

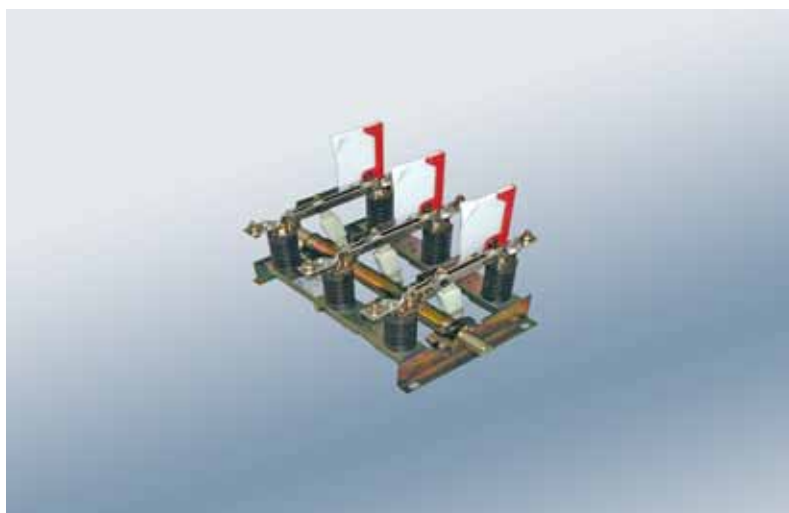
Medium Voltage Distribution

# L-TRI5

up to 36 kV

Indoor switch disconnectors

## Selection Guide



**Delivery Conditions**

The General Delivery Conditions as amended shall apply.

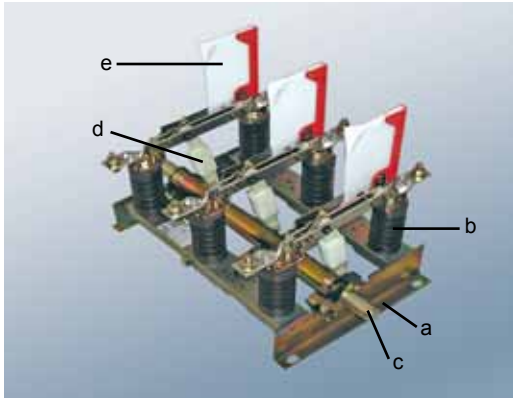
**Illustrations**

The illustrations are not binding.

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Cable disconnecter L-TRI 5...-D

- a Base frame
- b Epoxy resin insulator
- c Switch drive shaft
- d Main current path withn push rod
- e Arcing chamber

## The L-TRI 5 range of switch disconnectors

The L-TRI 5 range of switch disconnectors, incorporating proven flat-chamber arcing technology, can perform a wide variety of switching functions in medium-voltage distribution systems. They are the result of more than 50 year's experience in development and manufacture of switch disconnectors by Schneider Electric. The simple, low-maintenance and highly economic indoor switch disconnectors in the L-TRI 5 range have a proven service record, with hundreds of thousands of units installed and operating on a wide range of systems. L-TRI 5 switch disconnectors comply with the requirements of IEC 60694 (EN 60694) and IEC 60265-1 (EN 60265-1). Additionally, selected variants are available, complying with IEC 62271-105 (EN 62271-105).

## The TRI 5 range of disconnectors

By omitting the arc quenching device (flat explosion chamber and arcing blade), the L-TRI 5 switch disconnector can be used as a disconnector, type TRI 5. Because of the integrated rapid ON/OFF switching feature of the drive, the disconnector has the same short-circuit making capacity as the switch disconnector. TRI 5 disconnectors comply with the requirements of IEC 62271-102 (EN 62271-102).

## Main applications for L-TRI 5

L-TRI 5 switch disconnectors are designed for use in indoor medium- voltage switchgear systems. They have a making capacity and are suitable for switching:

- load currents
- currents in ring mains
- transformers, cables and overhead lines.

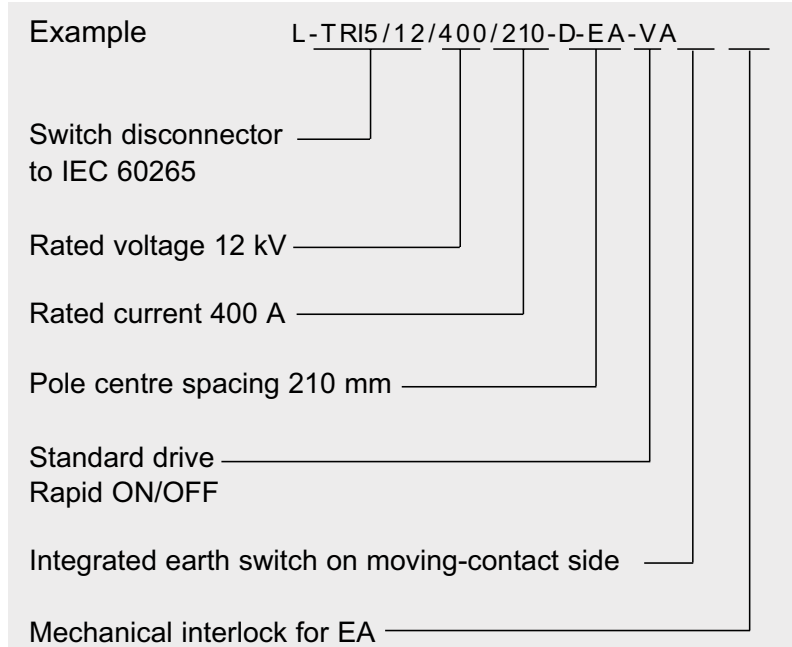
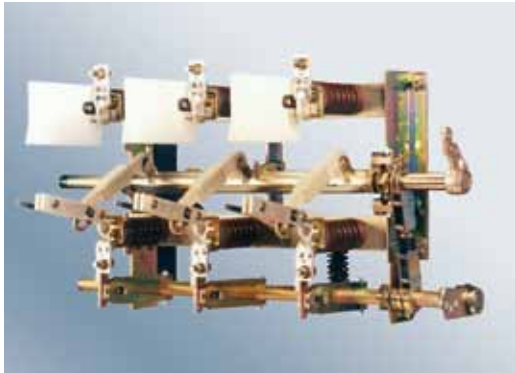
L-TRI 5 switch disconnectors are the reliable and economic solution for refurbishment and maintenance programs, extensions, renewal or upgrading of personnel protection.

## Special features of L-TRI 5

- high reliability and long service life
- low operating cost due to long periods between maintenance procedures
- space-saving design
- high switching capability
- low operating torques
- suitable for use in in harsh climatic conditions
- ideal as substitute for older switch disconnectors (ECOFIT measures) or disconnectors
- switch disconnector-fuse combination to IEC 62271-105 (EN 62271-105) available.

## Type designation

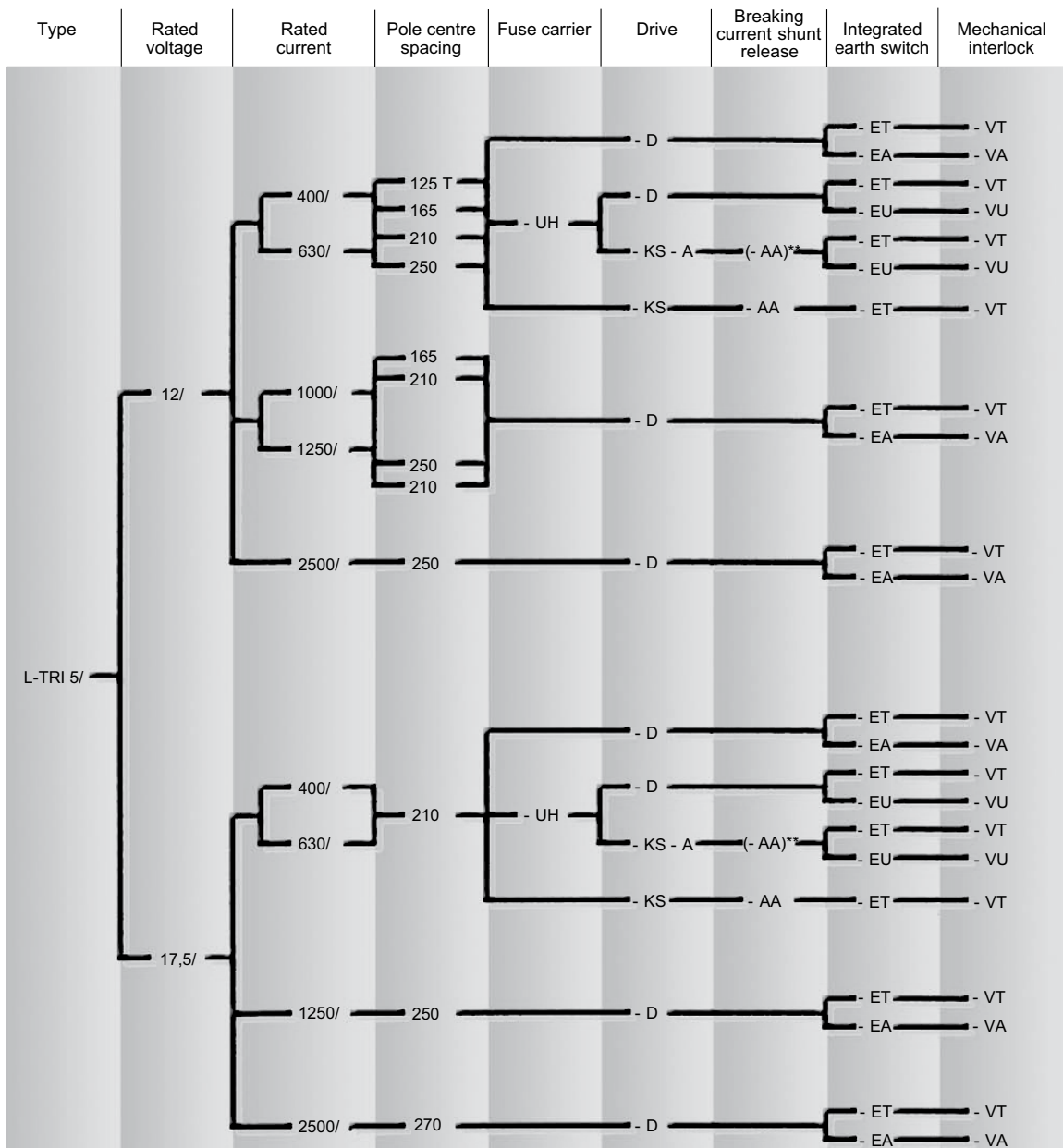
The type designation for the switch disconnecter defines its key technical parameters. The example below shows the structure of the type designation.



### Type designation for the L-TRI 5 range of switch disconnectors

	Type designation		Remarks
Variant	L-TRI 5/		without/with fuse attachment to IEC 60265
	L-TRI 5F/		Switch disconnecter fuse combination to IEC 62271-105
Rated voltage <b>kV</b>		12/	
		17.5/	
		24/	
		36/	
Rated current <b>A</b>		400/	
		630/	
		1000/	
		1250/	
		1600/	
		2500/	
Pole centre spacing <b>mm</b>		125	
		165	
		210	
		250	
		270	
		275	
		300	
		340	
		370	
		400	

## Product range 12/17.5 kV



Legend:

- T Phase partitions
- D Standard drive, rapid ON/OFF
- KS Stored energy drive; rapid CLOSING – breaking energy stored / rapid OPENING
- UH Fuse carrier
- A Fuse trip linkage for all-pole tripping
- AA Breaking current shunt release
- ET Integrated earth switch on fixed-contact side
- EA Integrated earth switch on moving-contact side
- EU Integrated earth switch on fuse carrier side, external
- VT Mechanical interlock for ET
- VA Mechanical interlock for EA
- VU Mechanical interlock for EU
- \*\* Breaking current shunt release

The type designation may end at the drive reference.

Example: L-TRI5/12/630/210-UH-KS-A

Switch disconnector with fuse carrier, stored energy drive and all-pole tripping by striker pin operation.

When motor-driven, no mechanic interlock between disconnector and earthing switch is possible!

Product range 24/36 kV

Type	Rated voltage	Rated current	Pole centre spacing	Fuse carrier	Drive	Breaking current shunt release	Integrated earth switch	Mechanical interlock
L-TRI 5/	24/	400/	165 T	- UH	- D		- ET	- VT
			250				- EA	- VA
		630/	275		- D		- ET	- VT
			300		- D		- EUI	- VUI
		630/	300		- KS - A	(- AA)**	- ET	- VT
			300		- KS	- AA	- EU	- VUI
	36/	1000/	250	- D		- ET	- VT	
			275		- EA	- VA		
		1250/	300	- D		- ET	- VT	
			1600/	300	- D		- EA	- VA
		630/	340(T)	- UH	- D		- ET	- VT
					- D		- EA	- VA
370	- D			- ET	- VT			
400	- D			- EUI	- VUI			
1000/	340(T)	- D		- ET	- VT			
	370		- EA	- VA				
		400						

Legend:

- T Phase partitions
- (T) Phase partitions as option
- D Standard drive, rapid ON/OFF
- KS Stored energy drive; rapid CLOSING – breaking energy stored / rapid OPENING
- UH Fuse carrier
- A Fuse trip linkage for all-pole tripping
- AA Breaking current shunt release
- ET Integrated earth switch on fixed-contact side
- EA Integrated earth switch on moving-contact side
- EU Integrated earth switch on fuse carrier side, external
- EUI Integrated earth switch on fuse carrier side, internal
- VT Mechanical interlock for ET
- VA Mechanical interlock for EA
- VU Mechanical interlock for EU
- VUI Mechanical interlock for EUI
- \*\* Breaking current shunt release

The type designation may end at the drive reference.

Example: L-TRI 5/24/630/275-UH-KS-A

Switch disconnector with fuse carrier, stored energy drive and all-pole tripping by striker pin operation.

When motor-driven, no mechanic interlock between disconnector and earthing switch is possible!

## Product range 12/24 kV to IEC 62 271-105, EN 62 271-105

Type	Rated voltage	Rated current	Pole centre spacing	Fuse carrier	Drive	Breaking current shunt release	Integrated earth switch	Mechanical interlock
L-TRI 5F/	12/	400/*	<ul style="list-style-type: none"> <li>125 T</li> <li>165</li> <li>210</li> <li>250</li> </ul>	- UH	- KS - A	(- AA)**	<ul style="list-style-type: none"> <li>- ET</li> <li>- EU</li> </ul>	<ul style="list-style-type: none"> <li>- VT</li> <li>- VU</li> </ul>
	24/		<ul style="list-style-type: none"> <li>165 T</li> <li>250</li> <li>275</li> <li>300</li> </ul>	- UH	- KS - A	(- AA)**	<ul style="list-style-type: none"> <li>- ET</li> <li>- EUI</li> <li>- EU</li> </ul>	<ul style="list-style-type: none"> <li>- VT</li> <li>- VUI</li> <li>- VU</li> </ul>

**Legend:**

- T Phase partitions
- KS Stored energy drive; rapid CLOSING – breaking energy stored / rapid OPENING
- UH Fuse carrier
- A Fuse trip linkage for all-pole tripping
- AA Breaking current shunt release
- ET Integrated earthing switch on fixed-contact side
- EUI Integrated earthing switch on fuse carrier, internal
- EU Integrated earthing switch on fuse carrier side, external
- VT Mechanical interlock for ET
- VUI Mechanical interlock for EUI
- VU Mechanical interlock for EU

\* Commonly, the rated current of the switch disconnector-fuse combination is lower (see technical data).

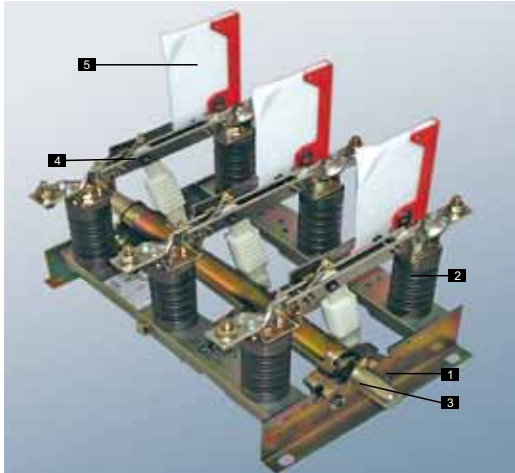
\*\* Breaking current shunt release

The type designation may end at the drive reference.

Example: L-TRI 5F/12/400/210-UH-KS-A

Switch disconnector with fuse carrier, stored energy drive and all-pole tripping by striker pin operation

When motor-driven, no mechanic interlock between disconnector and earth switch is possible!



L-TRI 5...-D

## Cable disconnecter L-TRI 5...-D

### Legend

- 1 Base frame
- 2 Epoxy resin insulator
- 3 Switch drive shaft
- 4 Main current path with push rod
- 5 Arcing chamber

### Design

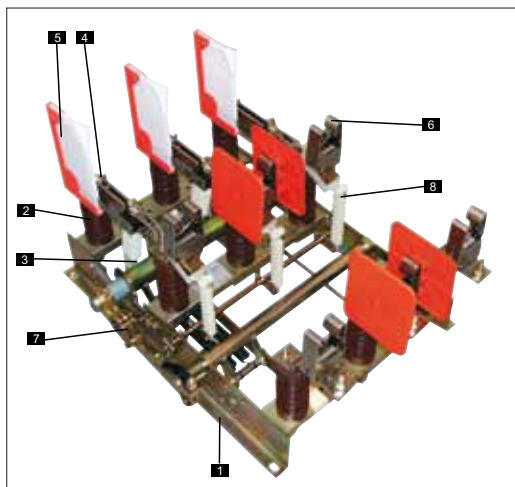
The standard disconnecter comprises the five main components shown above. The welded sectional steel frame (1) supports the epoxy resin insulators (2), the main current paths (4) and the arcing chamber (5). The frame also carries the switch drive shaft (3) with latching facility and the catch springs. The ribbed push rod with a very high creep resistance connects the switch shaft to the main current path.

### Torsion spring disconnecter (D-disconnector)

Torsion springs are integrated in the switch shaft. Turning the shaft end charges the torsion springs with stored energy. At the end of the movement, a cam plate drives the catch and releases the stored energy to operate the switch. This means that the closing and opening speeds are independent of the operator. This ensures safe closing at all times, even on to a short circuit. Also safe breaking of rated normal and fault currents is ensured. In the end position there is a reliable catch through the stored energy drive. The drive angle is 90°.

### Arcing chamber

The L-TRI 5 switch disconnecters employ the proven design of flat arcing chambers working on the hard-gas principle. The arc quenching facility is shunted to the main current path and incorporates a flat arcing chamber and arcing blade for each phase. The optimized design and the use of an improved quenching medium have allowed the dimensions to be reduced and the service life to be increased. For switch disconnectors with increased breaking capacity a modified quenching system with special arcing blades is available as an option.



Auxiliary switch attachment Type HS 3

## Transformer disconnecter L-TRI 5...-UH-KS-A

### Legend

- 1 Base frame
- 2 Epoxy resin insulators
- 3 Switch drive shaft
- 4 Main current path with push rod
- 5 Arcing chamber
- 6 Fuse carrier
- 7 Latch
- 8 Fuse tripping device

### Design

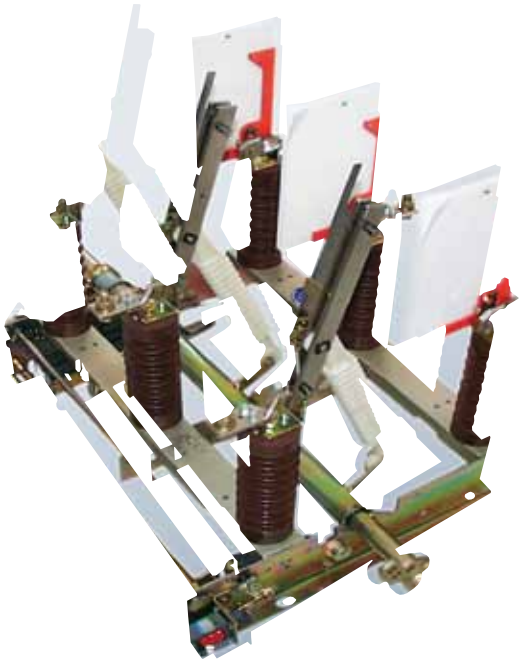
As for the D-type disconnecter, this type also consists of the main components (1) to (5). Additionally, the elongated base frame carries epoxy resin insulators with fuse carriers (6) to accommodate HH fuses to DIN 43625 and the fuse tripping device (8).

### Disconnecter drive type KS

For the drive type KS..(rapid CLOSING, stored energy for OPENING, rapid OPENING), low-maintenance springs are used. Charging of the breaking springs occurs automatically during the closing action. After the rapid closing action, the opening energy remains stored in the breaking spring. Opening may occur immediately after closing by actuation of the switch drive shaft, by tripping of an HH fuse, or by an attached breaking current shunt release. The drive angle is 90°.

### Arcing chamber

L-TRI 5 switch disconnecters employ proven flat arcing chambers working on the hard gas principle. The arc quenching facility is shunted to the main current path and incorporates a flat arcing chamber and arcing blade for each phase. The optimized design and the use of an improved quenching medium have allowed the dimensions to be reduced and the service life to be increased.



Switch disconnector L-TRI 5...-KS-AA

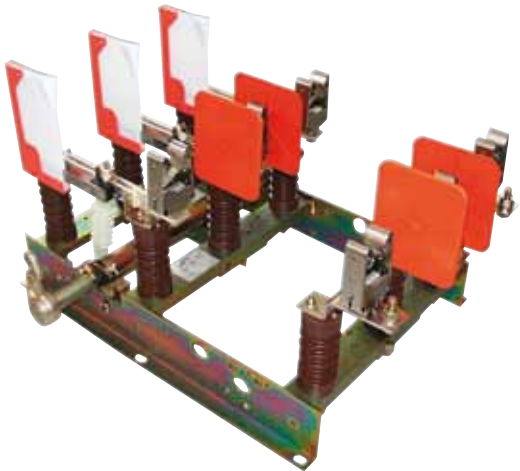
## Switch disconnectors L-TRI 5...-KS-AA

### General

The L-TRI 5...-KS-AA switch disconnector is a device with tripfree release and rapid closing. In principle, the drive works like that of the transformer disconnector UH-KS-A (see 'Disconnector drive type KS', page 9). Opening may occur immediately after closing by actuation of the switch drive shaft or by an attached breaking current shunt release. Apart from the short-circuit making capacity, the technical data is the same as for the transformer disconnector type UH-KS-A. The type L-TRI 5...-KS-AA has a reduced short-circuit making capacity/  $I_{ma}$  of 50 kA.

### Design

The design of the type KS-AA disconnector is similar to that of the type UH-KS-A. However, it does not include the additional row of 3 epoxy resin insulators with the fuse carriers and the fuse tripping device. Consequently, the disconnector base frame is correspondingly shorter compared to the type UH-KS-A.



Transformer disconnector L-TRI 5...-UH-D

## Transformer disconnector L-TRI 5...-UH-D

### General

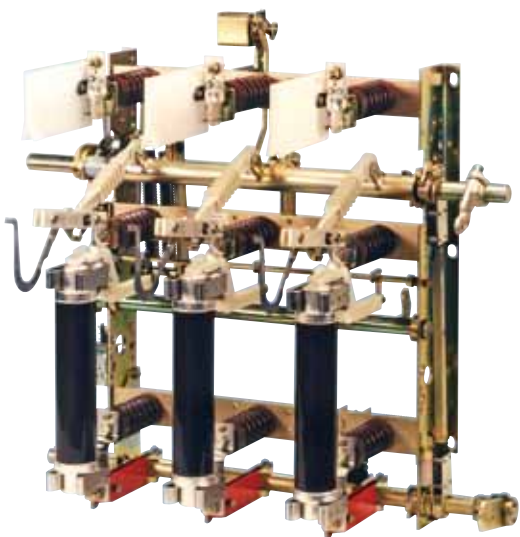
In addition to the type L-TRI 5...-UH-KS-A transformer disconnector, the type L-TRI 5...-UH-D is also available.

The differences are as follows:

- no HH fuse tripping
- torsion spring actuation (D-disconnector) (see 'Cable Disconnector L-TRI 5...-D', page 10).

### Design

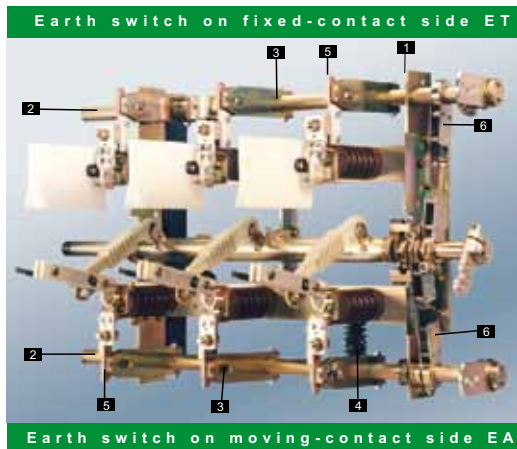
The design and the dimensions of this variant correspond to those of the type L-TRI 5...-UH-KS-A, but without fuse tripping and latch (see the 'Design' section of, Transformer Disconnector Type L-TRI 5...-UH-KS-A', page 10).



L-TRI 5F...-UH-KS-A-EU-VU

## Transformer disconnector L-TRI 5F...-UH-KS-A

The switch disconnector-fuse combination type L-TRI 5F with all-pole tripping for the striker pin release of the HH fuse links meets the specific test conditions of IEC 62271-105 (EN 62271-105). A key feature which ensures compliance with the above standards is an improved patentpending arc quenching system featuring an arcing chamber with a sickle-shaped arcing blade. Otherwise, the type L-TRI 5F...-UH-KS-A is the same as the standard transformer type L-TRI 5...-UH-KS-A.



L-TRI 5...-D-ET-VT-EA-VA

## Cable disconnecter with integral earth switch

### Legend

- 1 Base frame extension
- 2 Earth shaft
- 3 Earth blade
- 4 Rapid closing SPRING
- 5 Earth contact
- 6 Mechanical interlock

### General

Earth switches mounted on switch disconnectors improve safety for the operating personnel and operational reliability. The integrated earth switches have a defined high making capacity and are equipped with a rapid closing facility in the form of a rocker spring. The connection between switch shaft and frame forms a reliable transition resistance so that an additional earthing strap is not necessary. The integrated earth switches have a making capacity, and can be mounted on the fixed and/or the moving contact side of the switch disconnector.

### Design

The earth shaft (2) and the earth blades (3) are mounted on the frame extension (1) which is connected to the disconnector base frame. The earth contacts (5) are mounted on the connecting brackets. The rapid closing spring (4) is attached between the earth shaft (2) and the disconnector base frame. Earth switches may be mounted on the:

- fixed-contact side ET
- moving-contact side EA and also on both sides.

### Drive

Rapid operation of the earth switch drive is achieved with a toggle spring action. When operating the shaft, the dead point is passed after approx. 15° and the rapid closing is activated. It is possible to add a mechanical interlock between the shafts of the switch disconnector and the integrated earth switch (VT and VA). This interlock prevents closing of the open earth switch when the switch disconnector is CLOSED, and closing of the open switch disconnector when the earth switch is closed. The mechanical interlock between switch disconnector and earth switch is available only on manual drive versions.

## Transformer disconnecter with integral earth switch

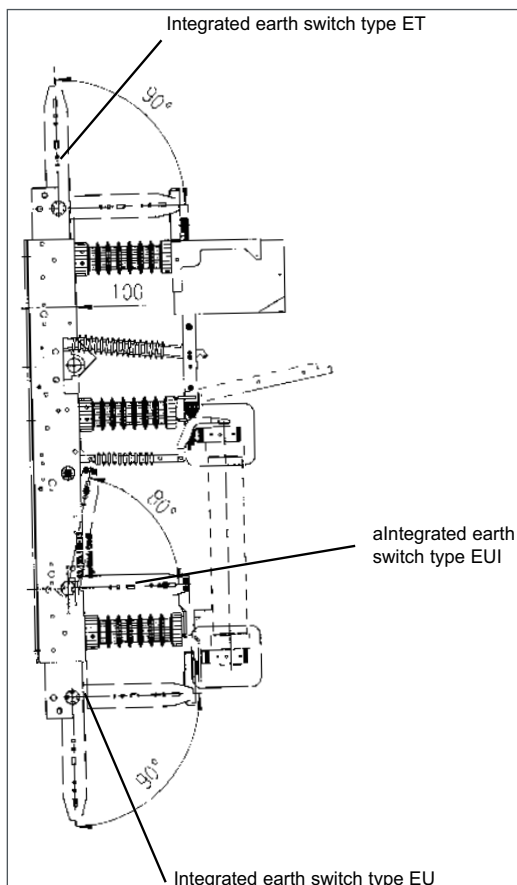
There are three options for mounting the earth switch on the transformer disconnecter:

- type ET on the fixed-contact side
- type EU on the outer fuse contact side, externally mounted (not available for 36 kV)
- type EUI on the outer fuse contact side, internally mounted (only available for 24 and 36 kV).

A combination of ET and EUI or ET and EU earth switches can be fitted to a transformer disconnecter. It is also possible to fit mechanical interlocks between the shafts of the switch disconnector and the integrated earth switch (VT; VUI; VU).

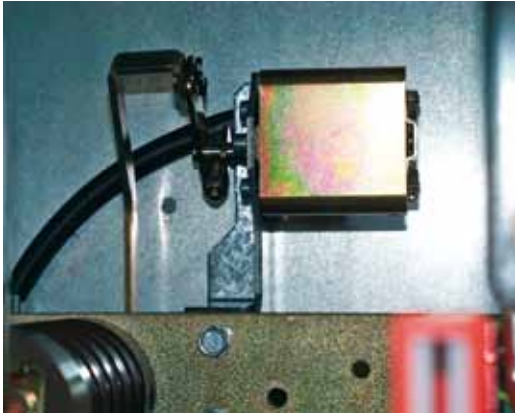
The mechanical interlock prevents

- closing of the open earth switch when the switch disconnector is CLOSED, and
- closing of the open switch disconnector when the earth switch is CLOSED.



## Auxiliary switch HS3

Switch disconnectors and integrated earth switches can be fitted with auxiliary switches type HS3 as 4-pole, 6-pole or 10-pole variants. The high switching capability allows the direct triggering of releases, locking magnets and attachments to motor drives (see technical data).



4-pole auxiliary switch attachment on a type ET earth switch

### Auxiliary switch (HS3) for switch disconnectors type L-TRI 5 and L-TRI 5F

Rated voltage kV	Rated current A	Pole centre spacing mm	Number of contacts		
			4pole	6pole	10pole
12	400...2500	125	■		
		165	■	■	
		210, 250	■	■	■
17.5	400...2500	210, 250, 270	■	■	■
24	400...1600	165	■	■	
		250, 275, 300	■	■	■
36	630...1000	340, 370, 400	■	■	■

### Auxiliary switch (HS3) on the earth switch

Rated voltage kV	Rated current A	Pole centre spacing mm	Number of contacts		
			4pole	6pole	10pole
12	400...2500	125	■		
		165	■	■	
		210, 250	■	■	■
17.5	400...2500	210, 250, 270	■	■	■
24	400...1600	165	■	■	
		250, 275, 300	■	■	■
36	630...1000	340, 370, 400	■	■	■

### Technical data

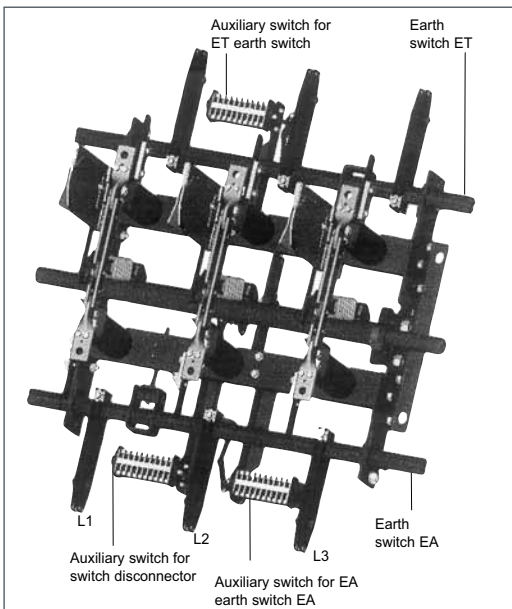
#### Auxiliary switch HS3

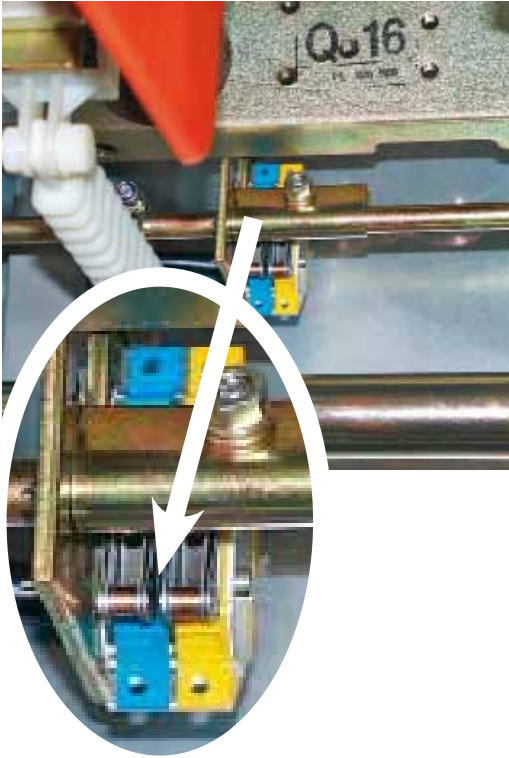
	24 V DC	60 V DC	110 V DC	220 V DC	220 V AC
Switching capability	8 A	3 A	2 A	1 A	10 A
Short-circuit rating	1 kA	1 kA	1 kA	1 kA	1 kA
Time constant T=L/R	≤30 ms	≤30 ms	≤30 ms	≤30 ms	-

## Standard mounting variants for auxiliary switches

Normally, the auxiliary switch for the switch disconnector is mounted on the moving-contact side between phases L1 and L2. For type EA earth switches, the auxiliary switch is mounted on the moving-contact side of the disconnector between phases L2 and L3. For type ET earth switches, the auxiliary switch is mounted on the fixed-contact side between phases L1 and L2.

Other mounting variants are available on request.





Signalling switch MSKM

## Signalling switch MSKM

The transformer disconnecter with HH fuse release has a signalling switch MSKM which indicates the fuse release. This signalling switch is located on the fuse tripping shaft.

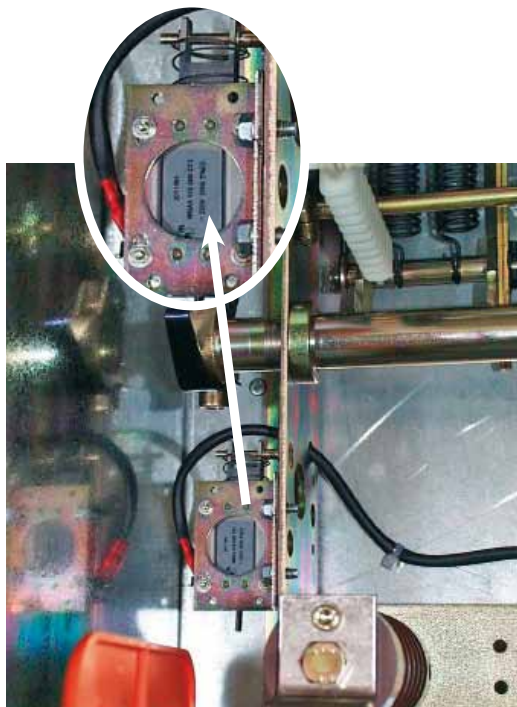
### Signalling switch (MSKM), HH fuse released (only possible with all-pole fuse release)

Available options:	1 S + 1 Ö
	2 S
	2 Ö

### Technical data

#### Signalling switch MSKM

	24 V DC	60 V DC	110 V DC	220 V DC	220 V DC
Switching capability	10 A	6 A	4 A	2 A	6 A
Time constant T=L/R	20 ms	21 ms	22 ms	23 ms	-



Breaking-current shunt release AA on the stored breaking energy device

## Breaking-current shunt release (operating current release AA)

It is possible to attach breaking current shunt releases to the switch disconnecters L-TRI 5 with stored breaking energy (-KS). The shunt release is used for remote breaking and is designed for pulsed operation. The associated auxiliary switch (standard variant) disconnects the breaking current shunt release from the supply voltage after breaking. Breaking-current shunt releases are available for the following auxiliary voltages:

- 220 V AC/DC
- 110 V AC/DC
- 60 V DC
- 48 V DC
- 24 V DC.

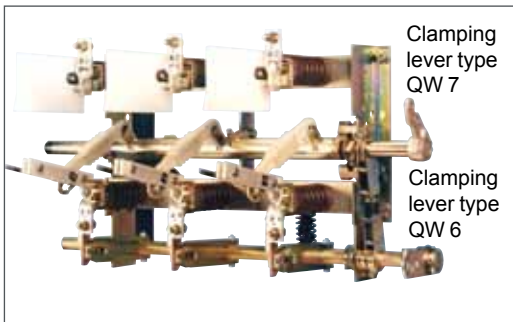
(Other values on request)



Divider attachment on the moving-contact side

## Capacitor dividers

The L-TRI 5 range is available with capacitor dividers as an option. Testing for voltage-free state and phase sequence is by integrated or non integrated voltage testing systems in accordance with VDE 0682 part 415 and IEC 78/183/CDV. The electrical characteristics and strength of the capacitor dividers correspond to common post insulators and they are suitable for connection to both high-resistive and also lowresistive systems. The capacitor dividers can be mounted on either the moving-contact or the fixed contact side.



Switch disconnector L-TRI 5...-D-EA- VA

## Clamping lever

The following clamping levers are available for the operation of standard variants of the switch disconnectors and earth switches:

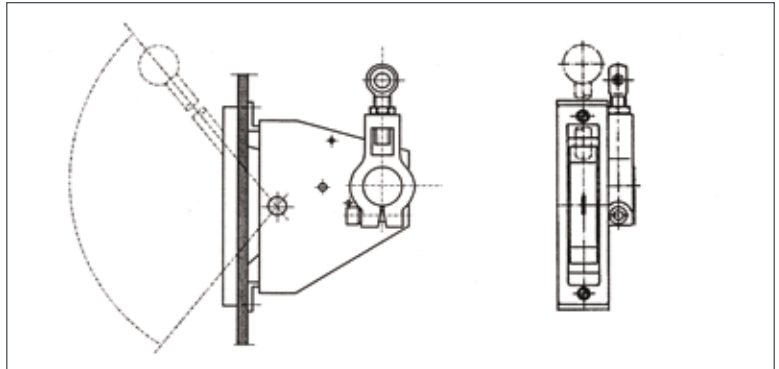
- Type QW 7 for switch disconnectors
- Type QW 6 for earth switches

As an option, it is possible to add a ring lever extension type QV 1 for hook-stick operation.

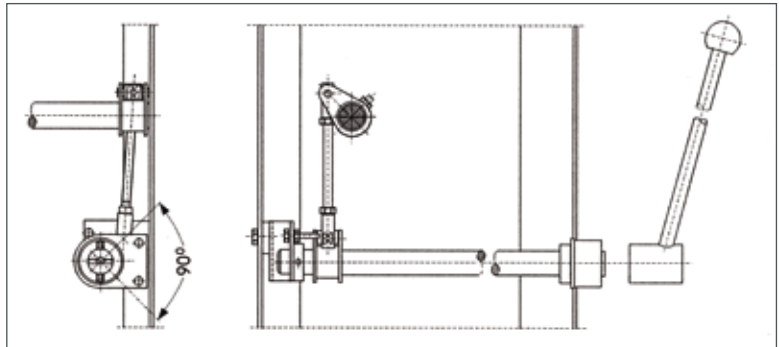
## Manual drives

As standard, a linkage-type manual drive STA 2 and an articulated drive STAD 2 are available for the mechanical operation of the L-TRI 5 switch disconnectors. In most applications, mounting of the drives depends on the cubicle variant, therefore only an indication of some of the different options is given here.

If required, please contact us for more details.



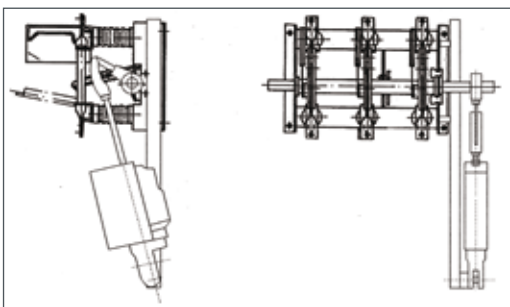
STA 2



STAD 2

## Motor drives

Motor drives are available for the electrical operation of the L-TRI 5 switch disconnectors. The motor drives are directly attached to the base frame of the switch disconnector to form a complete switchdrive unit.



Motor drive examples

## Plug-in board

If required, a plug-in board is available as an option, for fitting to the switch base frame below the arcing chamber.

Recommended board thickness:

12 kV = 4 mm

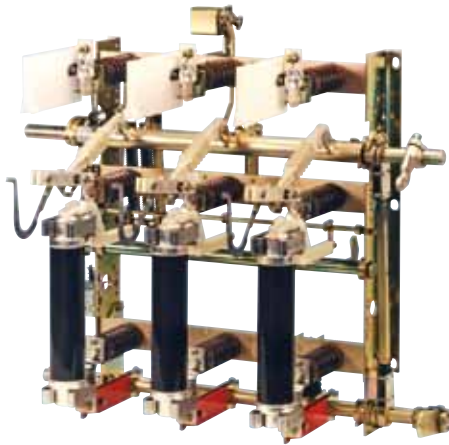
17.5 kV = 6 mm

24 kV = 8 mm

36 kV = 10 mm

# Selection

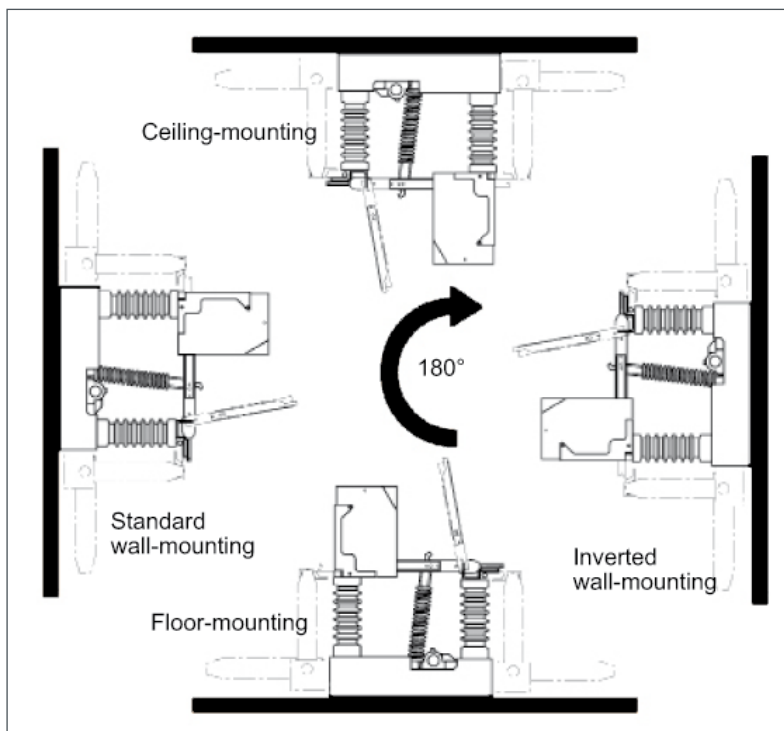
of mounting position, drive side and shaft length



Transformer disconnect L-TRI 5F...UH-KS-A

## Mounting position

In the case of cable disconnectors (type L-TRI 5...-D) with a rated current of up to 630 A and a horizontally located switch shaft, any mounting position is possible (see sketch). For cable disconnectors with a rated current of 1000 A or more, and transformer disconnectors (type L-TRI 5...UH-KS-A), wallmounting with the arcing chambers at the top is standard. For any other mounting positions, please consult us.



Possible mounting positions

# Selection

of mounting position, drive side and shaft length  
(contd.)

## Selection of the drive side

The selection of the drive side depends on whether manual or motor drive is used and on requirements for a mechanical interlock.

Switch disconnector				Integrated earth switch				Mechanical interlock possible
Manual drive		Attached motor drive		Manual drive		Attached motor drive		
left	right	left	right	left	right	left	right	
■								
	■							
■					■			
	■			■				■
■					■			■
	■	■						
			■					
		■		■				■ <sup>2)</sup>
			■ <sup>1)</sup>					■ <sup>2)</sup>
				■				
						■ <sup>1)</sup>	■ <sup>1)</sup>	
		■ <sup>1)</sup>						

<sup>1)</sup> For a combination of 3 switching devices (1 switch disconnector and 2 integrated earth switches) a maximum of two motor drives can be fitted.

Referred to the device they are located opposite to each other.

<sup>2)</sup> Activation of the motor by an auxiliary switch on the earth switch is strongly recommended for a motor drive on the load switch disconnector.

## Selection of shaft length

The selection of shaft length depends on the rated voltage and the pole centre spacing.

Rated voltage		12 kV				17.5 kV			24 kV			36 kV			
		125 T	165	210	250	210	250	270	165 T	250	275	300	340 T 340	370	400
Shaft length (mm)	566		■						■						
	588	■													
	666		■						■						
	766			■	■	■			■	■					
	866			■	■	■				■					
	966			■	■	■	■	■		■	■	■			
	1066										■	■			
	1100										■	■			
	1500												■	■	■

## Standards

Disconnecter type	Standards	
	IEC	EN
L-TRI 5 ...-D, UH-D, UH-KS-A, KS-AA	60694 60265-1	60694 60265-1
L-TRI 5F ...-UH-KS-A	60694 62271-105	60694 62271-105

## Tests

The outstanding features of the L-TRI 5 range of switch disconnectors have been repeatedly proven during extensive testing at the development stage, followed by comprehensive type testing against relevant national and international standards, and by continuous operating service.

The tests were carried out in our own high-performance test department and by independent testing institutions such as FGH, IPH and KEMA.

They also include the use in type tested switchgear. Additionally, the reliability, operational safety and mechanical functions have been proved by long-term endurance tests.

The ratings given in the technical data are the standard rated values. Maximum values may be higher - details are available on request. Switch disconnectors up to 630 A are classified as multipurpose switch disconnectors class E1 in accordance with IEC 60265-1.

## Transformer disconnectors to IEC 62271-105 TYP L-TRI 5F

IEC 62271-105 is a supplementary regulation for „Transformer disconnectors“ and specifically applies to switch disconnector-fuse combinations with fuse release (type L-TRI 5F...-UH-KS-A). The combination of switch disconnector and fuse is considered to be one unit and has to be tested accordingly. As the standard also requires the breaking of high fault currents with unfavourable power factors ( $\cos \varphi$ ) the arc quenching system has been modified and improved, but at the same time retaining the proven concept of the flat arcing chamber. The type L-TRI 5F can be easily recognized by the curved arcing blades (see photograph, page 12).

The fuse selection table assigns the tested HH fuse links from different manufacturers to the different transformer ratings, and is to be considered for engineering.

## Transformer disconnectors to IEC 60265-1

In addition, switch disconnector fuse combinations to IEC 60265-1 (EN 60265-1) are available, for breaking transformers of higher power ratings:

- 12 kV transformers up to 1250 kVA.
- 24/36 kV transformers up to 1600 kVA.

## Climatic conditions

The design, components and tolerances for the switch disconnectors are selected so that the devices can be used without any restriction in indoor conditions in accordance with IEC 60694 (EN 60694) over a maximum temperature range of -25°C to +40°C.

## Low maintenance

In normal operational conditions (so called EVU use) as specified in relevant regulations, L-TRI 5 switch disconnectors are virtually maintenance-free, as the time between two maintenance procedures is approximately 15 years under normal climatic conditions.

An inspection is recommended after 1500 switching cycles or after a serious short-circuit fault. In most applications, it will never be necessary to replace any parts during the operating life of the equipment. In the event of the maximum number of breaking operations actually being reached, it is a simple operation to replace the arc quenching device.

## Quality

The consistently high quality standards achieved by our products are ensured by our DIN ISO 9001 quality assurance management procedures, in accordance with DIN ISO 9001, introduced in 1993.

## Economy

When it comes to minimising procurement and operating costs, we recommend you consider the advantageous economic benefits of the L-TRI 5 range of products and accessories, in terms of quality, operational and functional reliability, availability and low maintenance costs.

## Characteristics of switch disconnectors (cable disconnectors)

Type to standard									
Rated voltage		$U_r$	kV	12					
Rated frequency		$f_r$	Hz	50/60					
Rated lightning impulse withstand voltage		$U_p$							
	to earth		kV	75					
	between phases		kV	75					
	across the isolating gap		kV	85					
Rated withstand alternating voltage		$U_d$							
	to earth		kV	28					
	between phases		kV	28					
	across the isolating gap		kV	32					
Rated current		$I_r$	A	400	630	1000	1000	1250	2500
Rated short-time current	1s	$I_k$	kA	25	25	40	32	40	50
	3s		kA	18	18	23	23	25	35
Rated peak current		$I_p$	kA	63	63	63	80	100	125
Rated short-circuit making current		$I_{ma}$	kA	63	63	63	63	50	50
Number of operations at rated short-circuit making current		$n$		2	2	2	2	2	2
Rated system breaking current for 20 cycles		$I_1$	A	400	630	630	630	630	630
System breaking current for 3 cycles			A	1000 1000 1250 2500					
System breaking current for 200 cycles			A	32	32	32	32	35	35
Rated ring main breaking current		$I_{2a}$	A	400	630	630	630	630	630
Rated transformer breaking current		$I_3$	A	10	10	10	10	10	10
Rated cable and overhead line breaking current		$I_{4a}, I_{4b}$	A	50	50	50	50	50	50
Rated earth-fault breaking current		$I_{6a}$	A	150	150	150	150	150	150
Rated cable and overhead line breaking current under earth-fault conditions		$I_{6b}$	A	86	86	86	86	86	86
Mechanical operations		$n$		1500	1500	1500	1500	1000	1000
		125	mm	□ <sup>1)</sup>	□ <sup>1)</sup>				
		165	mm	■	■	■			
		210	mm	■	■	■	■	■	
Pole centre spacing (3-pole switchgear)		250	mm	■	■	■	■	■	■
		270	mm						
		275	mm						
		300	mm						
		340	mm						
		370	mm						
		400	mm						
Integrated earth switch									
Rated short-time current	1s	$I_k$	kA	25	25	25 <sup>2)</sup>	32	32	32
	3s		kA	14	14	14 <sup>2)</sup>	23	23	23
Rated peak current		$I_p$	kA	63	63	63	80	80	80
Rated short-circuit making current		$I_{ma}$	kA	63	63	63	80	80	80

<sup>1)</sup> With phase partitions

<sup>2)</sup> Higher values on request.

L-TRI 5 IEC 60265-1 (EN 60265-1)													
17.5				24						36			
50/60				50/60						50/60		50/60	
95				125						170		145	
95				125						170		145	
110				145						195		165	
38				50						70		70	
38				50						70		70	
45				60						80		80	
400	630	1250	2500	400	630	1000	1000	1250	1600	630	1000	630	1000
25	25	40	50	25	25	40	32	40	40	20	20	20	20
18	18	25	35	18	18	23	23	25	25	14	14	14	14
63	63	100	125	63	63	63	80	100	100	50	50	50	50
63	63	45	45	63	63	63	63	37	37	20	20	20	20
2	2	2	2	2	2	2	2	2	2	2	2	2	2
400	630	630	630	400	630	630	630	630	630	630	630	630	630
		1250	1250			1000	1000	1250	1600		1000		1000
32	32	35	35	32	32	32	32	35	35	32	32	32	32
400	630	630	630	400	630	630	630	630	630	630	630	630	630
10	10	10	10	10	10	10	10	10	10	6,3	6,3	6,3	6,3
50	50	50	50	50	50	50	50	50	50	25	25	25	25
150	150	150	150	285	285	150	150	150	150	70	70	70	70
86	86	86	86	86	86	86	86	86	86	40	40	40	40
1500	1500	1000	1000	1500	1500	1500	1500	1000	1000	1000	1000	1000	1000
■	■	■	■	□ <sup>1)</sup>	□ <sup>1)</sup>	■	■	■	■	■	■	■	■
				■	■	■	■	■	■	□ <sup>1)</sup>	□ <sup>1)</sup>	■	■
				■	■	■	■	■	■	■	■		
25	25	32	32	25	25	25 <sup>2)</sup>	32	32	32	20	20	20	20
14	14	23	23	14	14	14 <sup>2)</sup>	23	23	23	14	14	14	14
63	63	80	80	63	63	63	80	80	80	50	50	50	50
63	63	80	80	63	63	63	80	80	80	50	50	50	50

## Characteristics of switch disconnectors (transformer disconnectors)

Description			Fuse switch disconnector						
Type to standard			L-TRI 5 IEC 60265-1 (EN 60265-1)						
Rated voltage	$U_r$	kV	12		17.5		24		
Rated frequency	$f_r$	Hz	50/60		50/60		50/60		
Rated lightning impulse withstand voltage	$U_p$								
to earth		kV	75		95		125		
between phases		kV	75		95		125		
across the isolating gap		kV	85		110		145		
Rated withstand alternating voltage	$U_d$								
to earth		kV	28		38		50		
between phases		kV	28		38		50		
across the isolating gap		kV	32		45		50		
Rated current	$I_r$	A	400	630	400	630	400	630	
Rated short-time current	$I_k$	kA	25	25	25	25	25	25	
	1s								
	3s	kA	18	18	18	18	18	18	
Rated peak current	$I_p$	kA	63	63	63	63	63	63	
Rated short-circuit making current	$I_{ma}$	kA	63	63	63	63	63	63	
Number of operations with rated short-circuit making current	$n$		2	2	2	2	2	2	
Rated short-circuit breaking current		kA							
System breaking current for 20 cycles		A	400	630	400	630	400	630	
System breaking current for 200 cycle		A	32	32	32	32	32	32	
Rated transformer breaking current	$I_3$	A	10	10	10	10	10	10	
Rated cable and overhead line breaking current	$I_{4a}, I_{4b}$	A	50	50	50	50	50	50	
Rated current for fuse carrier <sup>4)</sup>		A	200	200	200	200	200	200	
Rated take-over current with striker pin release	$I_4$	A							
Mechanical operations	$n$		1500	1500	1500	1500	1000	1000	
	125	mm	□ <sup>1)</sup>	□ <sup>1)</sup>					
	165	mm	■	■			□ <sup>1)</sup>	□ <sup>1)</sup>	
	210	mm	■	■	■	■			
Pole centre spacing	250	mm	■	■			■	■	
(3-pole switchgear)	275	mm					■	■	
	300	mm					■	■	
	340	mm							
	370	mm							
	400	mm							
Opening times of the switch disconnector with striker pin operation	$T_o$	ms							
Type of the approved fuse striker pin			medium		medium		medium		
Fuse length	$e$	mm	292		367		442		
					292 <sup>3)</sup>				
Integrated earth switch									
Rated short-time current	$I_k$	kA	25	25	25	25	25	25	
	1s								
	3s	kA	14	14	14	14	14	14	
Rated peak current	$I_p$	kA	63	63	63	63	63	63	
Rated short-circuit making current	$I_{ma}$	kA	63	63	63	63	63	63	
Number of operations at rated short-circuit making current	$n$		2	2	2	2	2	2	

<sup>1)</sup> With phase partitions

<sup>2)</sup> In general, the rated current of a switch disconnector-fuse combination is lower than the rated current specified by the fuse manufacturer.

<sup>3)</sup> Using of 12 kV fuses

<sup>4)</sup> Higher values on request

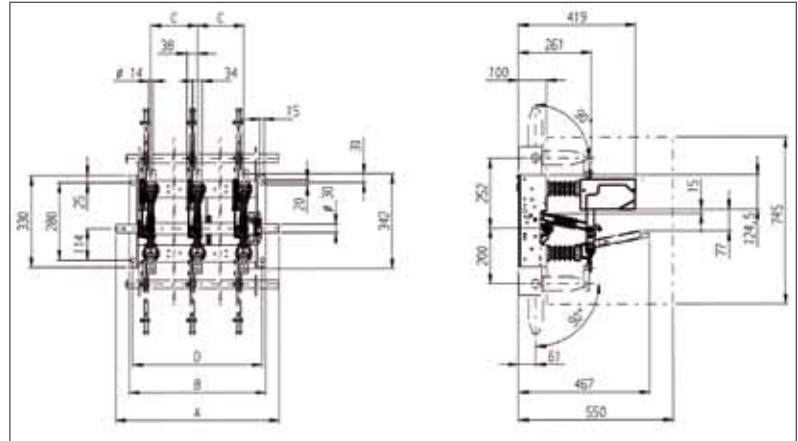
		Switch disconnector - fuse combination	
		L-TRI 5F	
		IEC 62271-105 (EN 62271-105)	
36		12	24
50/60		50/60	50/60
170	145	75	125
170	145	75	125
195	165	85	145
70	70	28	50
70	70	28	50
80	80	32	60
400	630	200 <sup>2)</sup>	200 <sup>2)</sup>
25	20	16	16
18	14		
63	50	40	40
63	25	40	40
2	2	2	2
		25	25
630	630	200	200
32	32	32	32
6,3	6,3	10	10
25	25	50	50
200	200	200	200
		1250	800
1000	1500	1500	1500
		□ <sup>1)</sup>	
		■	□ <sup>1)</sup>
		■	
		■	■
			■
			■
□ <sup>1)</sup>	■		
■			
■			
medium		medium	medium
537		292	442
20	20	16	16
14	14	14	14
63	50	40	40
63	50	40	40
2	2	2	2

## Dimensions and weights of L-TRI 5, 12 kV

## L-TRI 5/12/400...1000/...-D

Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

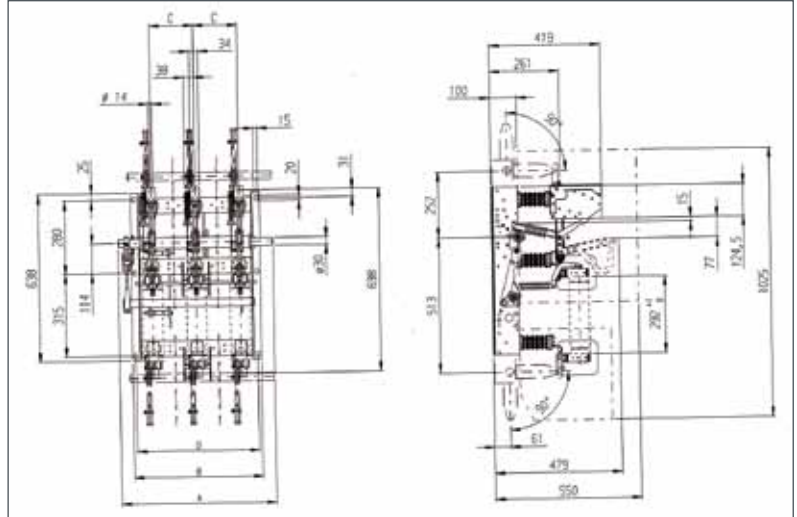


Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch	$I_r$ [A]
966	665	250	640	26	10	400/ 630/ 1000
866	665	250	640	26	10	
766	665	250	640	26	10	
966	625	210	600	23	9.5	
866	625	210	600	23	9.5	
766	625	210	600	23	9.5	
730	485	165	460	20	8	400/630
666	485	165	460	20	8	
566	485	165	460	20	8	
588	405	125T	380	19	7	

L-TRI 5/12/400...630/...-UH-D

L-TRI 5/12/400...630/...-UH-KS-A



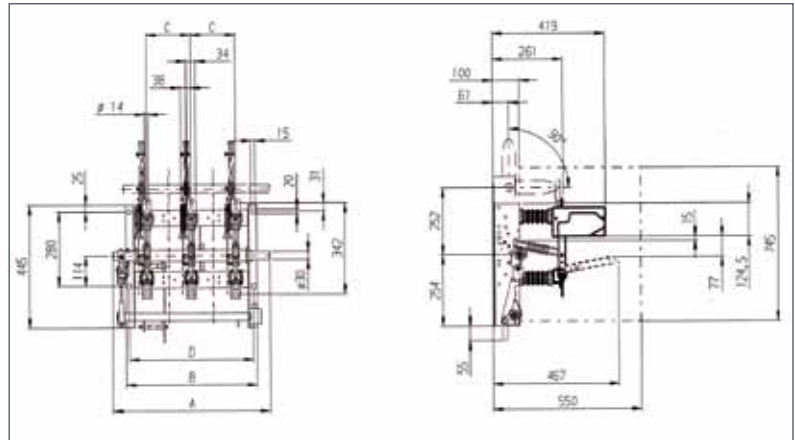
Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
966	665	250	640	41	11
866	665	250	640	41	11
766	665	250	640	41	11
966	625	210	600	38	10.5
866	625	210	600	38	10.5
766	625	210	600	38	10.5
730	485	165	460	35	8
666	485	165	460	35	8
566	485	165	460	35	8
588	405	125T	380	32	7

## L-TRI 5/12/400...630/...-KS-AA



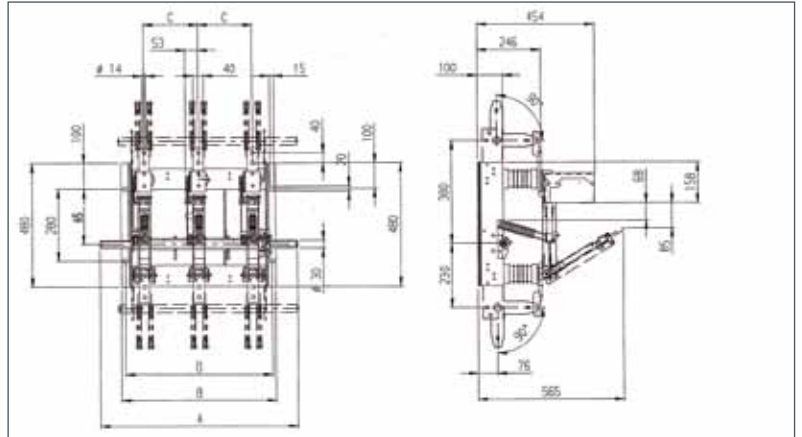
Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
966	665	250	640	30	10
866	665	250	640	30	10
766	665	250	640	30	10
966	625	210	600	26	9.5
866	625	210	600	26	9.5
766	625	210	600	26	9.5
730	485	165	460	23	8
666	485	165	460	23	8
566	485	165	460	23	8
588	405	125T	380	22	7

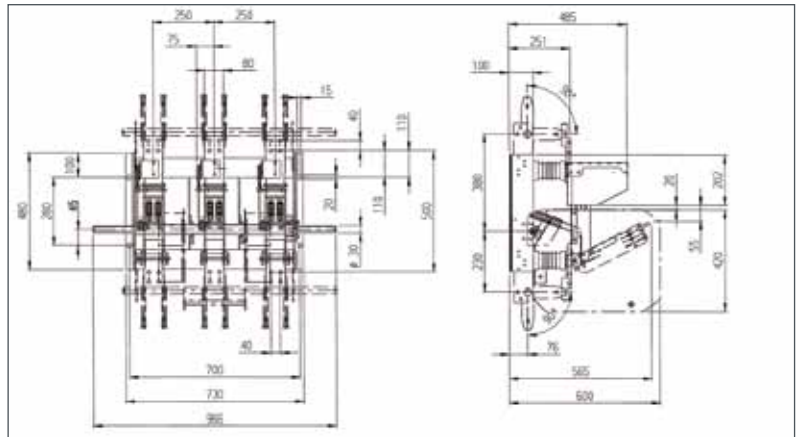
## L-TRI 5/12/1250/...-D



Reference dimension is „C” (pole centre spacing)  
 Define dimension „A” (switch shaft length).  
 Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
966	630	250	700	57	13
966	630	210	600	55	12.5
766	630	210	600	55	12.5

## L-TRI 5/12/2500/250-D



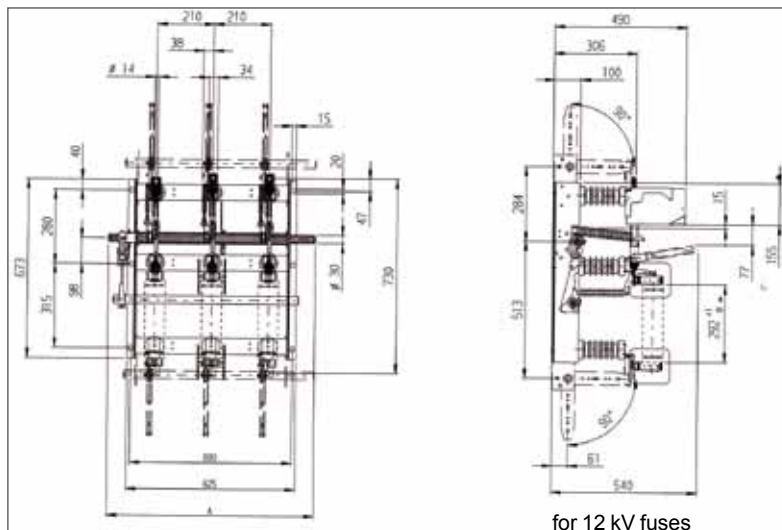
Weights in kg

Weight of L-TRI 5	Weight of earth switch
68	13

**L-TRI 5, 17.5 kV**

L-TRI 5/17.5/400...630/210-UH-D

L-TRI 5/17.5/400...630/210-UH-KS-A



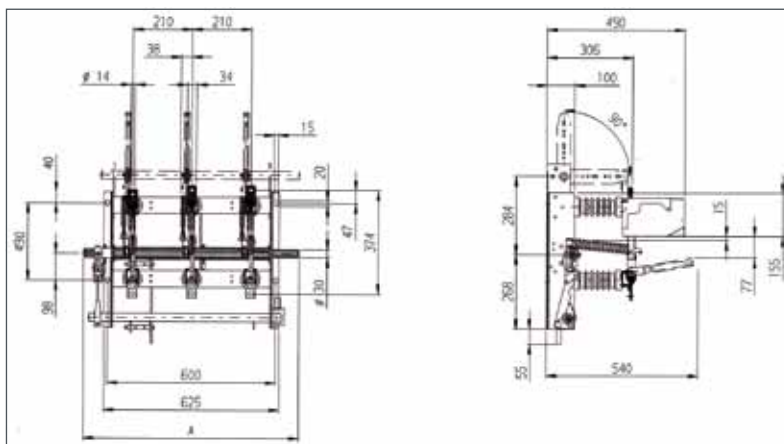
for 12 kV fuses

Define dimension „A” (switch shaft length)

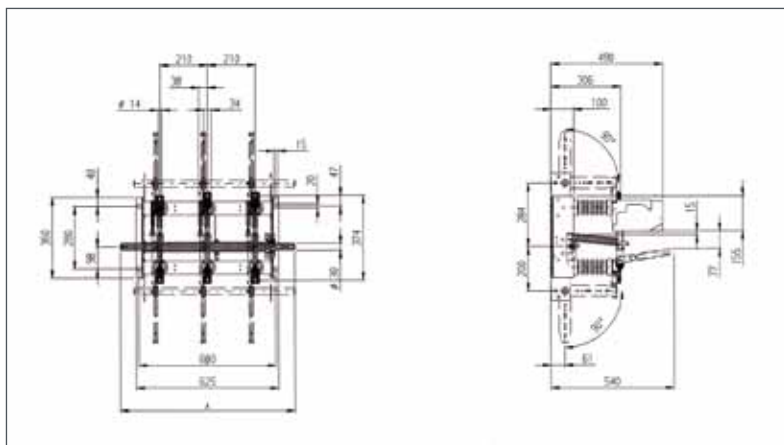
Weights in kg

A	Weight of L-TRI 5	Weight of earth switch
966	48	10
866	48	10
766	48	10

## L-TRI 5/17.5/400...630/210-KS-A



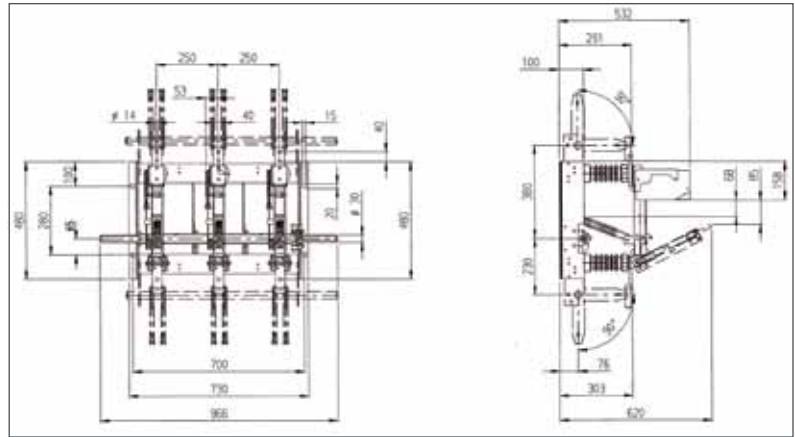
## L-TRI 5/17.5/400...630/210-D



Define dimension „A” (switch shaft length).  
Weights in kg

A	Weight of L-TRI 5	Weight of earth switch
966	28	10
866	28	10
766	28	10

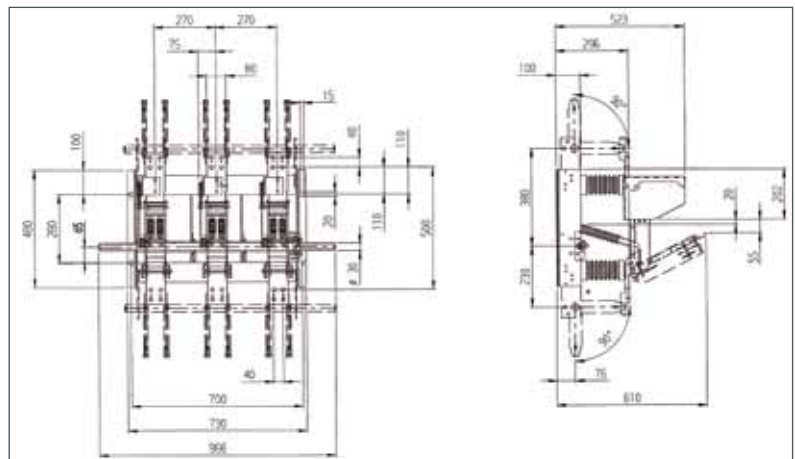
**L-TRI 5/17.5/1250/250-D**



Weights in kg

Weight of L-TRI 5	Weight of earth switch
57	13.5

**L-TRI 5/17.5/2500/270-D**

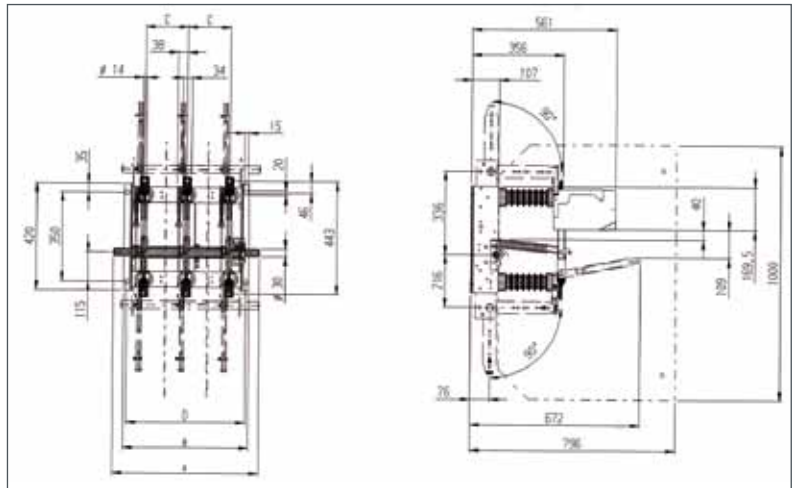


Weights in kg

Weight of L-TRI 5	Weight of earth switch
70	14

## L-TRI 5, 24 kV

L-TRI 5/24/400...1000/...-D



Reference dimension is „C” (pole centre spacing)

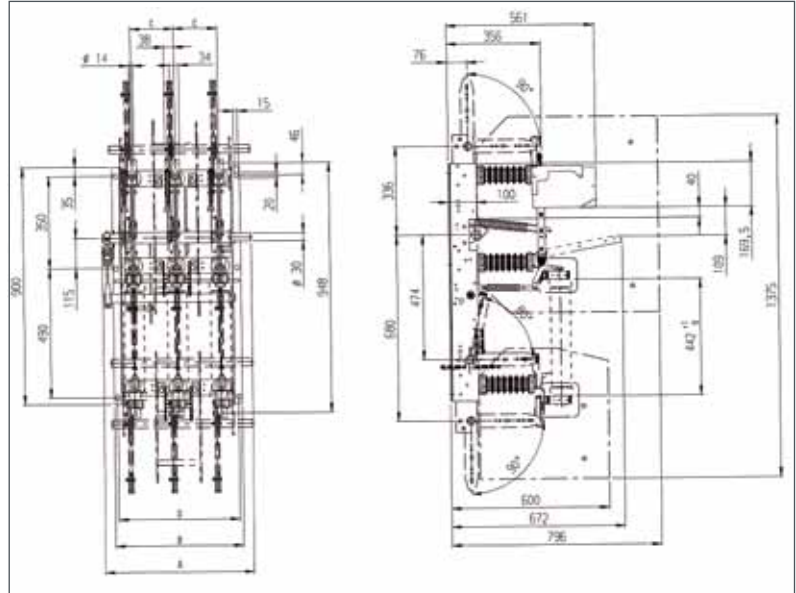
Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch	I <sub>r</sub> [A]
1066	775	300	750	32	11.5	400/ 630/ 1000
966	775	300	750	32	11.5	
1066	775	275	750	32	11.5	
966	775	275	750	32	11.5	
966	655	250	630	29	10.5	
866	655	250	630	29	10.5	
766	655	250	630	29	10.5	400/630
766	485	165T	460	28	8.5	
666	485	165T	460	28	8.5	
588	485	165T	460	28	8.5	

L-TRI 5/24/400...630/...-UH-D

L-TRI 5/24/400...630/...-UH-KS-A



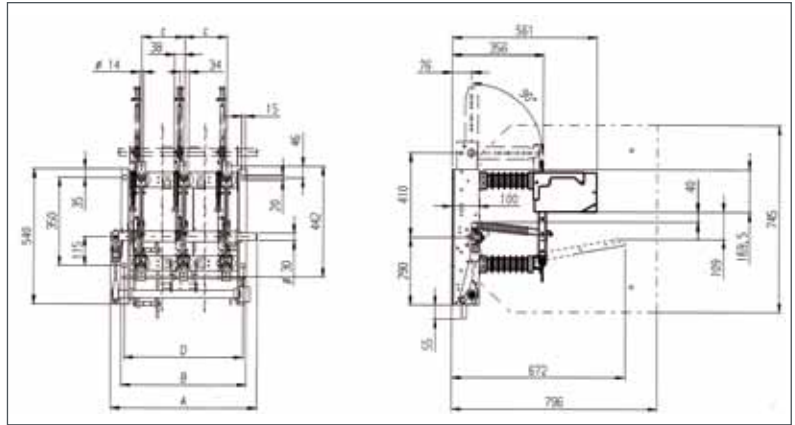
Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
1066	775	300	750	57	11.5
966	775	300	750	57	11.5
1066	775	275	750	57	11.5
966	775	275	750	57	11.5
966	655	250	630	53	10.5
866	655	250	630	53	10.5
766	655	250	630	53	10.5
766	485	165T	460	51	8.5
666	485	165T	460	51	8.5
566	485	165T	460	51	8.5

## L-TRI 5/24/400...630/...-KS-AA



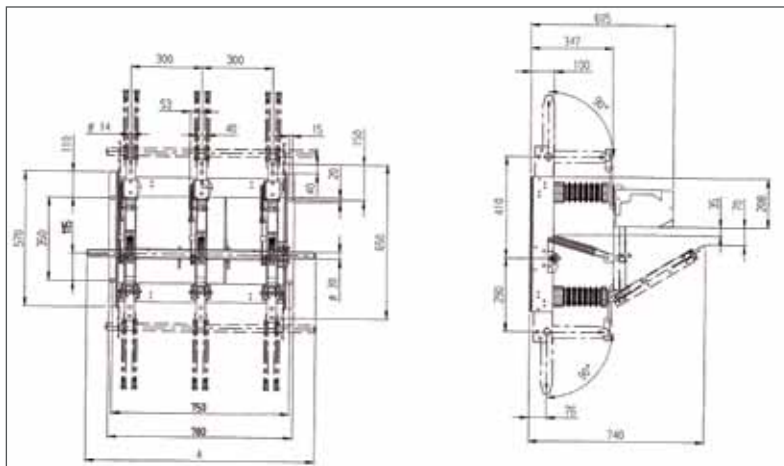
Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
1066	775	300	750	36	11.5
966	775	300	750	36	11.5
1066	775	275	750	36	11.5
966	775	275	750	36	11.5
966	655	250	630	33	10.5
866	655	250	630	33	10.5
766	655	250	630	33	10.5
766	485	165T	460	32	8.5
666	485	165T	460	32	8.5
566	485	165T	460	32	8.5

## L-TRI 5/24/1250/300-D



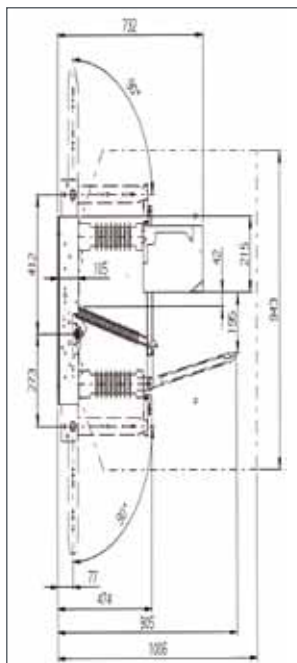
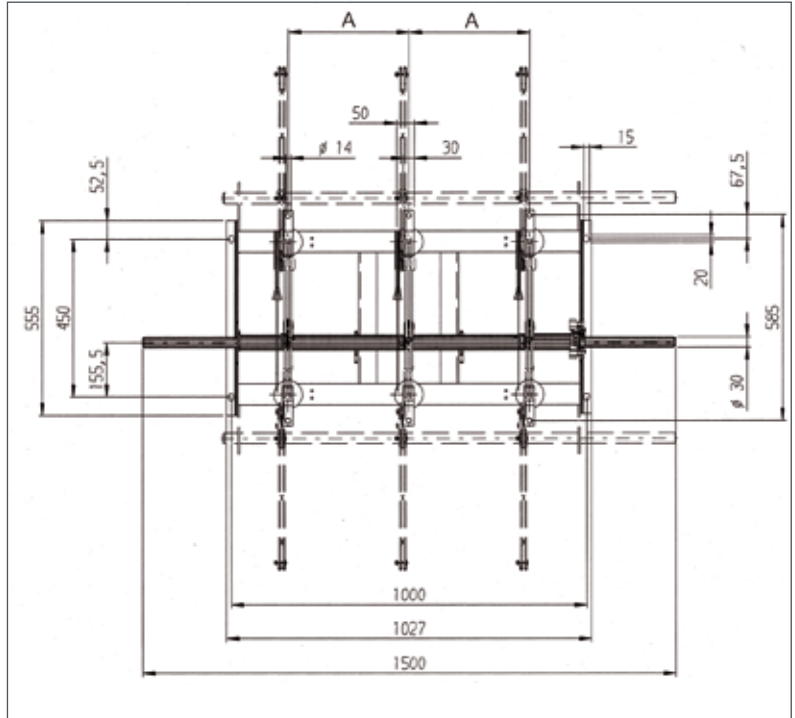
Define dimension „A” (switch shaft length)

Weights in kg

A	Weight of L-TRI 5	Weight of earth switch
1066	60	15
966	60	15

## L-TRI 5, 36 kV

L-TRI 5/36/630...1000/...-D

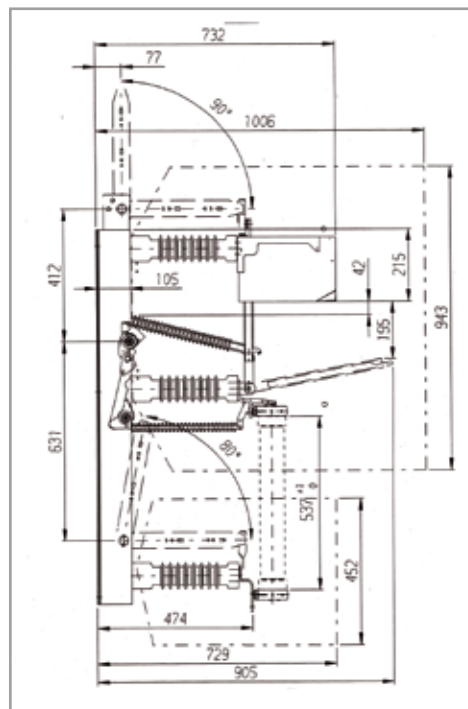
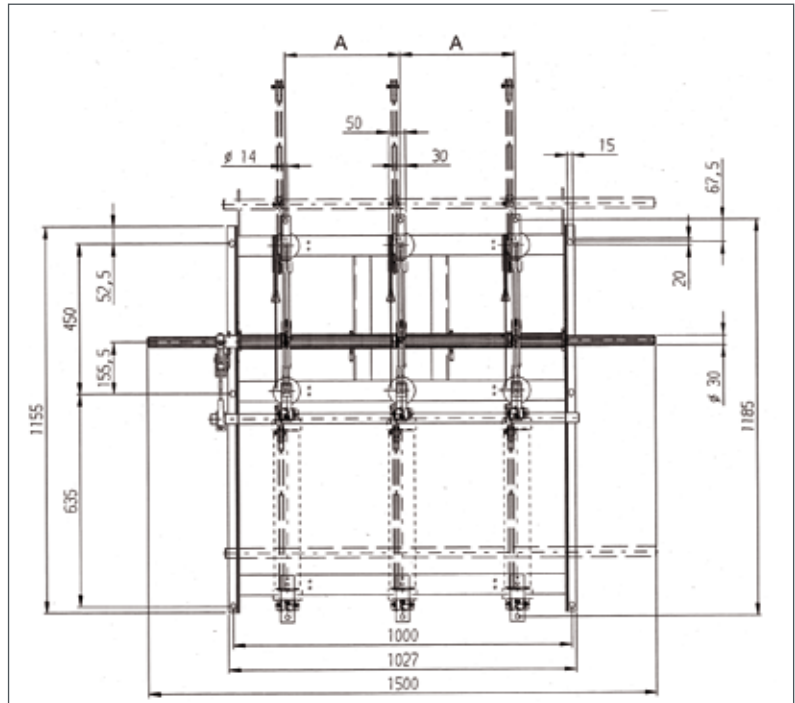


Reference dimension is „C” (pole centre spacing)  
 Define dimension „A” (switch shaft length)  
 Weights in kg

A	Weight of L-TRI 5	Weight of earth switch	U <sub>p</sub>
400	59	13	170
370	59	13	170
340 T	59	13	170
340	57	13	145

L-TRI 5/36/630/...-UH-D

L-TRI 5/36/630/...-UH-KS-A



Reference dimension is „C” (pole centre spacing)

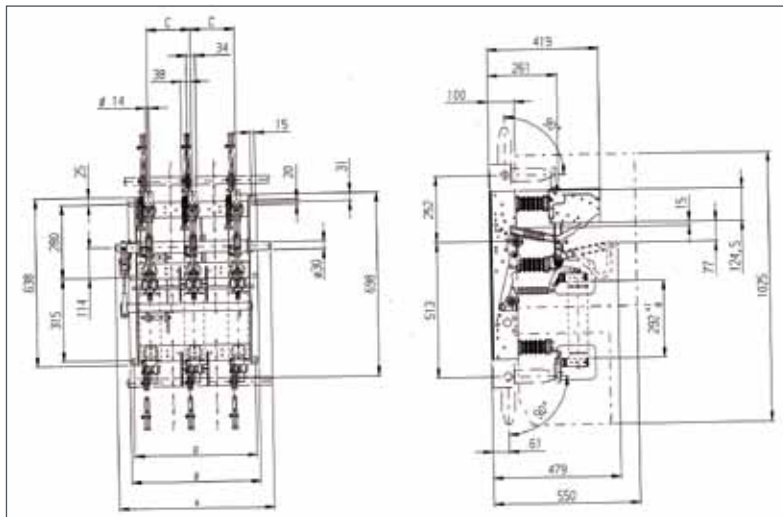
Define dimension „A” (switch shaft length)

Weights in kg

A	Weight of L-TRI 5	Weight of earth switch	U <sub>p</sub>
400	98	13	170
370	98	13	170
340 T	98	13	170
340	96	13	145

## L-TRI 5F to IEC 60420, 12 kV

L-TRI 5F/12/400...630/...-UH-KS-A



Reference dimension is „C” (pole centre spacing)

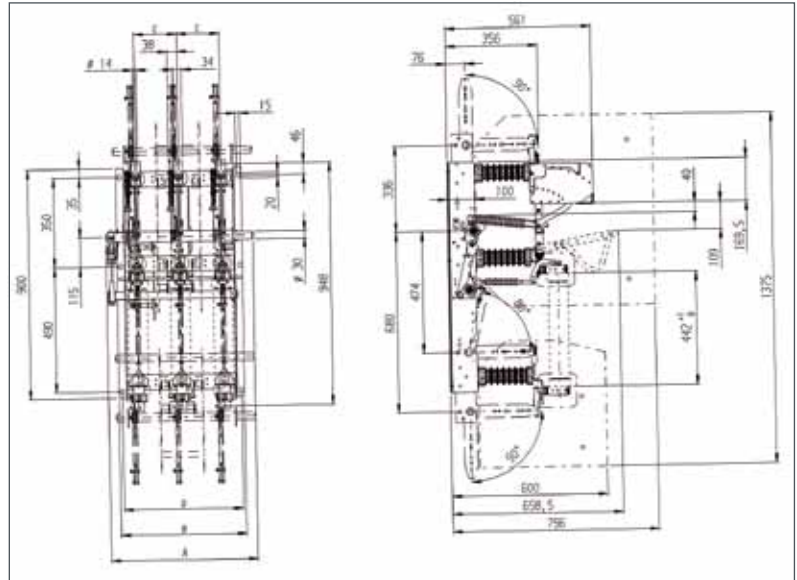
Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
966	665	250	640	41	11
866	665	250	640	41	11
766	665	250	640	41	11
966	625	210	600	38	10.5
866	625	210	600	38	10.5
766	625	210	600	38	10.5
730	485	165	460	35	8
666	485	165	460	35	8
566	485	165	460	35	8
588	405	125T	380	32	7

## L-TRI 5F to IEC 60420, 24 kV

L-TRI 5F/24/400...630/...-UH-KS-A



Reference dimension is „C” (pole centre spacing)

Define dimension „A” (switch shaft length)

Weights in kg

A	B	C	D	Weight of L-TRI 5	Weight of earth switch
1066	775	300	750	57	11.5
966	775	300	750	57	11.5
1066	775	275	750	57	11.5
966	775	275	750	57	11.5
966	655	250	630	53	10.5
866	655	250	630	53	10.5
766	655	250	630	53	10.5
766	485	165T	460	51	8.5
666	485	165T	460	51	8.5
566	485	165T	460	51	8.5

**To**

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**From**

**Company:**.....

**Address:**.....

.....

.....

**Contact name:**.....

**Department:**.....

**Phone:**.....

**Fax/E-mail:**.....

Please quote for the following switch disconnectors:

- L-TRI 5 /...../...../.....-D
- L-TRI 5 /...../...../.....-UH-KS-A
- L-TRI 5 /...../...../.....-UH-D
- L-TRI 5 /...../...../.....-KS-AA
- L-TRI 5F /...../...../.....-UH-KS-AA

Optional extras:

- 4 pole auxiliary switch on switch disconnector
- 8 pole auxiliary switch on switch disconnector
- 4 pole auxiliary switch on earth switch
- Breaking-current shunt release AA for switch disconnector (for KS drive only)
- Release signalling switch MSKM for switch disconnector (for UH-KS-A variant only)
- Manual drive for switch disconnector
- Manual drive for earth switch
- Motor drive for switch disconnector\*
- Motor drive for earth switch\*
- QV ring lever extension for hook-stick operation

\* Please state voltage!





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L-TRI EN

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.



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