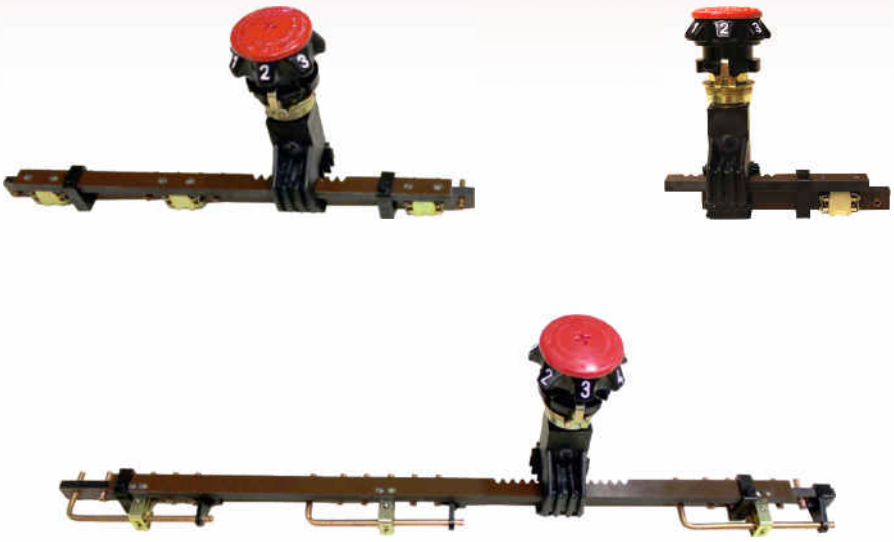
ELKOM®



tap changers
type EHR

GENERAL SPECIFICATION

These tap changers are available in one, two or three phase applications. Multi layer types are also available. The shaft length is fixed as 50, 70, 100 or 130mm. Driving mechanism can be either on the edge or in the middle of the phases.
Connection diagrams in page EHR 2 can be applied in any variation to all types.
Easy assembly and compact desing provides labor and cost savings.

ASSEMBLY

A notch is provided to mark each position. For operation, unscrew and release the notch by applying an axial pull on the control knob. Then turn the knob to the desired position. Engage the knob and screw the lock nut. This process is clearly marked on control knob as;

" I LIFT - II TURN - III SWITCH ON "
This description can be engraved in any language.

MATERIALS

Steel Parts: These parts can be stainless or mild steel. Mild steel parts are cadmium or zinc plated. Upon request galvanizing is also available.

Polyamide Parts : These parts are NYLON 66, superior mechanical properties against all acting forces, strong against UV lights.

Aluminum Parts : GAlSi12Cu

BrassParts : Cu ZN40Pb2 Ms 60 F34 DIN 17 673

Copper Parts : E - Cu F25 DIN 40500

Insulator Parts : Paper phenol - plastic resin based laminates, HP 2061.5 class of DIN 7735.

ON REQUEST

The aluminum parts can be protected by anodic oxidation.
The mild steel parts can be supplied in stainless steel.
The brass and copper parts can be tin, silver or cadmium plated.

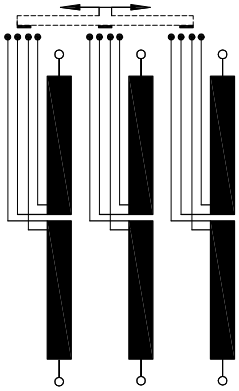
CURRENT

CURRENT	CONTACT INNER DIA. (For cable connection)
10 A	ø 2.1 mm.
30 A	ø 3.1 mm.
63 A	ø 5.1 mm.

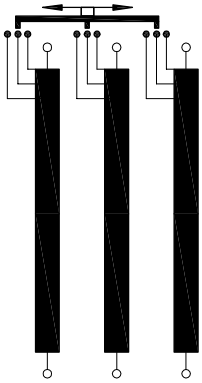
VOLTAGE CLASS

VOLTAGE CLASS	B. I. L.
15 kV	95 kV
20 kV	125 kV
30 kV	170 kV

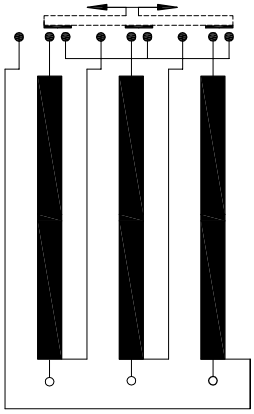
Other B. I. L. values are also available upon customer request.



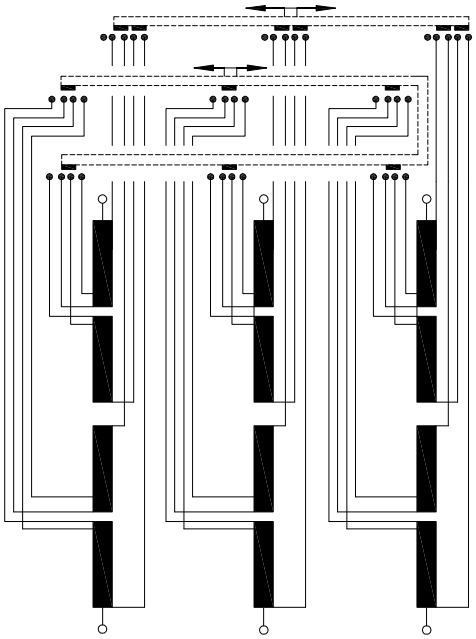
setting for delta transformer

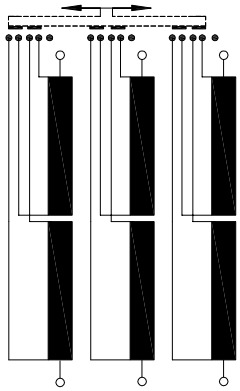


setting for star transformer



star - delta coupling

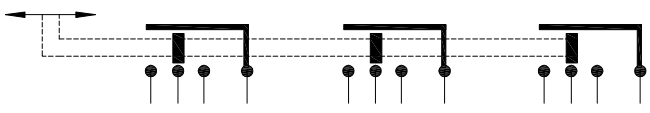




series - parallel coupling

Typical combination :

- 1 stage, series - parallel coupling
- 2 stages, delta diagram - setting ± 2,5% .

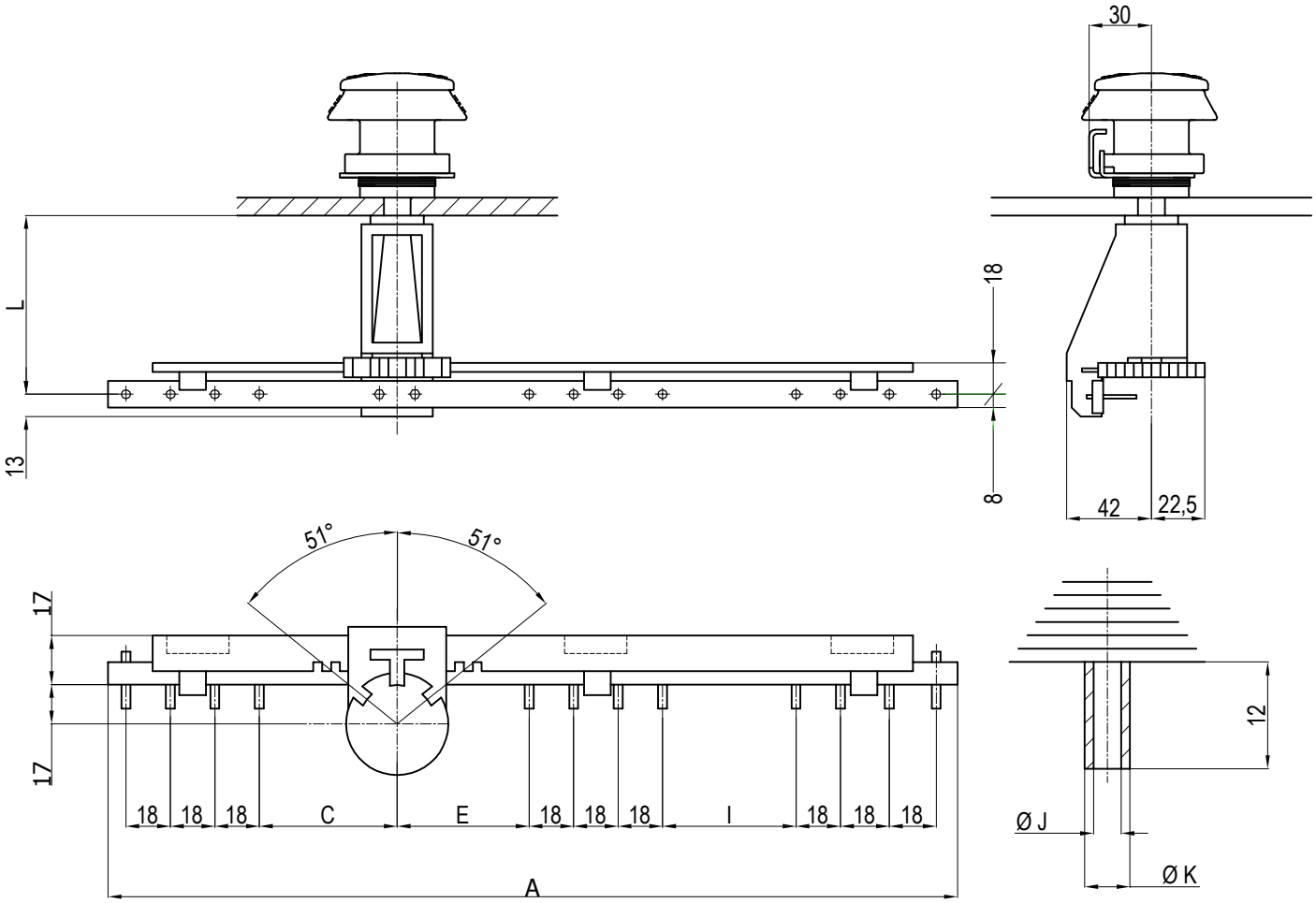


common output per phase

ELKOM®

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil
Delta diagram 20-30kV 30-63A 3-7 positions Setting 2.5 % per position



	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

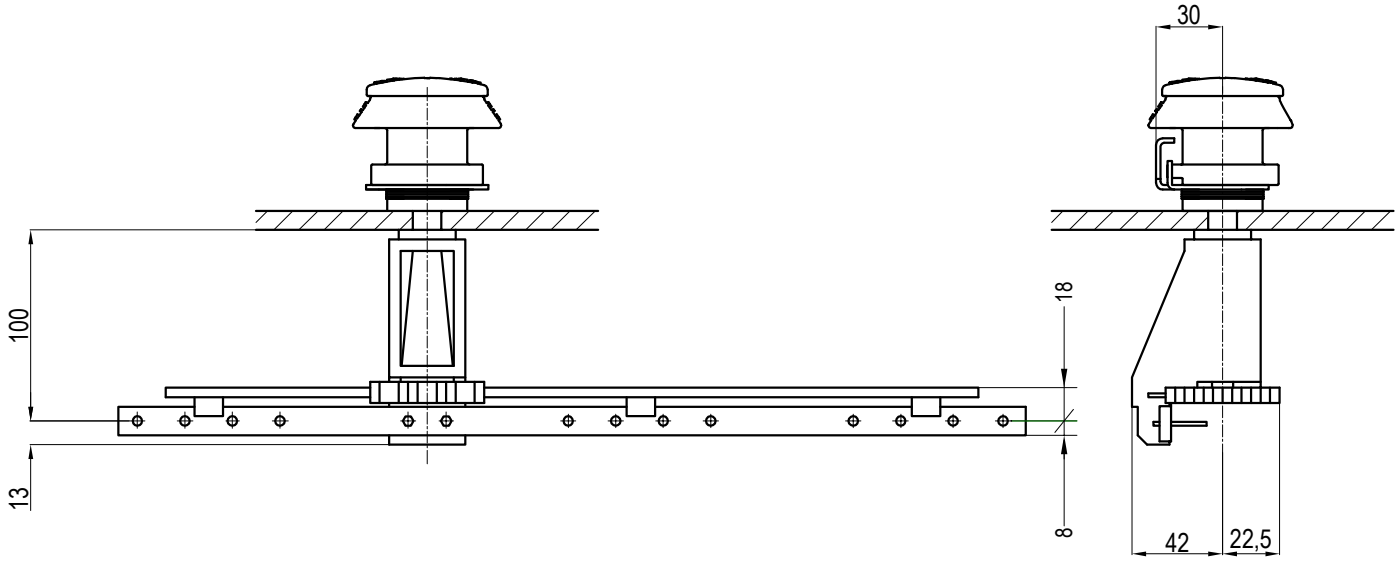
	20kV	30kV
C	55	80
E	55	80
I	55	80

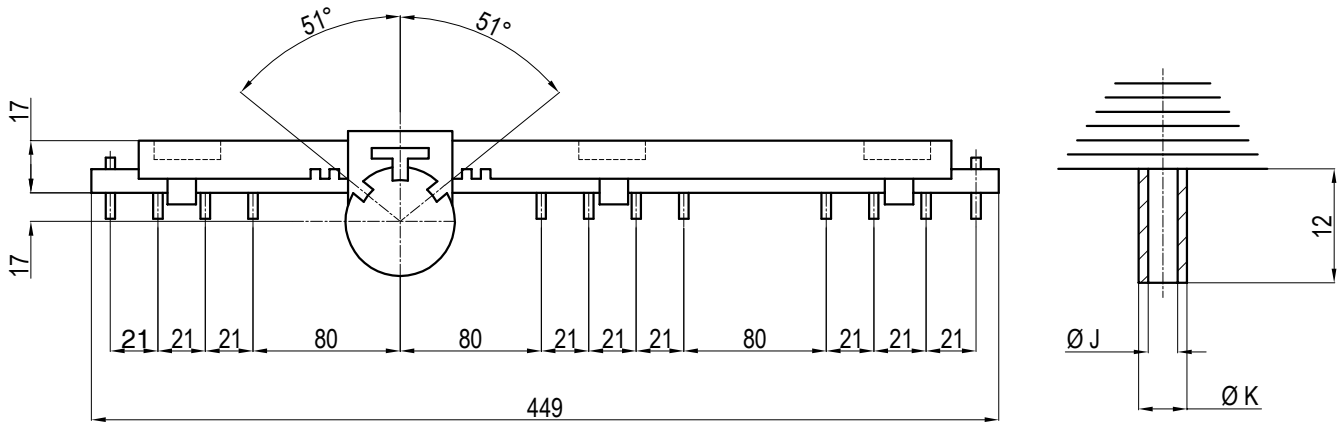
L	Number of Positions	20kV				30kV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.	A	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3	347	C13641D3	C13642D3	C13643D3	-	-	-	-
	4	401	C13641D4	C13642D4	C13643D4	-	-	-	-
	5	455	C13641D5	C13642D5	C13643D5	-	-	-	-
	6	509	C13641D6	C13642D6	C13643D6	-	-	-	-
	7	563	C13641D7	C13642D7	C13643D7	-	-	-	-
70	3	347	D13641D3	D13642D3	D13643D3	422	D13651D3	D13652D3	D13653D3
	4	401	D13641D4	D13642D4	D13643D4	476	D13651D4	D13652D4	D13653D4
	5	455	D13641D5	D13642D5	D13643D5	530	D13651D5	D13652D5	D13653D5
	6	509	D13641D6	D13642D6	D13643D6	584	D13651D6	D13652D6	D13653D6
	7	563	D13641D7	D13642D7	D13643D7	638	D13651D7	D13652D7	D13653D7
100	3	347	E13641D3	E13642D3	E13643D3	422	E13651D3	E13652D3	E13653D3
	4	401	E13641D4	E13642D4	E13643D4	476	E13651D4	E13652D4	E13653D4
	5	455	E13641D5	E13642D5	E13643D5	530	E13651D5	E13652D5	E13653D5
	6	509	E13641D6	E13642D6	E13643D6	584	E13651D6	E13652D6	E13653D6
	7	563	E13641D7	E13642D7	E13643D7	638	E13651D7	E13652D7	E13653D7
130	3	347	F13641D3	F13642D3	F13643D3	422	F13651D3	F13652D3	F13653D3
	4	401	F13641D4	F13642D4	F13643D4	476	F13651D4	F13652D4	F13653D4
	5	455	F13641D5	F13642D5	F13643D5	530	F13651D5	F13652D5	F13653D5
	6	509	F13641D6	F13642D6	F13643D6	584	F13651D6	F13652D6	F13653D6
	7	563	F13641D7	F13642D7	F13643D7	638	F13651D7	F13652D7	F13653D7

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil

Delta diagram 30kV 30-63A 3-7 positions (*) Setting 2.5 % per position





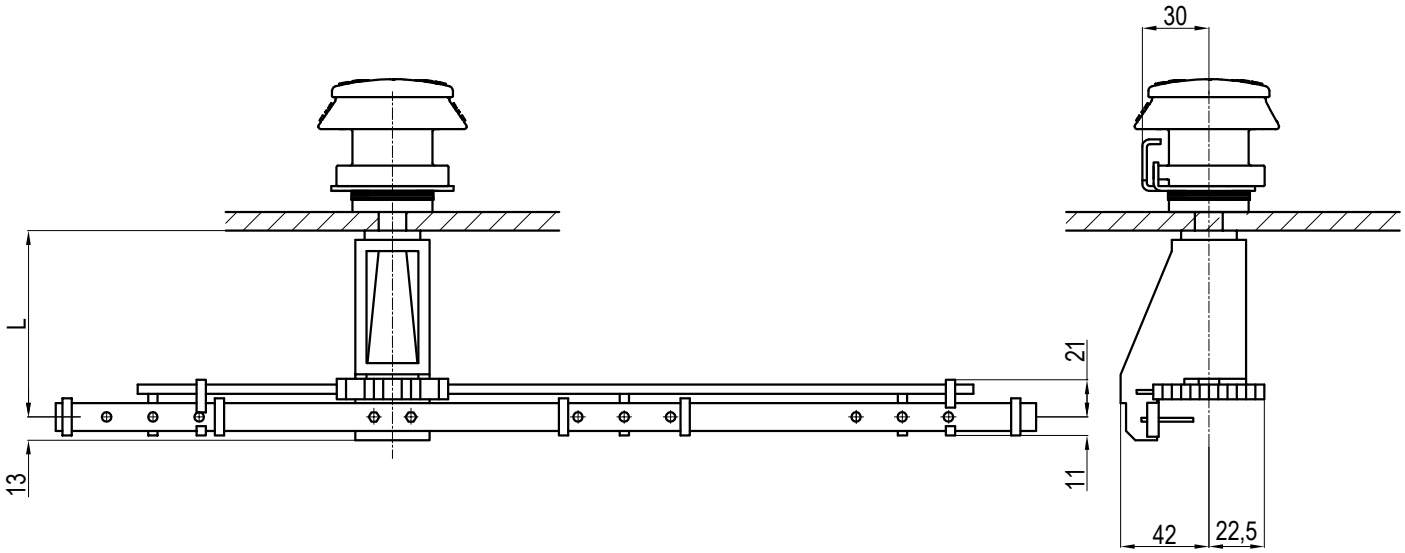
	30 A	63 A
J	3,1	5,1
K	5	7

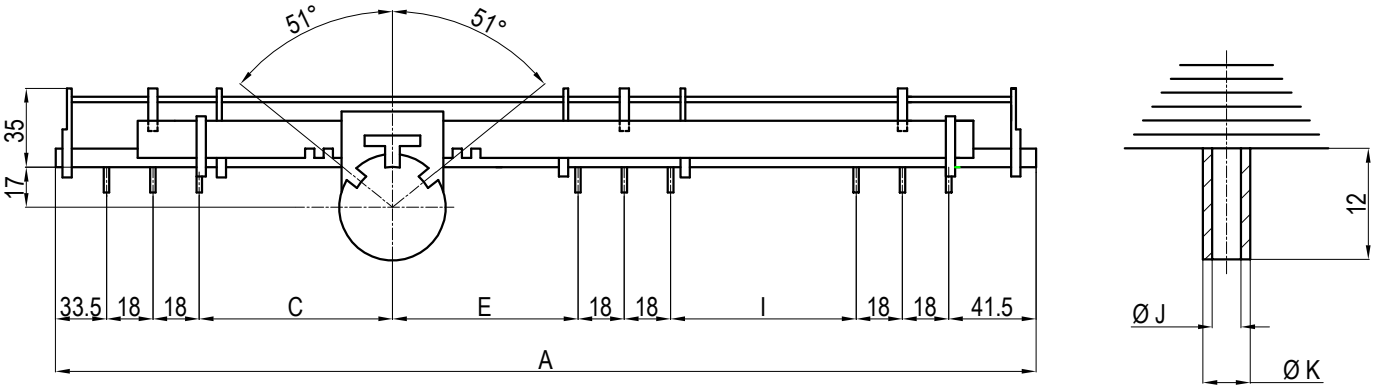
L	Number of Positions	30kV		
		A	30 A Unit No.	63 A Unit No.
100	3	449	E13652D3A	E13653D3A
	4	512	E13652D4A	E13653D4A
	5	575	E13652D5A	E13653D5A
	6	638	E13652D6A	E13653D6A
	7	701	E13652D7A	E13653D7A
130	3	449	F13652D3A	F13653D3A
	4	512	F13652D4A	F13653D4A
	5	575	F13652D5A	F13653D5A
	6	638	F13652D6A	F13653D6A
	7	701	F13652D7A	F13653D7A

(*) Special type with 21 distance between contacts for 30 kV.

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil
Star diagram 20-30kV 10-63A 3-7 positions Setting 2.5 % per position





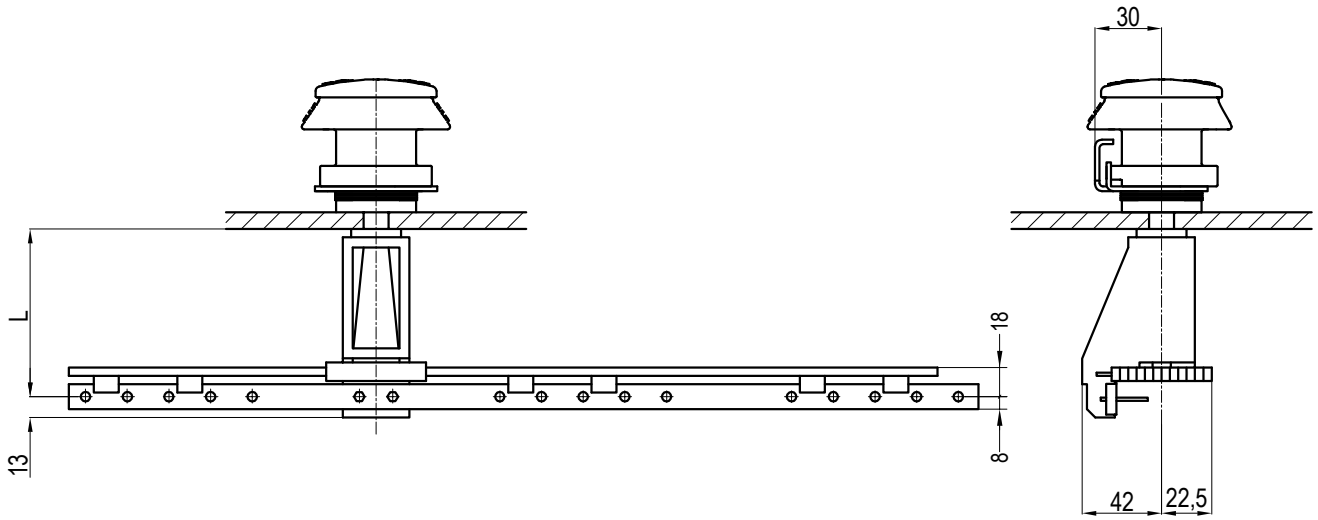
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

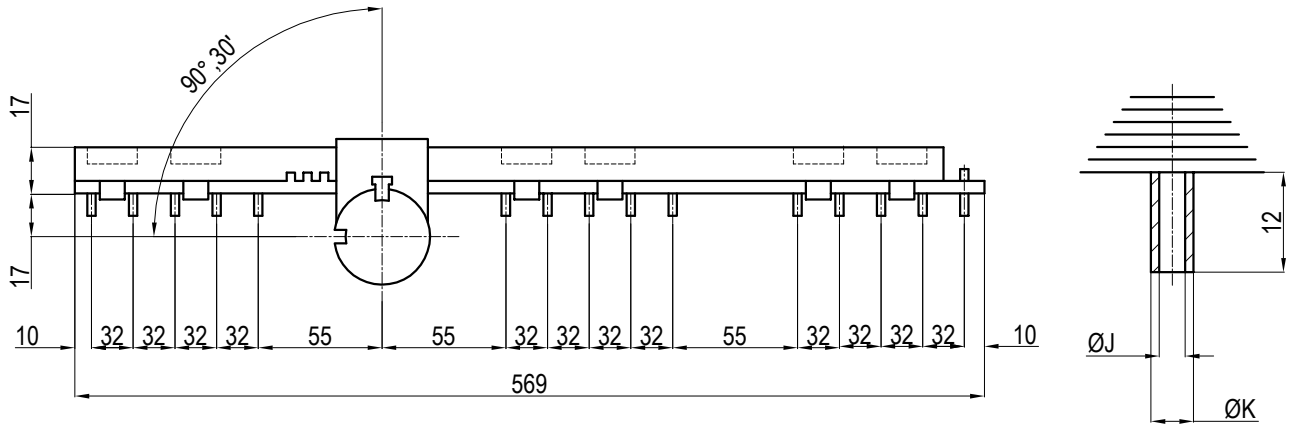
	20kV	30kV
C	55	91
E	55	91
I	55	91

L	Number of Positions	20kV				30kV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.	A	10 A Unit No.	30 A Unit No.	63 A Unit No.
70	3	347	D13641S3	D13642S3	D13643S3	455	D13651S3	D13652S3	D13653S3
	5	456	D13641S5	D13642S5	D13643S5	564	D13651S5	D13652S5	D13653S5
	7	564	D13641S7	D13642S7	D13643S7	672	D13651S7	D13652S7	D13653S7
100	3	347	E13641S3	E13642S3	E13643S3	455	E13651S3	E13652S3	E13653S3
	5	456	E13641S5	E13642S5	E13643S5	564	E13651S5	E13652S5	E13653S5
	7	564	E13641S7	E13642S7	E13643S7	672	E13651S7	E13652S7	E13653S7
130	3	347	F13641S3	F13642S3	F13643S3	455	F13651S3	F13652S3	F13653S3
	5	456	F13641S5	F13642S5	F13643S5	564	F13651S5	F13652S5	F13653S5
	7	564	F13641S7	F13642S7	F13643S7	672	F13651S7	F13652S7	F13653S7

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil
Series parallel coupling 15-20kV 30-63A





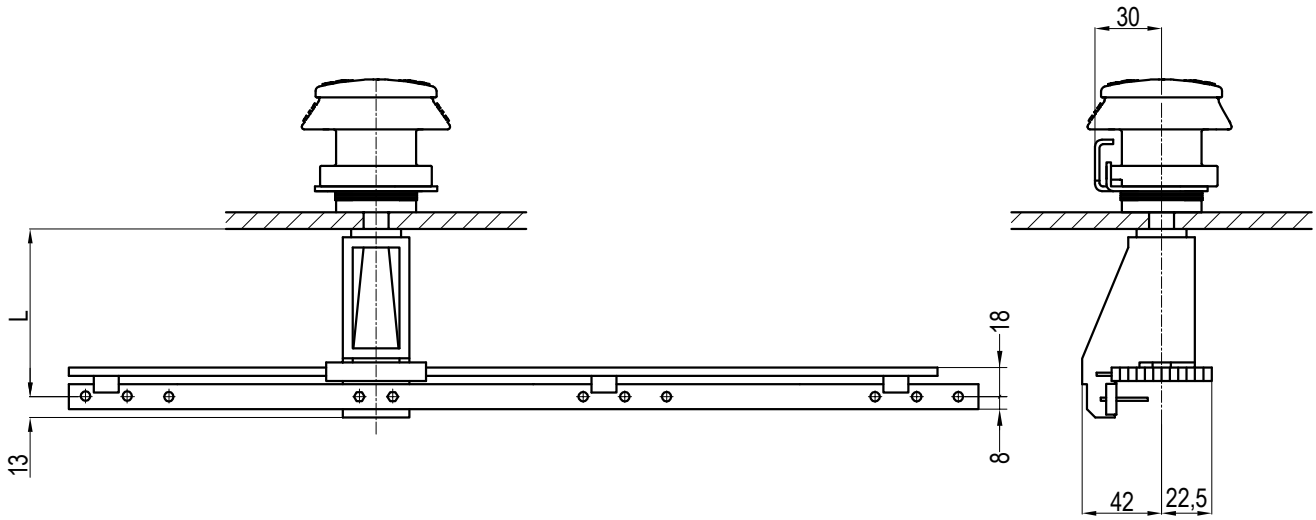
	30 A	63 A
J	3,1	5,1
K	5	7

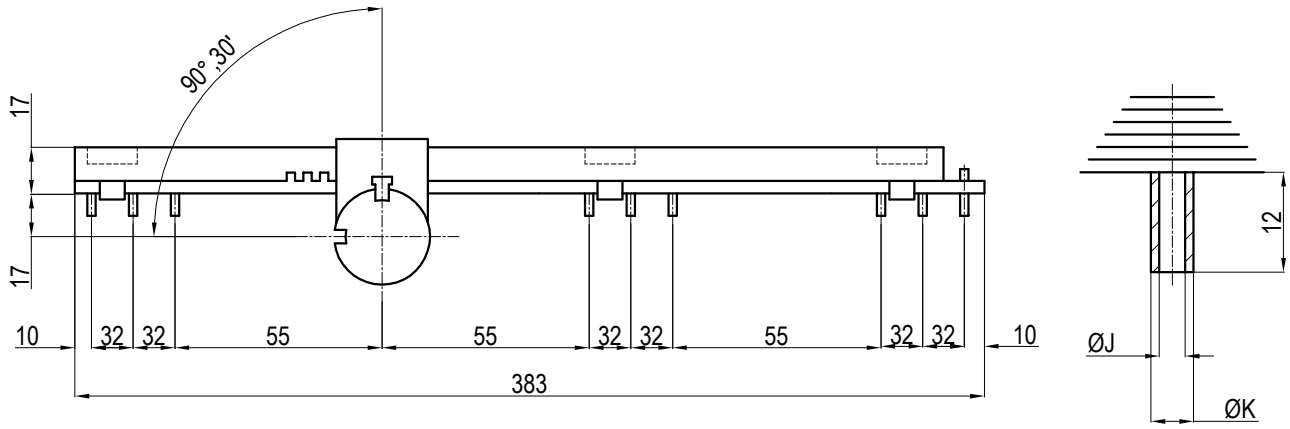
L	Number of Positions	30 A	63 A
		Unit No.	Unit No.
50	2	C13672P2	C13673P2
70	2	D13672P2	D13673P2
100	2	E13672P2	E13673P2
130	2	F13672P2	F13673P2

ELKOM®

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil
Star - Delta coupling 15-20kV 30-63A



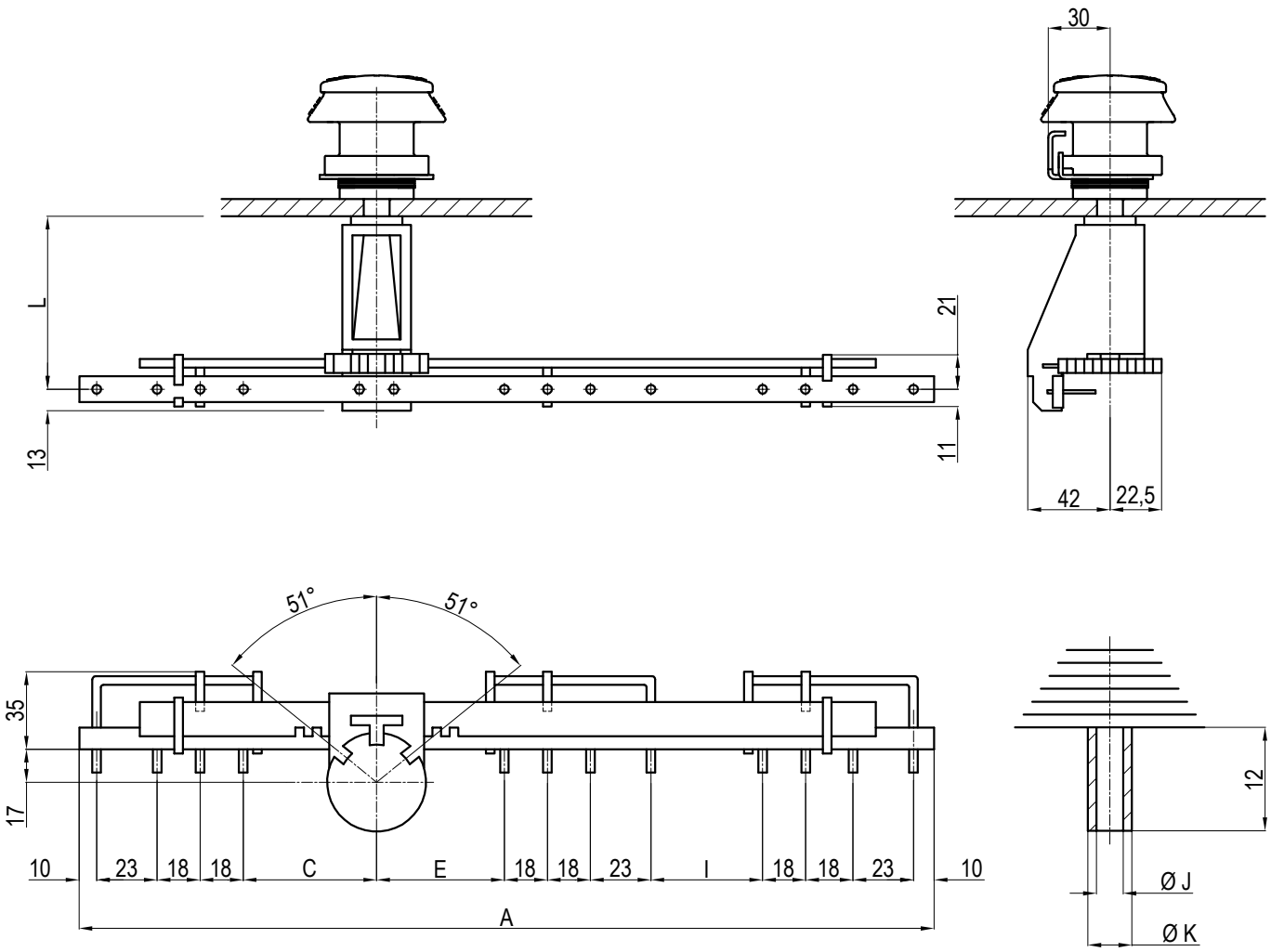


	30 A	63 A
J	3,1	5,1
K	5	7

L	Number of Positions	30 A	63 A
		Unit No.	Unit No.
50	2	C13672R2	C13673R2
70	2	D13672R2	D13673R2
100	2	E13672R2	E13673R2
130	2	F13672R2	F13673R2

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil or askarel Common output per phase
20-30kV 10-63A 3-7 positions. Setting 2.5 % per position



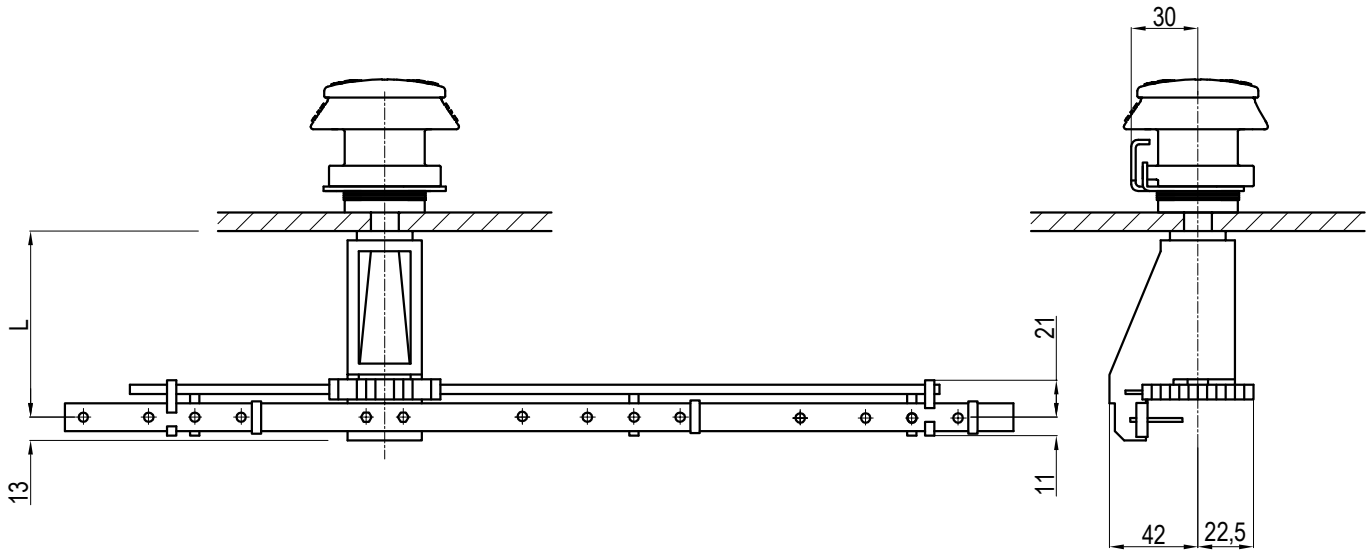
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

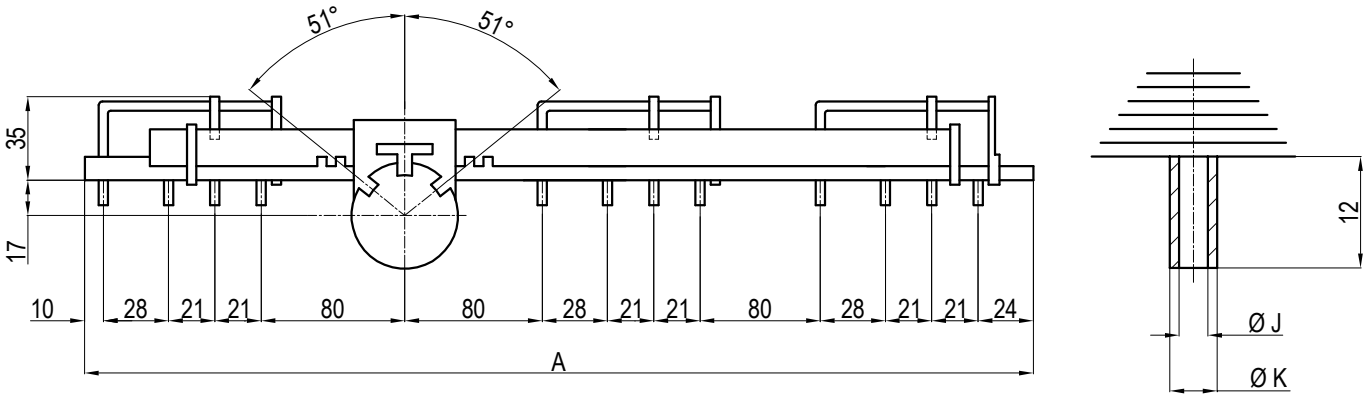
	20kV	30kV
C	65	90
E	65	90
I	65	90

L	Number of Positions	20kV				30kV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.	A	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3	392	C13641C3	C13642C3	C13643C3	467	-	-	-
	5	500	C13641C5	C13642C5	C13643C5	575	-	-	-
	7	608	C13641C7	C13642C7	C13643C7	683	-	-	-
70	3	392	D13641C3	D13642C3	D13643C3	467	D13651C3	D13652C3	D13653C3
	5	500	D13641C5	D13642C5	D13643C5	575	D13651C5	D13652C5	D13653C5
	7	608	D13641C7	D13642C7	D13643C7	683	D13651C7	D13652C7	D13653C7
100	3	392	E13641C3	E13642C3	E13643C3	467	E13651C3	E13652C3	E13653C3
	5	500	E13641C5	E13642C5	E13643C5	575	E13651C5	E13652C5	E13653C5
	7	608	E13641C7	E13642C7	E13643C7	683	E13651C7	E13652C7	E13653C7
130	3	392	F13641C3	F13642C3	F13643C3	467	F13651C3	F13652C3	F13653C3
	5	500	F13641C5	F13642C5	F13643C5	575	F13651C5	F13652C5	F13653C5
	7	608	F13641C7	F13642C7	F13643C7	683	F13651C7	F13652C7	F13653C7

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil or askarel Common output per phase
30kV 10-63A 3-7 positions. Setting 2.5 % per position



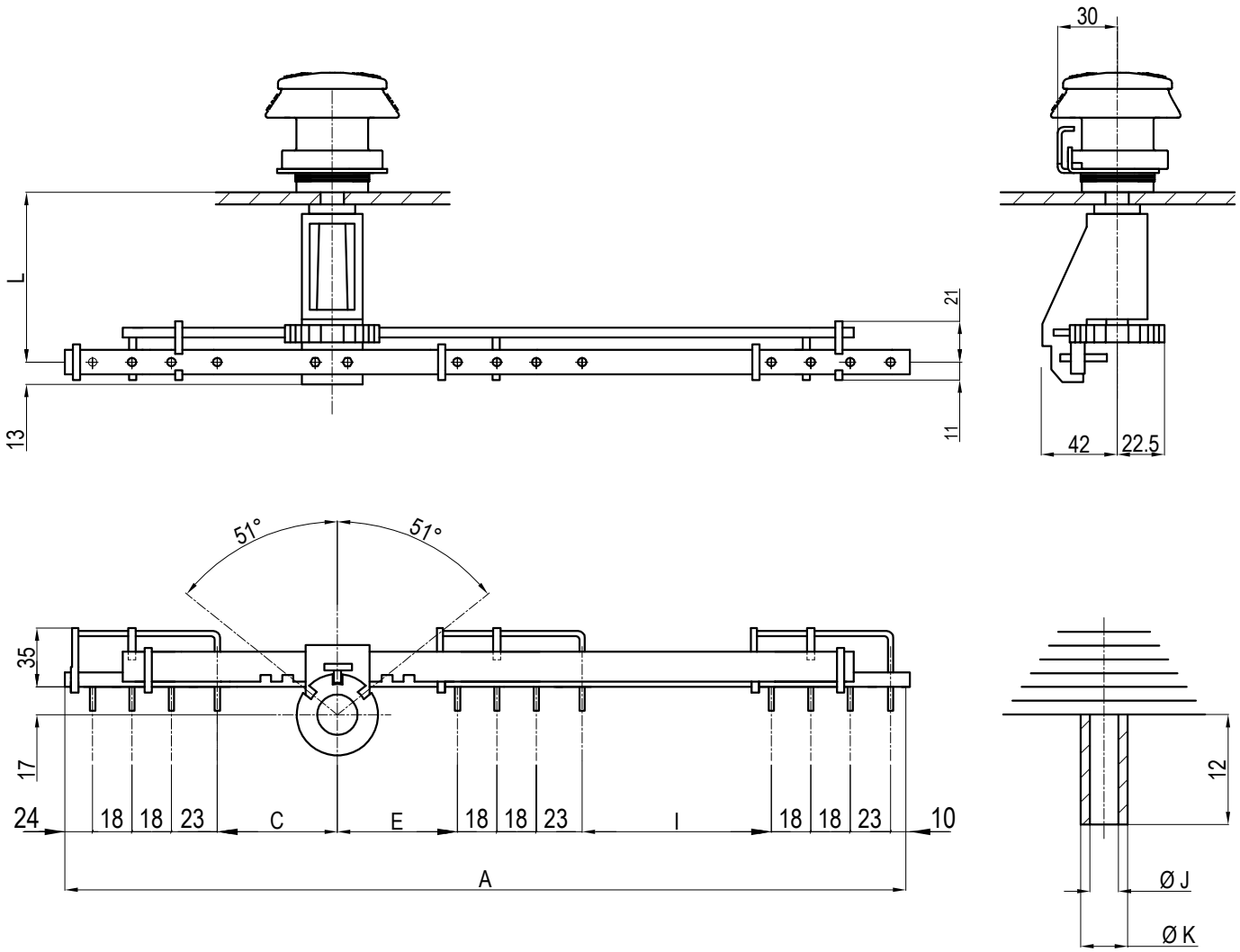


	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

L	Number of Positions	30KV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.
100	3	484	E13651C3A	E13652C3A	E13653C3A
	5	610	E13651C5A	E13652C5A	E13653C5A
	7	736	E13651C7A	E13652C7A	E13653C7A
130	3	484	F13651C3A	F13652C3A	F13653C3A
	5	610	F13651C5A	F13652C5A	F13653C5A
	7	736	F13651C7A	F13652C7A	F13653C7A

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil or askarel Common output per phase
20-30kV 10-63A 3-7 positions. Setting 2.5 % per position



	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

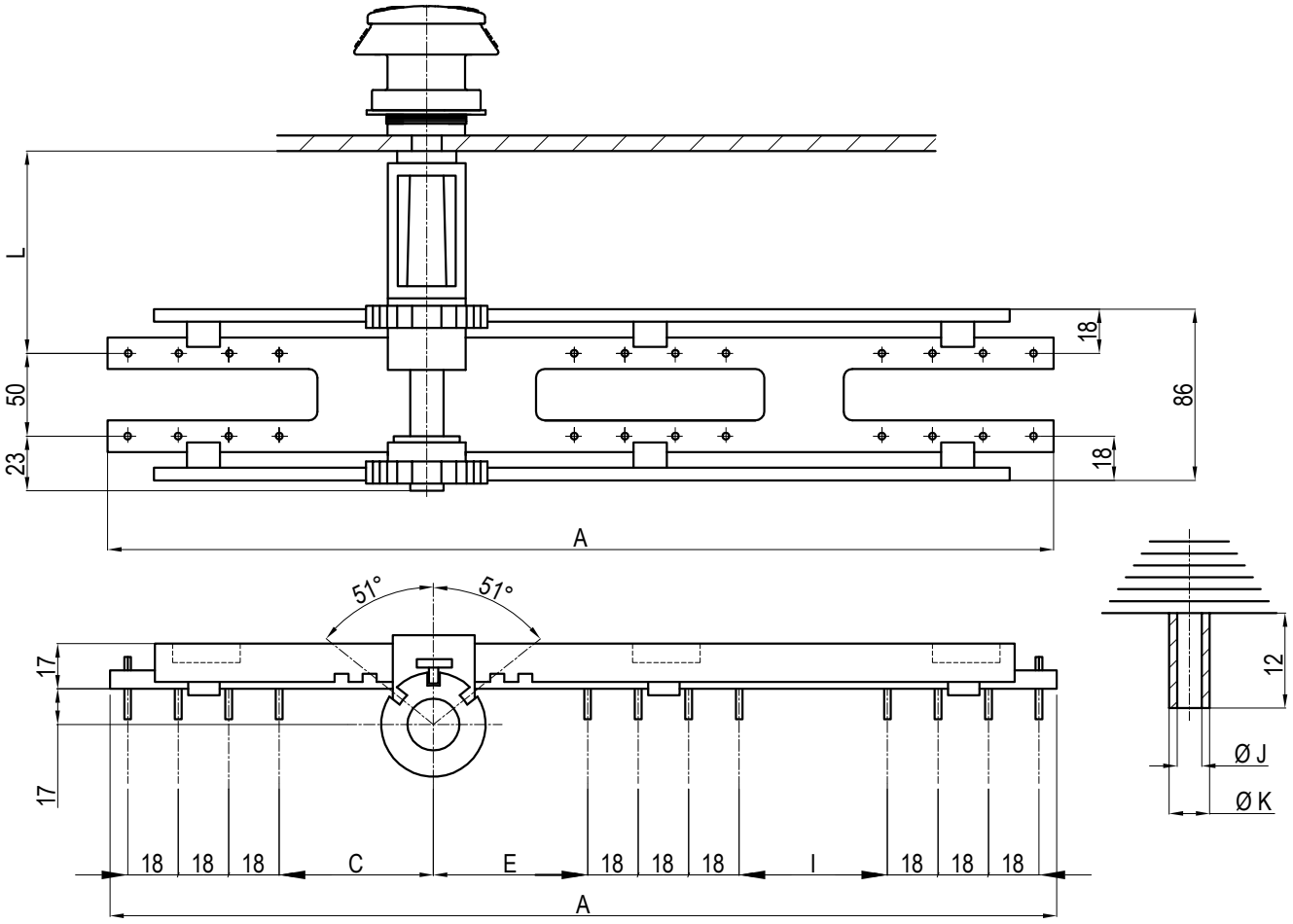
	20kV	30kV
C	71	90
E	71	90
I	142	142

L	Number of Positions	20kV				30kV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.	A	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3	495	C13641C3B	C13642C3B	C13643C3B	533	-	-	-
	5	603	C13641C5B	C13642C5B	C13643C5B	641	-	-	-
	7	711	C13641C7B	C13642C7B	C13643C7B	749	-	-	-
70	3	495	D13641C3B	D13642C3B	D13643C3B	533	D13651C3B	D13652C3B	D13653C3B
	5	603	D13641C5B	D13642C5B	D13643C5B	641	D13651C5B	D13652C5B	D13653C5B
	7	711	D13641C7B	D13642C7B	D13643C7B	749	D13651C7B	D13652C7B	D13653C7B
100	3	495	E13641C3B	E13642C3B	E13643C3B	533	E13651C3B	E13652C3B	E13653C3B
	5	603	E13641C5B	E13642C5B	E13643C5B	641	E13651C5B	E13652C5B	E13653C5B
	7	711	E13641C7B	E13642C7B	E13643C7B	749	E13651C7B	E13652C7B	E13653C7B
130	3	495	F13641C3B	F13642C3B	F13643C3B	533	F13651C3B	F13652C3B	F13653C3B
	5	603	F13641C5B	F13642C5B	F13643C5B	641	F13651C5B	F13652C5B	F13653C5B
	7	711	F13641C7B	F13642C7B	F13643C7B	749	F13651C7B	F13652C7B	F13653C7B

ELKOM®

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil or askarel Two Stages - Delta diagram
20-30kV 10-63A 3-7 positions. Setting 2.5 % per position



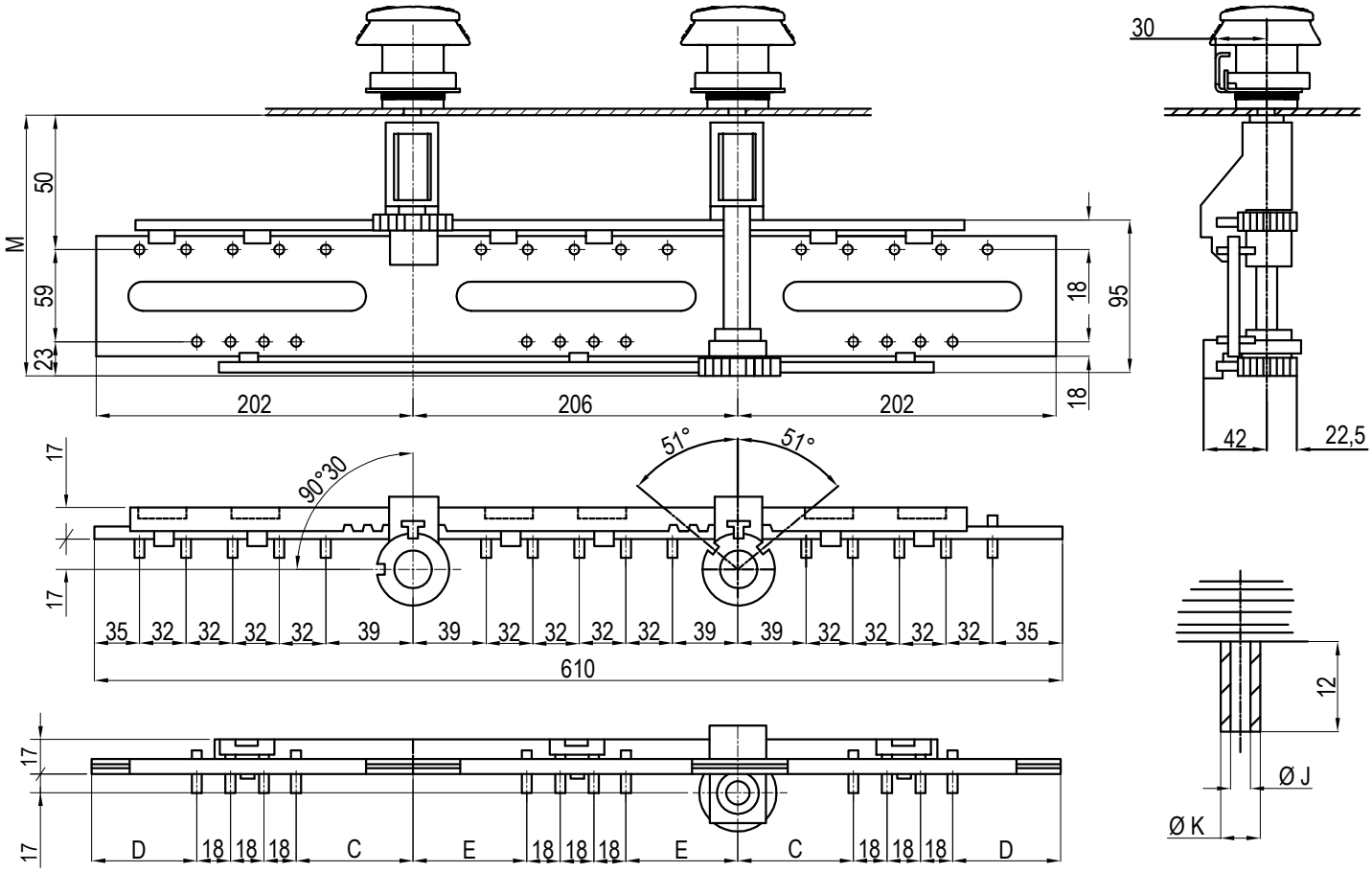
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

	20kV	30kV
C	55	80
E	55	80
I	55	80

L	Number of Positions	20kV				30kV			
		A	10 A Unit No.	30 A Unit No.	63 A Unit No.	A	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3	358	C14641D3	C14642D3	C14643D3	-	-	-	-
	4	412	C14641D4	C14642D4	C14643D4	-	-	-	-
	5	466	C14641D5	C14642D5	C14643D5	-	-	-	-
	6	520	C14641D6	C14642D6	C14643D6	-	-	-	-
	7	574	C14641D7	C14642D7	C14643D7	-	-	-	-
70	3	358	D14641D3	D14642D3	D14643D3	433	D14651D3	D14652D3	D14653D3
	4	412	D14641D4	D14642D4	D14643D4	487	D14651D4	D14652D4	D14653D4
	5	466	D14641D5	D14642D5	D14643D5	541	D14651D5	D14652D5	D14653D5
	6	520	D14641D6	D14642D6	D14643D6	595	D14651D6	D14652D6	D14653D6
	7	574	D14641D7	D14642D7	D14643D7	649	D14651D7	D14652D7	D14653D7
100	3	358	E14641D3	E14642D3	E14643D3	433	E14651D3	E14652D3	E14653D3
	4	412	E14641D4	E14642D4	E14643D4	487	E14651D4	E14652D4	E14653D4
	5	466	E14641D5	E14642D5	E14643D5	541	E14651D5	E14652D5	E14653D5
	6	520	E14641D6	E14642D6	E14643D6	595	E14651D6	E14652D6	E14653D6
	7	574	E14641D7	E14642D7	E14643D7	649	E14651D7	E14652D7	E14653D7
130	3	358	F14641D3	F14642D3	F14643D3	433	F14651D3	F14652D3	F14653D3
	4	412	F14641D4	F14642D4	F14643D4	487	F14651D4	F14652D4	F14653D4
	5	466	F14641D5	F14642D5	F14643D5	541	F14651D5	F14652D5	F14653D5
	6	520	F14641D6	F14642D6	F14643D6	595	F14651D6	F14652D6	F14653D6
	7	574	F14641D7	F14642D7	F14643D7	649	F14651D7	F14652D7	F14653D7

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil 1. Stage series parallel coupling 15-20kV 30-63A
1. Stage delta diagram 20kV 30-63A 3-7 positions. Setting 2.5 % per position



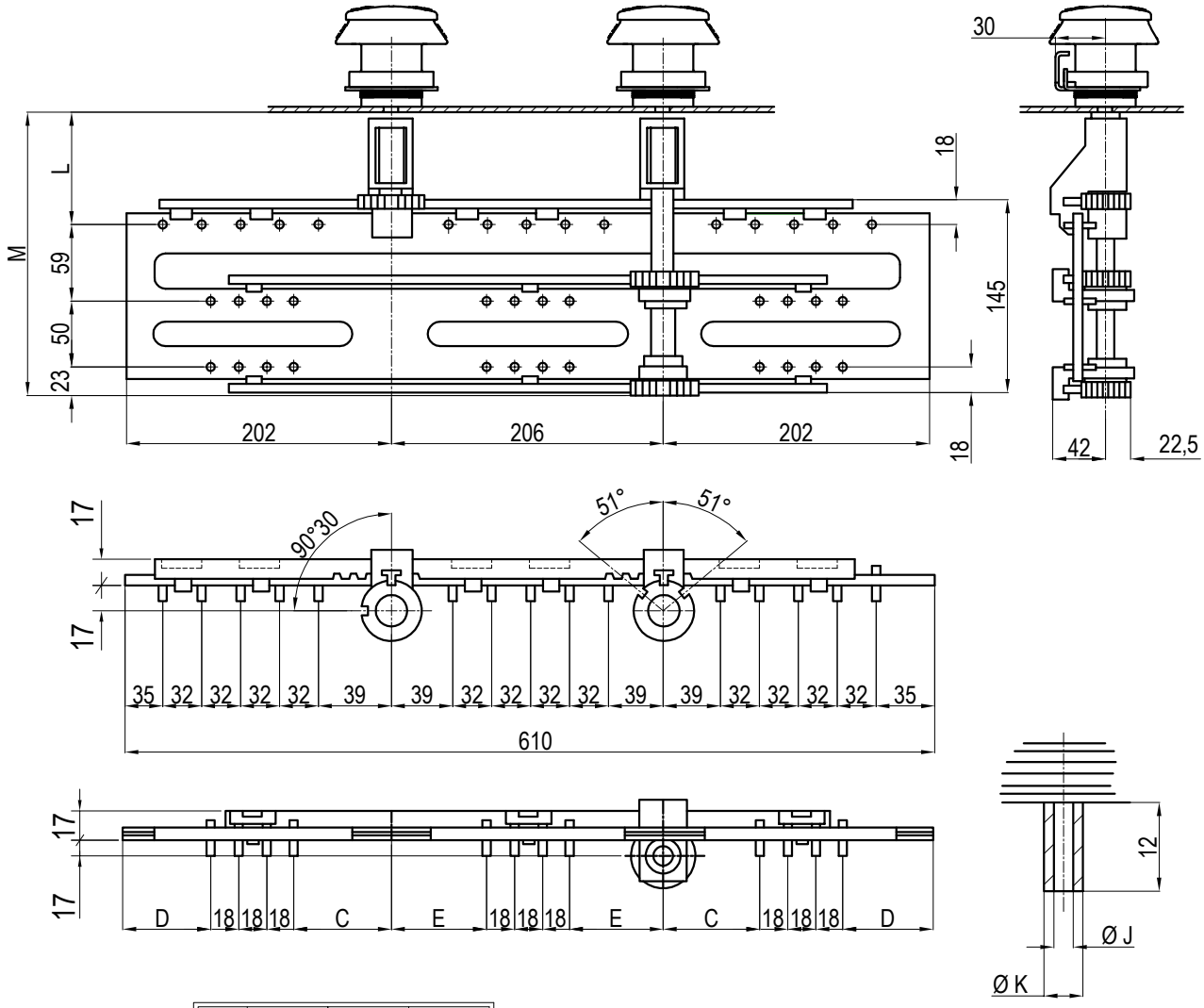
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

L	Number of Positions	20kV			
		M	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3 4 5 6 7	132	C14671H3 C14671H4 C14671H5 C14671H6 C14671H7	C14672H3 C14672H4 C14672H5 C14672H6 C14672H7	C14673H3 C14673H4 C14673H5 C14673H6 C14673H7
70	3 4 5 6 7	152	D14671H3 D14671H4 D14671H5 D14671H6 D14671H7	D14672H3 D14672H4 D14672H5 D14672H6 D14672H7	D14673H3 D14673H4 D14673H5 D14673H6 D14673H7
100	3 4 5 6 7	182	E14671H3 E14671H4 E14671H5 E14671H6 E14671H7	E14672H3 E14672H4 E14672H5 E14672H6 E14672H7	E14673H3 E14673H4 E14673H5 E14673H6 E14673H7
130	3 4 5 6 7	212	F14671H3 F14671H4 F14671H5 F14671H6 F14671H7	F14672H3 F14672H4 F14672H5 F14672H6 F14672H7	F14673H3 F14673H4 F14673H5 F14673H6 F14673H7

Number of Positions	C	D	E
3	73	75	76
5	55	57	58
7	37	39	40

TYPE EHR THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil 1. Stage series parallel coupling 15-20kV 30-63A
2. Stage delta diagram 20-30kV 30-63A 3-7 positions. Setting 2.5 % per position

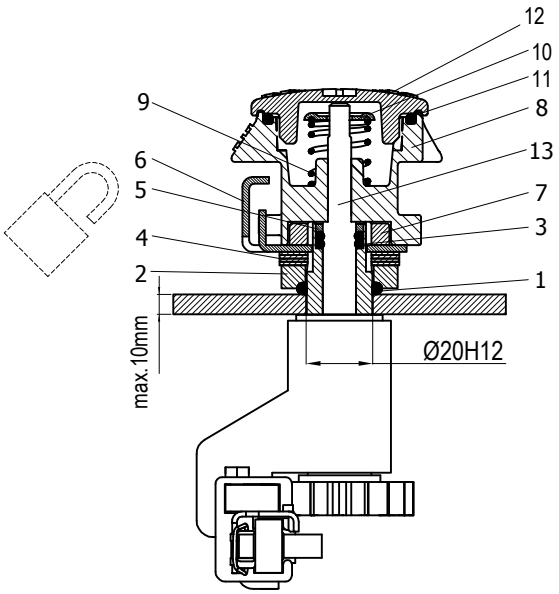


	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

L	Number of Positions	20kV			
		M	10 A Unit No.	30 A Unit No.	63 A Unit No.
50	3 4 5 6 7	182	C15671K3 C15671K4 C15671K5 C15671K6 C15671K7	C15672K3 C15672K4 C15672K5 C15672K6 C15672K7	C15673K3 C15673K4 C15673K5 C15673K6 C15673K7
70	3 4 5 6 7	202	D15671K3 D15671K4 D15671K5 D15671K6 D15671K7	D15672K3 D15672K4 D15672K5 D15672K6 D15672K7	D15673K3 D15673K4 D15673K5 D15673K6 D15673K7
100	3 4 5 6 7	232	E15671K3 E15671K4 E15671K5 E15671K6 E15671K7	E15672K3 E15672K4 E15672K5 E15672K6 E15672K7	E15673K3 E15673K4 E15673K5 E15673K6 E15673K7
130	3 4 5 6 7	262	F15671K3 F15671K4 F15671K5 F15671K6 F15671K7	F15672K3 F15672K4 F15672K5 F15672K6 F15672K7	F15673K3 F15673K4 F15673K5 F15673K6 F15673K7

Number of Positions	C	D	E
3	73	75	76
5	55	57	58
7	37	39	40

Assembly according to the order given below as numbers



Assembly Order:

1- O-ring 18.54x3.53
2- O-ring Sleeve
3- O-ring 9.13x2.62
4- WASHER 13.9x10.2x3.5
5- Positions Stopper
7- Fixing Nut
8- Control Device Body (Nylon-6)
9- Spring
10- Control Device Lid
11- O-ring
12- Control Device Cover
13- Shaft

Notes:

For the assembly of the tap changer, the thickness of the transformer cover sheet is assumed to be 10mm. If the sheet thickness is lower than 10mm then use the additional spacer washer (4) so that the resulting thickness is to be 10mm. For example, if the cover sheet thickness is 6mm then 4 washers are to be used, for the 10mm thick cover sheet no washer is needed.

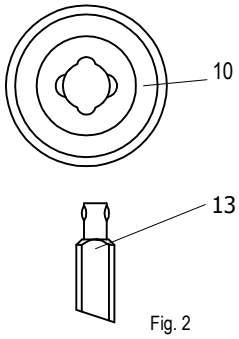
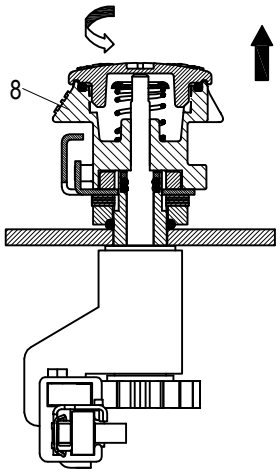


Fig. 2

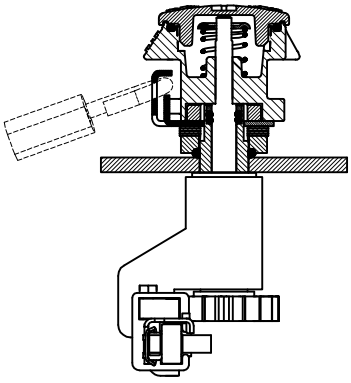
Lid Assembly

The notched end of the shaft (13) is to be fitted into the slot inside the lid. Press the lid onto the shaft, turn it 90° and release.The lid will be locked automatically. To dismantle the lid, apply the assembly operation in reverse order.

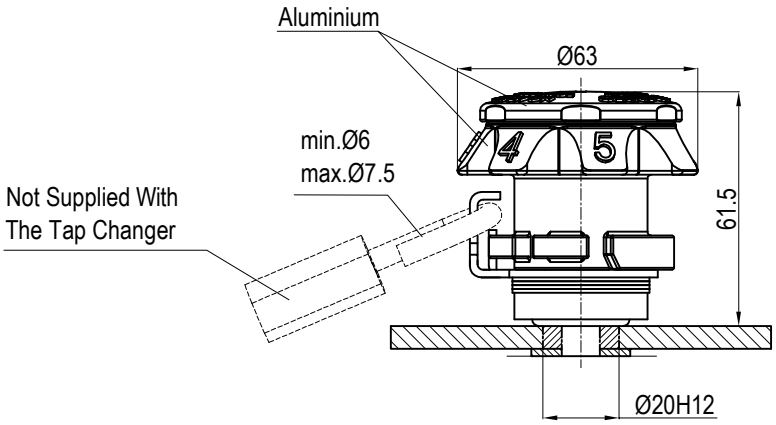


Position Changing Mode

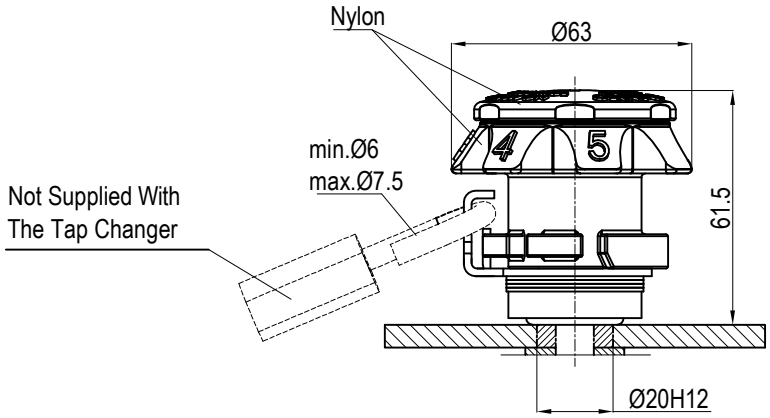
In order to change the position of the tap changer, pull the control device body (8) along the direction of the arrow, turn it to the desired position notch and release. The spring system will automatically lock the position via position stopper and position notch an the body.



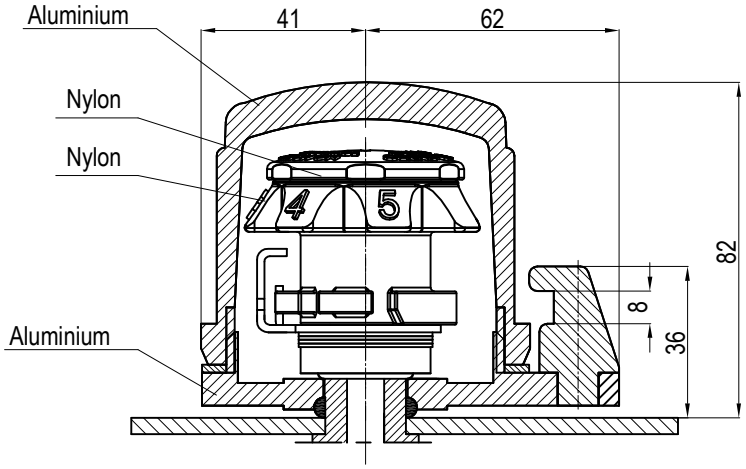
Normal Rest Mode



Code No: 44338

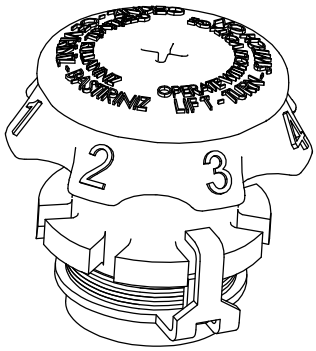


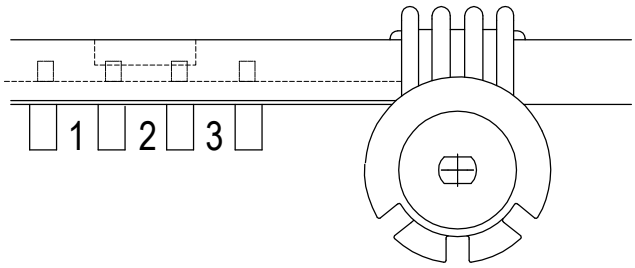
Code No: 44339



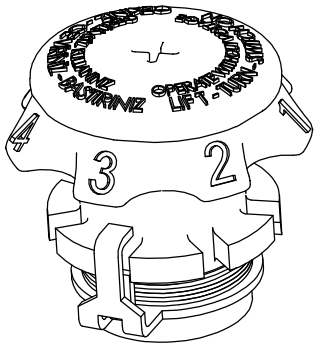
Code No: 44336P
With Protective Cover
Standart Type

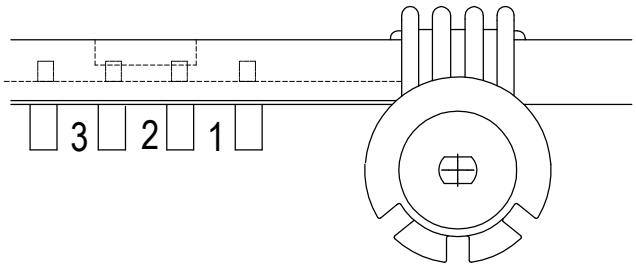
A1





B1





WHEN ORDERING PLEASE QUOTE:

1 - Tap changer unit no.
2 - The voltage class current and type of setting or coupling.
3 - Control device no.
4 - The language on the control device.
5 - Number of positions.
6 - The indication of the repeater disc (A1, B1, C1, D1)
7 - Dimensions of the fixed contacts (J and K)
8 - L, e, X, W dimensions from the tables.

For special setups not shown in the catalogue plaese consult us.

ELKOM®

ELKOM SDN. BHD. (271815-D)
GST NO: 002102853632

Lot PT 32696, Kawasan Perindustrian Sungai Purun, Jalan Bangi Lama Batu 1 1/2,
43500 Semenyih, Selangor Darul Ehsan, Malaysia
Tel : +6-03-8727 1488, 8727 1489 Fax : +6-03-8727 1487
Email : elkom@elkom.com.my, info@elkom.com.my Website : www.elkom.com.my

CERTIFICATE No. KLR 0404000