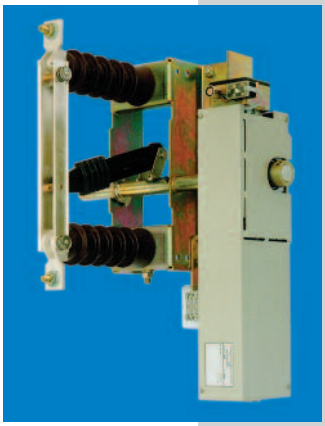
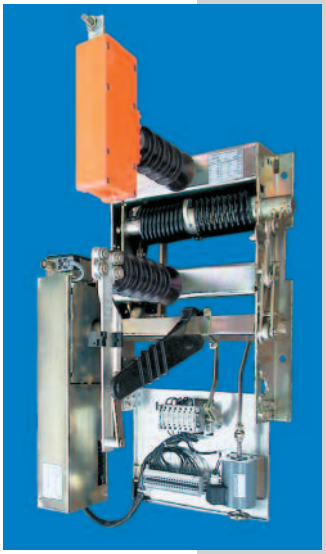
DRIESCHER -

Indoor Switches for Railway lines

- 1-pole design
- Nominal voltage up to 27.5 kV
- Rated current up to 4000 A





Driescher Moosburg
switching • electricity • safely
www.driescher.com

Railway

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DRIESCHER - Indoor switches for railway lines

according to EN 50152-2

content

- 3 **1-pole indoor switch-disconnector H 27-1B;** Un 15 kV
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- 6 **1-pole indoor disconnector L 31;** Un 15 kV, 630 A
- 7 **1-pole indoor disconnector L 31;** Un 15 kV, 1600 A
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- 15 **Fuse-holders L 31;** Un 27.5 kV**,** High-voltage high-breaking-capacity fuses 24 kV and 36 kV
- 16 **Stroke limitation pads**

General

These Driescher indoor switching devices are specifically designed for railway applications.
They are in compliance with the specifications according to EN 50152-2.
The 1-pole switches can be used for a rated voltage range of 15 kV to 27.5 kV, depending on the respective design, and for a rated current range of 400 A to 4000 A.
References: 25 kV Madrid-Sevilla; 27,5 kV Harbin-Dalian, China

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

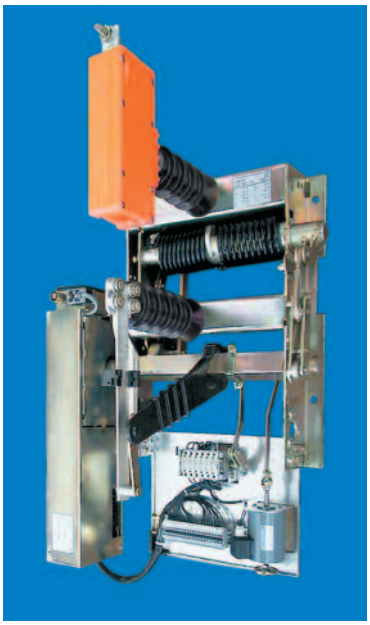
Technical description

Allgemein
These Driescher indoor switches are specially designed for railway applications. They meet the specifications according to the EN 50152-2.
The 1-pole switches are designed for a rated voltage range from 15 kV to 27.5 kV and a rated current range of 400 A to 4000 A.

Fittings
The switch disconnectors are basically fitted with a stored energy mechanism for rapid making and braking. The current carrying components are made of electrolytic copper with electro-silver plating in compliance with QTL 0200. All steel parts have been given an electro-plated coating which provides excellent corrosion resistance. Every switch is provided with an earthing screw.

DRIESCHER - Indoor switches for railway lines

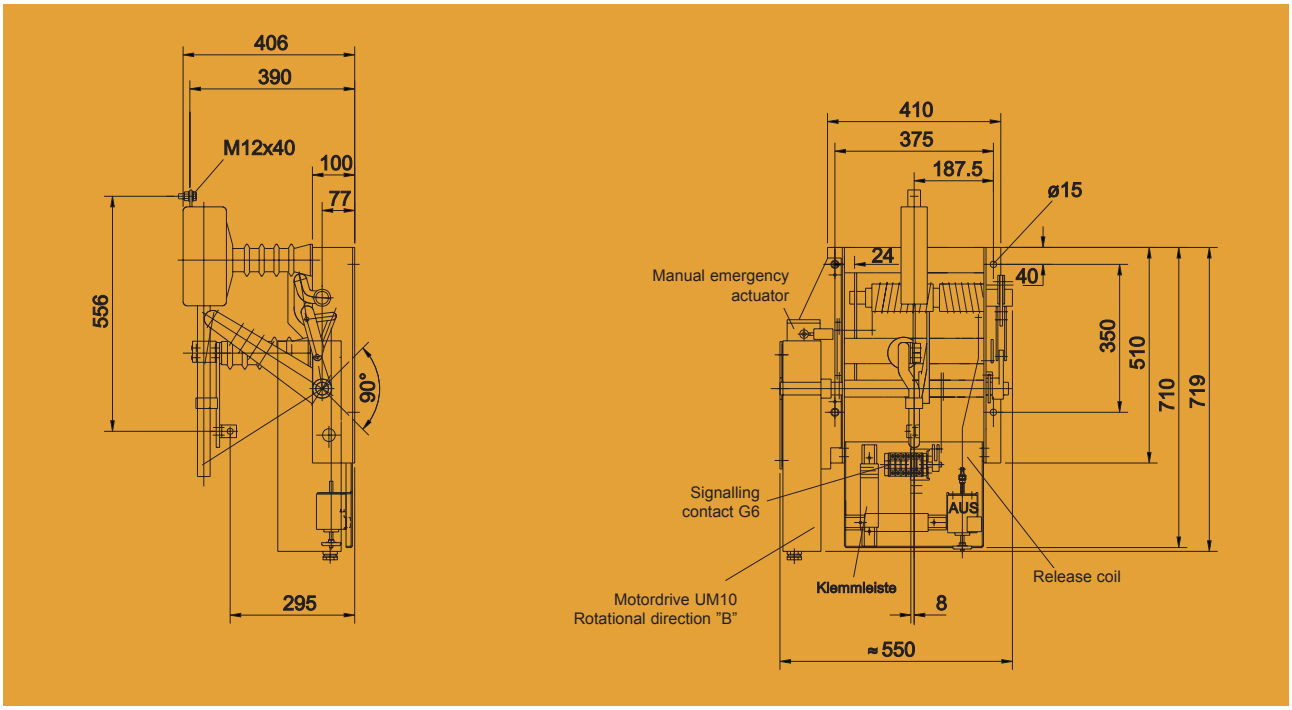
1-pole indoor switch-disconnector H 27-1B; Un 15 kV



Type		H 27-1B
Nominal voltage	U_n	15 kV
Rated current	I_n	400 A
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated breaking current	I_1	400 A
Rated short-time withstand current	I_k	16 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	40 kA
Rated short-circuit making current	I_{ma}	40 kA

1-pole indoor switch-disconnector H 27-1B
- with motordrive and release coil
- signalling contact (6-pole) and terminal strip
- for contact line feeders and transformer-train preheating

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

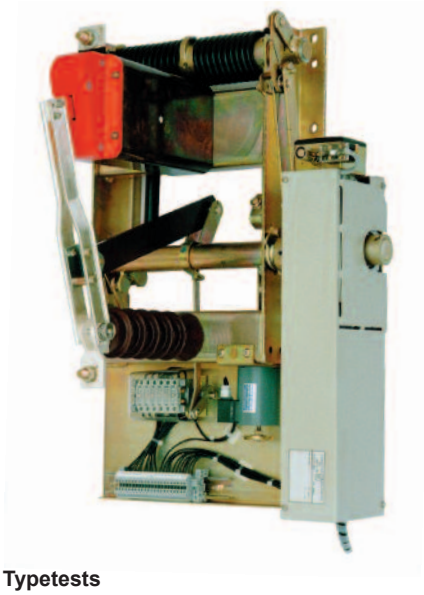


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive Type	Motordrive mechanism mounting side	Weight approx. kg
H 27-1B	LN3-098066	2-72722901	SP4-50909	60 V DC	UM 10 DB	left	45

DRIESCHER - Indoor switches for railway lines

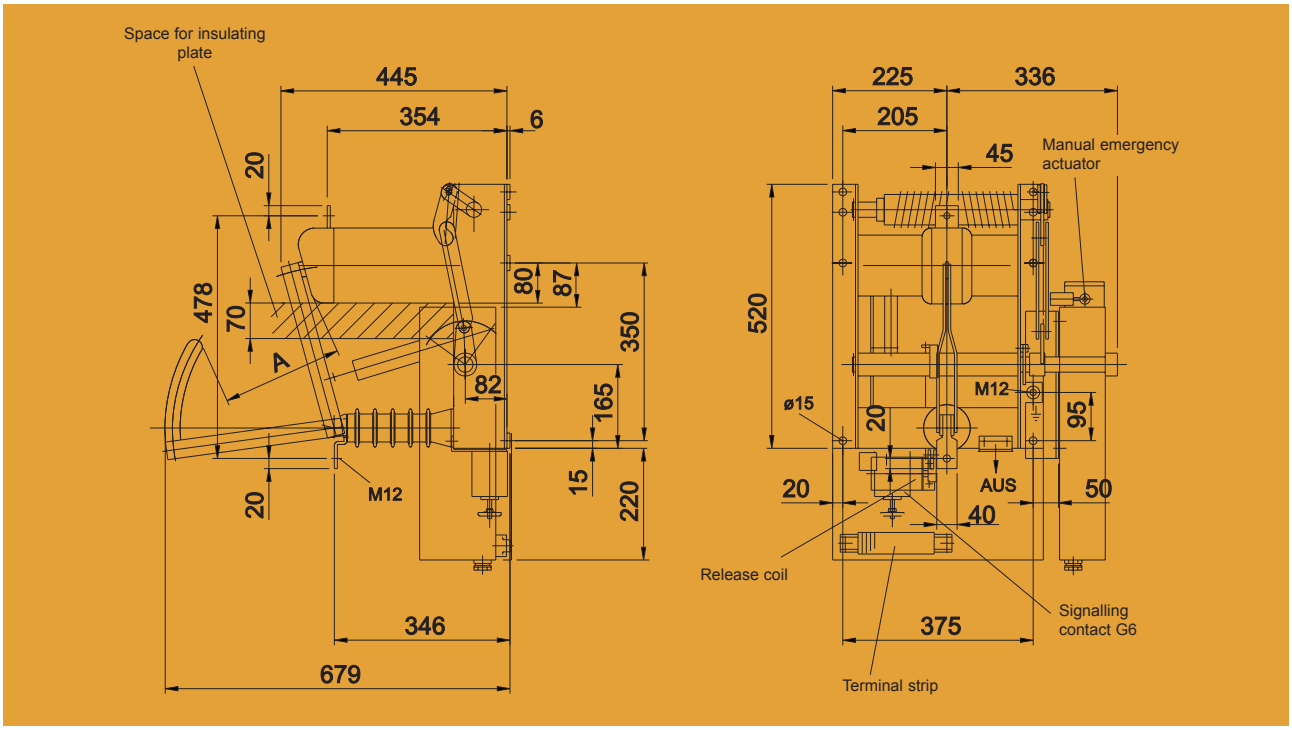
1-pole indoor switch-disconnector H 29-1B; Un 15 kV



Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

Type		H 29-1B
Nominal voltage	U_n	15 kV
Rated current	I_n	630 A
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated breaking current	I_1	100 A
Rated short-time withstand current	I_k	20 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	50 kA
Rated short-circuit making current	I_{ma}	5 kA

1-pole indoor switch-disconnector H 29-1B
- with motordrive and release coil
- signalling contact (6-pole) and terminal strip
- for contact line feeders and transformer-train preheating



• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive Type	Motordrive mechanism mounting side	Weight approx. kg
H 29-1B	LG4-068733	2-72952906	SP4-50909	60 V DC	UM 10 DB	right	50

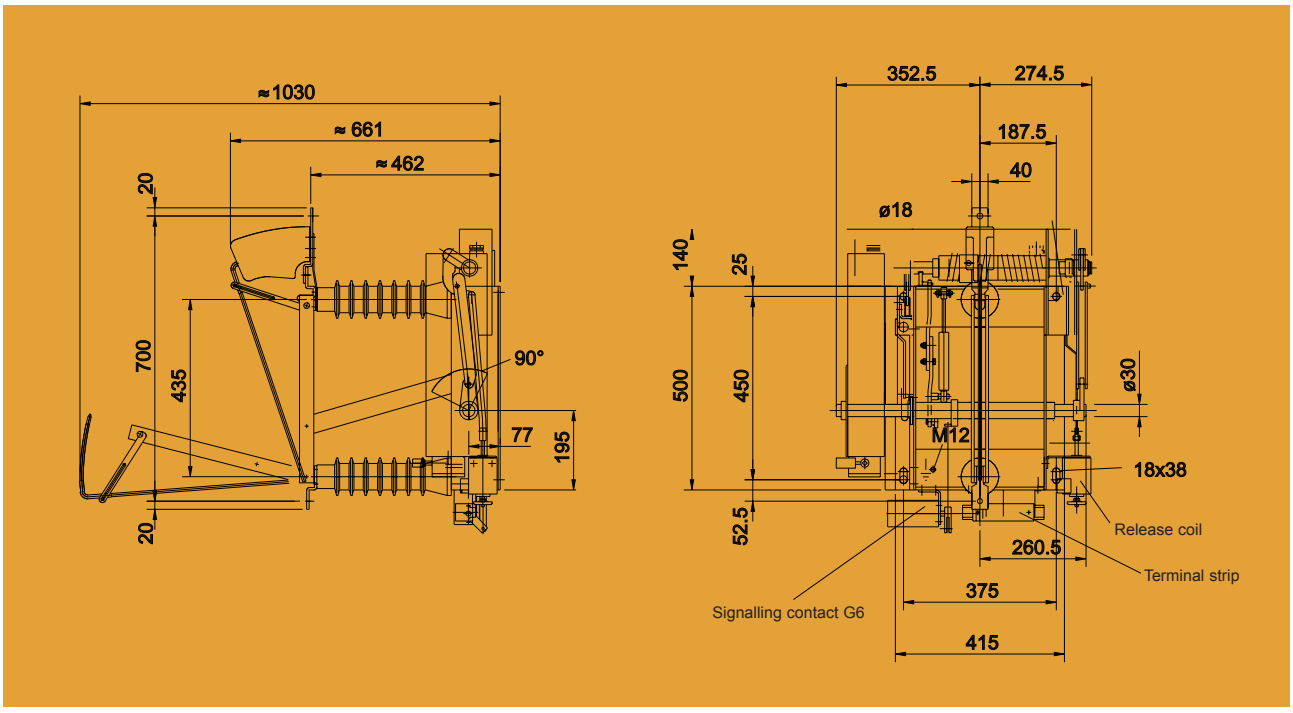
DRIESCHER - Indoor switches for railway lines

1-pole indoor switch-disconnector H 22-1B; Un 27.5 kV

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

Type		H 22-1B
Nominal voltage	U_n	27.5 kV
Rated current	I_n	630 A
Rated insulation level	U_{Nm}	29 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	630 A
Rated short-time withstand current	I_k	20 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	50 kA
Rated short-circuit making current	I_{ma}	20 kA

1-pole indoor switch-disconnector H 22-1B
- with motordrive and release coil
- with signalling contact (6-pole) and terminal strip
- for contact line feeders and transformer-train preheating

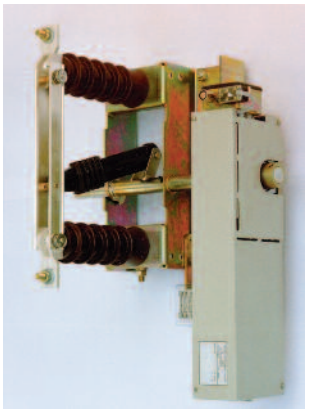


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive Type	Motordrive mechanism mounting side	Weight approx. kg
H 22-1B	LI3-094777	722 62900	SP3-55644/A	60V DC	UM 10	left	45

DRIESCHER - Indoor switches for railway lines

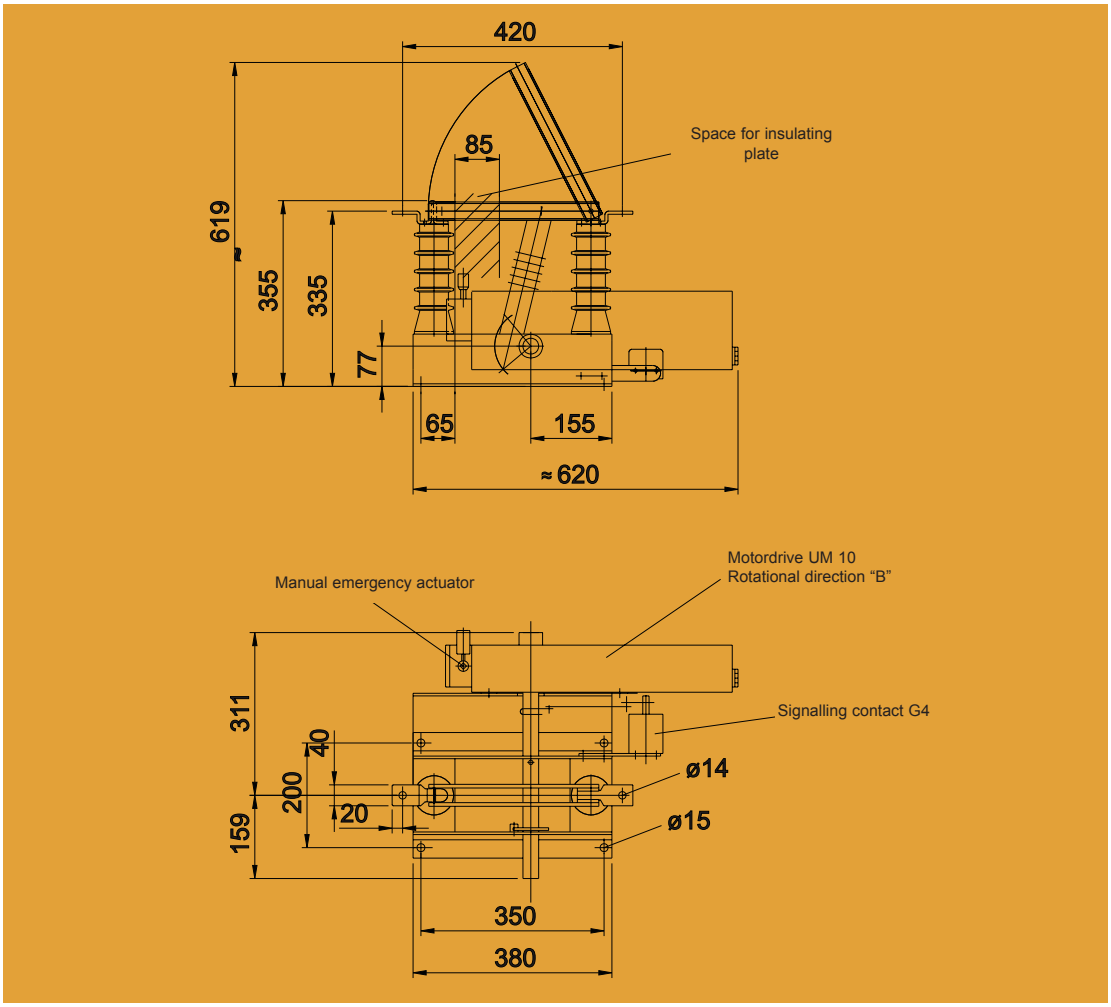
1-pole indoor disconnector L 31; Un 15 kV, In 630 A



Type		L 31/070194
Nominal voltage	U_n	15 kV
Rated current	I_n	630 A
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated short-time withstand current	I_k	20 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	50 kA

Typetests
• according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor-disconnector L 31/070194
• with motordrive
• 4-pole signalling contact

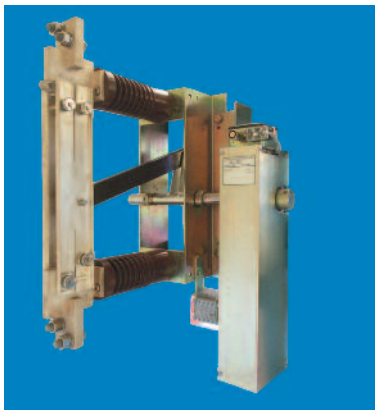


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L31/070194	IT4-070194	2-73153161	SP4-50907	60V DC	right	UM 10 DB	40
L31/070194	IT4-070199	2-73153163	SP4-55998	220V DC	right	UM 10 DB	40

DRIESCHER - Indoor switches for railway lines

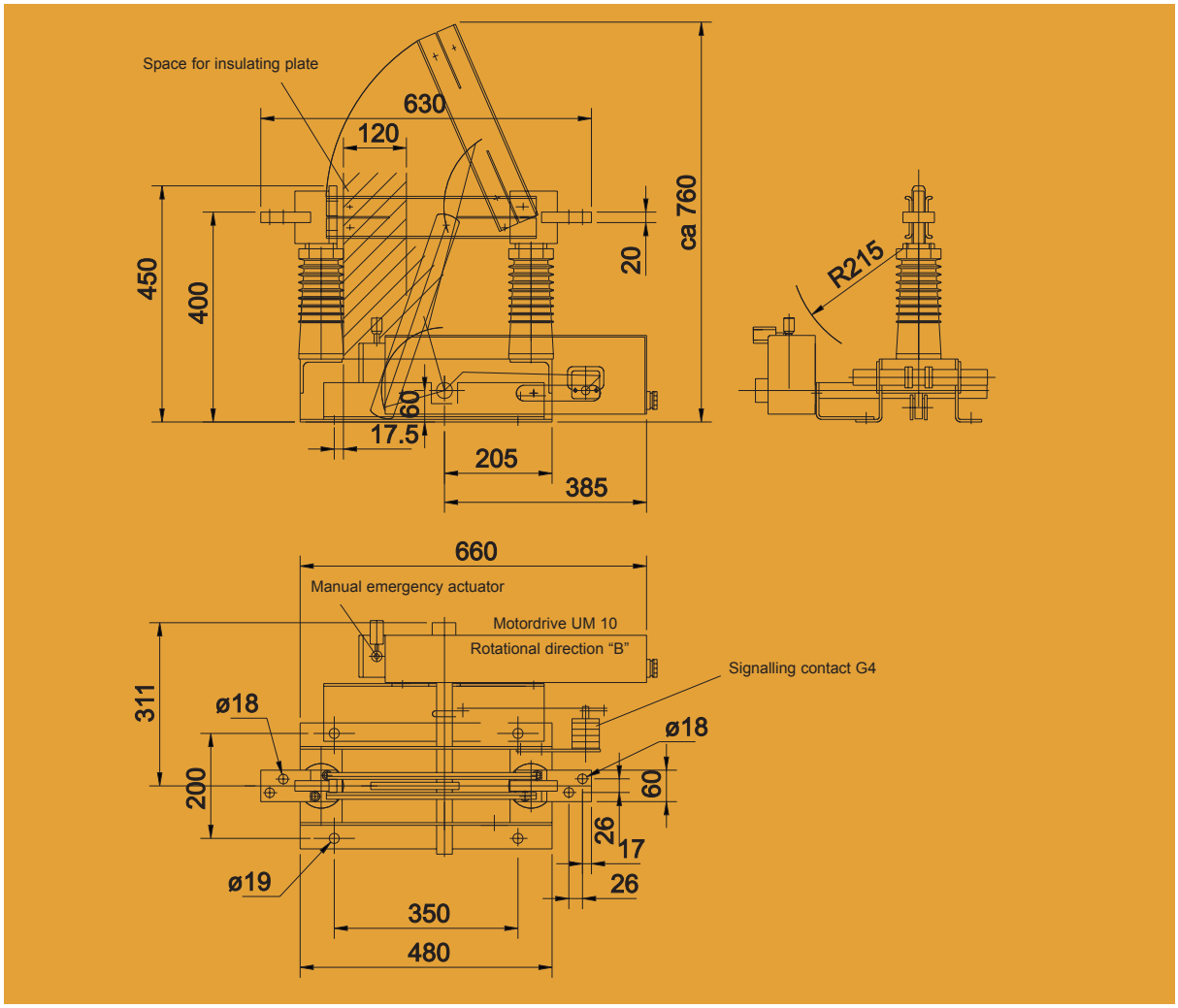
1-pole indoor disconnector L 31; Un 15 kV, In 1600 A



Type		L 31/070196
	U_n	
Nominal voltage	I_n	15 kV
Rated current	U_{Nm}	1600 A
Rated insulation level	U_{Ni}	17.5 kV
Rated impulse voltage	U_a	125 kV
Short-duration power-frequency test level	f_r	50 kV
Rated frequency (A.C.)	I_k	16.7 Hz
Rated short-time withstand current	t_k	31.5 kA
Rated duration of short-curcuit current	I_p	1 s
Rated peak withstand current		80 kA

Typetests
• according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor disconnector L 31/070196
• with motordrive
• 4-pole signalling contact

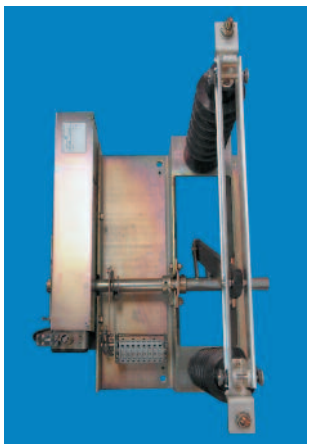


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/070196	IT4-070196	2-73672301	SP4-50907	60V DC	right	UM 10 DB	45
L 31/070197	IT4-070197	2-73672303	SP4-55998	220V DC	right	UM 10 DB	45

DRIESCHER - Indoor switches for railway lines

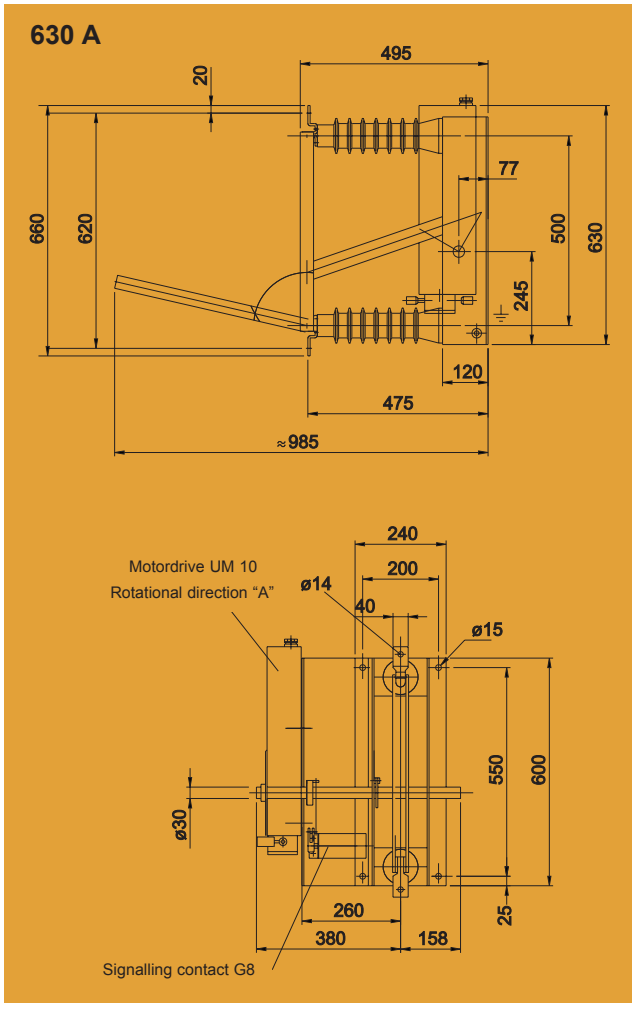
1-pole indoor disconnector L 31; Un 27.5 kV, In 630 A / 1250 A

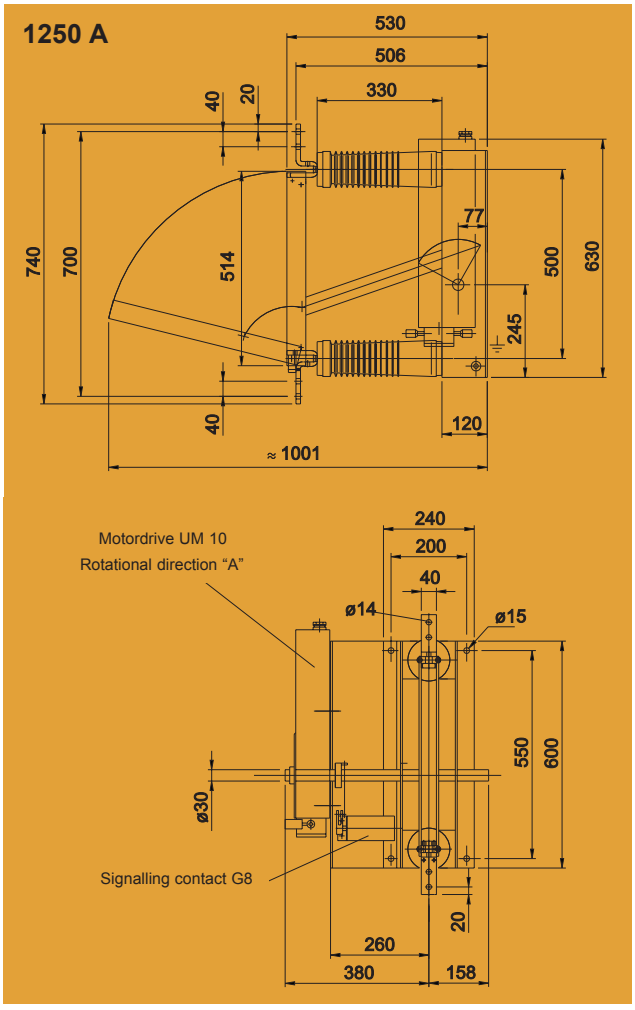


Type		L 31/093304	L 31/094741
Nominal voltage	U_n	27.5 kV	27.5 kV
Rated current	I_n	630 A	1250 A
Rated insulation level	U_{Nm}	29 kV	29 kV
Rated impulse voltage	U_{Ni}	185 kV	185 kV
Short-duration power-frequency test level	U_a	80 kV	80 kV
Rated frequency (A.C.)	f_r	50 Hz	50 Hz
Rated short-time withstand current	I_k	20 kA	31,5 kA
Rated duration of short-curcuit current	t_k	1 s	1 s
Rated peak withstand current	I_p	50 kA	80 kA

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor-disconnector L 31
- with motordrive
- 8-pole signalling contact



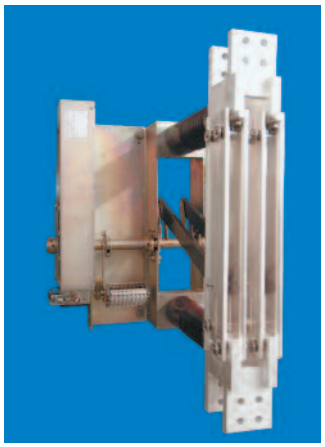


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/093304	L31-093304	731 69900	SP3-55644/A	60V DC	left	UM 10	40
L 31/094741	L31-094741	731 99900	SP3-55644/A	60V DC	right	UM 10	43

DRIESCHER - Indoor switches for railway lines

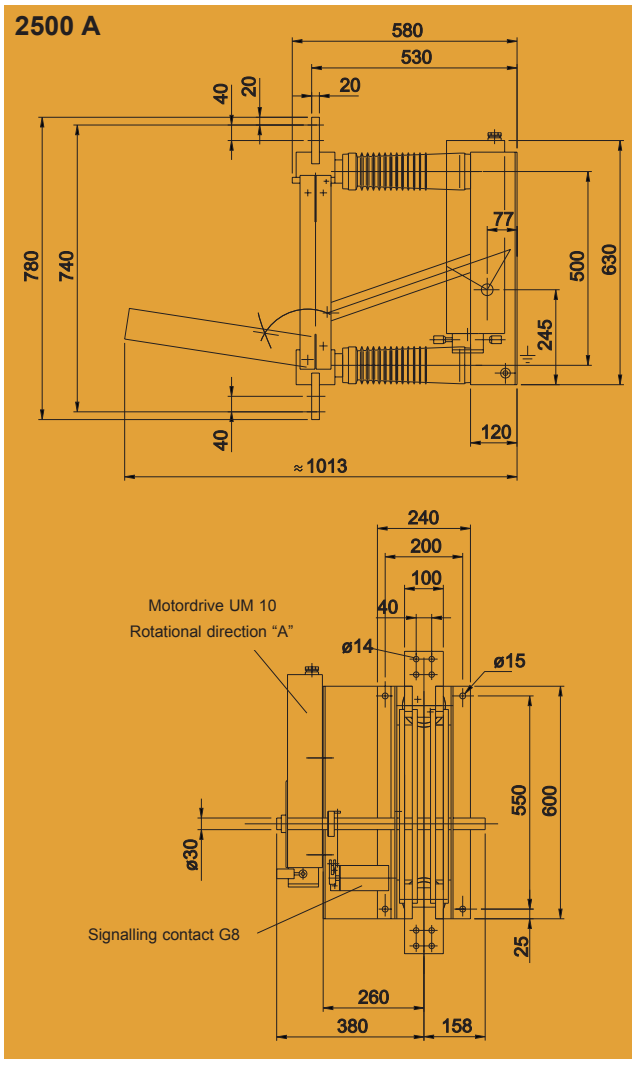
1-pole indoor disconnector L 31; Un 27.5 kV, In 2500 A / 4000 A

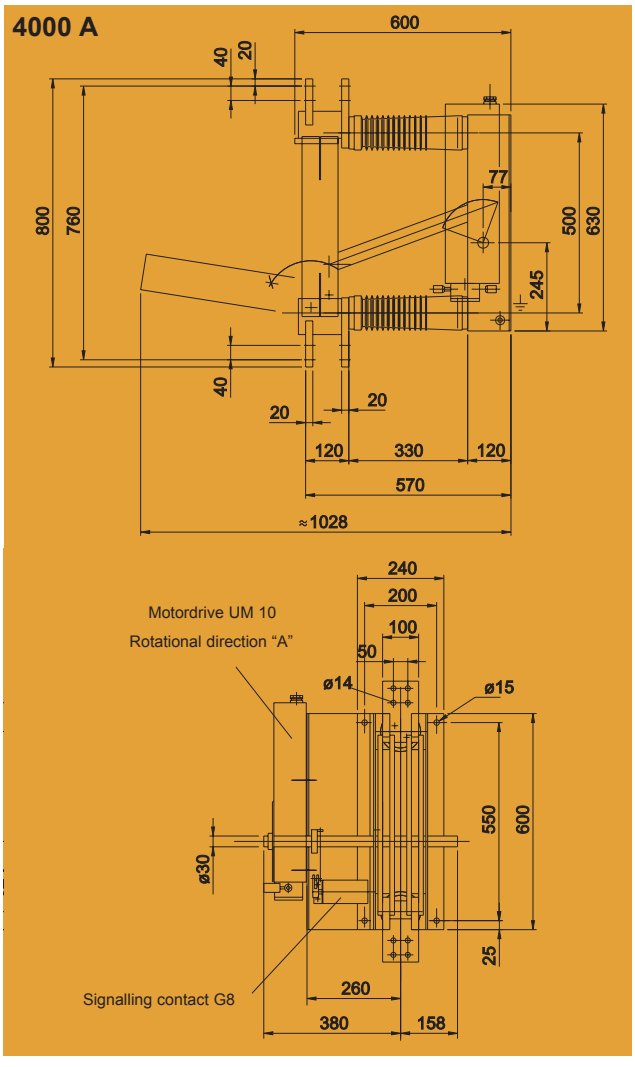


Type		L 31/093305	L 31/093306
Nominal voltage	U_n	27.5 kV	27.5 kV
Rated current	I_n	2500 A	4000 A
Rated insulation level	U_{Nm}	29 kV	29 kV
Rated impulse voltage	U_{Ni}	185 kV	185 kV
Short-duration power-frequency test level	U_a	80 kV	80 kV
Rated frequency (A.C.)	f_r	50 Hz	50 Hz
Rated short-time withstand current	I_k	40 kA	50 kA
Rated duration of short-curcuit current	t_k	1 s	1 s
Rated peak withstand current	I_p	100 kA	125 kA

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor-disconnector L 31
- with motordrive
- 8-pole signalling contact





• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/093305	L31-093305	736 83990	SP3-55644/A	60V DC	left	UM 10	45
L 31/093306	L31-093306	736 84990	SP3-55644/A	60V DC	right	UM 10	50

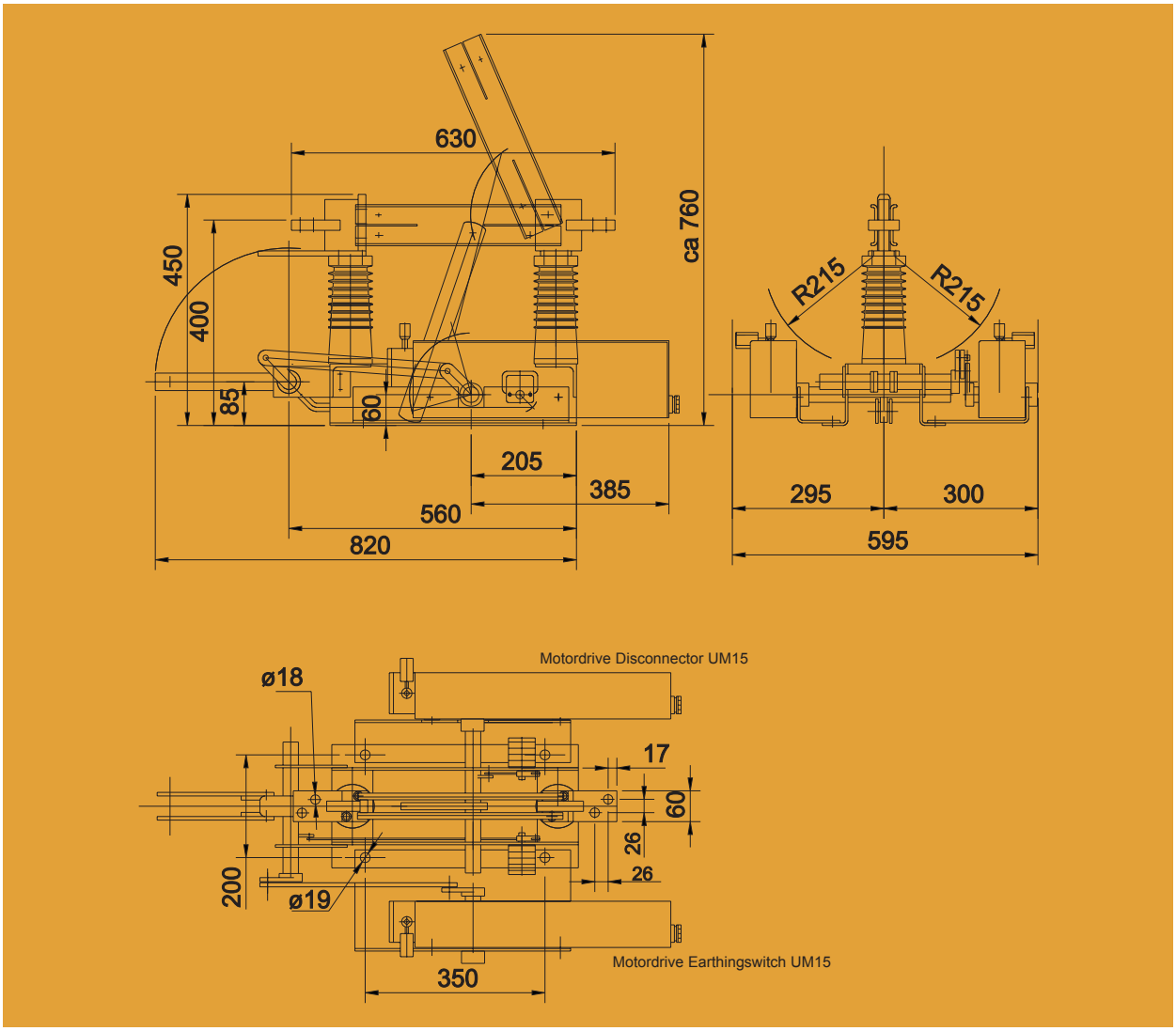
DRIESCHER - Indoor switches for railway lines

1-pole indoor disconnector with earthing switch Typ L 31; Un 15 kV

1-pole indoor disconnector
with mounted earthingswitch
- each with motordrive
- each with 4-pole signalling contact

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

Type		L 31/090820	L 31/100065
Nominal voltage	U_n	15 kV	15 kV
Rated current	I_n	1600 A	1600 A
Rated insulation level	U_{Nm}	17.5 kV	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV	125 kV
Short-duration power-frequency test level	U_a	50 kV	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz	16.7 Hz
Rated short-time withstand current	I_k	31.5 kA	20 kA
Rated duration of short-curcuit current	t_k	1 s	1 s
Rated peak withstand current	I_p	80 kA	80 kA



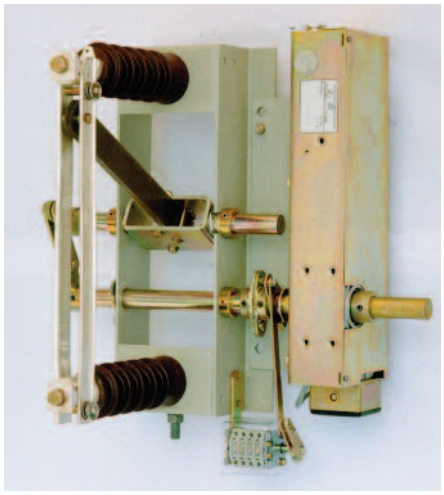
• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/090820	L31-090820	2-73672901	SP4-50907	60 V DC	right*	UM 15 DB	55
L 31/100065	L31-100065	2-73672905	SP4-50606	230 V AC	left*	UM 15 DB	55

* Motordrive on disconnector right, on earthingswitch left

DRIESCHER - Indoor switches for railway lines

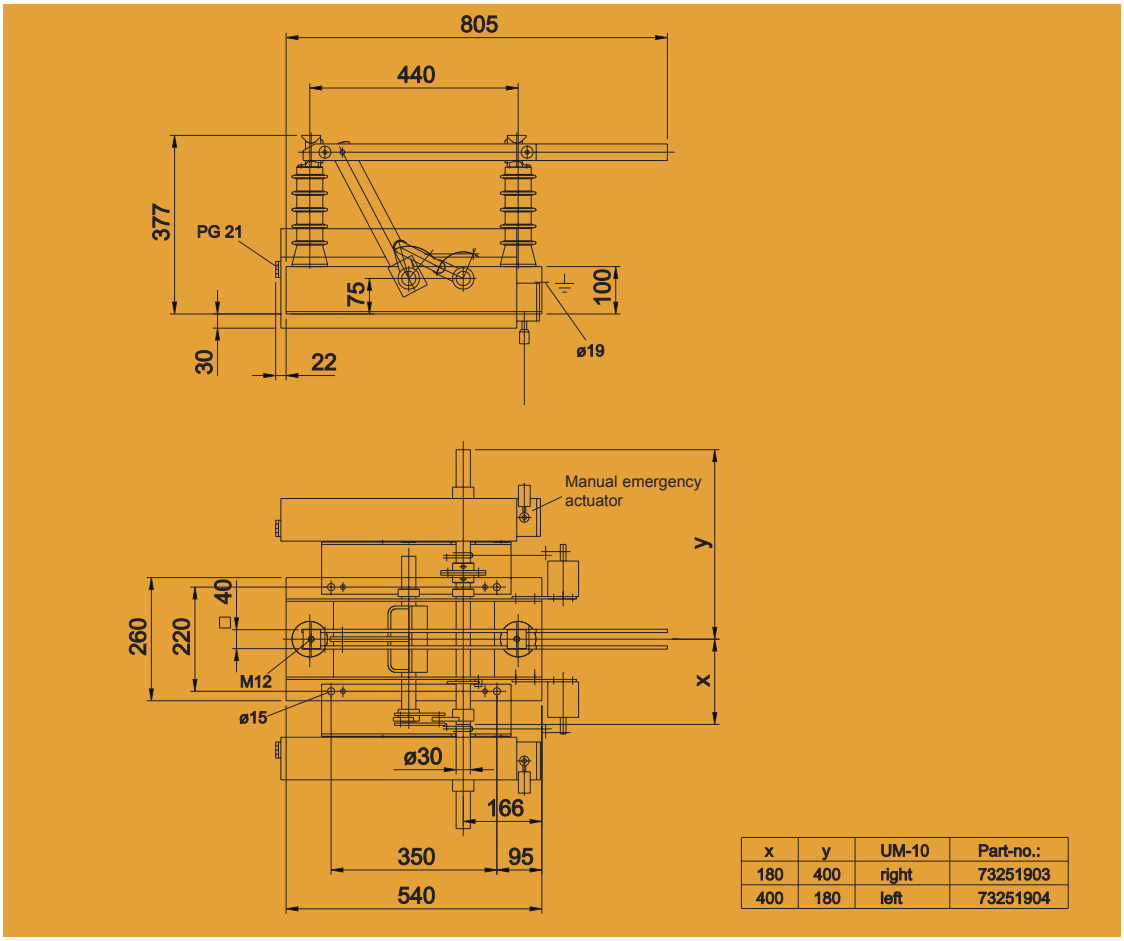
1-pole indoor slide-disconnector L 31; Un 15 kV, 630 A



Type		L 31/059871
Nominal voltage	U_n	15 kV
Rated current	I_n	630 A
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated short-time withstand current	I_k	20 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	50 kA

1-pole indoor slide-disconnector L 31/059871
- with motordrive left or right
- 4-pole signalling contact

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)



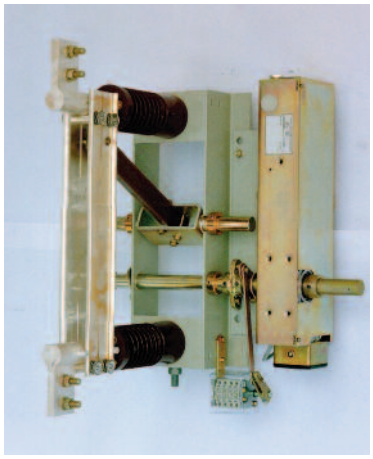
x	y	UM-10	Part-no.:
180	400	right	73251903
400	180	left	73251904

• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/59871	IT4-059871/1	2-73251903	SP4-50606	60V DC	right	UM 10	45
L 31/59871	IT4-059871/2	2-73251904	SP4-50606	60V DC	left	UM 10	45

DRIESCHER - Indoor switches for railway lines

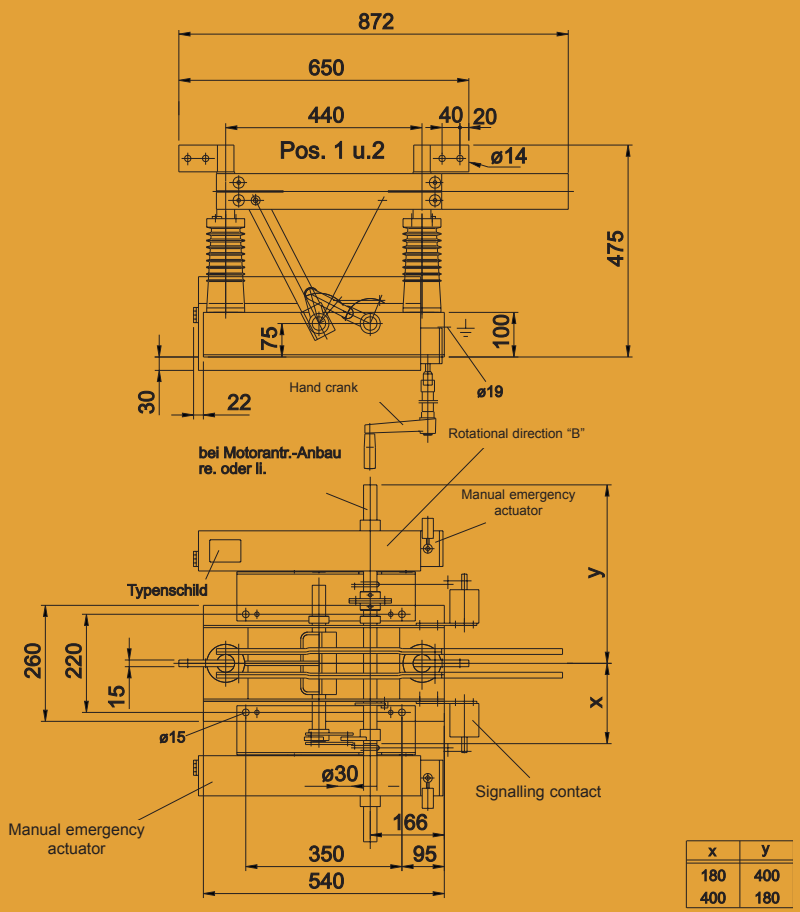
1-pole indoor slide-disconnector L 31; Un 15 kV, 1600 A



Type		L 31/059872
Nominal voltage	U_n	15 kV
Rated current	I_n	1600 A
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated short-time withstand current	I_k	31.5 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	80 kA

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole slide-disconnector L 31/059872
- with motordrive left or right
- 4-pole signalling contact



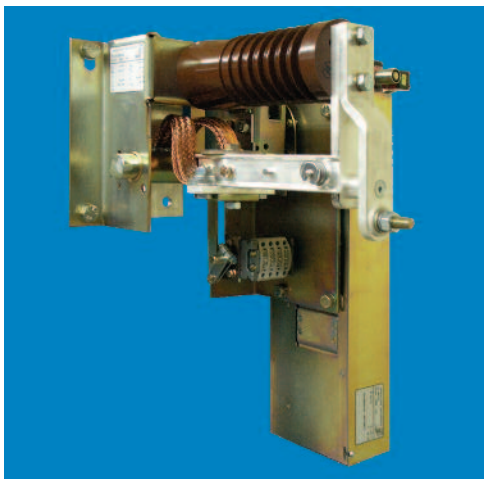
x	y
180	400
400	180

• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/59872	IT4-059872/1	2-73201903	SP4-50606	60V DC	right	UM 10	55
L 31/59872	IT4-059872/2	2-73201904	SP4-50606	60V DC	left	UM 10	55

DRIESCHER - Indoor switches for railway lines

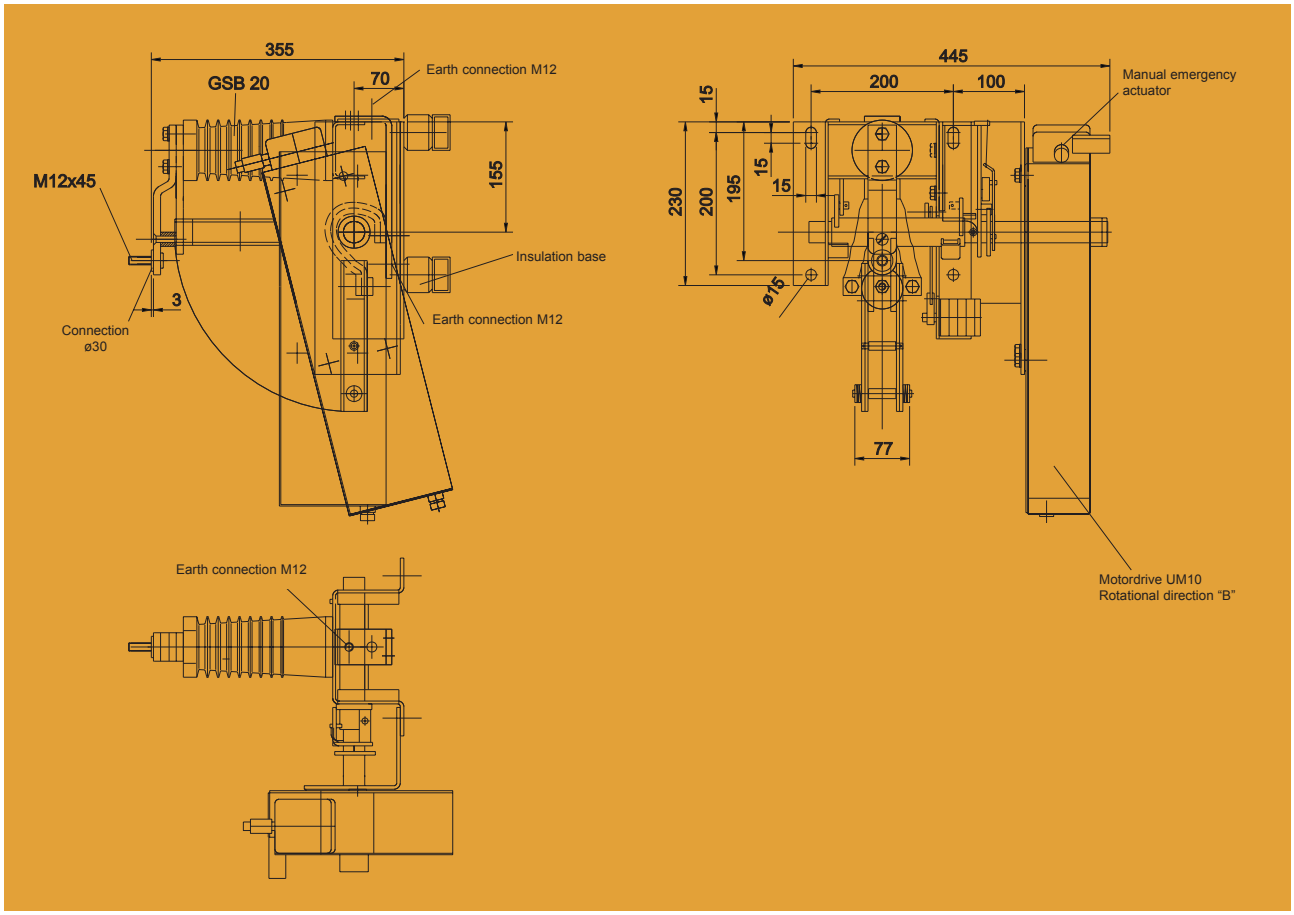
1-pole indoor earthing switch L 31; Un 15 kV



Type		L 31/090323
Nominal voltage	U_n	15 kV
Rated insulation level	U_{Nm}	17.5 kV
Rated impulse voltage	U_{Ni}	125 kV
Short-duration power-frequency test level	U_a	50 kV
Rated frequency (A.C.)	f_r	16.7 Hz
Rated short-time withstand current	I_k	31.5 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	80 kA
Rated short-circuit making current	I_{ma}	80 kA

Typetests
- according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor earthing switch L 31/090323
- with motordrive
- 4-pole signalling contact

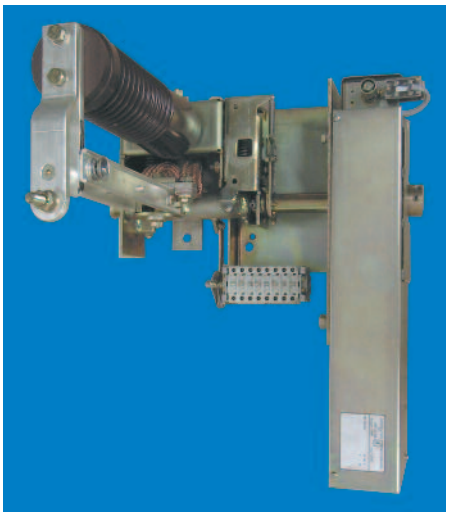


• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/090323	IT3-090323	2-73445160	SP4-50907	60V DC	right	UM 10 DB	35

DRIESCHER - Indoor switches for railway lines

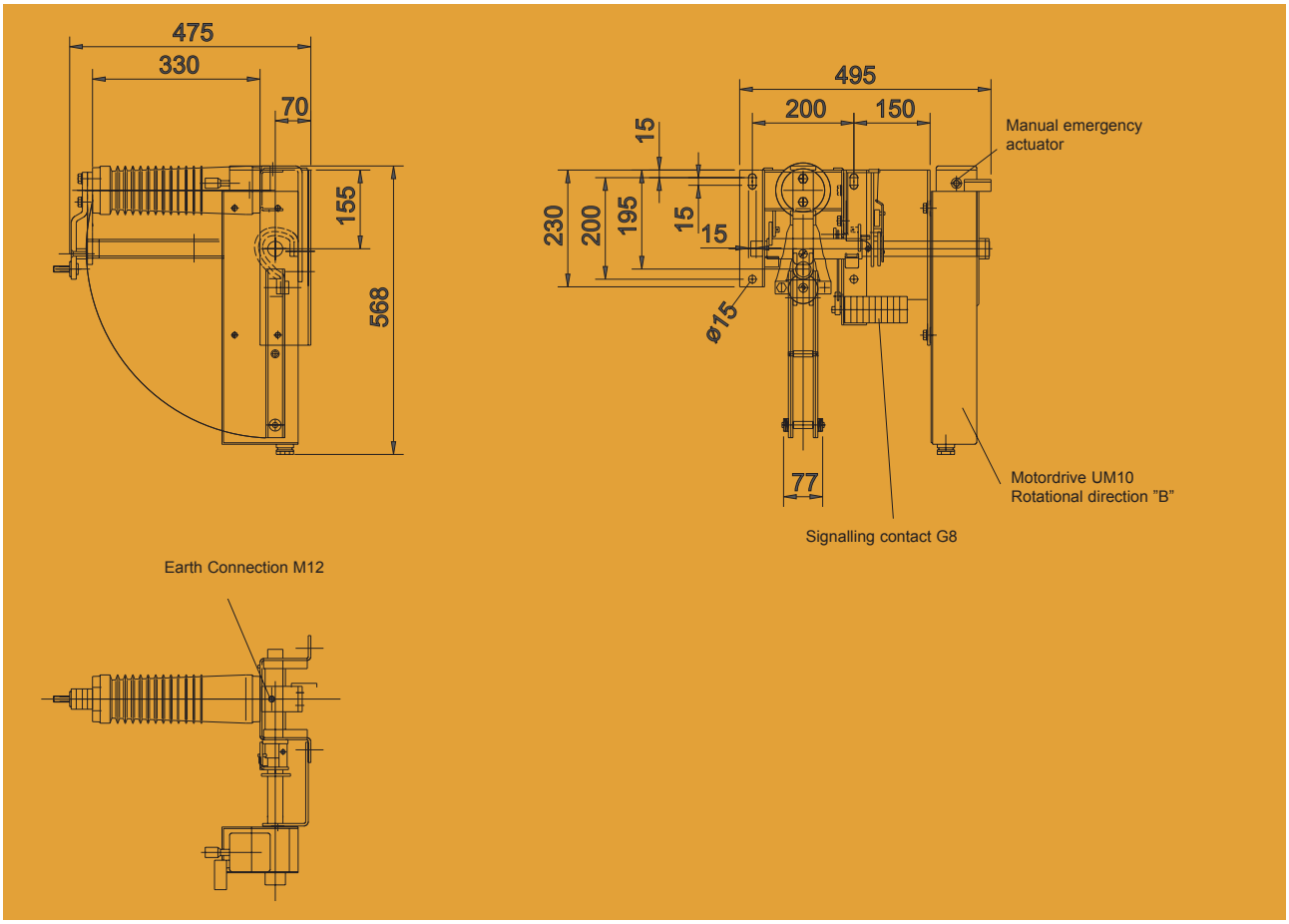
1-pole indoor earthing switch L 31; Un 27.5 kV



Type		L 31/093302
Nominal voltage	U_n	27.5 kV
Rated insulation level	U_{Nm}	29 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 short-time withstand current	I_k	31.5 kA
Rated duration of short-curcuit current	t_k	1 s
Rated peak withstand current	I_p	80 kA

Typetests
• according to DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)

1-pole indoor earthing switch L 31/093302
• with motordrive
• 8-pole signalling contact



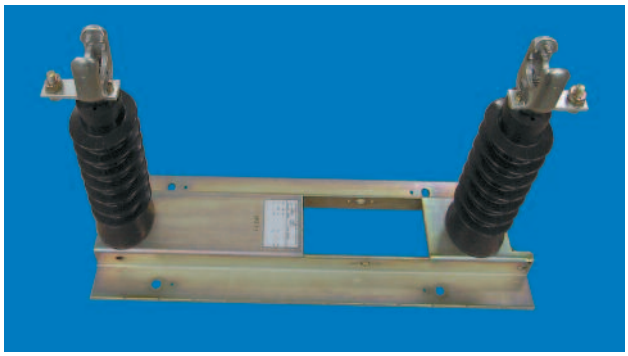
• Equipment

Switch Type	Drawing-no.	Part-no.	Wiring plan-no.	Motor-voltage	Motordrive mechanism mounting side	Motordrive Type	Weight approx. kg
L 31/093302	IT3-093302	73449900	SP3-55644/A	DC/AC	right	UM 10	35

DRIESCHER - Indoor switches for railway lines

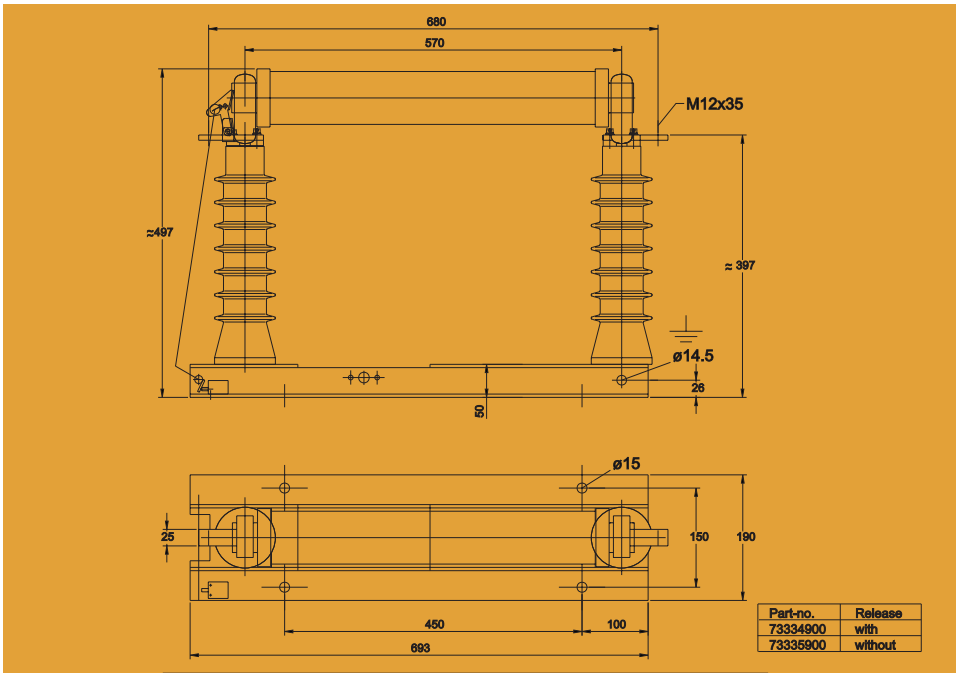
1-pole indoor fuse-holders L 31; Un 27.5 kV

1-pol. indoor fuse-holders with nominal voltage 27.5 kV.
Rated current 200 A to collet high-voltage high-breaking-capacity fuses for shunt switch heating systems.

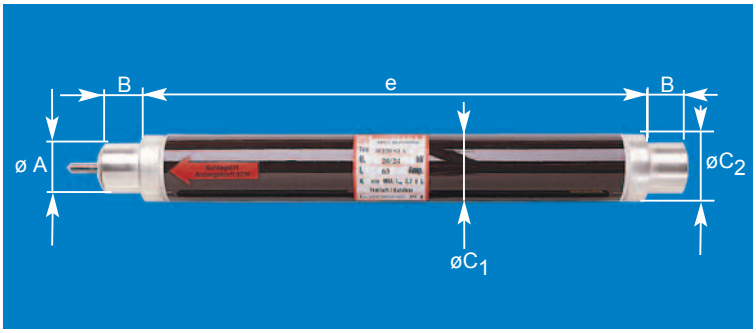


Type		L 31/093922
Nominal voltage	U_n	27.5 kV
Rated current	I_n	200 A
Rated insulation level	U_{Nm}	29 kV
Rated impulse voltage	U_{Ni}	185 kV
Short-duration power-frequency test level	U_a	80 kV
Rated frequency (A.C.)	f_r	50 Hz

Typetests
• nach DIN EN 50152-2 03/1998 (VDE 0115 part 320-2)



High-voltage high-Breaking-capacity fuses



Type H 221 Sta (with striker pin)

Rated voltage: 24 and 36 kV
Rated current: up to 200 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

ø A	B	øC2 (min.)	øC1 and C2 (max.)	e $^{0}_{-1}$
45 ± 1	33 $^{+2}_{0}$	50	88	442 (24 kV) 537 (36 kV)

Stroke limitation pads, 7 t or 10 t • Drawing no. AB2-25 281

Purpose of strike limitation pads

Because of frequent short circuits in contact-line networks, windings in main transforming stations are during operation exposed to extraordinary mechanical stress. That stress is taken into account even when transformers are being built by using extremely strong clamping structures and high winding pressures.
Since, however, windings will, despite preparatory treatment, set during isolation through compression of hollow spaces, the arrangement for the past few years has been that all new transformers will, after an operating time of approximately 3 hours, be re-compressed at the manufacturer's plant.
This re-compressing has proved a success but causes high cost (trans-former installation and removal, transport, wage costs or replacement transformer).

The Bundesbahn Central Office has therefore developed a stroke-limitation pad (the "HB pad") which in future will render redundant the re-compressing of transformers equipped with such pads.
The HB pad (drawing number, 2 Ekk 702.6.12.82.851.00) will be installed instead of the clamping screws which have until now been customary.
The task of the HB pad is to transfer the winding pressure from the clamping bolt via the winding's thrust collar to the winding and to compensate for the shortening of the winding which is caused by setting and high-impact short circuits, and thus to maintain the length of the winding.

Part-no. 7 t	Part-no. 10 t
772 07007	772 07010

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