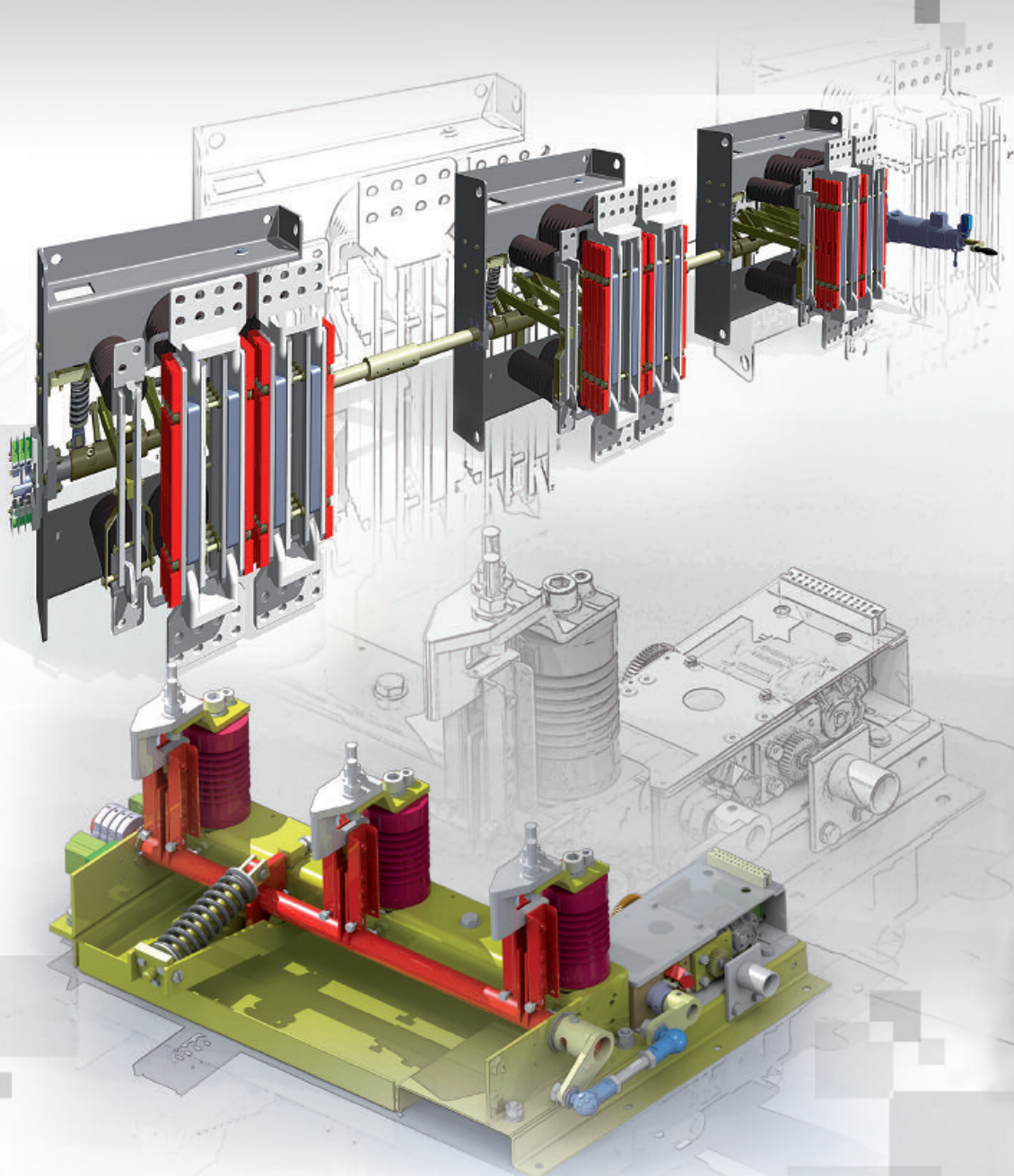


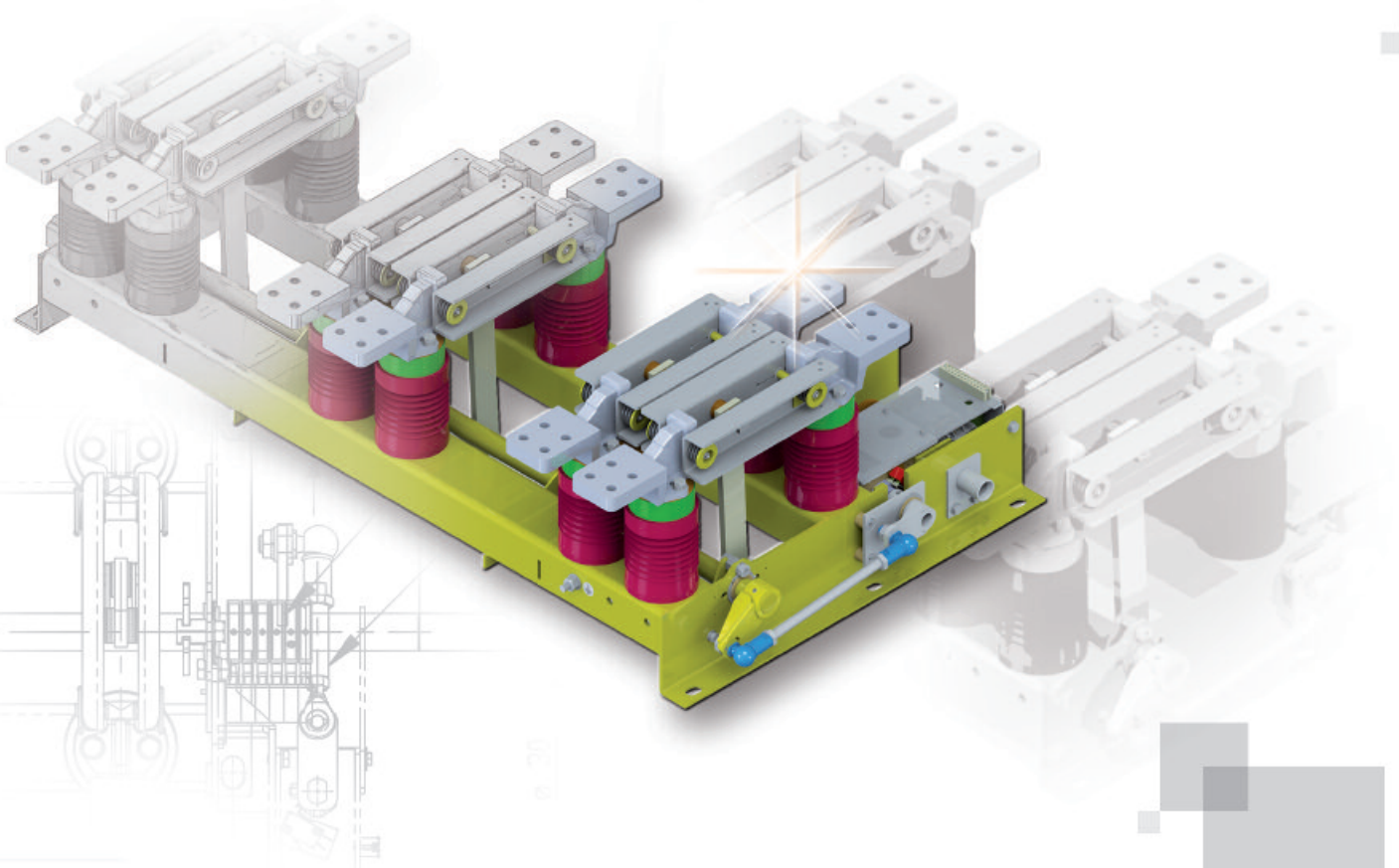


MEDIUM-VOLTAGE SWITCHGEAR...



FLOHE HAS STOOD FOR QUALITY EUROPE PRODUCTS

IN THE FIELD OF LOW AND MEDIUM VOLTAGE EQUIPMENT SINCE 1946

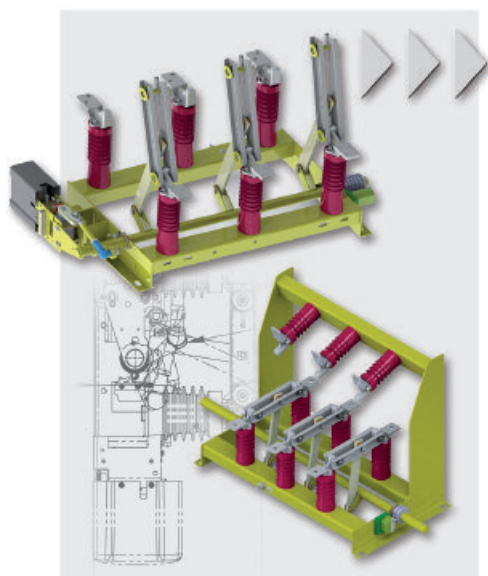


THE DIVISION RELATING TO MEDIUM VOLTAGE EQUIPMENT IS THE LATEST DEVELOPMENT FROM FLOHE

- In recent years, an independent and solid part of the group has emerged from the takeover of a small company in central Germany. Through the acquisition of the sales and manufacturing activities of a major German electrical company, it has been possible to extend the range continuously.
- Today, in the field of medium voltage equipment, we deal with all kinds of circuit breakers. Our range covers equipment from 1.5 kV to 40.5 kV. We achieve maximum amperages of up to 24000 A. In addition, standard grounding connections and grounding connections which cannot be powered up are part of the range of products. Here, we achieve surge currents up to 410 kA.
- Our equipment is based on a modular-system. Despite this, we implement application-specific and customer specific solutions in each of our orders.

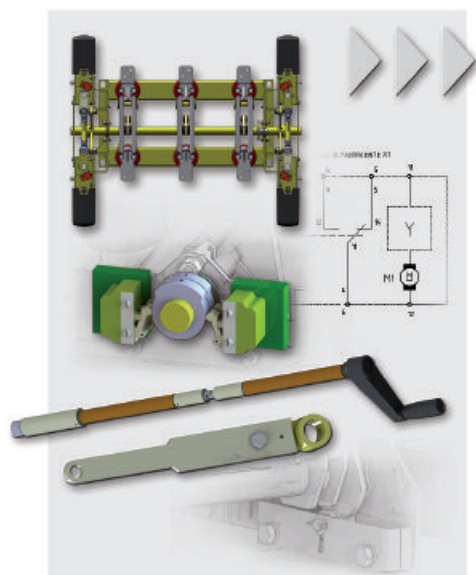
THE CATALOGUE PROVIDES A BRIEF OVERVIEW
OF THE TECHNICAL RANGE. CONTACT US!

CONTENTS



SWITCHGEAR...

With tradition into the future	4 - 5
Isolators	6 - 15
Isolator/Grounding connection combinations	16 - 27
Changeover disconnectors	28 - 29
Grounding devices	30 - 33
Earth proven grounding devices	34 - 39
Grounding devices ETM	40 - 41



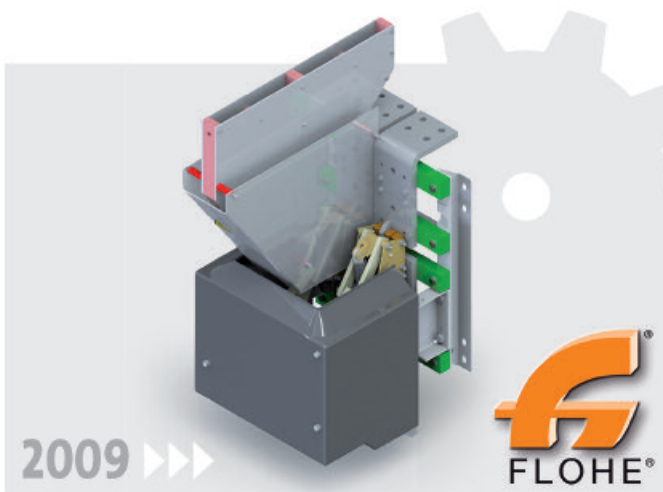
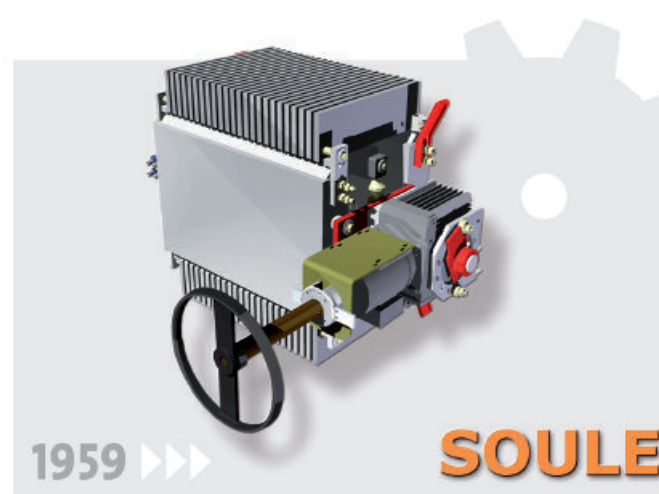
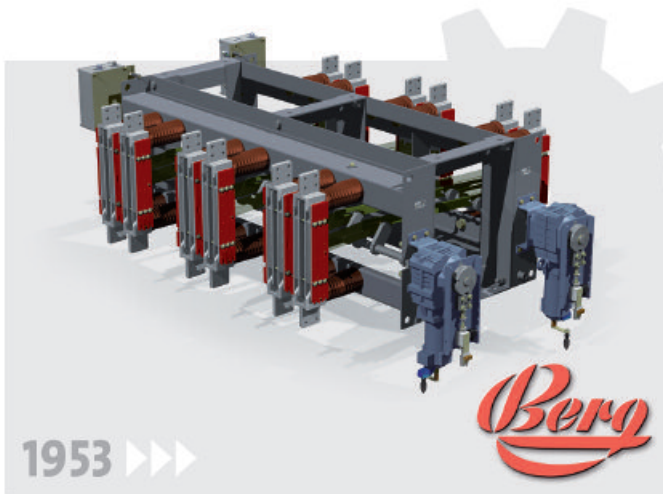
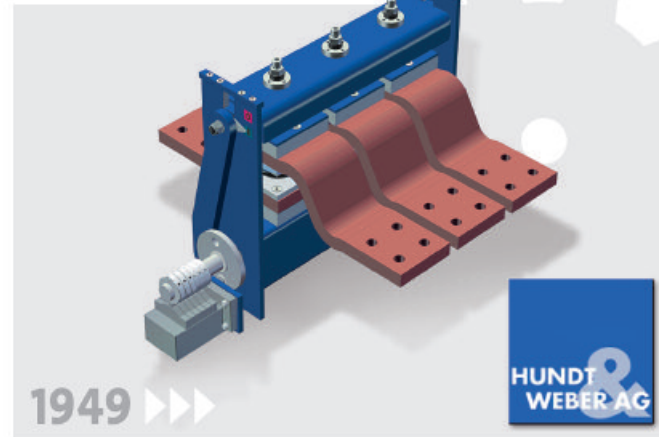
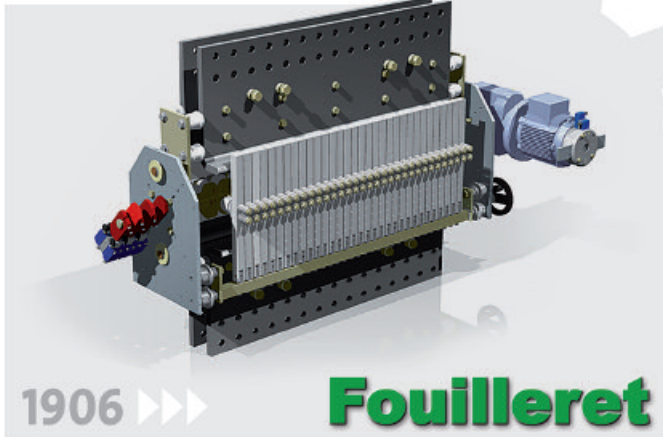
ATTACHMENTS...

Motor drives	42 - 47
Circuit diagrams	48
Auxiliary switches	49
Lever / Emergency hand levers	50
Locking mechanisms	51



Short name / Configurator	52 - 54
Environmental conditions	55

With tradition...



SINCE MORE THAN 110 YEARS



EXPERT TEAM FOR SWITCHING EQUIPMENT

FLOHE can build on the experience and know-how in switching equipment of the renowned traditional companies and develop these products with an experienced team.

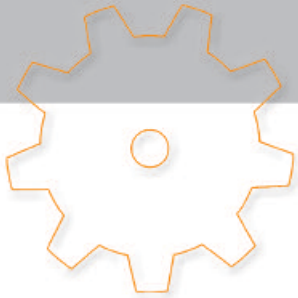
HIGH CURRENT

MEDIUM VOLTAGE

TRACTION

The range of services of our new companies includes the engineering, manufacturing of components and systems, and on-site service.

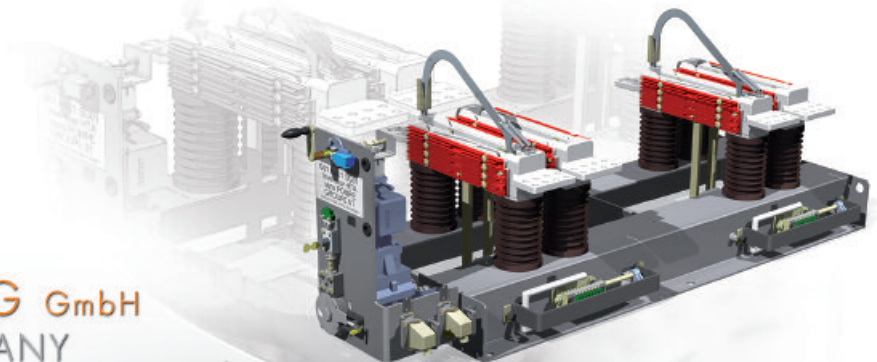
This covers the entire service spectrum of electrolysis (power rails, switches, flexible connections, installation and on-site maintenance), medium voltage (isolator switches, earthing switches, flexible connections), railway technology (circuit breakers, switch cabinet system solutions).



... into the future

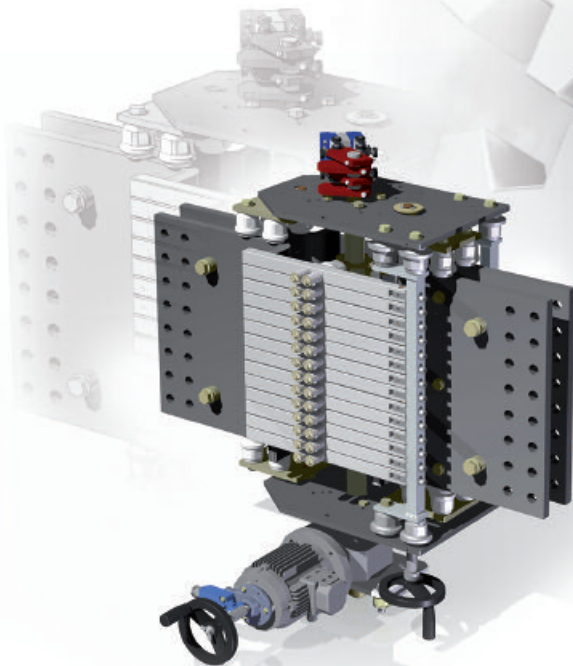


BERG GmbH
GERMANY

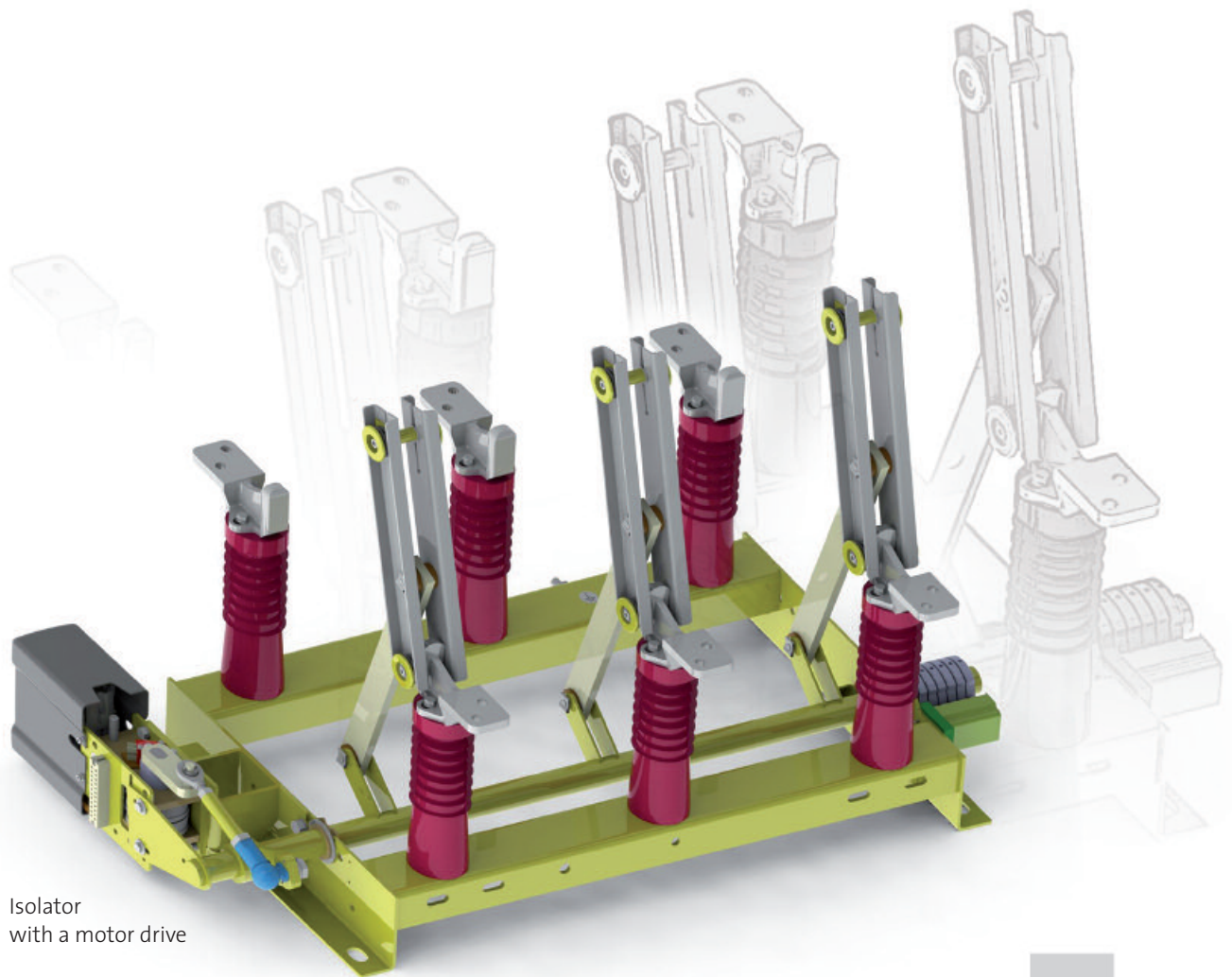


MEDIUM VOLTAGE
& TRACTION

HIGH CURRENT
SWITCHES



FOUILLERET SAS
FRANCE

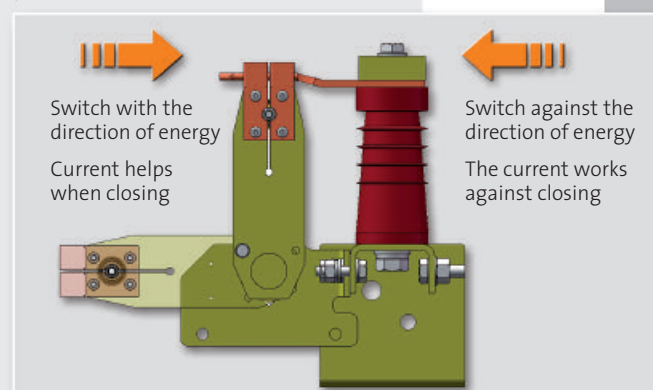


Isolator with a motor drive

SHORT CIRCUIT RESISTANCE

- The short circuit resistance of powered up isolator is tested in accordance with VDE/IEC. As a result of the loopless flowpath, the isolators do not need to be secured from being released by short circuit forces.
- Grounding switches, which are mounted to isolators or exist as independent devices, have to be secured in the case of surge currents over 50 kA if the grounding switch is installed in such a way that the flow current (in accordance with the drawing on the right) flows in direction 2 via the grounding switches. Strong opening forces are effective in this direction.
- In the case of a motor drive and self-closing manual drives (e.g. a ball joint drive), sufficient interlocking is assured.
- In the case of grounding switches, which are mounted on circuit breakers, the mechanical interlock between the disconnecter and grounding switch is a simple means of eliminate the disadvantages of the energy direction with inside force action.

Alignment of the current direction



TYPE GT

THE ISOLATORS ARE SUITABLE FOR INDOOR PLANT BETWEEN 1.5 kV TO 40.5 kV.

INFORMATION ON THE RATING PLATE

FLOHE Berg GmbH			
GT1.25-12.0-01-M1-A19-E06			
Serien-Nr.	A12468/S203471		-001
IEC 62271-102	Zg-Nr.:	WF16_15808	
U_p 12.0 kV	I_p 1.25 kA	fr	50/60Hz
U_s 75 kV	I_s 80 kA	Bj	2016
U_d 28 kV	I_d 31.5 kA /1s	M	19 kg

Note:

When asking questions in order to determine spare parts, additional deliveries, etc. the following four pieces of information are required:

- Type
- Factory no.
- Type indicator
- Year



Through the use of ribbed insulators made from cast resin, it is also possible to use the isolators in areas of high air humidity and occasional condensation, e.g. in the tropics. The devices are protected against corrosion. Steel parts are either blue galvanized, hot-dip galvanized or electrostatically-coated via a phosphate coating with an epoxy powder coating.

The switches can be installed in any position where the shaft is horizontal. Versions for installation with a vertical shaft are also available.

SERVICE LIFE

As a rule, isolators are rarely switched. Therefore, they are not built for high switching cycles. The mechanical service life and the contact service life is:

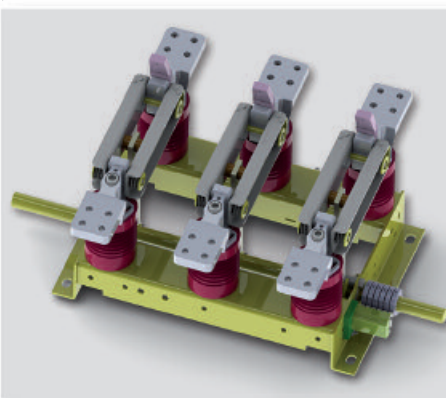
- 5.000 switching cycles in the case of isolators.
On request, up to 25.000 switching cycles can be realised.

SWITCH FUNCTIONS

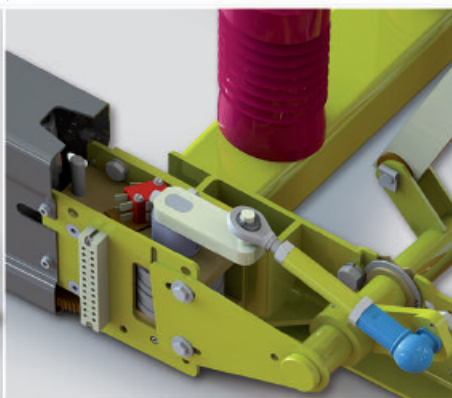
ISOLATORS HAVE THE FOLLOWING TASKS:

- Opening or closing circuits when either negligibly small currents have to be interrupted, or turned on when there is no appreciable voltage difference between the circuits to be separated or connected.
- To form an isolating distance in the open position between the terminals of each pole.

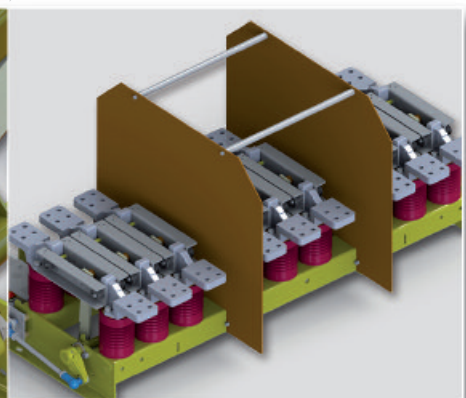
Isolator without motor drive

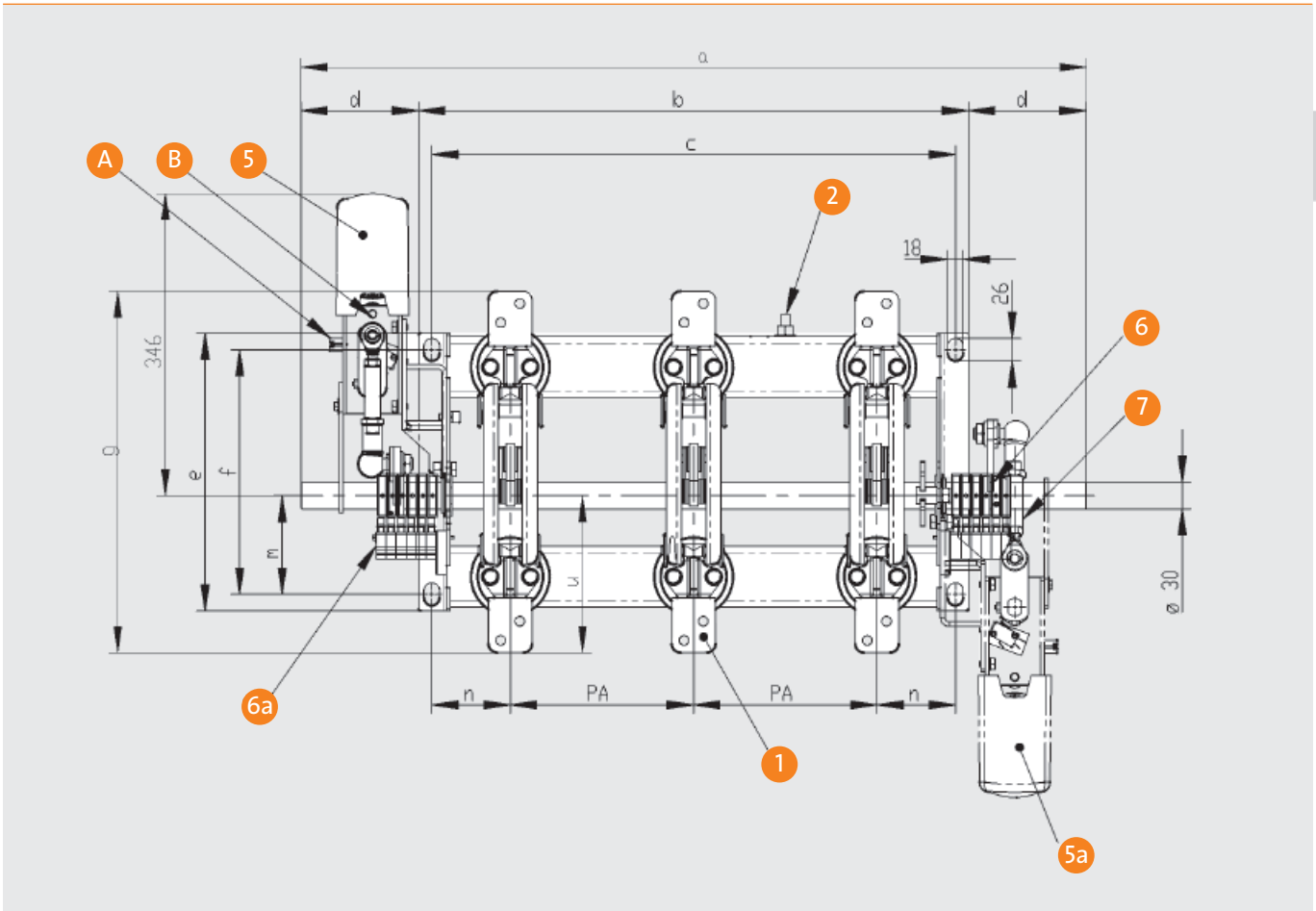


Motor drive a isolator



Isolator with separating walls

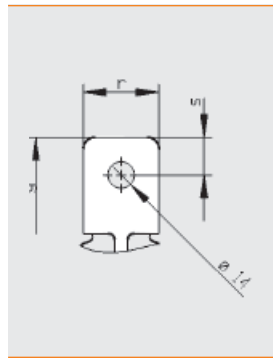
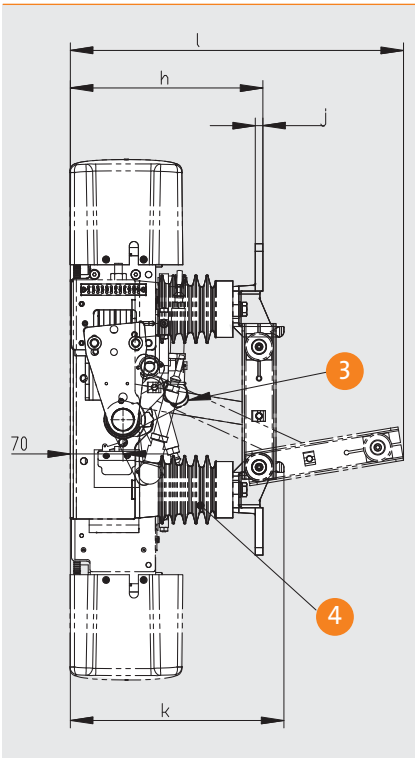




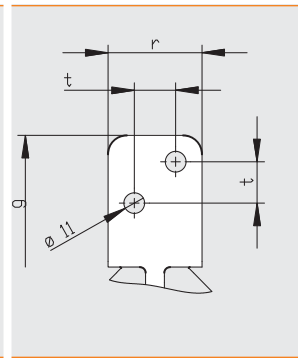
▶▶▶ pto – for other GT types, see p. 10-11

Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d	
12 kV	GT 0.63 -12.0-03-210-L1	12	75	28	630	20	50	20,5	210	900	630	600	135
	GT 0.63 -12.0-03-210-M1	12	75	28	630	31,5	80	20,5	210	900	630	600	135
	GT 1.25 -12.0-03-210-M1	12	75	28	1250	31,5	80	36	210	900	630	600	135
	GT 1.25 -12.0-03-210-P1	12	75	28	1250	50	125	48	210	880	618	580	131
	GT 1.25 -12.0-03-210-R1	12	75	28	1250	63	160	56	210	880	618	580	131
	GT 1.60 -12.0-03-210-M1	12	75	28	1600	31,5	80	36	210	900	630	600	135
	GT 1.60 -12.0-03-210-P1	12	75	28	1600	50	125	48	210	880	618	580	131
	GT 1.60 -12.0-03-210-R1	12	75	28	1600	63	160	56	210	880	618	580	131
	GT 2.50 -12.0-03-210-M1	12	75	28	2500	31,5	80	64	210	880	618	580	131
	GT 2.50 -12.0-03-210-P1	12	75	28	2500	50	125	65	210	880	618	580	131
	GT 2.50 -12.0-03-210-R1	12	75	28	2500	63	160	73	210	880	618	580	131
	GT 3.15 -12.0-03-210-P1	12	75	28	3150	50	125	66	230	920	658	620	131
GT 3.15 -12.0-03-210-R1	12	75	28	3150	63	160	67	230	920	658	620	131	
Field size 650 mm	GT 0.63 -12.0-03-150-L1	12	60	28	630	20	50	19	150	590	388	346	101
	GT 0.63 -12.0-03-150-M1	12	60	28	630	31,5	80	19	150	590	388	346	101
	GT 1.25 -12.0-03-150-M1	12	60	28	1250	31,5	80	25,5	150	590	388	346	101
Field size 900 mm	GT 0.63 -12.0-03-210-L1	12	75	28	630	20	50	21	210	780	582	552	99
	GT 0.63 -12.0-03-210-M1	12	75	28	630	31,5	80	21	210	780	582	552	99
	GT 1.25 -12.0-03-210-M1	12	75	28	1250	31,5	80	36,5	210	780	582	552	99
	GT 1.25 -12.0-03-210-P1	12	75	28	1250	50	125	47,5	210	780	618	580	81
	GT 1.60 -12.0-03-210-M1	12	75	28	1600	31,5	80	36,5	210	780	582	552	99
	GT 1.60 -12.0-03-210-P1	12	75	28	1600	50	125	47,5	210	780	618	580	81
	GT 2.50 -12.0-03-210-M1	12	75	28	2500	31,5	80	63	210	780	618	580	81
GT 2.50 -12.0-03-210-P1	12	75	28	2500	50	125	63	210	780	618	580	81	

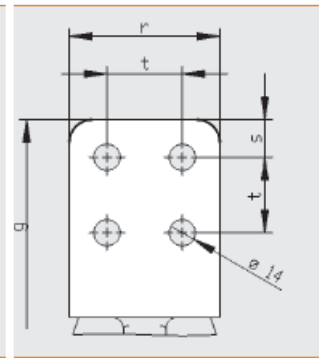
TYPE GT



▶ 630 A



▶ 1250 A / 1600 A

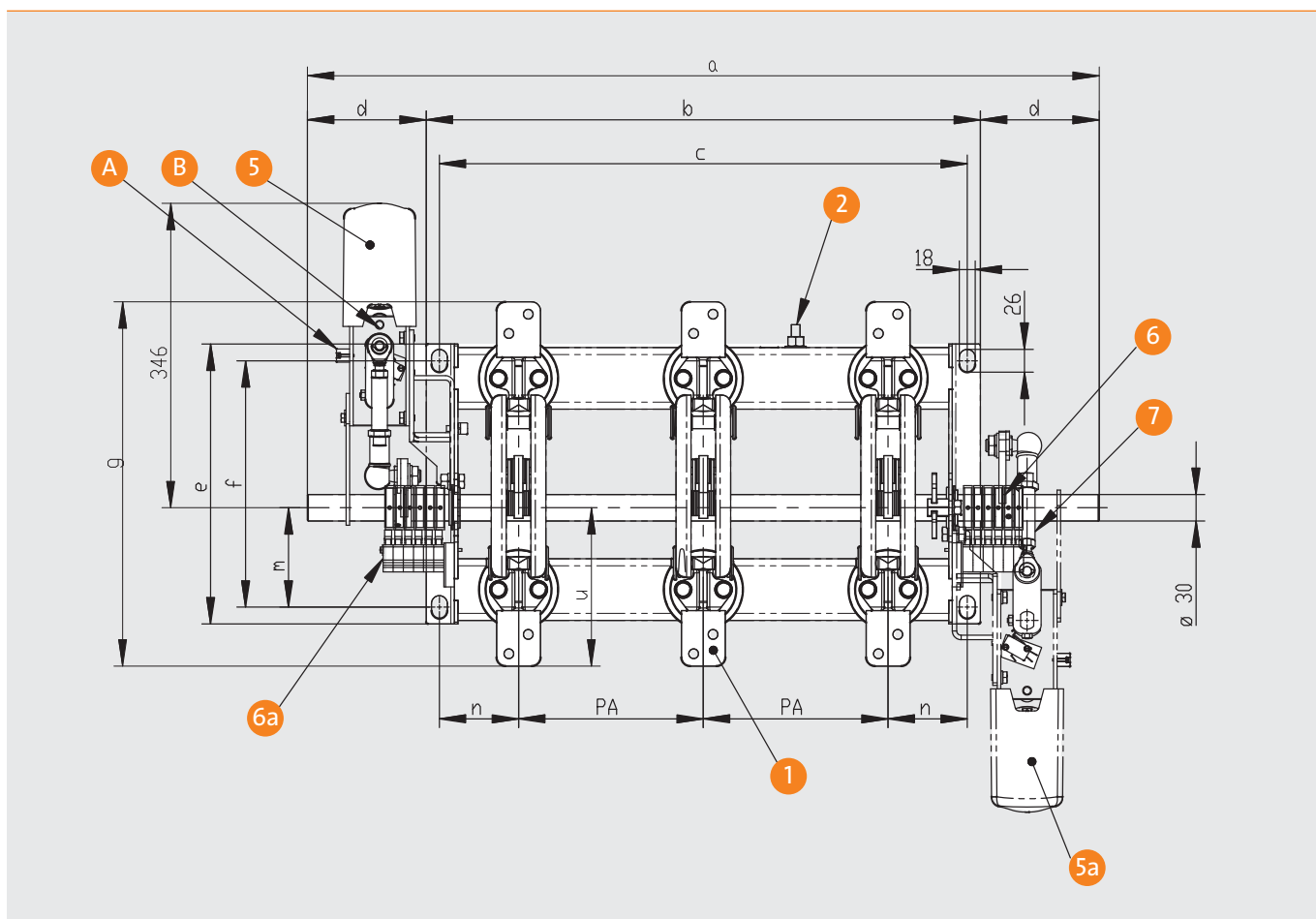


▶ 2500 A / 3150 A

- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
Optional position
 - 6 Auxiliary switches
 - 6a Auxiliary switches
Optional position
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

e	f	g	h	j	k	l	m	n	r	s	t	u	Type	
318	280	370	242	6	270	445	90	113	40	20	--	158	GT0.63 - 12.0-03-210-L1	12 kV
318	280	370	242	6	270	445	90	113	40	20	--	158	GT0.63 - 12.0-03-210-M1	
318	280	414	256	10	284	445	90	113	50	14	22	180	GT 1.25 - 12.0-03-210-M1	
348	280	440	270	10	355 *	470	80	113	50	14	22	193	GT 1.25 - 12.0-03-210-P1	
348	280	440	270	10	355 *	470	80	113	50	14	22	193	GT 1.25 - 12.0-03-210-R1	
318	280	414	256	10	284	445	90	113	50	14	22	180	GT 1.60 - 12.0-03-210-M1	
348	280	440	270	10	355 *	470	80	113	50	14	22	193	GT 1.60 - 12.0-03-210-P1	
348	280	440	270	10	355 *	470	80	113	50	14	22	193	GT 1.60 - 12.0-03-210-R1	
408	340	570	289	22	320	525	80	113	80	20	40	228	GT 2.50 - 12.0-03-210-M1	
408	340	570	289	22	395 *	525	80	113	80	20	40	228	GT 2.50 - 12.0-03-210-P1	
408	340	570	289	22	395 *	525	80	113	80	20	40	228	GT 2.50 - 12.0-03-210-R1	
408	340	570	289	22	395 *	525	80	113	80	20	40	228	GT 3.15 - 12.0-03-210-P1	
408	340	570	289	22	395 *	525	80	113	80	20	40	228	GT 3.15 - 12.0-03-210-R1	
318	280	414	268	6	296	470	23	113	40	20	--	158	GT0.63 - 12.0-03-150-L1	Field size 650 mm
318	280	414	268	6	296	470	23	113	40	20	--	158	GT0.63 - 12.0-03-150-M1	
318	280	414	282	10	310	470	23	113	50	14	22	180	GT 1.25 - 12.0-03-150-M1	
318	280	370	242	6	270	445	66	113	40	20	--	158	GT0.63 - 12.0-03-210-L1	Field size 900 mm
318	280	370	242	6	270	445	66	113	40	20	--	158	GT0.63 - 12.0-03-210-M1	
318	280	414	256	10	284	445	66	113	50	14	22	180	GT 1.25 - 12.0-03-210-M1	
348	280	440	270	10	355 *	470	80	113	50	14	22	193	GT 1.25 - 12.0-03-210-P1	
318	280	414	256	10	284	445	66	113	50	14	22	180	GT 1.60 - 12.0-03-210-M1	
348	280	440	270	10	355 *	470	80	113	50	14	22	180	GT 1.60 - 12.0-03-210-P1	
408	340	570	289	22	320	525	80	113	80	20	40	228	GT 2.50 - 12.0-03-210-M1	
408	340	570	289	22	395 *	525	80	113	80	20	40	228	GT 2.50 - 12.0-03-210-P1	

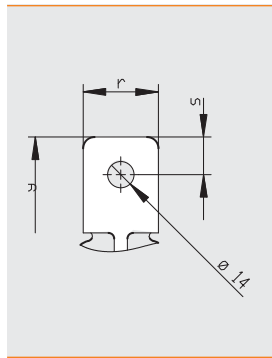
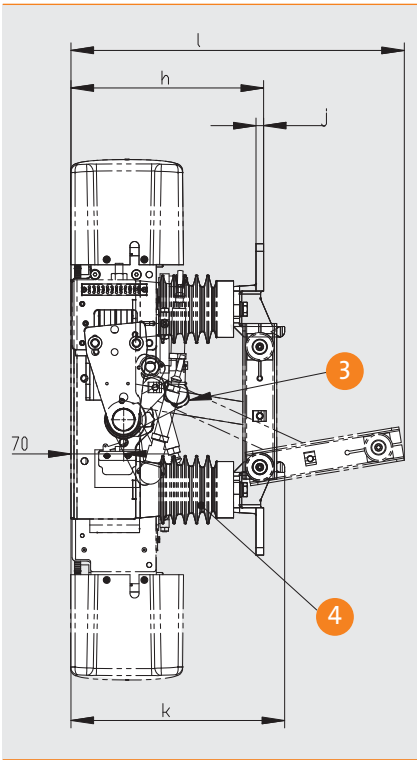
* Incl. inlet aid



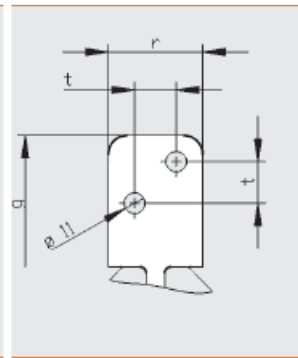
◀◀ pto – for other GT types, see p. 8-9

Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d
17,5 kV	GT0.63 -17.5-03-275-L1	17,5	75	28	630	50	20,5	275	970	630	670	135
	GT0.63 -17.5-03-275-M1	17,5	75	28	630	80	31,5	275	970	700	670	135
	GT 1.25 -17.5-03-275-M1	17,5	75	28	1250	80	31,5	36	275	970	700	135
	GT 1.25 -17.5-03-275-P1	17,5	75	28	1250	125	50	45	275	970	700	135
	GT 1.25 -17.5-03-275-R1	17,5	75	28	1250	160	63	48	275	970	700	135
	GT 1.60 -17.5-03-275-M1	17,5	75	28	1600	80	31,5	36	275	970	748	111
	GT 1.60 -17.5-03-275-P1	17,5	75	28	1600	125	50	45	275	970	748	111
	GT 1.60 -17.5-03-275-R1	17,5	75	28	1600	160	63	48	275	970	748	111
	GT 2.50 -17.5-03-275-M1	17,5	75	28	2500	80	31,5	64	275	1010	748	131
	GT 2.50 -17.5-03-275-P1	17,5	75	28	2500	125	50	66	275	1010	748	131
	GT 2.50 -17.5-03-275-R1	17,5	75	28	2500	160	63	70	275	1010	748	131
	GT 3.15 -17.5-03-275-P1	17,5	75	28	3150	125	50	68	275	1010	748	131
GT 3.15 -17.5-03-275-R1	17,5	75	28	3150	160	63	71	275	1010	748	131	
24 kV	GT0.63 -24.0-03-275-L1	24	125	50	630	50	20	31,5	275	1130	788	171
	GT 1.25 -24.0-03-275-M1	24	125	50	1250	80	31,5	36	275	1130	788	171
	GT 1.60 -24.0-03-275-M1	24	125	50	1600	80	31,5	36	275	1130	788	171
	GT2.50 -24.0-03-300-M1	24	125	50	2500	80	31,5	66	300	1180	838	171
	Field size 900 mm GT0.63 -24.0-03-210-L1	24	95	50	630	50	20	27,5	210	780	618	81
GT 1.25 -24.0-03-210-M1	24	95	50	1250	80	31,5	32	210	780	618	81	
36 kV	GT0.63 -36.0-03-400-L1	36	170	70	630	50	20	54	400	1550	1038	256
	GT 1.25 -36.0-03-400-M1	36	170	70	1250	80	31,5	58	400	1550	1038	256
	GT 2.50 -36.0-03-400-M1	36	170	70	2500	80	31,5	100	400	1550	1038	256
	GT 3.15 -36.0-03-420-M1	36	170	70	3150	80	31,5	100	420	1590	1078	256

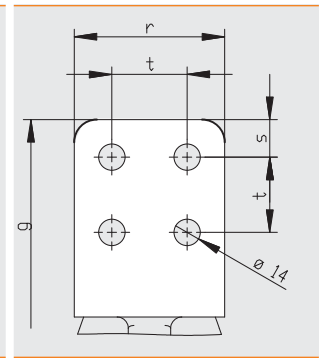
TYPE GT



▶ 630 A



▶ 1250 A / 1600 A

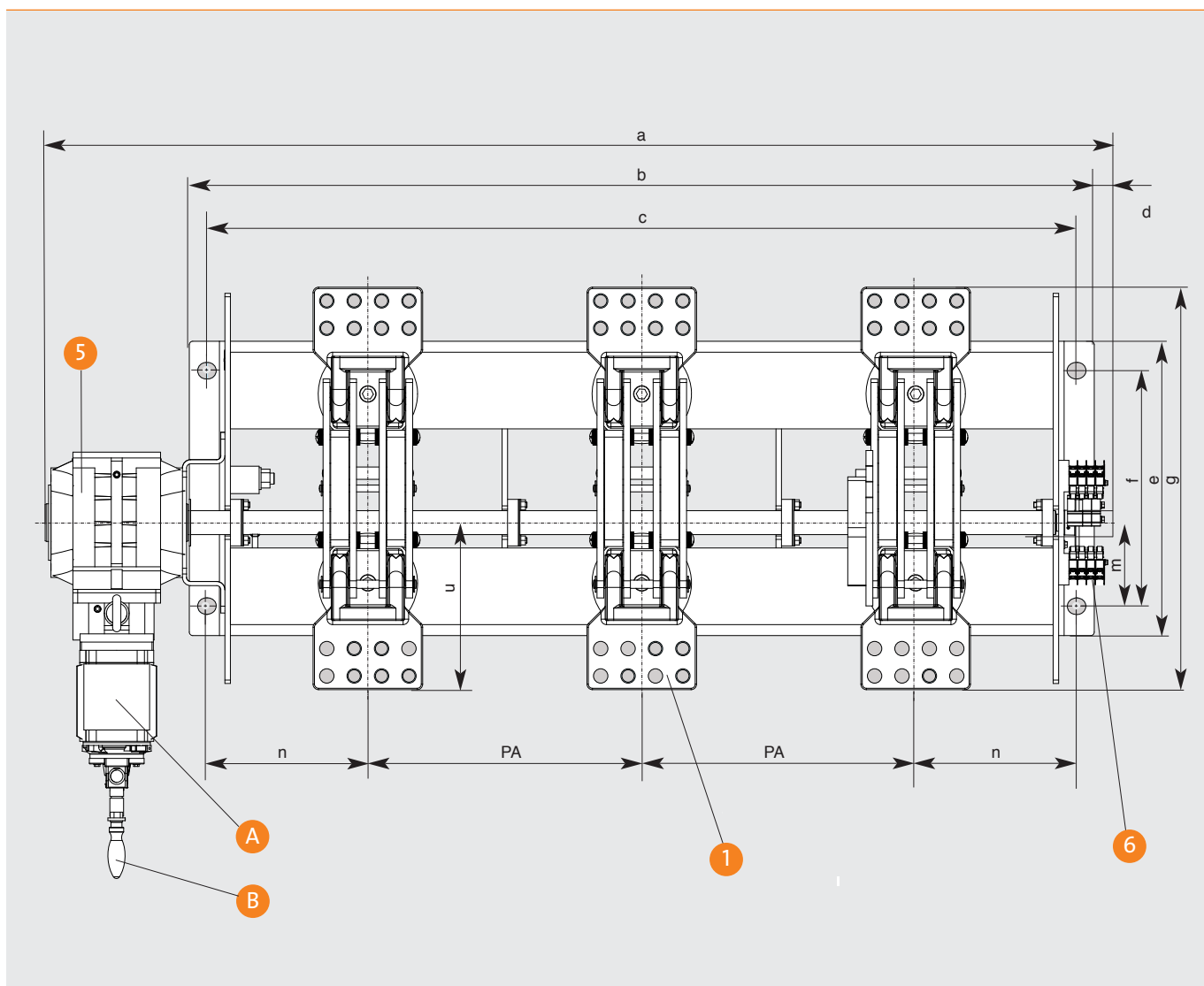


▶ 2500 A / 3150 A

- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
Optional position
 - 6 Auxiliary switches
 - 6a Auxiliary switches
Optional position
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

e	f	g	h	j	k	l	m	n	r	s	t	u	Type	
318	280	370	272	6	300	475	90	113	40	20	--	158	GT0.63 - 17.5-03-275-L1	17,5 kV
318	280	370	272	6	300	475	90	113	40	20	--	158	GT0.63 - 17.5-03-275-M1	
318	280	414	286	10	314	475	90	113	50	14	22	180	GT 1.25 - 17.5-03-275-M1	
348	280	440	300	10	385*	500	80	113	50	14	22	193	GT 1.25 - 17.5-03-275-P1	
348	280	440	300	10	385*	500	80	113	50	14	22	193	GT 1.25 - 17.5-03-275-R1	
318	280	414	286	10	314	475	90	113	50	14	22	180	GT 1.60 - 17.5-03-275-M1	
348	280	440	300	10	385*	500	80	113	50	14	22	193	GT 1.60 - 17.5-03-275-P1	
348	280	440	300	10	385*	500	80	113	50	14	22	193	GT 1.60 - 17.5-03-275-R1	
408	340	570	319	22	350	555	80	113	80	20	40	228	GT 2.50 - 17.5-03-275-M1	
408	340	570	319	22	425*	555	80	113	80	20	40	228	GT 2.50 - 17.5-03-275-P1	
408	340	570	319	22	425*	555	80	113	80	20	40	228	GT 2.50 - 17.5-03-275-R1	
408	340	570	319	22	425*	555	80	113	80	20	40	228	GT 3.15 - 17.5-03-275-P1	
408	340	570	319	22	425*	555	80	113	80	20	40	228	GT 3.15 - 17.5-03-275-R1	
418	350	470	338	6	366	637	100	98	40	20	--	158	GT0.63 - 24.0-03-275-L1	24 kV
418	350	514	352	10	380	637	100	98	50	14	22	180	GT 1.25 - 24.0-03-275-M1	
418	350	514	352	10	380	637	100	98	50	14	22	180	GT 1.60 - 24.0-03-275-M1	
498	350	660	371	22	402	682	100	73	80	20	40	228	GT 2.50 - 24.0-03-300-M1	
418	350	470	338	6	366	637	80	98	40	20	--	158	GT0.63 - 24.0-03-210-L1	
418	350	514	352	10	380	637	80	98	50	14	20	180	GT 1.25 - 24.0-03-210-M1	
528	450	570	452	6	480	852	100	93	40	20	--	153	GT0.63 - 36.0-03-400-L1	36 kV
528	450	614	466	10	494	852	100	93	50	14	22	175	GT 1.25 - 36.0-03-400-M1	
588	450	750	485	22	516	890	100	78	80	20	22	228	GT 2.50 - 36.0-03-400-M1	
588	450	750	485	22	516	890	100	78	80	20	22	228	GT 3.15 - 36.0-03-420-M1	

* Incl. inlet aid

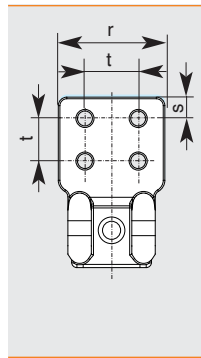
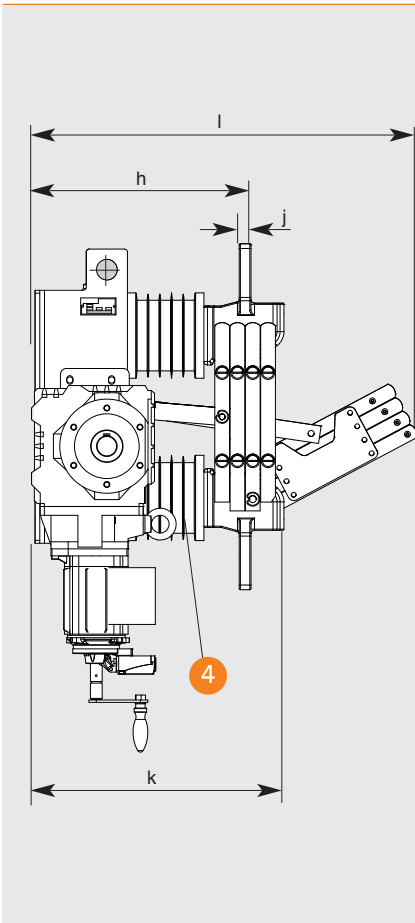


▶▶▶ pto – for other HAS types, see p. 14-15

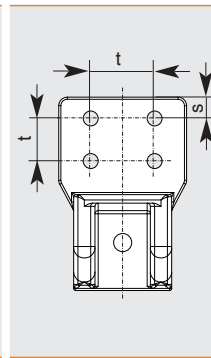
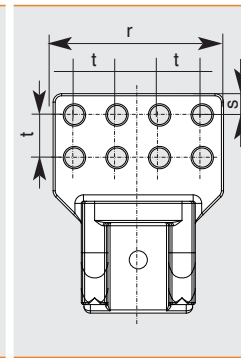
Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d	
12 kV	HAS3.15-12.0-03-300-S1	12	75	28	3150	72	177	150	300	**	950	910	**
	HAS4.00-12.0-03-400-S1	12	75	28	4000	72	177	190	400	**	1330	1270	**
	HAS6.30-12.0-03-400-W1	12	75	28	6300	85	214	300	400	**	1330	1270	**
	HAS8.00-12.0-03-500-VK1	12	75	28	8000	110	275	380	500	**	1530	1270	**
24 kV	HAS3.15-24.0-03-300-R1	24	125	50	4000	63	159	200	350	**	1070	1010	**
	HAS4.00-24.0-03-400-R1	24	125	50	4000	63	159	250	450	**	1430	1370	**
	HAS6.30-24.0-03-400-T1	24	125	50	6300	75	193	400	450	**	1430	1370	**
	HAS8.00-24.0-03-500-V1	24	125	50	8000	100	250	500	600	**	1730	1520	**
36 kV	HAS3.15-36.0-03-300-R1	36	170	70	3150	63	159	210	450	**	1410	1350	**
	HAS4.00-36.0-03-400-R1	36	170	70	4000	63	159	260	500	**	1530	1470	**
	HAS6.30-36.0-03-400-T1	36	170	70	6300	75	193	420	500	**	1530	1470	**
	HAS8.00-36.0-03-500-V1	36	170	70	8000	100	250	530	700	**	1930	1720	**
40,5 kV	HAS1.60-40.5-03-500-ME1	40,5	190	85	1600	37	91	220	500	**	1940	1878	**
	HAS3.15-40.5-03-550-RA1	40,5	190	85	3150	64	159	280	550	**	2096	2036	**

* not tested ** dimensions on request (depending to the signalling contacts)

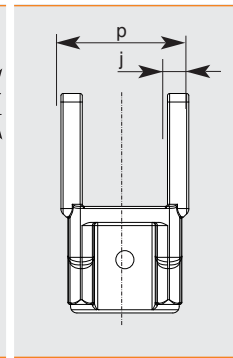
TYPE HAS



▶ 3150 A

▶ 4000 A
8000 A

▶ 6300 A

▶ 6300 A
VERTIKAL

- 1 Connection screws
 3150 A: M12x80
 4000 A: M12x80
 8000 A: M12x80
 6300 A: M16x80

- 2 Grounding screw
 1x M12 3150 A - 8000 A

- 3 Switching angle 100°

- 4 Supporter

- 5 Motor drive
 Weight of the drive 10-30 kg

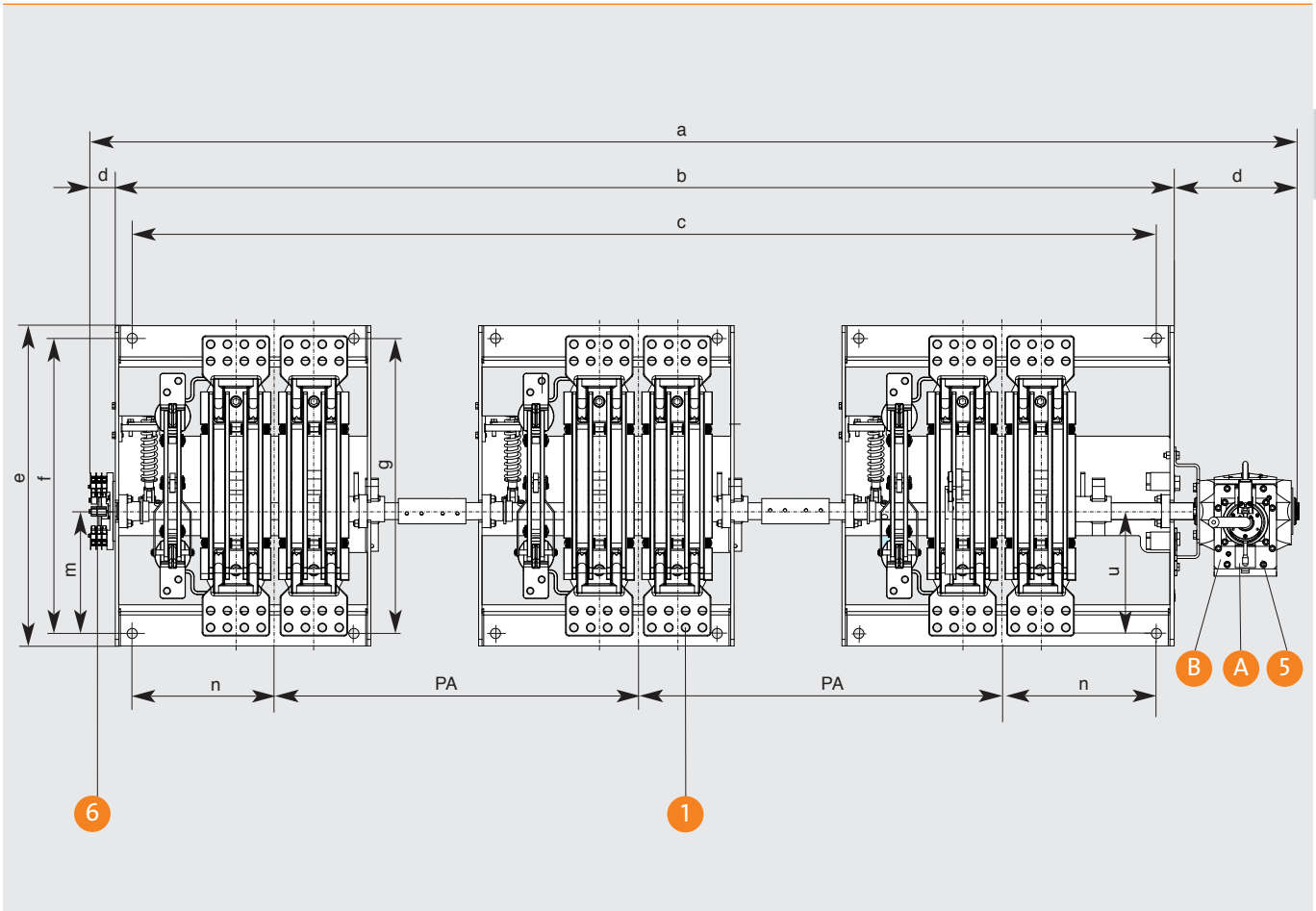
- 6 Auxiliary switches

- A Cable connection

- B Crank handle connection

Specify actuating voltage when ordering

f	g	h	j	k	l	m	n	p	r	s	t	u	Type	
265	500	308	18	350	560	82,5	155	--	100	20	50	200	HAS3.15-12.0-03-300-S1	12 kV
344	549	347	20	402	614	122	235	--	120	20	60	224,5	HAS4.00-12.0-03-400-S1	
344	588	367	20	433	654	122	235	120	160	20	40	244	HAS6.30-12.0-03-400-W1	
344	549	347	20	402	614	122	320	--	290	20	60	224,5	HAS8.00-12.0-03-500-VK1	
344	580	423	18	465	760	97	105	--	100	20	50	215	HAS3.15-24.0-03-300-R1	24 kV
414	673	450	20	505	820	147	185	--	120	20	60	276,5	HAS4.00-24.0-03-400-R1	
414	712	470	20	536	855	147	185	120	160	20	40	296	HAS6.30-24.0-03-400-T1	
414	673	450	20	505	820	147	320	--	290	20	60	276,5	HAS8.00-24.0-03-500-V1	
414	650	533	18	537	950	147	5	--	100	20	50	265	HAS3.15-36.0-03-300-R1	36 kV
520	753	550	20	605	994	150	135	--	120	20	60	266,5	HAS4.00-36.0-03-400-R1	
520	792	570	20	636	1040	150	135	120	160	20	40	286	HAS6.30-36.0-03-400-T1	
520	753	550	20	605	994	150	320	--	290	20	60	266,5	HAS8.00-36.0-03-500-V1	
452	604	604	12	647	1030	167	439	--	60	18	27	243	HAS1.60-40.5-03-500-ME1	40,5 kV
606	730	621	18	350	1130	193	456	--	100	20	40	255	HAS3.15-40.5-03-550-RA1	



- 1** Connection screws
12000 A: M16x80
18000 A: M16x80
24000 A: M16x80
 - 2** Grounding screw
1x M12 12000 A - 24000 A
 - 3** Switching angle 100°
 - 4** Supporter
 - 5** Motor drive
Weight of the drive 10-30 kg
 - 6** Auxiliary switches
 - A** Cable connection
 - B** Crank handle connection
- Betätigungs-
spannung
bei Bestellung
angeben

■ HAS disconnector form the premium devices up to 18000 A at up to 24kV. The devices are characterised by a rated peak current of up to 400kA.

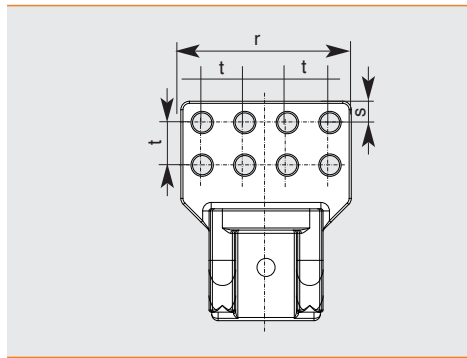
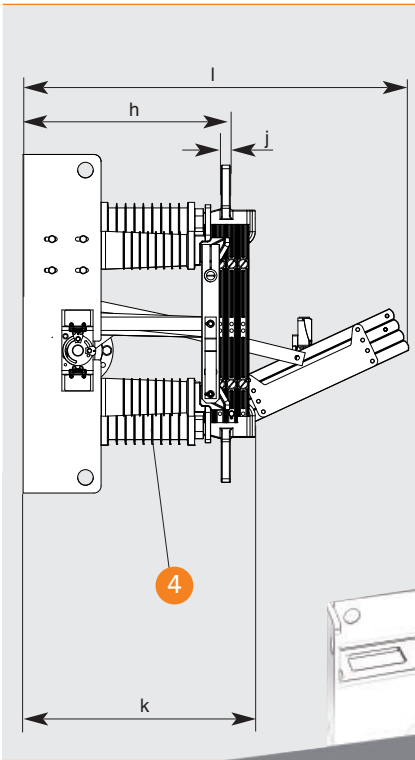
At currents of 12kA and more, the individual poles are supplied as separate devices which operated mechanically via couplings.

◀◀◀ pto – for other HAS types, see p.. S12-13

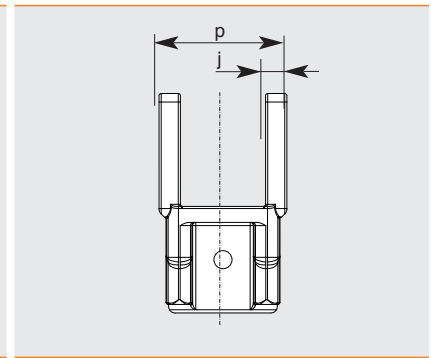
Type	U _n [kV]	U _p [kV]	U _d [kV]	I _n [kA]	I _{th} [kA]	I _{dyn} [kA]	Weight [kg]	PA	a	b	c	d
12 kV HAS12.0-12.0-03-500-VV1	12	75	28	12000	121	300	600	500	**	1530	1270	**
24 kV HAS12.0-24.0-03-500-VK1	24	125	50	12000	110	275	850	600	**	1730	1535	**
HAS18.0-24.0-03-1500-WS1	24	125	50	18000	140	360	1250	1500	**	3000	3335	**
HAS24.0-24.0-03-2000-XP1	24	125	50	24000	160*	410*	1600	2000	**	4530	4335	**
36 kV HAS12.0-36.0-03-500-VK1	36	170	70	12000	110	275	840	700	**	1930	1735	**

** dimensions on request (depending to the signalling contacts)

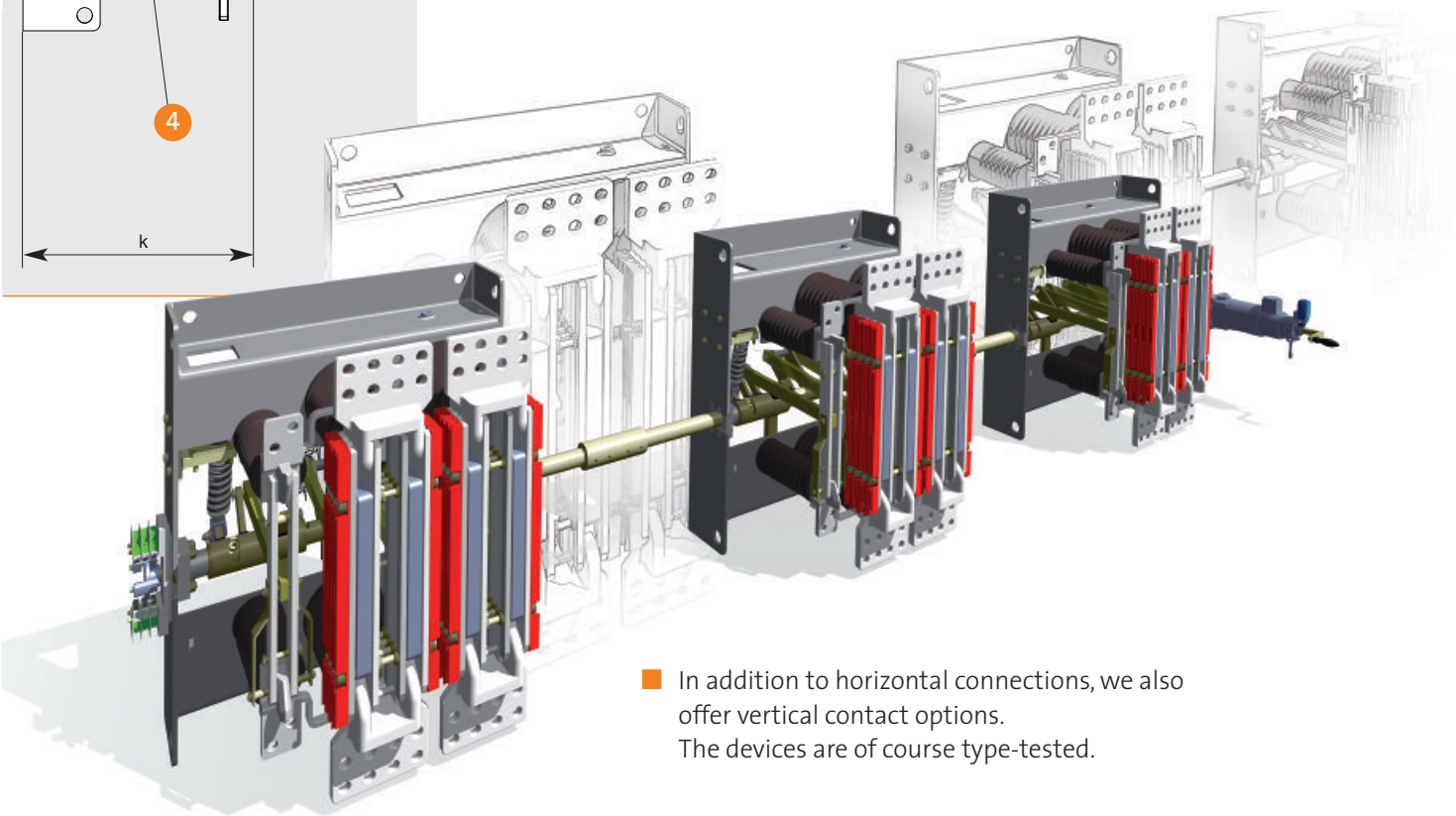
TYPE HAS



▶ 12000 A
18000 A
24000 A



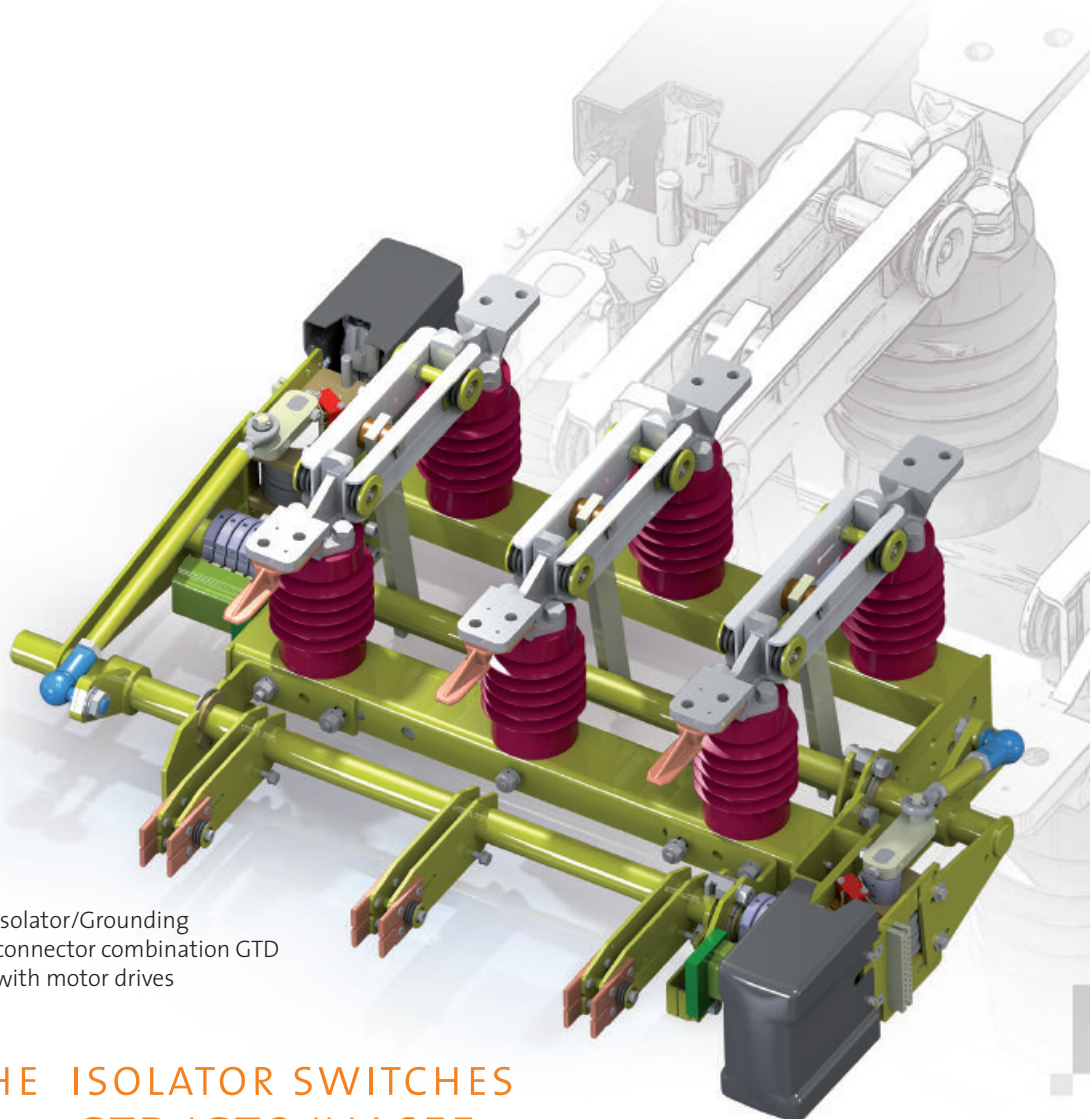
▶ 12000 A
VERTIKAL



- In addition to horizontal connections, we also offer vertical contact options. The devices are of course type-tested.

f	g	h	j	k	l	m	n	p	r	s	t	u	Type	
344	588	367	20	433	654	122	335	120	345	20	40	244	HAS12.0-12.0-03-300-VV1	12 kV
414	712	470	20	536	855	147	335	120	345	20	40	296	HAS12.0-24.0-03-500-VK1	24 kV
414	712	470	20	536	855	147	335	120	530	20	40	296	HAS18.0-24.0-03-1500-WS1	
414	712	470	20	536	855	147	335	120	715	20	40	296	HAS24.0-24.0-03-2000-XP1	
520	792	570	20	636	1040	150	335	120	345	20	40	286	HAS12.0-36.0-03-500-VK1	36 kV

FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS



Isolator/Grounding connector combination GTD with motor drives

THE ISOLATOR SWITCHES TYPE GTD/GTO/HASEE

ARE INTERIOR DEVICES FOR LOAD-FREE SWITCHING.

The following models are available:

- **GTD:** Mounting of the grounding connector on the side of the pivot
- **GTO:** Mounting of the grounding connector on the side of the opening
- **GTS:** Mounting of the grounding connector on both sides

The drive of the isolator / grounding connector combination can be executed differently:

- Individual drive the isolator shaft
- Individual drive of the grounding connector shaft
- Common drive of both shafts via a motor unit

The following drives are available:

- Electric
- Manual
- Pneumatic

A combination of the drives is also possible.

The rated values of the insulation level are related to normal atmospheric conditions and altitude. At altitudes higher than 1,000 m above sea level, the reduced insulation level must be considered.

The switchgear correspond to the standard IEC 62271-102; 2001-12, as well as DIN VDE 0111 Part 1/10.79 and IEC 129.1854.

TYPE GTD / GTO / HASEE

ISOLATOR / GROUNDING CONNECTOR COMBINATIONS

ARE THE COST-EFFECTIVE AND SPACE-SAVING ALTERNATIVE TO INDIVIDUAL DEVICES.

- Grounding connector units can be mounted on the side of the opening and on the side of the pivot.
- The drive can take place individually as well as via a unit.
- Both manual, electric and pneumatic drives are available.

INFORMATION ON THE RATING PLATE

FLOHE Berg GmbH			
GTO2.50-12.0-03-210-P1-A093-B32-E25			
Serien-Nr. A12422/S204904		-001	
IEC 62271-102	Zg-Nr.:	WF16 41809	
U_i 12.0 kV	I_i 2.50 kA	fr	50/60Hz
U_p 75 kV	I_p 125 kA	Bl	2016
U_s 26 kV	I_s 50.0 kA	/fs	M 92 kg

Note:

When asking questions in order to determine spare parts, additional deliveries, etc. the following four pieces of information are required:

- Type
- Factory no.
- Type indicator
- Year



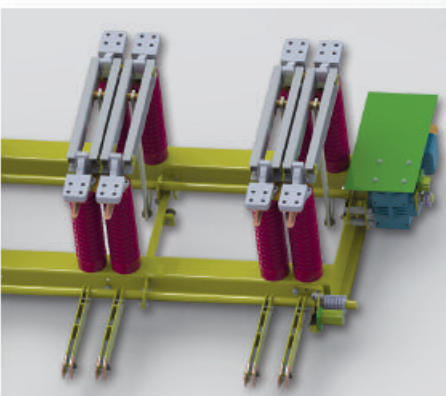
Additional equipment can be found from page 50 onwards.

Individual designs – even in small quantities – at any time.

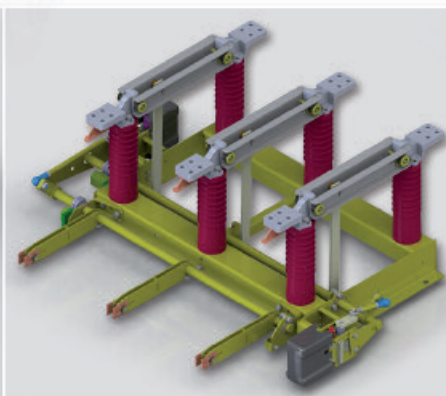
Our products are characterised by many years of experience.



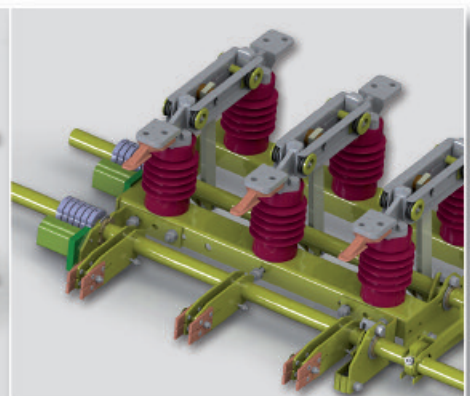
GTD with an AC drive



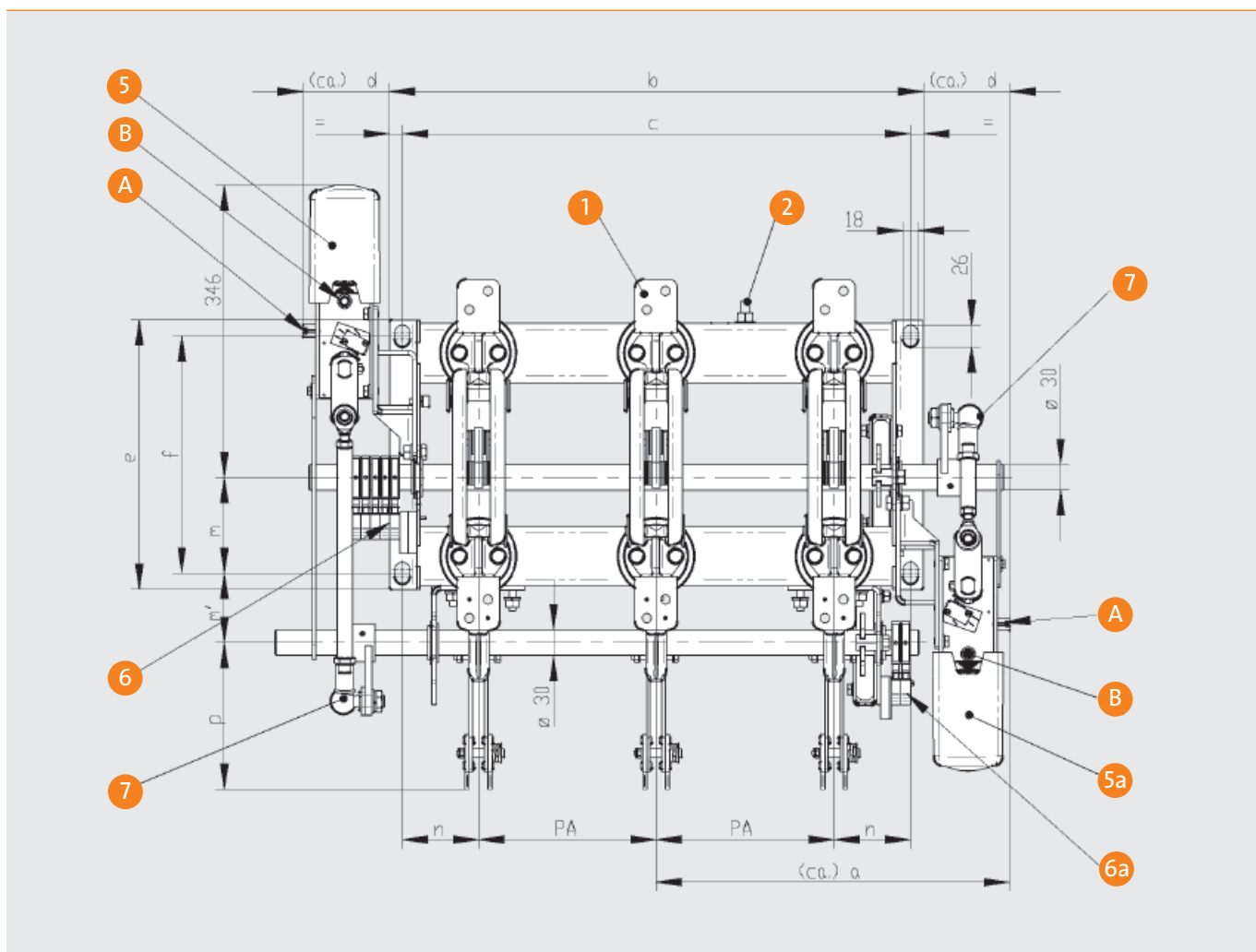
GTD



GTD with a mechanical interlock



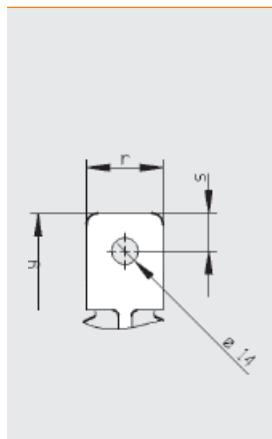
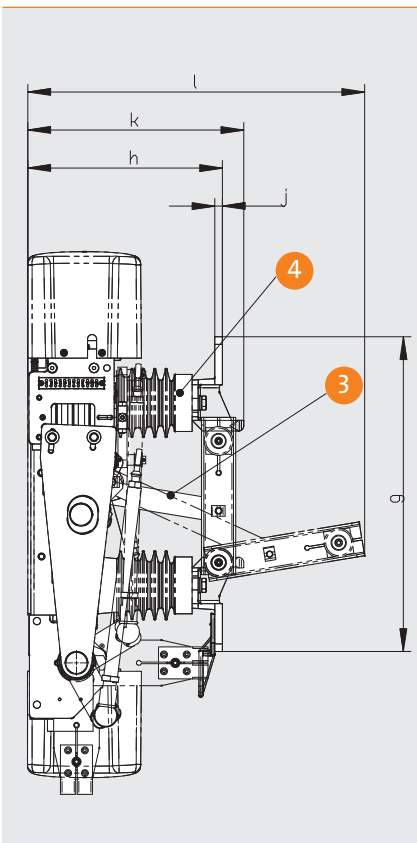
FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS



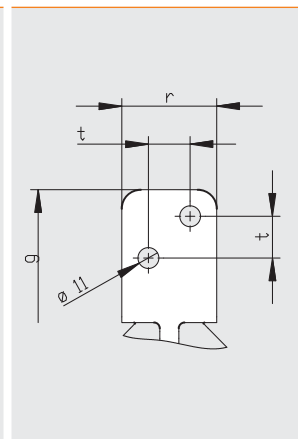
▶▶▶ pto – for other GTD types, see p. 20-21

Type	U _n [kV]	U _p [kV]	U _d [kV]	I _n [kA]	I _{th} [kA]	I _{dyn} [kA]	Weight [kg]	PA	a	b	c	d	e
12 kV GTD0.63 -12.0-03-150-L1	12	60	28	630	20	50	30	150	305	388	346	111	318
GTD0.63 -12.0-03-150-M1	12	60	28	630	31,5	80	30	150	305	388	346	111	318
GTD0.63 -12.0-03-210-L1	12	75	28	630	20	50	35	210	393	582	552	102	318
GTD0.63 -12.0-03-210-L1	12	75	28	630	20	50	45	210	417	630	600	207	318
GTD0.63 -12.0-03-210-M1	12	75	28	630	31,5	80	45	210	417	630	600	207	318
GTD0.63 -12.0-03-210-M1	12	75	28	630	31,5	80	38	210	393	582	552	102	318
GTD 1.25 -12.0-03-150-M1	12	60	28	1250	31,5	80	33	150	305	388	346	111	318
GTD 1.25 -12.0-03-210-M1	12	75	28	1250	31,5	80	52	210	417	630	600	207	318
GTD 1.25 -12.0-03-210-P1	12	75	28	1250	50	125	67	210	399	618	580	90	348
GTD 1.25 -12.0-03-210-R1	12	75	28	1250	63	160	76	210	399	618	580	90	348
GTD 1.25 -12.0-03-210-M1	12	75	28	1250	31,5	80	43	210	393	582	552	102	318
GTD 1.60 -12.0-03-210-M1	12	75	28	1600	31,5	80	46	210	393	582	552	102	318
GTD 1.60 -12.0-03-210-M1	12	75	28	1600	31,5	80	52	210	417	630	600	207	318
GTD 1.60 -12.0-03-210-P1	12	75	28	1600	50	125	67	210	399	618	580	90	348
GTD 1.60 -12.0-03-210-R1	12	75	28	1600	63	160	76	210	399	618	580	90	348
GTD 2.50 -12.0-03-210-M1	12	75	28	2500	31,5	80	87	210	399	618	580	90	408
GTD 2.50 -12.0-03-210-P1	12	75	28	2500	50	125	93	210	399	618	580	90	408
GTD 2.50 -12.0-03-210-R1	12	75	28	2500	63	160	102	210	399	618	580	90	408
GTD 3.15 -12.0-03-210-P1	12	75	28	3150	50	125	95	230	419	658	620	90	408
GTD 3.15 -12.0-03-210-R1	12	75	28	3150	63	160	105	230	419	658	620	90	408

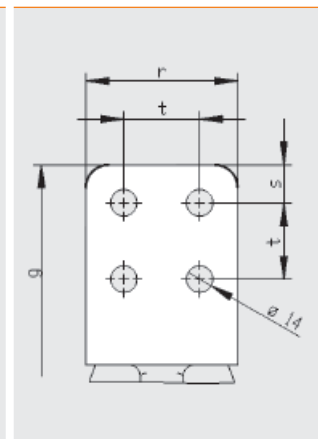
TYPE GTD



▶ 630 A



▶ 1250 A / 1600 A



▶ 2500 A / 3150 A

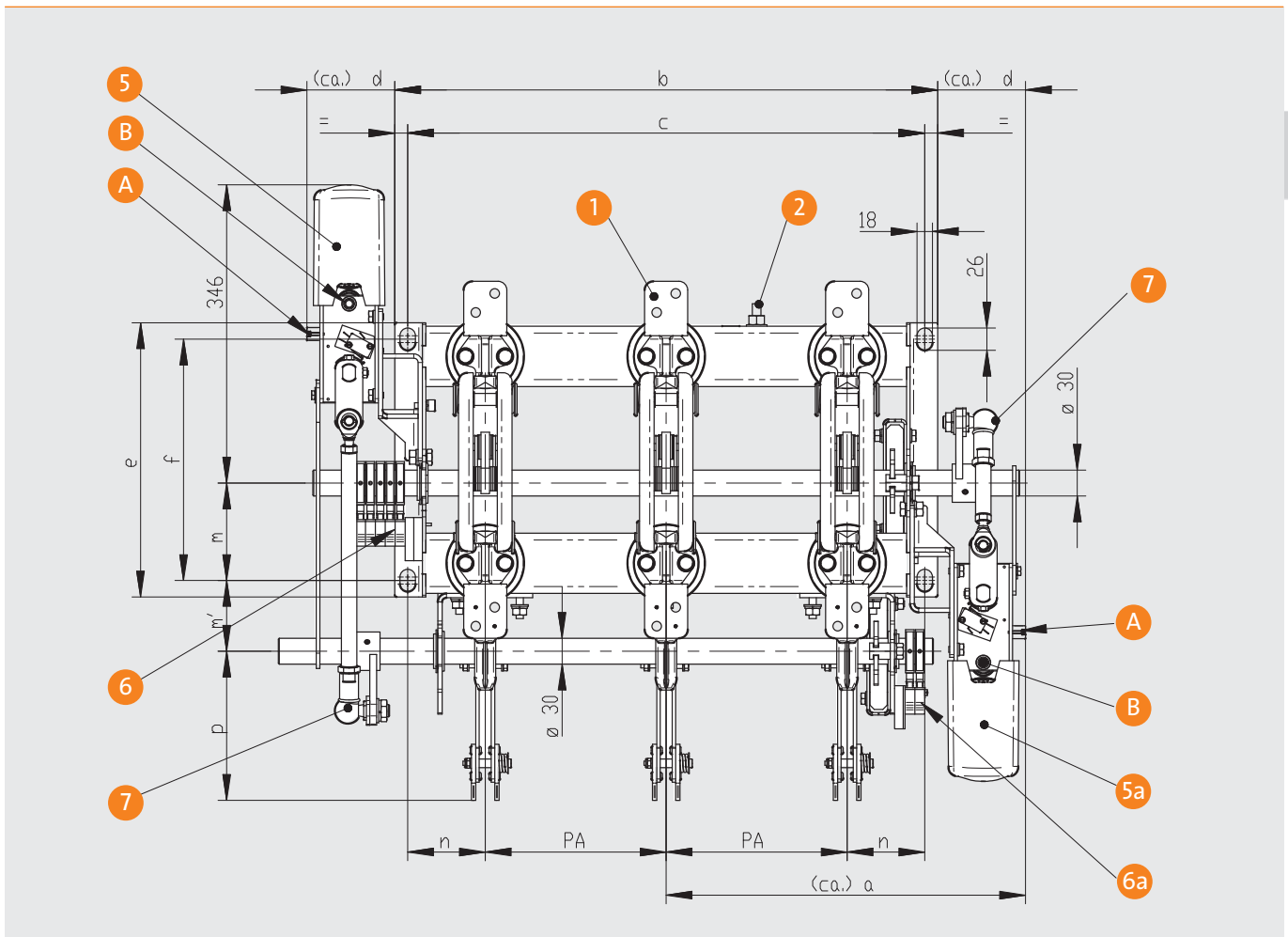
- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
 - 6 Auxiliary switches
 - 6a Auxiliary switches
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

Views without expansion joints

f	g	h	j	k	l	m	m'	n	p	r	s	t	u	Type	12 kV
280	414	268	6	296	470	23	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-150-L1	
280	414	268	6	296	470	23	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-150-M1	
280	370	242	6	270	445	66	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-210-L1	
280	370	242	6	270	445	90	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-210-L1	
280	370	242	6	270	445	90	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-210-M1	
280	370	242	6	270	445	66	82	113	173	40	20	--	158	GTD 0.63 -12.0-03-210-M1	
280	414	282	10	310	470	23	82	113	173	50	14	22	180	GTD 1.25 -12.0-03-150-M1	
280	414	256	10	284	445	90	82	113	173	50	14	22	180	GTD 1.25 -12.0-03-210-M1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTD 1.25 -12.0-03-210-P1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTD 1.25 -12.0-03-210-R1	
280	414	256	10	284	445	66	82	113	173	50	14	22	180	GTD 1.25 -12.0-03-210-M1	
280	414	256	10	284	445	66	82	113	173	50	14	22	180	GTD 1.60 -12.0-03-210-M1	
280	414	256	10	284	445	90	82	113	173	50	14	22	180	GTD 1.60 -12.0-03-210-M1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTD 1.60 -12.0-03-210-P1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTD 1.60 -12.0-03-210-R1	
340	570	289	22	320	525	80	97	113	166	80	20	40	228	GTD 2.50 -12.0-03-210-M1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTD 2.50 -12.0-03-210-P1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTD 2.50 -12.0-03-210-R1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTD 3.15 -12.0-03-210-P1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTD 3.15 -12.0-03-210-R1	

* Incl. inlet aid

FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS

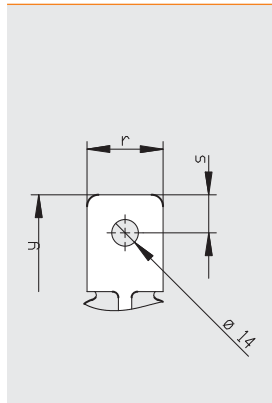
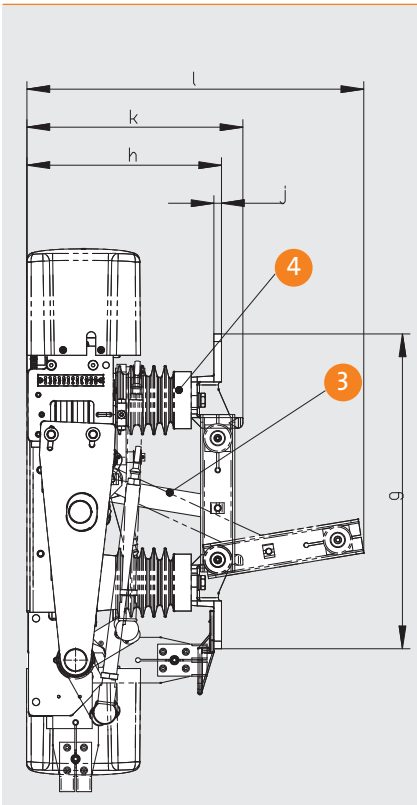


◀◀ pto – for other GTD types, see p. 18-19

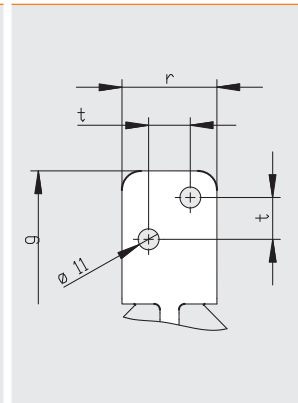
Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d	e	
17,5 kV	GTD0.63 -17.5-03-275-L1	17,5	75	28	630	50	20	38	275	**	630	670	**	318
	GTD0.63 -17.5-03-275-M1	17,5	75	28	630	80	31,5	38	275	**	700	670	**	318
	GTD 1.25 -17.5-03-275-M1	17,5	75	28	1250	80	31,5	55	275	**	700	670	**	318
	GTD 1.25 -17.5-03-275-P1	17,5	75	28	1250	125	50	69	275	**	700	670	**	348
	GTD 1.25 -17.5-03-275-R1	17,5	75	28	1250	160	63	78	275	**	700	670	**	348
	GTD 1.60 -17.5-03-275-M1	17,5	75	28	1600	80	31,5	55	275	**	748	710	**	318
	GTD 1.60 -17.5-03-275-P1	17,5	75	28	1600	125	50	69	275	**	748	710	**	348
	GTD 1.60 -17.5-03-275-R1	17,5	75	28	1600	160	63	78	275	**	748	710	**	348
	GTD 2.50 -17.5-03-275-M1	17,5	75	28	2500	80	31,5	84	275	**	748	710	**	408
	GTD 2.50 -17.5-03-275-P1	17,5	75	28	2500	125	50	90	275	**	748	710	**	408
	GTD 2.50 -17.5-03-275-R1	17,5	75	28	2500	160	63	95	275	**	748	710	**	408
	GTD 3.15 -17.5-03-275-P1	17,5	75	28	3150	125	50	98	275	**	748	710	**	408
GTD 3.15 -17.5-03-275-R1	17,5	75	28	3150	160	63	108	275	**	748	710	**	408	
24 kV	GTD0.63 -24.0-03-275-L1	24	125	50	630	50	20	58	275	523	788	750	130	418
	GTD 1.25 -24.0-03-275-M1	24	125	50	1250	80	31,5	61	275	523	788	750	130	418
	GTD 1.60 -24.0-03-275-M1	24	125	50	1600	80	31,5	70	275	523	788	750	130	418
	GTD 2.50 -24.0-03-300-M1	24	125	50	2500	80	31,5	94	300	549	838	800	130	498
36 kV	GTD0.63 -36.0-03-400-L1	36	170	70	630	50	20	78	400	668	1038	1000	149	528
	GTD 1.25 -36.0-03-400-M1	36	170	70	1250	80	31,5	82	400	668	1038	1000	149	528
	GTD 2.50 -36.0-03-400-M1	36	170	70	2500	80	31,5	100	400	668	1038	1000	149	588
	GTD 3.15 -36.0-03-420-M1	36	170	70	3150	80	31,5	120	420	688	1078	1040	149	588

** Dimensions on request (depending to the signalling contacts)

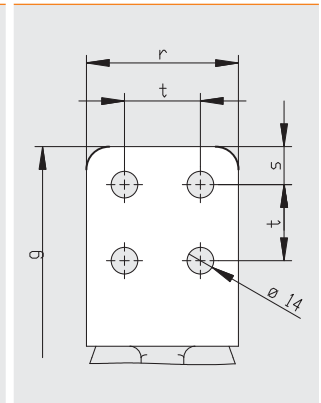
TYPE GTD



▶ 630 A



▶ 1250 A / 1600 A



▶ 2500 A / 3150 A

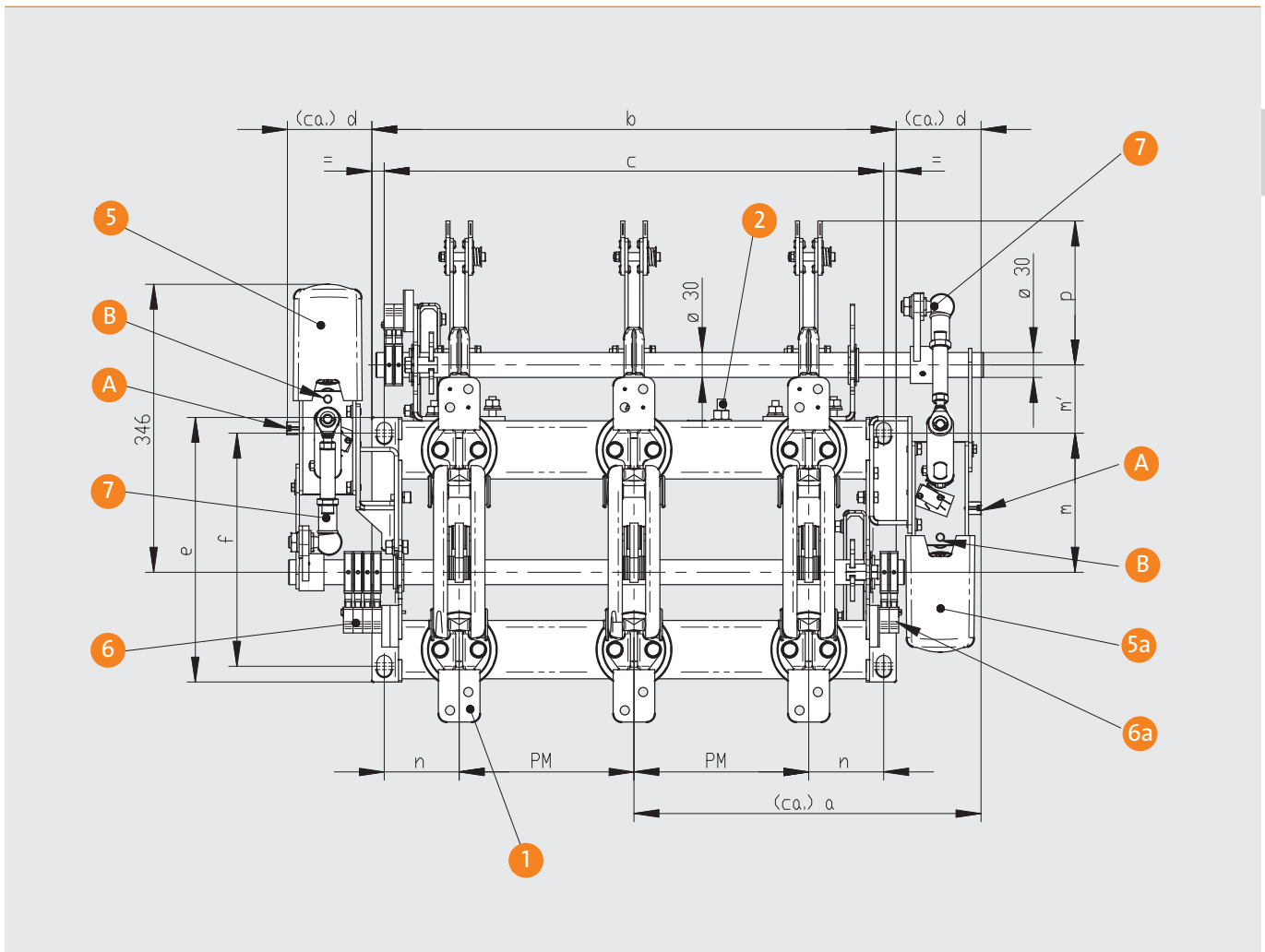
- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
 - 6 Auxiliary switches
 - 6a Auxiliary switches
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

Views without expansion joints

f	g	h	j	k	l	m	m'	n	p	r	s	t	u	Type	
280	370	272	6	300	475	90	82	113	203	40	20	--	158	GTD 0.63 -17.5-03-275-L1	17,5 kV
280	370	272	6	300	475	90	82	113	203	40	20	--	158	GTD 0.63 -17.5-03-275-M1	
280	414	286	10	314	475	90	82	113	203	50	14	22	180	GTD 1.25 -17.5-03-275-M1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTD 1.25 -17.5-03-275-P1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTD 1.25 -17.5-03-275-R1	
280	414	286	10	314	475	90	82	113	203	50	14	22	180	GTD 1.60 -17.5-03-275-M1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTD 1.60 -17.5-03-275-P1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTD 1.60 -17.5-03-275-R1	
340	570	319	22	350	555	80	97	113	203	80	20	40	228	GTD 2.50 -17.5-03-275-M1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTD 2.50 -17.5-03-275-P1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTD 2.50 -17.5-03-275-R1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTD 3.15 -17.5-03-275-P1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTD 3.15 -17.5-03-275-R1	
350	470	338	6	366	637	100	97	98	254	40	20	--	158	GTD 0.63 -24.0-03-275-L1	24 kV
350	514	352	10	380	637	100	97	98	254	50	14	22	180	GTD 1.25 -24.0-03-275-M1	
350	514	352	10	380	637	100	97	98	254	50	14	22	180	GTD 1.60 -24.0-03-275-M1	
350	660	371	22	402	682	100	137	73	254	80	20	40	228	GTD 2.50 -24.0-03-300-M1	
450	570	452	6	480	852	100	102	93	343	40	20	--	153	GTD 0.63 -36.0-03-400-L1	36 kV
450	614	466	10	494	852	100	102	93	343	50	14	22	175	GTD 1.25 -36.0-03-400-M1	
450	750	485	22	516	890	100	132	78	343	80	20	22	228	GTD 2.50 -36.0-03-400-M1	
450	750	485	22	516	890	100	132	78	343	80	20	22	228	GTD 3.15 -36.0-03-420-M1	

* Incl. inlet aid

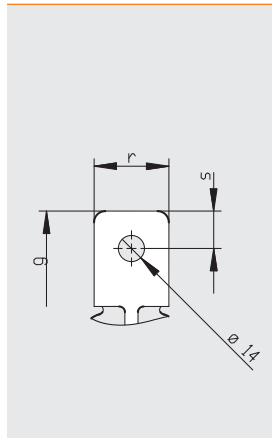
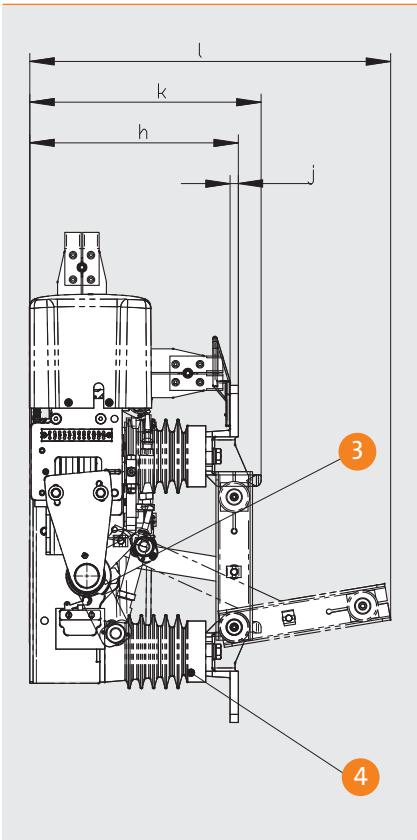
FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS



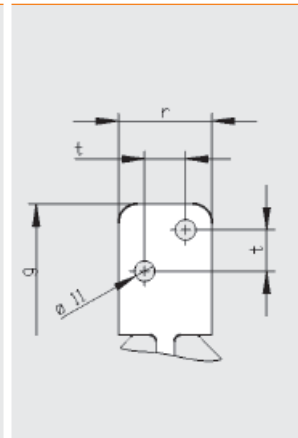
▶▶▶ pto – for other GTO types, see p. 24-25

Type	U _n [kV]	U _p [kV]	U _d [kV]	I _n [kA]	I _{th} [kA]	I _{dyn} [kA]	Weight [kg]	PA	a	b	c	d	e
12 kV GTO0.63-12.0-03-150-L1	12	60	28	630	20	50	30	150	305	388	346	111	318
GTO0.63-12.0-03-150-M1	12	60	28	630	31,5	80	30	150	305	388	346	111	318
GTO0.63-12.0-03-210-L1	12	75	28	630	20	50	35	210	393	582	552	102	318
GTO 0.63-12.0-03-210-L1	12	75	28	630	20	50	45	210	417	630	600	207	318
GTO0.63-12.0-03-210-M1	12	75	28	630	31,5	80	45	210	417	630	600	207	318
GTO0.63-12.0-03-210-M1	12	75	28	630	31,5	80	38	210	393	582	552	102	318
GTO 1.25-12.0-03-150-M1	12	60	28	1250	31,5	80	33	150	305	388	346	111	318
GTO 1.25-12.0-03-210-M1	12	75	28	1250	31,5	80	52	210	417	630	600	207	318
GTO 1.25-12.0-03-210-P1	12	75	28	1250	50	125	67	210	399	618	580	90	348
GTO 1.25-12.0-03-210-R1	12	75	28	1250	63	160	76	210	399	618	580	90	348
GTO 1.25-12.0-03-210-M1	12	75	28	1250	31,5	80	43	210	393	582	552	102	318
GTO 1.60-12.0-03-210-M1	12	75	28	1600	31,5	80	46	210	393	582	552	102	318
GTO 1.60-12.0-03-210-M1	12	75	28	1600	31,5	80	52	210	417	630	600	207	318
GTO 1.60-12.0-03-210-P1	12	75	28	1600	50	125	67	210	399	618	580	90	348
GTO 1.60-12.0-03-210-R1	12	75	28	1600	63	160	76	210	399	618	580	90	348
GTO 2.50-12.0-03-210-M1	12	75	28	2500	31,5	80	87	210	399	618	580	90	408
GTO 2.50-12.0-03-210-P1	12	75	28	2500	50	125	93	210	399	618	580	90	408
GTO 2.50-12.0-03-210-R1	12	75	28	2500	63	160	102	210	399	618	580	90	408
GTO 3.15-12.0-03-210-P1	12	75	28	3150	50	125	95	230	419	658	620	90	408
GTO 3.15-12.0-03-210-R1	12	75	28	3150	63	160	105	230	419	658	620	90	408

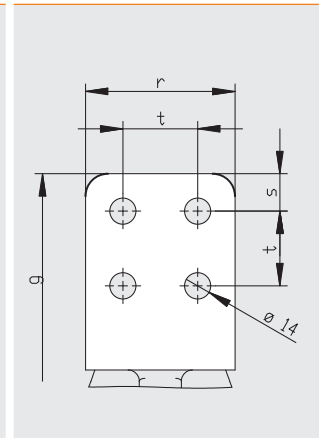
TYPE GTO



▶ 630 A



▶ 1250 A / 1600 A



▶ 2500 A / 3150 A

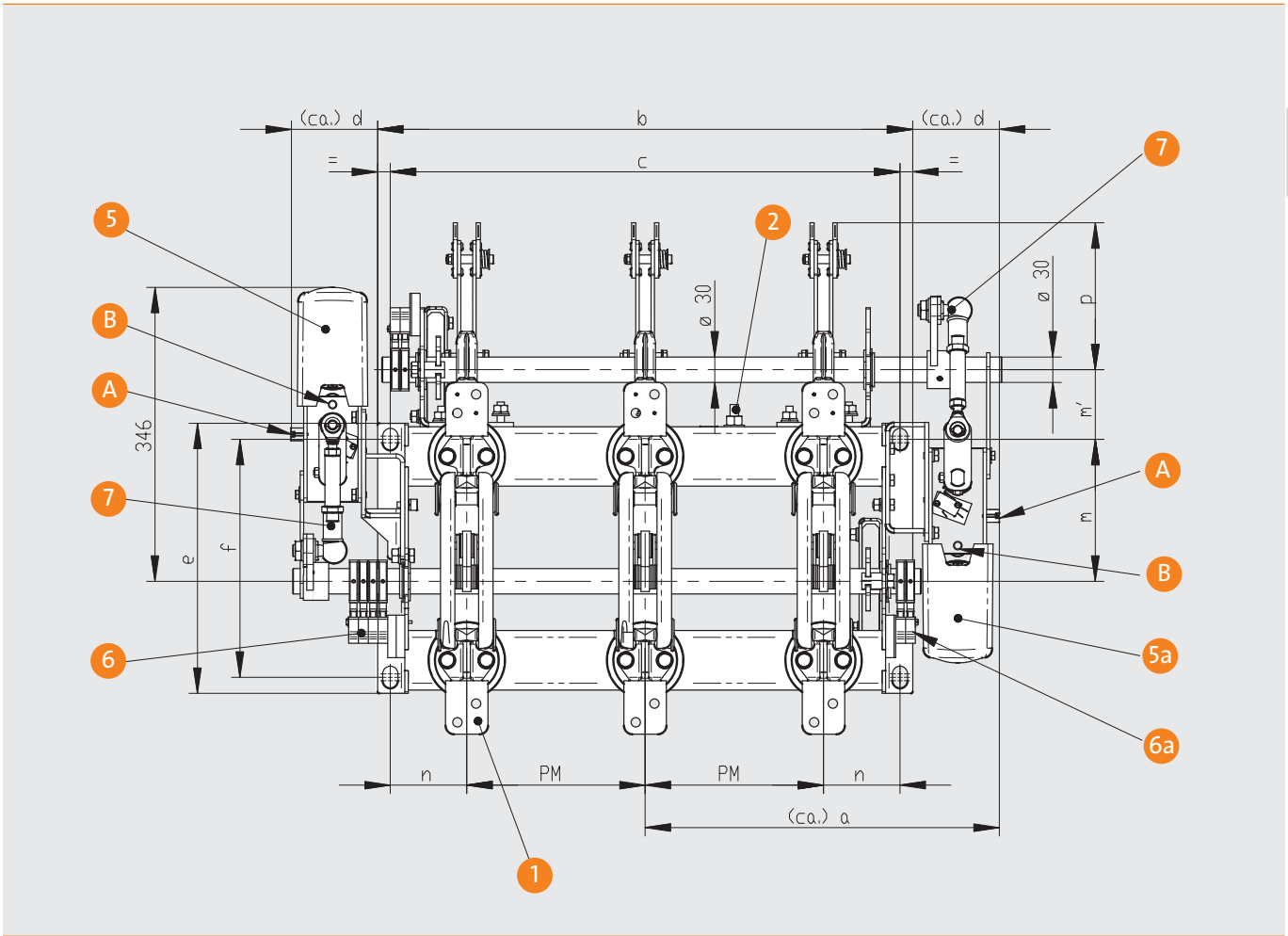
- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
 - 6 Auxiliary switches
 - 6a Auxiliary switches
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

Views without expansion joints

f	g	h	j	k	l	m	m'	n	p	r	s	t	u	Type	12 kV
280	414	268	6	296	470	23	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-150-L1	
280	414	268	6	296	470	23	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-150-M1	
280	370	242	6	270	445	66	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-210-L1	
280	370	242	6	270	445	90	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-210-M1	
280	370	242	6	270	445	90	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-210-R1	
280	370	242	6	270	445	66	82	113	173	40	20	--	158	GTO 0.63 -12.0-03-210-M1	
280	414	282	10	310	470	23	82	113	173	50	14	22	180	GTO 1.25 -12.0-03-150-M1	
280	414	256	10	284	445	90	82	113	173	50	14	22	180	GTO 1.25 -12.0-03-210-M1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTO 1.25 -12.0-03-210-P1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTO 1.25 -12.0-03-210-R1	
280	414	256	10	284	445	66	82	113	173	50	14	22	180	GTO 1.25 -12.0-03-210-M1	
280	414	256	10	284	445	66	82	113	173	50	14	22	180	GTO 1.60-12.0-03-210-M1	
280	414	256	10	284	445	90	82	113	173	50	14	22	180	GTO 1.60-12.0-03-210-M1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTO 1.60-12.0-03-210-P1	
280	440	270	10	355*	470	80	97	113	166	50	14	22	193	GTO 1.60-12.0-03-210-R1	
340	570	289	22	320	525	80	97	113	166	80	20	40	228	GTO 2.50 -12.0-03-210-M1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTO 2.50 -12.0-03-210-P1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTO 2.50 -12.0-03-210-R1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTO 3.15 -12.0-03-210-P1	
340	570	289	22	395*	525	80	97	113	166	80	20	40	228	GTO 3.15 -12.0-03-210-R1	

* Incl. inlet aid

FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS

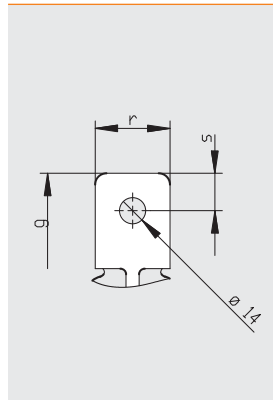
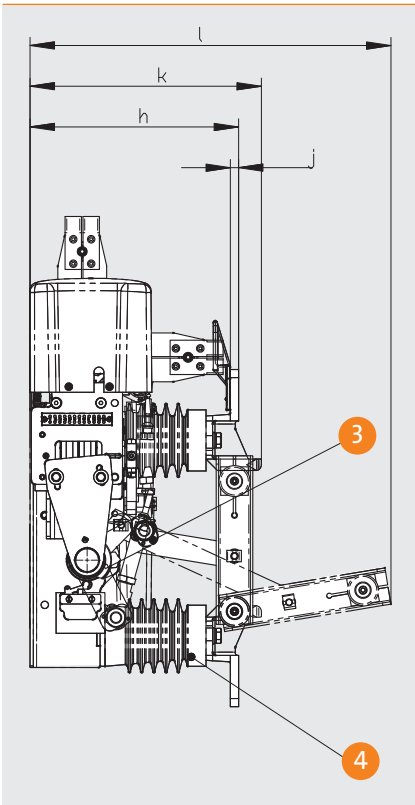


◀◀◀ pto – for other GTO types, see p. 22-23

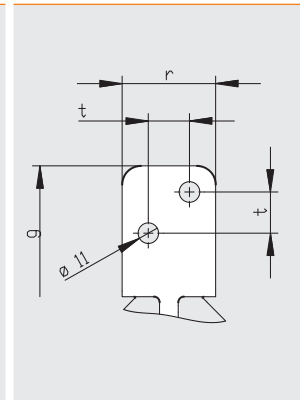
Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d	e	
17,5 kV	GTO0.63-17.5-03-275-L1	17,5	75	28	630	50	20	38	275	**	630	670	**	318
	GTO0.63-17.5-03-275-M1	17,5	75	28	630	80	31,5	38	275	**	700	670	**	318
	GTO 1.25-17.5-03-275-M1	17,5	75	28	1250	80	31,5	55	275	**	700	670	**	318
	GTO 1.25-17.5-03-275-P1	17,5	75	28	1250	125	50	69	275	**	700	670	**	348
	GTO 1.25-17.5-03-275-R1	17,5	75	28	1250	160	63	78	275	**	700	670	**	348
	GTO 1.60-17.5-03-275-M1	17,5	75	28	1600	80	31,5	55	275	**	748	710	**	318
	GTO 1.60-17.5-03-275-P1	17,5	75	28	1600	125	50	69	275	**	748	710	**	348
	GTO 1.60-17.5-03-275-R1	17,5	75	28	1600	160	63	78	275	**	748	710	**	348
	GTO 2.50-17.5-03-275-M1	17,5	75	28	2500	80	31,5	84	275	**	748	710	**	408
	GTO 2.50-17.5-03-275-P1	17,5	75	28	2500	125	50	90	275	**	748	710	**	408
	GTO 2.50-17.5-03-275-R1	17,5	75	28	2500	160	63	95	275	**	748	710	**	408
24 kV	GTO0.63-24.0-03-275-L1	24	125	50	630	50	20	58	275	523	788	750	130	418
	GTO 1.25-24.0-03-275-M1	24	125	50	1250	80	31,5	61	275	523	788	750	130	418
	GTO 1.60-24.0-03-275-M1	24	125	50	1600	80	31,5	70	275	523	788	750	130	418
	GTO 2.50-24.0-03-300-M1	24	125	50	2500	80	31,5	94	300	549	838	800	130	498
36 kV	GTO0.63-36.0-03-400-L1	36	170	70	630	50	20	78	400	668	1038	1000	149	528
	GTO1.25-36.0-03-400-M1	36	170	70	1250	80	31,5	82	400	668	1038	1000	149	528
	GTO2.50-36.0-03-400-M1	36	170	70	2500	80	31,5	100	400	668	1038	1000	149	588
	GTO3.15-36.0-03-420-M1	36	170	70	3150	80	31,5	120	420	688	1078	1040	149	588

**Dimensions on request (depending to the signalling contacts)

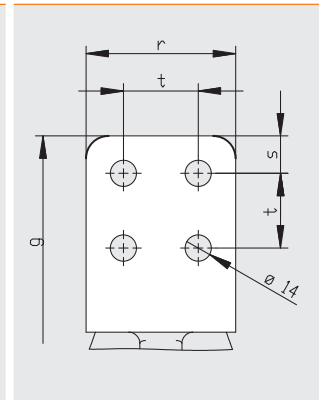
TYP GTO



▶ 630 A



▶ 1250 A / 1600 A



▶ 2500 A / 3150 A

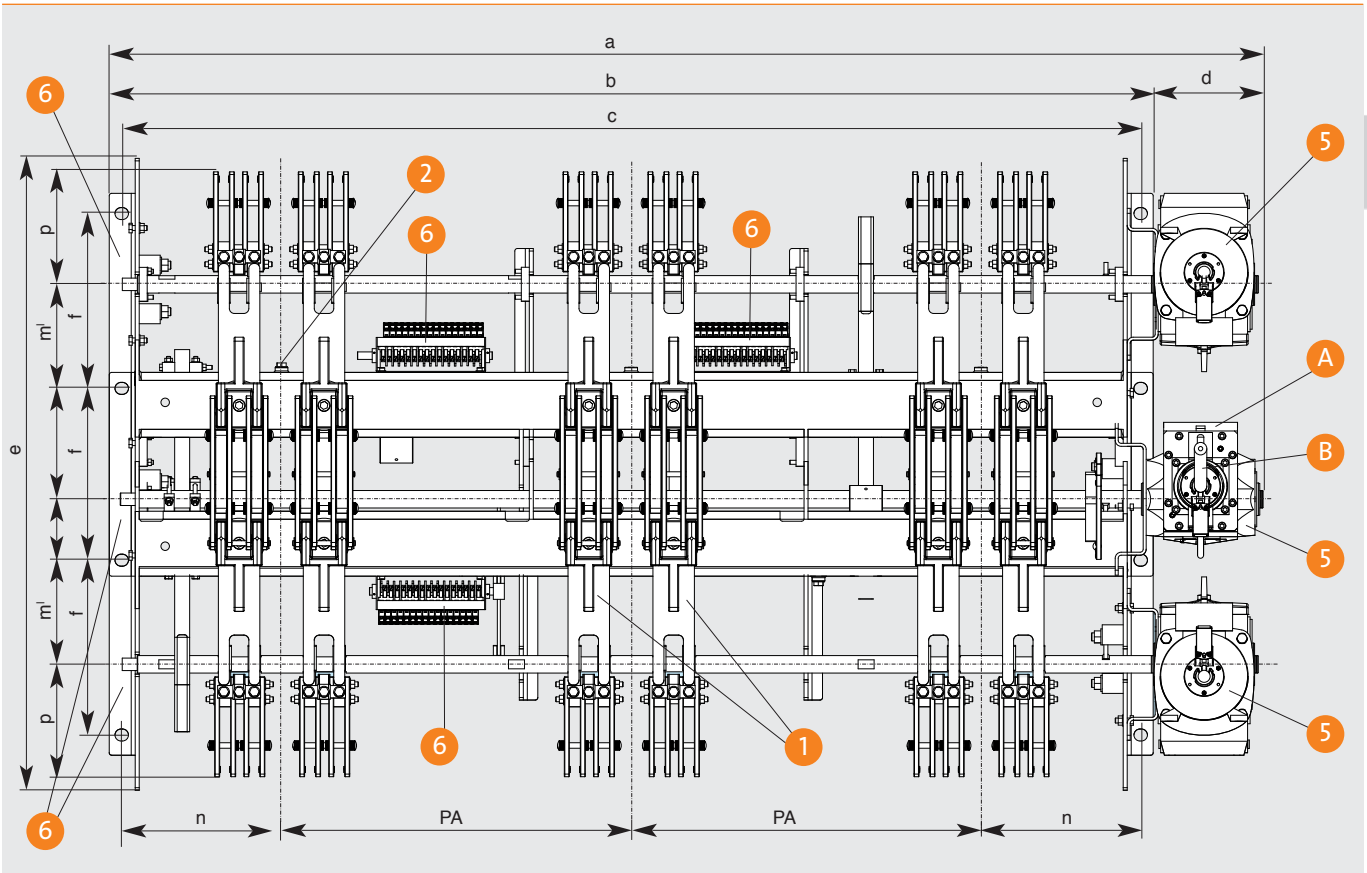
- 1 Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
 - 2 Grounding screw
1x M12 630A / 1250 A / 1600 A
2x M12 2500 A / 3150 A
 - 3 Switching angle 90°
 - 4 Supporter
 - 5 Motor drive
Weight of the drive 4.8 kg
 - 5a Motor drive
 - 6 Auxiliary switches
 - 6a Auxiliary switches
 - 7 Motor drive coupling
 - A Cable connection
 - B Crank handle connection
- Specify actuating voltage when ordering

Views without expansion joints

f	g	h	j	k	l	m	m'	n	p	r	s	t	u	Type	
280	370	272	6	300	475	90	82	113	203	40	20	--	158	GTO 0.63 - 17.5-03-275-L1	17,5 kV
280	370	272	6	300	475	90	82	113	203	40	20	--	158	GTO 0.63 - 17.5-03-275-M1	
280	414	286	10	314	475	90	82	113	203	50	14	22	180	GTO 1.25 - 17.5-03-275-M1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTO 1.25 - 17.5-03-275-P1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTO 1.25 - 17.5-03-275-R1	
280	414	286	10	314	475	90	82	113	203	50	14	22	180	GTO 1.60 - 17.5-03-275-M1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTO 1.60 - 17.5-03-275-P1	
280	440	300	10	385*	500	80	97	113	196	50	14	22	193	GTO 1.60 - 17.5-03-275-R1	
340	570	319	22	350	555	80	97	113	203	80	20	40	228	GTO 2.50 - 17.5-03-275-M1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTO 2.50 - 17.5-03-275-P1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTO 2.50 - 17.5-03-275-R1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTO 3.15 - 17.5-03-275-P1	
340	570	319	22	425*	555	80	97	113	196	80	20	40	228	GTO 3.15 - 17.5-03-275-R1	
350	470	338	6	366	637	100	97	98	254	40	20	--	158	GTO 0.63 - 24.0-03-275-L1	24 kV
350	514	352	10	380	637	100	97	98	254	50	14	22	180	GTO 1.25 - 24.0-03-275-M1	
350	514	352	10	380	637	100	97	98	254	50	14	22	180	GTO 1.60 - 24.0-03-275-M1	
350	660	371	22	402	682	100	137	73	254	80	20	40	228	GTO 2.50 - 24.0-03-300-M1	
450	570	452	6	480	852	100	102	93	343	40	20	--	153	GTO 0.63 - 36.0-03-400-L1	36 kV
450	614	466	10	494	852	100	102	93	343	50	14	22	175	GTO 1.25 - 36.0-03-400-M1	
450	750	485	22	516	890	100	132	78	343	80	20	22	228	GTO 2.50 - 36.0-03-400-M1	
450	750	485	22	516	890	100	132	78	343	80	20	22	228	GTO 3.15 - 36.0-03-420-M1	

* Incl. inlet aid

FLOHE ISOLATOR/GROUNDING CONNECTOR COMBINATIONS

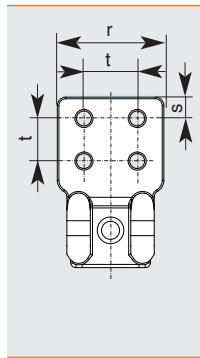
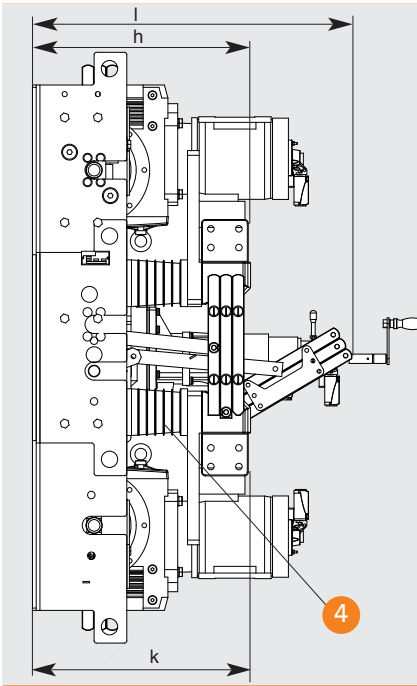


- 1** Connection screws
630 A: M12x45
1250 A / 1600 A: M12x60
2500 A / 3150 A: M12x80
4000 A: M12x80
6300 A: M16x80
 - 2** Grounding screw
1x M12
 - 4** Supporter
 - 5** Motor drive
Weight of the drive 10-30 kg
 - 6** Auxiliary switches
 - A** Cable connection
 - B** Crank handle connection
- Specify actuating voltage when ordering

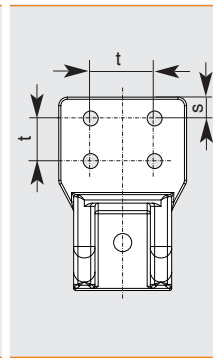
Type	U_n [kV]	U_p [kV]	U_d [kV]	I_n [kA]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d	
12 kV	HASxx3.15-12.0-03-300-S1	12	75	28	3150	72	177	150	300	**	950	910	**
	HASxx4.00-12.0-03-400-S1	12	75	28	4000	72	177	190	400	**	1330	1270	**
	HASxx6.30-12.0-03-400-W1	12	75	28	6300	85	214	300	400	**	1330	1270	**
	HASxx8.00-12.0-03-500-VK1	12	75	28	8000	110	275	380	500	**	1530	1270	**
	HASxx12.0-12.0-03-500-VV1	12	75	28	12000	121	300	600	500	**	1530	1270	**
24 kV	HASxx3.15-24.0-03-300-R1	24	125	50	3150	63	159	200	350	**	1070	1010	**
	HASxx4.00-24.0-03-400-R1	24	125	50	4000	63	159	250	450	**	1430	1370	**
	HASxx6.30-24.0-03-400-T1	24	125	50	4000	63	159	250	450	**	1430	1370	**
	HASxx8.00-24.0-03-500-V1	24	125	50	8000	100	250	500	600	**	1730	1520	**
	HASxx12.0-24.0-03-500-VK1	24	125	50	12000	110	275	800	600	**	1730	1535	**
	HASxx18.0-24.0-03-1500-WS1	24	125	50	18000	140	360	1200	1500	**	3000	3335	**
	HASxx24.0-24.0-03-2000-XP1	24	125	50	24000	164*	410*	1600	2000	**	4530	4335	**
36 kV	HASxx3.15-36.0-03-300-R1	36	170	70	3150	63	159	210	450	**	1410	1350	**
	HASxx4.00-36.0-03-400-R1	36	170	70	4000	63	159	260	500	**	1530	1470	**
	HASxx6.30-36.0-03-400-T1	36	170	70	6300	75	193	420	500	**	1530	1470	**
	HASxx8.00-36.0-03-500-V1	36	170	70	8000	100	250	530	700	**	1930	1720	**
	HASxx12.0-36.0-03-500-VK1	36	170	70	12000	110	275	840	700	**	1930	1735	**

*not tested ** Dimensions on request (depending to the signalling contacts)

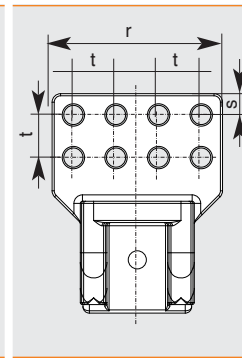
TYPE HASE / HASEE



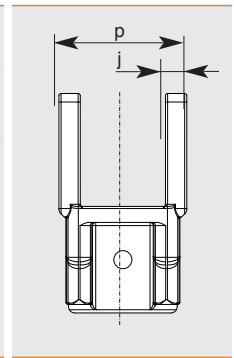
▶ 3150 A



▶ 4000 A
8000 A



▶ 6300 A
12000 A



▶ 6300 A
VERTICAL

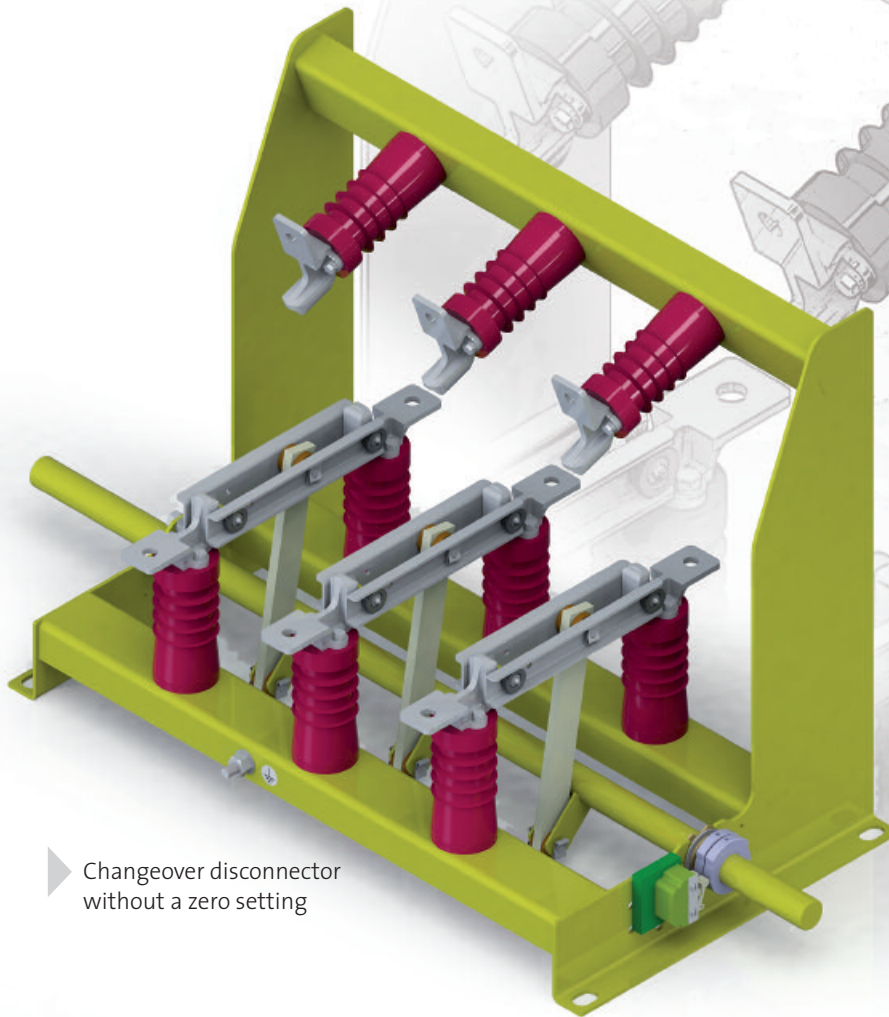


■ HASE devices
with grounding connector one-sided

■ HASEE devices
with grounding connectors on both sides

f	g	h	j	k	l	m	m'	n	p	r	s	t	u	v	Type	
265	500	338	18	380	560	82,5	208	155	--	100	20	50	200	231	HASxx3.15-12.0-03-300-S1	12 kV
344	549	377	20	432	614	122	208	235	--	120	20	60	224,5	231	HASxx4.00-12.0-03-400-S1	
344	588	397	20	463	654	122	208	235	120	160	20	40	244	231	HASxx6.30-12.0-03-400-W1	
344	549	377	20	432	614	122	208	320	--	290	20	60	224,5	231	HASxx8.00-12.0-03-500-VK1	
344	588	397	20	463	654	122	208	335	120	345	20	40	244	231	HASxx12.0-12.0-03-500-VV1	
344	580	453	18	495	760	97	208	105	--	100	20	50	215	346	HASxx3.15-24.0-03-300-R1	24 kV
414	673	480	20	535	820	147	208	185	--	120	20	60	276,5	346	HASxx4.00-24.0-03-400-R1	
414	712	500	20	566	855	147	208	185	120	160	20	40	296	346	HASxx6.30-24.0-03-400-T1	
414	673	480	20	535	820	147	208	320	--	290	20	60	276,5	346	HASxx8.00-24.0-03-500-V1	
414	712	500	20	566	855	147	208	335	120	345	20	40	296	346	HASxx12.0-24.0-03-500-VK1	
414	712	500	20	566	855	147	208	335	120	530	20	40	296	346	HASxx18.0-24.0-03-1500-WS1	
414	712	500	20	566	855	147	208	335	120	715	20	40	296	346	HASxx24.0-24.0-03-2000-XP1	
414	650	566	18	608	950	147	208	5	--	100	20	50	265	459	HASxx3.15-36.0-03-300-R1	36 kV
520	753	580	20	635	994	150	208	135	--	120	20	60	266,5	459	HASxx4.00-36.0-03-400-R1	
520	792	600	20	666	1040	150	208	135	120	160	20	40	286	459	HASxx6.30-36.0-03-400-T1	
520	753	580	20	635	994	150	208	320	--	290	20	60	266,5	459	HASxx8.00-36.0-03-500-V1	
520	792	600	20	666	1040	150	208	335	120	345	20	40	286	459	HASxx12.0-36.0-03-500-VK1	

* Incl. inlet aid



▶ Changeover disconnecter without a zero setting

THERE ARE 4 VARIANTS

- **GTU** ▶ Changeover disconnecter without a zero setting: makes a contact in every position
- **GTN** ▶ Changeover disconnecter with a zero position: has 3 defined positions
- **GTP** ▶ Commutator without a zero position: change from plus to minus
- **GTPN** ▶ Commutator with a zero setting: from plus to minus

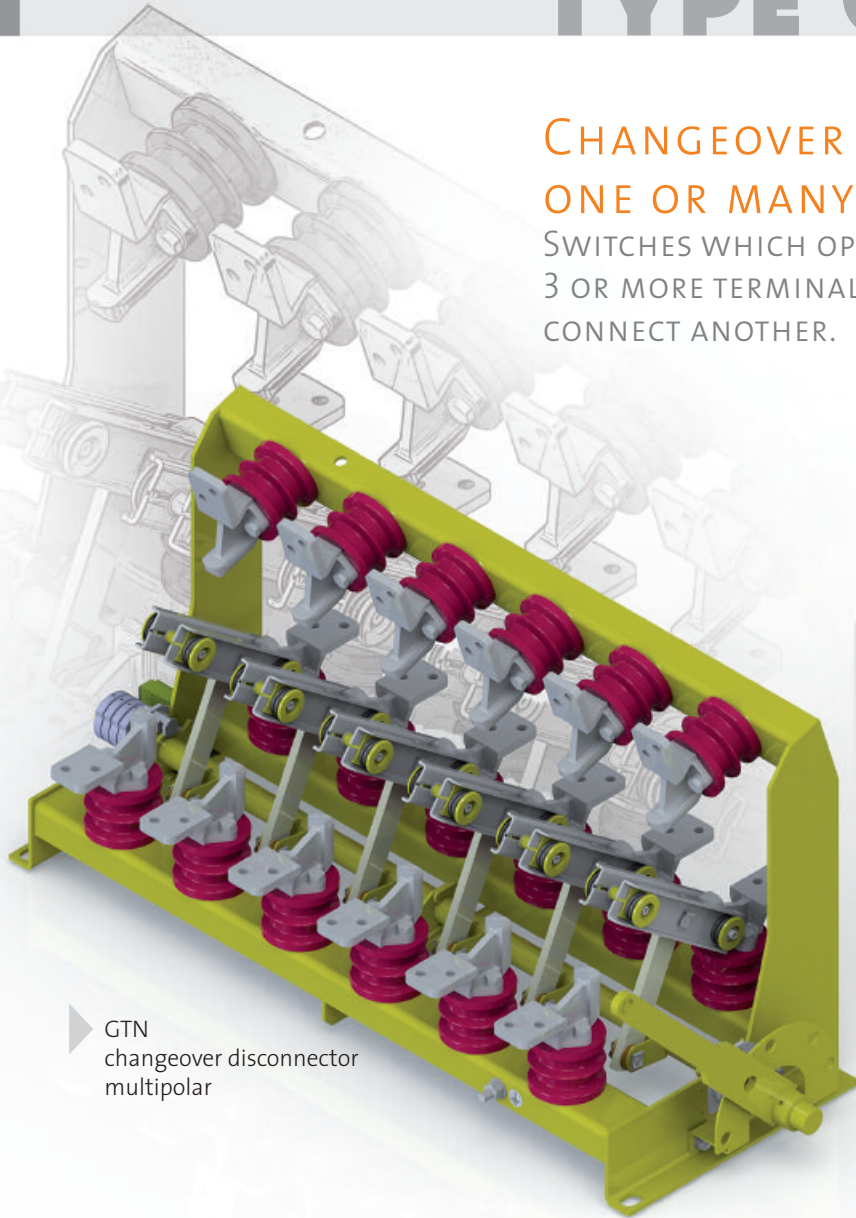
The technical connection requirements for medium voltage equipment apply. The technical data is based on the empty isolators GT (for the dimension sheets, see page 6 et seq.).

The units can be delivered at voltage levels between 500 V and 40.5 kV. Currents up to 24,000 A are possible. Devices with more than 3 poles are always available on request (see the diagram on page 29).

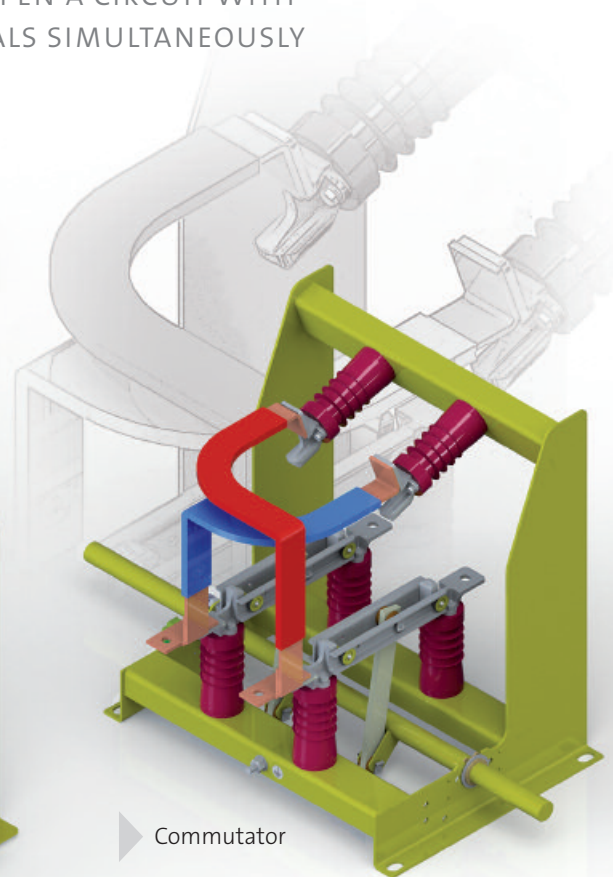
TYPE GTU/GTN

CHANGEOVER DISCONNECTOR (CHANGER) ONE OR MANY POLES

SWITCHES WHICH OPEN A CIRCUIT WITH
3 OR MORE TERMINALS SIMULTANEOUSLY
CONNECT ANOTHER.

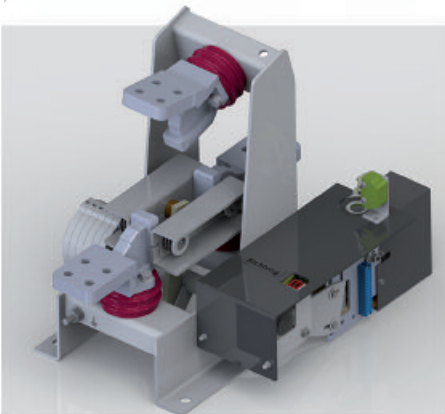


▶ GTN
changeover disconnecter
multipolar

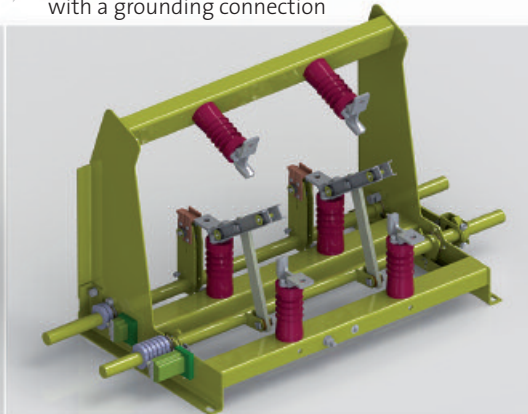


▶ Commutator

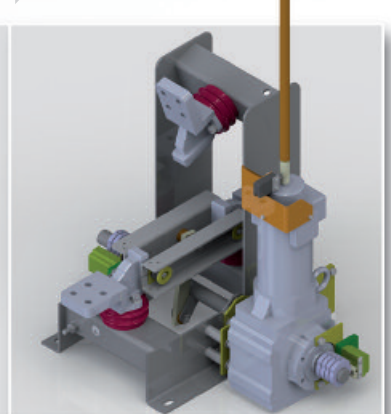
▶ GTU with position indicator

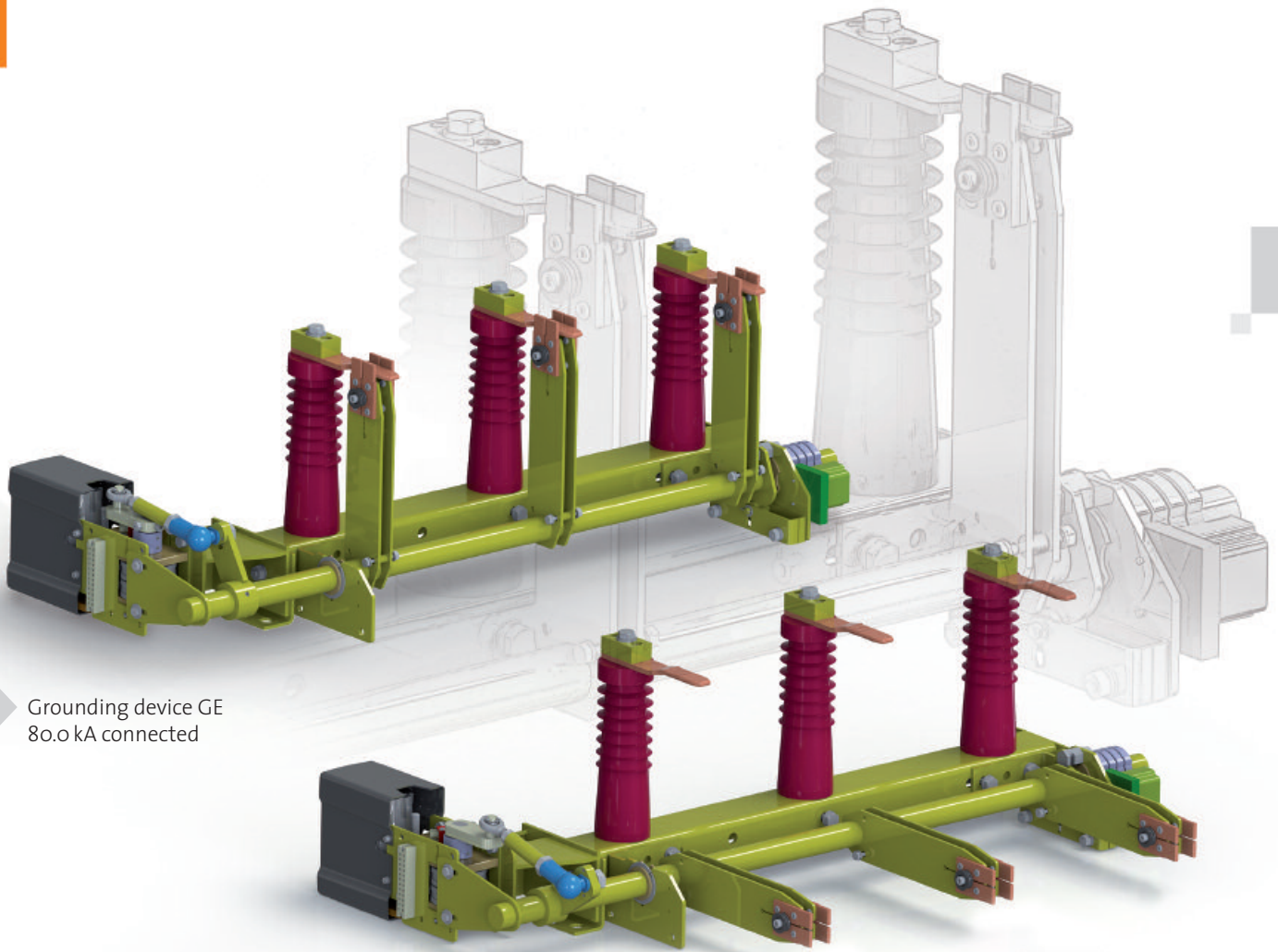


▶ GTUE changeover disconnecter
with a grounding connection



▶ GTU with an AC drive





▶ Grounding device GE
80.0 kA connected

▶ Grounding device GE
80.0 kA open

PROPERTIES...

SERVICE LIFE

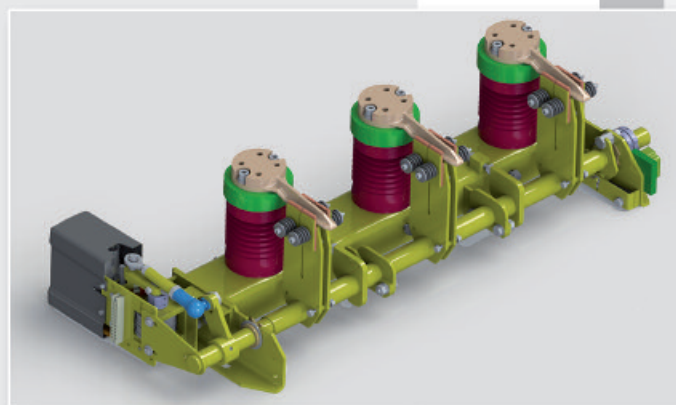
- As a rule, the grounding device are connected relatively little. A high number of switching operations are not envisaged on account of the standard devices. The mechanical service life, which mainly due to wear and tear is 5,000 switching operations among grounding device. A higher number of switching operations (up to 25,000) are available on request.

SHORT CIRCUIT RESISTANCE

- The short circuit resistance of the grounding devices is tested in accordance with IEC (VDE).

Equipment is offered with a rated voltage of 500 V to 40.5 kV and a rated peak current of up to 160 kA.

▶ GE grounding device
with a motor drive



TYPE GE

GROUNDING DEVICE WHICH CAN BE POWERED UP

INFORMATION ON THE RATING PLATE

FLOHE Berg GmbH			
GE080.0-36.0-03-425-M-A04-B33-E06			
Serien-Nr.		A12513/S205230 -001	
IEC 62271-102		Zg-Nr.: WF16 15808	
U_p	36,0 kV	I_p	0,00 kA
U_p	170 kV	I_p	80 kA
U_p	70 kV	I_p	31,5 kA /1s
		fr	50/60Hz
		BJ	2016
		M	37 kg

Note:

When asking questions in order to determine spare parts, additional deliveries, etc. the following four pieces of information are required:

- Type
- Factory no.
- Type indicator
- Year



THE OBJECT OF THE GROUNDING DEVICE IS TO GROUND AFTER OPENING THE CIRCUIT.

In the case of multi-pole grounding device, the poles are additionally shorted together. In the case of grounding device there are grounding device which cannot be powered up and grounding device which can be powered up must be distinguished.

In the standard, the differences are reflected in the designation.

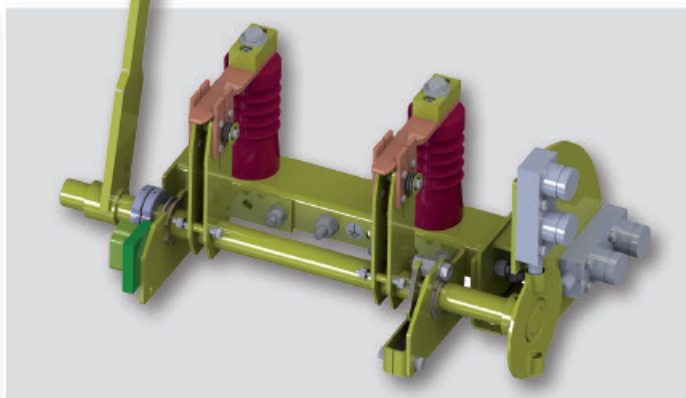
The Eo grounding device is a device which cannot be powered up, i.e. this grounding device cannot be connected when voltage is applied (when they are live).

THE GROUNDING DEVICE ARE PROVIDED FOR INTERIOR APPLICATIONS UP TO A RATED VOLTAGE OF 40.5 kV.

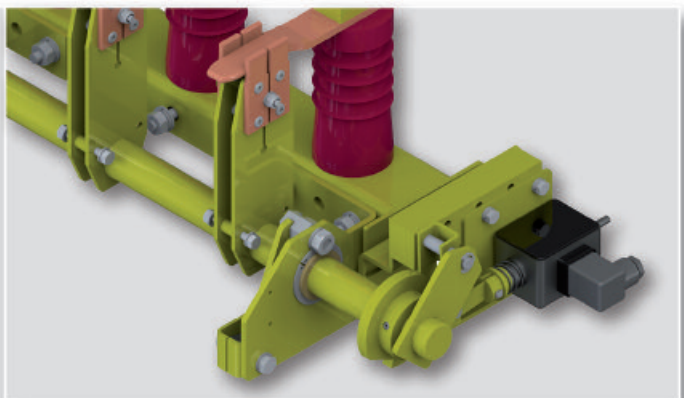
Through the use of insulators which have a ribbing, the grounding device can also be used in areas where there is high humidity and occasional condensation. As such, use in the tropics is not a problem.

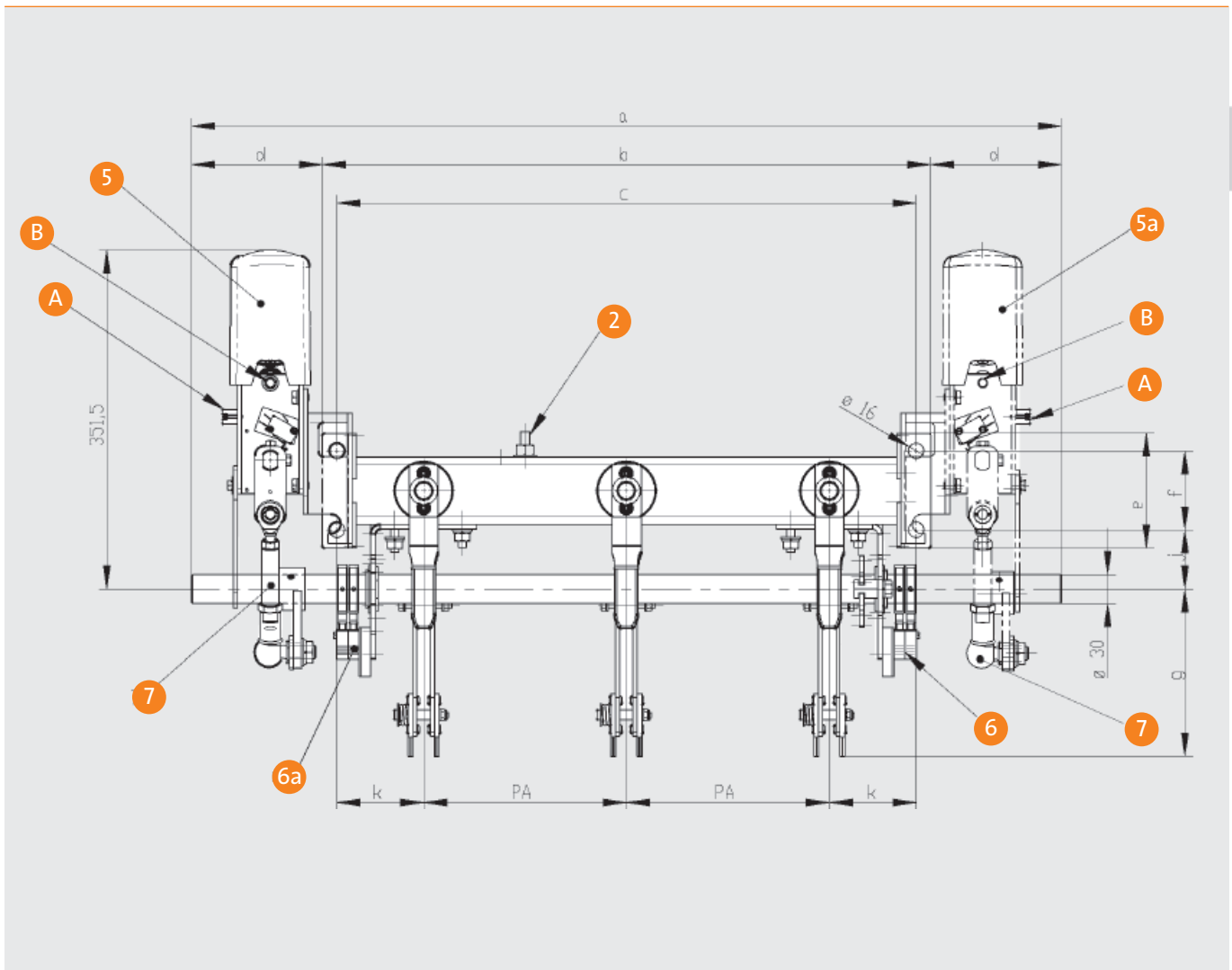
The switching devices can be installed in a horizontal position, i.e. a wall mounting, standing on the floor or hanging from the ceiling. The horizontal position based on the position of the switch shaft.

▶ GE grounding device with a Castell lock



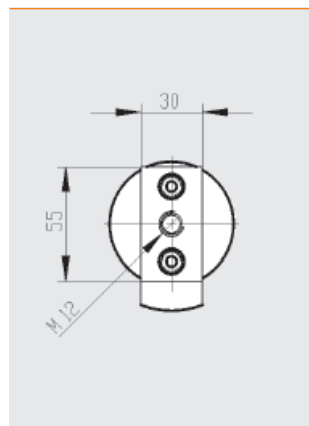
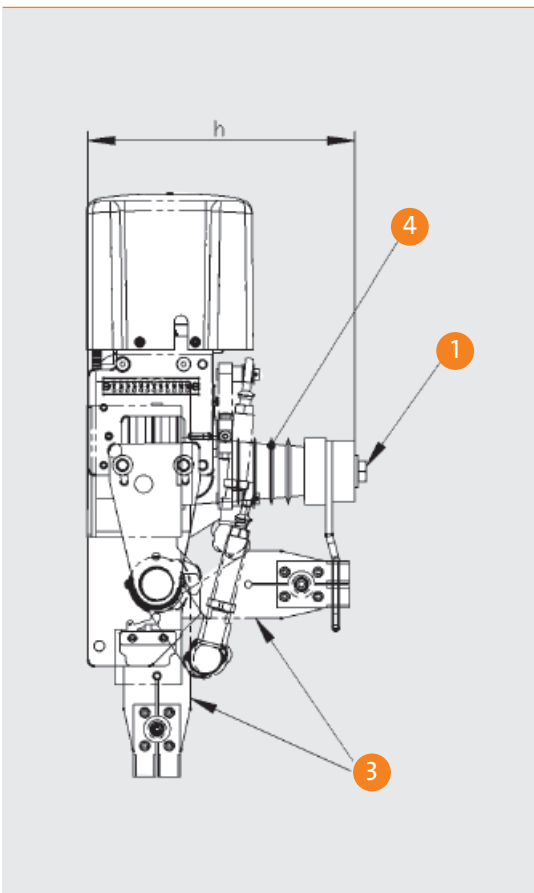
▶ GE grounding device with electromechanical locking magnet



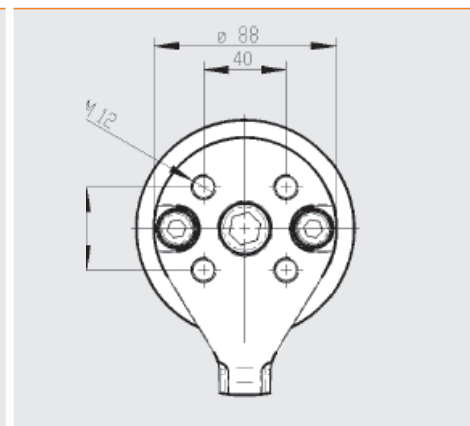


Type	U_n [kV]	U_p [kV]	U_d [kV]	I_{dyn} [kA]	I_{th} [kA]	Weight [kg]	PA	a		
12 kV	GE 050.0-12.0-03-210-L	12	75	28	50	20	13,5	210	900	
	GE 080.0-12.0-03-210-M	12	75	28	80	31,5	13,5	210	900	
	GE 125.0-12.0-03-210-P	12	75	28	125	50	32	210	880	
	GE 160.0-12.0-03-210-R	12	75	28	160	63	38	210	880	
	Field size 650 mm	GE 050.0-12.0-03-150-L	12	60	28	50	20	19	150	590
12 kV	GE 080.0-12.0-03-150-M	12	60	28	80	31,5	19	150	590	
	Field size 900 mm	GE 050.0-12.0-03-210-L	12	75	28	50	20	12,5	210	780
	GE 080.0-12.0-03-210-M	12	75	28	80	31,5	12,5	210	780	
	GE 125.0-12.0-03-210-P	12	75	28	125	50	31,5	210	780	
	24 kV (1-polig)	GE 050.0-24.0-01-L	24	125	50	50	20	7	--	580
GE 080.0-24.0-01-M		24	125	50	80	31,5	7	--	580	
GE 050.0-24.0-03-275-L		24	125	50	50	20	20	275	1130	
GE 080.0-24.0-03-275-M		24	125	50	80	31,5	20	275	1130	
Field size 900 mm		GE 050.0-24.0-03-210-L	24	95	50	50	20	19	210	780
GE 080.0-24.0-03-210-M	24	95	50	80	31,5	19	210	780		
36 kV	GE 050.0-36.0-03-400-L	36	170	70	50	20	31	400	1550	
	GE 080.0-36.0-03-400-M	36	170	70	80	31,5	31	400	1550	

TYPE GE



▶ 50 kA / 80 kA

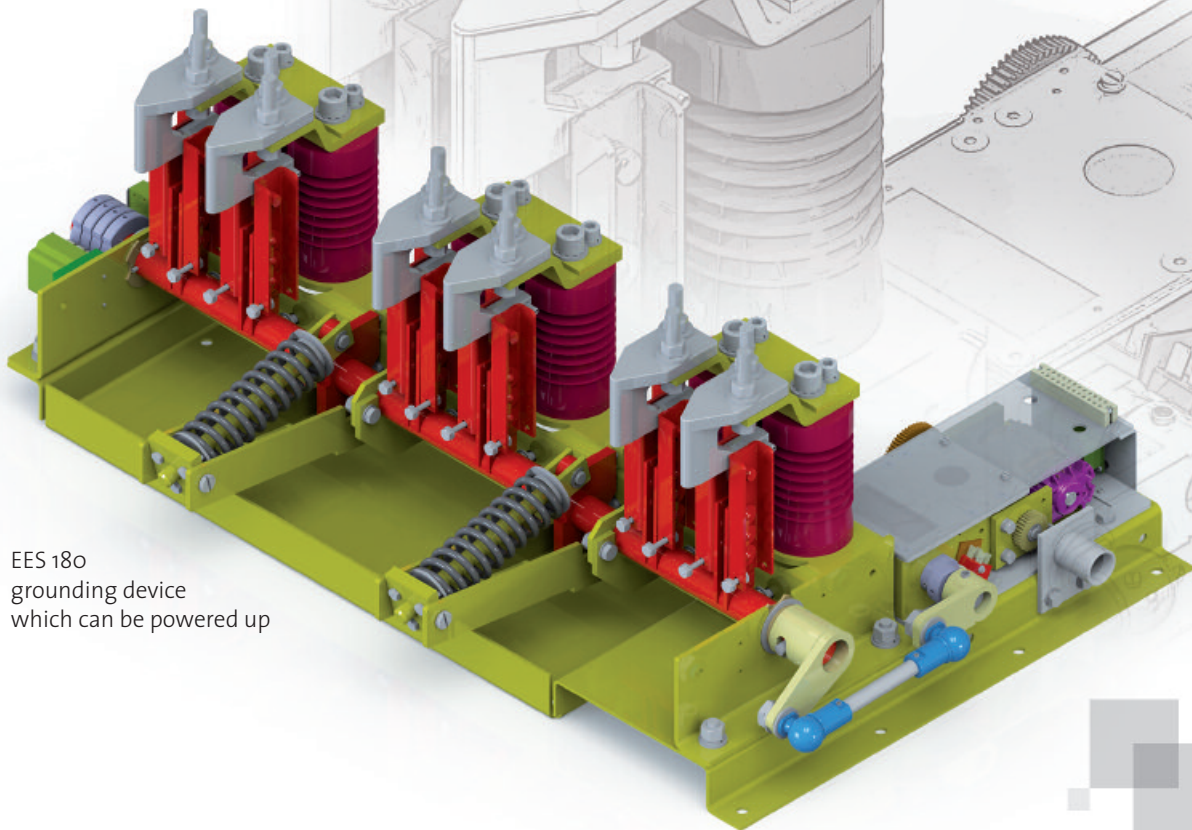


▶ 125 kA

- | | |
|---|---|
| <p>1 Connection screws
50 A / 80 kA: M12
125 kA: M12</p> <p>2 Grounding screw
1x M12 50 kA / 80 kA
2x M12 125 kA</p> <p>3 Switching angle 90°</p> <p>4 Supporter</p> <p>5 Motor drive
Weight of the drive 4.8 kg</p> | <p>5a Motor drive
Optional position</p> <p>6 Auxiliary switches</p> <p>6a Auxiliary switches
Optional position</p> <p>7 Motor drive coupling</p> <p>A Cable connection</p> <p>B Crank handle connection
Specify actuating voltage
when ordering</p> |
|---|---|

Views without expansion joints

b	c	d	e	f	g	h	j	k	Type	
630	600	135	119	82	173	241	42,5	90	GE 050.0-12.0-03-210-L	12 kV
630	600	135	119	82	173	241	42,5	90	GE 080.0-12.0-03-210-M	
618	580	131	200	162	166	255	36	80	GE 125.0-12.0-03-210-P	
618	580	131	200	162	166	255	36	80	GE 160.0-12.0-03-210-R	
388	346	101	120	82	173	268	82	23	GE 050.0-12.0-03-150-L	Field size 650 mm
388	346	101	120	82	173	268	82	23	GE 080.0-12.0-03-150-M	
582	552	99	120	82	173	241	61	66	GE 050.0-12.0-03-210-L	Field size 900 mm
582	552	99	120	82	173	241	61	66	GE 080.0-12.0-03-210-M	
618	580	81	200	162	166	255	36	80	GE 125.0-12.0-03-210-P	
238	200	171	120	82	253	321	61	100	GE 050.0-24.0-01-L	24 kV (1-polig)
238	200	171	120	82	253	321	61	100	GE 080.0-24.0-01-M	
788	750	171	120	82	253	321	61	100	GE 050.0-24.0-03-275-L	
788	750	171	120	82	253	321	61	100	GE 080.0-24.0-03-275-M	
618	580	81	120	82	253	332	61	80	GE 050.0-24.0-03-210-L	Field size 900 mm
618	580	81	120	82	253	332	61	80	GE 080.0-24.0-03-210-M	
1038	1000	256	120	82	343	411	61	100	GE 050.0-36.0-03-400-L	36 kV
1038	1000	256	120	82	343	411	61	100	GE 080.0-36.0-03-400-M	



▶ EES 180
grounding device
which can be powered up

PROPERTIES...

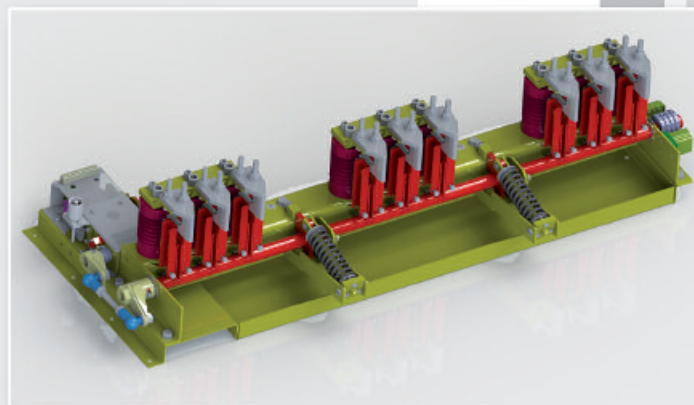
SERVICE LIFE

- As a rule, the grounding switches are connected relatively rarely. Due to this, a high number of switching operations are not envisaged among standard devices.

The mechanical service life, which is mainly due to the wear and tear of the contacts, is 500 switching operations in the case of grounding connections which cannot be powered up.

A high number of switching operations (up to 25.000) is possible upon request.

▶ Grounding device which
can be powered up $I_p=210$ kA



TYPE EES

GROUNDING DEVICES

ARE ESSENTIAL FOR THE SAFETY OF PERSONS.

These kind of switching devices are used to protect staff at work on equipment, which are normally live. Therefore, they must be very reliable and safely operated – even under difficult operating conditions.

The object of the grounding devices is to ground after opening the circuit. In the case of multi-pole grounding devices, the poles are additionally shorted together. Among grounding devices, a distinction is made between grounding devices which can and cannot be powered up. In the standard, the differences are reflected in the designation. In the case of classes E1 and E2, these are grounding devices which can be powered up and can be connected when a voltage is applied.

The grounding devices in the EES series are three-pole switching devices with a spring operated snap-action mechanism for powering up. As a rule, powering down is performed manually. The grounding devices are available for the rated voltages of 12 kV to 40.5 kV. The standard devices are designed for installation in interior-switching plant and tested in accordance with VDE 0670 – part 6, IEC 298 and VDE 0101.

In addition to the standard equipment, special designs are available, e.g. 1- or 2-pole devices. However devices with up to 12 poles are possible, which are adapted to the respective requirements. The standard units can be equipped with motor drive.

INFORMATION ON THE RATING PLATE

FLOHE Berg GmbH			
EES160.0-17.5-03-275-R-A64E58-G3-D			
Serien-Nr. A12458/S204955		-001	
IEC 62271-102		Zg-Nr.: WF16_2044	
U_n	17.5 kV	I_n	0,00 kA fr 50/60Hz
U_p	95 kV	I_p	160 kA Bj 2016
U_s	38 kV	I_s	63,0 kA /1s M 60 kg

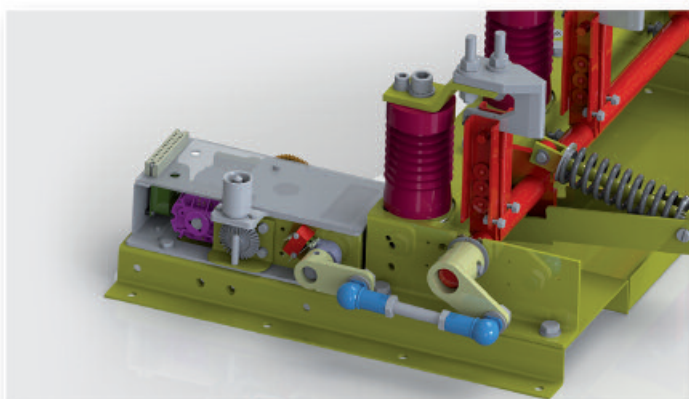
Note:

When asking questions in order to determine spare parts, additional deliveries, etc. the following four pieces of information are required:

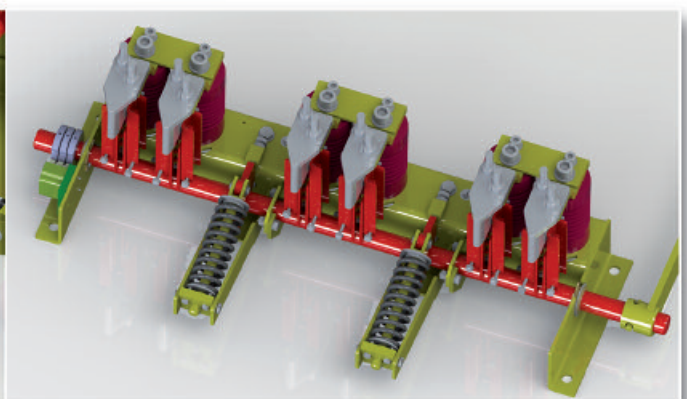
- Type
- Factory no.
- Type indicator
- Year

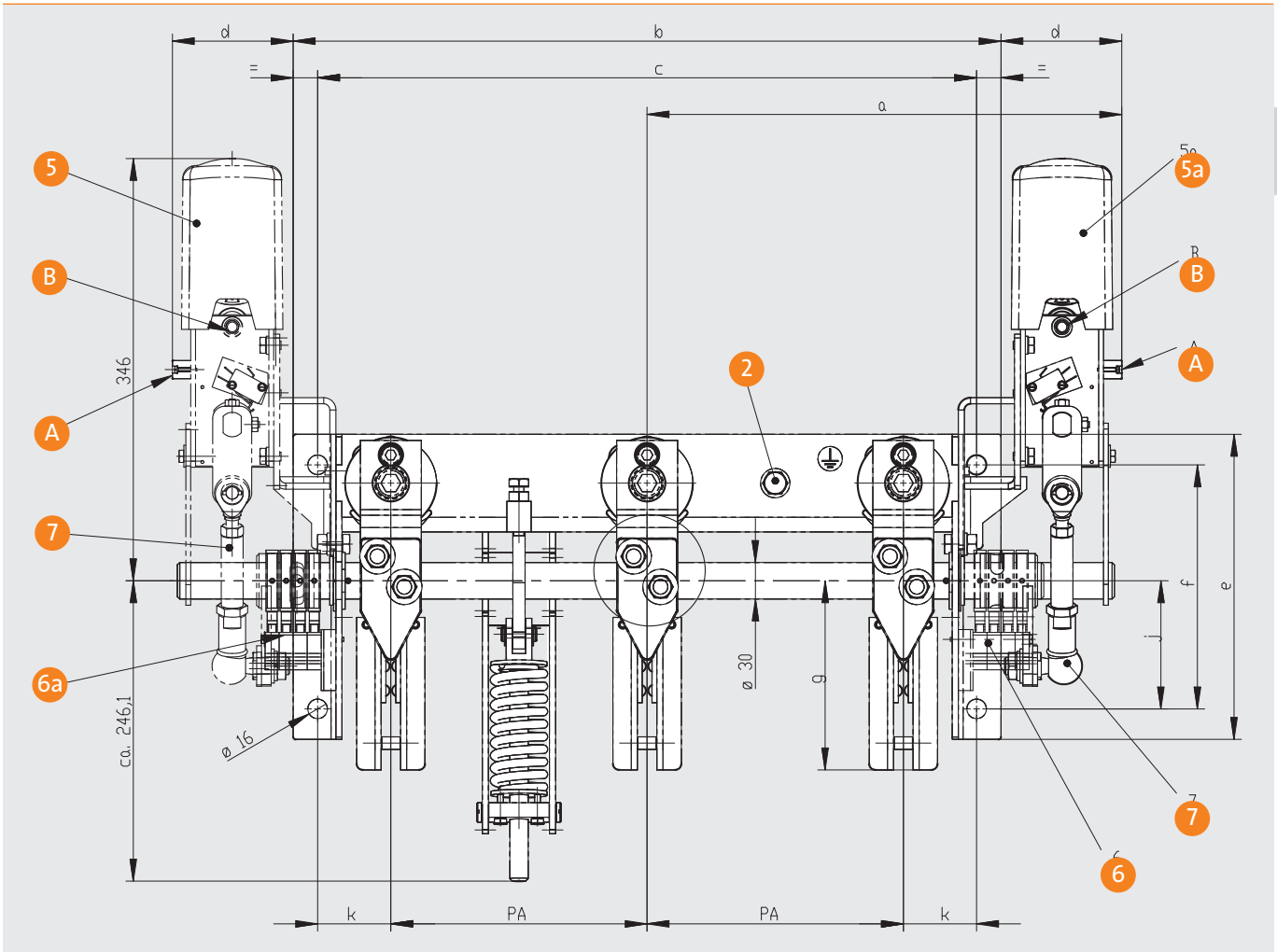


▶ Earth proven grounding device
with a motor drive
Emergency manual crank operation from the top / front



▶ Earth proven grounding device
which cannot be powered up with a manual lever



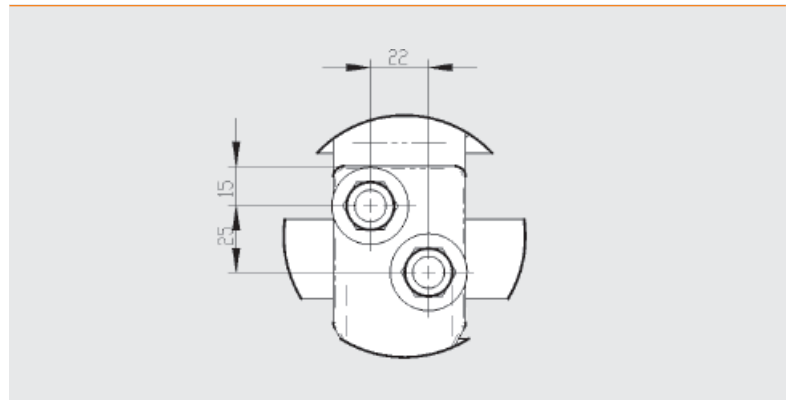
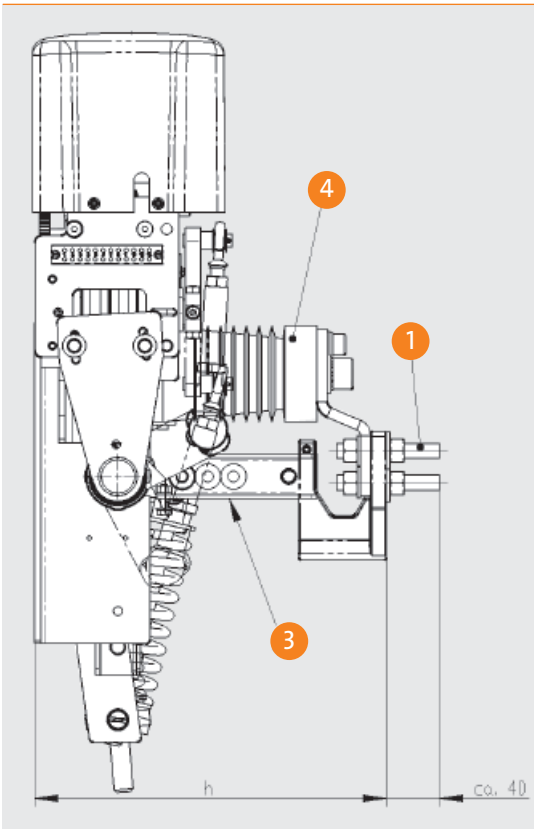


▶▶▶ pto – for other EES types, see p. 38-39

Type	U_n [kV]	U_p [kV]	U_d [kV]	I_{dyn} [kA]	I_{th} [kA]	Weight [kg]	PA	a
12 kV	EES 050.0-12.0-03-175-L	12	75	28	50	21	175	354
	EES 050.0-12.0-03-210-L	12	75	28	50	22	210	389
	EES 080.0-12.0-03-175-M	12	75	28	80	31,5	21	175
	EES 080.0-12.0-03-210-M	12	75	28	80	31,5	22	210
	EES 125.0-12.0-03-175-P	12	75	28	125	50	21	175
	EES 125.0-12.0-03-210-P	12	75	28	125	50	22	210
17,5 kV	EES 050.0-17.5-03-210-L	17,5	95	38	50	23	210	**
	EES 050.0-17.5-03-275-L	17,5	95	38	50	24	275	**
	EES 080.0-17.5-03-210-M	17,5	95	38	80	31,5	23	210
	EES 080.0-17.5-03-275-M	17,5	95	38	80	31,5	24	275
	EES 125.0-17.5-03-210-P	17,5	95	38	125	50	23	210
	EES 125.0-17.5-03-275-P	17,5	95	38	125	50	24	275
24 kV	EES 050.0-24.0-03-275-L	24	125	50	50	27	275	514
	EES 050.0-24.0-03-300-L	24	125	50	50	28	300	539
	EES 080.0-24.0-03-275-M	24	125	50	80	31,5	27	275
	EES 080.0-24.0-03-300-M	24	125	50	80	31,5	28	300
	EES 125.0-24.0-03-275-P	24	125	50	125	50	27	275
	EES 125.0-24.0-03-300-P	24	125	50	125	50	28	300
36 kV	EES 050.0-36.0-03-400-L	36	125	50	50	37	400	674
	EES 080.0-36.0-03-400-M	36	125	50	80	37	400	674
	EES 125.0-36.0-03-400-P	36	125	50	125	50	37	400

** Dimension on request (depending to the signalling contacts)

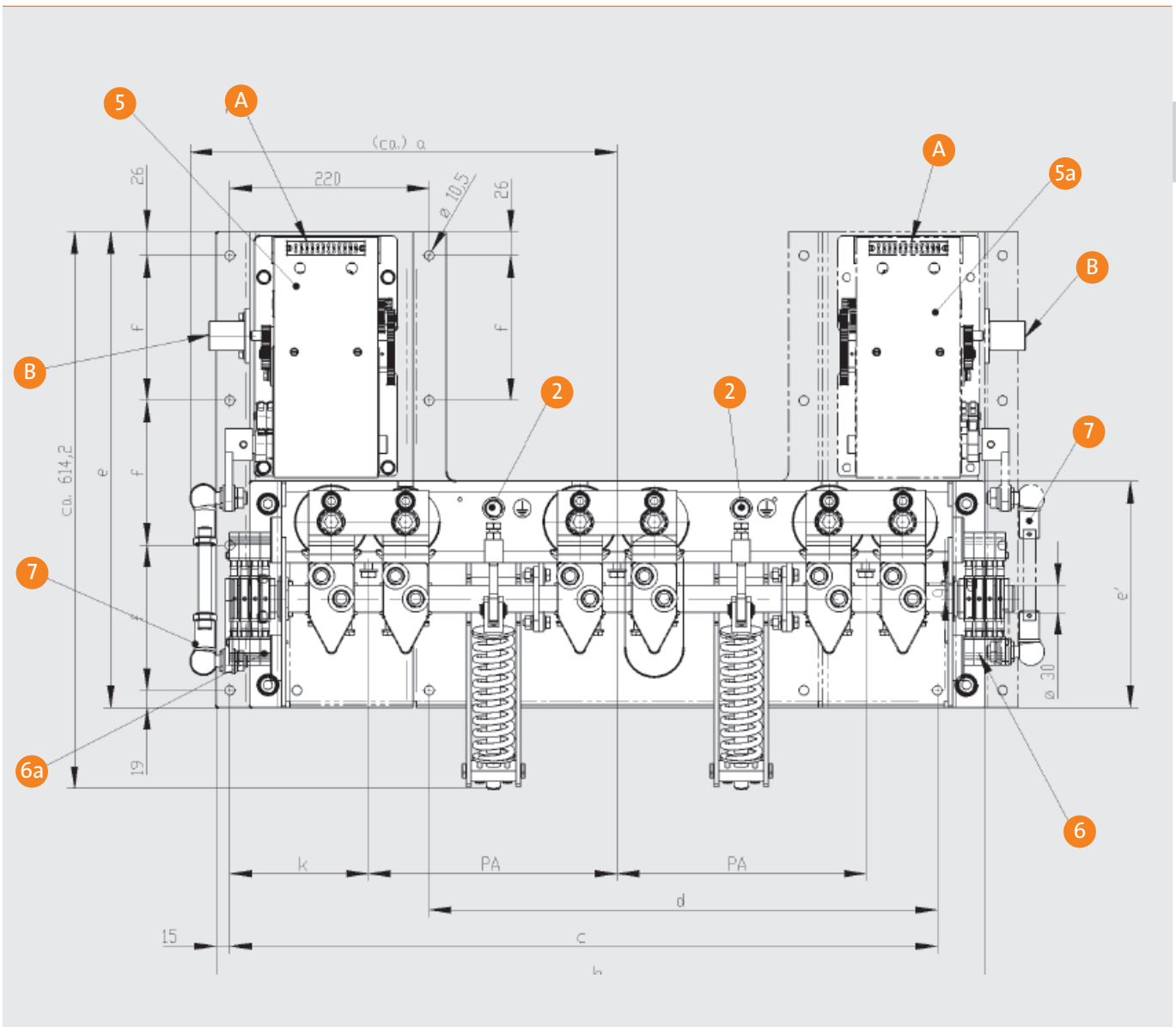
TYPE EES



- | | | | |
|----|--|----|--|
| 1 | Connection screws
50 A / 80 / 125 kA: M12 | 6 | Auxiliary switches |
| 2 | Grounding screw
1x M12 50 kA / 80 kA / 125 kA | 6a | Auxiliary switches
Optional position |
| 3 | Switching angle 90° | 7 | Motor drive coupling |
| 4 | Supporter | A | Cable connection |
| 5 | Motor drive
Weight of the drive 4.8 kg | B | Crank handle connection |
| 5a | Motor drive
Optional position | | Specify actuating voltage
when ordering |

Views without expansion joints

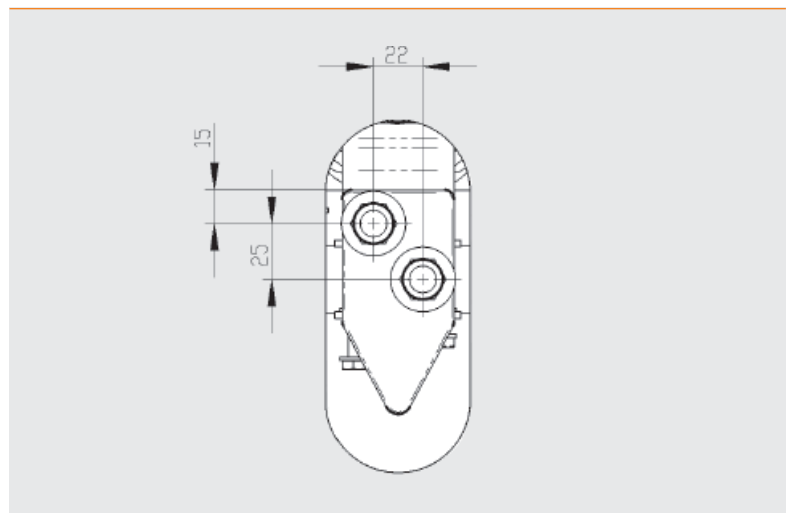
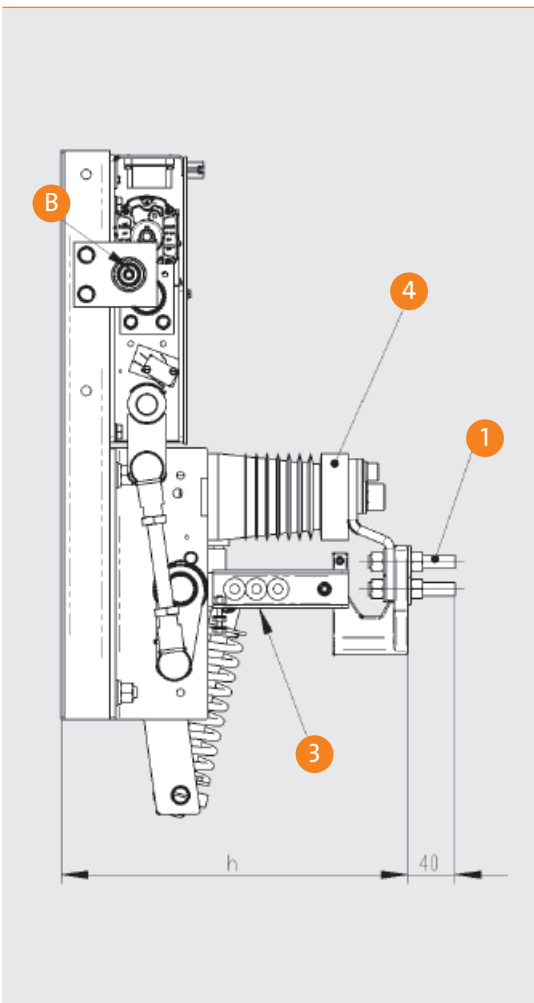
b	c	d	e	f	g	h	j	k	Type	
510	470	99	250	200	155	274	105	60	EES 050.0-12.0-03-175-L	12 kV
580	540	99	250	200	155	274	105	60	EES 050.0-12.0-03-210-L	
510	470	99	250	200	155	274	105	60	EES 080.0-12.0-03-175-M	
580	540	99	250	200	155	274	105	60	EES 080.0-12.0-03-210-M	
510	470	99	250	200	155	274	105	60	EES 125.0-12.0-03-175-P	
580	540	99	250	200	155	274	105	60	EES 125.0-12.0-03-210-P	
580	540	**	250	200	185	304	105	60	EES 050.0-17.5-03-210-L	17,5 kV
710	670	**	250	200	185	304	105	60	EES 050.0-17.5-03-275-L	
580	540	**	250	200	185	304	105	60	EES 080.0-17.5-03-210-M	
710	670	**	250	200	185	304	105	60	EES 080.0-17.5-03-275-M	
580	540	**	250	200	185	304	105	60	EES 125.0-17.5-03-210-P	
710	670	**	250	200	185	304	105	60	EES 125.0-17.5-03-275-P	
760	720	134	250	200	235	354	95	85	EES 050.0-24.0-03-275-L	24 kV
810	770	134	250	200	235	354	95	85	EES 050.0-24.0-03-300-L	
760	720	134	250	200	235	354	95	85	EES 080.0-24.0-03-275-M	
810	770	134	250	200	235	354	95	85	EES 080.0-24.0-03-300-M	
760	720	134	250	200	235	354	95	85	EES 125.0-24.0-03-275-P	
810	770	134	250	200	235	354	95	85	EES 125.0-24.0-03-300-P	
1040	1000	154	250	200	325	444	95	100	EES 050.0-36.0-03-400-L	36 kV
1040	1000	154	250	200	325	444	95	100	EES 080.0-36.0-03-400-M	
1040	1000	154	250	200	325	444	95	100	EES 125.0-36.0-03-400-P	



pto – for other EES types, see p. 36-37

Type	U_n [kV]	U_p [kV]	U_d [kV]	I_{dyn} [kA]	I_{th} [kA]	Weight [kg]	PA	a	b	
12 kV	EES 160.0-12.0-03-275-R	12	75	28	160	63	50	275	472	849
	EES 160.0-12.0-03-300-R	12	75	28	160	63	52	300	497	899
	EES 180.0-12.0-03-275-S	12	75	28	180	72	50	275	472	849
	EES 180.0-12.0-03-300-S	12	75	28	180	72	52	300	497	899
	EES 200.0-12.0-03-275-T	12	75	28	200	80	50	275	472	849
	EES 200.0-12.0-03-300-T	12	75	28	200	80	52	300	497	899
	EES 210.0-12.0-03-350-W	12	75	28	210	85	69	350	591	1086
	EES 210.0-12.0-03-470-W	12	75	28	210	85	72	470	711	1326
24 kV	EES 160.0-24.0-03-360-R	24	125	50	160	63	60	360	557	1019
	EES 160.0-24.0-03-400-R	24	125	50	160	63	62	400	597	1099
	EES 180.0-24.0-03-360-S	24	125	50	180	72	60	360	557	1019
	EES 180.0-24.0-03-400-S	24	125	50	180	72	62	400	597	1099
	EES 200.0-24.0-03-360-T	24	125	50	200	80	60	360	557	1019
	EES 200.0-24.0-03-400-T	24	125	50	200	80	62	400	597	1099
	EES 210.0-24.0-03-470-W	24	125	50	210	85	80	470	711	1326

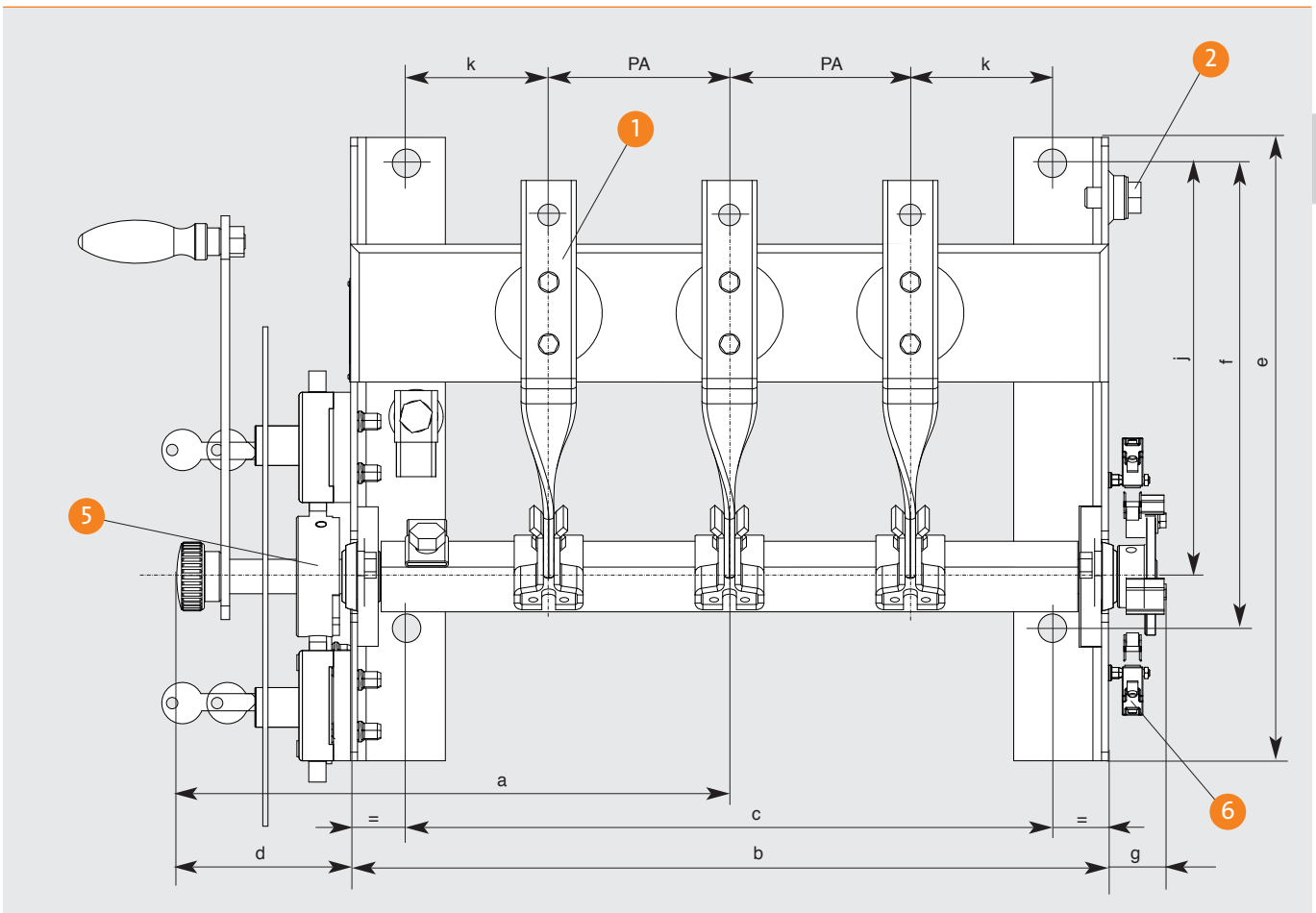
TYP EES



- | | | | |
|----|--|----|--|
| 1 | Connection screws
160 / 180 / 200 / 210 kA: M12 | 6 | Auxiliary switches |
| 2 | Grounding screw
2x M12 160 / 180 / 200 / 210 kA | 6a | Auxiliary switches
Optional position |
| 3 | Switching angle 90° | 7 | Motor drive coupling |
| 4 | Supporter | A | Cable connection |
| 5 | Motor drive
Weight of the drive 4.8 kg | B | Crank handle connection |
| 5a | Motor drive
Optional position | | Specify actuating voltage
when ordering |

Views without expansion joints

c	d	e	e'	f	g	h	j	k	Type	
782	572	525	250	160	155	319	95	153	EES 160.0-12.0-03-275-R	12 kV
832	622	525	250	160	155	319	95	153	EES 160.0-12.0-03-300-R	
782	572	525	250	160	155	319	95	153	EES 180.0-12.0-03-275-S	
832	622	525	250	160	155	319	95	153	EES 180.0-12.0-03-300-S	
782	572	525	250	160	155	319	95	153	EES 200.0-12.0-03-275-T	
832	622	525	250	160	155	319	95	153	EES 200.0-12.0-03-300-T	
1019	799	525	250	160	155	319	95	197	EES 210.0-12.0-03-350-W	
1259	1039	525	250	160	155	319	95	197	EES 210.0-12.0-03-470-W	
720	732	525	250	160	235	399	95	153	EES 160.0-24.0-03-360-R	24 kV
770	812	525	250	160	235	399	95	153	EES 160.0-24.0-03-400-R	
720	732	525	250	160	235	399	95	153	EES 180.0-24.0-03-360-S	
770	812	525	250	160	235	399	95	153	EES 180.0-24.0-03-400-S	
720	732	525	250	160	235	399	95	153	EES 200.0-24.0-03-360-T	
770	812	525	250	160	235	399	95	153	EES 200.0-24.0-03-400-T	
1259	1039	525	250	160	235	399	95	197	EES 210.0-24.0-03-470-W	



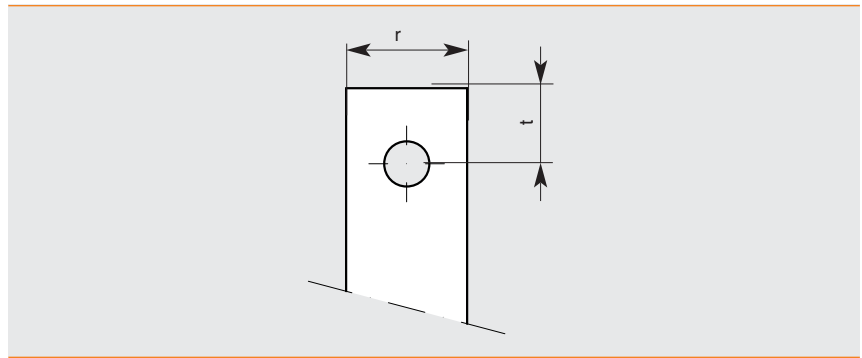
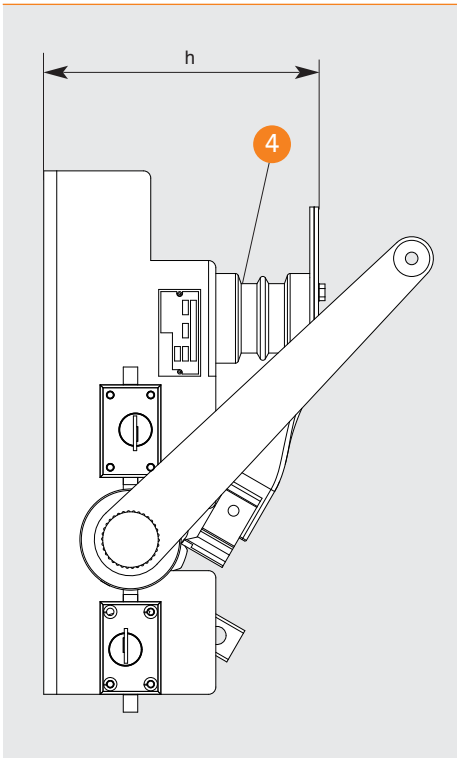
- 1 Connection screws M12x45
- 2 Grounding screw 1x M12
- 3 Supporter
- 4 Specify actuating voltage when ordering
- 5 Locking Motor drive optional
- 6 Auxiliary switches

ETM LIGHT DEVICES STAND OUT FROM:

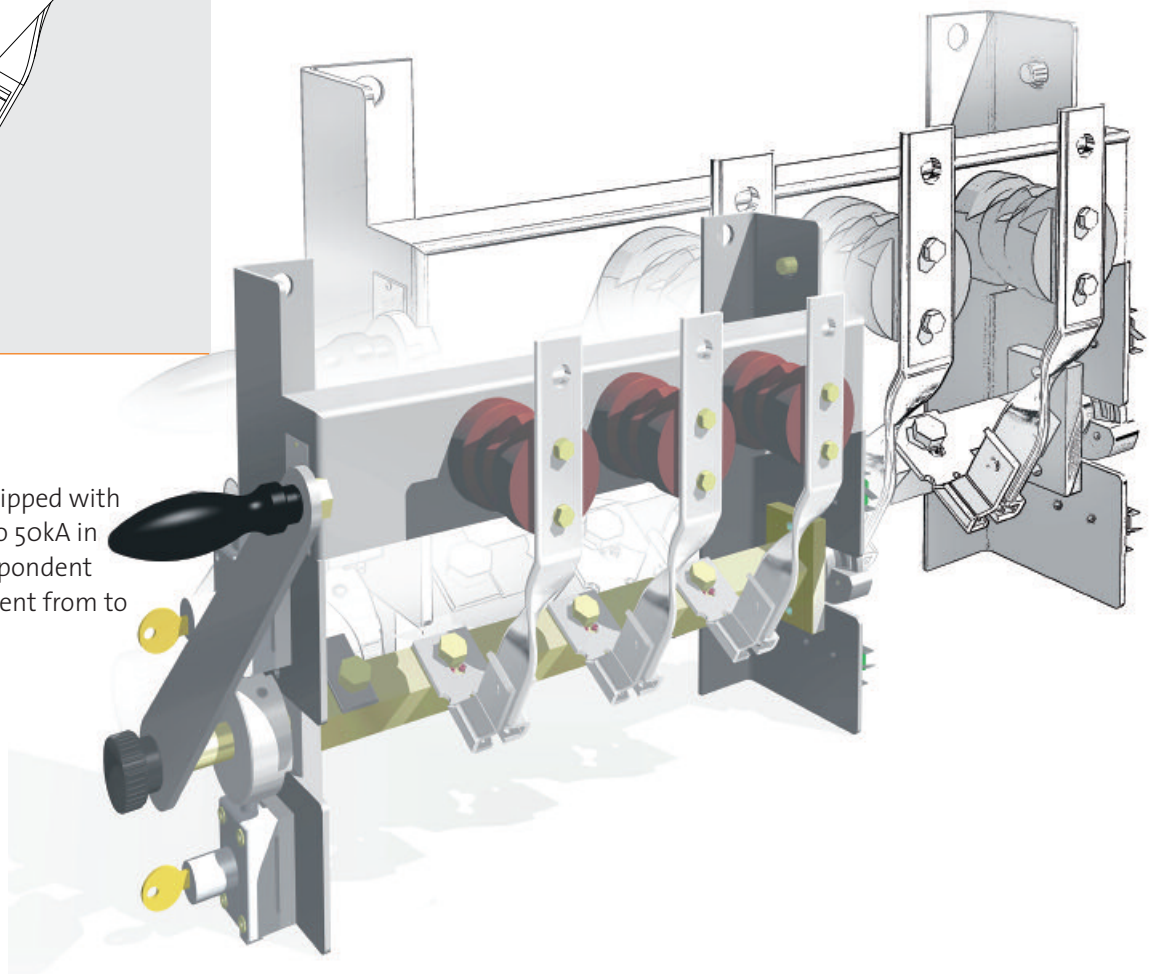
- QUICK MOUNTING MECHANISM
- CLOSING WITH SHORT-CIRCUIT CURRENT
- LARGE INSULATION AND CREEPAGE DISTANCE
- REAL OPENING AND VISIBLE SEPARATION DISTANCE
- ROBUST ANTI-TORSION CONSTRUCTION
- GREAT INDIVIDUALIZATION WITH
 - MANUAL OR MOTOR DRIVE
 - AUXILIARY SWITCH AND LOCKING MAGNET

Type	U_n [kV]	U_p [kV]	U_d [kV]	I_{th} [kA]	I_{dyn} [kA]	Weight [kg]	PA	a	b	c	d
3,6 kV ETM050.0-3.60-03-105-L	3,6	20	10	20	50	20	105	322	440	375	100
7,2 kV ETM050.0-7.20-03-105-L	7,2	40	20	20	50	22	105	322	440	375	100

ETM-LIGHT



- The devices are equipped with a peak current up to 50kA in the case of a correspondent the short-term current from to 20kA/1s.



e	f	g	h	j	l	m	n	r	s	t	u	Type	
362	270	33	190	6	205	30	82,5	32	20	20	230	ETM050.0-3.60-03-105-L	3,6kV
362	270	33	190	6	205	90	82,5	32	20	20	230	ETM050.0-7.20-03-105-L	7,2 kV

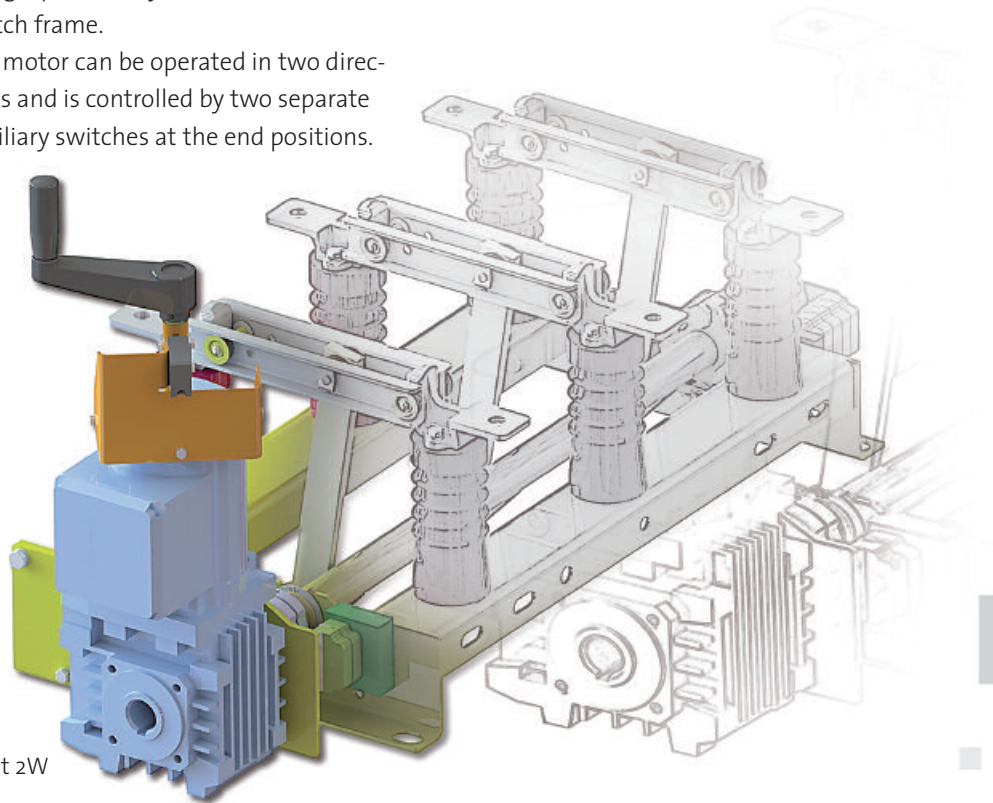
FLOHE MOTOR DRIVES

ARE USED TO PROPEL THE MAIN SWITCHING SHAFT OF THE SWITCHING EQUIPMENT. THERE ARE TWO MAIN TYPES OF DRIVES:

- "2W": firstly the motor drive with clockwise/anti-clockwise rotation, i.e. the motor is pushed through the switching shaft using a parallel key and screwed to the switch frame.

The motor can be operated in two directions and is controlled by two separate auxiliary switches at the end positions.

- "1W": the alternative comprises a compact motor unit that only has one rotation direction. The de-energisation is controlled using two auxiliary switches installed in the motor unit.



▶ with motor unit 2W

- The clockwise/anti clockwise version varies significantly from the other standard drives. We custom design these for customers and various options are available. Accordingly voltages between 24 VDC and 400 VAC can be obtained as standard.
- Other, diverse voltages and/or frequencies can also be achieved as bespoke designs. The motor units are supplied with IP54 as standard. Higher requirements can also be realised on request. For DC drives constructional brake modules must be considered, otherwise the motor cannot come to a clean stop at the end positions.
- External, industry standard auxiliary switches are used for the controlled shut down. Components with protection class IP40 are used as standard. Higher protection classes can also be implemented on request.
- Motor units equipped with a torque limiter are also available as an option. The advantage of this version is that in the event of switching equipment malfunction, the drive is shut down in such a way that serious damage is avoided.
- An emergency hand crank, which is simply inserted into the motor shaft, can be used for emergency operation. The motor unit can also be equipped with an additional optional auxiliary switch, which ensures that the motor can no longer be operated electronically.
- This motor unit can be supplied as a remote actuator. Thus the motor is installed separately and is connected using cardan shafts.

MOTOR DRIVES Axx

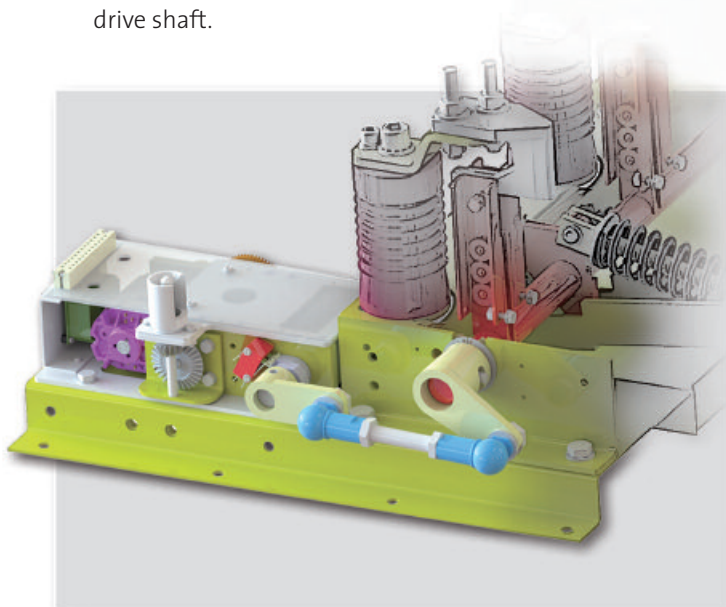
THE COMPACT MOTOR UNIT "1W" IS AVAILABLE IN TWO DESIGNS. THEY DIFFER BY CONSTRUCTION AND TORQUE.

- One is mounted upright on the switching equipment i.e. the drive is attached to the side of the base frame of the switching equipment,
- The other, second version is a horizontal drive that is mounted on the equipment behind the current paths. Due to its design, this version has a higher torque.
- All motor drive designs correspond to the VDE standards 0530, constructed with insulation class B. The protection class of the drives is IP54 pursuant to DIN 40050.
- The drives are available as standard with voltages between 24 VDC and 230 VAC.

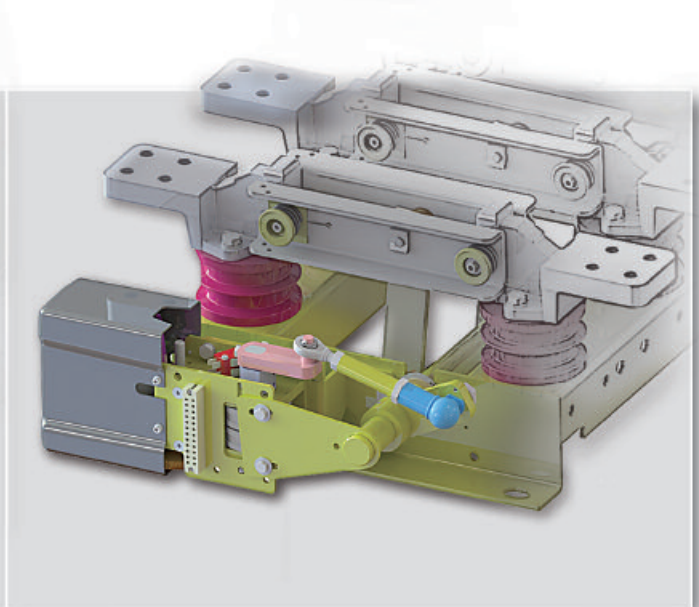
THE FORCE IS GENERATED

ON THE DRIVE SHAFT, WHEREBY THE MOTOR PROPELS A PINION VIA A GEARWHEEL THAT IS DIRECTLY PINNED TO THE MOTOR SHAFT.

- The pinion then moves the eccentric shaft via a plastic gearwheel that engages with two rocker arms. If the eccentric shaft is rotated, both rocker arms create a pendulum movement. As the rocker arms enclose the drive shaft and are equipped with a freewheel, with each oscillating movement of the rocker arm the drive shaft rotates around a small area itself. As both rocker arms are installed inversely, one rocker arm is idle, i.e. moves backwards, while the second continues to rotate the drive shaft.
- The freewheels therefore transfer the force and/or the rotary movement to the drive shaft. As these motion sequences are performed very quickly, a rotary movement of the drive shaft is generated. The technical design also means that the drive only delivers the rotary movement in one direction.
- The motor drives are not designed for long-term operation i.e. only between individual operations

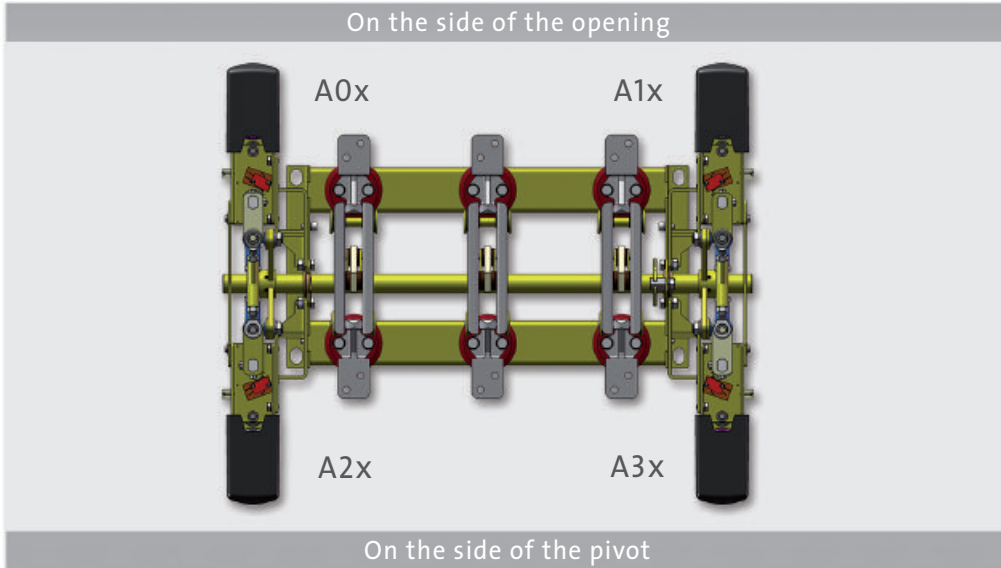


▶ Isolators with horizontal drive



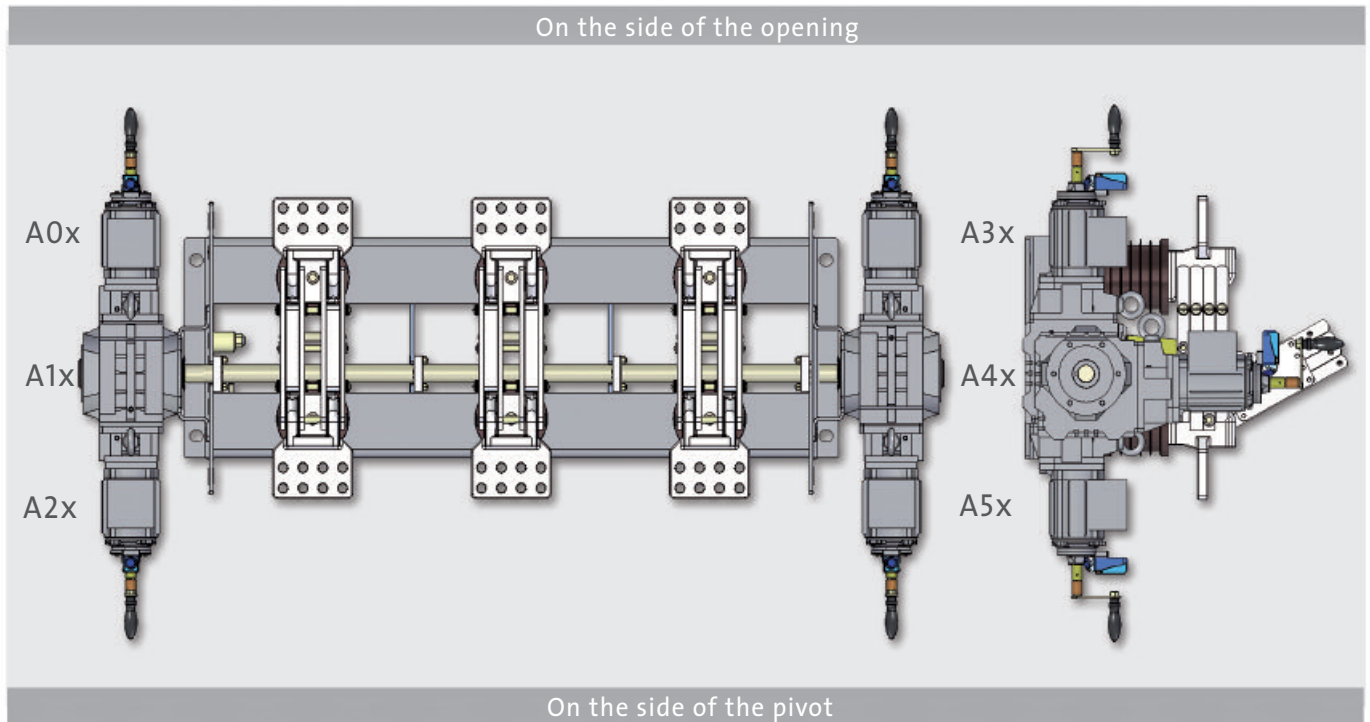
▶ Isolators with vertical drive

MOTOR DRIVE DISCONNECTOR GT



A0x: left top A1x: right top A2x: left bottom A3x: right bottom

MOTOR DRIVE DISCONNECTER HAS



A0x: left, horizontally, opening side A1x: left, upright A2x: left, horizontally, pivot-side A3x: right, horizontally, opening side A4x: right, upright A5x: right, horizontally, pivot-side

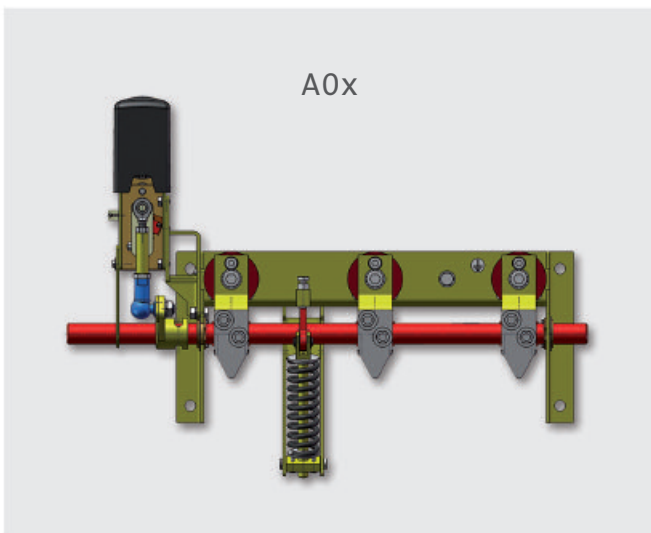
MOTOR-DRIVE Axx

Motor voltages

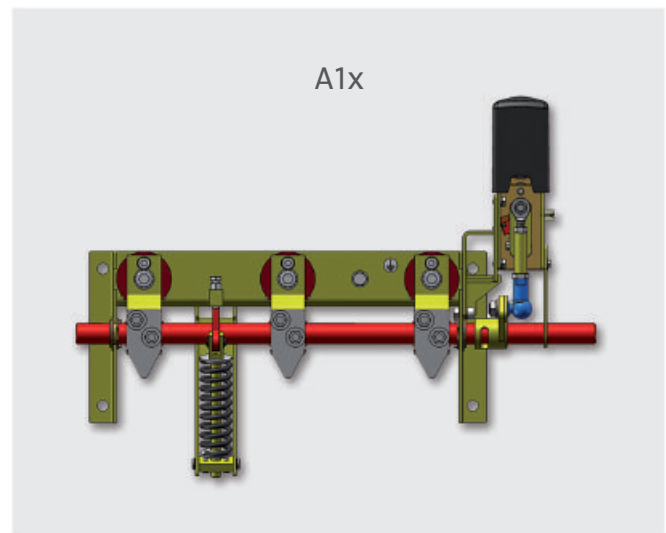
24 V DC	x = 1
48 V DC	x = 2
60 V DC	x = 3
110 V DC	x = 4
125 V DC	x = 5
220 V DC	x = 6
110 V AC	x = 7
125 V AC	x = 8
230 V AC	x = 9

MOTOR DRIVE OF GROUNDING CONNECTION WHICH CANNOT BE POWERED UP

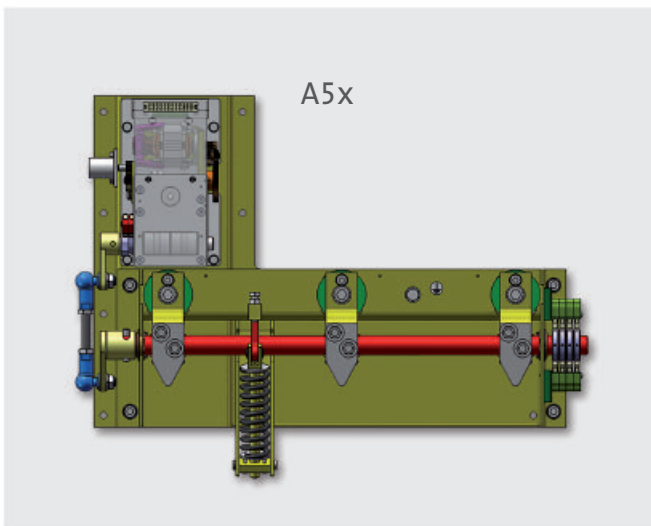
▶▶ EES/GE ◀◀



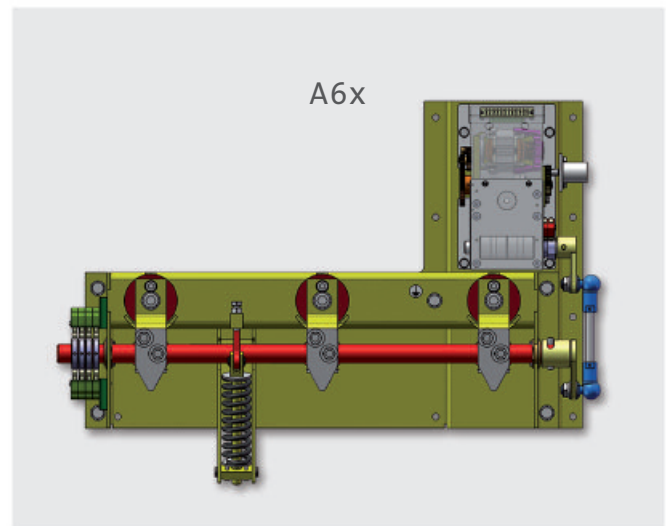
▶▶ EES/GE ◀◀



▶▶ EES ◀◀



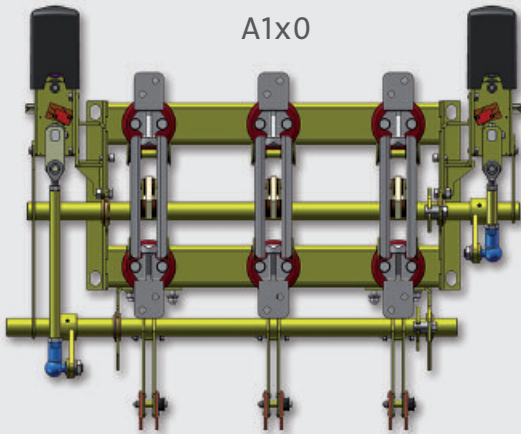
▶▶ EES ◀◀



MOTOR DRIVE OF DISCONNECTOR /
GROUNDING CONNECTION
COMBINATION GT

▶▶ GTD ◀◀

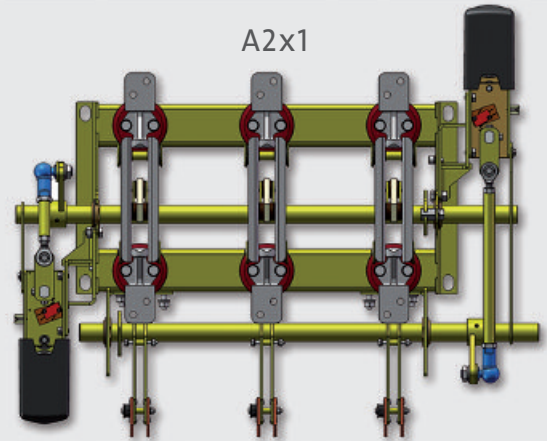
On the side of the opening



On the side of the pivot

▶▶ GTD ◀◀

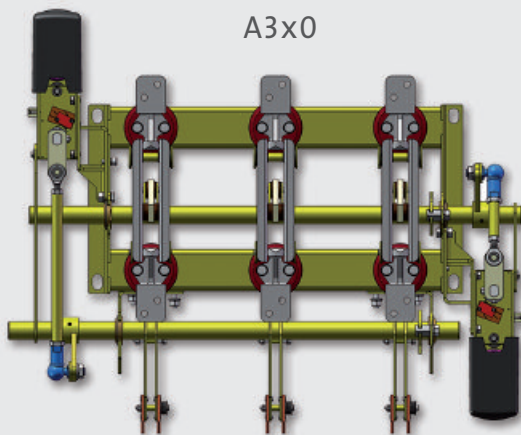
On the side of the opening



On the side of the pivot

▶▶ GTD ◀◀

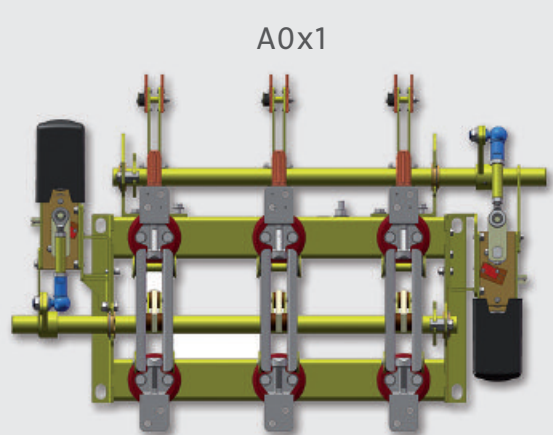
On the side of the opening



On the side of the pivot

▶▶ GTO ◀◀

On the side of the opening

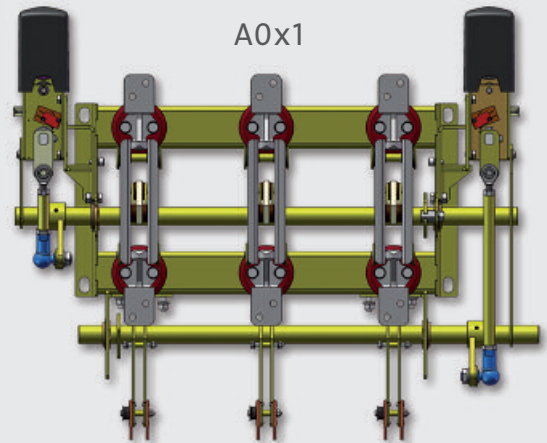


On the side of the pivot

▶▶ GTD ◀◀

On the side of the opening

A0x1

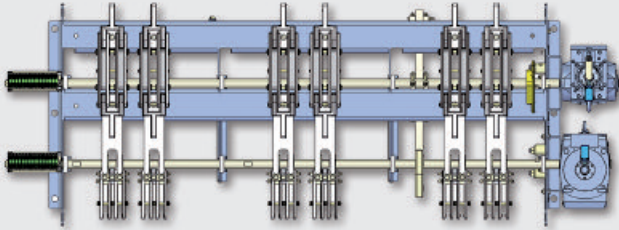


On the side of the pivot

▶▶ HASE ◀◀

On the side of the opening

A4x4

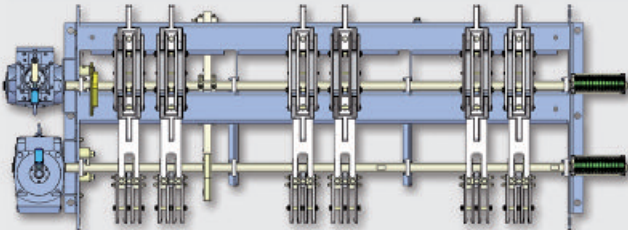


On the side of the pivot

▶▶ HASE ◀◀

On the side of the opening

A1x1

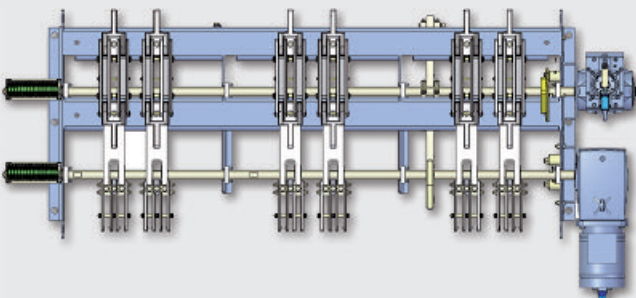


On the side of the pivot

▶▶ HASE ◀◀

On the side of the opening

A4x5

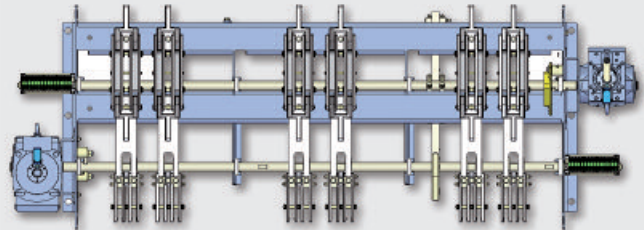


On the side of the pivot

▶▶ HASE ◀◀

On the side of the opening

A4x1

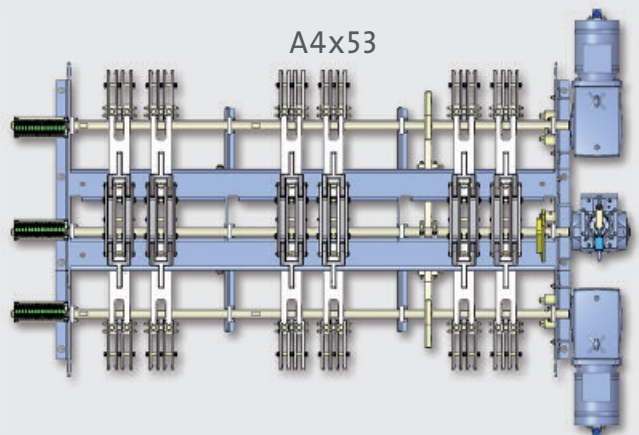


On the side of the pivot

▶▶ HASEE ◀◀

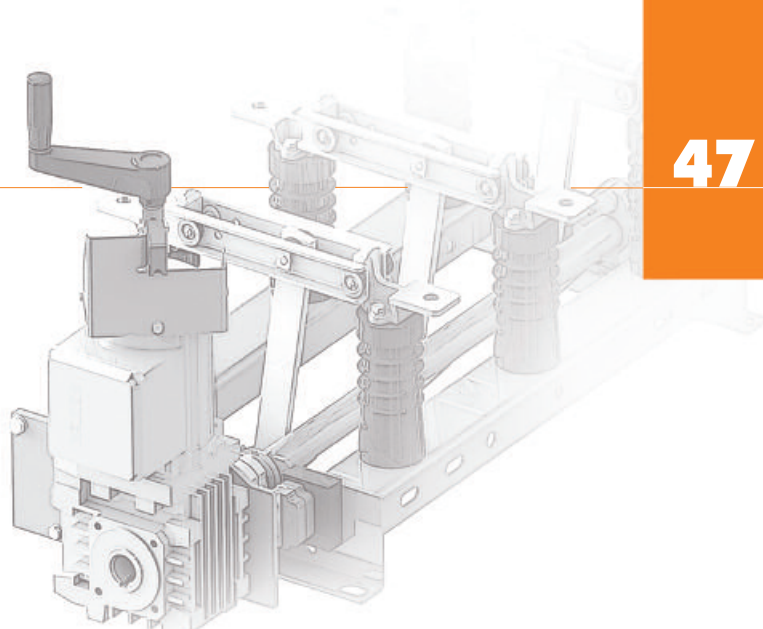
On the side of the opening

A4x53

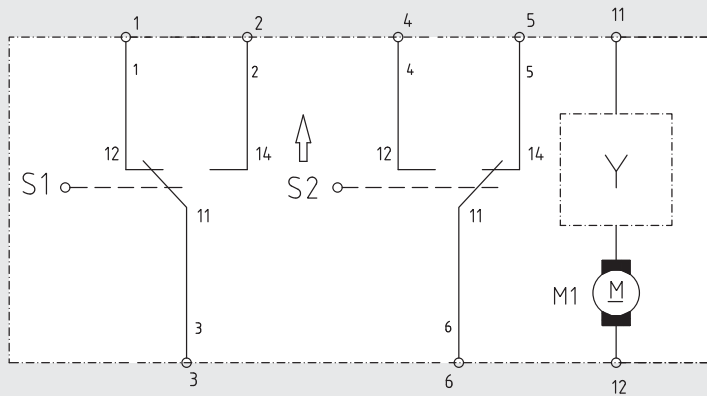


On the side of the pivot

MOTOR DRIVE OF DISCONNECTOR /
GROUNDING CONNECTION
COMBINATION HAS



MOTOR DRIVE MA 1.2 + 2.2 MA WITH A TERMINAL STRIP X1



Motor drive (MA1.2 / MA2.2) for switch "off" position of the disconnecting and grounding switch (Version 2 de-energising contacts)

Switch position isolator/ grounding connection	De-energising contact	
	-S1	-S2
OFF	x	↓
RUN	x	x
ON	↓	x

x non-actuated
↓ actuated

M1 Motor
S1, S2 Command release contact
Y Motorbrake device

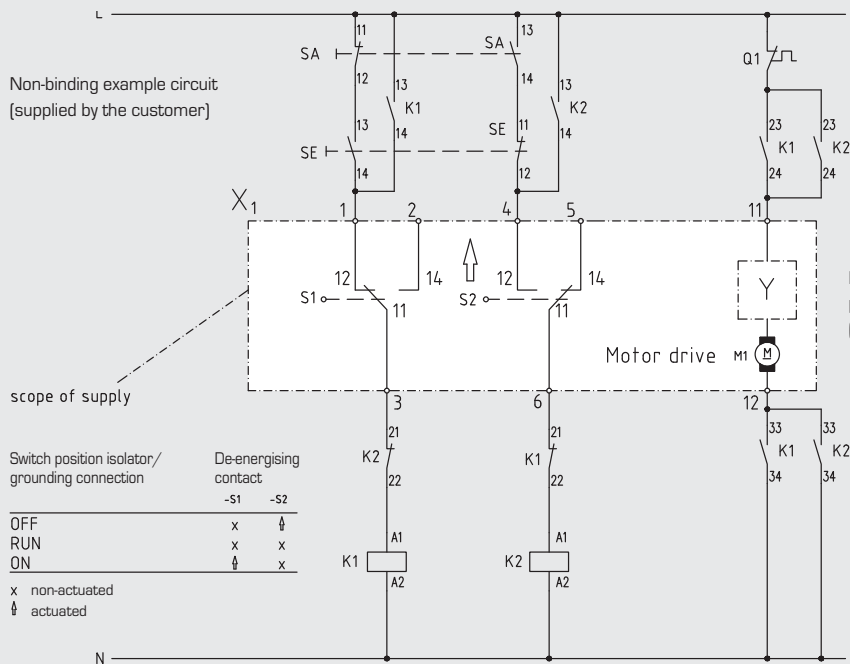
Circuit board connection motor MA1.2

green	white	blue	black
1	2	3	4

Circuit board connection motor MA2.2

green	white	blue	black
1	2	3	4

NON-BINDING EXAMPLE CIRCUIT



Non-binding example circuit (supplied by the customer)

scope of supply

Motor drive (MA1.2 / MA2.2) for switch "off" position of the disconnecting and grounding switch (Version 2 de-energising contacts)

Switch position isolator/ grounding connection	De-energising contact	
	-S1	-S2
OFF	x	↓
RUN	x	x
ON	↓	x

x non-actuated
↓ actuated

M1 Motor
S1,S2 Position switch on the motor drive
Y Motor brake device
SA Isolator/Grounding connection off
SE Isolator/Grounding connection on
Q1 Motor protection switch

AUXILIARY SWITCHES

AUXILIARY SWITCH WITH
2 NO + 2 NC OR **6 NO + 6 NC**
 CAN BE MOUNTED ON THE ISOLATORS
 AND GROUNDING SWITCHES.

With the motor drive, the auxiliary switch is on the side facing away from motor.
 The rated current is 10 A.

STANDARDS

The isolators and grounding switches conform to the following standards and recommendations:

- DIN VDE 0670 part 2
- DIN VDE 0111 part 1
- IEC 129
- IEC 62271-1 (formerly IEC 60694)

e.g. E54
 4 auxiliary switches with 2 cams

e.g. E06
 6 auxiliary switches with 6 cams

Auxiliary switches GT/GTU/GTN/GE/EES/HAS/ETM

1NO + 1NC ON THE ISOLATOR	WITH 1 CAM	E01
2NO + 2NC ON THE ISOLATOR	WITH 2 CAMS	E02
3NO + 3NC ON THE ISOLATOR	WITH 3 CAMS	E03
4NO + 4NC ON THE ISOLATOR	WITH 4 CAMS	E04
5NO + 5NC ON THE ISOLATOR	WITH 5 CAMS	E05
6NO + 6NC ON THE ISOLATOR	WITH 6 CAMS	E06
7NO + 7NC ON THE ISOLATOR	WITH 7 CAMS	E07
8NO + 8NC ON THE ISOLATOR	WITH 8 CAMS	E08
9NO + 9NC ON THE ISOLATOR	WITH 9 CAMS	E09
10NO + 10NC ON THE ISOLATOR	WITH 10 CAMS	E10
12NO + 12NC ON THE ISOLATOR	WITH 12 CAMS	E12
16NO + 16NC ON THE ISOLATOR	WITH 16 CAMS	E16
2NO + 2NC ON THE ISOLATOR	WITH 1 CAM	E52
3NO + 3NC ON THE ISOLATOR	WITH 2 CAMS	E53
4NO + 4NC ON THE ISOLATOR	WITH 2 CAMS	E54
5NO + 5NC ON THE ISOLATOR	WITH 3 CAMS	E55
6NO + 6NC ON THE ISOLATOR	WITH 3 CAMS	E56
7NO + 7NC ON THE ISOLATOR	WITH 4 CAMS	E57
8NO + 8NC ON THE ISOLATOR	WITH 4 CAMS	E58
9NO + 9NC ON THE ISOLATOR	WITH 5 CAMS	E59
10NO + 10NC ON THE ISOLATOR	WITH 5 CAMS	E60
12NO + 12NC ON THE ISOLATOR	WITH 6 CAMS	E62
16NO + 16NC ON THE ISOLATOR	WITH 8 CAMS	E66

Auxiliary switches GTD / GTO / GTS / HASEE

1NO + 1NC ON THE ISOLATOR	1NO + 1NC ON THE GROUNDING CONNec.	EACH WITH 1 CAM	E01
2NO + 2NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	EACH WITH 2 CAMS	E02
3NO + 3NC ON THE ISOLATOR	3NO + 3NC ON THE GROUNDING CONNec.	EACH WITH 3 CAMS	E03
4NO + 4NC ON THE ISOLATOR	4NO + 4NC ON THE GROUNDING CONNec.	EACH WITH 4 CAMS	E04
6NO + 6NC ON THE ISOLATOR	6NO + 6NC ON THE GROUNDING CONNec.	EACH WITH 6 CAMS	E06
8NO + 8NC ON THE ISOLATOR	8NO + 8NC ON THE GROUNDING CONNec.	EACH WITH 8 CAMS	E08
3NO + 3NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	WITH 3 + 2 CAMS	E21
6NO + 6NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	WITH 6 + 2 CAMS	E22
6NO + 6NC ON THE ISOLATOR	4NO + 4NC ON THE GROUNDING CONNec.	WITH 6 + 4 CAMS	E23
8NO + 8NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	WITH 8 + 2 CAMS	E24
4NO + 4NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	WITH 4 + 2 CAMS	E25
2NO + 2NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	EACH WITH 1 CAM	E52
3NO + 3NC ON THE ISOLATOR	3NO + 3NC ON THE GROUNDING CONNec.	EACH WITH 2 CAMS	E53
4NO + 4NC ON THE ISOLATOR	4NO + 4NC ON THE GROUNDING CONNec.	EACH WITH 2 CAMS	E54
6NO+6NC ON THE ISOLATOR	6NO + 6NC ON THE GROUNDING CONNec.	EACH WITH 3 CAMS	E56
8NO + 8NC ON THE ISOLATOR	8NO + 8NC ON THE GROUNDING CONNec.	EACH WITH 4 CAMS	E58
6NO + 6NC ON THE ISOLATOR	2NO + 2NC ON THE GROUNDING CONNec.	WITH 3 + 1 CAMS	E71
6NO + 6NC ON THE ISOLATOR	4NO + 4NC ON THE GROUNDING CONNec.	WITH 3 + 4 CAMS	E72
8NO + 8NC ON THE ISOLATOR	8NO + 8NC ON THE GROUNDING CONNec.	WITH 4 + 8 CAMS	E73

MANUAL LEVER...

DIRECT, MANUAL SHAFT ACTUATION



EMERGENCY MANUAL LEVERS...

FOR MOTOR DRIVES



ADDITIONAL EQUIPMENT

Voltages Electromechanical interlock

24 V DC	C01
48 V DC	C02
60 V DC	C03
110 V DC	C04
125 V DC	C05
220 V DC	C06
110 V AC	C07
125 V AC	C08
230 V AC	C09

MANUAL DRIVES

INSTEAD OF ACTUATION WITH A MOTOR, THE SWITCHING SHAFT CAN BE ACTUATED BY HAND.

Actuation by means of a switching rod depends on the mounting position and accessibility. Switching rods are made of a fibreglass reinforced polyester tube and can be used in systems with rated AC voltage over 1 kV.

With them, the switching rod lever, mounted on the switching shaft is operated (available as accessory). Switching rod levers made of insulating material are used in cases where the required minimum distances are undershot. For fixing in the end positions, a sprung notch is always provided in the switching rod actuation (see Locking mechanisms).

ELECTROMECHANICAL INTERLOCK

- Electromechanical interlocks can be mounted on all isolators and grounding switches without power drive.
- In the case of non-energised magnet, the interlocks lock the switch in the end positions. In the intermediate position, the lockout is not effective.
- The solenoids are suitable for permanent connection.

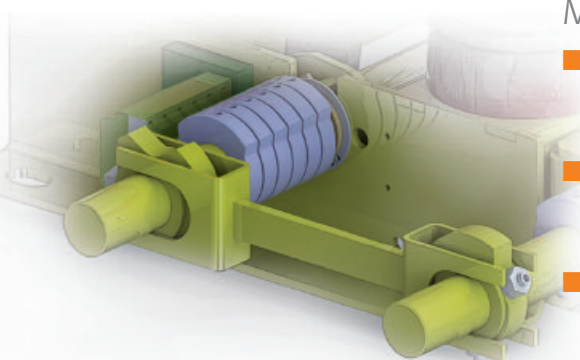
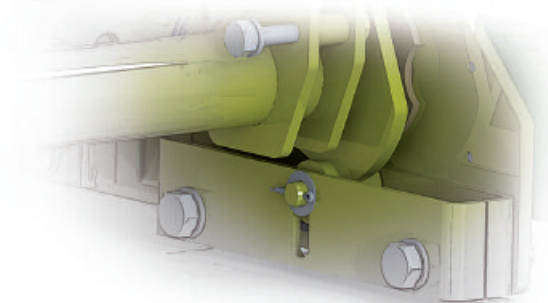
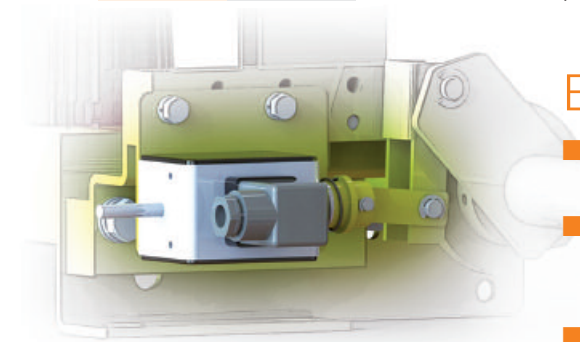
LOCKING MECHANISMS

CATCH

- For isolator and grounding switches, a catch is available, which spring snaps into the end positions.
- This catch is envisaged when actuating this switch manually with a shift bar.

MECHANICAL LOCKING

- The isolator with a mounted grounding switch can be fitted with a mechanical lock if the grounding switch is actuated by means of a switching rod.
- Switchgear with power drive must be interlocked with the associated driving means so that operation can be prevented. For this purpose, an auxiliary switch is required on the part, without a power drive.
- If neither the isolator nor the mounted grounding switch have a power drive, the mechanical lock can also be used in connection with an electromechanical interlock. The electromechanical interlock is then mounted to the isolator.



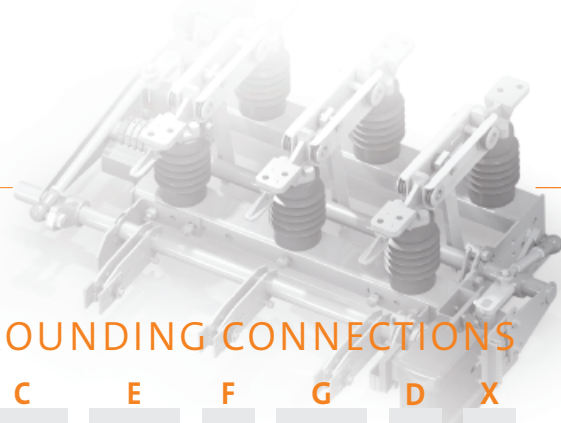


CONFIGURATOR

NAME: EES / GE / ETM GROUNDING CONNECTIONS

1 - 2 - 3 - 4 - 5 - A - B - C - E - G - D - X

1 Switch type earth proven grounding devices Grounding device Surge current / Switch on capacity I_p 50.0 kA 80.0 kA 125.0 kA 160.0 kA 180.0 kA 200.0 kA 210.0 kA	EES GE/ETM 050.0 080.0 125.0 160.0 180.0 200.0 210.0	A Motor drive and position Grounding connection top left / upright design Grounding connection top right / upright design Grounding connection Bottom left / upright design Grounding connection bottom right / upright design Grounding connection top left / flat design Grounding connection top right / flat design Grounding connection bottom left / flat design Grounding connection bottom right / flat design Motor voltage 24 V DC 48 V DC 60 V DC 110 V DC 125 V DC 220 V DC 110 V AC 125 V AC 230 V AC Special voltage pneumatic manual Manual lever	A 0 1 2 3 5 6 7 8 1 2 3 4 5 6 7 8 9 X P M H	E Auxiliary switches (LYING IN A ROW) 2NO + 2NC on the grounding connection with 2 cams 4NO + 4NC on the grounding connection with 4 cams 6NO + 6NC on the grounding connection with 6 cams 8NO + 8NC on the grounding connection with 8 cams etc. also see designation GT/NT (OPPOSITE) 2NO + 2NC on the grounding connection with 1 cam 4NO + 4NC on the grounding connection with 2 cams 6NO + 6NC on the grounding connection with 3 cams 8NO + 8NC on the grounding connection mit 4 Nocken etc. also see designation GT/NT	E 02 04 06 08 52 54 56 58
2 Rated voltage 1.50 kV 3.60 kV 7.20 kV 12.0 kV 17.5 kV 24.0 kV 36.0 kV 40.5 kV	1.50 3.60 7.20 12.0 17.5 24.0 36.0 40.5	B Locking / Catch on the grounding connection	B 33	G with capacitive insulators	G3
3 Number of poles Selectable between 01 and 12	01 ... 12	C Blocking magnet / Electromech. interlock Voltage 24 V DC 48 V DC 60 V DC 110 V DC 125 V DC 220 V DC 110 V AC 125 V AC 230 V AC	C 11 12 13 14 15 16 17 18 19	D with partitions	D
4 Pole centre e.g. 90 mm e.g. 150 mm e.g. 275 mm etc.	090 150 275	X Special wishes Additions which are not in the catalogue · must be clearly described	X	Field size 650 mm FG 650 900 mm FG 900	Rated lightning surge withstand voltage / Rated short term withstand voltage U_p / U_d 75 / 28 kV 75/28 125 / 50 kV 125/50 95 / 50 kV 95/50 170 / 70 kV 170/70
5 Rated short term current I_k 20 kA 20 kA/3s 31.5 kA 31.5 kA/3s 50 kA 50 kA/3s 63 kA 72 kA 75 kA 85 kA	L H M K P J R S T W	Please enter decimal numbers in the short text (.). Only components which are incorporated in the designation are installed on the switching device.	Use our convenient configurator on our website www.flohe.eu		



NAME: ISOLATOR WITH GTD AND GTO GROUNDING CONNECTIONS

1	2	3	4	5	A	B	C	E	F	G	D	X
---	---	---	---	---	---	---	---	---	---	---	---	---

1 Switch type	
Grounding connection on the side of the pivot	GTD
Grounding connection on the side of the opening	GTO
Grounding connection on the side of the pivot and the opening	GTS
EES on the side of the pivot	GTDE
EES on the side of the opening	GTOE
Earthing one-sided	HASE
Earthing double-sided	HASEE
Rated current	
0.63 kA	0.63
1.25 kA	1.25
1.60 kA	1.60
2.50 kA	2.50
3.15 kA	3.15
4.00 kA	4.00
5.00 kA	5.00
6.30 kA	6.30
8.00 kA	8.00
12.0 kA	12.0

2 Rated voltage	
1.50 kV	1.50
3.60 kV	3.60
7.20 kV	7.20
12.0 kV	12.0
17.5 kV	17.5
24.0 kV	24.0
36.0 kV	36.0
40.5 kV	40.5

3 Number of poles	01
Selectable	...
between 01 and 12	12

4 Pole centre	
e.g. 90 mm	090
e.g. 150 mm	150
e.g. 275 mm	275
etc.	

5 Rated short term current I_k	
20 kA	L
25 kA	B
31.5 kA	M
40 kA	N
50 kA	P
63 kA	R
72 kA	S
75 kA	T
85 kA	W
Factor for surge current	
2.50	1
2.74	2
Short-time current 3 seconds	3

A Motor drive and position	A
on the isolator top left / upright design	0
on the isolator top right / upright design	1
on the isolator bottom left / upright design	2
on the isolator bottom right / upright design	3
on the isolator top left / flat design	5
on the isolator top right / flat design	6
on the isolator bottom left / flat design	7
on the isolator bottom right / flat design	8
Motor voltage	
24 V DC	1
48 V DC	2
60 V DC	3
110 V DC	4
125 V DC	5
220 V DC	6
110 V AC	7
125 V AC	8
230 V AC	9
Special voltage	X
pneumatic	P
manual	M
Manual lever / Switch rod lever	H
on the grounding connection top left / upright design	0
on the grounding connection top right / upright design	1
on the grounding connection bottom left / upright design	2
on the grounding connection bottom right / upright design	3
on the grounding connection top left / flat design	5
on the grounding connection top right / flat design	6
on the grounding connection bottom left / flat design	7
on the grounding connection bottom right / flat design	8

B Locking / Catch	B
on the isolator	31
on the isolator and grounding connection	32
on the grounding connection	33

C Blocking magnet / Electromech. interlock	C
Voltage	
24 V DC	01
48 V DC	02
60 V DC	03
110 V DC	04
125 V DC	05
220 V DC	06
110 V AC	07
125 V AC	08
230 V AC	09
	Isolator
	Grounding connection

E Auxiliary switches (LYING IN A ROW)	E
1NO + 1NC on the isolator / on the grounding connection each with 1 cam	01
2NO + 2NC on the isolator / on the grounding connection each with 2 cams	02
3NO + 3NC on the isolator / on the grounding connection each with 3 cams	03

4NO + 4NC on the isolator / 4NO + 4NC on the grounding connection each with 4 cams	04
6NO + 6NC on the isolator / 6NO + 6NC on the grounding connection each with 6 cams	06
3NO + 3NC on the isolator / 2NO + 2NC on the grounding connection with 3 + 2 cams	21
6NO + 6NC on the isolator / 2NO + 2NC on the grounding connection with 6 + 2 cams	22
6NO + 6NC on the isolator / 4NO + 4NC on the grounding connection with 6 + 4 cams	23
8NO + 8NC on the isolator / 2NO + 2NC on the grounding connection with 8 + 2 cams	24
4NO + 4NC on the isolator / 2NO + 2NC on the grounding connection with 4 + 2 cams	25
etc. For unequal HIKO assignment, use consecutive no. 21-50, otherwise see GT/NT	
(OPPOSITE)	
2NO + 2NC on the isolator / 2NO + 2NC on the grounding connection each with 1 cam	52
3NO + 3NC on the isolator / 3NO + 3NC on the grounding connection each with 2 cams	53
4NO + 4NC on the isolator / 4NO + 4NC on the grounding connection each with 2 cams	54
6NO + 6NC on the isolator / 6NO + 6NC on the grounding connection each with 3 cams	56
6NO + 6NC on the isolator / 2NO + 2NC on the grounding connection each with 3 + 1 cams	71
6NO + 6NC on the isolator / 4NO + 4NC on the grounding connection each with 3 + 4 cams	72
8NO + 8NC on the isolator / 8NO + 8NC on the grounding connection each with 4 + 8 cams	73
etc. For unequal HIKO assignment, use consecutive no. 71-99, otherwise see GT/NT	

F Mechanical lock	F
between grounding connection and isolator	

G with capacitive insulators	G3
on the isolator / on the side of the pivot	1
on the isolator / on the side of the opening	2

D with partitions	D
--------------------------	----------

X Special wishes	X
Additions which are not in the catalogue - must be clearly described	

Field size	650 mm	FG 650	900 mm	FG 900
Rated lightning surge withstand voltage / Rated short term withstand voltage Up / Ud	75 / 28 kV	75/28	125 / 50 kV	125/50
	95 / 50 kV	95/50	170 / 70 kV	170/70

Please enter decimal numbers in the short text (.). Only components which are incorporated in the designation are installed on the switching device.

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ENVIRONMENTAL CONDITIONS



THE ISOLATORS AND GROUNDING SWITCHES ARE DESIGNED FOR THE NORMAL OPERATING CONDITIONS LAID DOWN IN THE STANDARDS.

Note: Condensation can occasionally occur under the described environmental conditions.

INSULATION CAPACITY

The insulating capacity of insulation in air decreases with increasing altitude due to low air density. The rated lightning surge withstand voltage values and rated short term withstand voltage values in the chapter "Technical Data" are valid in accordance with IEC 62271-1 up to a site altitude of 1000 m above sea level.

Above an altitude of 1000 m, the insulation level must be corrected according to the adjacent diagram. The characteristic curve shown applies to both rated withstand voltages.

FOR SELECTING THE DEVICES, THE FOLLOWING APPLIES:

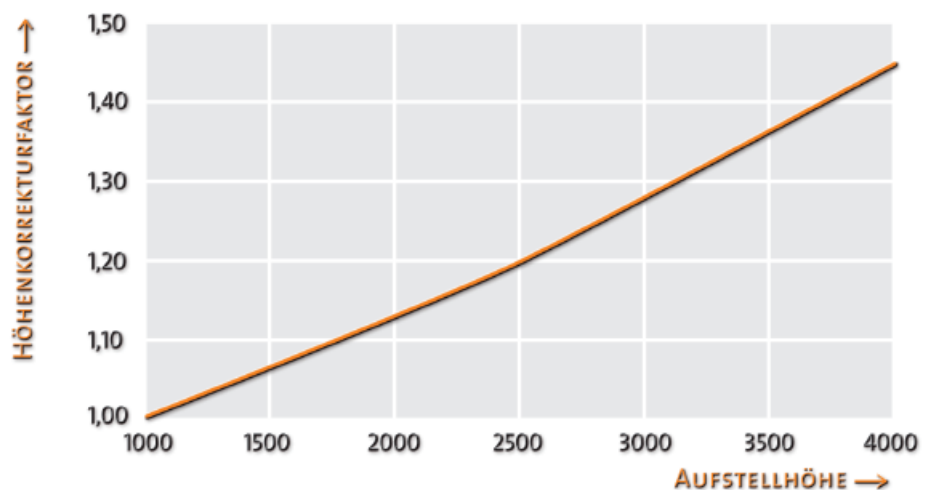
$$U \geq U_o \times K_a$$

U Withstand voltage under reference atmosphere

U_o required rated withstand voltage for the installation site

K_a Altitude correction factor according to the chart below

Example: For a required rated lightning surge withstand voltage of 75 kV at an altitude of 2500 m, an insulation level of at least 90 kV is needed under the reference atmosphere: $90 \text{ kV} \geq 75 \text{ kV} \times 1,2$



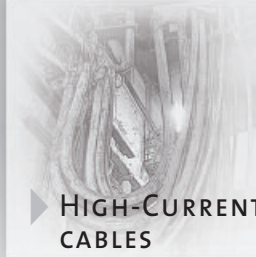
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...FROM INDIVIDUAL COMPONENTS THROUGH
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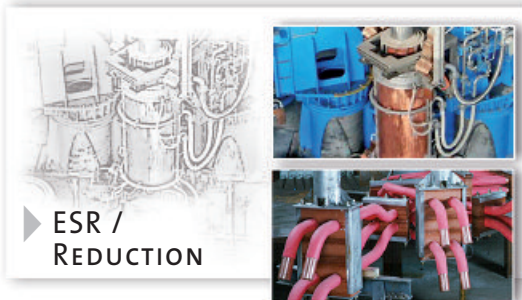
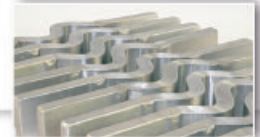
▶ HIGH-CURRENT
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▶ EAF / LF /



▶ FLEXIBLE
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▶ ELEKTROLYSIS:
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