

DC- and NF-Contactors

to switching on-load

List 350/1E

Edition 01 / 2008

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Application:

HOMA-air contactors serve the purpose of switching on and off DC and AC equipment of any kind (inductive and non-inductive loads).

Construction:

The fixed main switch contacts and the magnetic core with magnetic coils assembly are mounted on a horizontal bar. The moving contacts are fixed to the moveable shaft and the operating armature. Dependent on the type of contactor, from one to eight poles can be designed. The auxiliary contacts are mounted under the magnet operating system. The main switch contacts contains single-type interrupters and it find be easy to check or change during folding up the arc chambers. Each of any magnetic blow out coils are build on main switch contact and, therefore, the arc chambers shortens the burning life of the arc. Contactors for slip ring motor starting according list 280E, possess no blow out coils and arc chambers.

Actuating:

All contactors can be actuated with DC current via an economy contact and economy resistor. A rectifier is connected to the AC mains (see circuit 2 and 3 on page 10a). Contactors with AC magnets as per circuit 1.

Magnetic coils:

Corresponding to VDE 0660, HOMA contactors operate between 0,85 times up to 1,1 times the rated operating voltage. In case of non standard mounting conditions, consult with suppliers.

Insulation:

Creepage and air paths corresponding to the VDE 0110 group C. The voltage test is carried out in accordance with VDE 0660.

Main switch contacts:

The contactors possesses switching contacts with a C15s plating, which are suitable for permanent switching-on and for frequent switching. Exception G 320 and G 320v group A and C. This contactors have switches with a AgCdO plating.

Arc chambers

Dependent on the operating voltage and the switching duty, we deliver contactors as per following groups:

group A	with fibre cement chambers nominal insulating voltage $U_i = 750V$
group C	with steatite chambers and DY-blow out system nominal insulating voltage $U_i = 750V$ (G125 - G320v) nominal insulating voltage $U_i = 1000V$ (ab G 500)
group D	G 200 with fibre cement chambers 2 poles in series connection $U_i = 1000V$ ab G 320 with steatite chambers and DY-blow out system 2 pole in series connection $U_i = 1500V$
group 1000V	steatite chambers with DY-blow out system and Chamber mount $U_i = 1500V$ and $U_i = 3000V$

Switching capacity:

The rated switching capacity is in accordance with the "Regulations for L.V. Switch Gear" VDE 0660.

Mechanical interlocking:

Besides the electrical interlocking via auxiliary contacts, the contactors could be equipped with a mechanical interlocking against extra costs. For that purpose, the contactors must be arranged vertically on top of each other.

Mechanical coupling:

According to group D, two contacts must be connected in series in case of higher operating voltages. For higher current, the poles of two or three contactors may be connected in series for that purpose. Besides electrical coupling through series connection of the coils, there is a mechanical coupling (see fig. 24) for the synchronous operating of the contactors.

higher operating frequencies:

For their application in control installations and in static frequency transformers, the HOMA-contactor must be provided with a wound blow out coil and laminated blow out sheet.

Negative-contactors

For the purpose of breaking and short-circuiting motors and generators, contactors can be supplied with NC contacts. See list 549 "Contactors with NC-contacts for on-load switching" and list 624 "Contactors with NC-contacts off-load switching".

operation aboard ships

For operation aboard ships, the contactor are provided with a balance weight in order to balance a sloping position of 30° fowards the normal mounting position (The contactor must be designed to suit the various climatic conditions). Examples are shown in fig. 28 - 28c.

climatic conditions

The standard type of air contactors are suitable for tropics with 50% relative air humidity at 40°C, or up to 90% relative air humidity at 20°C, or up to 5% relative air humidity at 50°C. If the contactors are operated at a place that is situated between 15° northern latitude and 30° southern latitude, or on highly humidity areas (up to 95% relative air humidity and 45°C), they must be designed to suit the various climatic conditions (DIN 50010).

Altitudes above sealevel

The quoted continuous currents and the continuous switching capacities are valid for mounting at altitudes up to 1000 m above sealevel. The derated values are:

	91%	up to	2000 m above sealevel
	87%	up to	3000 m above sealevel
and	82%	up to	4000 m above sealevel

Rise of ambient temperature

With an ambient temperature of more than 35°C, the admissible continuous currents and switch capacities are derated to:

95%	at 40°C
90%	at 45°C
85%	at 50°C
80%	at 55°C

Foreign standards

HOMA air contactors correspond to following standards: ¹⁾

I.E.C ¹⁾	-	International Electrotechnical Commission
NEMA	- USA	National Electrical Manufactures Association
CSA	- Canada	Canadian Standards Association
BS	- Great Britain	British Standard
UTE	- France	Union Technique de Syndicate de l'Electricité
NBN	- Belgium	Normes Belges
AEI	- Italy	Associazione Elettrotecnica Italiana
LroS ¹⁾	-	Lloyd's Register of Shipping
DNV ¹⁾	-	Det Norske Veritas, Oslo

1) consult with suppliers

Fixing:

The contactors must be mounted horizontally to two vertical steel fixings which shall not be longer than approximately one metre. Contactors with a bar up to 541 mm long may be fitted to a steel angle 50 x 50 x 5 mm, and still larger contactors to U-shape steel 65 or 80. HG-contactors are delivered fitted to a frame which also serves for transporting. For mounting of these contactors, it is recommended to provide a mounting angle each at the left side and at the right side within the contactor's rack; these angle serve as brackets for the contactor frames to be fixed to.

Data required for orders

- 1) Quantity, type of contactor, number of poles and contactor group
- 2) Type of switching, operating current, operating voltage and operating frequency
- 3) switching duty
- 4) control voltage for the magnetic coil and, possibly of the release magnet
- 5) special designs and supplementary parts

All data are subject to alternatives.

Auxiliary contacts - Standard design 2NC + 4NO

The auxiliary contacts are normally open (NO) and normally closed (NC) contacts. The auxiliary contacts are mounted as auxiliary contact blocks under the magnet system (see page 10).

Mechanical-durability

The mechanical-durability corresponds nearly to apparatus classes D1 - E1, where the life expectancy is inversely proportional to the size of the contactor. Dependent on the number of poles, the group of contactor, and the design of the supplementary parts, the mechanical-durability could be distinguished slightly.

Parallel connection

In order to increase the rated current, two poles can be parallel connected; this should however be done only at the least one metre before and behind the contactor, because this length of line will have the effect of a stabilizing resistor.

switching conditions

For the assessment of switching conditions, the following categories of use are set up in accordance with VDE 0660.

1) Alternating current

Category AC 1 (ohmic load)

Easy switching conditions with ohmic or low inductive load ($\cos. \varphi = 0,95$)

Inrush current	=	rated operating current I_e
Breaking current	=	rated operating current I_e (without counter current breaking)
rated operating current I_e	=	continuous current $I_{1,12}$

Category AC 2 (slip ring rotors)

Easy switching conditions ($\cos. \varphi = 0,65$)

Inrush current	=	2,5 x rated operating current I_e
Breaking current	=	rated operating current I_e (without counter current breaking)
rated operating current I_e	=	2,5 x rated operating current I_e (with counter current breaking)

Category AC 3 (squirrel-cage motors)

Normal switching conditions ($\cos. \varphi = 0,35$)

Inrush current	=	6 x rated operating current I_e
Breaking current	=	rated operating current I_e

Category AC 4 (squirrel-cage motors)

Difficult switching conditions, quick-operation, counter current breaking and reversing ($\cos. \varphi = 0,35$)

Inrush current	=	6 x rated operating current I_e
Breaking current	=	6 x rated operating current I_e

Switching of capacitors (capacitive load)

When connecting capacitors in parallel to an already live capacitor bank, very high inrush current peaks occur. Capacitor contactor are described in List 507 and 616.

Switching of induction furnaces with damping resistor

Normal switching conditions ($\cos. \varphi = 1$); $\cos. \varphi$ of the furnace coil $\geq 0,2$

Inrush current	=	8 x	Rated operating current I_e
Breaking current	=	1,2 x	Rated operating current I_e

Note: with occasional inductive or capacitive detuning of the resonant circuit $\cos. \varphi = 0,5$

Switching of induction channel furnaces or billet heater furnace without damping resistor

Moderately difficult switching conditions ($\cos. \varphi = 0,75$ inductively up to $\cos. \varphi = 1$)

$\cos. \varphi$ of the furnace coil $\geq 0,35$

Inrush current	=	12 x	Rated operating current I_e
Breaking current	=	1,2 x	Rated operating current I_e

2) Direct current

Category DC 1 (ohmic load)

Easy switching conditions with ohmic or low inductive load ($T = 1\text{ms}$)

Inrush current	=	Rated operating current I_e
Breaking current	=	Rated operating current I_e
Rated operating current I_e	=	continuous current I_{t12}

Category DC 2 and DC 3 (shunt motors)

Normal switching conditions

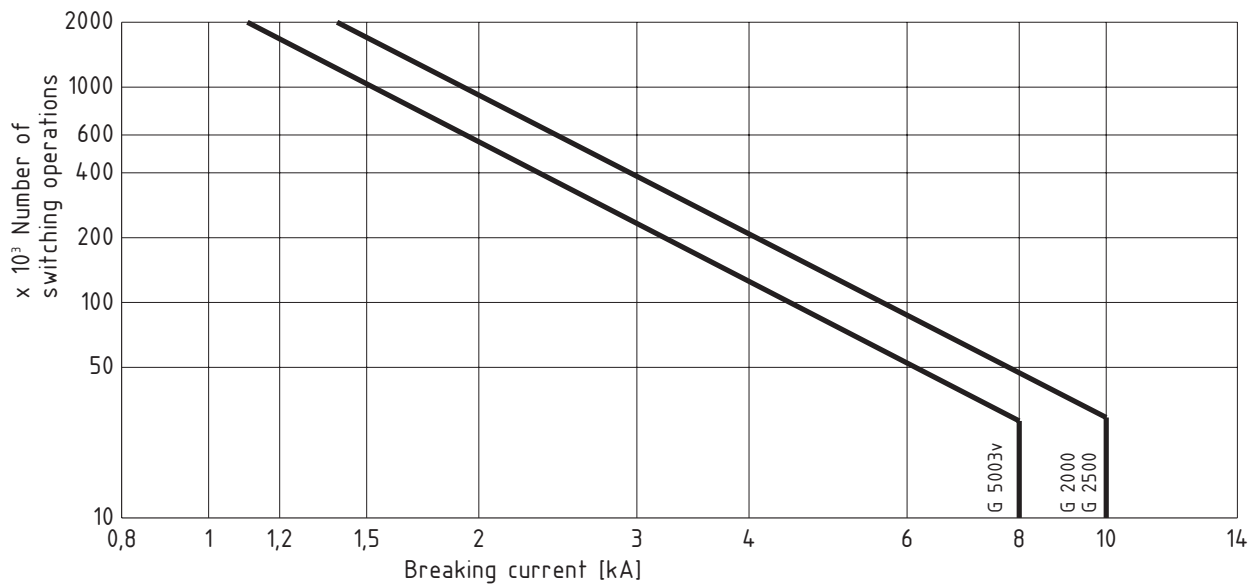
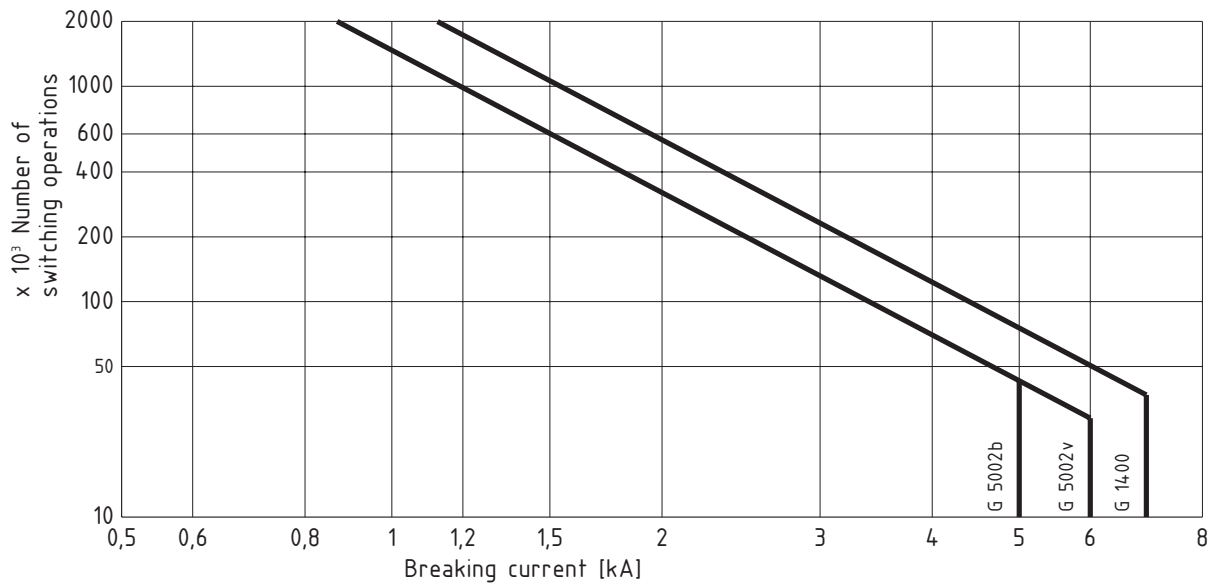
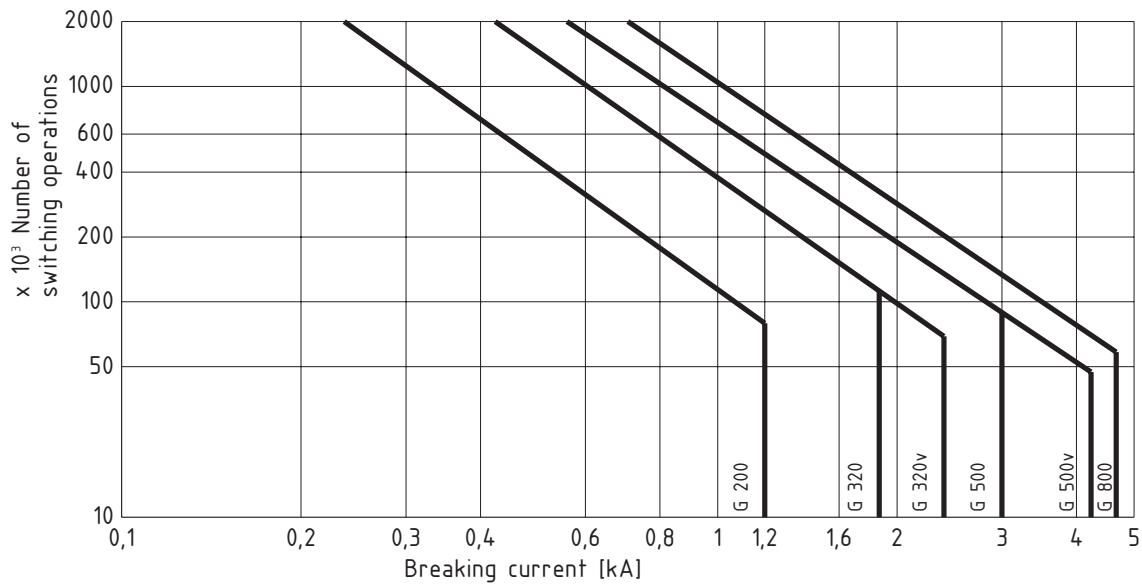
Inrush current	=	2,5 x	Rated operating current I_e bei $T = 2\text{ms}$
Breaking current	=		Rated operating current I_e bei $T = 7,5\text{ms}$
or		2,5 x	Rated operating current I_e bei $T = 2\text{ms}$
or occasionally		4 x	Rated operating current I_e bei $T = 2,5\text{ms}$

Category DC 4 (series motors)

Difficult switching conditions

Inrush current	=	2,5 x	Rated operating current I_e bei $T = 7,5\text{ms}$
Breaking current	=		Rated operating current I_e bei $T = 10\text{ms}$
or		2,5 x	Rated operating current I_e bei $T = 7,5\text{ms}$
or occasionally		4 x	Rated operating current I_e bei $T = 15\text{ms}$

Life expectancy as a function of the breaking current



Air-contactors for A.C.-current and D.C.-current - technical data

type of contactor	Continuous current I _{th2}	Thermal limiting ¹⁾ 1s-current	rated surge current ¹⁾ 50 ms	three-phases current				Direct current			
				rated switch-on capacity ¹⁾ at 500V	ultimate breaking capacity ³⁾ cos. φ = 0,4 [kA]			rated switch-on capacity ¹⁾ at 600V	Ultimate breaking capacity ³⁾ for 2-pole switching T = L/R = 30 ms [kA]		
					220V ⁴⁾	380V ⁴⁾	500V ⁴⁾		[kA]	220V ²⁾⁴⁾	440V ⁴⁾
G 200	200	1,8	4	2,4	3	2,2	1,8	2	1,5	1,5	-
G 320	320	4	5	4	6	5	4	3	4,5	4,5	3
G 320v	400	4	5	5	6	5	4	4	4,5	4,5	3
G 500	500	5	7	6	9	7	6	6	7	7	5
G 500v	700	5	7	6	9	7	6	6	7	7	5
G 800	800	8	9,5	7,5	12	9	7,5	7,5	9	9	6
G 5002b	1000	9	15	9,5	15	12	9	9	9	9	6
G 5002v	1250	10	15	10	15	12	10	10	9	9	6
G 1400	1400	14	18	12	16	12	10	10	10	10	7
G 5003v	1600	16	22	14	18	14	12,5	12	10	10	7
G 2000	2000	20	25	16	20	18	15	15	12	12	8
G 2500	2500	25	28	18	22	20	16	16	12	12	8
HG 2400	2400	24	30	30	30	25	20	20	15	15	10
HG 2750	2750	27,5	35	35	35	30	25	25	18	18	12
HG 3500	3500	35	52	52	45	40	35	30	18	18	12
HG 4000	4000	40	60	60	60	50	40	35	20	20	14

1) without contact welding, higher values upon enquiry

2) with 1-pole switching

3) switching voltage per pole group A = 220V, group C = 330V, group D = 660V, group 1000V = 550V

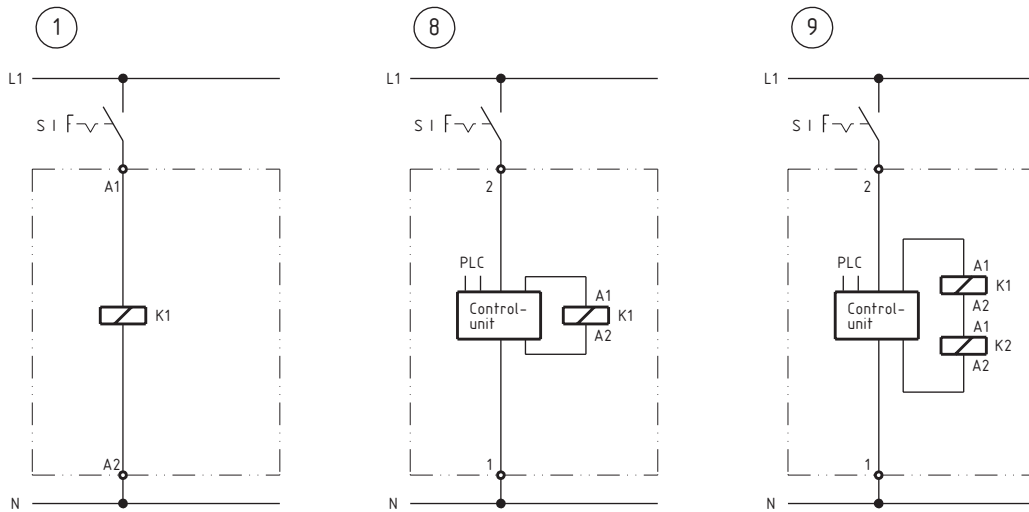
4) values for group C, for group A the values range approx. 33% lower

Coil loading and time elements

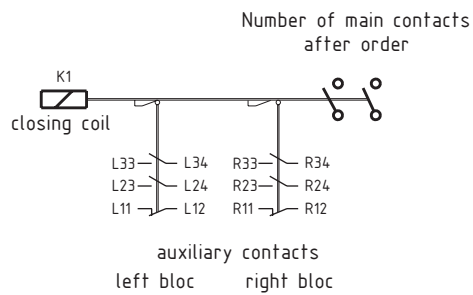
Type of contactor	Number of poles	A.C. Operation				D.C. Operation also via mounted Si-rectifier			
		Power consumption [VA]		Delay in closing action [ms]	Delay in opening action [ms]	Power consumption [W]		Delay in closing action [ms]	Delay in opening action [ms]
		closing	holding			closing	holding ¹⁾		
G 200	I	800	110	50	20	230	20	80	40
	II								
	III								
G 320	I	800	110	50	20	230	20	90	40
	II								
	III								
G 320v	I	800	110	50	20	230	20	90	40
	II								
	III								
G 500	I	2300	200	65	25	365	22	120	40
	II								
	III								
G 500v	I	2300	200	65	25	365	22	120	40
	II								
	III								
G 800	I	2300	2300	65	25	365	22	125	40
	II								
	III								
G 5002b	I	2300	200	65	25	365	22	125	40
	II								
	III								
G 5002v	I	2300	200	65	65	365	22	125	40
	II								
	III								
G 1400	I	2300	200	65	25	365	22	125	40
	II								
	III								
G 5003v	I	2300	200	65	25	365	22	125	40
	II								
	III								
G 2000	I	---	---	---	---	365	22	125	40
	II								
	III								
G 2500	I	---	---	---	---	365	22	125	40
	II								
	III								
HG 2400	I	---	---	---	---	1200	80	140	120
	II								
	III								
HG 2750	I	---	---	---	---	1200	80	140	120
	II								
	III								
HG 3500	I	---	---	---	---	1200	80	140	120
	II								
	III								
HG 4000	I	---	---	---	---	1200	80	140	120
	II								
	III								

1) including economy resistor

coil circuit and arrangement for auxiliary contacts



Arrangement for auxiliary contacts



Loading data for 3-phases motors

switching of 3-phases motors													
contactor type	Category AC 2 ³⁾ at 120 switching / h ¹⁾ [kW]			Category AC 3 at 120 switching / h ¹⁾ [kW]			Category AC 4 at 120 switching / h ¹⁾ [kW]			Rotor contactors ²⁾ permissible thermal rated operating current [A] at ... % of operating duration			
	220V	380V	500V	220V	380V	500V	220V	380V	500V	100	60	40	20
G 200	60	100	110	60	100	100	50	80	80	200	220	250	300
G 320	90	160	180	90	160	180	70	120	150	320	360	400	480
G 320v	100	180	200	100	180	200	85	135	160	400	450	500	600
G 500	150	250	300	140	250	280	110	200	220	500	560	625	700
G 500v	200	320	400	180	300	350	150	240	280	600	700	800	900
G 800	220	380	450	220	380	440	180	300	350	750	850	950	1100
G 5002b	245	425	500	250	425	475	200	350	380	1000	1100	1250	1500
G 5002v	320	550	700	300	500	600	250	425	450	1200	1400	1500	1800
G 1400	380	650	800	375	625	725	300	500	600	1300	1500	1600	2000
G 5003v	425	750	900	400	725	800	325	600	650	1500	1700	1850	2200
G 2000	500	900	1100	500	850	1000	400	700	800	1800	2100	2250	2600
G 2500	values upon enquiry												
HG 2400													
HG 2750													
HG 3500													
HG 4000													
contactor group	group A			group A	C	group C			group A and C				

1) with 300 switching / h values x 0,9 - with 600 switching / h values x 0,75

2) rotor contactors for off-load switching as per List 280

3) for star-delta-switching, output x $\sqrt{3}$ or mains- and delta-contactors and output x 3 for star-contactor

Loading data for DC-motors

switching of DC-motors										
contactor-type	Category DC 2 and DC 3 at 150 switching / h ¹⁾					Category DC 4 and DC 5 at 150 switching / h ¹⁾				
	[kW]					[kW]				
	110V	220V	440V	660V	1000V	110V	220V	440V	660V	1000V
G 200	18	36	65	---	---	15	30	50	---	---
G 320	28	56	100	125	150	25	50	90	110	125
G 320v	33	66	120	150	180	30	60	100	125	140
G 500	45	90	160	200	225	40	80	140	175	200
G 500v	55	110	200	250	300	50	100	180	225	250
G 800	65	130	230	280	330	55	110	200	250	280
G 5002b	75	150	270	325	375	66	130	225	280	325
G 5002v	100	200	350	425	500	90	180	320	400	450
G 1400	110	220	400	500	580	95	180	340	425	500
G 5003v	125	250	450	550	650	110	220	400	500	575
G 2000	150	300	520	625	725	130	260	450	550	600
G 2500	values upon enquiry									
HG 2400										
HG 2750										
HG 3500										
HG 4000										
contactor group	group A		group C		group 1000V	group C				group 1000V
required switching	I-pole		II-pole		III-polig	I-pole		II-pole		III-pole

- 1) at 300 switching / h value x 0,9
at 600 switching / h value x 0,75

Note :

with thyristor controlled motors, higher values admissible (consult with suppliers)

Loading data for induction furnaces

switching of main frequency induction furnaces, 3-phases connected ⁵⁾												
contactor-type	damping switching, maximum rated output of furnace [kW] ⁴⁾ at an operating of V, 50 Hz										undamped switching maximum output of furnace [kW] ⁴⁾ at an operating voltage of V, 50 Hz	
	600V		750V		1000V		1500V		2400V ³⁾		380V	500V
	D ¹⁾	H ²⁾	D ¹⁾	H ²⁾	D ¹⁾	H ²⁾	D ¹⁾	H ²⁾	D ¹⁾	H ²⁾		
G 200	285	200	---	---	---	---	---	---	---	---	100	130
G 320	420	300	500	400	---	---	950	750	---	---	165	205
G 320V	575	400	700	500	---	---	1300	950	---	---	210	260
G 500	700	500	900	630	1000	750	1600	1200	2500	1900	260	325
G 500V	925	650	1100	800	1300	950	2000	1500	3200	2400	360	450
G 800	1050	750	1400	1000	1700	1200	2600	1900	4250	3000	400	520
G 5002b	1300	925	1600	1200	1900	1450	3000	2250	4800	3600	500	640
G 5002v	1650	1150	2000	1400	2400	1650	3800	2650	6000	4250	650	800
G 1400	1850	1300	2250	1600	2700	1900	4250	3000	6800	4800	720	900
G 5003v	2150	1500	2500	1800	3000	2150	4750	3400	7500	5400	840	1000
G 2000	2700	1900	3000	2300	2300	2750	5700	---	---	7000	1000	1300
G 2500	values upon enquiry											
HG 2400	---	2250	---	2800	---	3300	---	5250	---	---	1200	1550
HG 2750	---	-----	---	---	---	---	---	---	---	---	1400	1750
HG 3000	---	---	---	---	---	---	---	---	---	---	1800	2250
HG 4000	---	---	---	---	---	---	---	---	---	---	2000	2600
	group C Ui = 750V / 1000V				group 1000V Ui = 1500				group 1000V Ui = 3000		group A Ui = 750V	

- 1) D = damping contactors switch-in time $t_e \leq 1,5s$
- 2) H = main or bridging contactor
- 3) required contactor connections as per list 411E
- 4) in case of voltages increased by a maximum of 10% and inductive or capacitive increase, the loading currents I_e of the main contactors may not be higher than their admissible continuous currents I_{th2} . With higher ambient temperature and mounting at higher altitudes, reducing factors shall be taken into account.
- 5) for 2-pole contactors AC connected, only 0,58 of the quoted 3-phase current outputs is permissible.

Dimensions- and weight-table for contactors group A and C

contactor group A														
contactor type	rated-insulation-voltage [V]	fig.	dimension A [mm] for 1 – 8-pole design						net weight [kg] for 1 – 8-pole design					
			I	II	III	IV	VI	VIII	I	II	III	IV	VI	VIII
G 200	750	1	212	256	300	344	432	---	10	14	17,5	21	26,5	---
G 320 G 320v		3	256	344	432	490	---	---	10,5	15	18,5	24,5	---	---
G 500 G 500v G 800	1000	6	345	445	541	635	885	1065	22	28	34,5	46	62,5	76,5
G 5002b G 5002v G 1400		9	385	541	680	885	---	---	28	40,5	58,5	72	---	---
G 5003v G 2000		12	445	680	885	---	---	---	34	58,5	78,5	---	---	---
G 2500		14	541	760	1150	---	---	---	40,5	72	111,5	---	---	---
HG 2400 HG 2750	1500	16	590	770	950	1130	---	---	114,5	153	191,5	232	---	---
HG 3500 HG 4000		17	640	880	1120	1360	---	---	130,5	189	248	304	---	---

contactor group C														
contactor type	rated-insulation-voltage [V]	fig.	dimension A [mm] for 1 – 8-pole design						net weight [kg] for 1 – 8-pole design					
			I	II	III	IV	VI	VIII	I	II	III	IV	VI	VIII
G 320 G 320v	750	3	256	344	432	540	---	---	10,5	15	19	25	---	---
G 500 G 500v G 800	1000	6	345	445	541	635	885	1065	23	30,5	40	50,5	69	85
G 5002b G 5002v G 1400		9	385	541	680	885	---	---	30	45	65	83	---	---
G 5003v G 2000		12	445	680	885	---	---	---	37,5	65	89,5	---	---	---
G 2500		14	541	760	1150	---	---	---	45,5	81	127	---	---	---
HG 2400 HG 2750	1500	16	590	770	950	1130	---	---	119,5	162	207	249	---	---
HG 3500 HG 4000		17	640	880	1120	1360	---	---	139,5	202	267,5	330,5	---	---

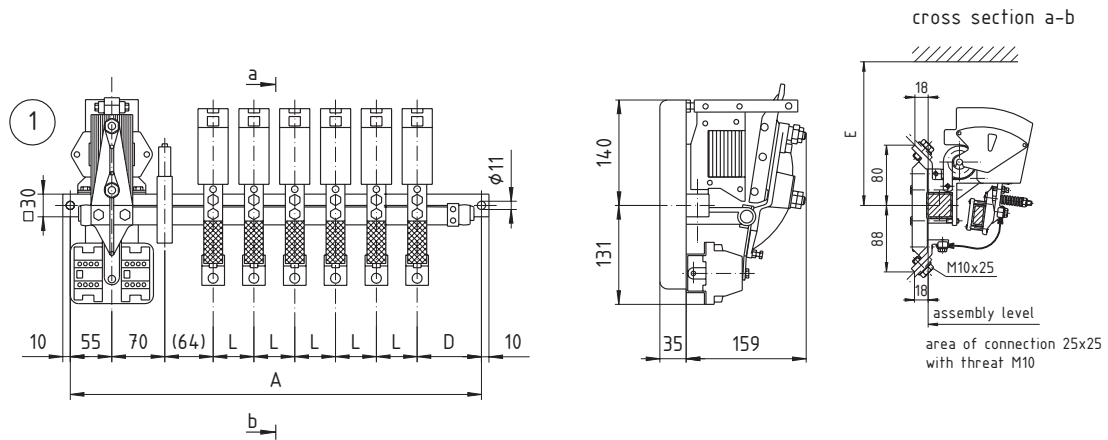
Dimensions- and weight-table for contactors group D and group 1000V

contactor group D												
contactor type	rated-insulation-voltage [V]	fig.	dimension A [mm] for 1 – 6-pole design					net weight [kg] for 1 – 6-pole design				
			I	II	III	IV	VI	I	II	III	IV	VI
G200	1000	2	300	380	490	---	---	14,5	22,5	33,5	---	---
G 320 und G 320v	1500	4	344	540	760	---	---	15	26,5	36	---	---
G 500, G 500v und G 800		7	445	635	885	---	---	30,5	50,5	69	---	---
G 5002b, G 5002v und G 1400		10	541	885	1300	---	---	45	83	130	---	---

contactor group 1000V Ui = 1500V												
contactor type	rated-insulation-voltage [V]	fig.	dimension A [mm] for 1 – 6-pole design					net weight [kg] for 1 – 6-pole design				
			I	II	III	IV	VI	I	II	III	IV	VI
G 320 und G 320v	1500	5	300	380	490	---	850	12	17	25	---	49
G 500, G 500v und G 800		8	385	541	635	760	850	24	32	45,5	54	73,5
G 5002b, G 5002v und G 1400		11	445	635	760	950	---	31	53	70,5	88,5	---
G 5003v und G 2000		13	541	760	950	---	---	39,5	70,5	96	---	---
G 2500		15	541	885	1250	---	---	47	87,5	136,5	---	---
HG 2400 und HG 2750		16	590	770	950	1130	---	121,5	167	214	259	---
HG 3500 und HG 4000		17	640	880	1120	1360	---	143	209	278,5	345	---

contactor group 1000V Ui = 3000V												
contactor type	rated-insulation-voltage [V]	fig.	dimension A [mm] for 1 – 6-pole design					net weight [kg] for 1 – 6-pole design				
			I	II	III	IV	VI	I	II	III	IV	VI
G 320 und G 320v	3000	5	300	432	540	---	1000	12	17	25,5	---	49,5
G 500, G 500v und G 800		8	385	541	635	760	950	24	32	45,5	54	73,5
G 5002b, G 5002v und G 1400		11	445	635	760	950	---	31	53	70,5	88,5	---
G 5003v und G 2000		13	541	760	950	---	---	39,5	70,5	96	---	---
G 2500		15	541	885	1250	---	---	47	87,5	136,5	---	---
HG 2400 und HG 2750		16	590	770	950	1130	---	121,5	167	214	259	---
HG 3500 und HG 4000		17	640	880	1120	1360	---	143	209,5	278,5	345	---

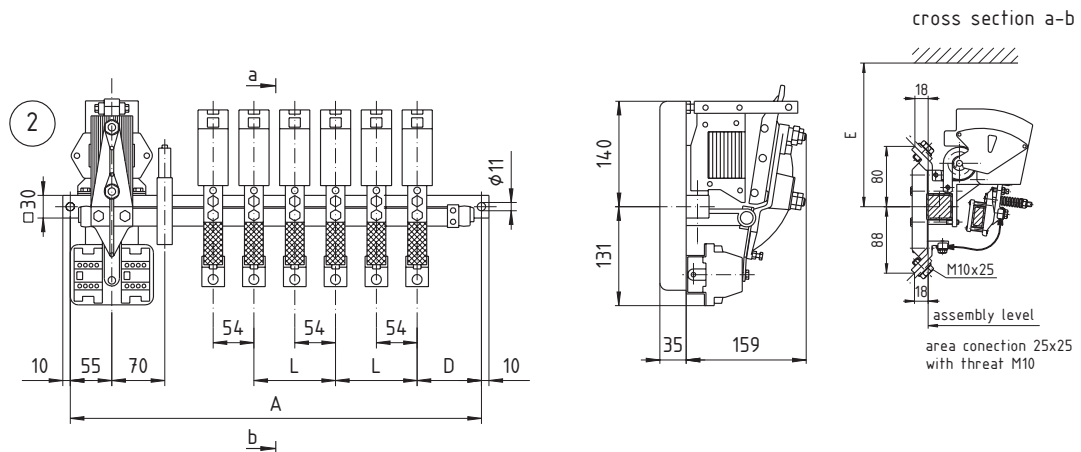
Dimension for G 200 group A and D



dimensional table G 200 group A

rated voltage [V]	D	L	L ₁	E	dimension A with 1 - 6-pole design				
					I	II	III	IV	VI
750	69	44	-	240	212	256	300	344	432
1000	78	54	-	240	256 ¹⁾	300 ¹⁾	344	380	490

1) 1 economy contact on bar possible

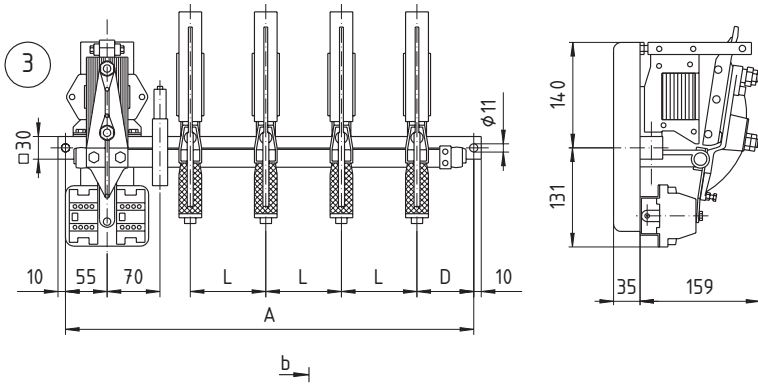


dimension table G 200 group D

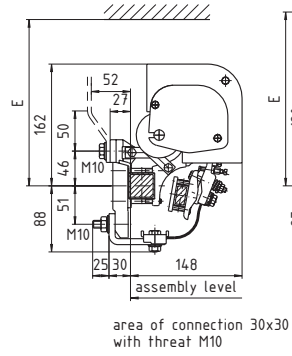
rated voltage [V]	D	L	L ₁	E	dimension A with 1 - 4-pole design		
					I	III	IV
1000	78	108	-	260	300 ¹⁾	300	344

1) 1 economy contact on bar possible

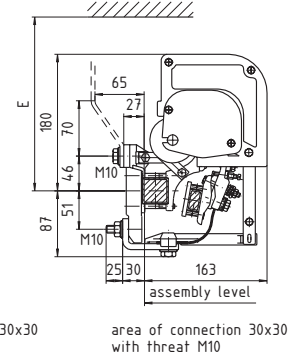
Dimension for G 320 and G 320v group A, C and D



cross section a-b
group A



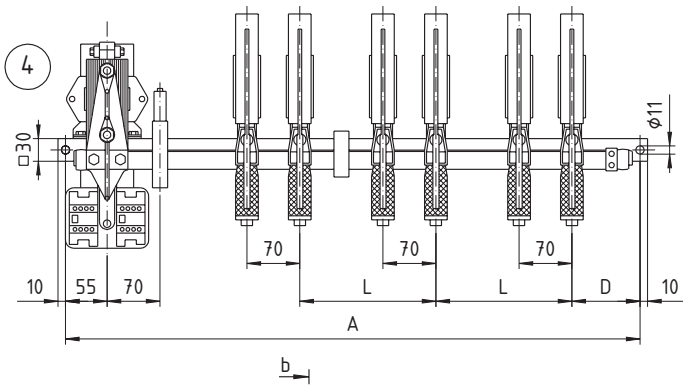
cross section a-b
group C



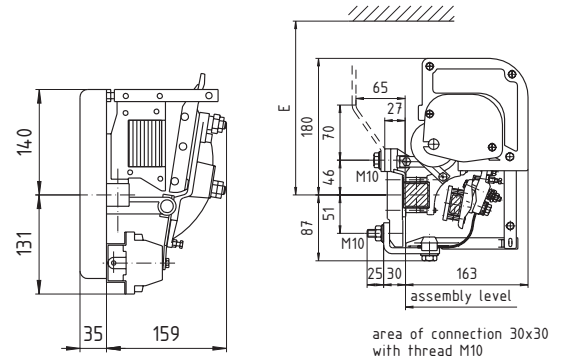
dimension table G 320 and G 320v group A and C, $U_i = 750 \text{ V}$

group	D	L	L_1	E	dimension A [mm] with 1 - 4-pole design			
					I	II	III	IV
A	75	85	-	250	256 ¹⁾	344 ¹⁾	432 ¹⁾	490 ¹⁾
C	75	100	-	300	256 ¹⁾	344 ¹⁾	432 ¹⁾	490 ¹⁾
A+C $U_i=1000\text{V}$	90	100	-	300	300 ¹⁾	380 ¹⁾	490 ¹⁾	-

1) 1 economy contact on bar possible



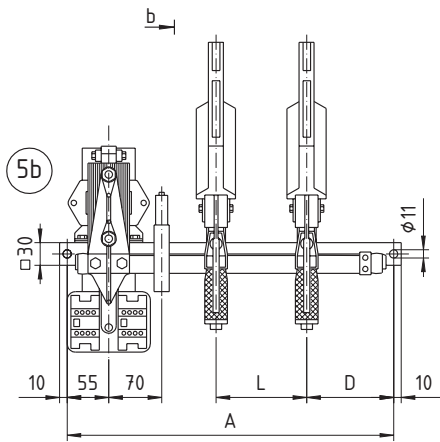
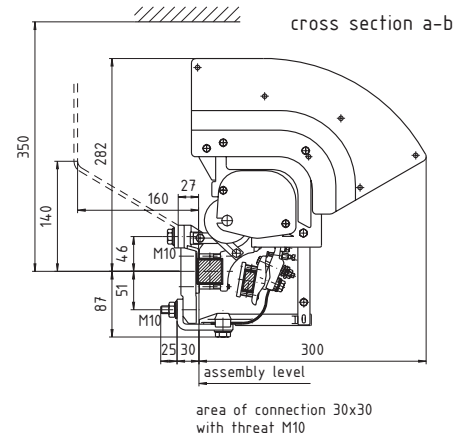
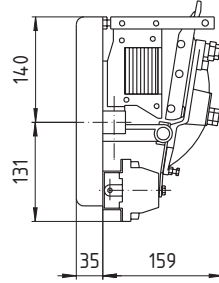
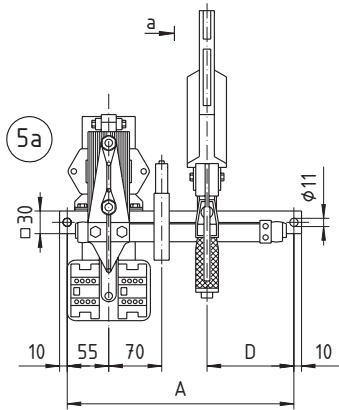
cross section a-b
group C



dimension table G 320 and G 320v group D

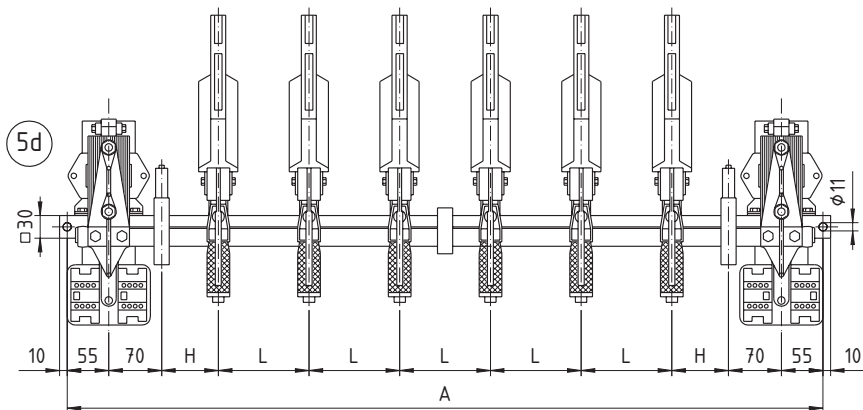
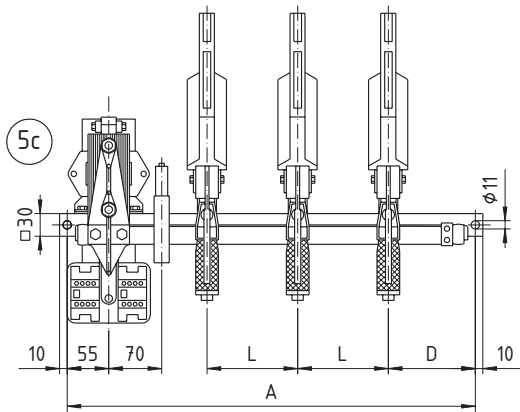
Gruppe	U_i [V]	D	L	L_1	E	dimension A [mm] with 1 - 3-pole design		
						I	II	III
D	1500	90	180	-	325	344	540	760
D	3000	110	180	-	325	--	--	760

Dimension for G 320 and G 320v group 1000V $U_i = 1500V$ and 3000V

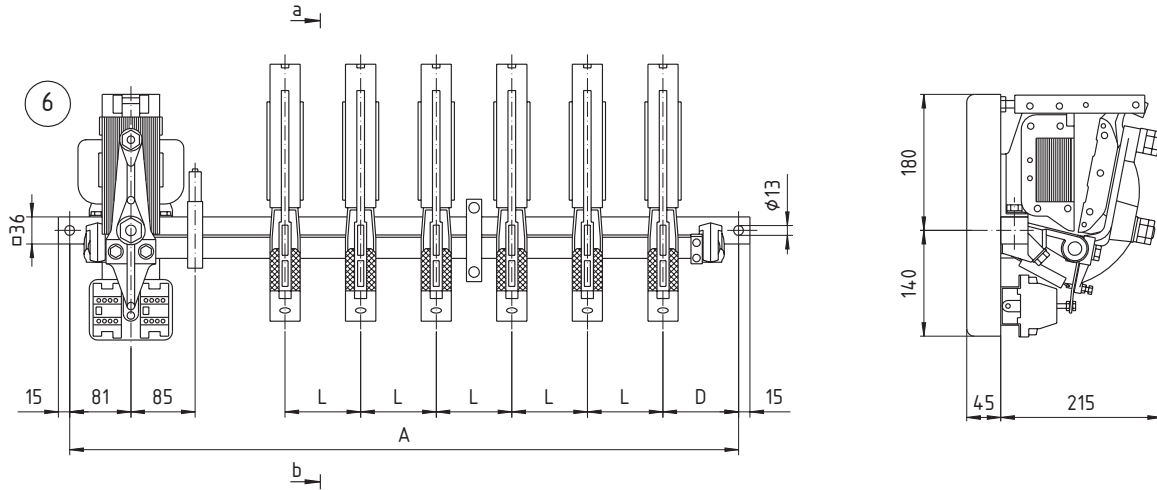


dimension table G 320 and G 320v group 1000V

contactor group 1000V	D	L	H	dimension A [mm] for 1 - 6-pole design			
				I	II	III	VI
$U_i = 1500V$	90	100	50	300	380	490	850
$U_i = 3000V$	105	120	75	300	432	540	1000

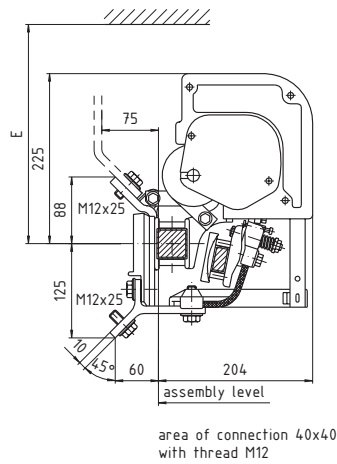
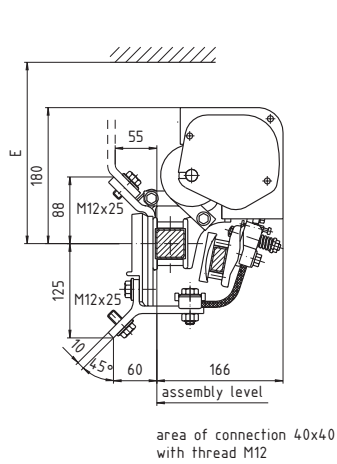


Dimension for G 500, G 500v and G 800 group A and C $U_i = 1000V$



cross section a-b
group A

cross section a-b
group C

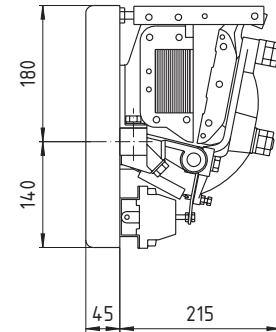
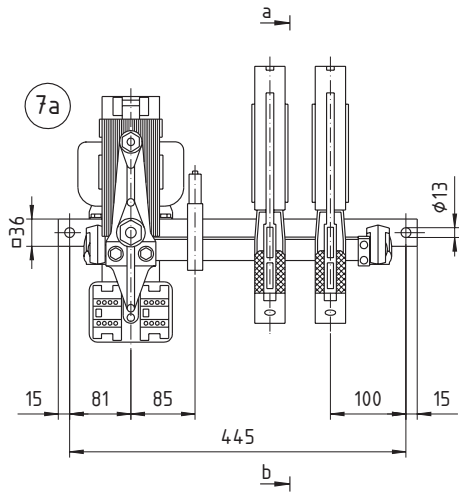


dimension table G 500, G 500v and G 800, $U_i = 1000V$

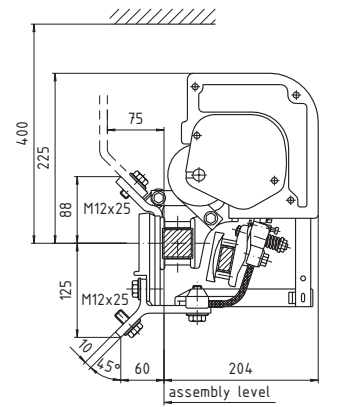
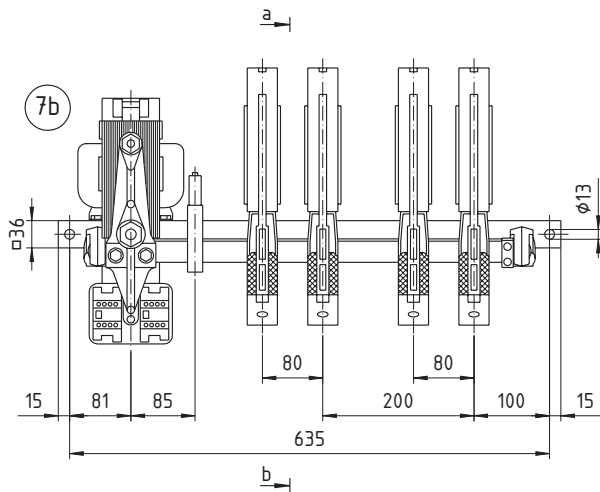
group	D	L	E	dimension A [mm] 1 - 8-pole design					
				I	II	III	IV	VI ¹⁾	VIII ¹⁾
A	100	100	300	345	445	541	635	885	1065
C	100	100	350	345	445	541	635	885	-

1) with 6-pole and 8-pole design intermediate bearing between 3rd and 4th pole starting from left.

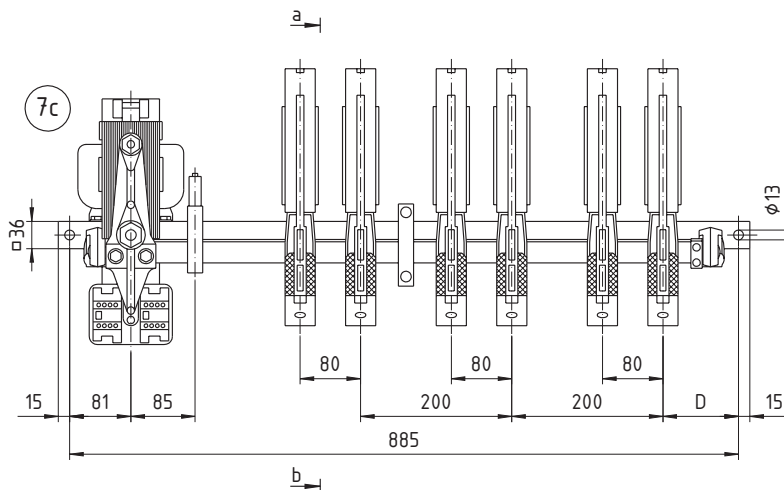
Dimension for G 500, G 500v and G 800 group D $U_i = 1500V$ and $3000V$



cross section a-b

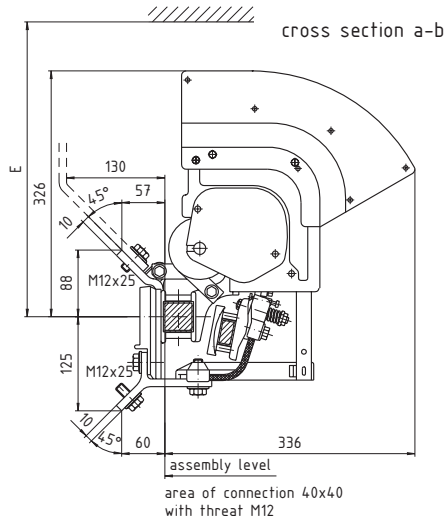
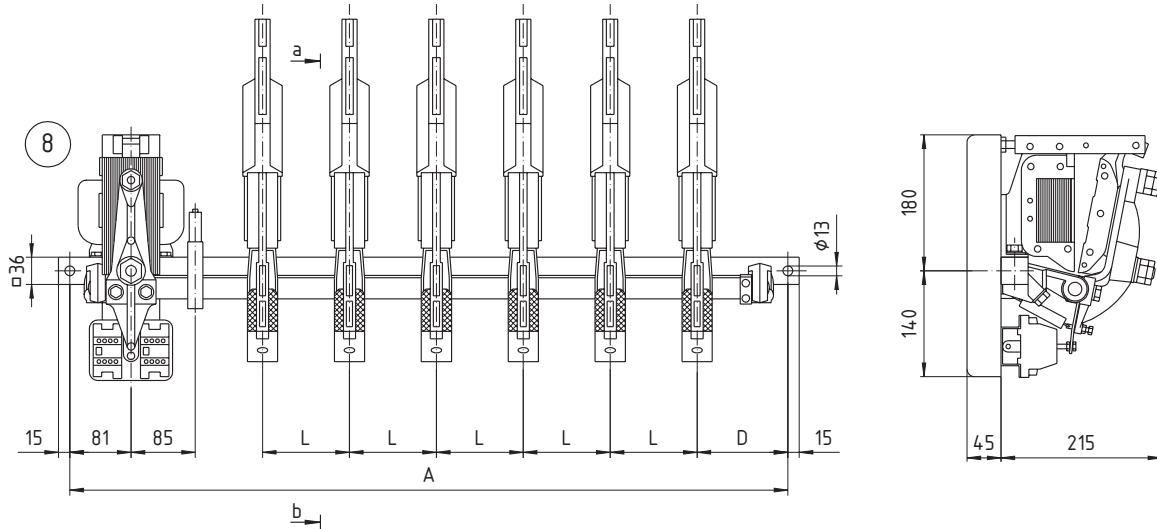


area of connecting 40x40 with thread M12



U_i	D
1500V	100
3000V	120

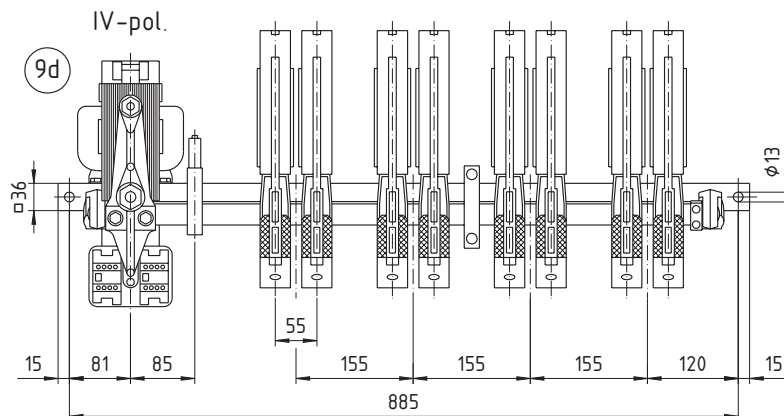
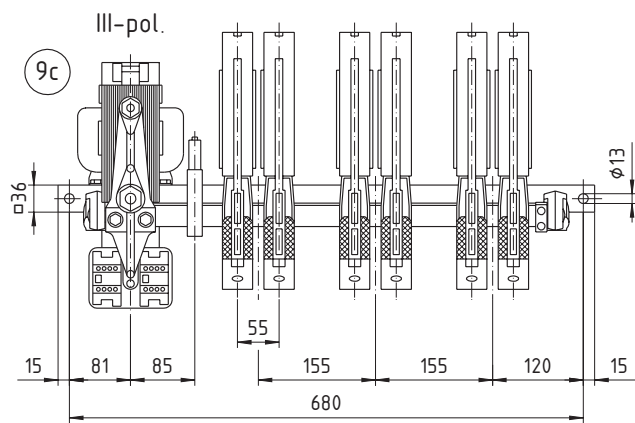
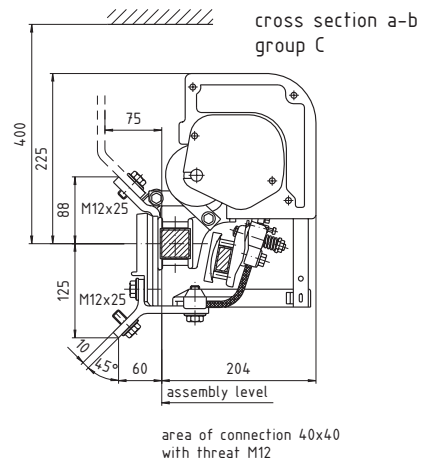
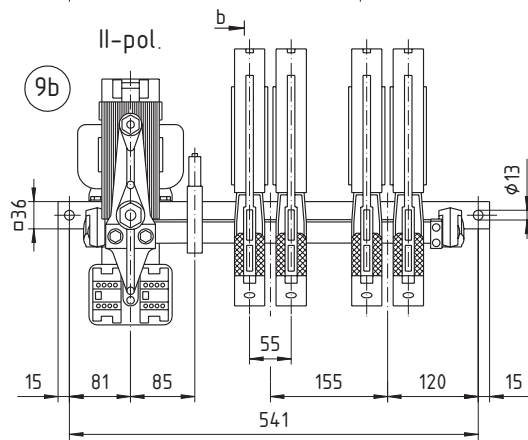
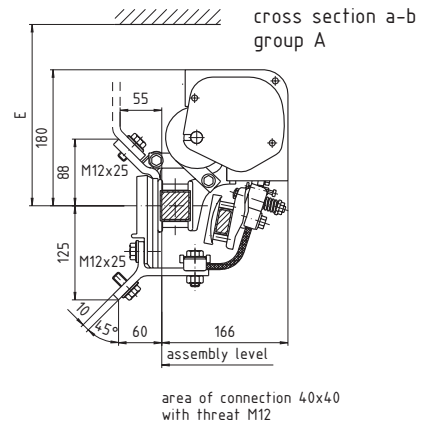
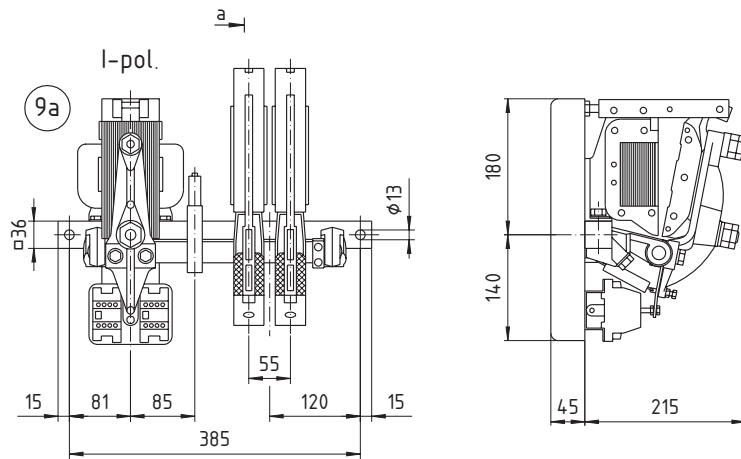
Dimension for G 500, G 500v and G 800, group 1000V, $U_i = 1500V$ and $3000V$



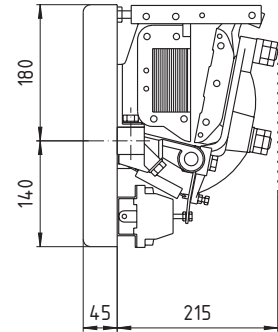
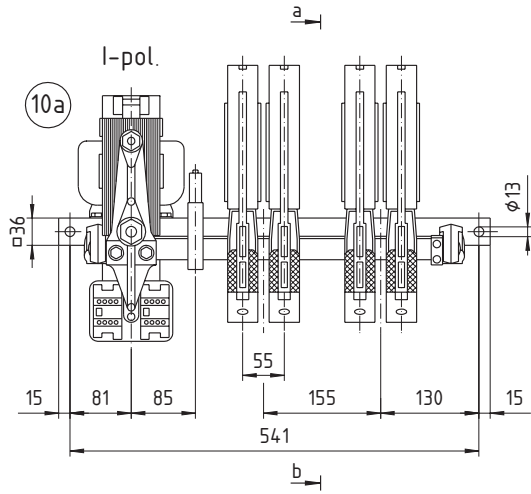
dimension G 500, G 500v and G 800, $U_i = 1500V$ and $3000V$

group	D	L	E	dimension A with 1 - 6-pole design				
				I	II	III	IV	VI
1000V	120	115	500	385	541	635	760	950

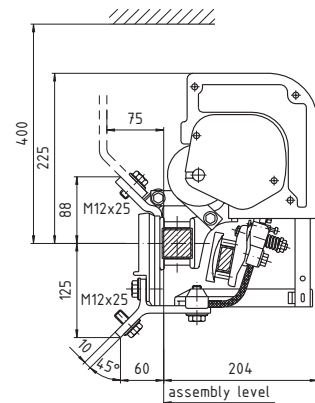
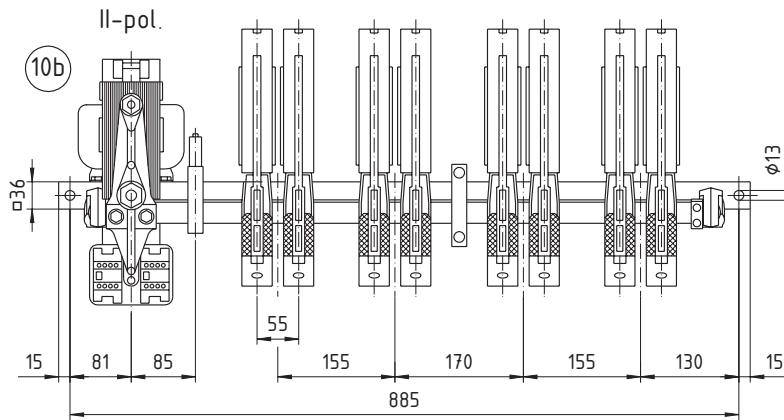
Dimension for G 5002b, G 5002v and G 1400 group A and C Ui = 1000V



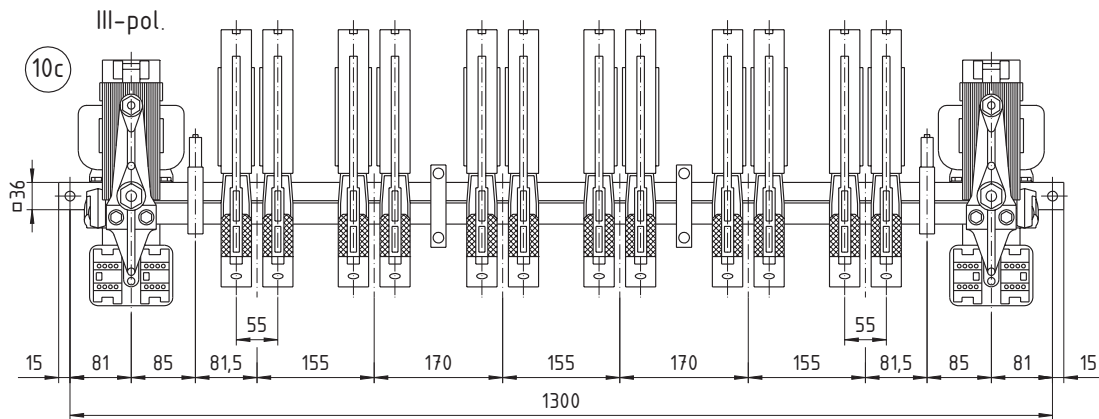
Dimension for G 5002b, G 5002v and G 1400, group D $U_i = 1500V$



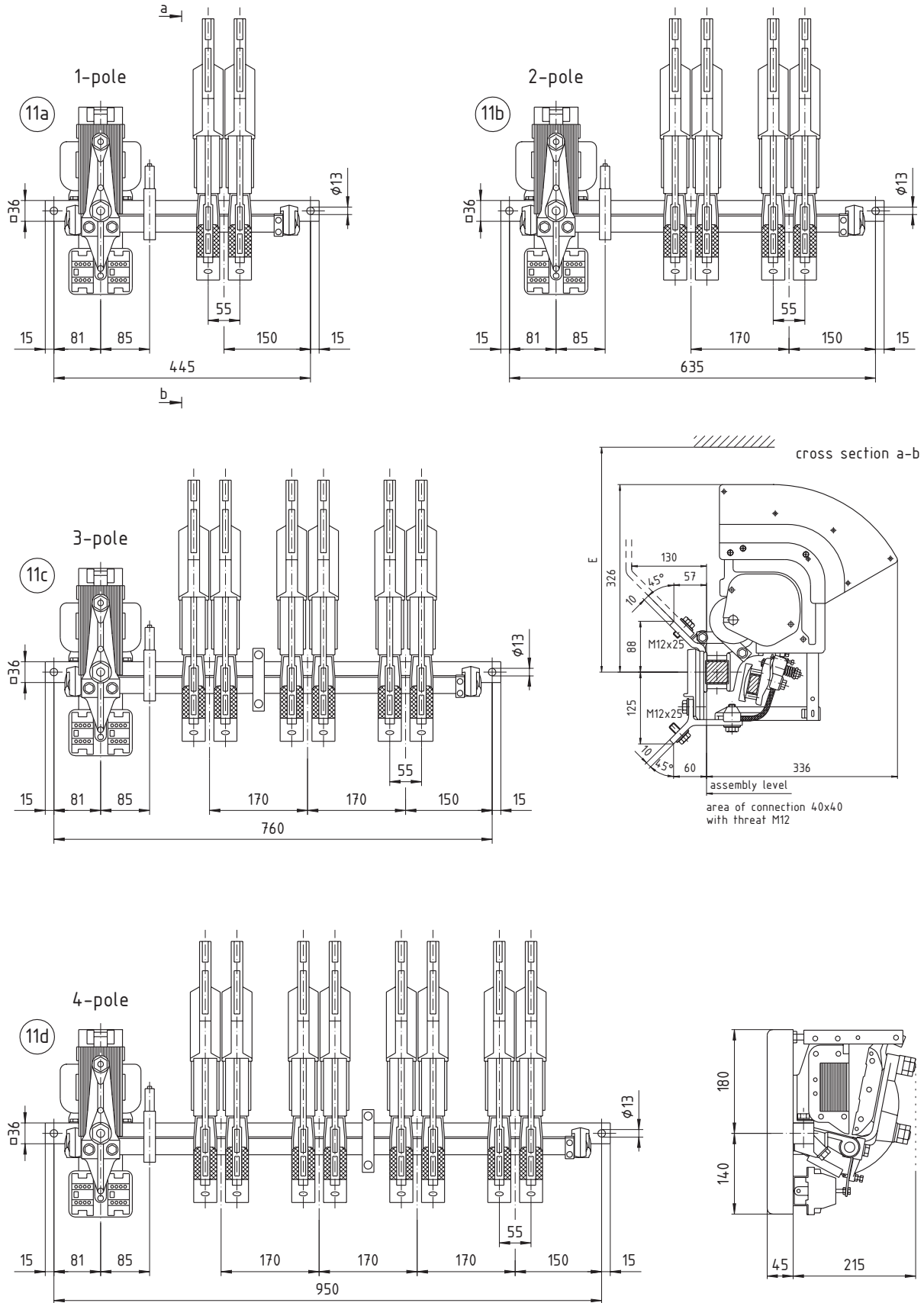
sectional cross a-b



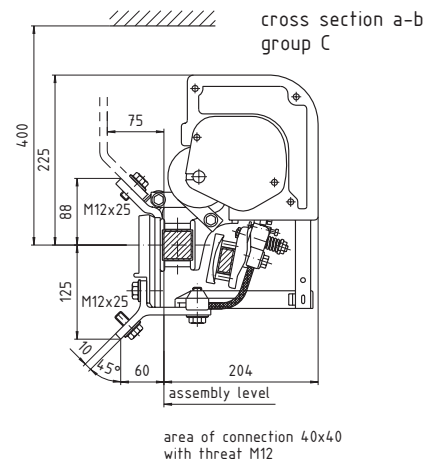
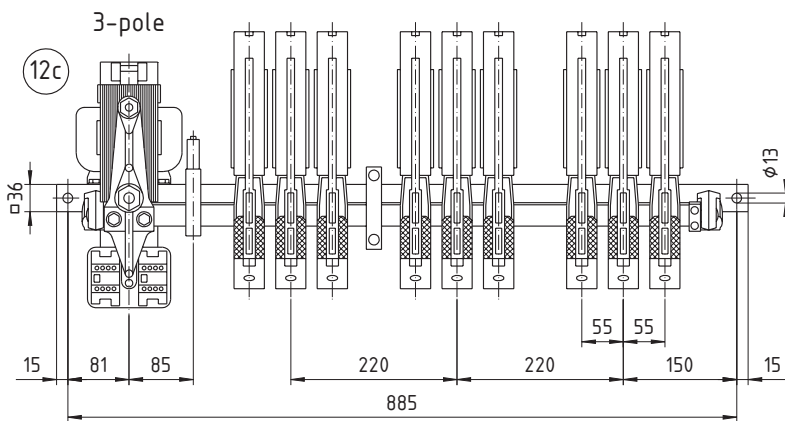
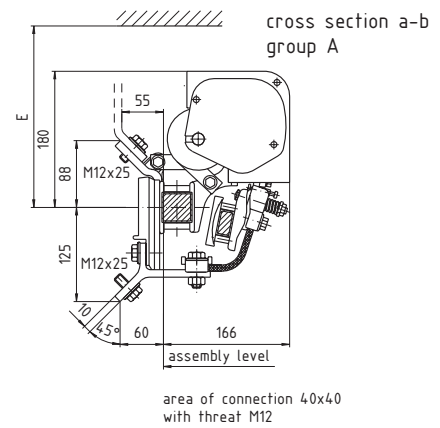
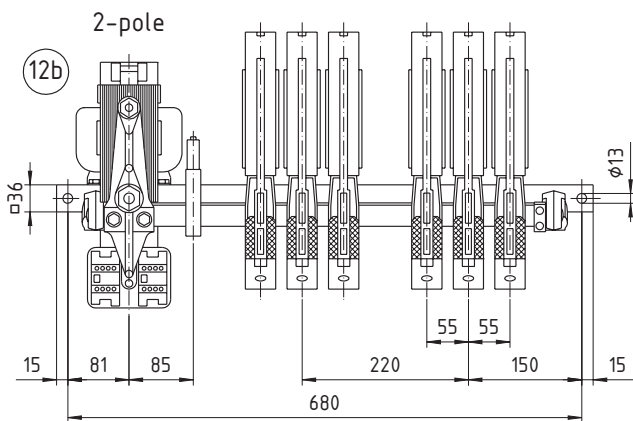
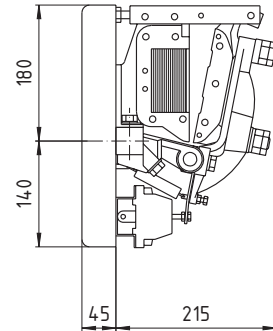
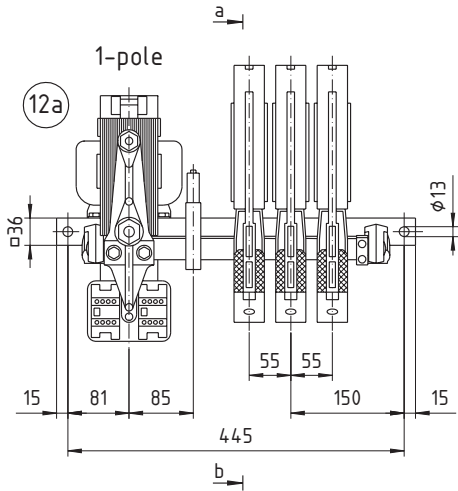
area of connection 40x40 with thread M12



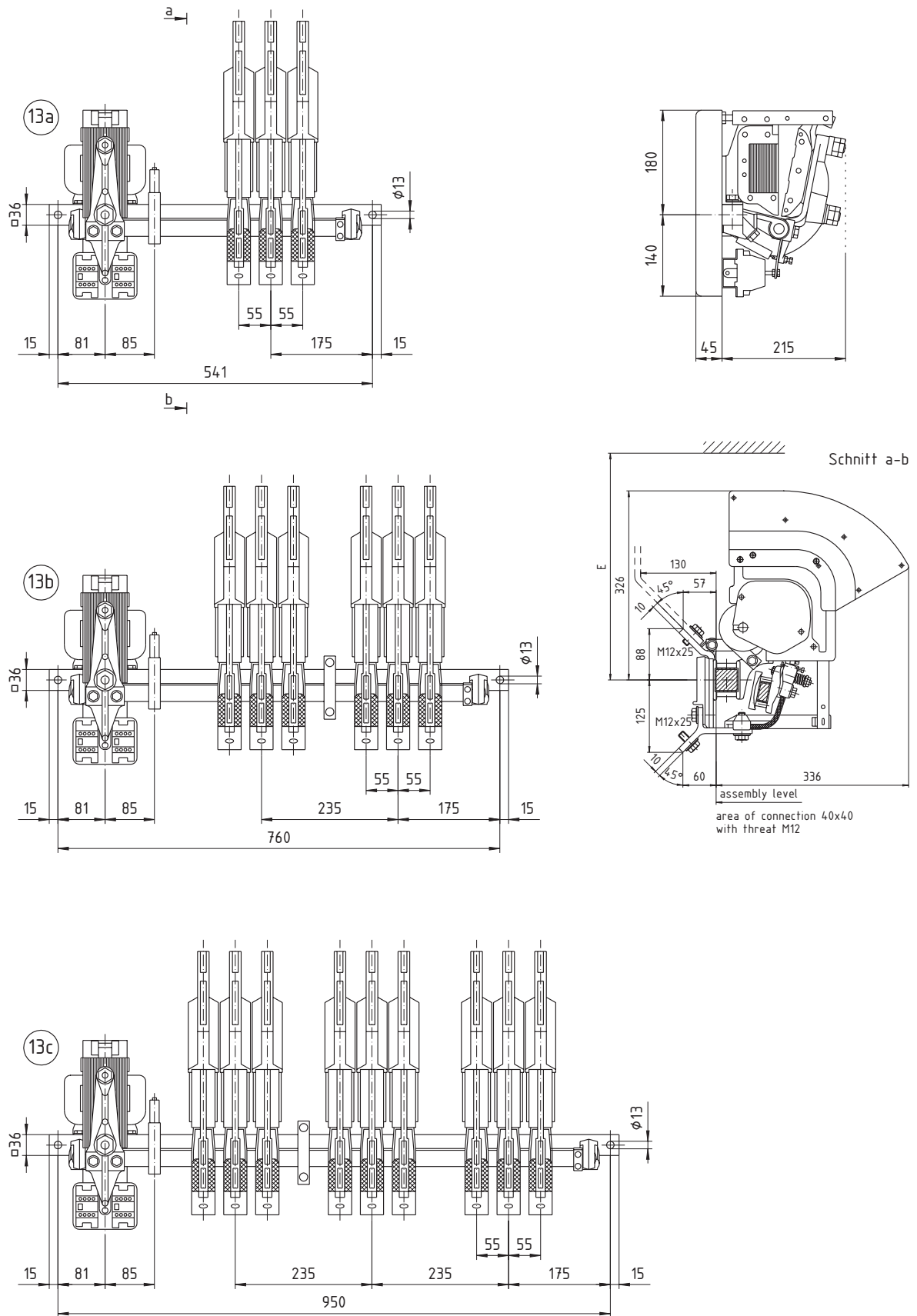
Dimension for G 5002b, G 5002v and G 1400, group 1000V, $U_i = 1500V$ and $3000V$



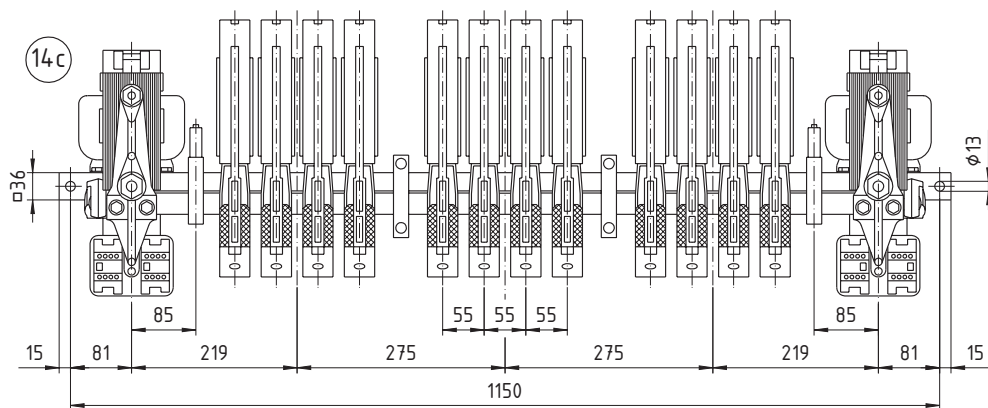
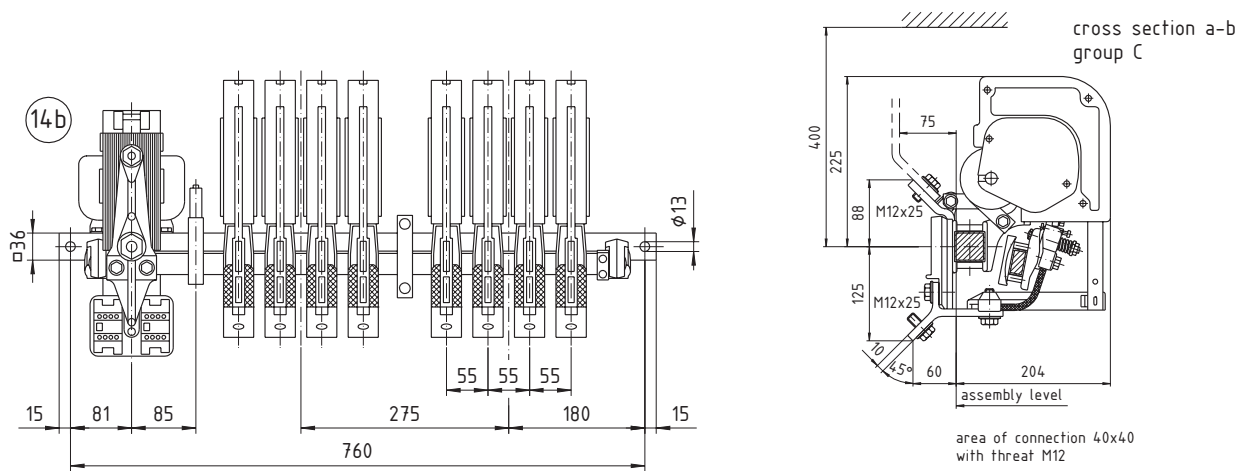
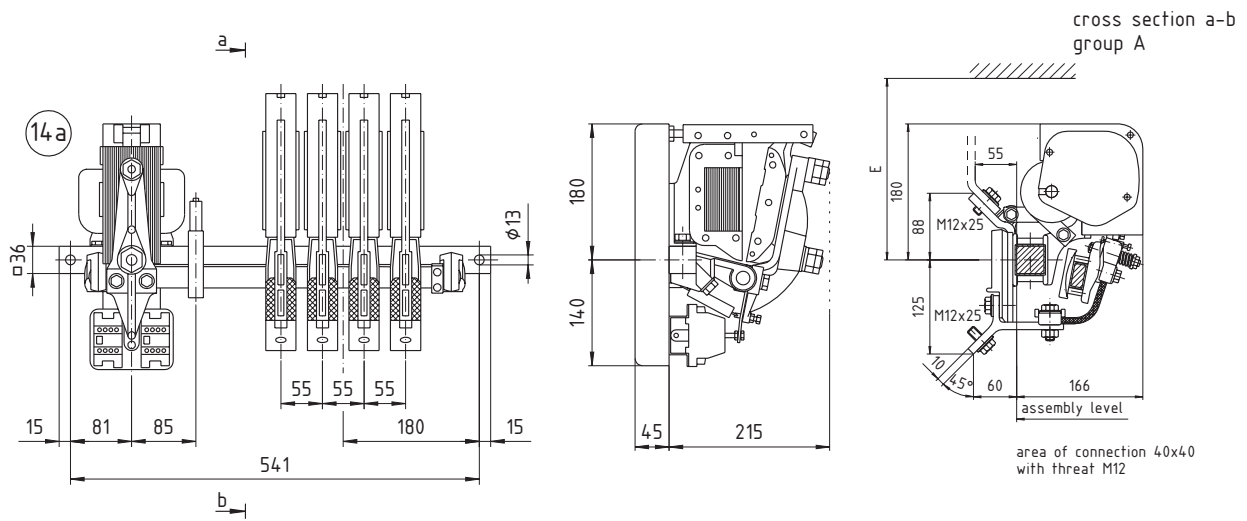
Dimension for G 5003v and G 2000 group A and C, $U_i = 1000V$



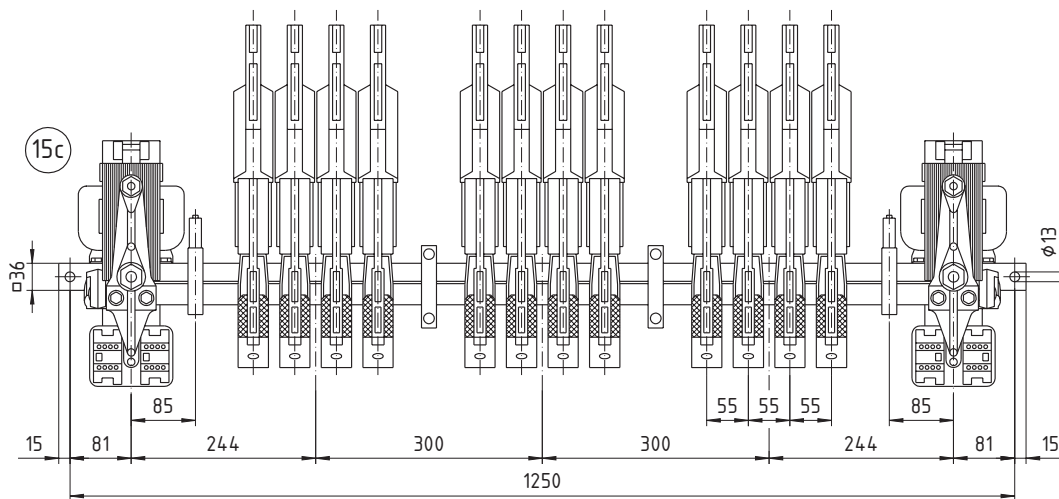
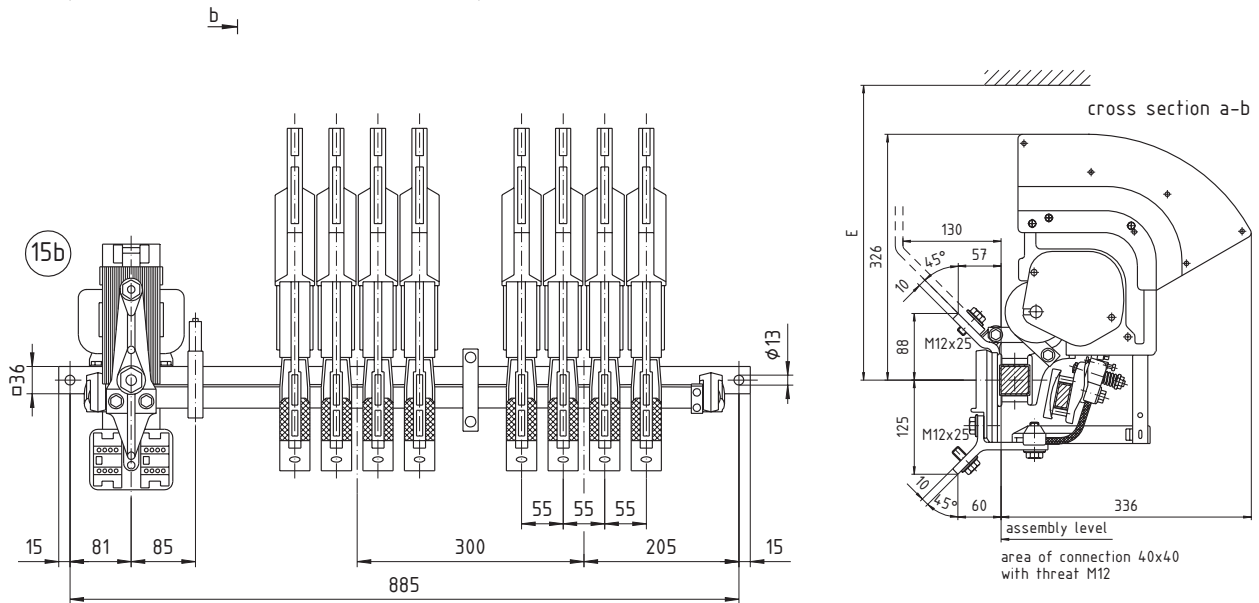
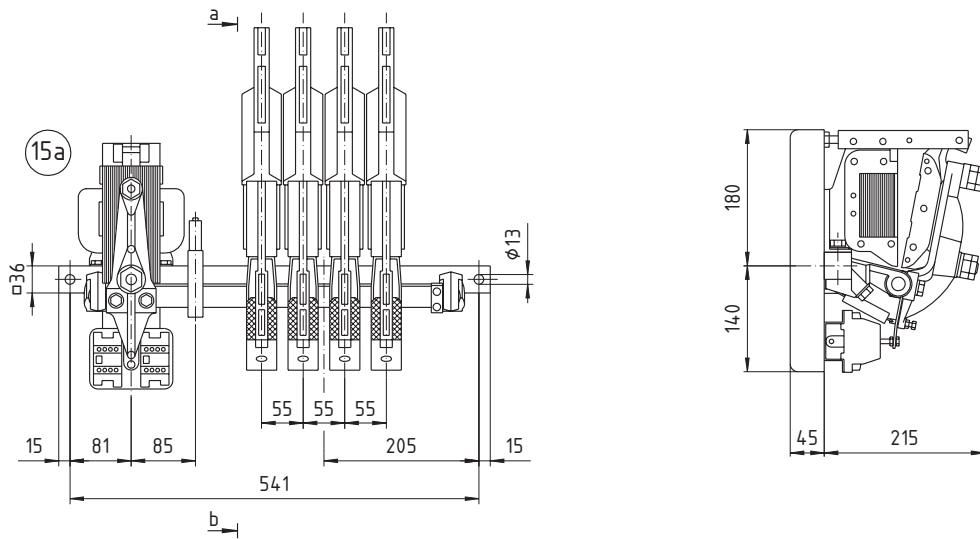
Dimension for G 5003v and G 2000 group 1000V, $U_i = 1500V$ and $U_i = 3000V$



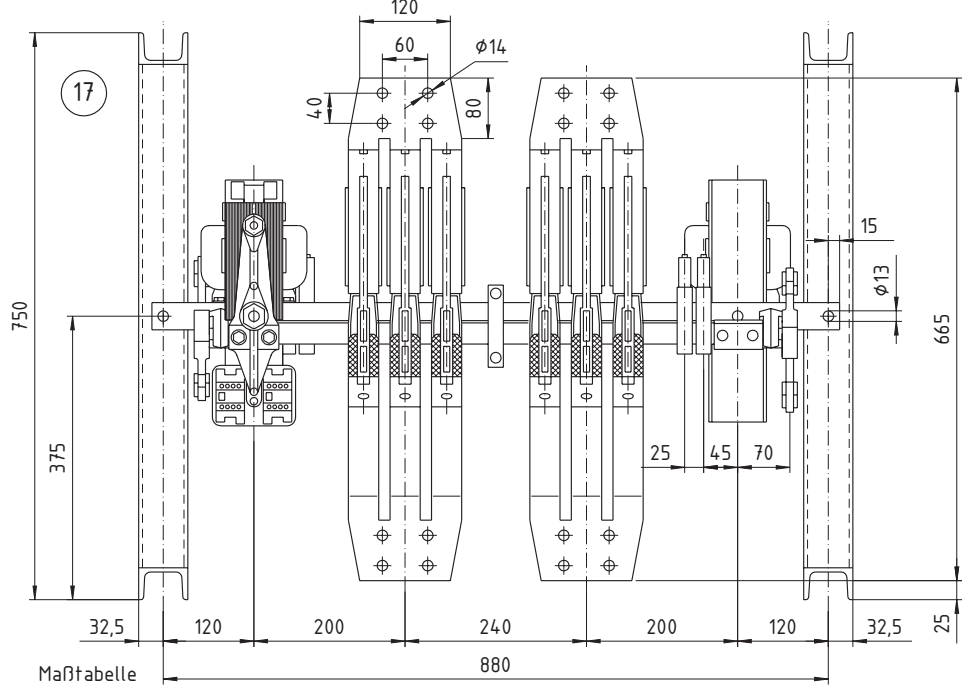
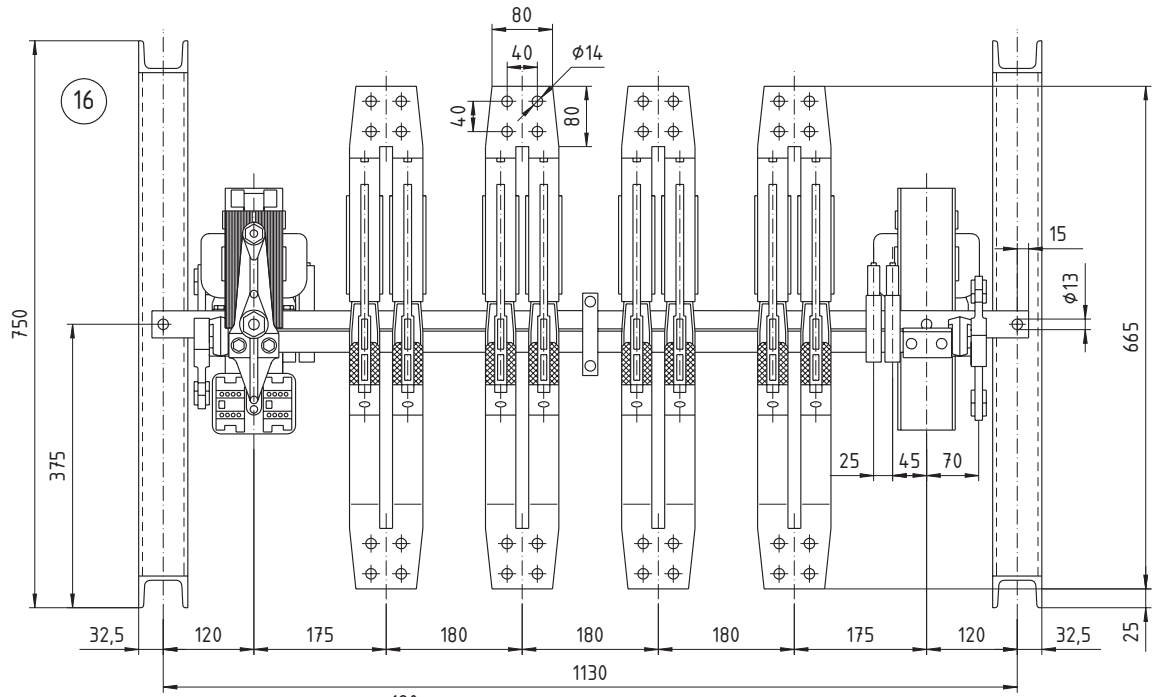
Dimension for G 2500 group A and C $U_i = 1000V$



Dimension for G 2500 group 1000V, $U_i = 1500V$ and $U_i = 3000V$



**Dimensional drawings for HG contactors HG 2400, HG 2750, HG 3500 and HG 4000
Groups A, C and 1000V (group C not shown)**



end view and
sectional a-b
common to groups
A, C und 1000V
see page 27

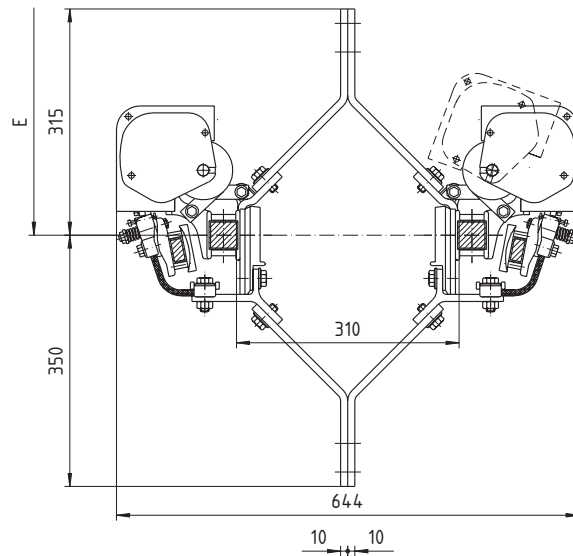
Maßtabelle

contactor type	contactor group	U _i [V]	fig.	L	E	dimension A [mm] with 1 - 4-pole design			
						I	II	III	IV
HG 2400 and HG 2750	A	1500	16	180	450	590	770	950	1130
	C	1500			600				
	1000V	1500			750				
	1000V	3000			750				
HG 3500 and HG 4000	A	1500	17	240	500	640	880	1120	1360
	C	1500			650				
	1000V	1500			800				
	1000V	3000			800				

Dimensional drawings for HG-contactors

17a

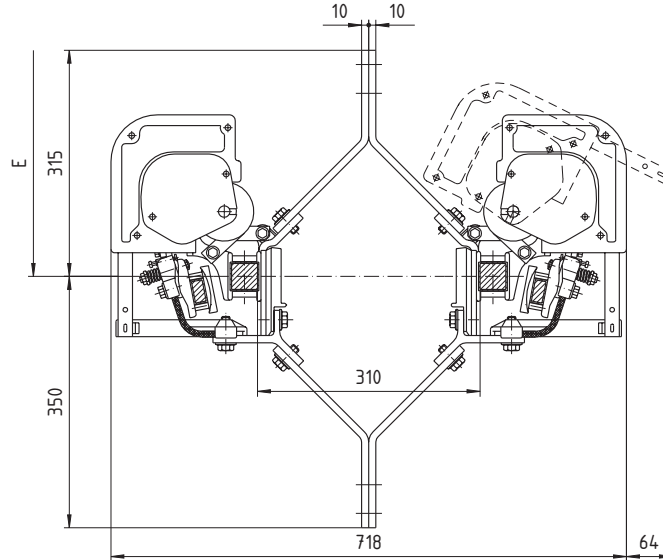
Gruppe A



Schnitt a-b

17b

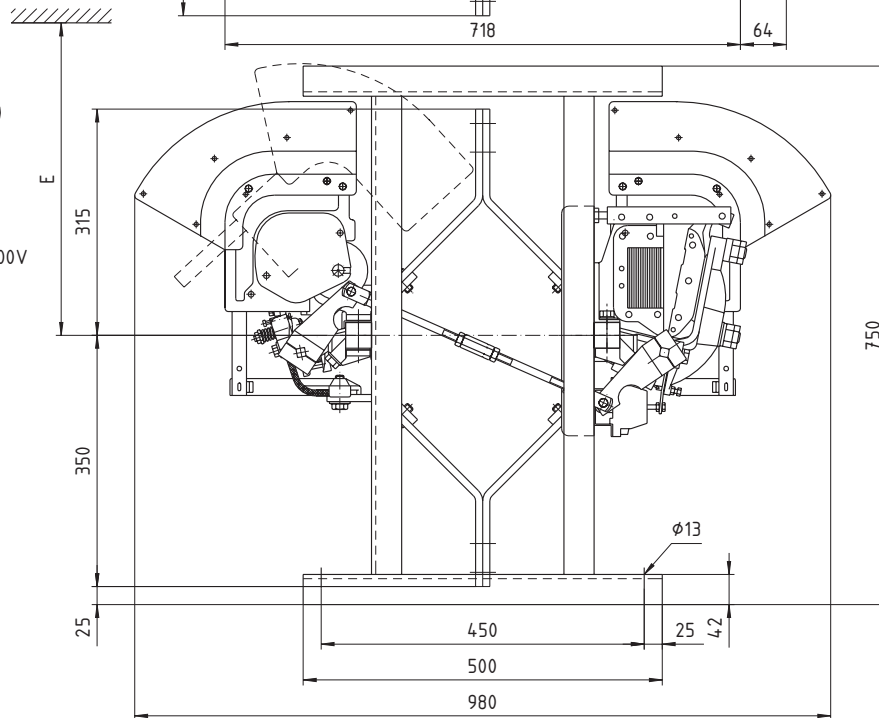
Gruppe C



Schnitt a-b

17c

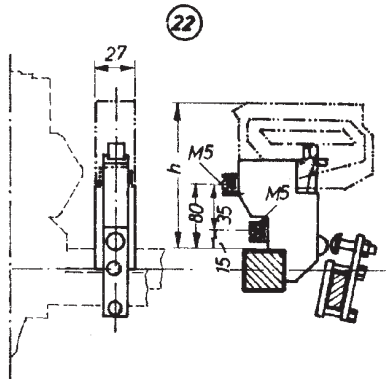
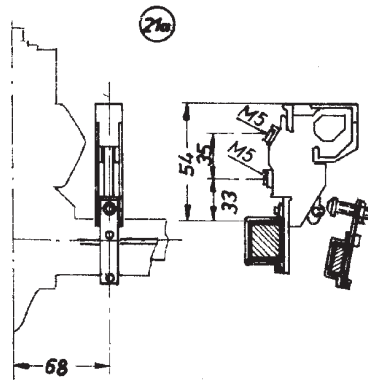
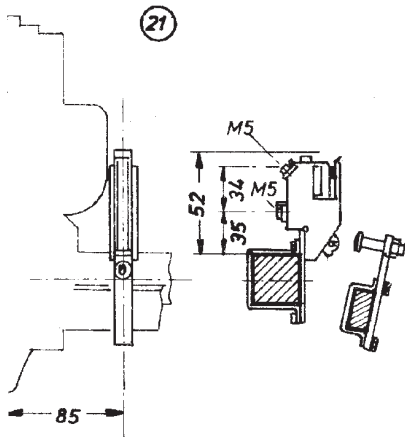
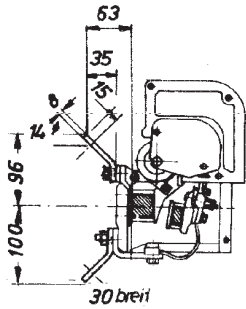
Gruppe 1000V



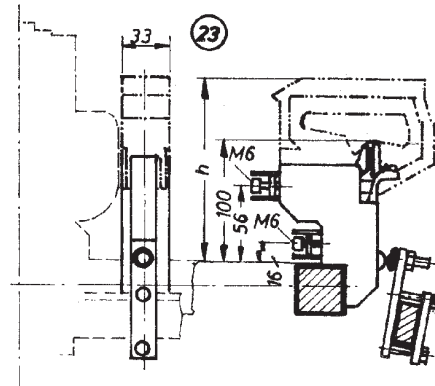
gemeinsame
Seitenansicht

Front face connections and negative poles

18 G 320 - G 320 v



negative pole for 90 A with blow-out coil
and for 100 A without blow-out coil

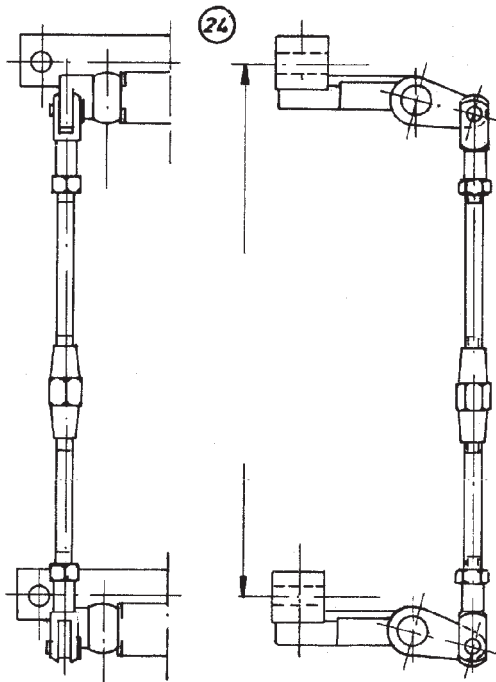


negative pole for 160 A with blow-out coil
and for 200 A without blow-out coil

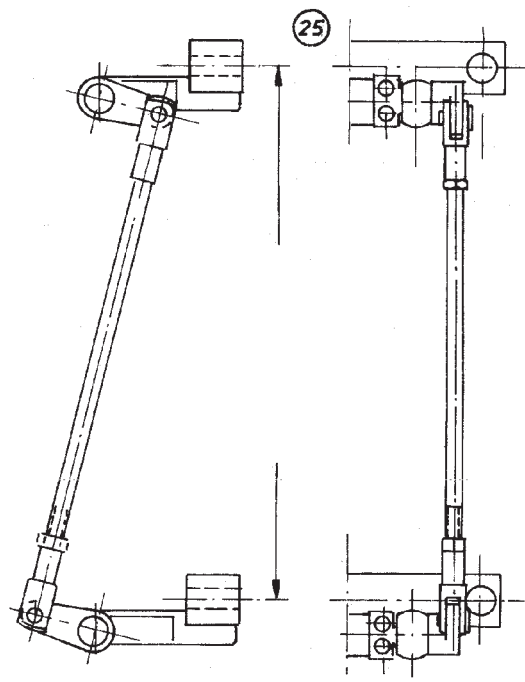
High of negative poles	
Amperes	dimension h
90 A w bl.	110
100 A w/o. bl.	90
160 A w bl.	135
200 A w/o. bl.	117

The negative poles can be mounted to all types of contactor.

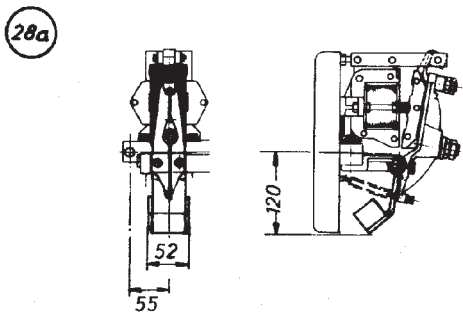
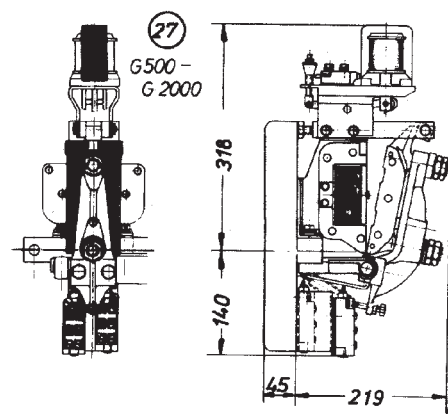
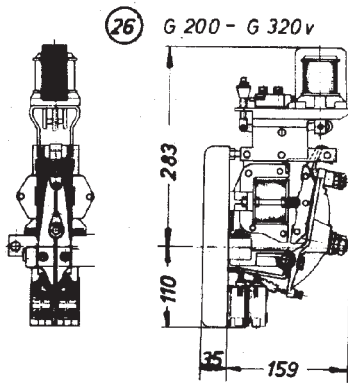
Mechanical coupling, mechanical interlocking and mechanical latch-in with electromagnetic release



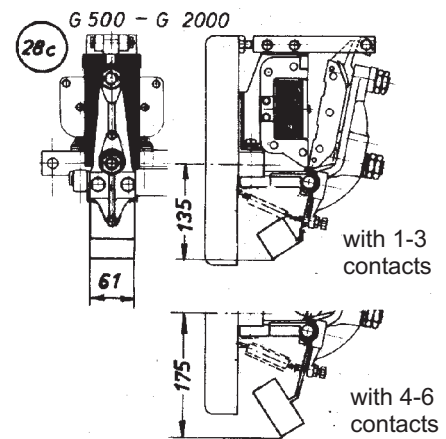
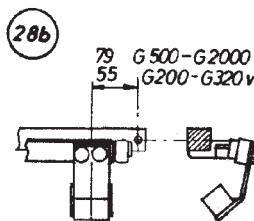
mechanical coupling G 200 G 2000



mechanical interlocking G 200 G 2000



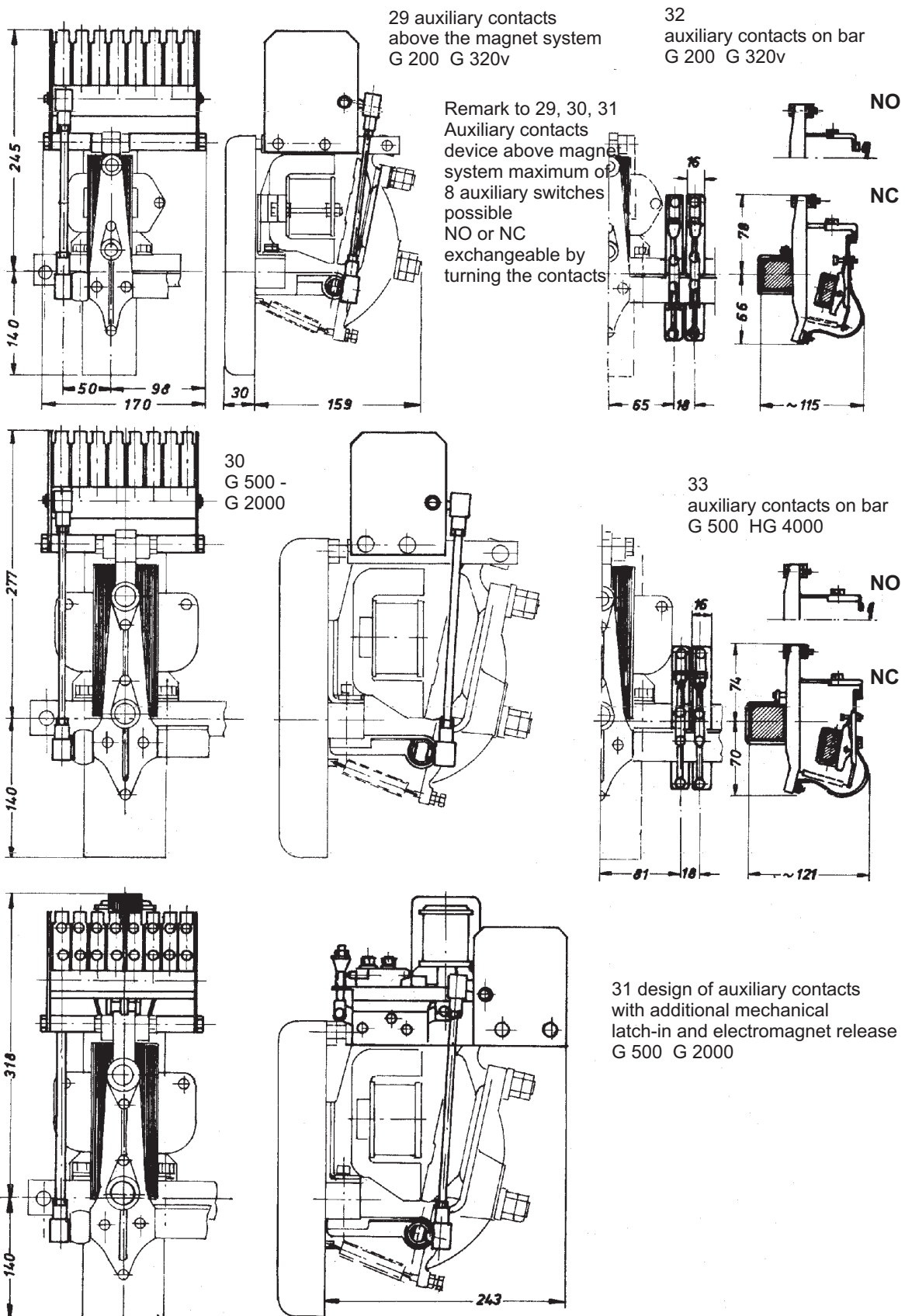
with 1-3 contacts



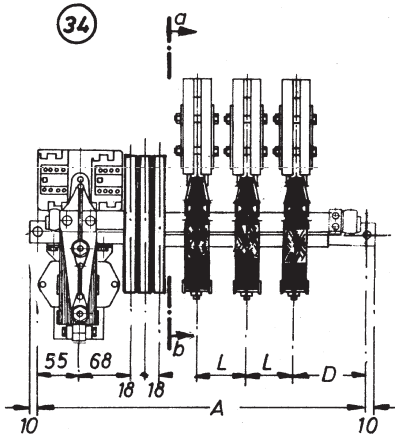
with 1-3 contacts

with 4-6 contacts

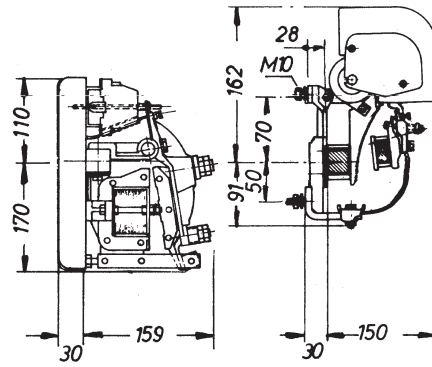
Arrangement of auxiliary contacts above the magnet and on the bar



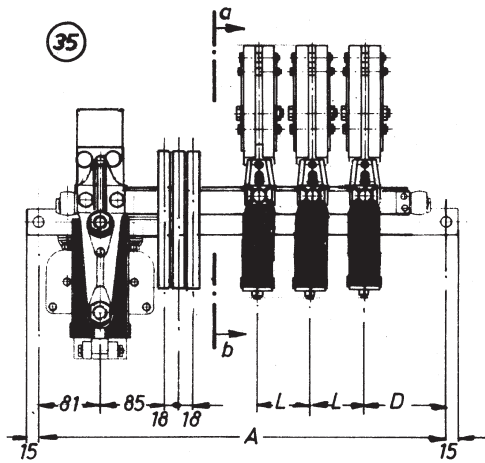
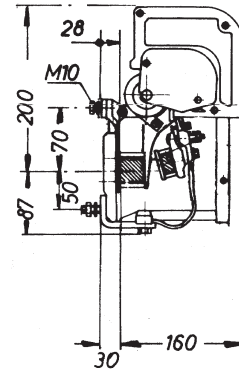
Dimensions drawings for negative-contactors



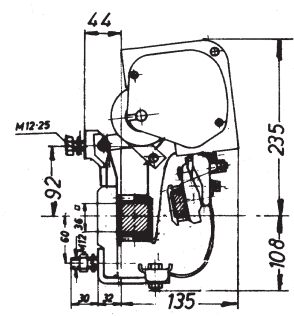
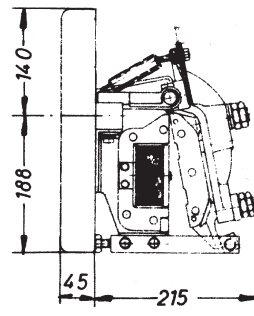
section a-b
group A



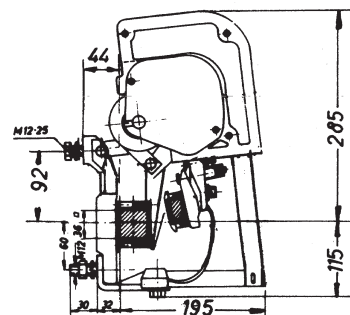
section a-b
group C



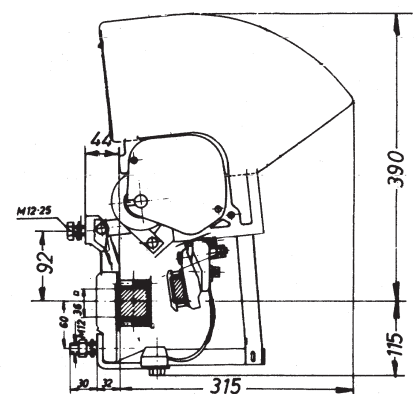
section a-b
group A



section a-b
group C



section a-b
group 1000V



Manufacturing-program

026/1	pole-changing switches, change over switches, circuit breakers
145E	NF and MF high-current switches (air-cooled)
280E	NF and MF contactors for off-load switching
282	Damping resistors
350/1E	<i>DC- and NF-contactors for on-load switching</i>
421	Prism-contacts (air- and water-cooled)
427E	NF and MF high-current switches (watercooled)
460	insulator-supports and bus-bar-supports
467	MF-contactors for on-load switching
475/1	Prism-contacts (air-cooled)
502	cable (air- and water-cooled)
506	discharge- and dropping-resistors
507E	capacitor-contactor for on-load switching
549	contactors with NC-contacts for on-load switching
559	Prism-contacts for the electrode-position
560E	spare parts
600	pole-changing switches, with motor-drive (water-cooled)
615	NF and MF high-current circuit breaker for off-load switching (water-cooled)
617	NF and MF high-current circuit breaker for off-load switching (air-cooled)
624	contactors with NC-contacts off-load switching
625	DC-contactors with brake-contacts
641	Air-cooled-current-carrying leads