	Peak current (kA)
145	650	63	160
245	950 - 1050	63	160
362 - 550	1175	63	160
420	1175	50	130
550	1175	50	130
800	2100	50	130

TC



TC disconnector

Earthing switch – TC:

The earthing switch requires too a command and a grounding blade, which can already be assembled or ordered later.

Main characteristics

- It is a modular component and fits to every product.
- It has a mechanical interlock system that prevents short-circuits.
- Counterweights are dimensioned at the factory.
- Designed lifetime for over 30 years.

Adaptable to customers needs

The earthing switch TC/GTF are adaptable to any project needs. They can be acquired along with the disconnector set or in a later purchase, not affecting the disconnector operation and/or the earthing blades.

TC

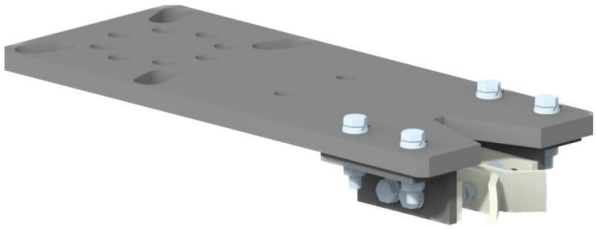
Mounting bases

Each pole from the TC disconnector is mounted over a galvanized steel base. The bases are compacts and designed to support high mechanical loads. High quality bearings are used, which are maintenance and lubrication free.

The product package is optimized developed, reaffirming the Siemens Energy commitment with the preservation of the natural resources.

Contact system

The TC earthing switch contact system occurs through the simple locking system. The main blade contains a silver contact. This bar connects to the fixed contact that contains pressure springs, strengthening the electrical connection and preventing the switch from opening.



Voltage range (kV)	Atmospheric impulse withstand voltage (kV)	Withstand current of short duration -1s (kA)	Peak current (kA)
72,5	350	31,5	82
145	550 - 650	31,5	82
170	750	31,5	82

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The information contained in this document is general descriptions about the technical possibilities of the equipment. The intended performance characteristics must be determined case-by-case at the moment of contract signature. Any other demands, contact us for more information.

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