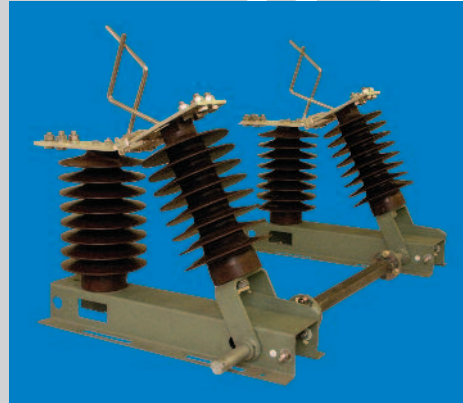


**DRIESCHER -****Outdoor Switches for  
Railway lines**

- 1-pole and 2-pole design
- Nominal voltage up to 29 kV
- Rated current up to 2000 A



# Railway

**ELEKTROTECHNISCHE WERKE  
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## DRIESCHER - Outdoor switches for railway lines

according to EN 50152-2

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The general trend is now to use a vacuum, advantages

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1-pole outdoor switch-disconnector **FLa 15/97-1B**; Un 15 kV and 25 kV

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1-pole outdoor switch-disconnector **FLa 15/97-1B**; cast-resin; Un 27.5 kV and 29 kV

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2-pole outdoor switch-disconnector **FLa 15/97-2B**; cast-resin; Un 25 kV

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1-pole outdoor switch-disconnector **FLa 15/97-1B**; composite; Un 25 kV and 27,5 kV

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2-pole outdoor switch-disconnector **FLa 15/97-2B**; composite; Un 2 x 25 kV a. 52 kV AT

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1-pole outdoor disconnecter **FTr-1B**; cast-resin; Un 25 kV

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1-pole outdoor switch-disconnector **FLa 15/9700-1B**; Un 25 kV

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Arrangement of actuators

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Universal motordrive **UM 90**

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Outdoor-fuse holders, high-voltage high-breaking-capacity fuses

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Product overview

### General information

Our good and successful cooperation with Deutsche Bahn AG already began in the fifties.

Over the course of time more and more importance was attached to the reliability of traction power supply which made it necessary to design switching devices with new technologies. Initial efforts already commenced in the Sixties in the field of vacuum technology and this led to the first outdoor line sectionalizers\* with vacuum interrupter.

Based on a very intensive cooperation with DB (German Rail) we were able to install an outdoor switch disconnector **FLa** in the railway network for trial operation.

Today our product program for railway operations covers a comprehensive range of products for 1 and 2-pole switches including accessories, enabling us to meet rail technology requirements worldwide.

A list of references relating to various railway projects includes the following:

*25 kV Madrid-Barcelona; 25 kV Tunnelstrecke Taipei; 27.5 kV Harbin-Dalian, China; 25 kV Havenspoorlijn, Netherlands; 25 kV Gerdermobanen, Norwegen; 25 kV Spoornet, South-Africa; 25 kV HZ-Hrvatske, Kroatien .....*

### Operating conditions

The equipment can be installed in places at an altitude of up to 1000 meters above sea level. At an altitude above 1000 meters the rated insulation level of the switchgear must be adjusted accordingly. The switchgears are designed for use under normal operating conditions in compliance with EN 62271-1.

According to this specification the following limit values apply: Ambient temperature:

Max. value :	+40°C
Max. value of 24-h average	+35°C
Min. value (corresponding to class "Minus 40 outdoors")	- 40°C

## DRIESCHER - Outdoor switches for railway lines

### Vacuum switching



#### The advantages of the vacuum switches FLa 15/97

- distinct operating separation between main and switching contact system
- patented switching kinematics making and braking via the shunted vacuum interrupter
- low contact erosion
- high loading capacity
- no arcing effect on the main contact system

- The trend is to use a vacuum

Basic research on switching in a vacuum began in Germany during the Seventies. At this time low-oil switches had become firmly established in medium voltage networks, based on their reliable operation over decades, and were accepted by users as reliable devices. In laboratory tests it proved that the vacuum switches were superior by far to the conventionally applied switching principles.

All these requirements necessitate a switching unit with electrical properties that preferably do not change throughout its service life. The vacuum interrupter is hermetically sealed and fitted with the purest of materials. For reliable switching the required vacuum remains intact throughout the entire service life. Also the contact resistance remains at very low values and does not increase due to age because there is practically no oxidation process in a vacuum.

Based on an patented insulation system developed by us there is also no liquid or gaseous medium required for the external insulation strength of the vacuum interrupters.

The outdoor switch disconnecter FLa 15/97-1B is therefore also suitable for all applications and for rated voltages of 15 kV to 29 kV.

Through the use of insulators with different creepage distances the switches are suitable for very different cases of application.

## DRIESCHER - Outdoor switches for railway lines

### Technical description

#### General

These Driescher outdoor switches are specially designed for railway applications. They meet the specifications according to the EN 50152-2. The 1-pole and 2-pole switches are designed for a rated voltage range from 15 kV to 29 kV and a rated current range of 630 A and 2000 A.

#### Design

The live parts are in silver-plated copper with galvanization according QTL 0200. All steel parts are hot galvanized. Upon special request an additional coating of paint (RAL 7033) is available.

There is increased resistance against corrosion through the use of non-rusting materials and surface protective coating.

Each switchgear is fitted with an earth connector screw. Optionally a fixed earthing switch can be mounted.

#### Design of switch

The types of outdoor switch-disconnector and outdoor disconnecting switch mostly differ through the application of different cast-resin insulators (length and height of creepage path) as well as in the baseframes (U-profile and sheet-metal frame).

Optionally its possible to equip the switches with, silicon combined insulators.

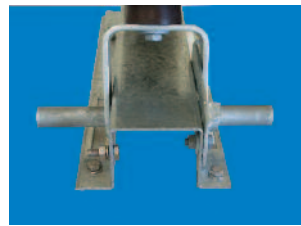


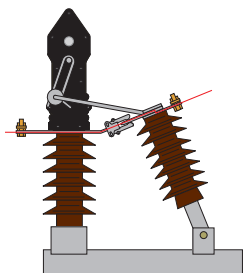
Fig. 1: Sheet metal baseframe



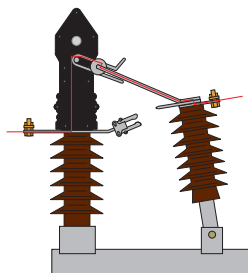
Fig. 2: U-Profile baseframe

### Operating mode

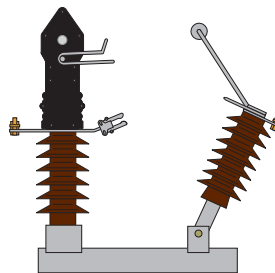
#### • Breaking Operation



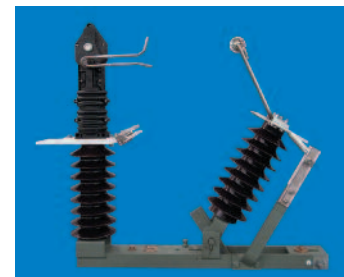
Switch in "ON" position  
Main and shunted circuit  
(vacuum interrupter) closed.



Switch during disconnection phase.  
The main circuit is opened, the operating current is commutated to the shunted circuit. (Vacuum interrupter is shunted).

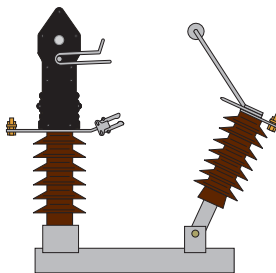


Switch in "OFF" position  
Main and shunted circuit  
(vacuum interrupter) opened.  
Visible isolating distance is provided

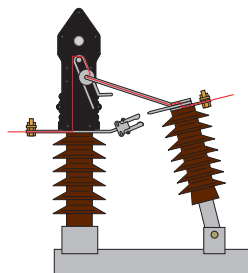


Switch "OFF"  
Fig. With optionally available earthing contact

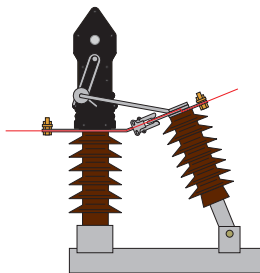
#### • Making Operation



Switch in "OFF" position  
Main and shunted circuit  
(vacuum interrupter) opened.



Switch during the making phase  
The main circuit is still open while the operating or short-circuit current (max. 16 kA) is switched on via the shunted circuit.



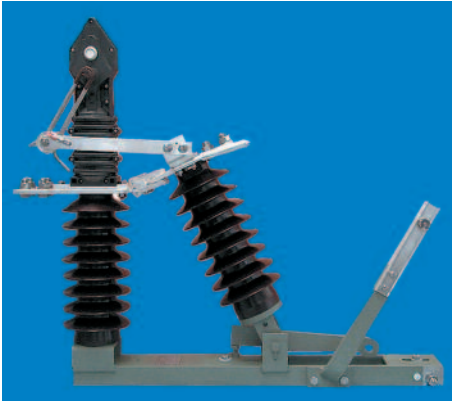
Switch in "ON" position  
Main and shunted circuit (vacuum interrupter) closed.  
(vacuum interrupter is shunted)



Switch "ON"  
Fig. With optionally available earthing contact

## DRIESCHER - Outdoor switches for railway lines

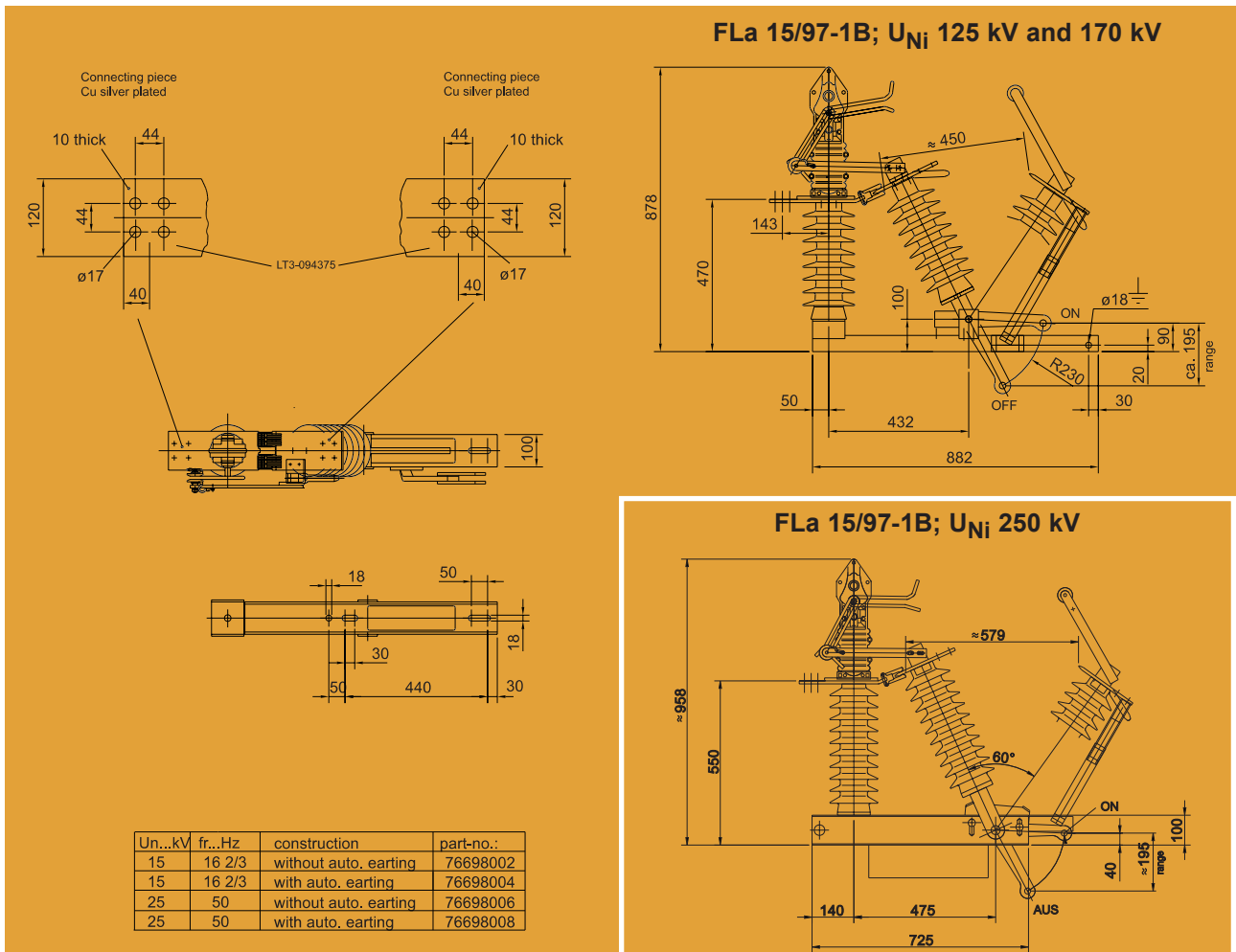
### 1-pole outdoor switch-disconnector FLA 15/97-1B; Un 15 kV and 25 kV



Type	FLA 15/97-1B			
according 3EBS09.04.20 (DB-Mode)				
Nominal voltage	$U_n$	15 kV	25 kV	25 kV
Rated current	$I_n$	2000 A	2000 A	2000 A
Rated insulation level	$U_{Nm}$	17.5 kV	27.5 kV	27.5 kV
Rated impulse voltage	$U_{Ni}$	125 kV	170 kV	250 kV
Short-duration power-frequency test level	$U_a$	50 kV	95 kV	95 kV
Rated frequency (A.C.)	$f_r$	16,7 Hz	50 Hz	16,7 Hz
Rated breaking current	$I_1$	2000 A	2000 A	2000 A
Rated cable-charging breaking current	$I_{4a}$	32 A	32 A	32 A
Rated short-time withstand current	$I_k$	20 kA	20 kA	20 kA
Rated duration of short-circuit current	$t_k$	3 s	3 s	3 s
Rated peak withstand current	$I_p$	50 kA	50 kA	50 kA
Rated short-circuit making current	$I_{ma}$	16 kA	16 kA	16 kA
Creepage distance approx.	s	765	765	965
Drawing-No.		LT3-094634	LT3-094634	LT3-097733
Part-No. (see drawing)				
Weight approx.		45 kg	45 kg	50 kg

#### Typetests

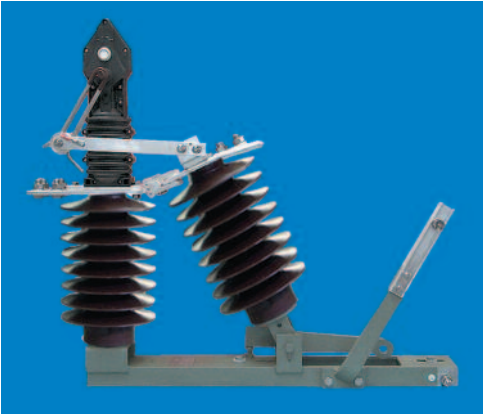
- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)



- U-Profile baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Cast-resin insulators

## DRIESCHER - Outdoor switches for railway lines

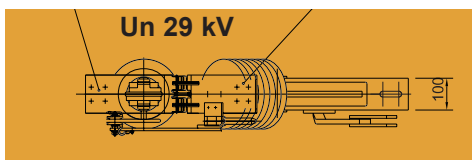
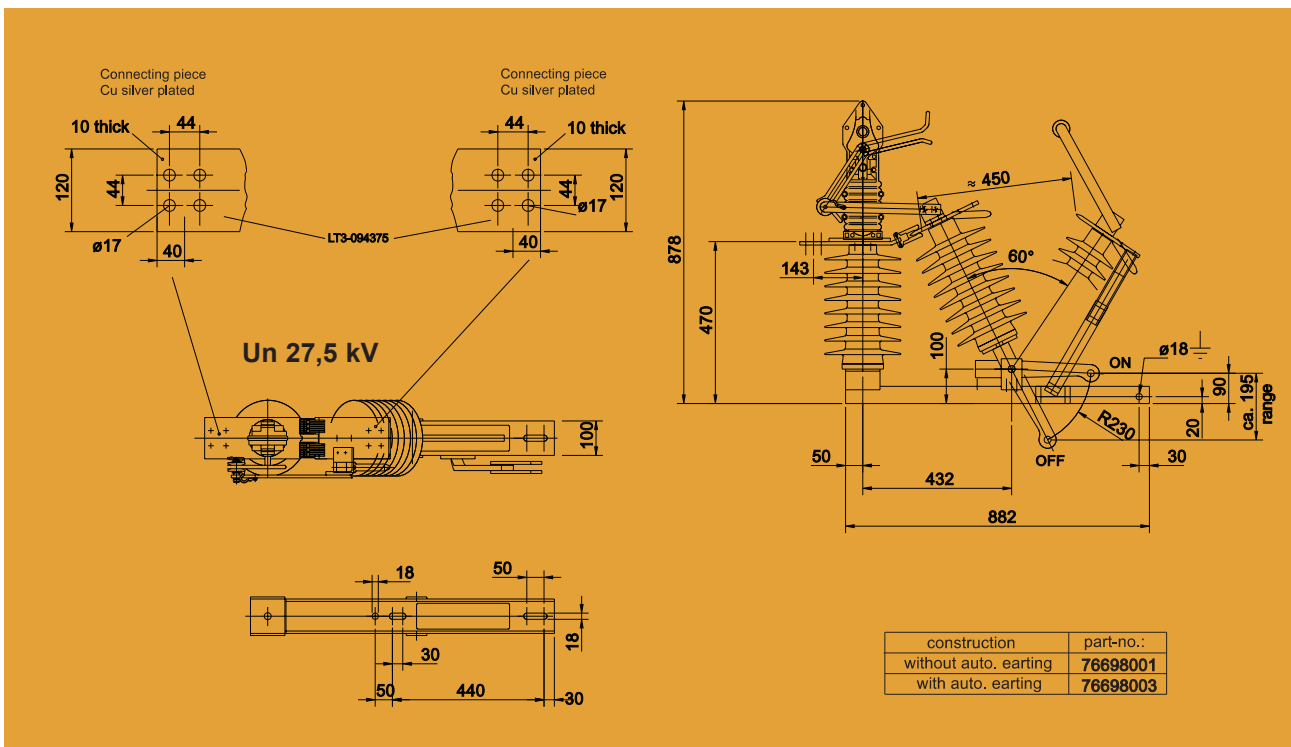
### 1-pole outdoor switch-disconnector FLa 15/97-1B; Un 27.5 kV and 29 kV



#### Typetests

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)

Type	FLa 15/97-1B	
Nominal voltage	$U_n$	27.5 kV   29 kV
Rated current	$I_n$	2000 A   630 A
Rated insulation level	$U_{Nm}$	29 kV   31.5 kV
Rated impulse voltage	$U_{Ni}$	185 kV   185 kV
Short-duration power-frequency test level	$U_a$	80 kV   80 kV
Rated frequency (A.C.)	$f_r$	50 Hz   50 Hz
Rated breaking current	$I_1$	2000 A   630 A
Rated cable-charging breaking current	$I_{4a}$	32 A   32 A
Rated short-time withstand current	$I_k$	20 kA   20 kA
Rated duration of short-circuit current	$t_k$	3 s   3 s
Rated peak withstand current	$I_p$	50 kA   50 kA
Rated short-circuit making current	$I_{ma}$	16 kA   16 kA
Creepage distance approx.	s	1200 mm   1200 mm
Drawing-no.	LT3-094693	LT3-097706
Part-no. (see drawing)		
Weight approx.	50 kg	50 kg



- U-Profile baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Cast-resin insulators



## DRIESCHER - Outdoor switches for railway lines

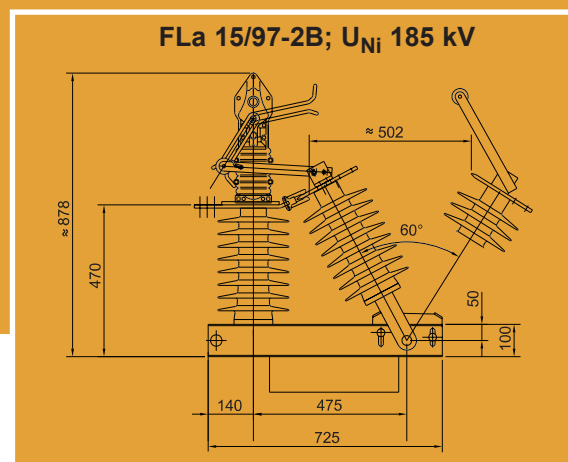
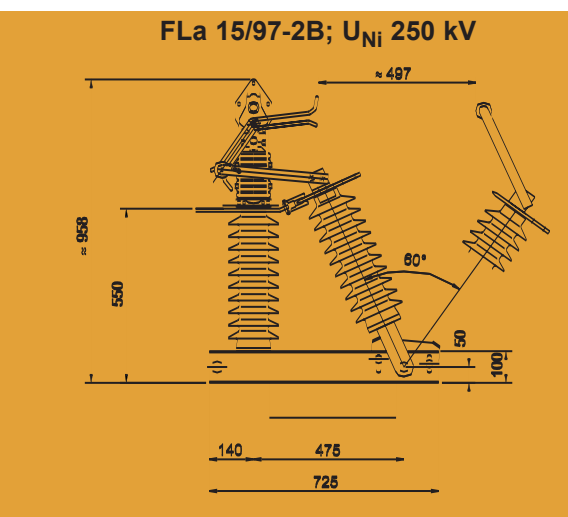
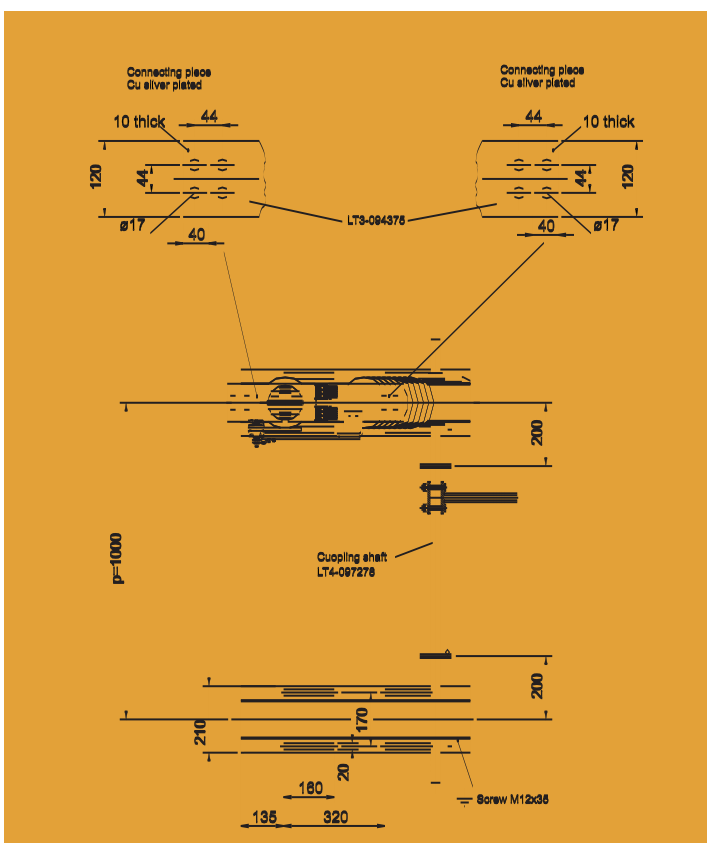
## 2-pole outdoor switch-disconnector FLa 15/97-2B; Un 25 kV



## Type tests

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)

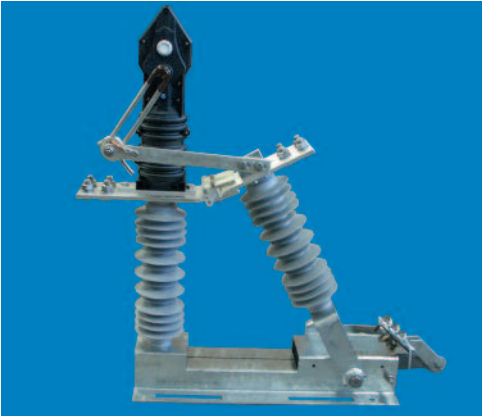
Type	FLa 15/97-2B		
Nominal voltage	$U_n$	25 kV	25 kV
Rated current	$I_n$	2000 A	2000 A
Rated insulation level	$U_{Nm}$	27.5 kV	27.5 kV
Rated impulse voltage	$U_{Ni}$	250 kV	185 kV
Short-duration power-frequency test level	$U_a$	95 kV	80 kV
Rated frequency (A.C.)	$f_r$	50 Hz	50 Hz
Rated breaking current	$I_1$	2000 A	2000 A
Rated cable-charging breaking current	$I_{4a}$	32 A	32 A
Rated short-time withstand current	$I_k$	20 kA	20 kA
Rated duration of short-circuit current	$t_k$	3 s	3 s
Rated peak withstand current	$I_p$	50 kA	50 kA
Rated short-circuit making current	$I_{ma}$	16 kA	16 kA
Creepage distance approx.	$s$	964 mm	1200 mm
Distance between phases min.	$p$	1000 mm	1000 mm
Drawing-no.		LT3-093977	LT3-096029
Part-no.		76699053	76699920
Weight approx.		110 kg	110 kg



- Sheet metal baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Cast-resin insulators
- Coupling shaft with adjustable square-head operating crank

**DRIESCHER - Outdoor switches for railway lines**

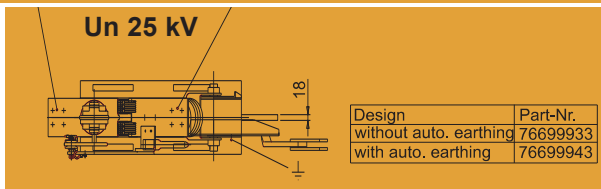
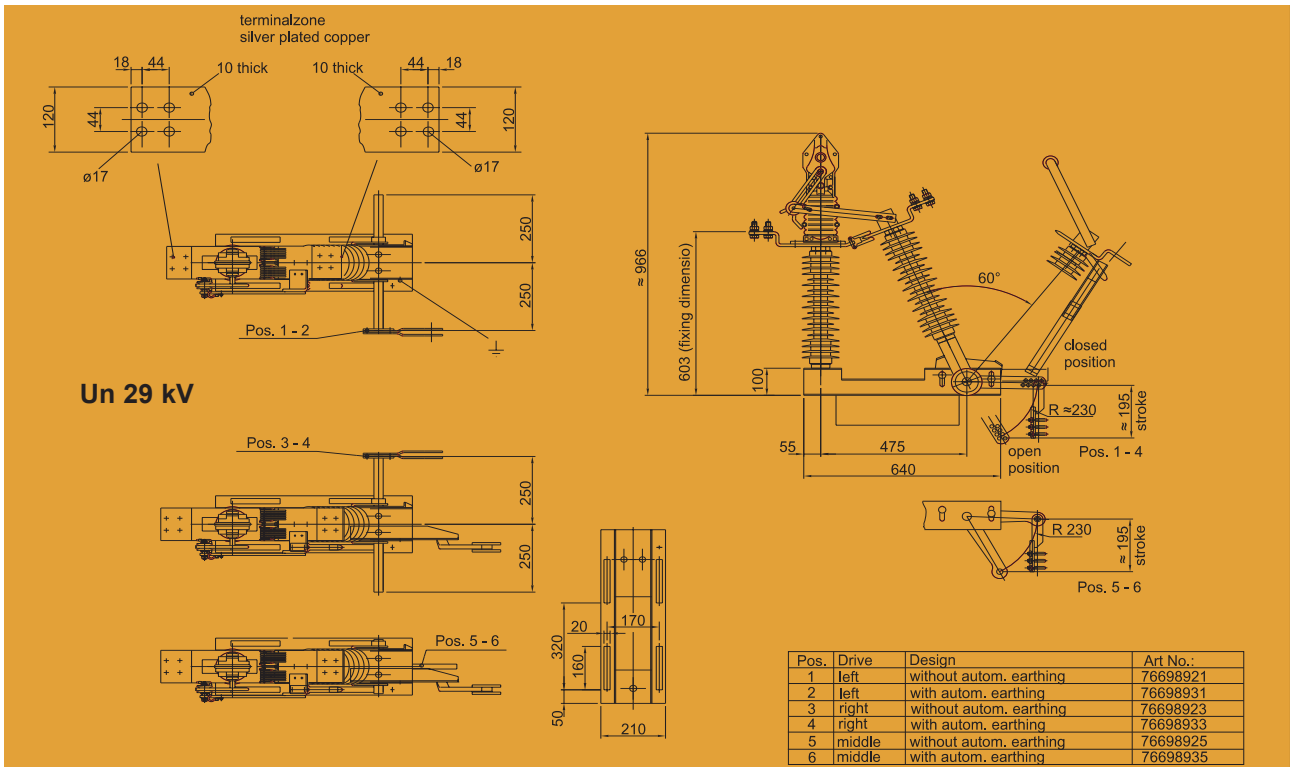
**1-pole outdoor switch-disconnector FLa 15/97-1B; Un 25 kV and 27,5 kV**



Type	FLa 15/97-1B	
Nominal voltage	U <sub>n</sub>	25 kV   27,5 kV
Rated current	I <sub>n</sub>	2000 A   2000 A
Rated insulation level	U <sub>Nm</sub>	27.5 kV   31.5 kV
Rated impulse voltage	U <sub>Ni</sub>	185 kV   250 kV
Short-duration power-frequency test level	U <sub>a</sub>	80 kV   95 kV
Rated frequency (A.C.)	f <sub>r</sub>	16.7 u. 50 Hz   50 Hz
Rated breaking current	I <sub>1</sub>	2000 A   2000 A
Rated cable-charging breaking current	I <sub>4a</sub>	32 A   32 A
Rated short-time withstand current	I <sub>k</sub>	20 kA   20 kA
Rated duration of short-circuit current	t <sub>k</sub>	3 s   3 s
Rated peak withstand current	I <sub>p</sub>	50 kA   50 kA
Rated short-circuit making current	I <sub>ma</sub>	16 kA   16 kA
Creepage distance approx.	s	1120 mm   1420 mm
Drawing-no.	LT3-104066	LT3-102657
Part-no. (see drawing)		
Weight approx.	40 kg	40 kg

**Typetests**

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)



- U-Profile baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Composite insulators



## DRIESCHER - Outdoor switches for railway lines

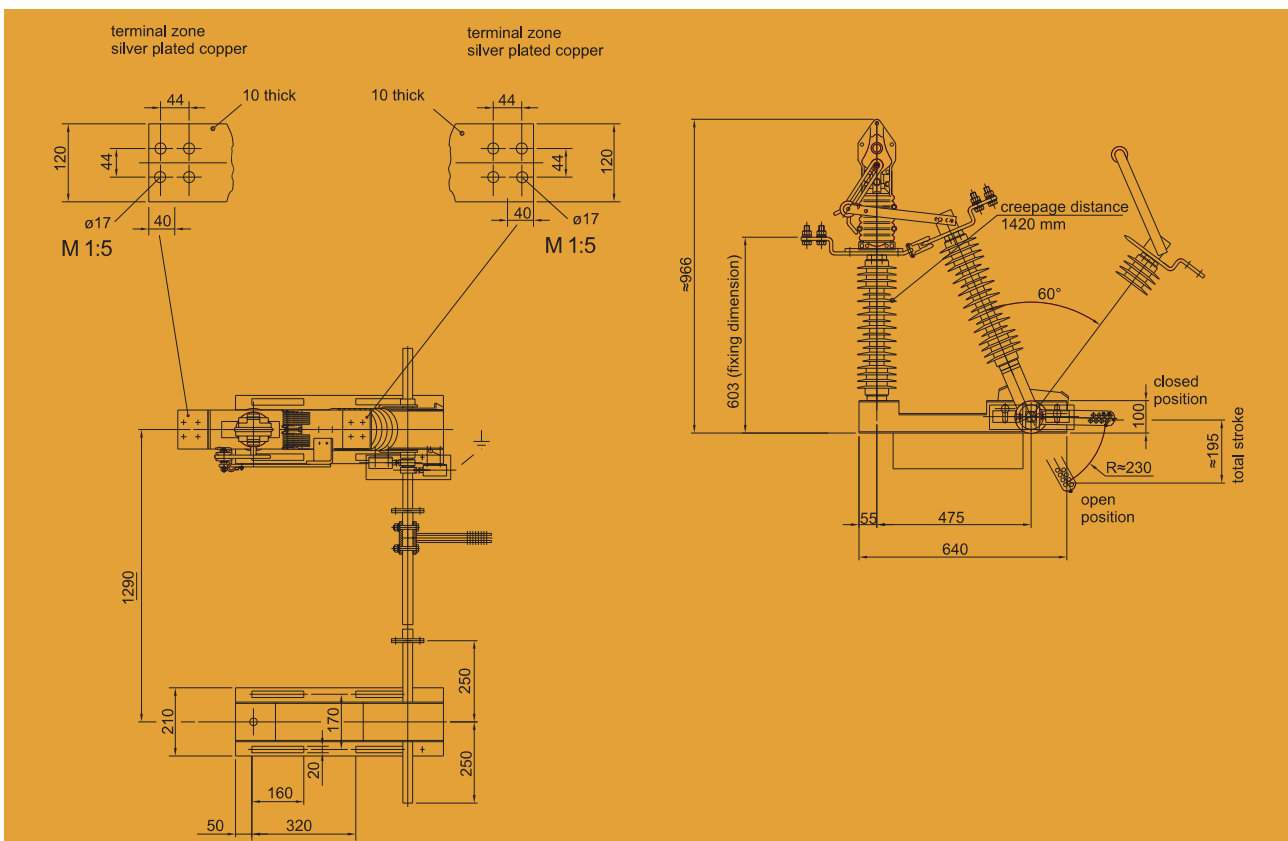
### 2-pole outdoor switch-disconnector FLa 15/97-2B; Un 2 x 27,5 kV a. 52 kV AT



#### Typetests

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)

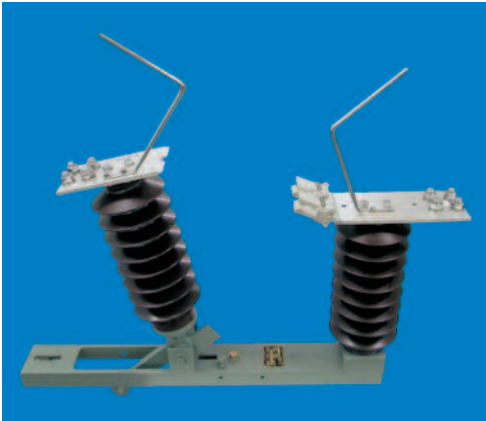
Type	FLa 15/97-2B	
Nominal voltage	$U_n$	27,5 kV
Rated current	$I_n$	2000 A
Rated insulation level	$U_{Nm}$	31.5 kV
Rated impulse voltage	$U_{Ni}$	250 kV
Short-duration power-frequency test level	$U_a$	95 kV
Rated frequency (A.C.)	$f_r$	50 Hz
Rated breaking current	$I_1$	2000 A
Rated cable-charging breaking current	$I_{4a}$	32 A
Rated short-time withstand current	$I_k$	20 kA
Rated duration of short-circuit current	$t_k$	3 s
Rated peak withstand current	$I_p$	50 kA
Rated short-circuit making current	$I_{ma}$	16 kA
Creepage distance approx.	s	1420 mm
Distance between phases min.	p	1290 mm
Drawing-no.	LT3-106223	
Part-no.	76699925	
Weight approx.	90 kg	



- Sheet metal baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Composite insulators
- Coupling shaft with adjustable square-head operating crank

**DRIESCHER - Outdoor switches for railway lines**

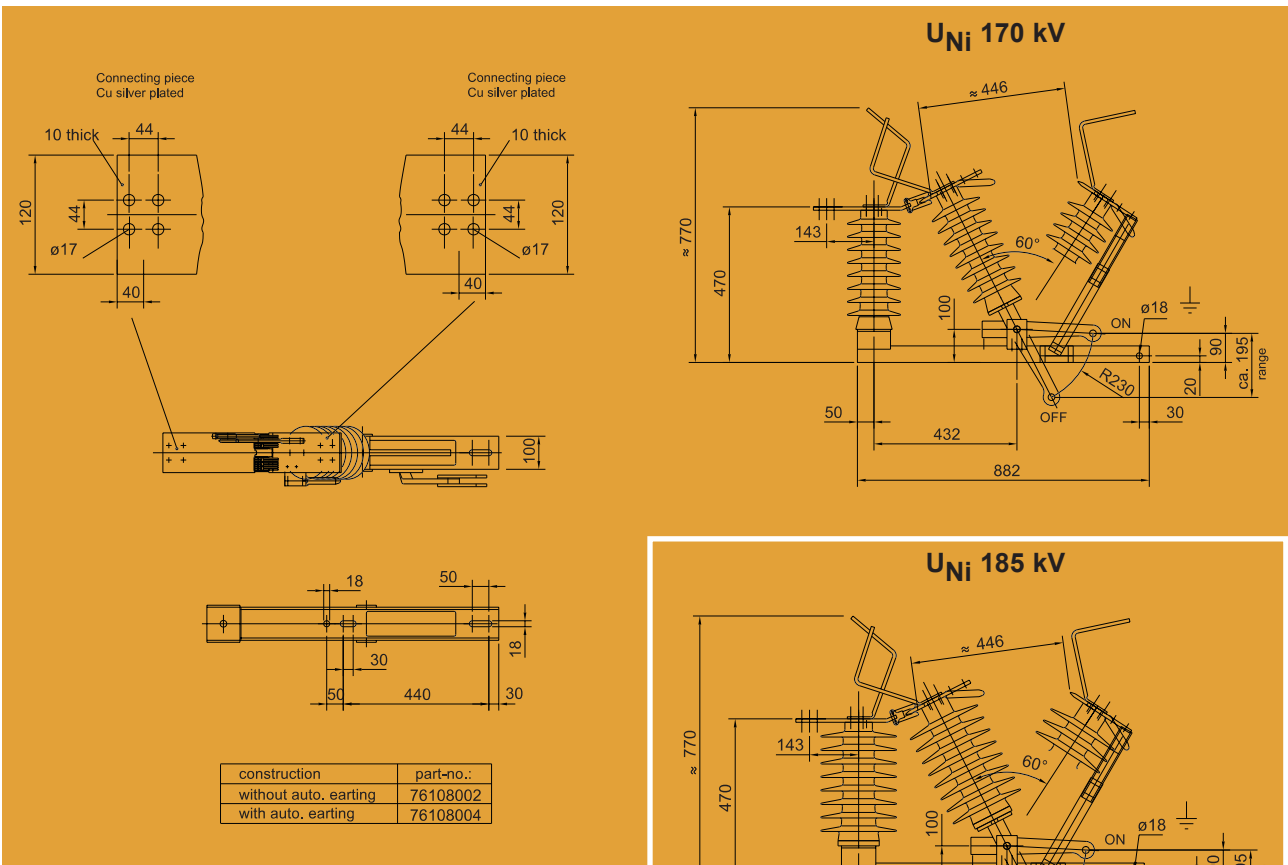
**1-pole outdoor disconnector type FTr 25-2000-1B; Un 25 kV and 27.5 kV**



Type	FTr 25-2000-1B	FTr 27.5-2000-1B
acc. to 3 Ebs 09.04.30 (DB-design)		
Nominal voltage	U <sub>n</sub> 25 kV	27.5 kV
Rated current	I <sub>n</sub> 2000 A	2000 A
Rated insulation level	U <sub>Nm</sub> 27.5 kV	29 kV
Rated impulse voltage	U <sub>Ni</sub> 170 kV	185 kV
Short-duration power-frequency test level	U <sub>a</sub> 95 kV	80 kV
Rated frequency (A.C.)	f <sub>r</sub> 50 Hz	50 Hz
Rated cable-charging breaking current	I <sub>4a</sub> 6 A	6 A
Rated transformer breaking current	I <sub>3</sub> 9 A	9 A
Rated short-time withstand current	I <sub>k</sub> 20 kA	20 kA
Rated duration of short-circuit current	t <sub>k</sub> 3 s	3 s
Rated peak withstand current	I <sub>p</sub> 50 kA	50 kA
Creepage distance approx.	s 775 mm	1200 mm
Drawing-no.	FT3-096398	FT3-099787
Part-no. (see drawing)		
Weight approx.	45 kg	45 kg

**Typetests**

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)



- U-Profile baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Cast-resin insulators

## DRIESCHER - Outdoor switches for railway lines

### 2-pole outdoor disconnector type FTr 25-2000-2B

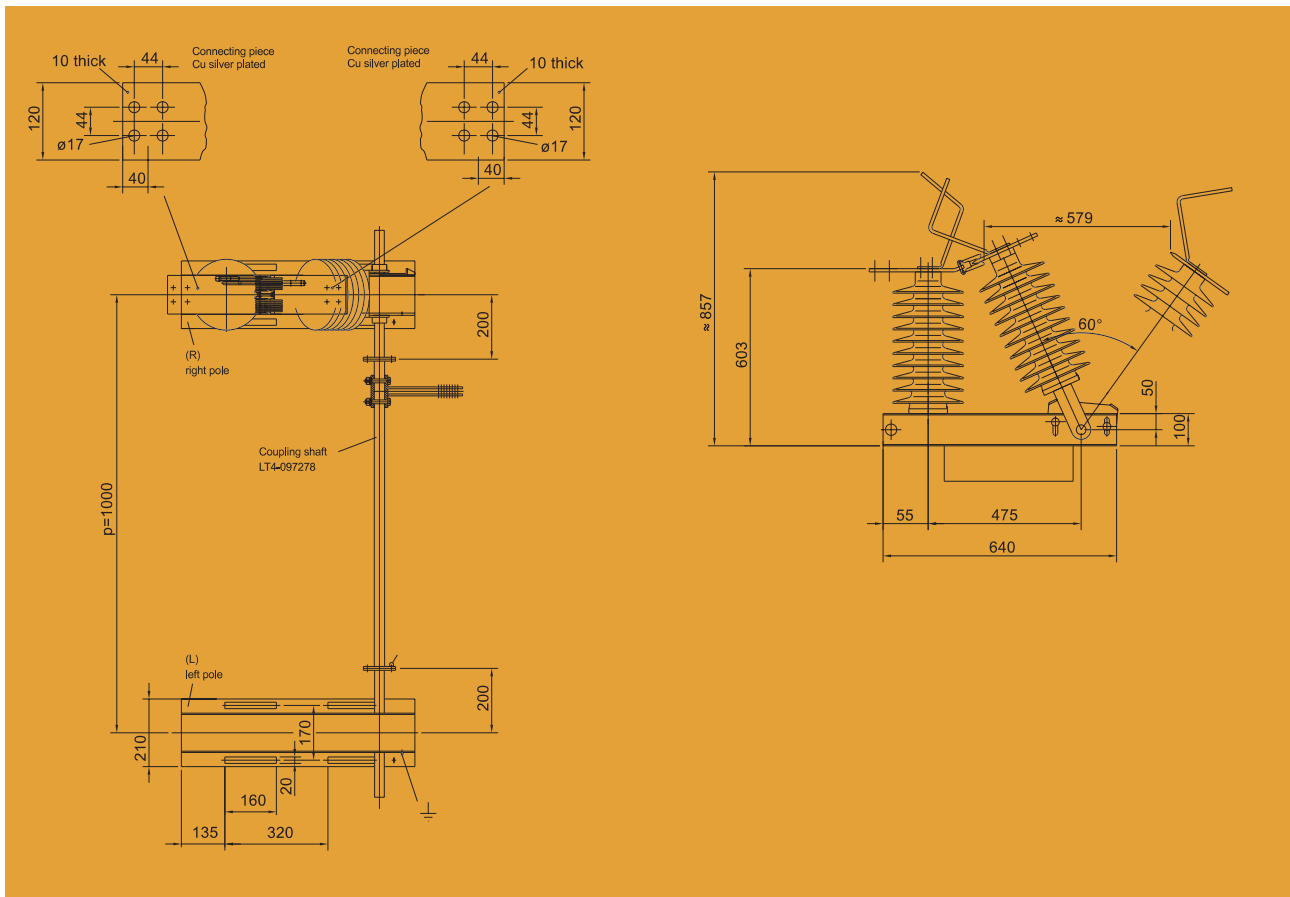


Type	FTr 25-2000-2B	
Nominal voltage	$U_n$	25 kV
Rated current	$I_n$	2000 A
Rated insulation level	$U_{Nm}$	27.5 kV
Rated impulse voltage	$U_{Ni}$	250 kV
Short-duration power-frequency test level	$U_a$	95 kV
Rated frequency (A.C.)	$f_r$	50 Hz
Rated cable-charging breaking current	$I_{4a}$	6 A
Rated transformer breaking current	$I_3$	9 A
Rated short-time withstand current	$I_k$	20 kA
Rated duration of short-circuit current	$t_k$	3 s
Rated peak withstand current	$I_p$	50 kA
Creepage distance approx.	s	1600 mm
Distance between phases min.	p	1000 mm

#### Typetests

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)

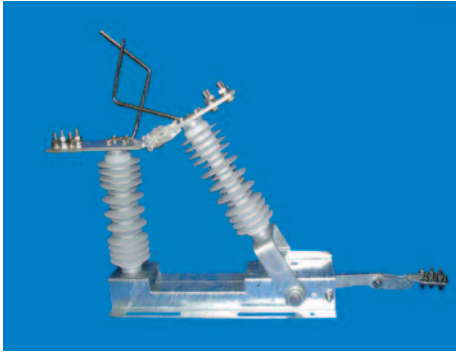
Drawing-no.	FT3-097021
Part-no.	76108016
Weight approx.	100 kg



- Sheet metal baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Cast-resin insulators
- Coupling shaft with adjustable square-head operating crank

## DRIESCHER - Outdoor switches for railway lines

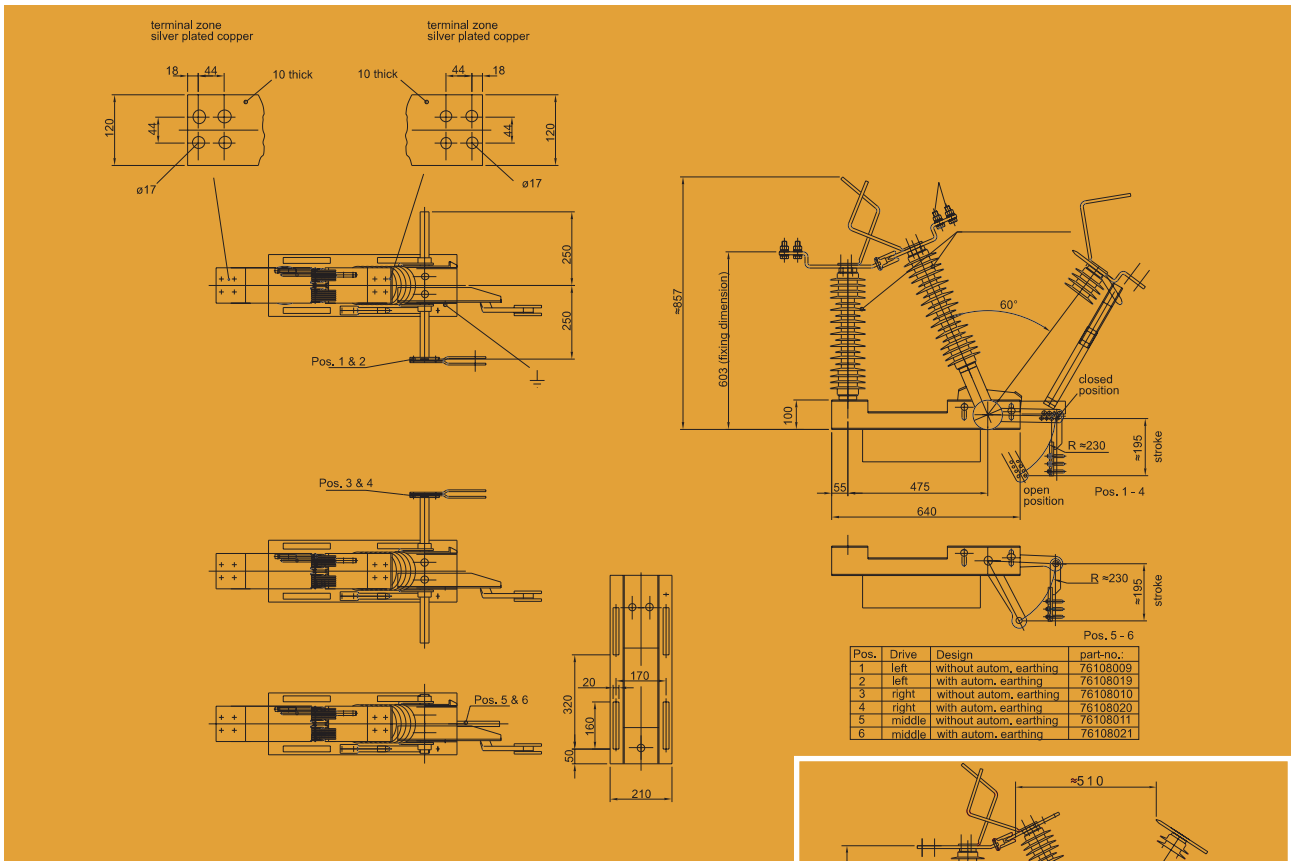
### 1-pole outdoor disconnector type FTr 25-2000-1B; Un 25 kV and 27.5 kV



Type	FTr 25-2000-1B	FTr 27.5-2000-1B
Nominal voltage	$U_n$ 25 kV	27.5 kV
Rated current	$I_n$ 2000 A	2000 A
Rated insulation level	$U_{Nm}$ 27.5 kV	31,5 kV
Rated impulse voltage	$U_{Ni}$ 185 kV	250 kV
Short-duration power-frequency test level	$U_a$ 80 kV	95 kV
Rated frequency (A.C.)	$f_r$ 50 Hz	50 Hz
Rated cable-charging breaking current	$I_{4a}$ 6 A	6 A
Rated transformer breaking current	$I_3$ 9 A	9 A
Rated short-time withstand current	$I_k$ 20 kA	20 kA
Rated duration of short-circuit current	$t_k$ 3 s	3 s
Rated peak withstand current	$I_p$ 50 kA	50 kA
Creepage distance approx.	s 1120 mm	1420 mm
Drawing-no.	FT3-104211	FT3-103023
Part-no. (see drawing)		
Weight approx.	40 kg	40 kg

#### Typetests

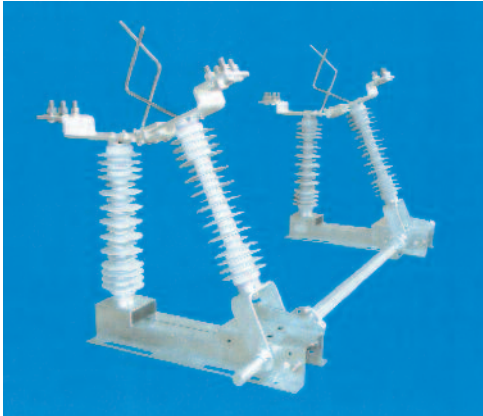
- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)



- Sheet metal baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Composite insulators

## DRIESCHER - Outdoor switches for railway lines

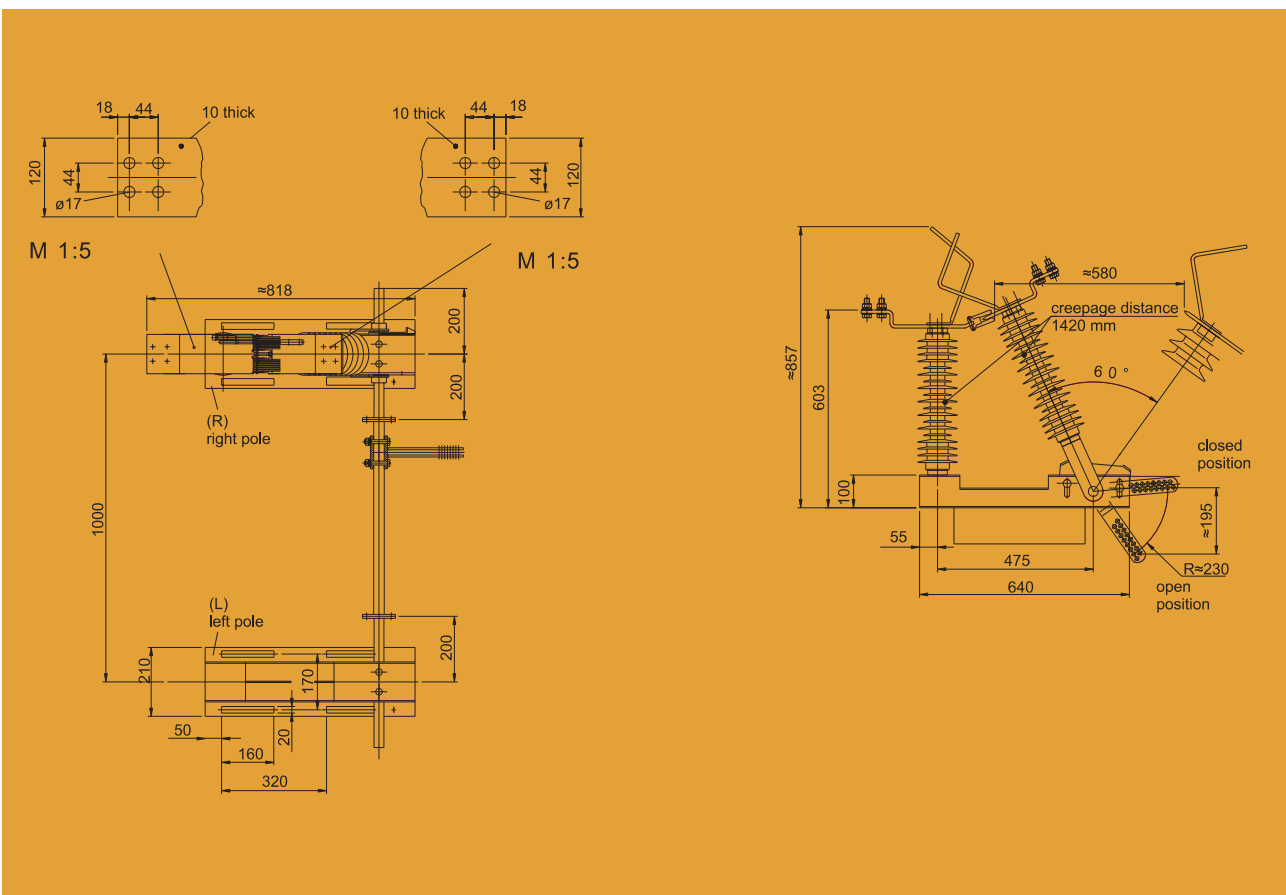
### 2-pole outdoor disconnecter type FTTr 25-2000-2B



Type	FTTr 25-2000-2B	
Nominal voltage	$U_n$	29 kV
Rated current	$I_n$	2000 A
Rated insulation level	$U_{Nm}$	31.5 kV
Rated impulse voltage	$U_{Ni}$	250 kV
Short-duration power-frequency test level	$U_a$	95 kV
Rated frequency (A.C.)	$f_r$	50 Hz
Rated cable-charging breaking current	$I_{4a}$	6 A
Rated transformer breaking current	$I_3$	9 A
Rated short-time withstand current	$I_k$	20 kA
Rated duration of short-circuit current	$t_k$	3 s
Rated peak withstand current	$I_p$	50 kA
Creepage distance approx.	s	1420 mm
Distance between phases min.	p	1000 mm
Drawing-no.	FT3-103022	
Part-no.	76108028	
Weight approx.	90 kg	

#### Typetests

- according to DIN EN 50152-2 03/98 (VDE 0115 Part 320-2)



- Sheet metal baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Composite insulators possible
- Coupling shaft with adjustable square-head operating crank





## DRIESCHER - Outdoor switches for railway lines

### 1-pole und 2-pole outdoor switch-disconnector FLaV 25-2000-16-1B and -2B

The 1-pole and 2-pole outdoor switch-disconnectors, types FLaV 25-2000-16-1B and -2B, are innovations developed specifically for the railway sector.

Compared with the FLa 15/97-1B type, they offer increased short-circuit withstand capability. For this to be realised, it was necessary to provide the switching device with additional pre-arcing electrodes.

Because of its modified functional characteristics, the switch-disconnector switch is capable of switching not only its rated making current of  $I_n$  2000 A but also a short-circuit current of  $I_{ma}$  40 kA.

Load-breaking operations continue to be carried out by a vacuum tube integrated into the switchgear cabinet. The silicone composite insulators, with a minimum creepage path of 1420 mm, may be regarded as another significant innovation.

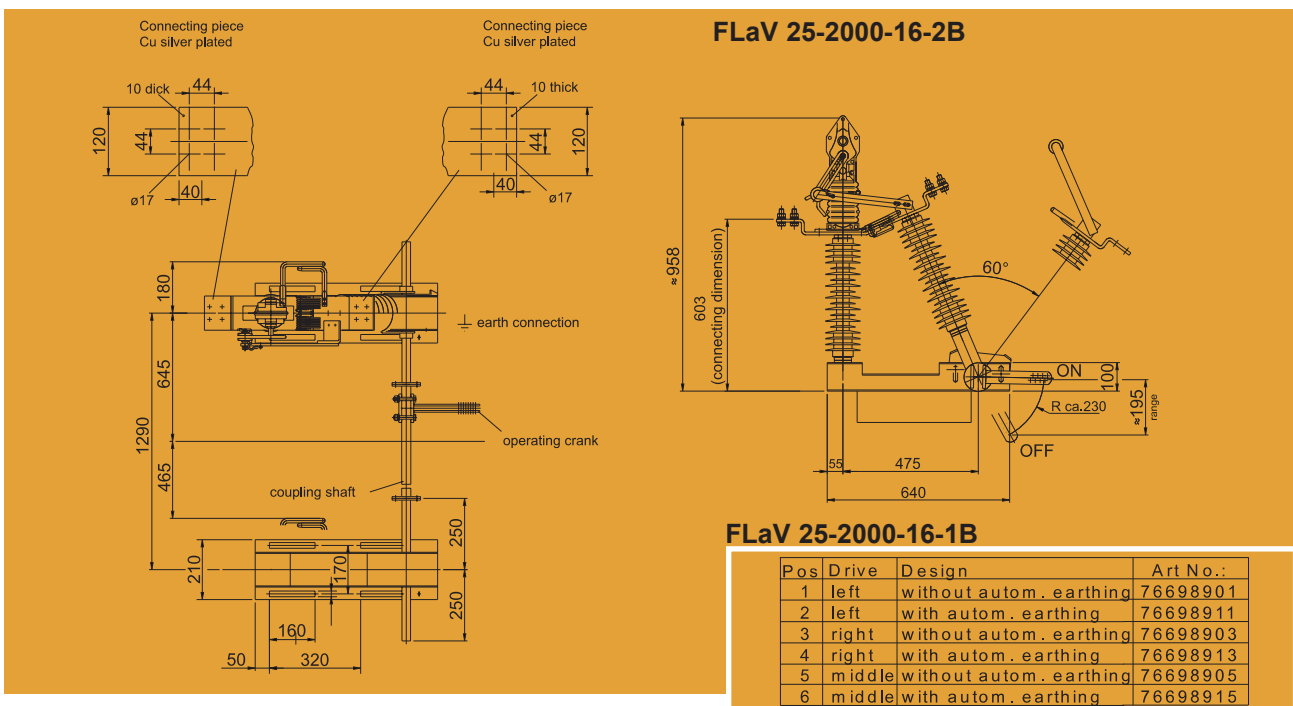
This will ensure the use of the switchgear even in extremely adverse atmospheric conditions.

These outdoor switch-disconnectors, types FLaV 25-2000-16-1B and -2B, have been designed for a rated voltage of 25 kV and a rated current of 2000 A, and meet the applicable requirements in accordance with EN 50152-2.



Fig.: Type FLaV 25-2000-16-1B

Type	FLaV 25-2000-16	
	-1B	-2B
Nominal voltage	$U_n$ 25 kV	25 kV
Rated current	$I_n$ 2000 A	2000 A
Rated insulation level	$U_{Nm}$ 27.5 kV	27.5 kV
Rated impulse voltage	$U_{Ni}$ 250 kV	250 kV
Short-duration power-frequency test level	$U_a$ 95 kV	95 kV
Rated frequency (A.C.)	$f_r$ 50 Hz	50 Hz
Rated breaking current	$I_1$ 2000 A	2000 A
Rated short-time withstand current	$I_k$ 16 kA	16 kA
Rated duration of short-circuit current	$t_k$ 3 s	3 s
Rated peak withstand current	$I_p$ 40 kA	40 kA
Rated short-circuit making current	$I_{ma}$ 40 kA	40 kA
Creepage distance approx.	$s$ 1420 mm	1420 mm
Distance between phases min.	$p$	1290 mm
Drawing-no.	LT3-101081	LT3-101373
Part-no.	see drawing	76698902
Weight approx.	45 kg	100 kg



## DRIESCHER - Outdoor switches for railway lines

### 1-pole outdoor switch-disconnector FLa 15/9700-1B

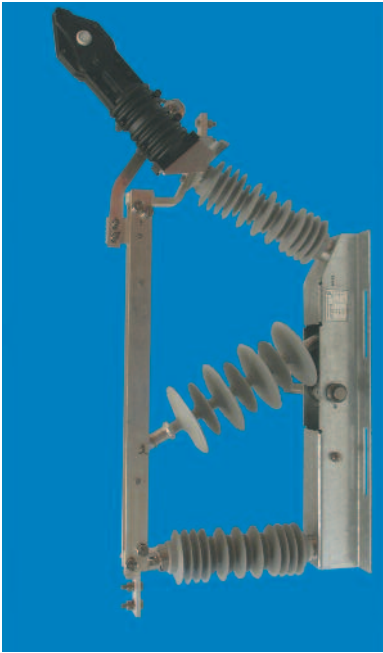
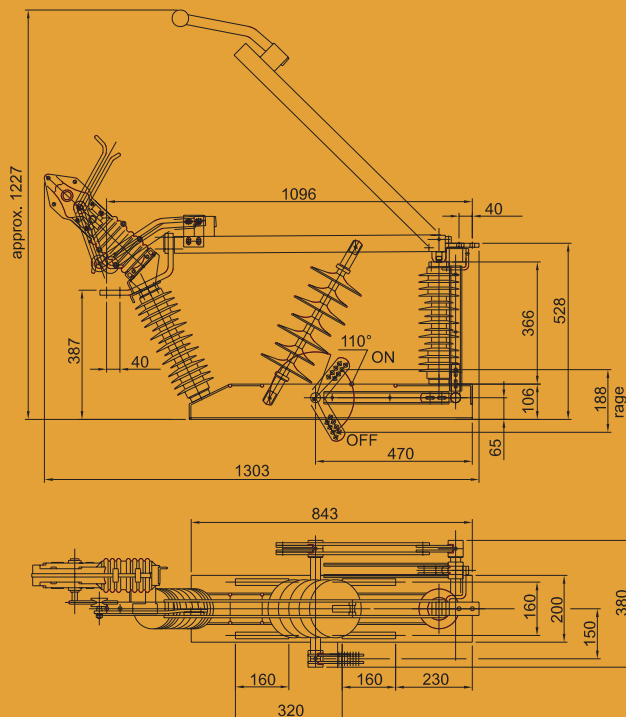


Fig.: Type FLa 15/9700-1B

Type	FLa 15/9700-1B	
Nominal voltage	$U_n$	25 kV
Rated current	$I_n$	1600 A
Rated insulation level	$U_{Nm}$	27.5 kV
Rated impulse voltage	$U_{Ni}$	185 kV
Short-duration power-frequency test level	$U_a$	80 kV
Rated frequency (A.C.)	$f_r$	50 Hz
Rated breaking current	$I_1$	1600 A
Rated cable-charging breaking current	$I_{4a}$	32 A
Rated short-time withstand current	$I_k$	31.5 kA
Rated duration of short-circuit current	$t_k$	3 s
Rated peak withstand current	$I_p$	80 kA
Rated short-circuit making current	$I_{ma}$	16 kA
Creepage distance approx.	s	1120 mm
Drawing-no.	LT3-102888	
Part-no.	look at drawing	
Weight approx.	50 kg	

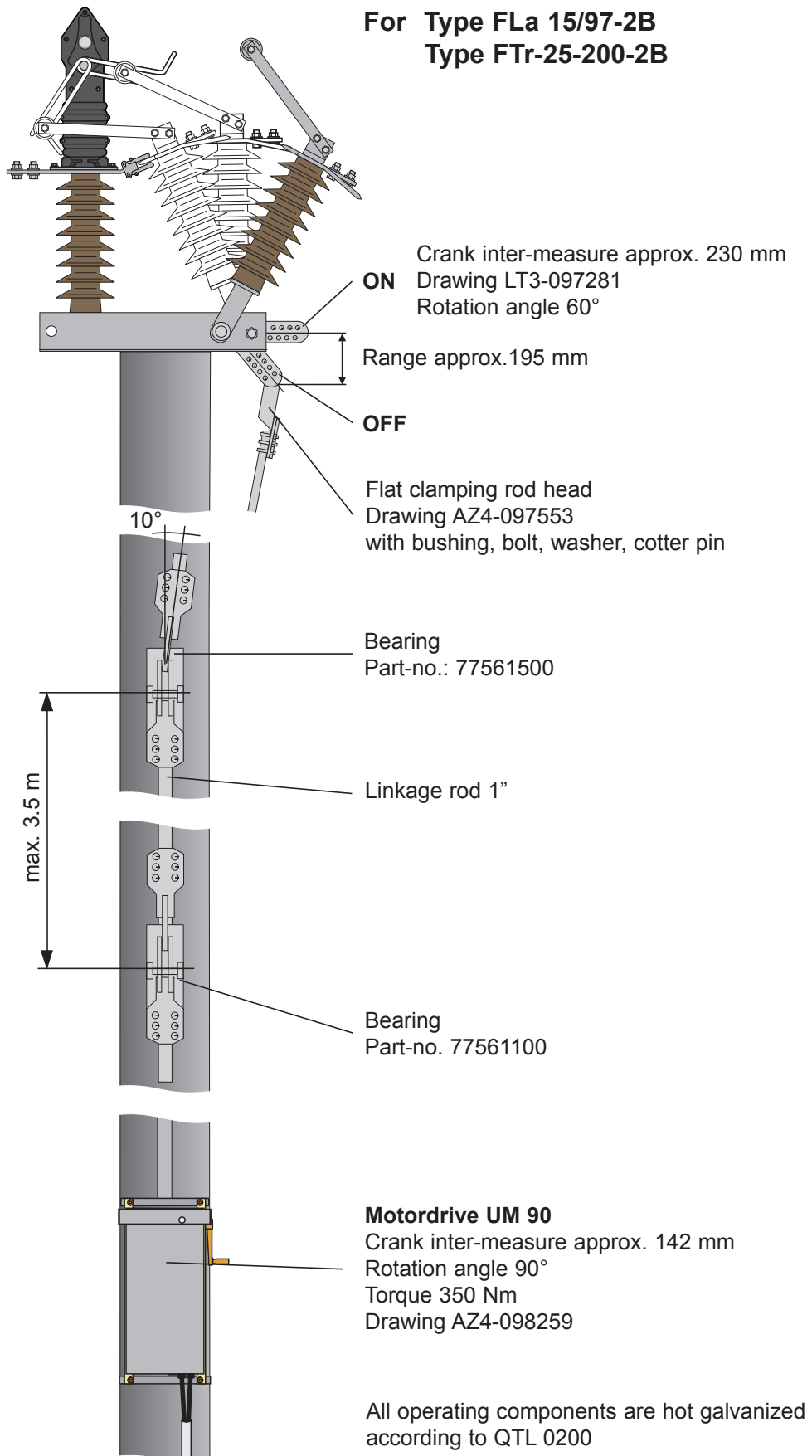


Pos.	Design	part-no.:
1	without auto. earthing	76779001
2	with auto.earthing	76779011

- Steel baseframe
- Steel parts hot galvanized according to QTL 0200, additional paint (accord. DB rule, material-no. 675.61)
- Composite insulators

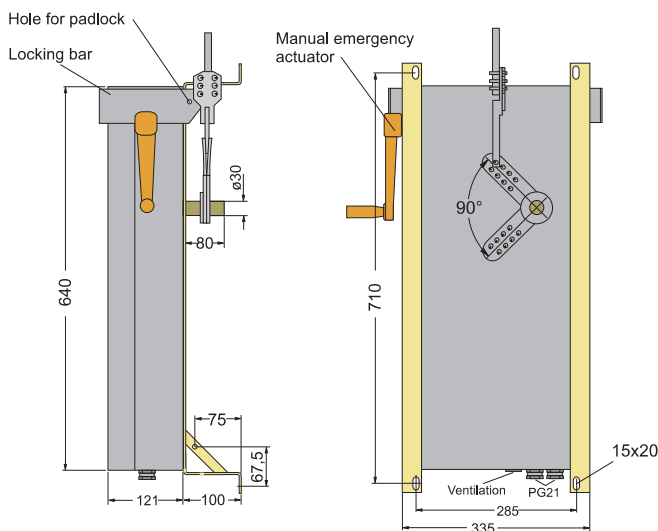
## DRIESCHER - Outdoor switches for railway lines

## Operation arrangement



**DRIESCHER - Outdoor switches for railway lines**

**Universal-motordrive UM 90**

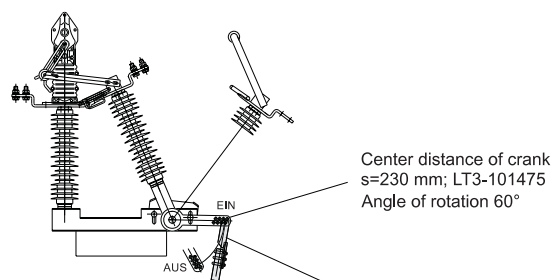
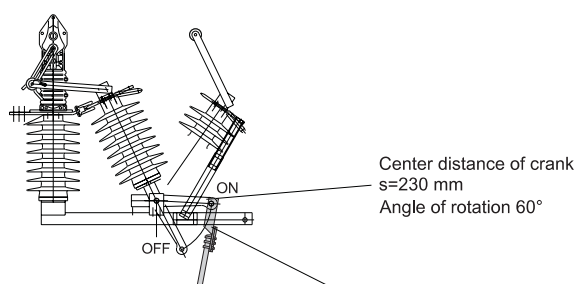


**Crank inter-measure approx. 140 mm for  
Typ FTr 25-2000-1B and 2B  
Typ FLA 15/97-1B and 2B**

- Rotation angle 90°
- Weight approx. 35 kg
- Drawing-no. AZ4-098259
- for DC, alternatively 24 V, 60 V, 110 V or 220 V
- for AC, alternatively 110 V, 230 V

exactly data in brochure 776

**Examples for operating arrangements: Type FLA 15/97**



Forked stub head  
AZ4-099446, Assembly-no.: 77571915  
with bushing, pin, washer and cotter

Flat stub head\*  
AZ4-097553, Assembly-no. 77571990  
with bushing, pin, washer and cotter

Intermediate bearing  
with articulated bush  
s=140 mm

Intermediate bearing  
with articulated bush  
s=140 mm

Linkage pipe 1"  
(on order)

Linkage pipe 1"  
(on order)

Intermediate bearing  
s=ca.140 mm

Intermediate bearing  
s=ca.140 mm

Centre distance  
of crank  
s=142 mm  
Angle of rotation 90°

Motor-operated mechanism  
UM90, 350Nm  
AZ4-098259

Centre distance  
of crank  
s=142 mm  
Angle of rotation 90°

Motor-operated mechanism  
UM90, 350Nm  
AZ4-098259

2 intermediate bearings are required for  
linkages exceeding 6 meters length

2 intermediate bearings are required for  
linkages exceeding 6 meters length

\* belonging to switch

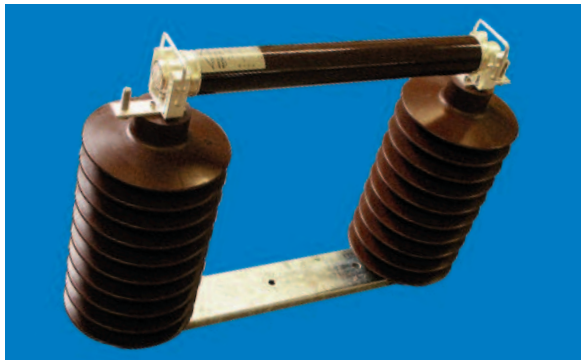
**Drawing LT4-100032**

**Drawing LT4-101461**

## DRIESCHER - Outdoor switches for railway lines

### Outdoor fuse-holders

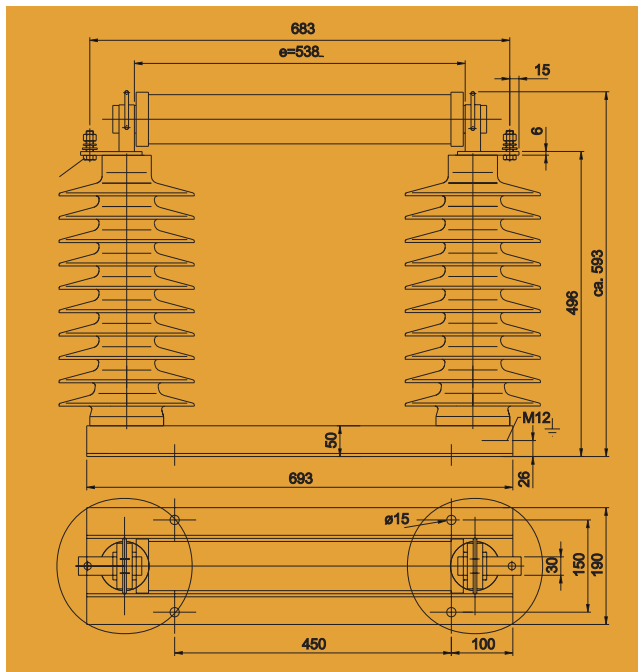
1-pole Outdoor Fuse-Holders Type FSu 25-200-1B nominal voltage 25 kV.  
Rated current 200 A to collect high-voltage high-breaking-capacity fuses for shunt switch heating systems.



#### Typetests

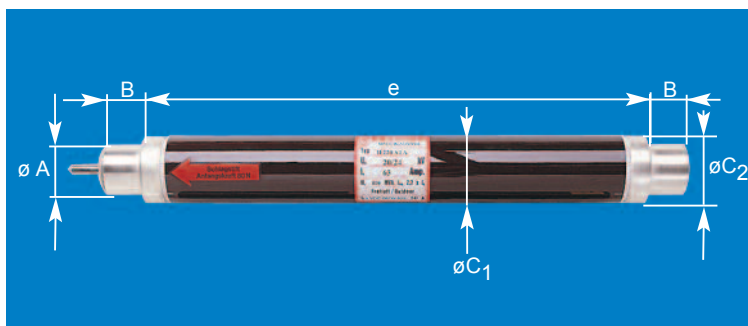
- according to DIN EN 60282-1 (EN 60694)
- Steelparts hot galvanized

Type	FSu 25-200-1B	
Nominal voltage	$U_n$	25 kV
Rated current	$I_n$	200 A
Rated insulation level	$U_{Nm}$	27.5 kV
Rated impulse voltage	$U_{Ni}$	250 kV
Short-duration power-frequency test level	$U_a$	95 kV
Rated frequency (A.C.)	$f_r$	50 Hz
Creepage distance	$s$	1550 mm
Drawing-no.	FT4-099929	
Part-no. (see drawing)	75272901	
Weight approx.	25 kg	



see brochure 751 page 9

### High-voltage high-breaking-capacity fuses



#### Type H 221 Sta (with striker pin)

Rated voltage: 36 kV  
Rated current: bis 63 A

All types of our h.v.h.b.c. fuses are made with porcelain tubes which are glazed brown for use indoors and outdoors.

see brochure 791

$\varnothing A$	B	$\varnothing C_2$ (min.)	$\varnothing C_1$ and $C_2$ (max.)	$e_{-1}^0$
$45 \pm 1$	$33 \begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$	50	88	537

## **Our range of products includes:**

### **Medium-voltage systems**

- Single-bus and duplicate-bus switchgear
- Non-withdrawable, withdrawable, and truck-type units
- Compact switchgear assemblies
- Custom-made models
- Industrial systems

### **Medium-voltage switchgear**

- Indoor switches, disconnectors, and earthing switches (single and triple pole)
- Indoor circuit breakers (vacuum)
- Outdoor switches (low oil content and vacuum)
- High-voltage high-breaking-capacity fuses

### **Low-voltage systems**

- Open-framework design
- Enclosed break devices (up to 6.300 A)
- Cable and fixed-station distribution cabinets

### **Low-voltage switchgear**

- Switch disconnectors
- Switch and fuse blocks
- Low-voltage high-breaking-capacity fuses

### **Driving gear**

- Hand-operated and motor-operated mechanisms
- Indoor and outdoor driving gear

### **Accessories**

- For medium and low voltages
- For station equipment
- Insulators (0.5 kV - 38.5 kV)
- Plastic and glass-reinforced plastic screening

Dimensions, weights, diagrams and descriptions in this brochure are non-binding. Subject to change without notice.

**switching • electricity • safely**

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