



Type	PDR
Voltage (kV)	20 - 30
Current (A)	10 - 30 - 63
Number of positions	2.....7
Connection	Delta, Star, Series-parallel, Common output per phase

Type	PDF II
Voltage (kV)	20 - 30 - 60
Current (A)	150 - 400
Number of positions	2.....11
Connection	Delta, Star, Series-parallel, Common output per phase

Type	PDZ
Voltage (kV)	20 - 30
Current (A)	30 - 63 - 120
Number of positions	2.....11
Connection	Delta, Star, Series-parallel

Type	PDF III
Voltage (kV)	20 - 30
Current (A)	400 - 800
Number of positions	2.....6
Connection	Delta, Star, Series-parallel, Common output per phase

Type	PDM
Voltage (kV)	10 - 15 - 20 - 30
Current (A)	30 - 63 - 120
Number of positions	2.....7
Connection	Delta, Star, Series-parallel



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 130 mm.
Driving mechanism can be either on the edge or in the middle of the phases.
Connection diagrams in page PDR 2 can be applied in any variation to all types.
Easy assembly and compact design 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 : GAISI12Cu

Brass Parts : CuZn40Pb2 Ms 60 F34 DIN 17673

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.

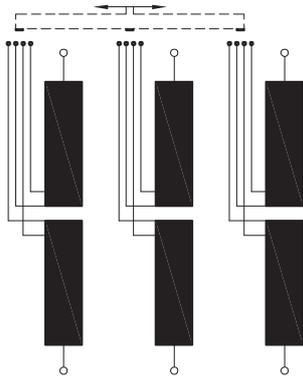
CURRENT

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

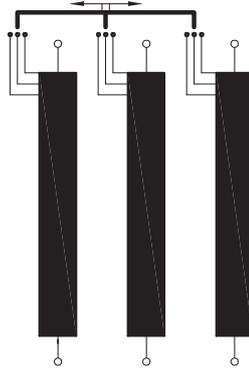
VOLTAGE CLASS

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

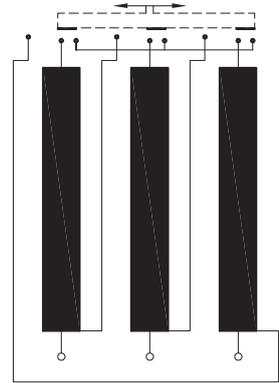
Other B.I.L. values are also available upon customer request.



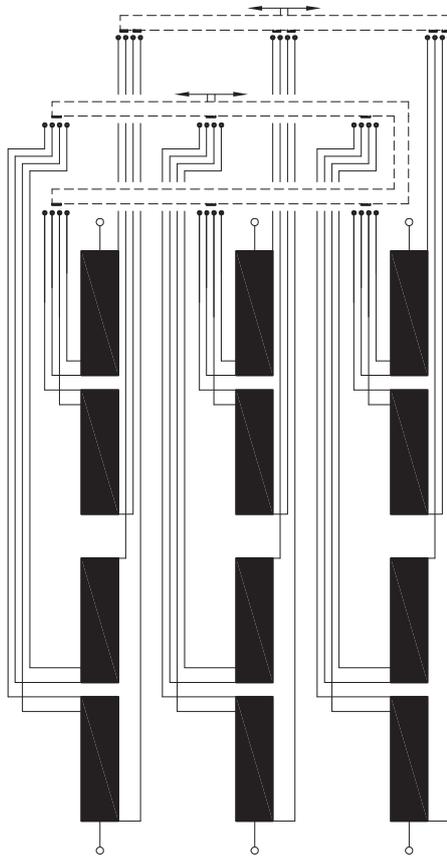
Setting for delta transformer



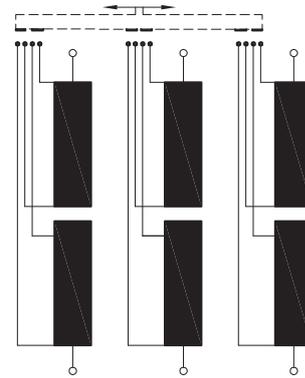
Setting for star transformer



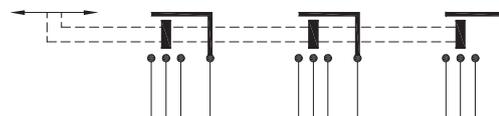
Star -delta coupling



Typical combination :
- 1 stage, series - parallel coupling
- 2 stage, delta diagram - setting $\pm 2,5\%$.



Series - parallel coupling

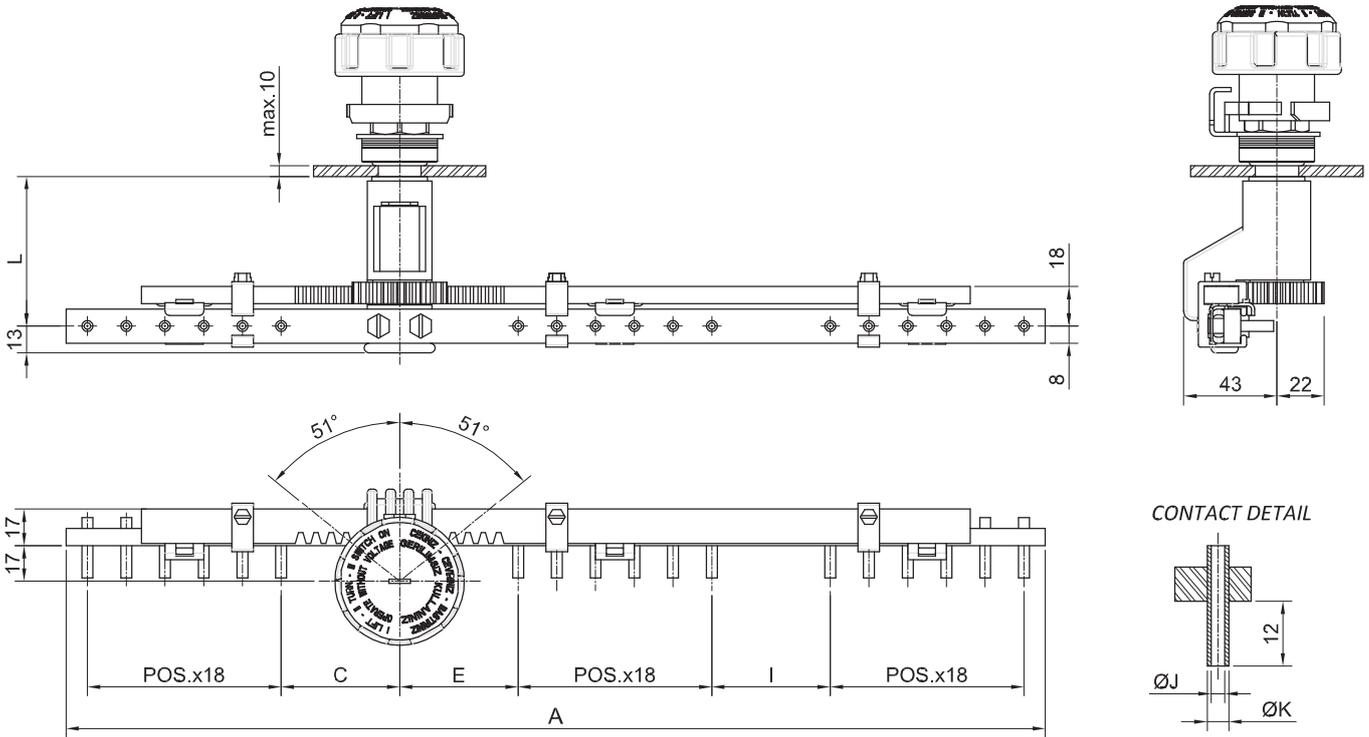


Common output per phase



TYPE PDR THREEPHASE TAP CHANGER

Off- circuit operation can be used in oil
Delta diagram 20-30kV 30-63A 3-7 positions



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

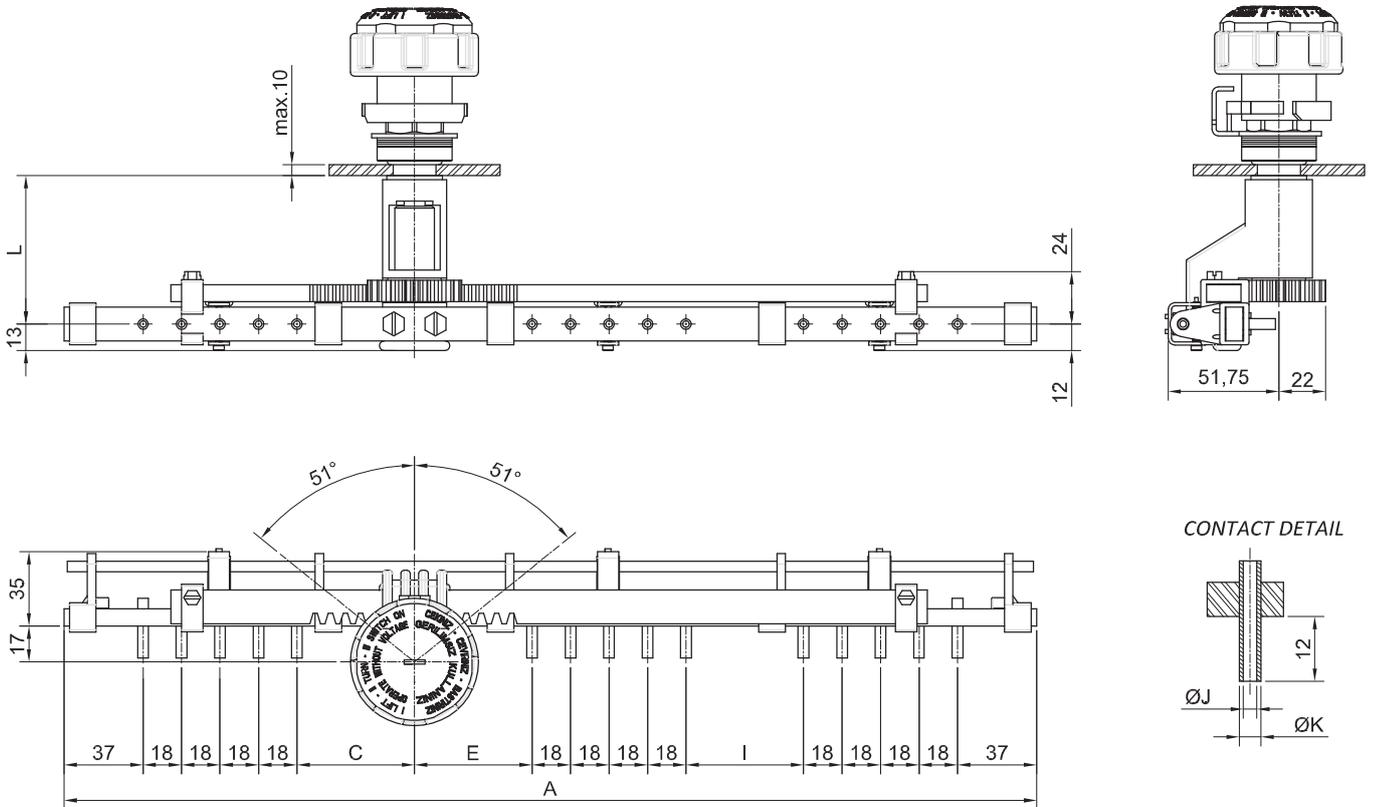
	20kV	30kV
C	55	80
E	55	80
I	55	80

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	TCR32A31	TCR32B31	TCR32C31	-	-	-	-
	4	401	TCR32A41	TCR32B41	TCR32C41	-	-	-	-
	5	455	TCR32A51	TCR32B51	TCR32C51	-	-	-	-
	6	509	TCR32A61	TCR32B61	TCR32C61	-	-	-	-
	7	563	TCR32A71	TCR32B71	TCR32C71	-	-	-	-
70	3	347	TCR32A32	TCR32B32	TCR32C32	422	TCR33A32	TCR33B32	TCR33C32
	4	401	TCR32A42	TCR32B42	TCR32C42	476	TCR33A42	TCR33B42	TCR33C42
	5	455	TCR32A52	TCR32B52	TCR32C52	530	TCR33A52	TCR33B52	TCR33C52
	6	509	TCR32A62	TCR32B62	TCR32C62	584	TCR33A62	TCR33B62	TCR33C62
	7	563	TCR32A72	TCR32B72	TCR32C72	638	TCR33A72	TCR33B72	TCR33C72
100	3	347	TCR32A33	TCR32B33	TCR32C33	422	TCR33A33	TCR33B33	TCR33C33
	4	401	TCR32A43	TCR32B43	TCR32C43	476	TCR33A43	TCR33B43	TCR33C43
	5	455	TCR32A53	TCR32B53	TCR32C53	530	TCR33A53	TCR33B53	TCR33C53
	6	509	TCR32A63	TCR32B63	TCR32C63	584	TCR33A63	TCR33B63	TCR33C63
	7	563	TCR32A73	TCR32B73	TCR32C73	638	TCR33A73	TCR33B73	TCR33C73
130	3	347	TCR32A34	TCR32B34	TCR32C34	422	TCR33A34	TCR33B34	TCR33C34
	4	401	TCR32A44	TCR32B44	TCR32C44	476	TCR33A44	TCR33B44	TCR33C44
	5	455	TCR32A54	TCR32B54	TCR32C54	530	TCR33A54	TCR33B54	TCR33C54
	6	509	TCR32A64	TCR32B64	TCR32C64	584	TCR33A64	TCR33B64	TCR33C64
	7	563	TCR32A74	TCR32B74	TCR32C74	638	TCR33A74	TCR33B74	TCR33C74



TYPE PDR THREEPHASE TAP CHANGER

Off- circuit operation can be used in oil
Star diagram 20-30kV 30-63A 3-7 positions



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

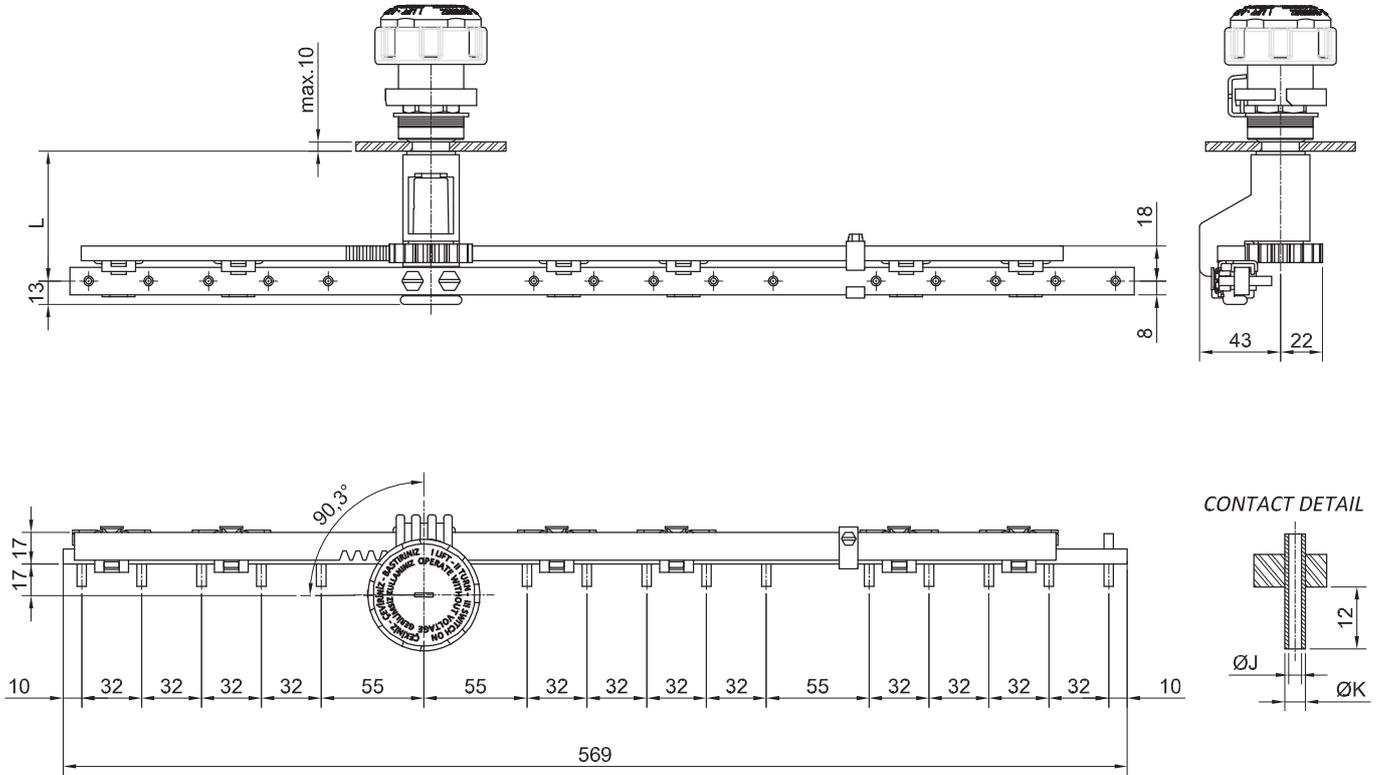
	20kV	30kV
C	55	91
E	55	91
I	55	91

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	TCR72A32	TCR72B32	TCR72C32	455	TCR73A32	TCR73B32	TCR73C32
	5	456	TCR72A52	TCR72B52	TCR72C52	564	TCR73A52	TCR73B52	TCR73C52
	7	564	TCR72A72	TCR72B72	TCR72C72	672	TCR73A72	TCR73B72	TCR73C72
100	3	347	TCR72A33	TCR72B33	TCR72C33	455	TCR73A33	TCR73B33	TCR73C33
	5	456	TCR72A53	TCR72B53	TCR72C53	564	TCR73A53	TCR73B53	TCR73C53
	7	564	TCR72A73	TCR72B73	TCR72C73	672	TCR73A73	TCR73B73	TCR73C73
130	3	347	TCR72A34	TCR72B34	TCR72C34	455	TCR73A34	TCR73B34	TCR73C34
	5	456	TCR72A54	TCR72B54	TCR72C54	564	TCR73A54	TCR73B54	TCR73C54
	7	564	TCR72A74	TCR72B74	TCR72C74	672	TCR73A74	TCR73B74	TCR73C74



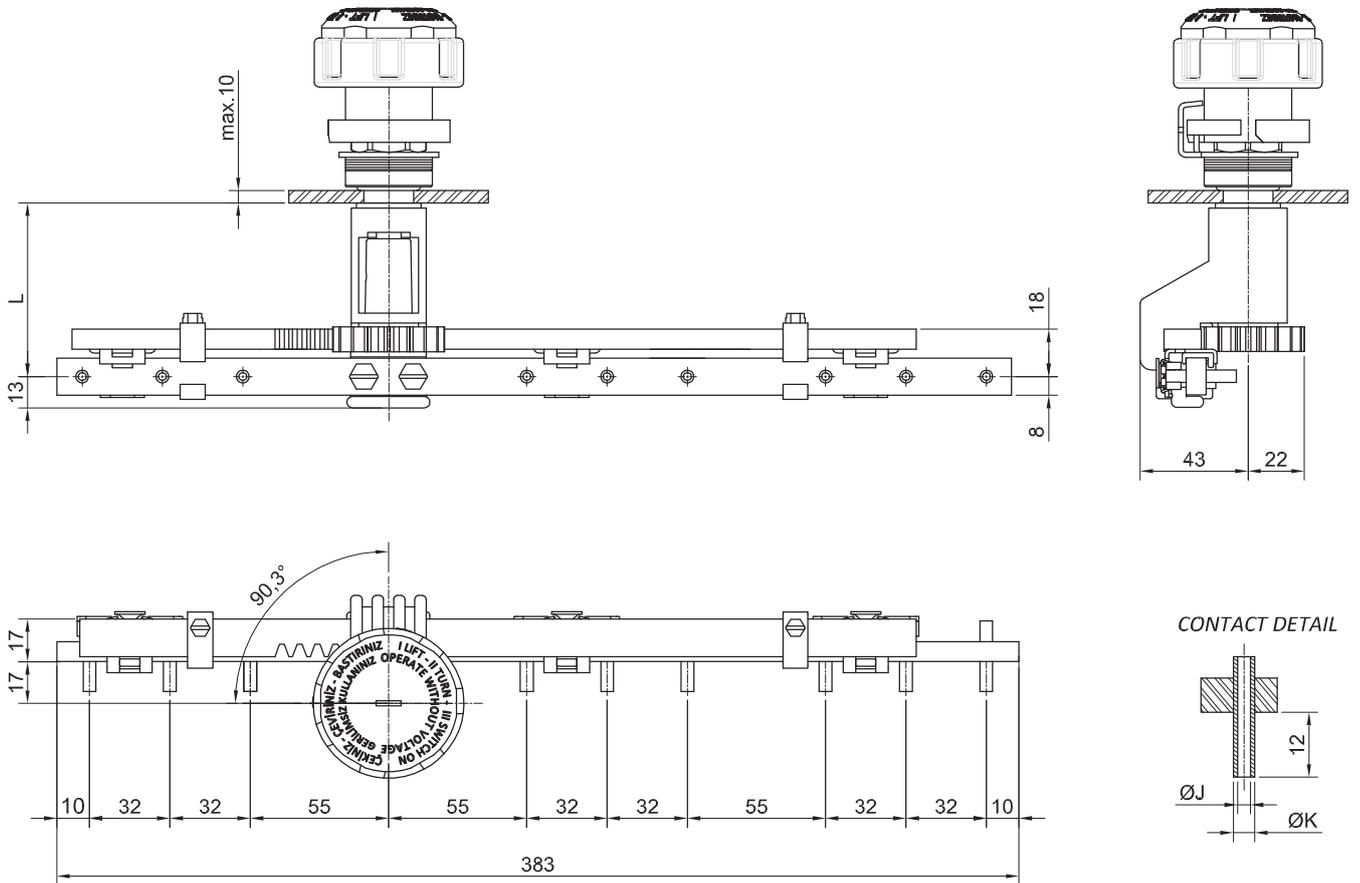
TYPE PDR THREEPHASE TAP CHANGER

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



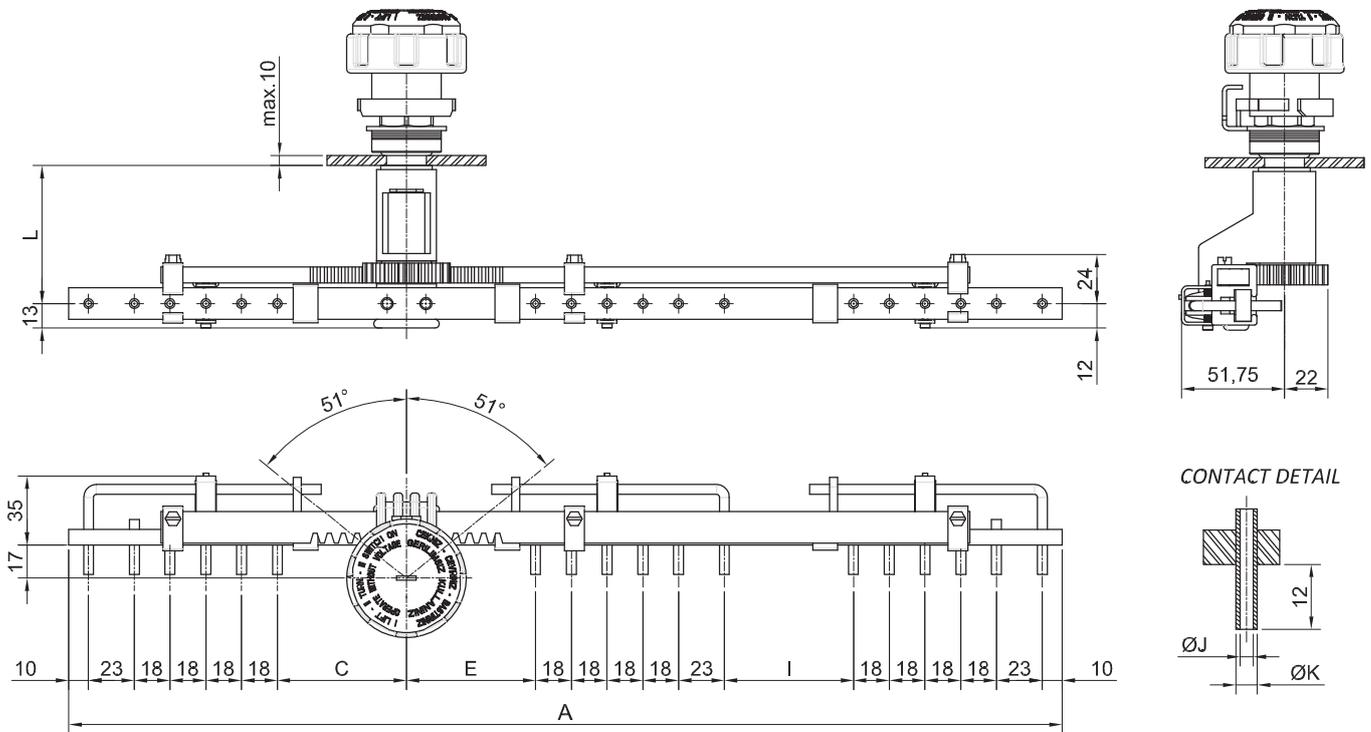
	30 A	63 A
J	3,1	5,1
K	5	7

L	Number of Positions	30 A	63 A
		Unit No.	Unit No.
50	2	TCR62B21	TCR62C21
70	2	TCR62B22	TCR62C22
100	2	TCR62B23	TCR62C23
130	2	TCR62B24	TCR62C24



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

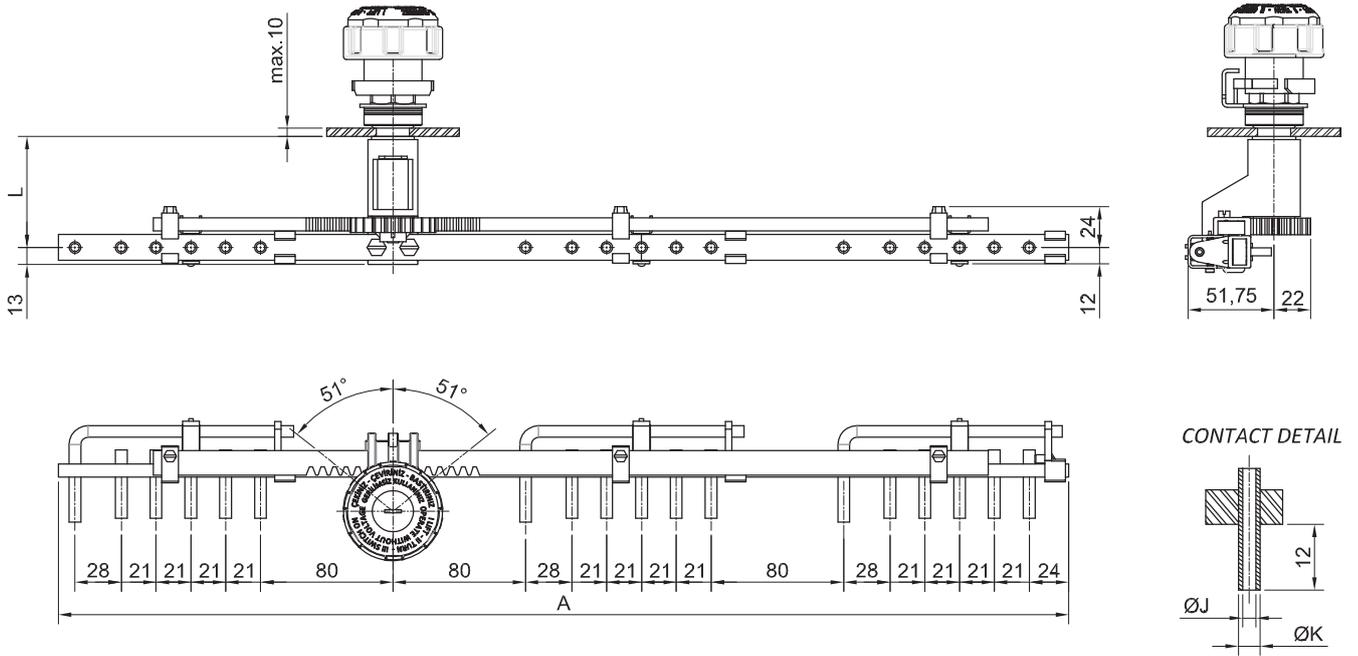
L	Number of Positions	30 A	63 A
		Unit No.	Unit No.
50	2	TCR52B21	TCR52C21
70	2	TCR52B22	TCR52C22
100	2	TCR52B23	TCR52C23
130	2	TCR52B24	TCR52C24



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

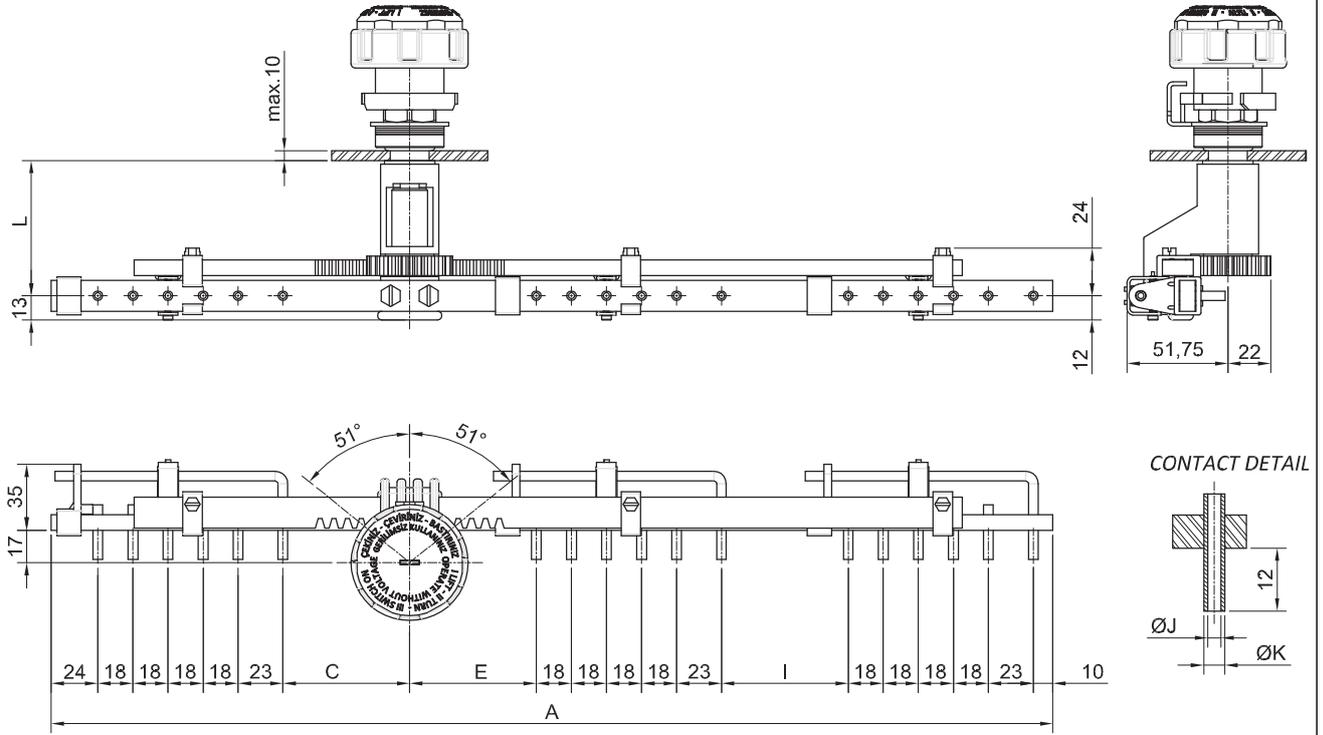
	20kV	30kV
C	65	90
E	65	90
I	65	90

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	TCR42A31-C	TCR42B31-C	TCR42C31-C	-	-	-	-
	5	500	TCR42A51-C	TCR42B51-C	TCR42C51-C	-	-	-	-
	7	608	TCR42A71-C	TCR42B71-C	TCR42C71-C	-	-	-	-
70	3	392	TCR42A32-C	TCR42B32-C	TCR42C32-C	467	TCR43A32-C	TCR43B32-C	TCR43C32-C
	5	500	TCR42A52-C	TCR42B52-C	TCR42C52-C	575	TCR43A52-C	TCR43B52-C	TCR43C52-C
	7	608	TCR42A72-C	TCR42B72-C	TCR42C72-C	683	TCR43A72-C	TCR43B72-C	TCR43C72-C
100	3	392	TCR42A33-C	TCR42B33-C	TCR42C33-C	467	TCR43A33-C	TCR43B33-C	TCR43C33-C
	5	500	TCR42A53-C	TCR42B53-C	TCR42C53-C	575	TCR43A53-C	TCR43B53-C	TCR43C53-C
	7	608	TCR42A73-C	TCR42B73-C	TCR42C73-C	683	TCR43A73-C	TCR43B73-C	TCR43C73-C
130	3	392	TCR42A33-C	TCR42B33-C	TCR42C33-C	467	TCR43A33-C	TCR43B33-C	TCR43C33-C
	5	500	TCR42A53-C	TCR42B53-C	TCR42C53-C	575	TCR43A53-C	TCR43B53-C	TCR43C53-C
	7	608	TCR42A73-C	TCR42B73-C	TCR42C73-C	683	TCR43A73-C	TCR43B73-C	TCR43C73-C



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

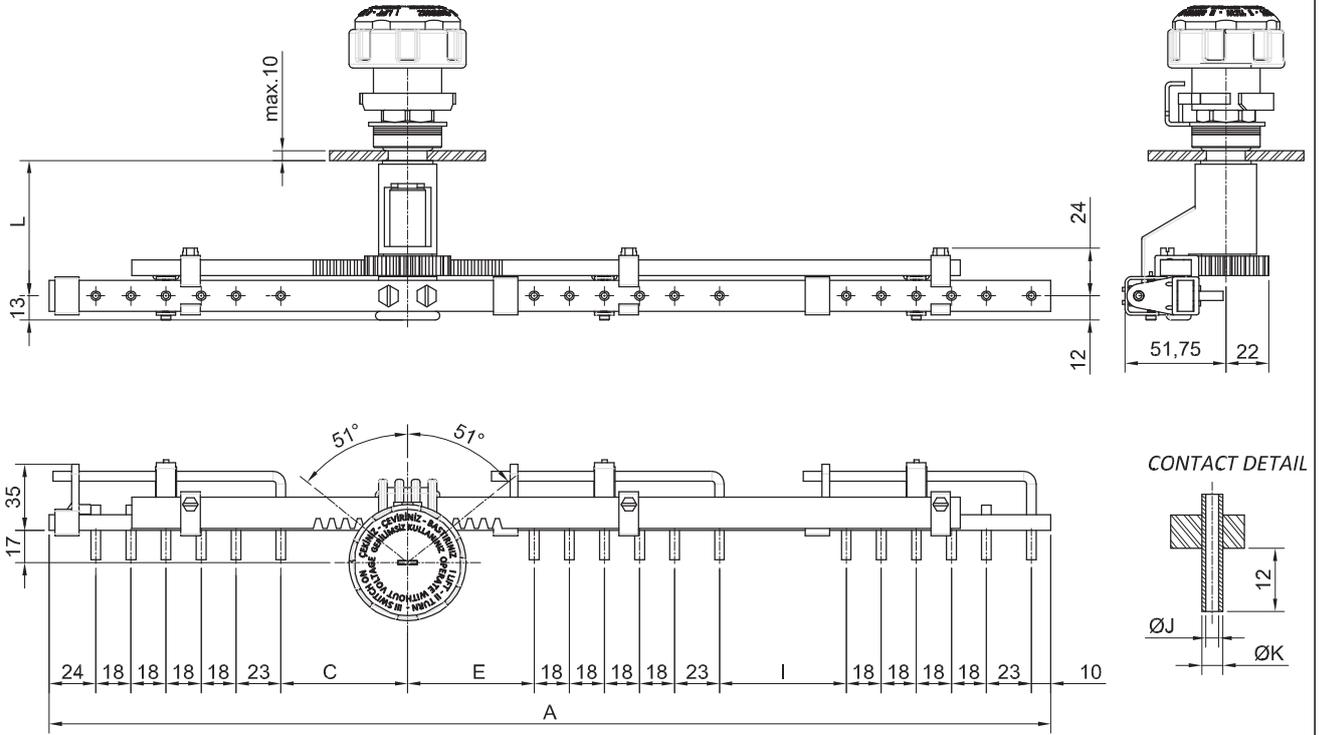
L	Number of Positions	30kV			
		A	10 A Unit No	30 A Unit No	63 A Unit No
100	3	484	TCR43A33B	TCR43B33B	TCR43C33B
	5	610	TCR43A53B	TCR43B53B	TCR43C53B
	7	736	TCR43A73B	TCR43B73B	TCR43C73B
130	3	484	TCR43A34B	TCR43B34B	TCR43C34B
	5	610	TCR43A54B	TCR43B54B	TCR43C54B
	7	736	TCR43A74B	TCR43B74B	TCR43C74B



	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

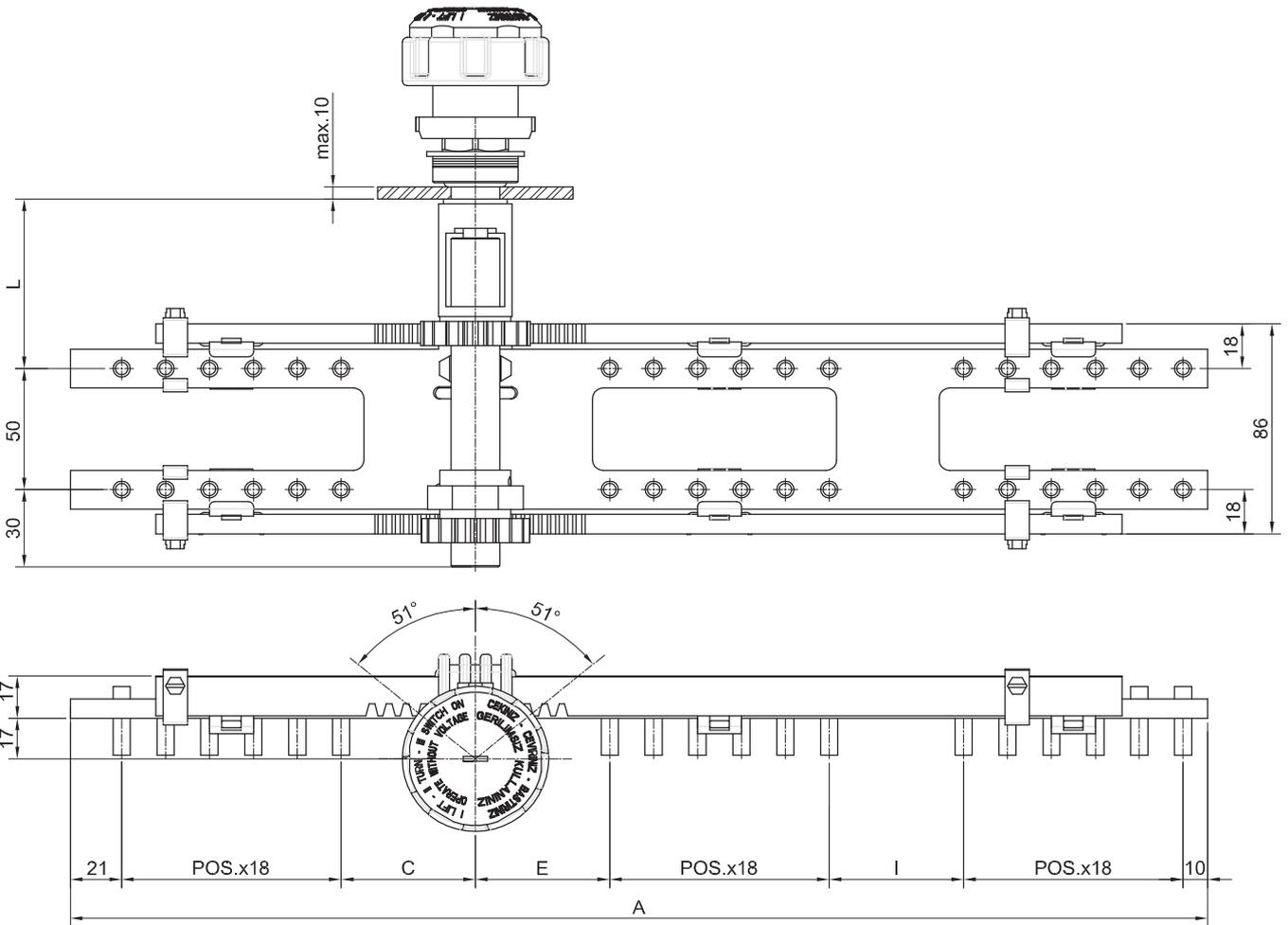
L	Number of Positions	20kV				30kV			
		A	10 A Unit No	30 A Unit No	63 A Unit No	A	10 A Unit No	30 A Unit No	63 A Unit No
50	3	495	TCR42A31	TCR42B31	TCR42C31	-	-	-	-
	5	603	TCR42A51	TCR42B51	TCR42C51	-	-	-	-
	7	711	TCR42A71	TCR42B71	TCR42C71	-	-	-	-
70	3	495	TCR42A32	TCR42B32	TCR42C32	533	TCR43A32	TCR43B32	TCR43C32
	5	603	TCR42A52	TCR42B52	TCR42C52	641	TCR43A52	TCR43B52	TCR43C52
	7	711	TCR42A72	TCR42B72	TCR42C72	749	TCR43A72	TCR43B72	TCR43C72
100	3	495	TCR42A33	TCR42B33	TCR42C33	533	TCR43A33	TCR43B33	TCR43C33
	5	603	TCR42A53	TCR42B53	TCR42C53	641	TCR43A53	TCR43B53	TCR43C53
	7	711	TCR42A73	TCR42B73	TCR42C73	749	TCR43A73	TCR43B73	TCR43C73
130	3	495	TCR42A34	TCR42B34	TCR42C34	533	TCR43A34	TCR43B34	TCR43C34
	5	603	TCR42A54	TCR42B54	TCR42C54	641	TCR43A54	TCR43B54	TCR43C54
	7	711	TCR42A74	TCR42B74	TCR42C74	749	TCR43A74	TCR43B74	TCR43C74



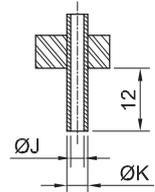
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

	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	406	TCR42A31-K	TCR42B31-K	TCR42C31-K	-	-	-	-
	5	514	TCR42A51-K	TCR42B51-K	TCR42C51-K	-	-	-	-
	7	622	TCR42A71-K	TCR42B71-K	TCR42C71-K	-	-	-	-
70	3	406	TCR42A32-K	TCR42B32-K	TCR42C32-K	481	TCR43A32-K	TCR43B32-K	TCR43C32-K
	5	514	TCR42A52-K	TCR42B52-K	TCR42C52-K	589	TCR43A52-K	TCR43B52-K	TCR43C52-K
	7	622	TCR42A72-K	TCR42B72-K	TCR42C72-K	697	TCR43A72-K	TCR43B72-K	TCR43C72-K
100	3	406	TCR42A33-K	TCR42B33-K	TCR42C33-K	481	TCR43A33-K	TCR43B33-K	TCR43C33-K
	5	514	TCR42A53-K	TCR42B53-K	TCR42C53-K	589	TCR43A53-K	TCR43B53-K	TCR43C53-K
	7	622	TCR42A73-K	TCR42B73-K	TCR42C73-K	697	TCR43A73-K	TCR43B73-K	TCR43C73-K
130	3	406	TCR42A34-K	TCR42B34-K	TCR42C34-K	481	TCR43A34-K	TCR43B34-K	TCR43C34-K
	5	514	TCR42A54-K	TCR42B54-K	TCR42C54-K	589	TCR43A54-K	TCR43B54-K	TCR43C54-K
	7	622	TCR42A74-K	TCR42B74-K	TCR42C74-K	697	TCR43A74-K	TCR43B74-K	TCR43C74-K



CONTACT DETAIL



	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

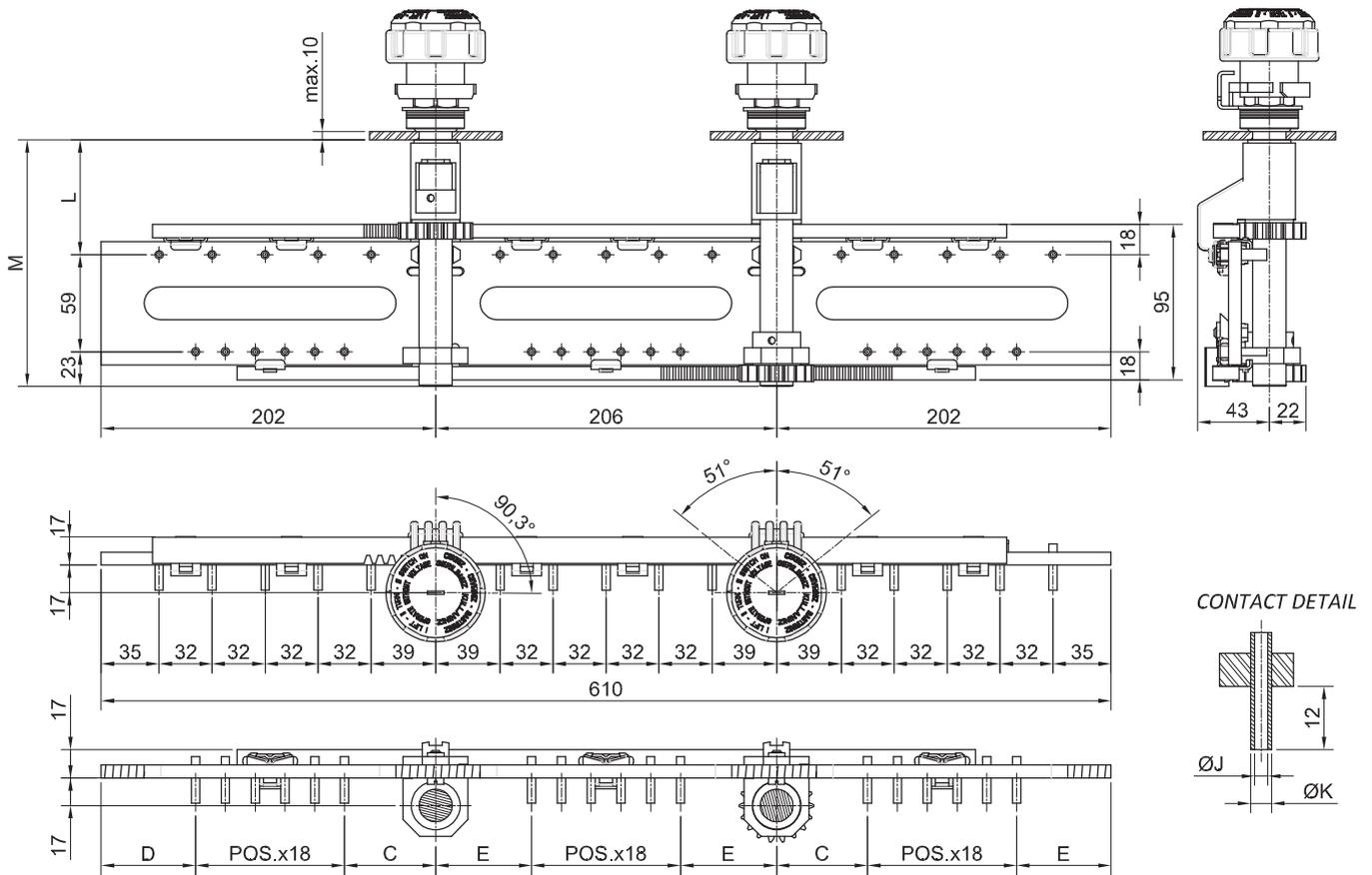
L	Number of Positions	20kV				30kV			
		A	10 A Unit No	30 A Unit No	63 A Unit No	A	10 A Unit No	30 A Unit No	63 A Unit No
50	3	358	TCR82A31	TCR82B31	TCR82C31	-	-	-	-
	4	412	TCR82A41	TCR82B41	TCR82C41	-	-	-	-
	5	466	TCR82A51	TCR82B51	TCR82C51	-	-	-	-
	6	520	TCR82A61	TCR82B61	TCR82C61	-	-	-	-
	7	574	TCR82A71	TCR82B71	TCR82C71	-	-	-	-
70	3	358	TCR82A32	TCR82B32	TCR82C32	433	TCR83A32	TCR83B32	TCR83C32
	4	412	TCR82A42	TCR82B42	TCR82C42	487	TCR83A42	TCR83B42	TCR83C42
	5	466	TCR82A52	TCR82B52	TCR82C52	541	TCR83A52	TCR83B52	TCR83C52
	6	520	TCR82A62	TCR82B62	TCR82C62	595	TCR83A62	TCR83B62	TCR83C62
	7	574	TCR82A72	TCR82B72	TCR82C72	649	TCR83A72	TCR83B72	TCR83C72
100	3	358	TCR82A33	TCR82B33	TCR82C33	433	TCR83A33	TCR83B33	TCR83C33
	4	412	TCR82A43	TCR82B43	TCR82C43	487	TCR83A43	TCR83B43	TCR83C43
	5	466	TCR82A53	TCR82B53	TCR82C53	541	TCR83A53	TCR83B53	TCR83C53
	6	520	TCR82A63	TCR82B63	TCR82C63	595	TCR83A63	TCR83B63	TCR83C63
	7	574	TCR82A73	TCR82B73	TCR82C73	649	TCR83A73	TCR83B73	TCR83C73
130	3	358	TCR82A34	TCR82B34	TCR82C34	433	TCR83A34	TCR83B34	TCR83C34
	4	412	TCR82A44	TCR82B44	TCR82C44	487	TCR83A44	TCR83B44	TCR83C44
	5	466	TCR82A54	TCR82B54	TCR82C54	541	TCR83A54	TCR83B54	TCR83C54
	6	520	TCR82A64	TCR82B64	TCR82C64	595	TCR83A64	TCR83B64	TCR83C64
	7	574	TCR82A74	TCR82B74	TCR82C74	649	TCR83A74	TCR83B74	TCR83C74



TYPE PDR THREEPHASE TAP CHANGER

Off-circuit operation can be used in 1. Stage serial paralel coupling 15-20kV 30-63A

1. Stage delta diagram 20kV 30-63A 3-7 positions.



L	Number of Positions	20kV			
		M	10 A Unit No	30 A Unit No	63 A Unit No
50	3	132	TCRB2A31	TCRB2B31	TCRB2C31
	4		TCRB2A41	TCRB2B41	TCRB2C41
	5		TCRB2A51	TCRB2B51	TCRB2C51
	6		TCRB2A61	TCRB2B61	TCRB2C61
	7		TCRB2A71	TCRB2B71	TCRB2C71
70	3	152	TCRB2A32	TCRB2B32	TCRB2C32
	4		TCRB2A42	TCRB2B42	TCRB2C42
	5		TCRB2A52	TCRB2B52	TCRB2C52
	6		TCRB2A62	TCRB2B62	TCRB2C62
	7		TCRB2A72	TCRB2B72	TCRB2C72
100	3	182	TCRB2A33	TCRB2B33	TCRB2C33
	4		TCRB2A43	TCRB2B43	TCRB2C43
	5		TCRB2A53	TCRB2B53	TCRB2C53
	6		TCRB2A63	TCRB2B63	TCRB2C63
	7		TCRB2A73	TCRB2B73	TCRB2C73
130	3	212	TCRB2A34	TCRB2B34	TCRB2C34
	4		TCRB2A44	TCRB2B44	TCRB2C44
	5		TCRB2A54	TCRB2B54	TCRB2C54
	6		TCRB2A64	TCRB2B64	TCRB2C64
	7		TCRB2A74	TCRB2B74	TCRB2C74

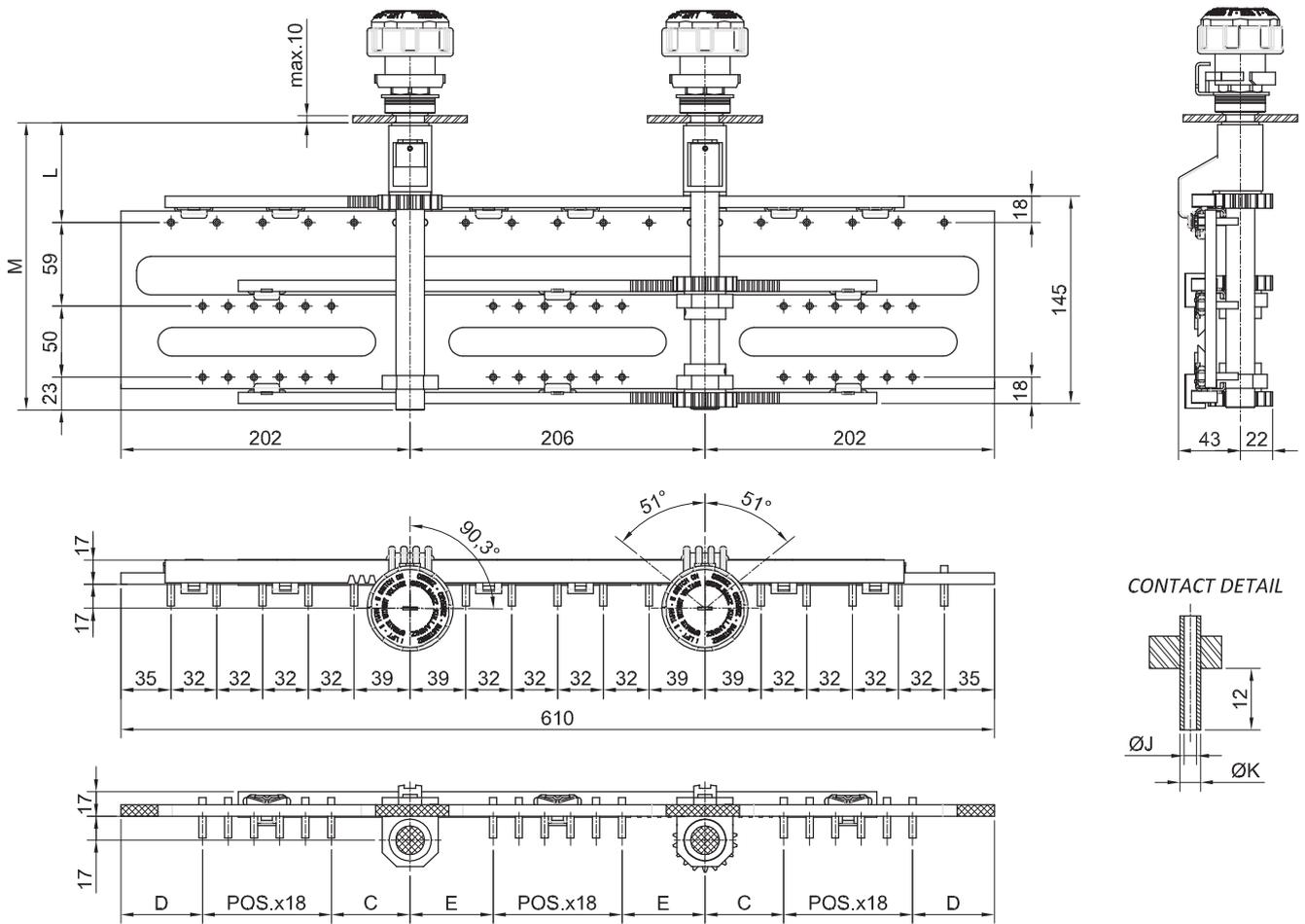
	10 A	30 A	63 A
J	2,1	3,1	5,1
K	4	5	7

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



TYPE PDR THREEPHASE TAP CHANGER

Off-circuit operation can be used in 1. Stage serial paralel coupling 15-20kV 30-63A
2. Stage delta diagram 20kV 30-63A positions.



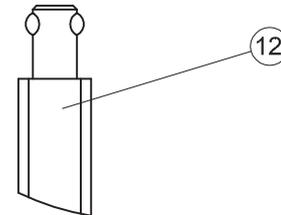
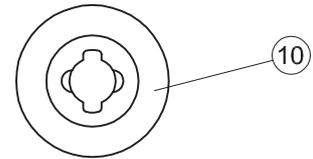
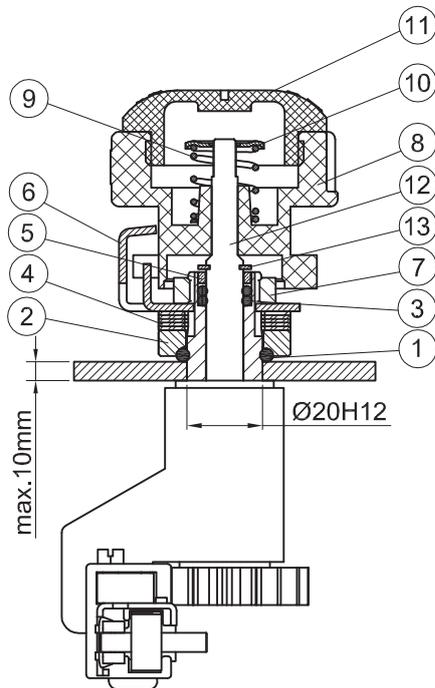
L	Number of Positions	20kV			
		M	10 A Unit No	30 A Unit No	63 A Unit No
50	3	182	TCRD2A31	TCRD2B31	TCRD2C31
	4		TCRD2A41	TCRD2B41	TCRD2C41
	5		TCRD2A51	TCRD2B51	TCRD2C51
	6		TCRD2A61	TCRD2B61	TCRD2C61
	7		TCRD2A71	TCRD2B71	TCRD2C71
70	3	202	TCRD2A32	TCRD2B32	TCRD2C32
	4		TCRD2A42	TCRD2B42	TCRD2C42
	5		TCRD2A52	TCRD2B52	TCRD2C52
	6		TCRD2A62	TCRD2B62	TCRD2C62
	7		TCRD2A72	TCRD2B72	TCRD2C72
100	3	232	TCRD2A33	TCRD2B33	TCRD2C33
	4		TCRD2A43	TCRD2B43	TCRD2C43
	5		TCRD2A53	TCRD2B53	TCRD2C53
	6		TCRD2A63	TCRD2B63	TCRD2C63
	7		TCRD2A73	TCRD2B73	TCRD2C73
130	3	262	TCRD2A34	TCRD2B34	TCRD2C34
	4		TCRD2A44	TCRD2B44	TCRD2C44
	5		TCRD2A54	TCRD2B54	TCRD2C54
	6		TCRD2A64	TCRD2B64	TCRD2C64
	7		TCRD2A74	TCRD2B74	TCRD2C74

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

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

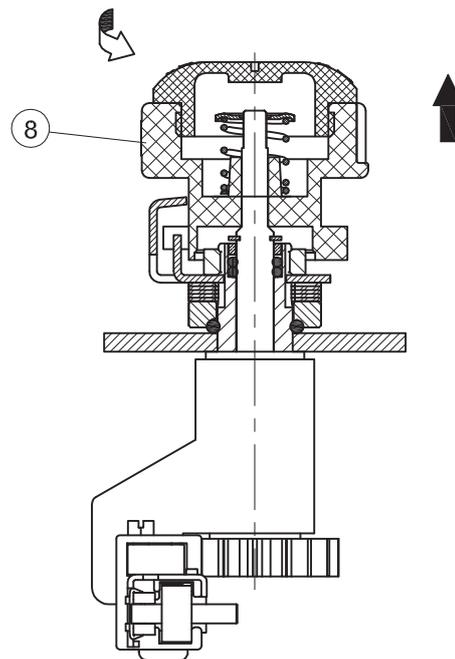


Lid Assembly

The notched end of the shaft (12) 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.

Assembly Order:

- 1- O-ring 18.64x3.53
- 2- O-ring Sleeve
- 3- O-ring 9.19x2.62
- 4- Spacer Washers
- 5- Washer 14x10.2x3.5
- 6- Position Stopper
- 7- Fixing Nut
- 8- Control Device Body (Nylon-6)
- 9- Spring
- 10- Control Device Lid
- 11- Control Device Cover
- 12- Shaft
- 13- Moon segment

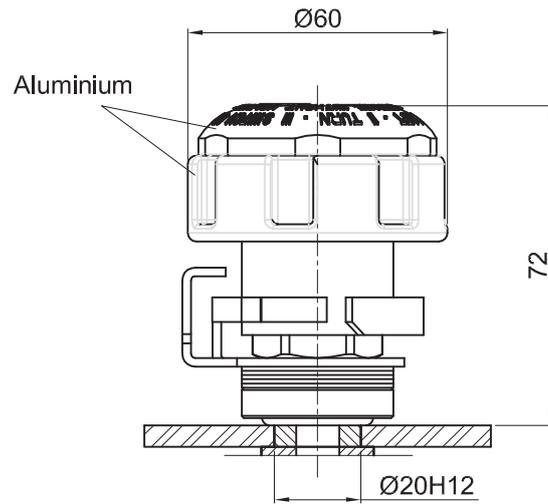


Position Changing Mode

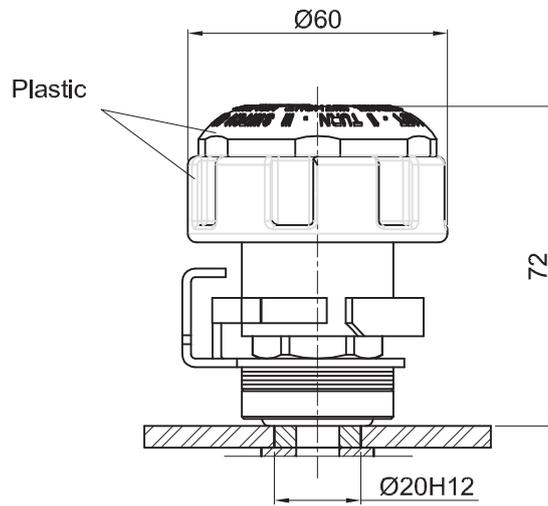
In order to change the position of the tap changer, pull the control device body (8) along the direction of the arrow, turn it to the desired position notch and release. The spring system will automatically lock the position via position stopper and position notch on the body.

Notes:

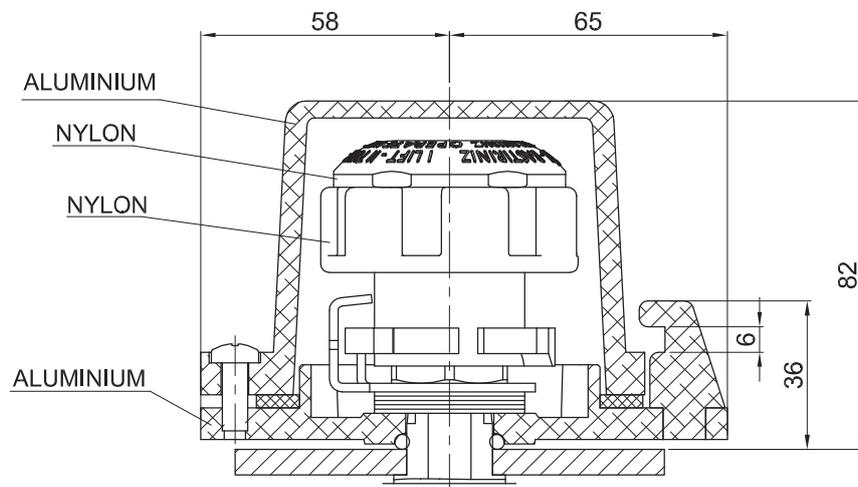
For the assembly of the tap changer, the thickness of the transformer cover sheet is assumed to be 10 mm. If the sheet thickness is lower than 10 mm then use the additional spacer washers (4) so that the resulting thickness is to be 10 mm. For example, if the cover sheet thickness is 6 mm then 4 washers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



Code No : KNB100A



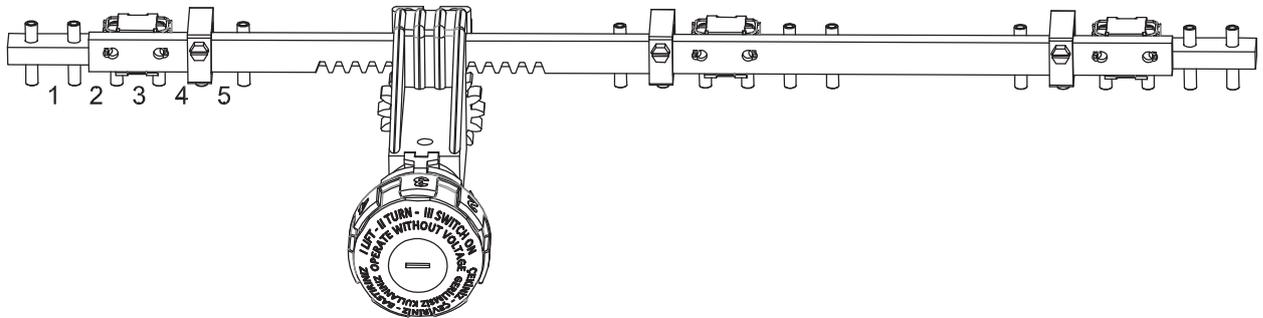
Code No : KNB100P



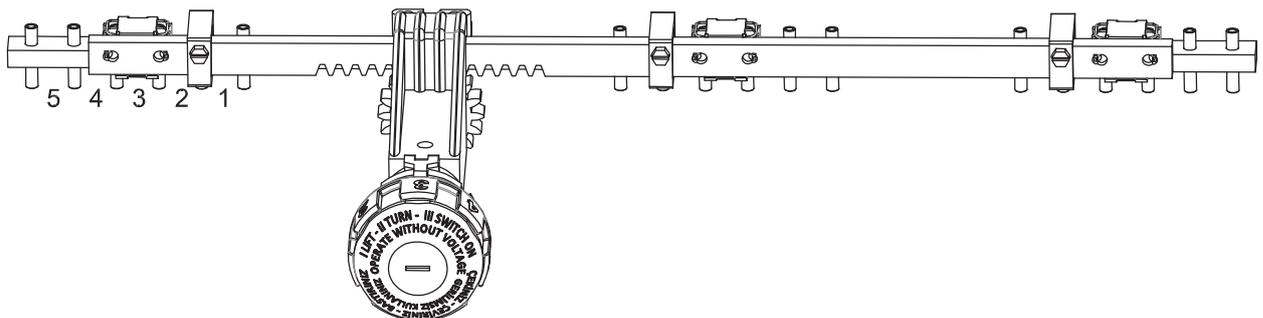
KNB102A
With Protective Cover
Standart Type



Numbering (A1)



Numbering (B1)



WHEN ORDERING PLEASE QUOTE

- 1- The tap changer unit no.
- 2- The voltage class current and type of setting orcoupling.
- 3- Control device no.
- 4- The language on the control device.
- 5- Number of positions.
- 6- The indication of the repeater disc (A1, B1)
- 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 please consult us.



PDR CODE PLAN

T C

X X X X X X X X X X

TAP CHANGER

TYPE

CONNECTION STYLE

VOLTAGE (KV)

CURRENT (A)

POSITION

LENGTH L

KNOB DIRECTION

KNOB MATERIAL

DETAIL

TYPE PDR

CONNECTION STYLE

- 1 - MONO PHASE DELTA
- 2 - MONO PHASE COMMON OUTPUT
- 3 - THREE PHASE DELTA
- 4 - THREE PHASE COMMON OUTPUT "A-B-C" TYPE
- 5 - STAR - DELTA
- 6 - SERIES PARALLEL
- 7 - THREE PHASE STAR
- 8 - THREE PHASE TWO STAGES DELTA
- 9 - THREE PHASE TWO STAGES COMMON OUTPUT
- A - THREE PHASE THREE STAGE (1SERIES PARALLEL+2 STAGE STAR)
- B - THREE PHASE TWO STAGE (1SERIES PARALLEL+1 STAGE DELTA)
- C - THREE PHASE TWO STAGE (1SERIES PARALLEL+1 STAGE STAR)
- D - THREE PHASE THREE STAGE (1SERIES PARALLEL+ 2 STAGE DELTA)

VOLTAGE (KV)
2 - 20KV
3 - 30 KV

CURRENT (A)
A - 10
B - 30
C - 63

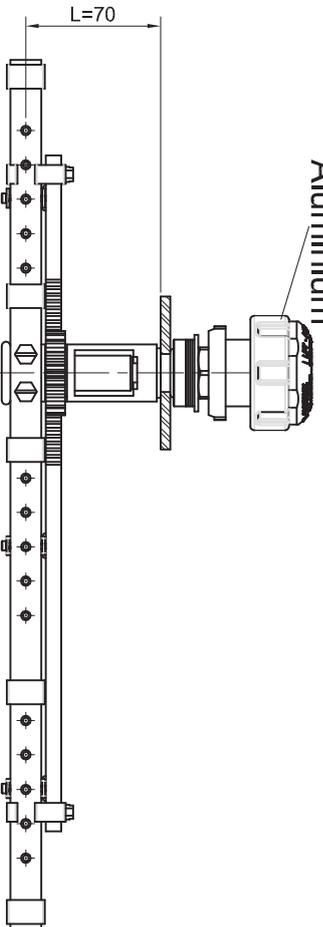
POSITION
3
4
5
6
7

LENGTH L
L:50 - 1
L:70 - 2
L:100 - 3
L:130 - 4

DIRECTION
A1
B1

KNOB MATERIAL
AL - ALUMINIUM
PA - PLASTIC

Aluminium



Star diagram - 20 KV - 30 A - 5 pos.

Code No : TCR72B52A1AL0



GENERAL SPECIFICATION

These tap changers are available in one, two or three phase applications. Multi layer types are also available.

The shaft length is variable.

Driving mechanism can be either on the edge or in the middle of the phases.

Connection diagrams in page PDZ 2 can be applied in any variation to all types.

These tap changers are bolted on to the supports, welded under transformer cover and allow strong construction.

ASSEMBLY

A notch is provided to mark each position. For operation, the notch must be released by applying an axial pull on the control knob.

Once the knob is in the desired position it will drop into the respective space by the help of a high tension spring. This process is clearly marked on control knob as;

“ LIFT – TURN – 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.

Aluminum Parts : GAISi12Cu

Brass Parts : CuZn40Pb2 Ms 60 F34 DIN 17673

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.

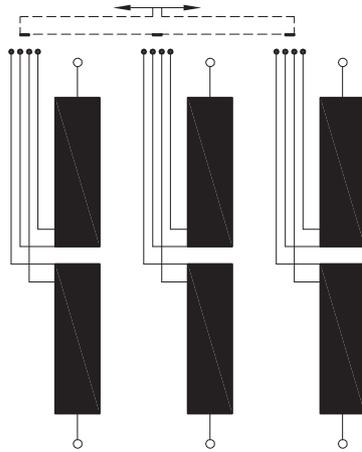
CURRENT

CURRENT	CONTACT INNER DIA (for cable connection)
30 A	Ø 3.1 mm
63 A	Ø 5.1 mm
120 A	Ø 8.1 mm

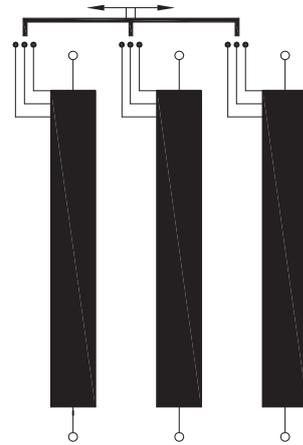
VOLTAGE CLASS

VOLTAGE CLASS	B.I.L.
10kV	75 kV
15 kV	95 kV
20 kV	125 kV
30 kV	170 kV

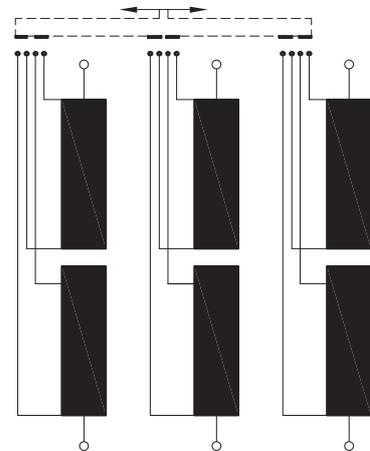
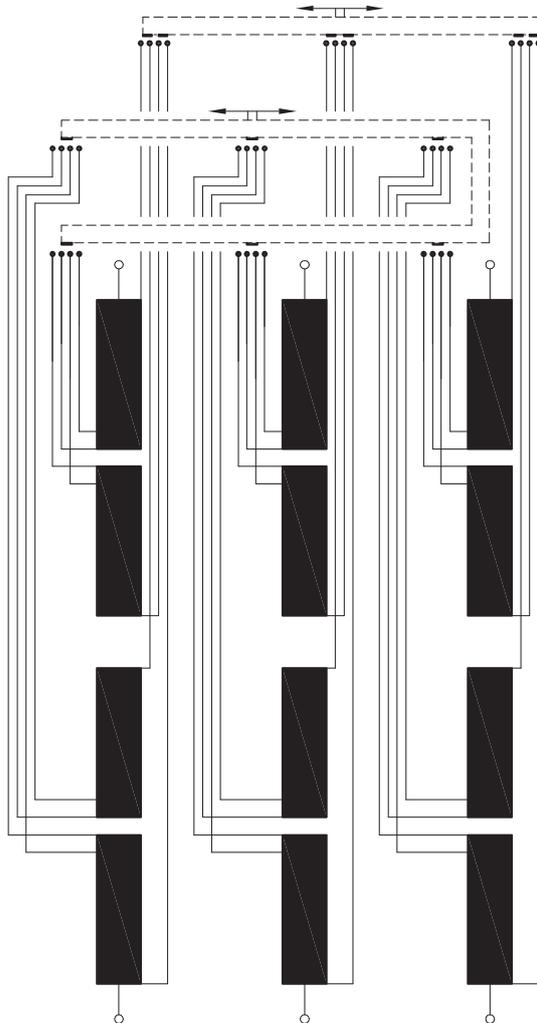
Other B.I.L. values are also available upon customer request.



Setting for delta transformer



Setting for star transformer



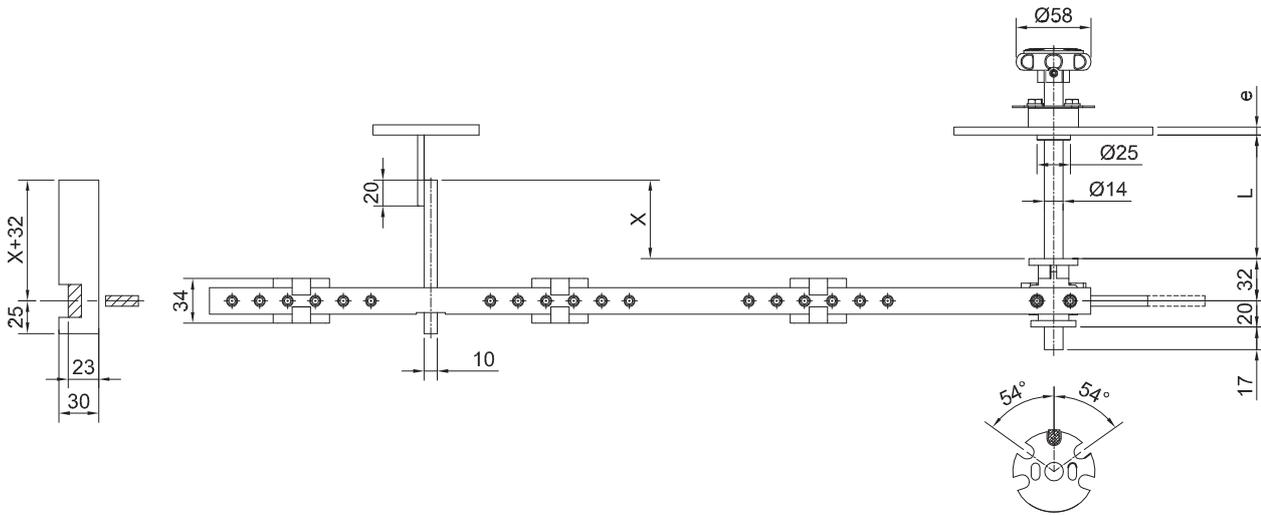
Series - parallel coupling

Typical combination :
- 1 stage, series - parallel coupling
- 2 stage, delta diagram - setting $\pm 2,5\%$.

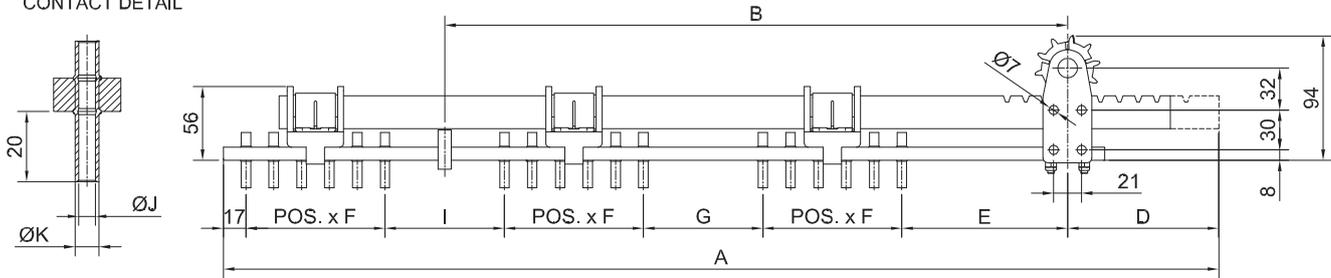


TYPE PDZ THREE PHASE TAP CHANGER

Off-circuit operation can be used in oil
Delta diagram 10-30kV 30-63A 3-7 positions (With HP support)



CONTACT DETAIL

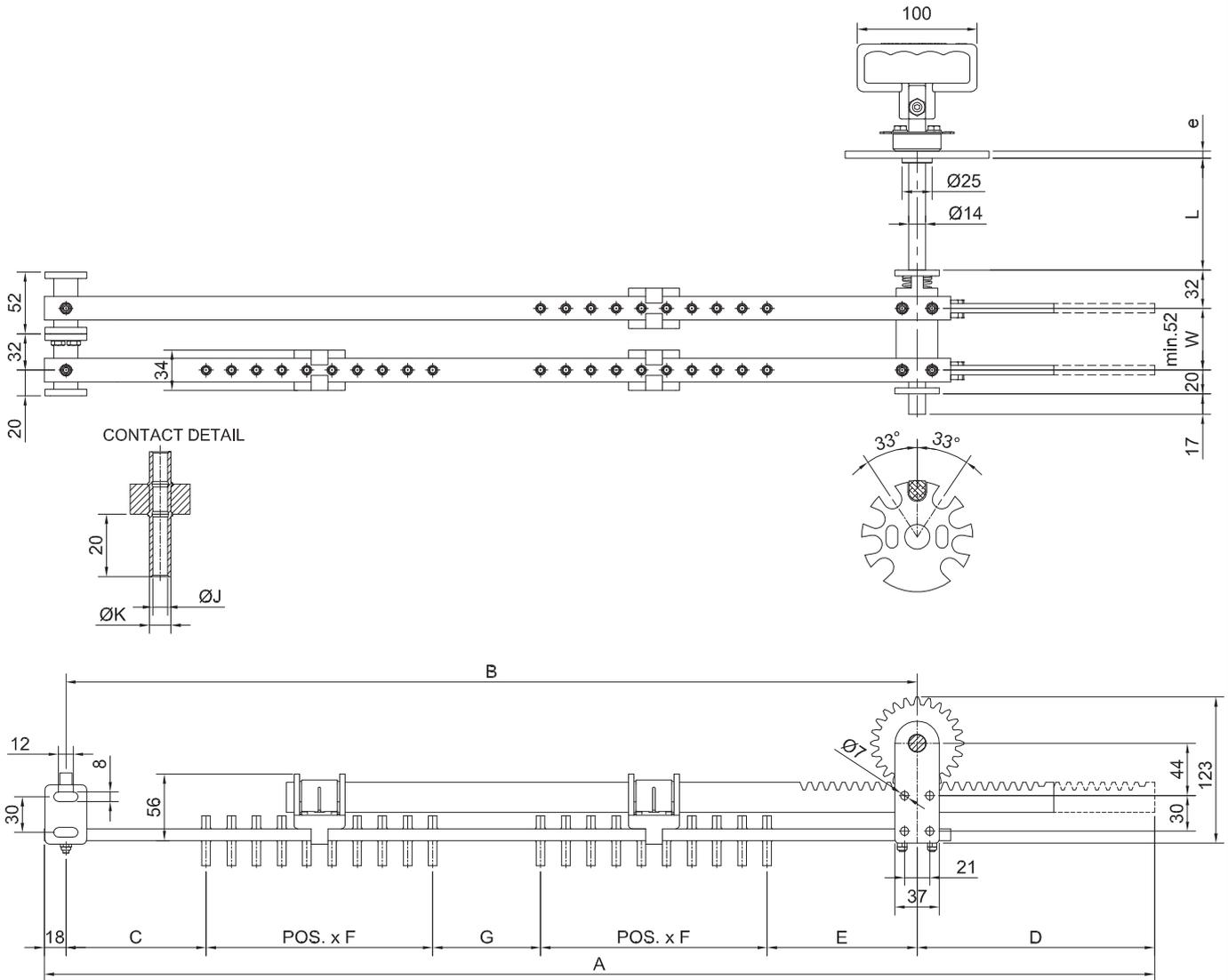


Voltage class kV	Current A	Number of positions	A	B	D	E	G	F	I	X min.	L	e	Unit No	
													30A J:3.1 K:5	63A J:5.1 K:7
10	30 or 63	3	431	254	72	61	42	21	50	48	Please quote when ordering		TCZ31A23	TCZ31A33
		4	515	296	93	61	42	21	50	48			TCZ31A24	TCZ31A34
		5	599	338	114	61	42	21	50	48			TCZ31A25	TCZ31A35
		6	683	380	135	61	42	21	50	48			TCZ31A26	TCZ31A36
		7	767	422	156	61	42	21	50	48			TCZ31A27	TCZ31A37
15	30 or 63	3	468	286	72	76	54	21	60	48			TCZ31B23	TCZ31B33
		4	552	328	93	76	54	21	60	48			TCZ31B24	TCZ31B34
		5	636	370	114	76	54	21	60	48			TCZ31B25	TCZ31B35
		6	720	412	135	76	54	21	60	48			TCZ31B26	TCZ31B36
		7	804	454	156	76	54	21	60	48			TCZ31B27	TCZ31B37
20	30 or 63	3	503	313	72	84	65	21	76	48			TCZ31C23	TCZ31C33
		4	587	355	93	84	65	21	76	48			TCZ31C24	TCZ31C34
		5	671	397	114	84	65	21	76	48			TCZ31C25	TCZ31C35
		6	755	439	135	84	65	21	76	48			TCZ31C26	TCZ31C36
		7	839	481	156	84	65	21	76	48	TCZ31C27	TCZ31C37		
30	30 or 63	3	583	386	72	125	90	21	90	88	TCZ31D23	TCZ31D33		
		4	667	428	93	125	90	21	90	88	TCZ31D24	TCZ31D34		
		5	751	470	114	125	90	21	90	88	TCZ31D25	TCZ31D35		
		6	835	512	135	125	90	21	90	88	TCZ31D26	TCZ31D36		
		7	919	554	156	125	90	21	90	88	TCZ31D27	TCZ31D37		



TYPE PDZ THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil Delta diagram
10-30kV 30-63A 8-11 positions Special diagram (With Aluminium support)

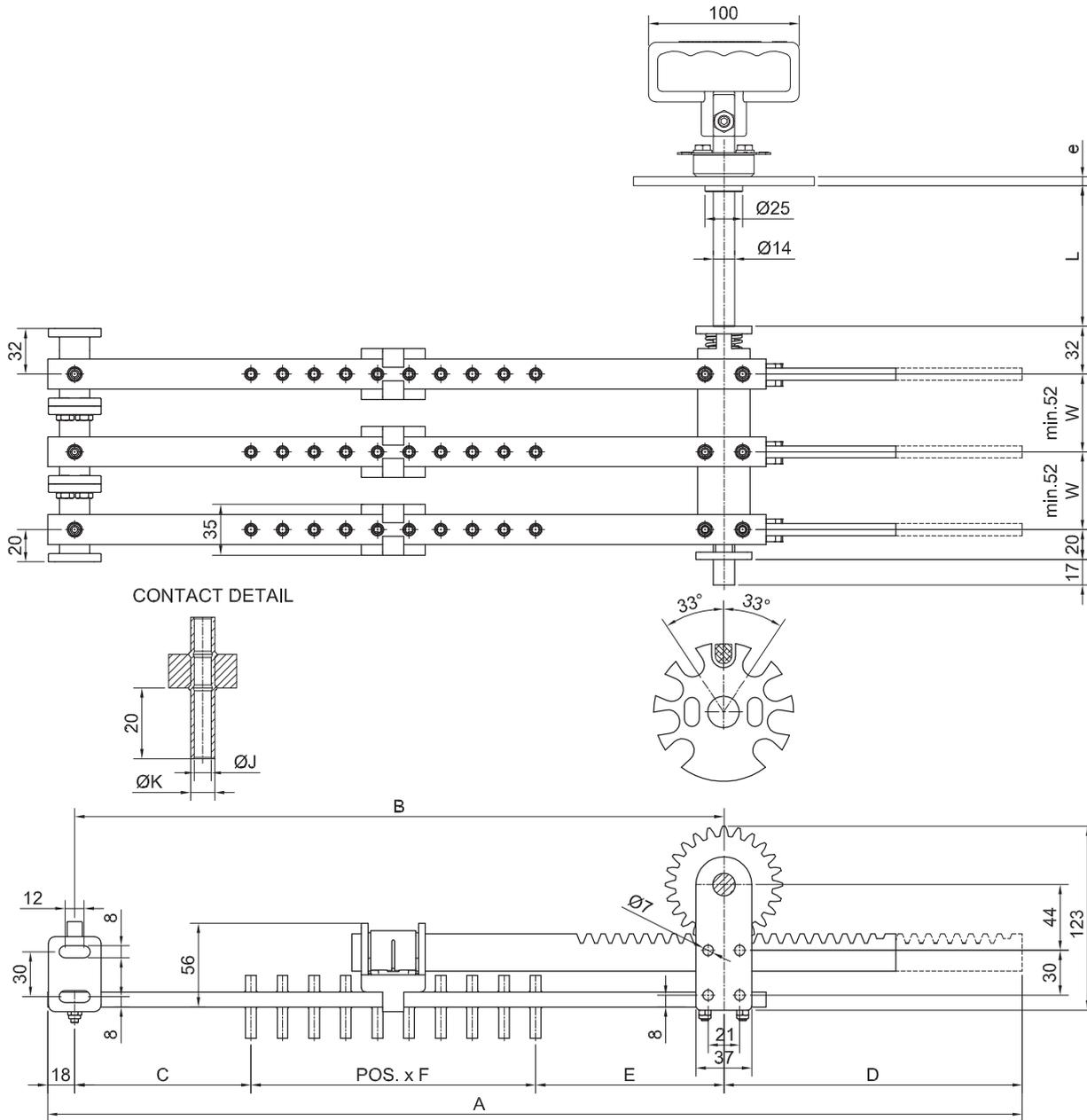


Voltage class kV	Current A	Number of positions	A	B	C	D	E	G	F	L	W	e	Unit No	Unit No
													30A J:3.1 K:5	63A J:5.1 K:7
10	30 or 63	8	692	492	53	182	61	42	21	Please quote when ordering			TCZ83A28	TCZ83A38
		9	755	534	53	203	61	42	21				TCZ83A29	TCZ83A39
		10	818	576	53	224	61	42	21				TCZ83A2A	TCZ83A3A
		11	881	618	53	245	61	42	21				TCZ83A2B	TCZ83A3B
15	30 or 63	8	732	532	66	182	76	54	21				TCZ83B28	TCZ83B38
		9	795	574	66	203	76	54	21				TCZ83B29	TCZ83B39
		10	858	616	66	224	76	54	21				TCZ83B2A	TCZ83B3A
		11	921	658	66	245	76	54	21				TCZ83B2B	TCZ83B3B
20	30 or 63	8	761	561	76	182	84	65	21				TCZ83C28	TCZ83C38
		9	824	603	76	203	84	65	21				TCZ83C29	TCZ83C39
		10	887	645	76	224	84	65	21				TCZ83C2A	TCZ83C3A
		11	950	687	76	245	84	65	21				TCZ83C2B	TCZ83C3B
30	30 or 63	8	868	668	117	182	125	90	21	TCZ83D28	TCZ83D38			
		9	931	710	117	203	125	90	21	TCZ83D29	TCZ83D39			
		10	994	752	117	224	125	90	21	TCZ83D2A	TCZ83D3A			
		11	1057	794	117	245	125	90	21	TCZ83D2B	TCZ83D3B			



TYPE PDZ THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Delta diagram
10-30kV 30-63A 8-11 position special diagram.(With Aluminium Support)

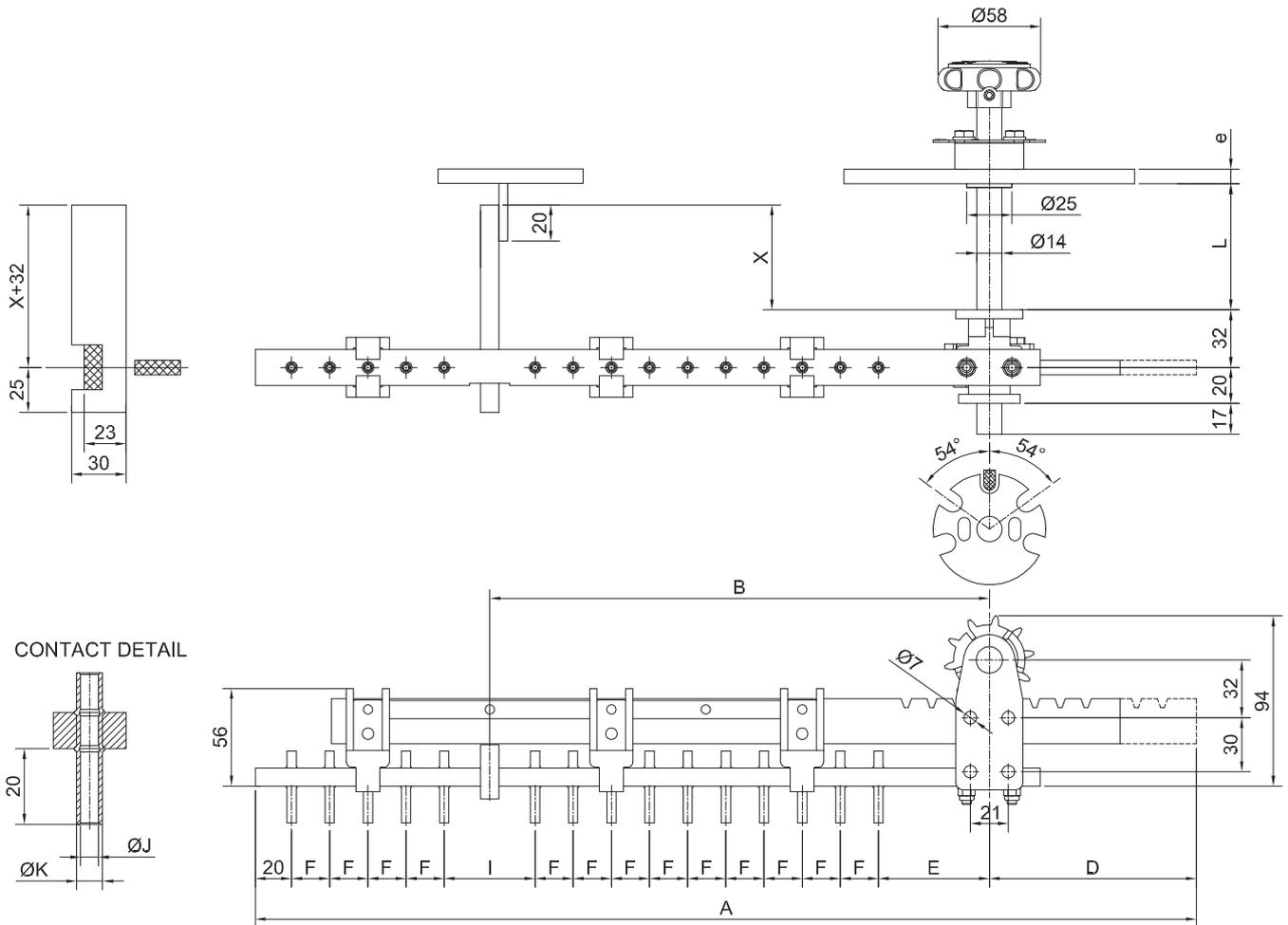


Voltage class kV	Current A	Number of positions	A	B	C	D	E	F	L	W	e	Unit No		
												30A J:3.1 K:5	63A J:5.1 K:7	
10	30 or 63	8	476	282	53	182	61	21	Please quote when ordering				TCZ3X13A28	TCZ3X13A38
		9	524	303	53	203	61	21					TCZ3X13A29	TCZ3X13A39
		10	572	324	53	224	61	21					TCZ3X13A2A	TCZ3X13A3A
		11	620	345	53	245	61	21					TCZ3X13A2B	TCZ3X13A3B
15	30 or 63	8	510	310	66	182	76	21					TCZ3X13B28	TCZ3X13B38
		9	558	331	66	203	76	21					TCZ3X13B29	TCZ3X13B39
		10	606	352	66	224	76	21					TCZ3X13B2A	TCZ3X13B3A
		11	654	373	66	245	76	21					TCZ3X13B2B	TCZ3X13B3B
20	30 or 63	8	528	328	76	182	84	21					TCZ3X13C28	TCZ3X13C38
		9	576	349	76	203	84	21					TCZ3X13C29	TCZ3X13C39
		10	624	370	76	224	84	21					TCZ3X13C2A	TCZ3X13C3A
		11	672	391	76	245	84	21	TCZ3X13C2B	TCZ3X13C3B				
30	30 or 63	8	610	410	117	182	125	21	TCZ3X13D28	TCZ3X13D38				
		9	658	431	117	203	125	21	TCZ3X13D29	TCZ3X13D39				
		10	706	452	117	224	125	21	TCZ3X13D2A	TCZ3X13D3A				
		11	754	473	117	245	125	21	TCZ3X13D2B	TCZ3X13D3B				

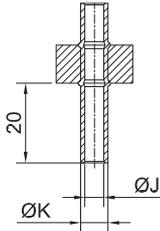


DEMIRMAKINE
BEST COMPLEMENT OF TRANSFORMERS

TYPE PDZ THREEPHASE TAP CHANGER
Off-circuit operation can be used in oil Star diagram
10-30kV 30-63A 3-7 position. (With HP Support)



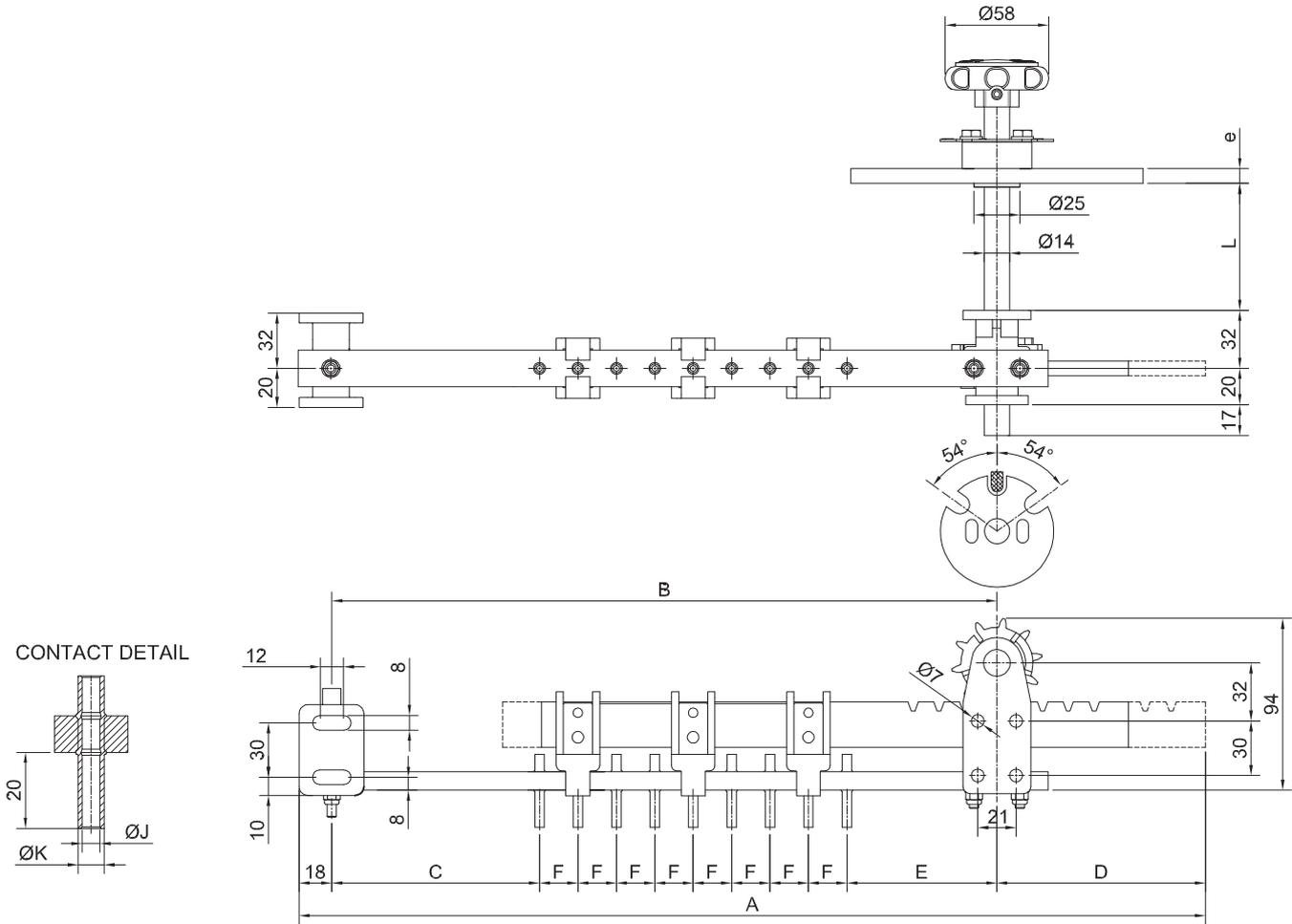
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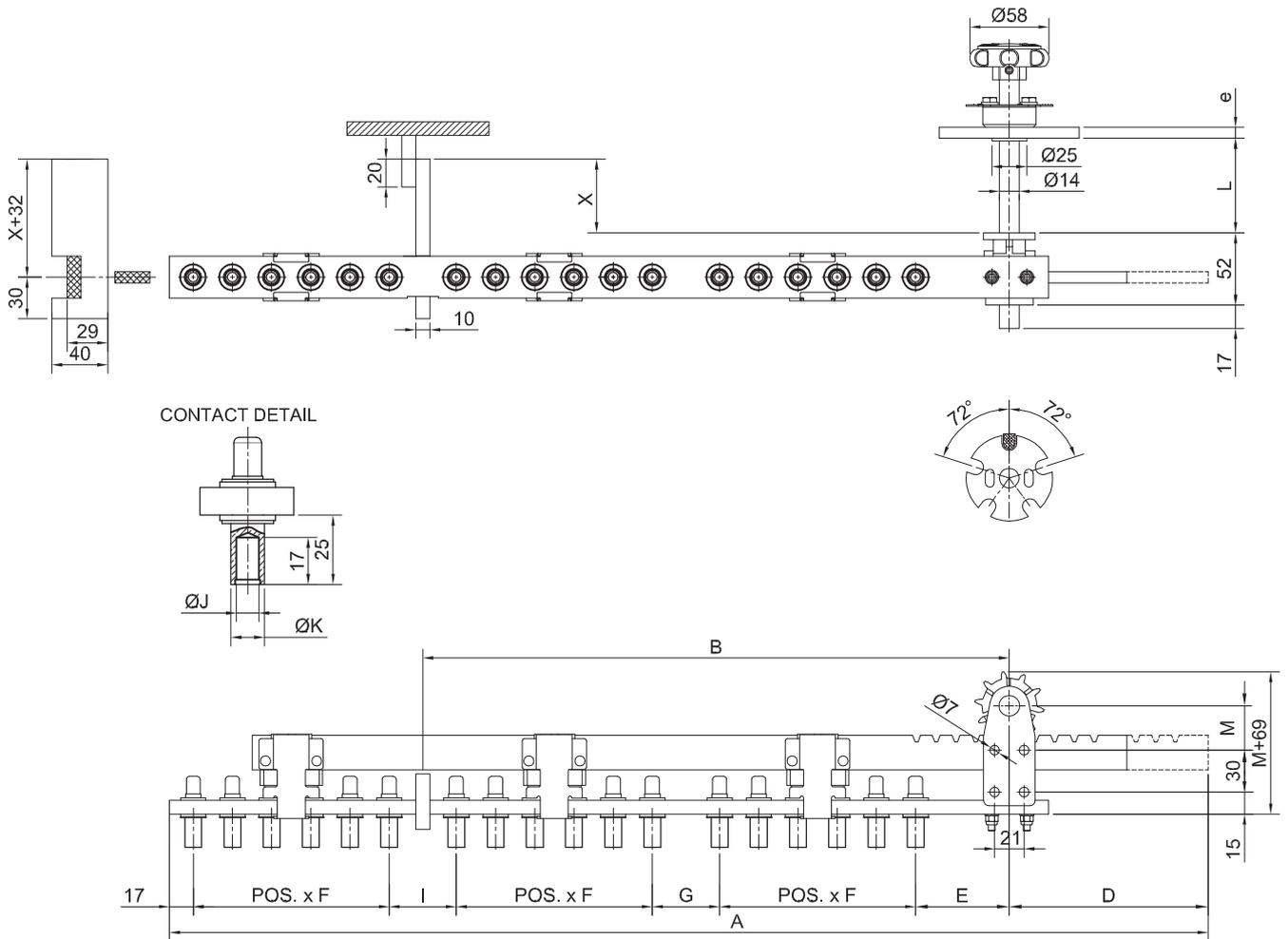
Voltage class kV	Current A	Number of positions	A	B	D	E	I	F	X min.	L	e	Unit No 30A J:3.1 K:5	Unit No 63A J:5.1 K:7
10	30 or 63	3	350	191	72	61	50	21	48	Please quote when ordering		TCZ71A23	TCZ71A33
		4	434	233	93	61	50	21	48			TCZ71A24	TCZ71A34
		5	518	275	114	61	50	21	48			TCZ71A25	TCZ71A35
		6	602	317	135	61	50	21	48			TCZ71A26	TCZ71A36
		7	686	359	156	61	50	21	48			TCZ71A27	TCZ71A37
15	30 or 63	3	365	206	72	76	50	21	48			TCZ71B23	TCZ71B33
		4	449	248	93	76	50	21	48			TCZ71B24	TCZ71B34
		5	533	290	114	76	50	21	48			TCZ71B25	TCZ71B35
		6	617	332	135	76	50	21	48			TCZ71B26	TCZ71B36
		7	701	374	156	76	50	21	48			TCZ71B27	TCZ71B37
20	30 or 63	3	373	214	72	84	50	21	48			TCZ71C23	TCZ71C33
		4	457	256	93	84	50	21	48			TCZ71C24	TCZ71C34
		5	541	298	114	84	50	21	48			TCZ71C25	TCZ71C35
		6	625	340	135	84	50	21	48			TCZ71C26	TCZ71C36
		7	709	382	156	84	50	21	48	TCZ71C27	TCZ71C37		
30	30 or 63	3	414	255	72	125	50	21	88	TCZ71D23	TCZ71D33		
		4	498	297	93	125	50	21	88	TCZ71D24	TCZ71D34		
		5	582	339	114	125	50	21	88	TCZ71D25	TCZ71D35		
		6	666	381	135	125	50	21	88	TCZ71D26	TCZ71D36		
		7	750	423	156	125	50	21	88	TCZ71D27	TCZ71D37		



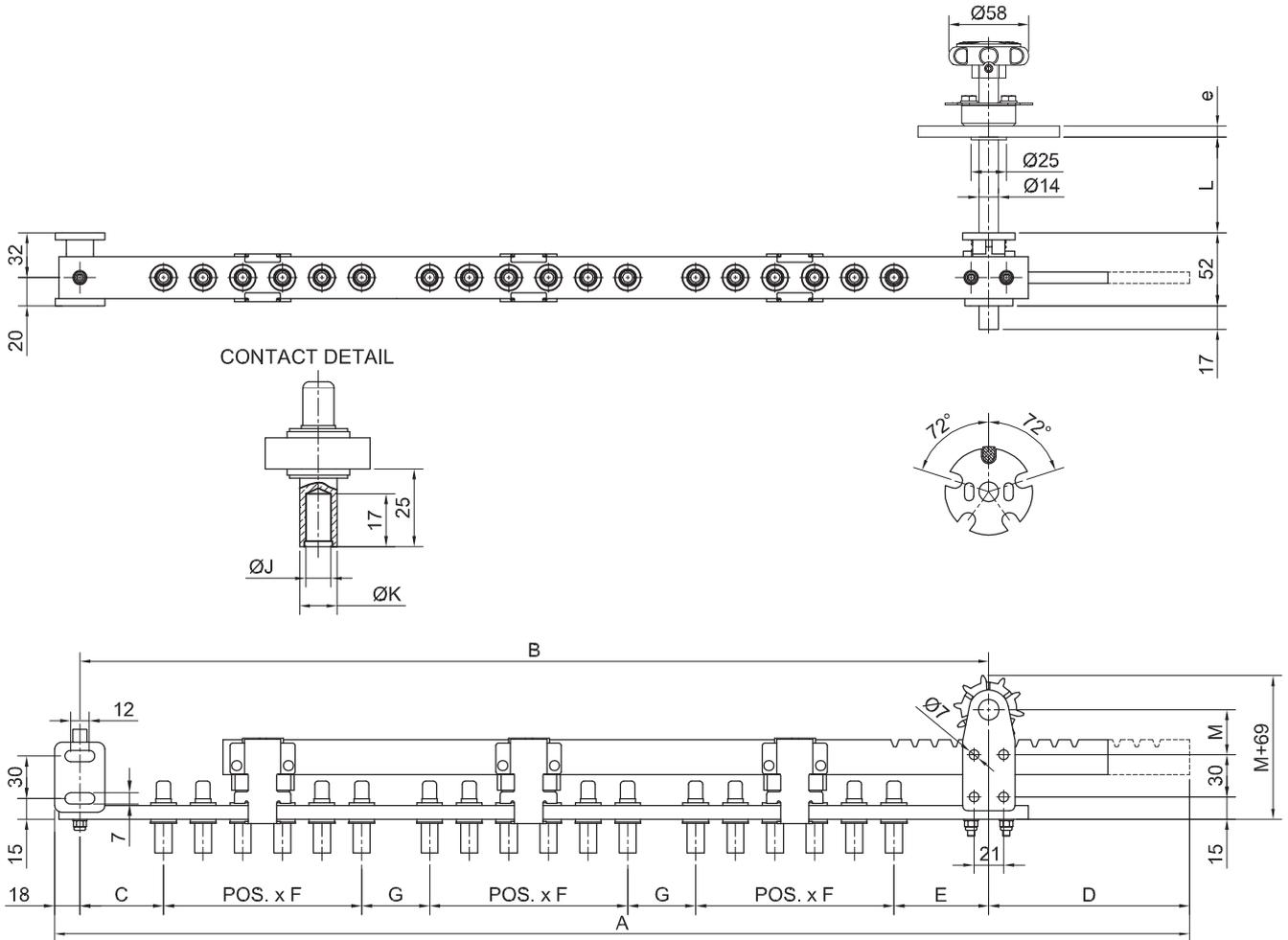
TYPE PDZ THREEPHASE TAP CHANGER
Off-circuit operation can be used in oil Star diagram
10-30kV 30-63A 3-7 position. (With Aluminium Support)



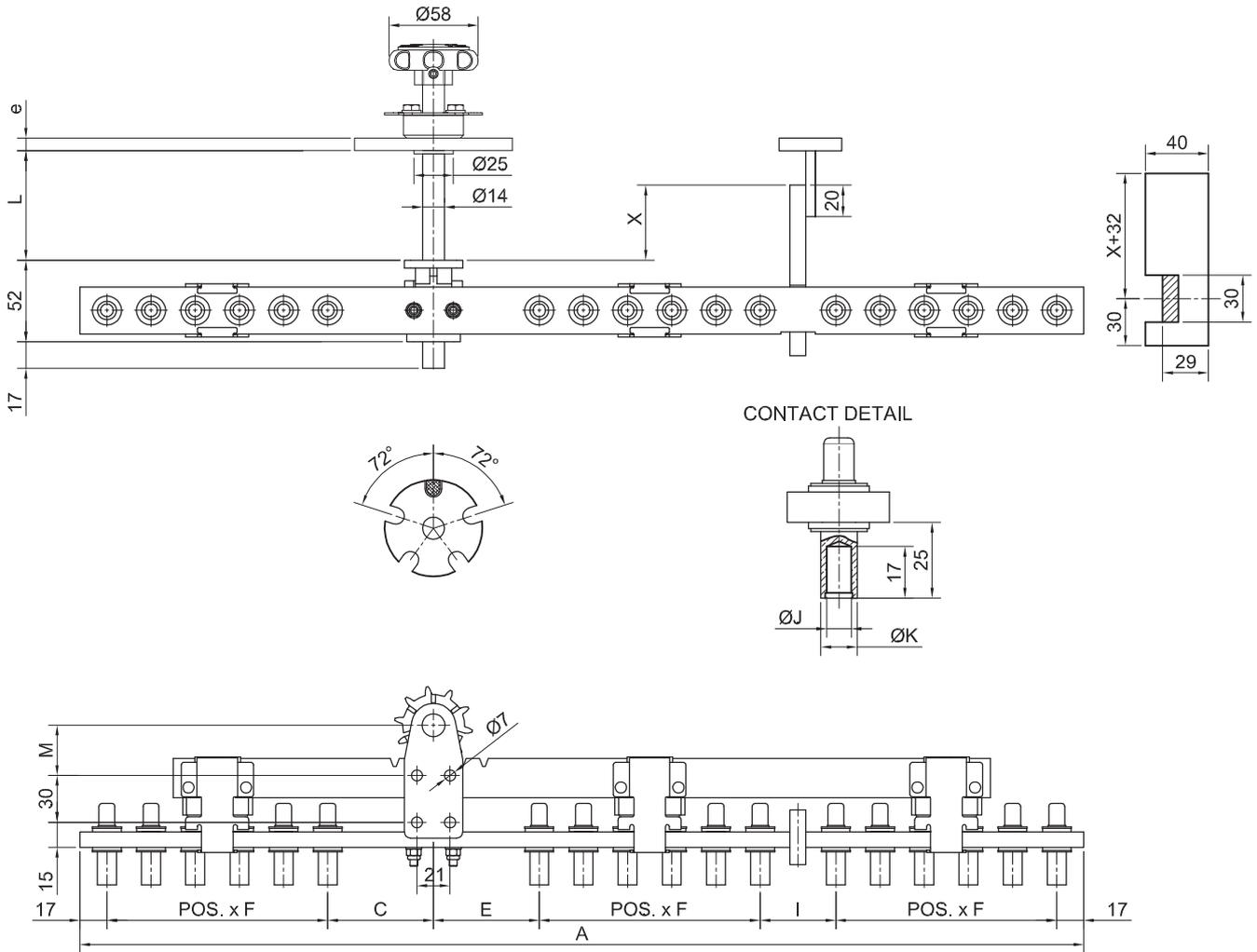
Voltage class kV	Current A	Number of positions	A	B	C	D	E	F	L	e	Unit No	Unit No
											30A J:3.1 K:5	63A J:5.1 K:7
10	30 or 63	3	372	282	53	72	61	21	Please quote when ordering		TCZ73A23	TCZ73A33
		4	456	345	53	93	61	21			TCZ73A24	TCZ73A34
		5	540	408	53	114	61	21			TCZ73A25	TCZ73A35
		6	624	471	53	135	61	21			TCZ73A26	TCZ73A36
		7	708	534	53	156	61	21			TCZ73A27	TCZ73A37
20	30 or 63	3	418	328	76	72	84	21			TCZ73C23	TCZ73C33
		4	502	391	76	93	84	21			TCZ73C24	TCZ73C34
		5	586	454	76	114	84	21			TCZ73C25	TCZ73C35
		6	670	517	76	135	84	21			TCZ73C26	TCZ73C36
		7	754	580	76	156	84	21			TCZ73C27	TCZ73C37
30	30 or 63	3	500	410	117	72	125	21			TCZ73D23	TCZ73D33
		4	584	473	117	93	125	21			TCZ73D24	TCZ73D34
		5	668	536	117	114	125	21			TCZ73D25	TCZ73D35
		6	752	599	117	135	125	21			TCZ73D26	TCZ73D36
		7	836	662	117	156	125	21			TCZ73D27	TCZ73D37



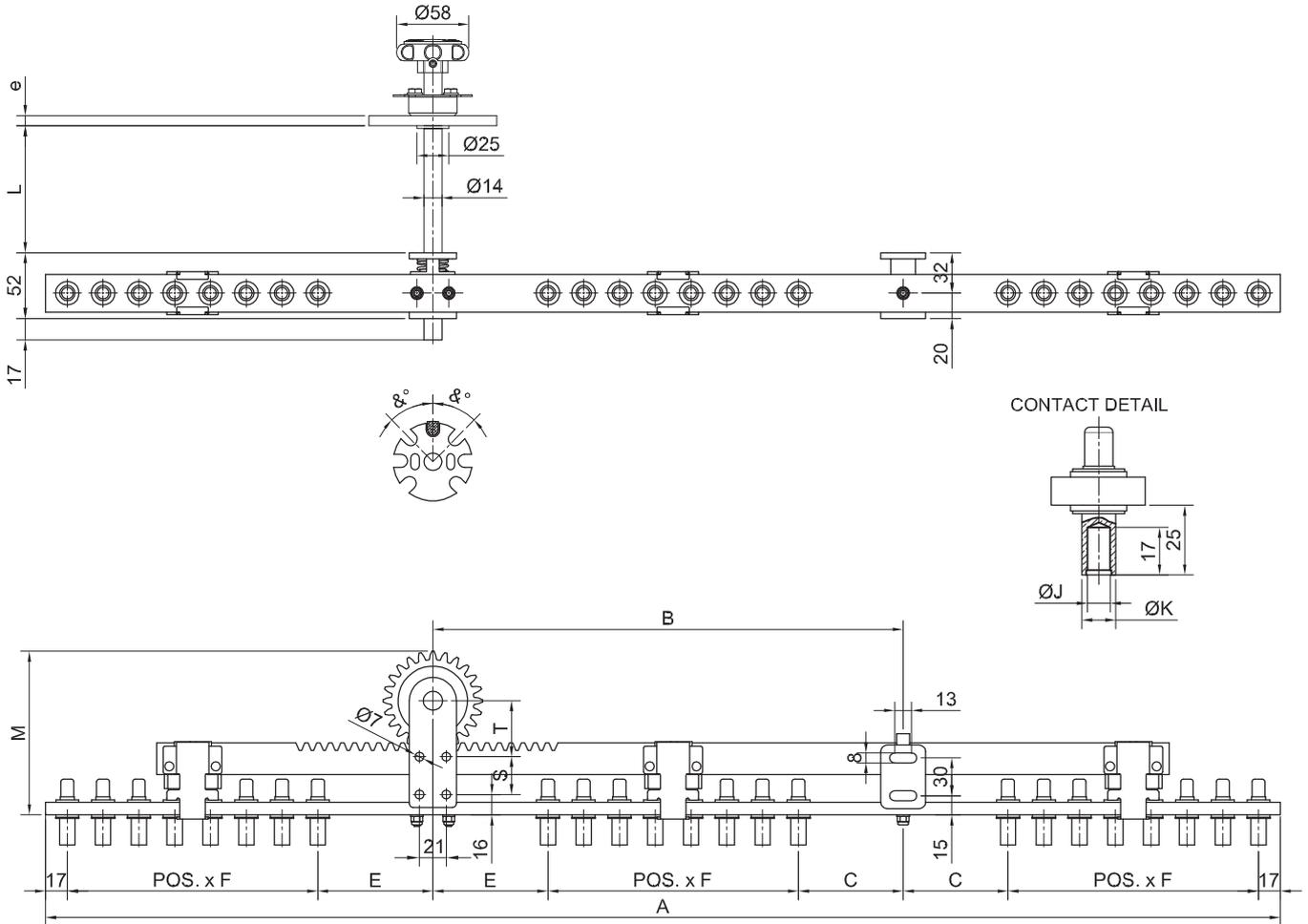
Voltage class kV	Current A	Number of positions	A	B	D	E	G	I	F	X min.	M	L	e	Unit No 120A J:8.1 K:12
10	120	3	518	307	86	67	48	48	28	48	32	Please quote when ordering		TCZ31A43
		4	630	363	114	67	48	48	28	48	32			TCZ31A44
		5	742	419	142	67	48	48	28	48	32			TCZ31A45
20	120	3	587	364	86	90	71	71	28	48	32			TCZ31C43
		4	699	420	114	90	71	71	28	48	32			TCZ31C44
		5	811	476	142	90	71	71	28	48	32			TCZ31C45
30	120	3	675	440	86	130	95	95	28	88	32			TCZ31D43
		4	787	496	114	130	95	95	28	88	32			TCZ31D44
		5	899	552	142	130	95	95	28	88	32			TCZ31D45



Voltage class kV	Current A	Number of positions	A	B	C	D	E	G	F	M	L	e	Unit No 120A J:8.1 K:12
10	120	3	578	474	59	86	67	48	28	32	Please quote when ordering		TCZ33A43
		4	690	558	59	114	67	48	28	32			TCZ33A44
		5	802	642	59	142	67	48	28	32			TCZ33A45
20	120	3	670	566	82	86	90	71	28	32			TCZ33C43
		4	782	650	82	114	90	71	28	32			TCZ33C44
		5	894	734	82	142	90	71	28	32			TCZ33C45
30	120	3	798	694	122	86	130	95	28	32			TCZ33D43
		4	910	778	122	114	130	95	28	32			TCZ33D44
		5	1022	862	122	142	130	95	28	32			TCZ33D45



Voltage class kV	Current A	Number of positions	A	B	C	E	I	F	X min.	M	L	e	Unit No 120A J:8.1 K:12
10	120	3	468	175	67	67	48	28	48	32	Please quote when ordering		TCZ32A43
		4	552	203	67	67	48	28	48	32			TCZ32A44
		5	636	231	67	67	48	28	48	32			TCZ32A45
20	120	3	537	209	90	90	71	28	48	32			TCZ32C43
		4	621	237	90	90	71	28	48	32			TCZ32C44
		5	705	265	90	90	71	28	48	32			TCZ32C45
30	120	3	641	261	130	130	95	28	88	32			TCZ32D43
		4	725	289	130	130	95	28	88	32			TCZ32D44
		5	809	317	130	130	95	28	88	32			TCZ32D45

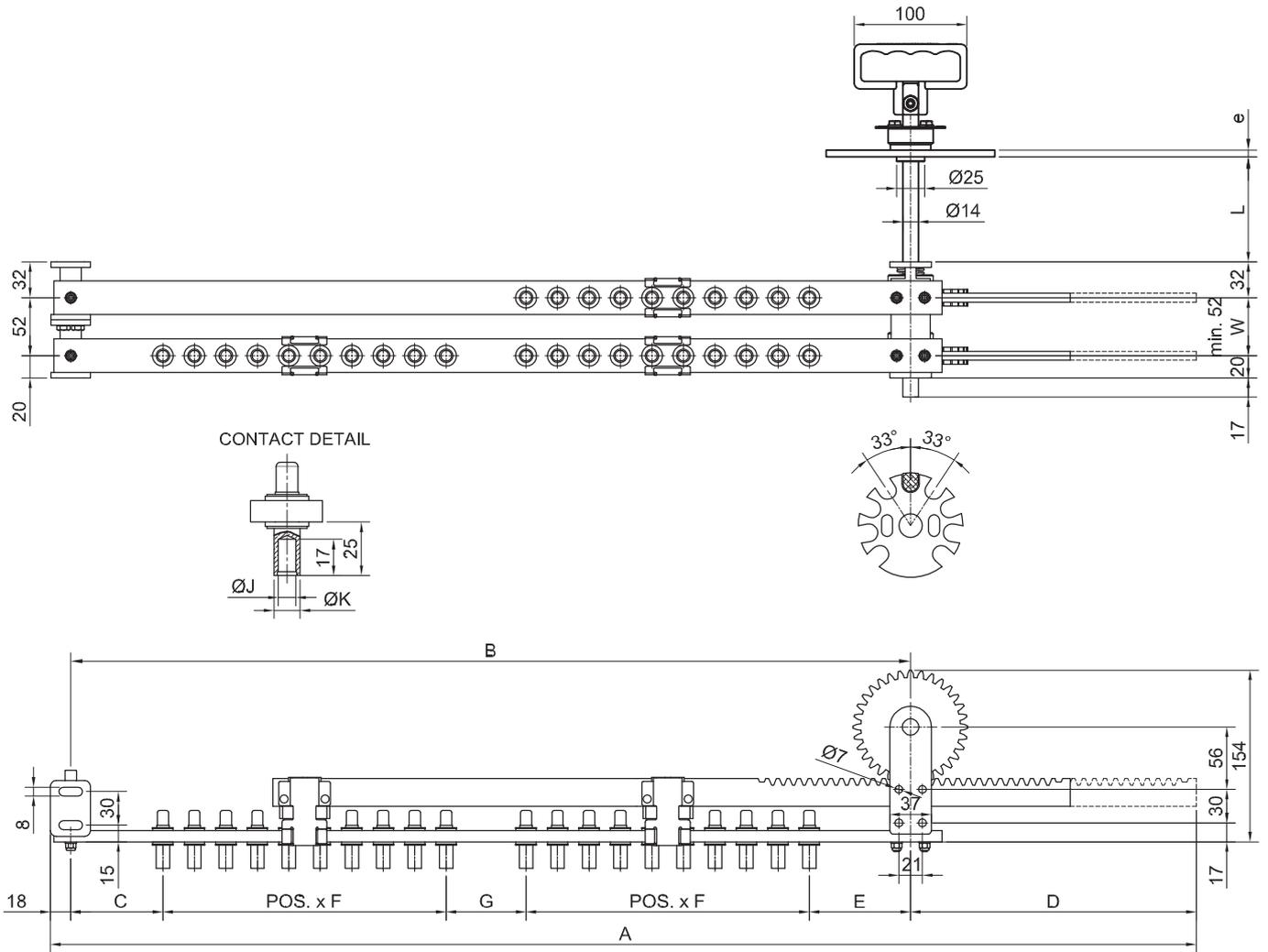


Voltage class kV	Current A	Number of positions	A	B	C	E	S	T	M	F	&°	L	e	Unit No 120A J:8.1 K:12
10	120	6	790	294	59	67	30	44	129.5	28	44.3°	Please quote when ordering		TCZ34A46
		7	874	322	59	67	30	44	129.5	28	44.3°			TCZ34A47
		8	958	350	59	67	30	56	152.5	28	33°			TCZ34A48
		9	1042	378	59	67	30	56	152.5	28	33°			TCZ34A49
		10	1126	406	59	67	30	56	152.5	28	33°			TCZ34A4A
		11	1210	434	59	67	30	56	152.5	28	33°			TCZ34A4B
20	120	6	882	340	82	90	30	44	129.5	28	44.3°			TCZ34C46
		7	966	368	82	90	30	44	129.5	28	44.3°			TCZ34C47
		8	1050	396	82	90	30	56	152.5	28	33°			TCZ34C48
		9	1134	424	82	90	30	56	152.5	28	33°			TCZ34C49
		10	1218	452	82	90	30	56	152.5	28	33°			TCZ34C4A
		11	1302	480	82	90	30	56	152.5	28	33°			TCZ34C4B
30	120	6	1042	420	122	130	30	44	129.5	28	44.3°			TCZ34D46
		7	1126	448	122	130	30	44	129.5	28	44.3°			TCZ34D47
		8	1210	476	122	130	30	56	152.5	28	33°			TCZ34D48
		9	1294	504	122	130	30	56	152.5	28	33°			TCZ34D49
		10	1378	532	122	130	30	56	152.5	28	33°			TCZ34D4A
		11	1462	560	122	130	30	56	152.5	28	33°			TCZ34D4B



TYPE PDZ THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Delta diagram
10-30kV 120A 8-11 position Special diagram. (With Aluminium Support)

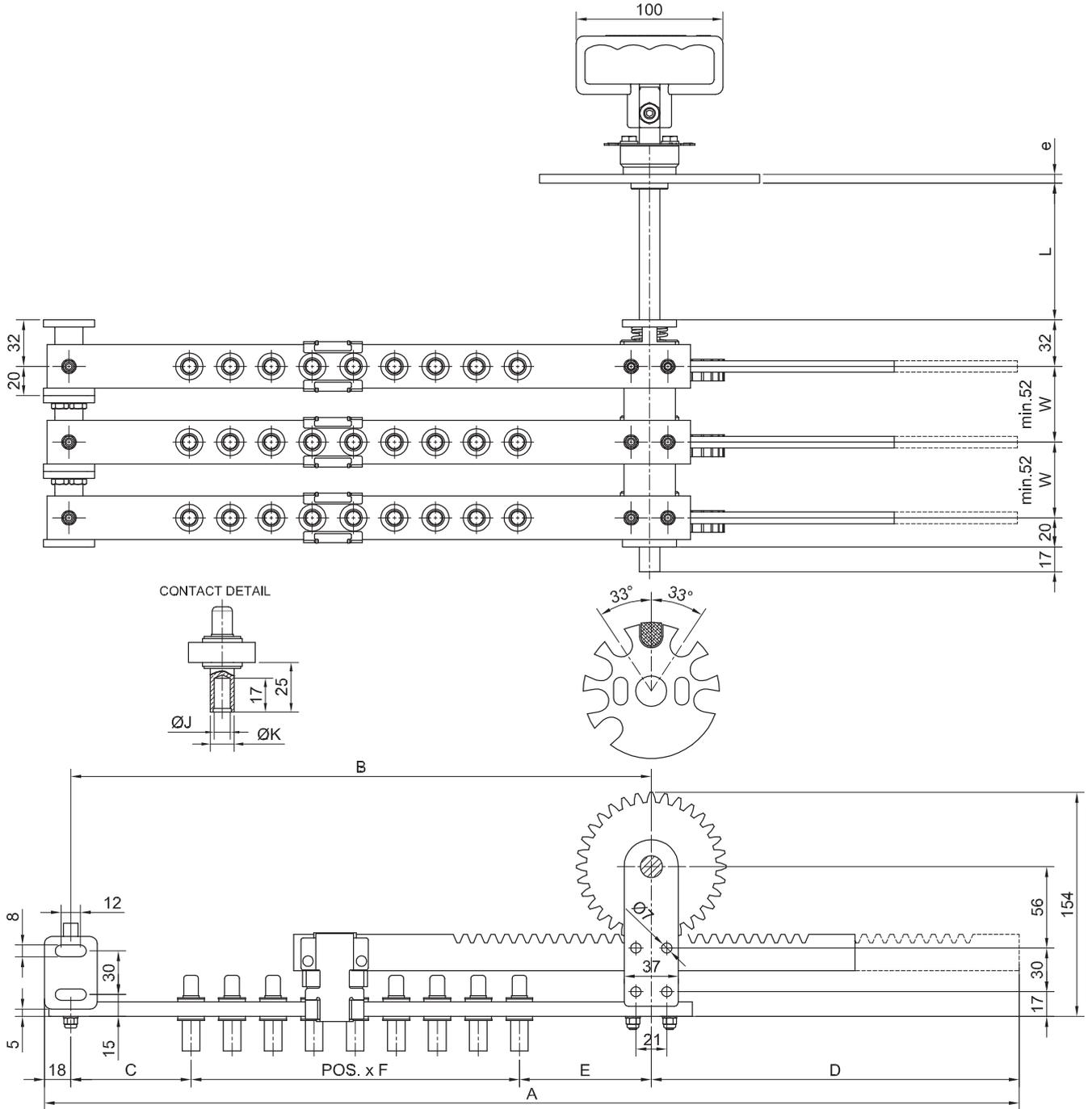


Voltage class kV	Current A	Number of positions	A	B	C	D	E	G	F	L	W	e	Unit No 120A J:8.1 K:12
10	120	8	866	622	59	251	67	48	28	Please quote when ordering			TCZ83A48
		9	950	678	59	279	67	48	28				TCZ83A49
		10	1034	734	59	307	67	48	28				TCZ83A4A
		11	1118	790	59	335	67	48	28				TCZ83A4B
20	120	8	935	691	82	251	90	71	28				TCZ83C48
		9	1019	414	82	279	90	71	28				TCZ83C49
		10	1103	803	82	307	90	71	28				TCZ83C4A
		11	1187	859	82	335	90	71	28				TCZ83C4B
30	120	8	1039	795	122	251	130	95	28				TCZ83D48
		9	1123	851	122	279	130	95	28				TCZ83D49
		10	1207	907	122	307	130	95	28				TCZ83D4A
		11	1291	963	122	335	130	95	28				TCZ83D4B



TYPE PDZ THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Delta diagram
10-30kV 120A 8-11 position Special diagram. (With Aluminium Support)



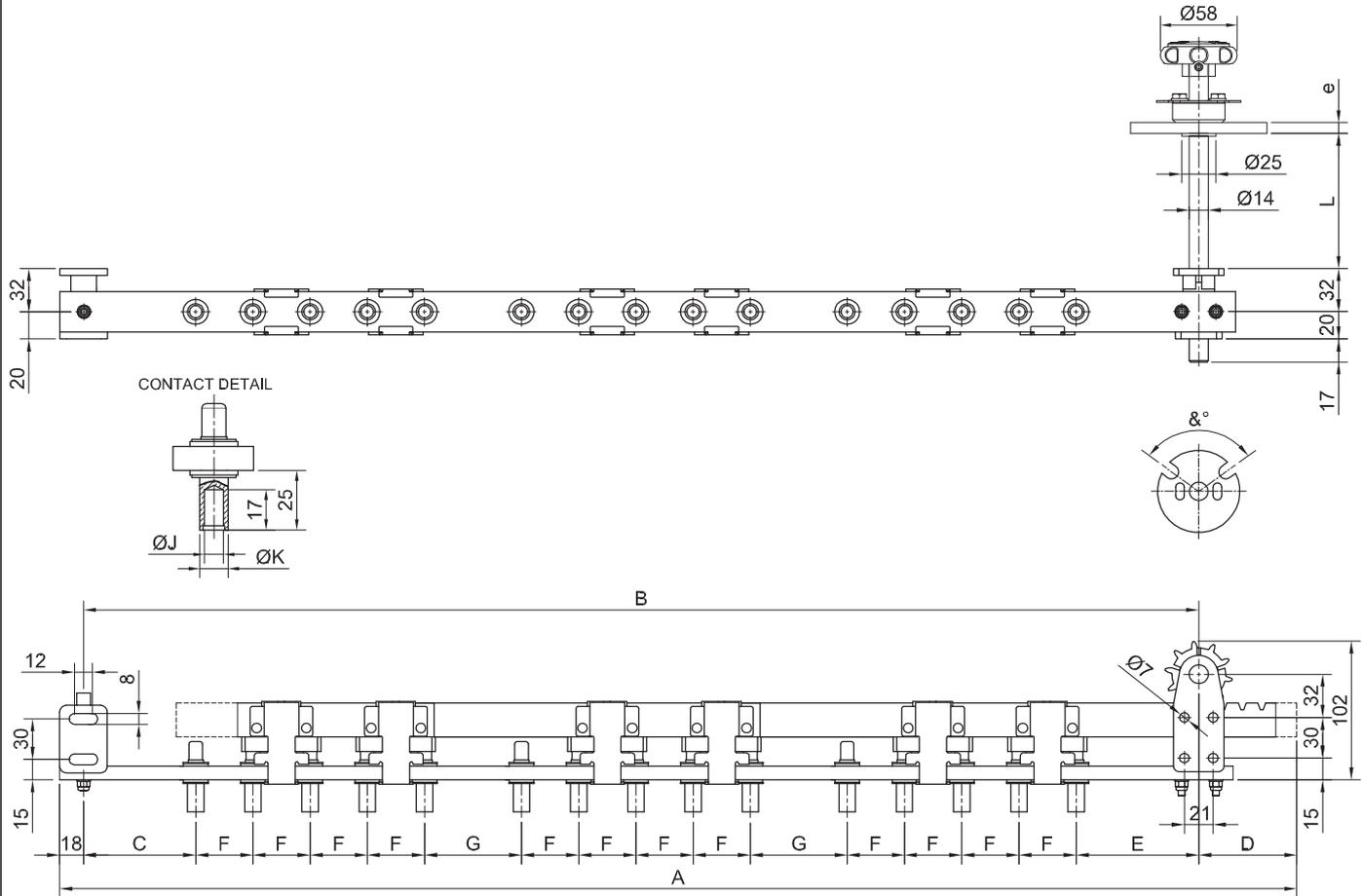
Voltage class kV	Current A	Number of positions	A	B	C	D	E	F	L	W	e	Unit No 120A J:8.1 K:12
10	120	8	619	350	59	251	67	28	Please quote when ordering			TCZ3X13A48
		9	675	378	59	279	67	28				TCZ3X13A49
		10	721	406	59	307	67	28				TCZ3X13A4A
		11	777	434	59	335	67	28				TCZ3X13A4B
20	120	8	665	396	82	251	90	28				TCZ3X13C48
		9	721	424	82	279	90	28				TCZ3X13C49
		10	777	452	82	307	90	28				TCZ3X13C4A
		11	833	480	82	335	90	28				TCZ3X13C4B
30	120	8	745	476	122	251	130	28				TCZ3X13D48
		9	801	504	122	279	130	28				TCZ3X13D49
		10	857	532	122	307	130	28				TCZ3X13D4A
		11	913	560	122	335	130	28				TCZ3X13D4B



DEMIRMAKINE
BEST COMPLEMENT OF TRANSFORMERS

TYPE PDZ THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Series parallel coupling up the to 25-30kV 120A (With Aluminium Support)

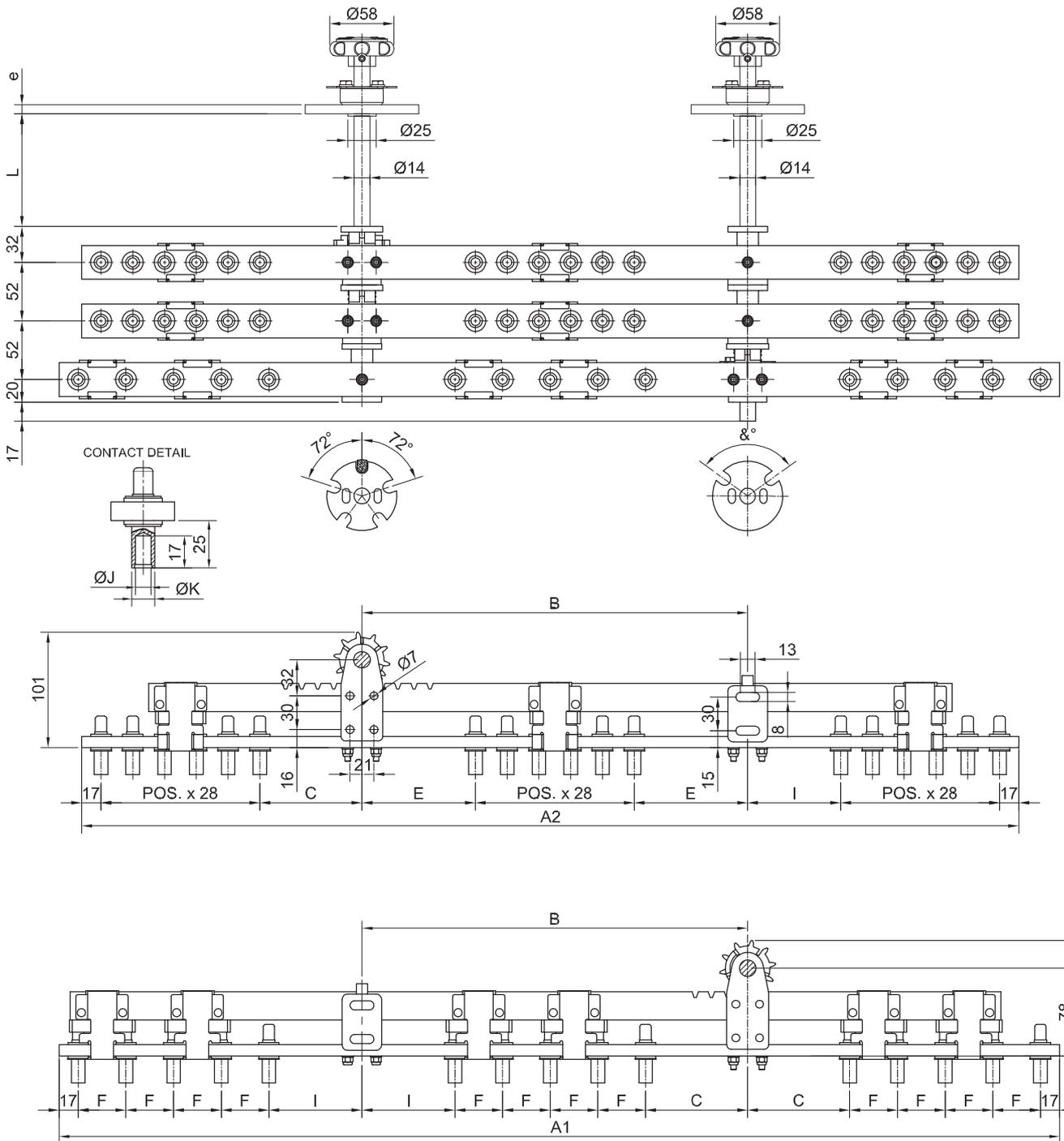


Voltage class kV	Current A	A	B	C	D	E	F	G	&°	L	e	Unit No 120A J:8.1 K:12
5-10	120	833	743	68	72	75	42	48	108°	Please quote when ordering		TCZ63E42
10-20		908	818	82	72	90	42	71	108°			TCZ63F42
25-30		1127	1030	122	79	130	49	95	126°			TCZ63I42

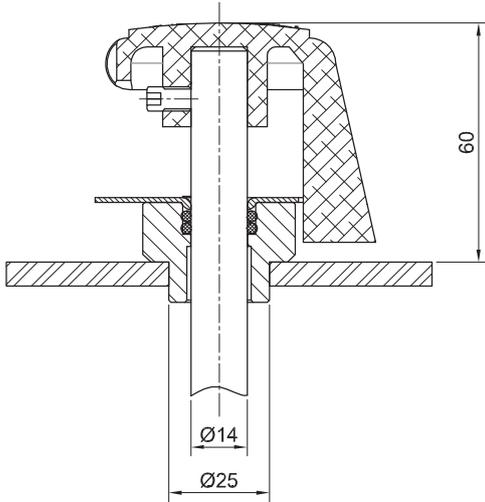


TYPE PDZ THREEPHASE TAP CHANGER

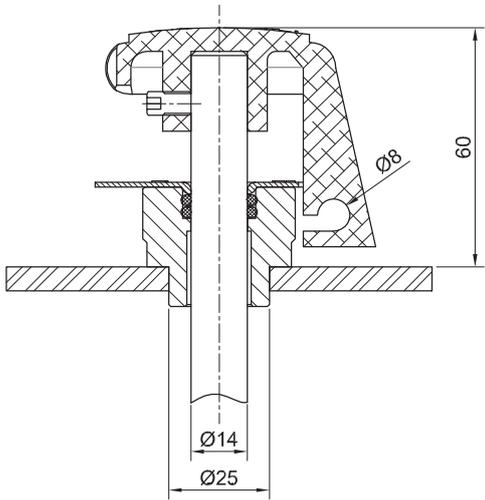
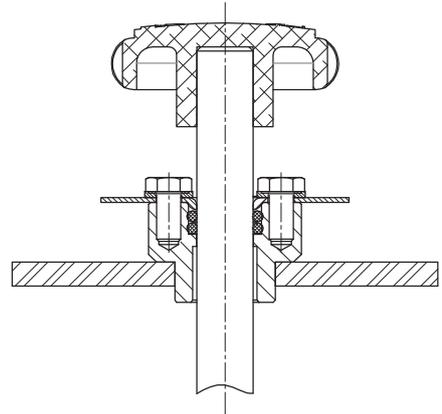
Off-circuit operation can be used in oil Series parallel coupling 10-30/25-30kV 120A
2 Delta settings 20-30kV120A (With Aluminium Support)



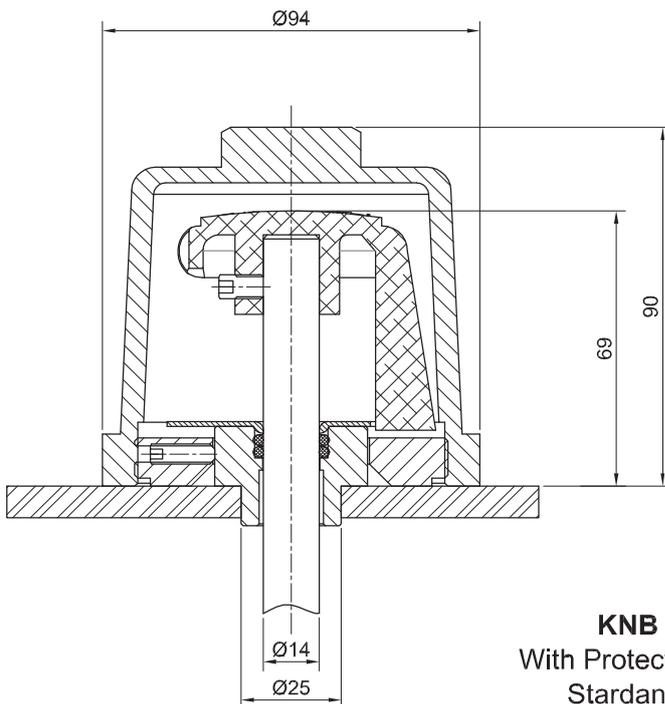
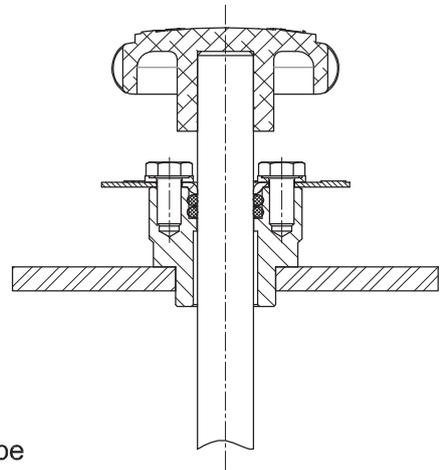
Voltage Class kV		Current A	Number of Positions	A1	A2	B	C	E	I	F	&°	L	e	Unit No
Series Parallel	Delta													
10-20	20	120	3	882	714	340	90	128	82	42	108°	Please quote when ordering		TCZD4F43
			4	882	770	340	90	114	82	42	108°			TCZD4F44
			5	882	826	340	90	100	82	42	108°			TCZD4F45
25-30	30	120	3	1126	902	448	130	182	122	49	126°	Please quote when ordering		TCZD4I43
			4	1126	958	448	130	168	122	49	126°			TCZD4I44
			5	1126	1014	448	130	154	122	49	126°			TCZD4I45



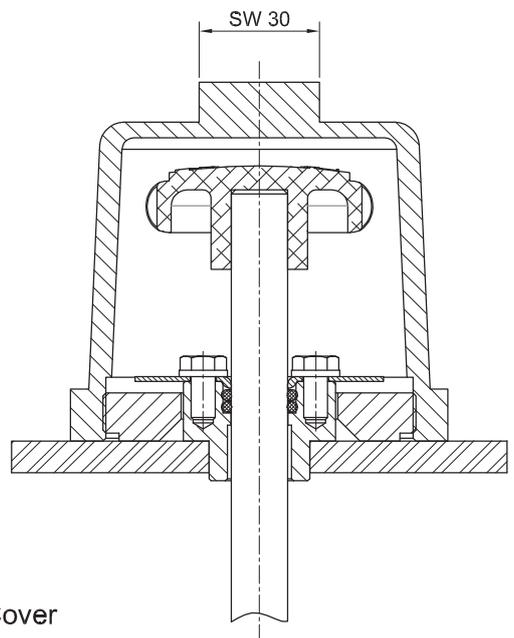
KNB 200
Stardant Type

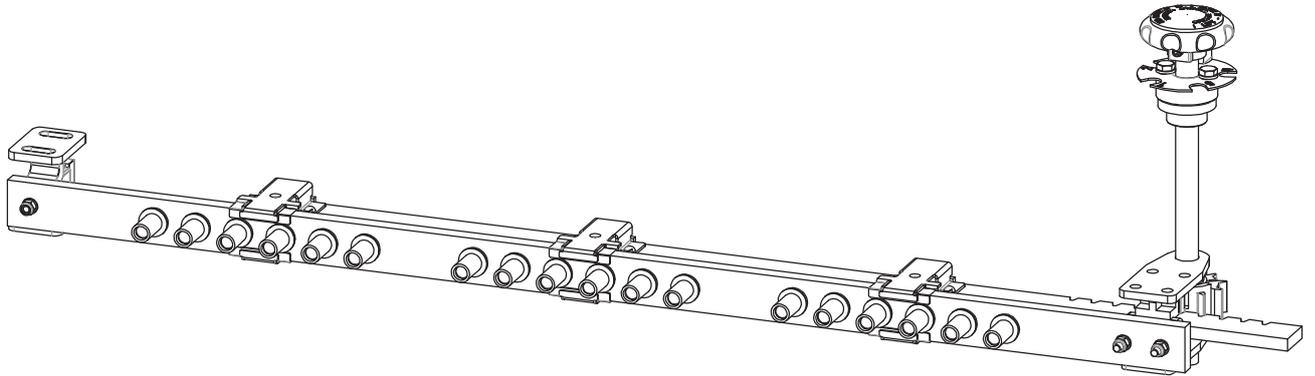


KNB 202
Padlockable Type

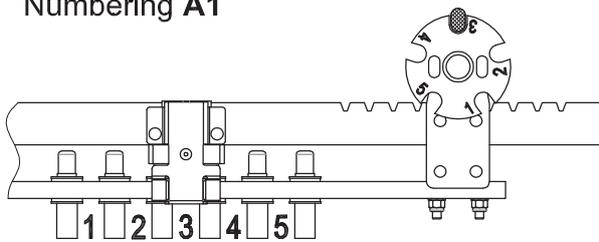


KNB 203
With Protective Cover
Stardant Type

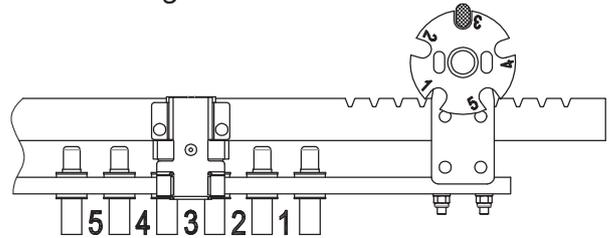




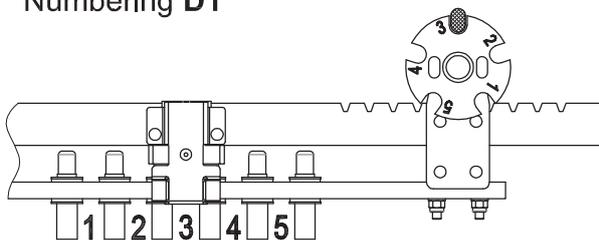
Numbering A1



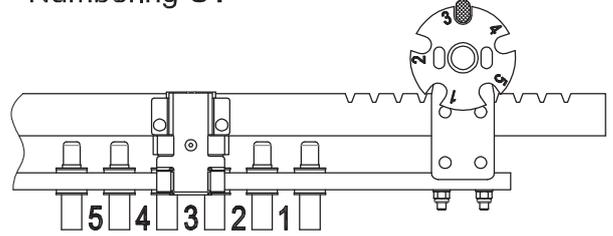
Numbering B1

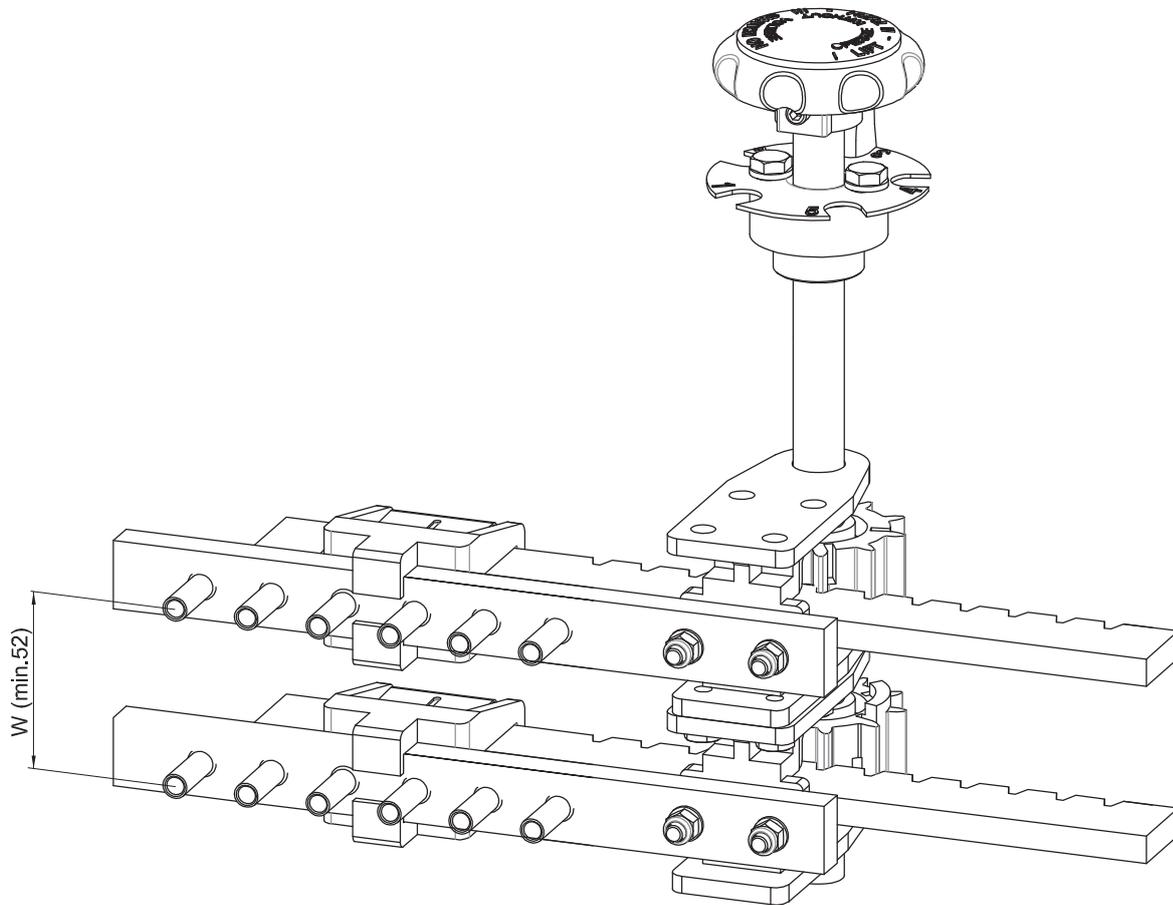


Numbering D1



Numbering C1





All the standard series horizontal tap changers can be paired by superimposing several tap changers whose purpose-built steel brackets are assembled by nuts and bolts.

Depending on which system is adopted, the user can:

- either operate the tap changers with one shaft
- or operate part of the tap changers with one shaft and the other part with a second shaft.

If so, please specify the position of the coupling shaft and of the setting shaft.

Note: When ordering, it is essential not to omit dimension "W" the minimum value of which to be set in each case depends on the insulation conditions and on the position of the various tap changers.

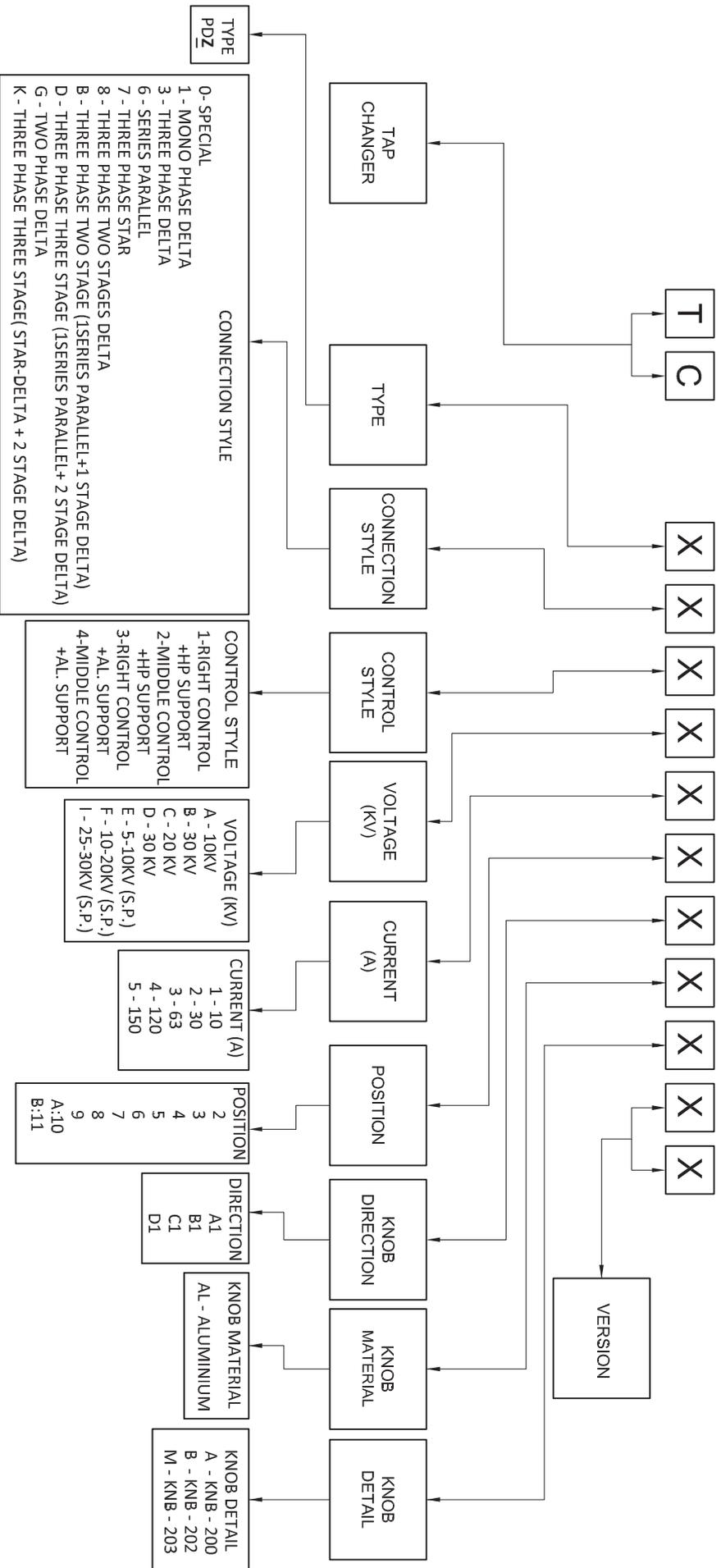
WHEN ORDERING PLEASE QUOTE

- 1- The tap changer unit no.
- 2- The voltage class current and type of setting or coupling.
- 3- The service voltages and test voltages at industrial frequency (50 Hz) and on impulse (1/50), on the earth, across phases, across contact of the same phase, across contact and common output.
- 4- Control device no.
- 5- The language on the control device.
- 6- Number of positions.
- 7- The indication of the repeater disc (A1, B1,C1, D1)
- 8- Dimensions of the fixed contacts (J and K)
- 9- L, e, X, W dimensions from the tables.

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



PDZ CODE PLAN





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 91 and 131 mm. Driving mechanism can be either on the edge or in the middle of the phases. Connection diagrams in page PDM 2 can be applied in any variation to all types. These tap changers are bolted together with supports, under transformer cover and allow strong construction.

ASSEMBLY

A notch is provided to mark each position. For operation, the notch must be released by applying an axial pull on the control knob. Once the knob is in the desired position it will drop into the respective space by the help of a high tension spring. This process is clearly marked on control knob as;

“ LIFT – TURN – 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.

Aluminum Parts : GAISi12Cu

Brass Parts : CuZn40Pb2 Ms 60 F34 DIN 17673

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.

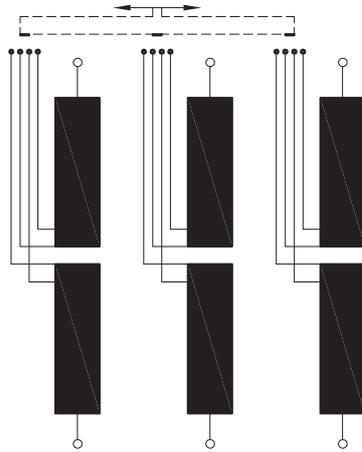
CURRENT

CURRENT	CONTACT INNER DIA (for cable connection)
30 A	Ø 3.1 mm
63 A	Ø 5.1 mm
120 A	Ø 8.1 mm

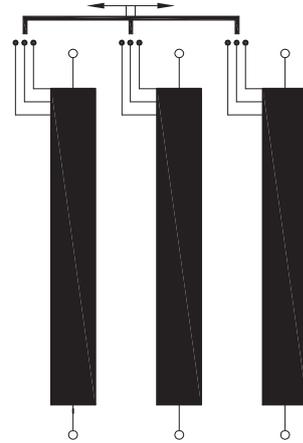
VOLTAGE CLASS

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

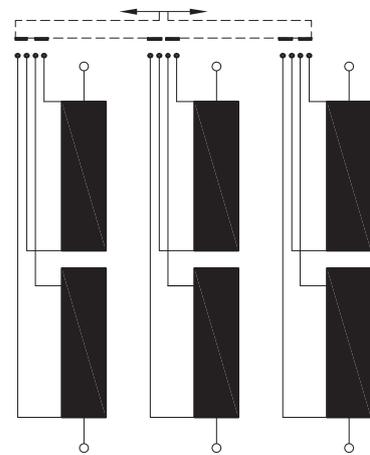
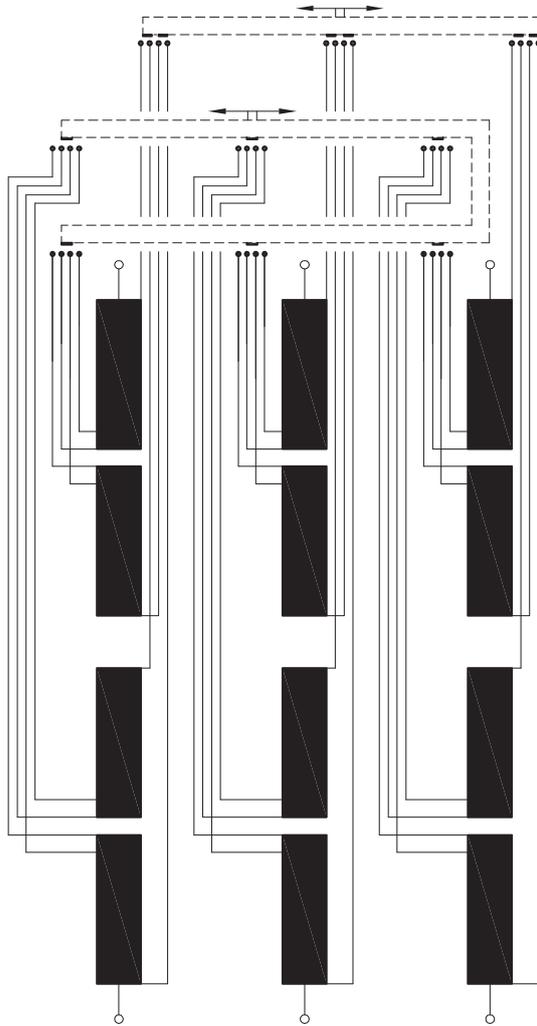
Other B.I.L. values are also available upon customer request.



Setting for delta transformer



Setting for star transformer



Series - parallel coupling

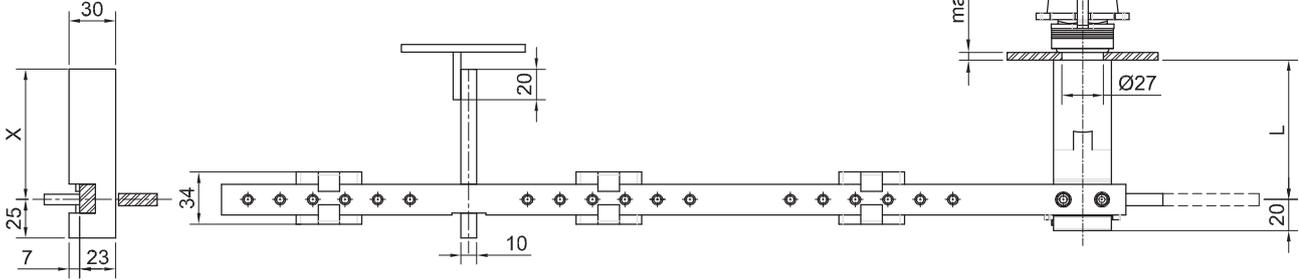
- Typical combination :**
- 1 stage, series - parallel coupling
 - 2 stage, delta diagram - setting $\pm 2,5\%$.



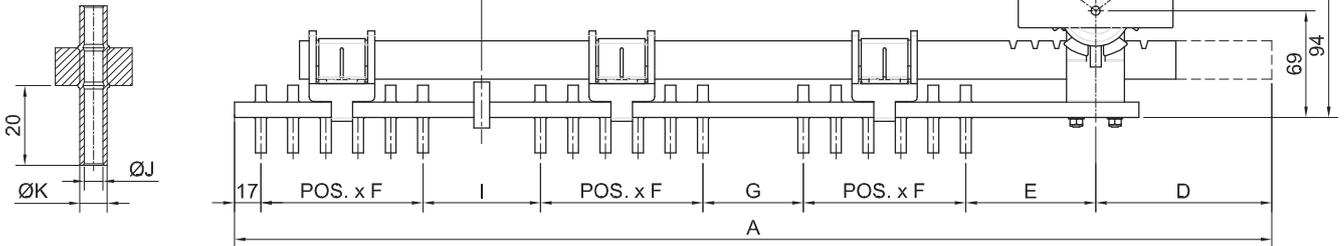
TYPE PDM THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil
Delta diagram 20-30kV 30-63A 3-7 positions

HANGER DETAIL



CONTACT DETAIL

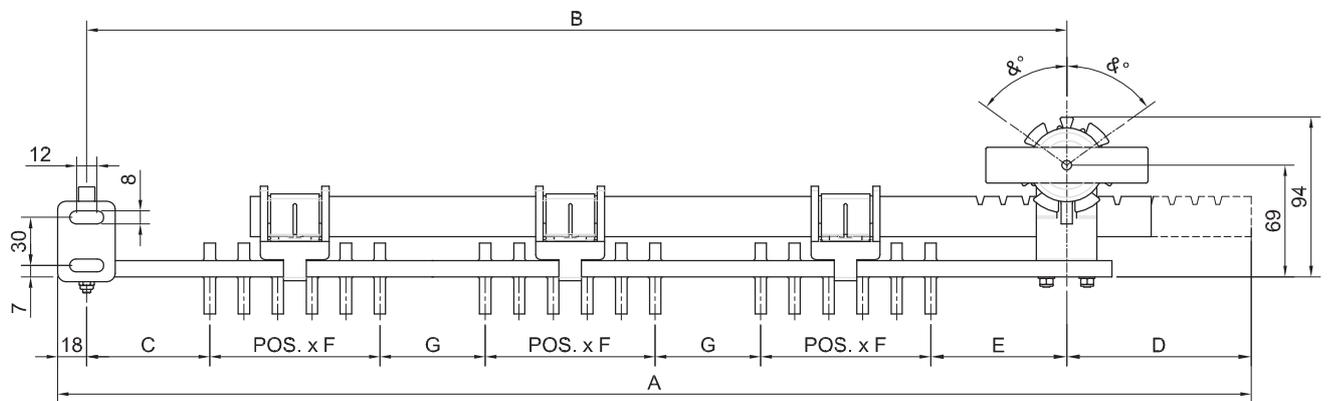
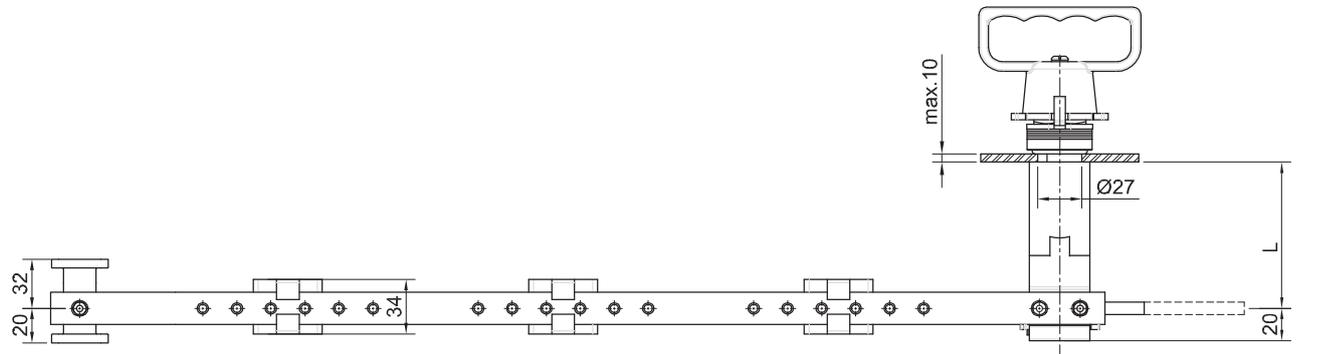


Voltage class kV	Number of positions	A	B	D	E	F	G	I	°	Unit No			
										30A J:3.1 K:5		63A J:5.1 K:7	
										L=91	L=131	L=91	L=131
										X=85	X=120	X=85	X=120
20	3	503	313	72	84	21	65	76	54°	TCM31C23A	TCM31C23B	TCM31C33A	TCM31C33B
	4	587	355	93	84	21	65	76	54°	TCM31C24A	TCM31C24B	TCM31C34A	TCM31C34B
	5	671	397	114	84	21	65	76	54°	TCM31C25A	TCM31C25B	TCM31C35A	TCM31C35B
	6	755	439	135	84	21	65	76	54°	TCM31C26A	TCM31C26B	TCM31C36A	TCM31C36B
	7	839	481	156	84	21	65	76	54°	TCM31C27A	TCM31C27B	TCM31C37A	TCM31C37B
30	3	583	386	72	125	21	90	90	54°	TCM31D23A	TCM31D23B	TCM31D33A	TCM31D33B
	4	667	428	93	125	21	90	90	54°	TCM31D24A	TCM31D24B	TCM31D34A	TCM31D34B
	5	751	470	114	125	21	90	90	54°	TCM31D25A	TCM31D25B	TCM31D35A	TCM31D35B
	6	835	512	135	125	21	90	90	54°	TCM31D26A	TCM31D26B	TCM31D36A	TCM31D36B
	7	919	554	156	125	21	90	90	54°	TCM31D27A	TCM31D27B	TCM31D37A	TCM31D37B

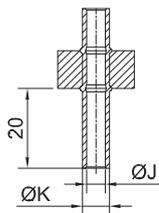


TYPE PDM THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil
Delta diagram 20-30kV 30-63A 3-7 positions



CONTACT DETAIL



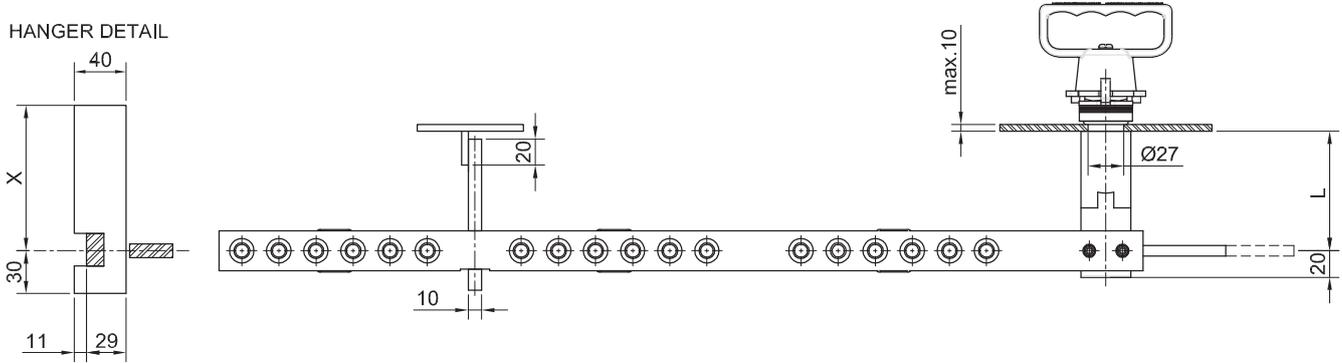
Voltage class kV	Number of positions	A	B	C	D	E	F	G	&°	Unit No			
										30A J:3.1 K:5		63A J:5.1 K:7	
										L=91 X=85	L=131 X=120	L=91 X=85	L=131 X=120
20	3	569	479	76	72	84	21	65	54°	TCM33C23A	TCM33C23B	TCM33C33A	TCM33C33B
	4	653	542	76	93	84	21	65	54°	TCM33C24A	TCM33C24B	TCM33C34A	TCM33C34B
	5	737	605	76	114	84	21	65	54°	TCM33C25A	TCM33C25B	TCM33C35A	TCM33C35B
	6	821	668	76	135	84	21	65	54°	TCM33C26A	TCM33C26B	TCM33C36A	TCM33C36B
	7	905	731	76	156	84	21	65	54°	TCM33C27A	TCM33C27B	TCM33C37A	TCM33C37B
30	3	701	611	117	72	125	21	90	54°	TCM33D23A	TCM33D23B	TCM33D33A	TCM33D33B
	4	785	674	117	93	125	21	90	54°	TCM33D24A	TCM33D24B	TCM33D34A	TCM33D34B
	5	869	737	117	114	125	21	90	54°	TCM33D25A	TCM33D25B	TCM33D35A	TCM33D35B
	6	953	800	117	135	125	21	90	54°	TCM33D26A	TCM33D26B	TCM33D36A	TCM33D36B
	7	1037	863	117	156	125	21	90	54°	TCM33D27A	TCM33D27B	TCM33D37A	TCM33D37B



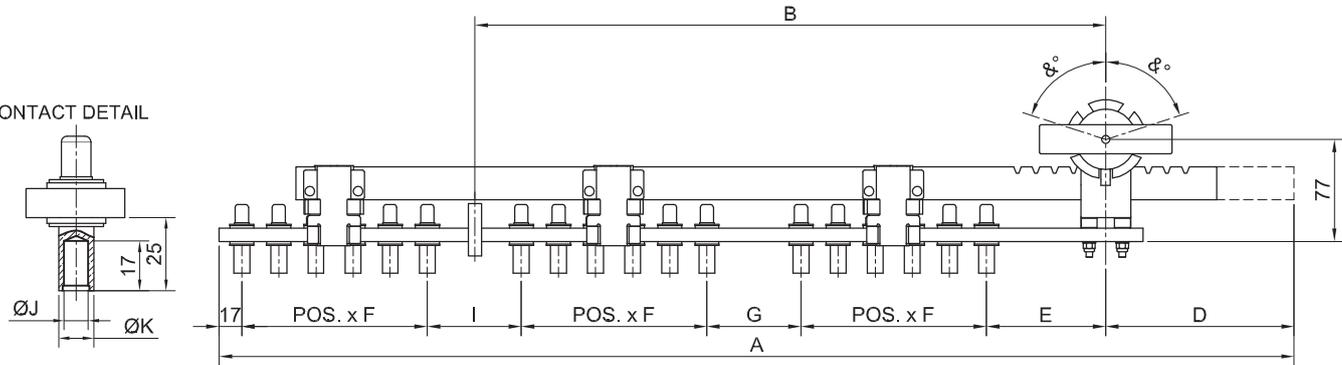
TYPE PDM THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil
Delta diagram 20-30kV 120A 3-5 positions

HANGER DETAIL



CONTACT DETAIL

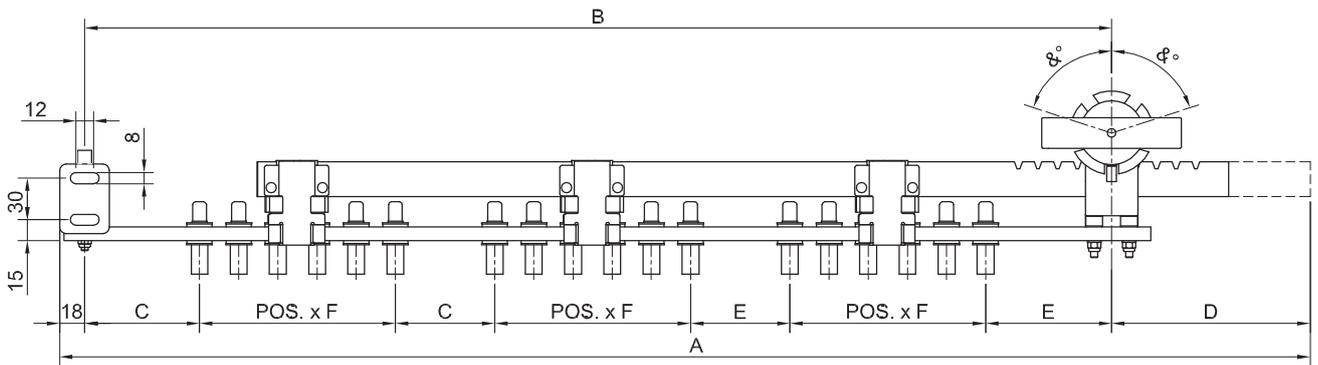
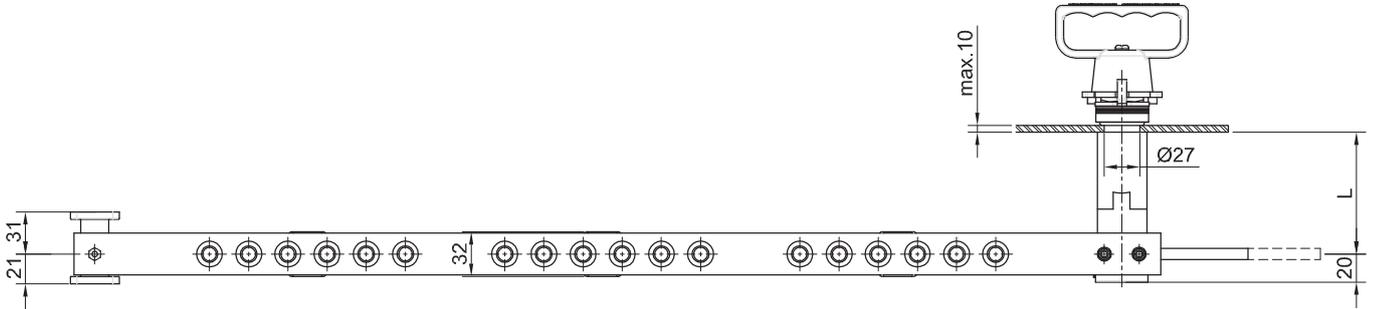


Voltage class kV	Number of positions	A	B	D	E	F	G	I	&°	Unit No	
										120A J:8.1 K:12	
										L=91 X=85	L=131 X=120
20	3	587	364	86	90	28	71	71	72°	TCM31C43A	TCM31C43B
	4	699	420	114	90	28	71	71	72°	TCM31C44A	TCM31C44B
	5	811	476	142	90	28	71	71	72°	TCM31C45A	TCM31C45B
30	3	675	440	86	130	28	95	95	72°	TCM31D43A	TCM31D43B
	4	787	496	114	130	28	95	95	72°	TCM31D44A	TCM31D44B
	5	899	552	142	130	28	95	95	72°	TCM31D45A	TCM31D45B

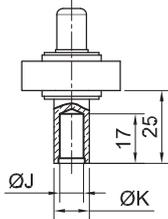


TYPE PDM THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil
Delta diagram 20-30kV 120A 3-5 positions



CONTACT DETAIL



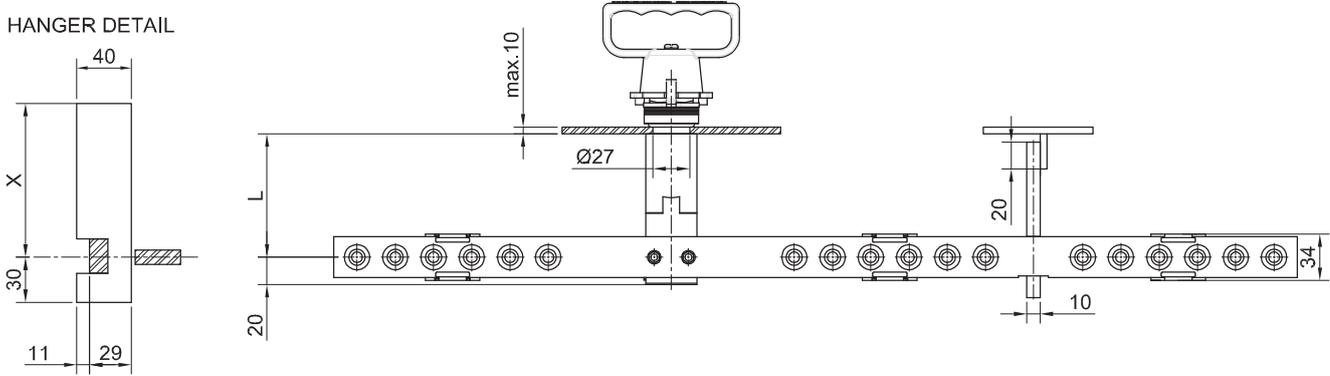
Voltage class kV	Number of positions	A	B	C	D	E	F	G	&°	Unit No	
										120A J:8.1 K:12	
										L=91 X=85	L=131 X=120
20	3	670	566	82	86	90	28	71	72°	TCM33C43A	TCM33C43B
	4	782	650	82	114	90	28	71	72°	TCM33C44A	TCM33C44B
	5	894	734	82	142	90	28	71	72°	TCM33C45A	TCM33C45B
30	3	798	694	122	86	130	28	95	72°	TCM33D43A	TCM33D43B
	4	910	778	122	114	130	28	95	72°	TCM33D44A	TCM33D44B
	5	1022	862	122	142	130	28	95	72°	TCM33D45A	TCM33D45B



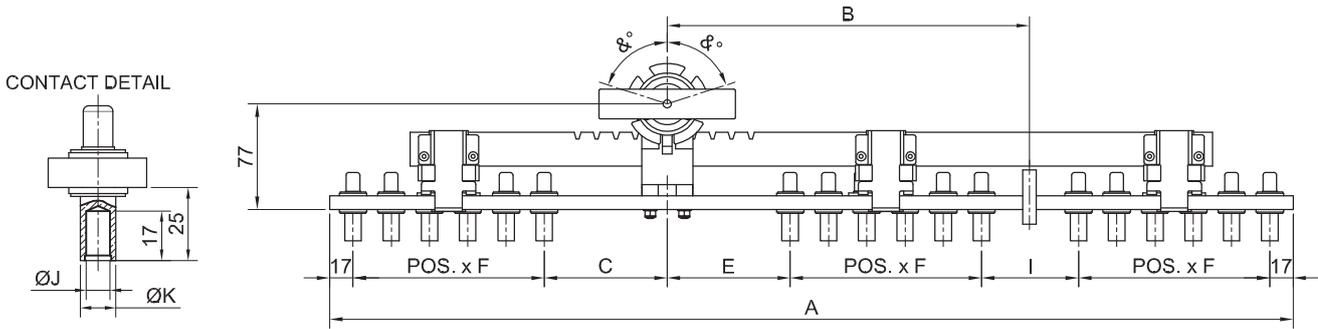
TYPE PDM THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil
Delta diagram 20-30kV 120A 3-5 positions.

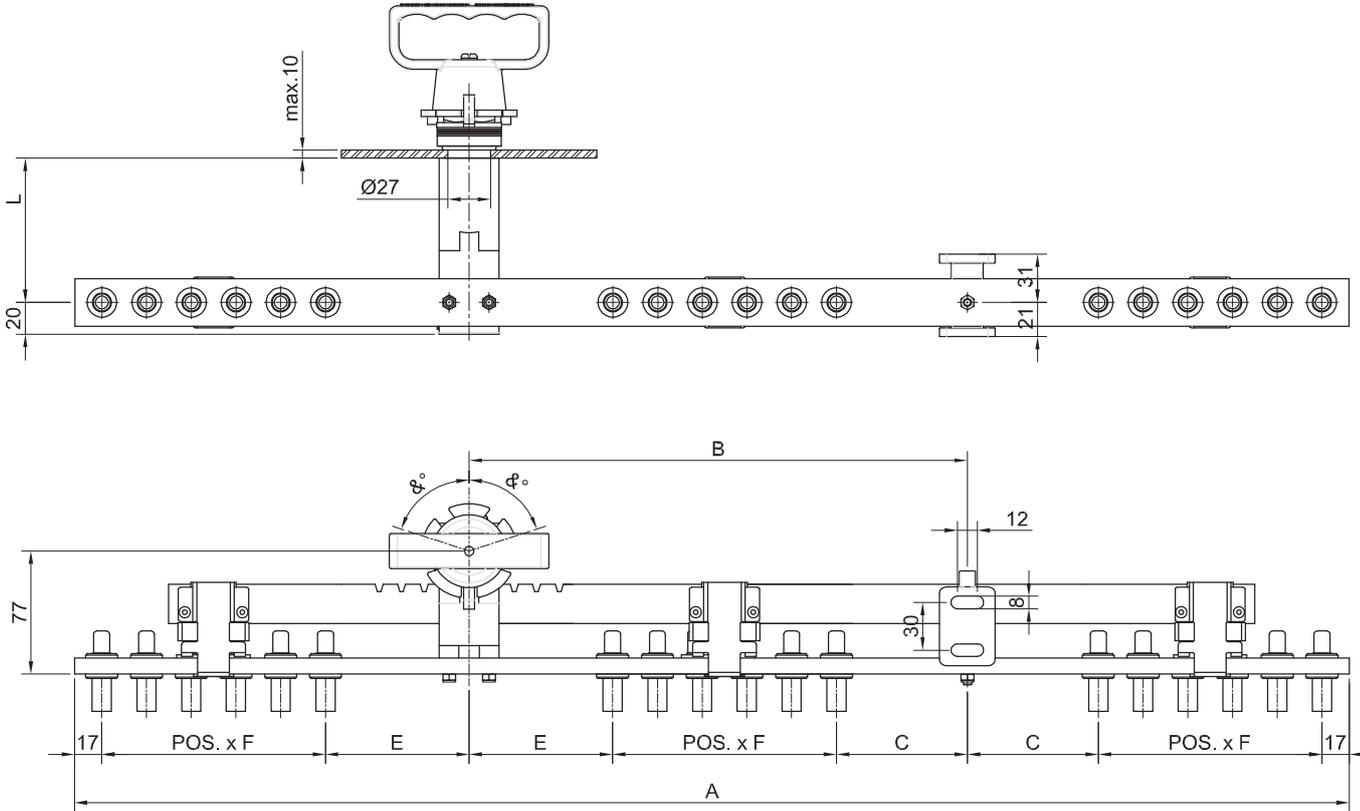
HANGER DETAIL



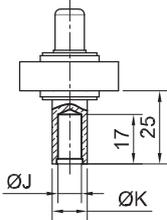
CONTACT DETAIL



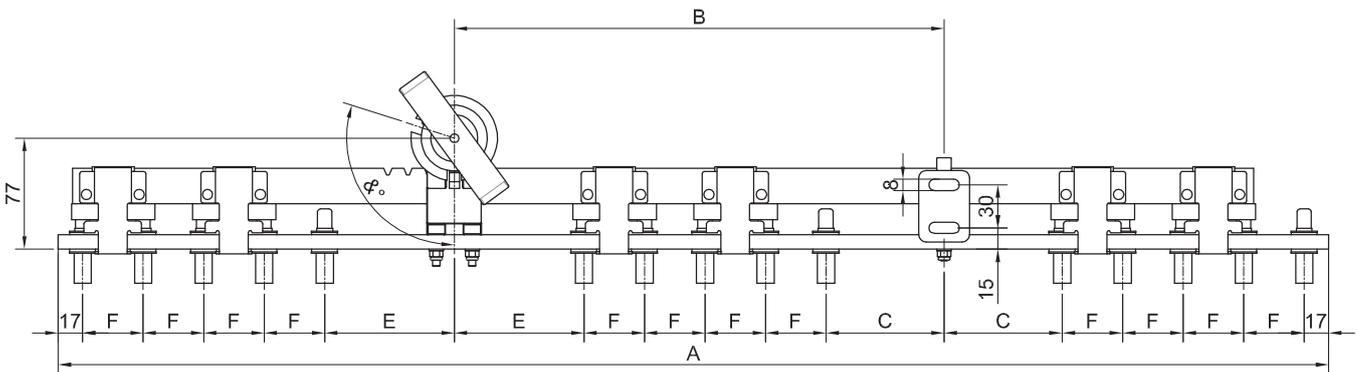
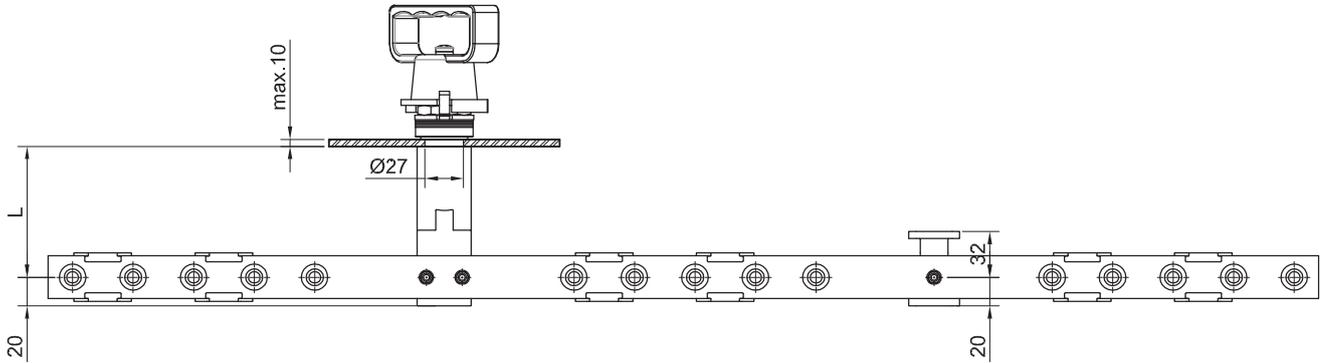
Voltage class kV	Number of positions	A	B	C	E	F	I	&°	Unit No	
									120A J:8.1 K:12	
									L=91 X=85	L=131 X=120
20	3	537	209	90	90	28	71	72°	TCM32C43A	TCM32C43B
	4	621	237	90	90	28	71	72°	TCM32C44A	TCM32C44B
	5	705	265	90	90	28	71	72°	TCM32C45A	TCM32C45B
30	3	641	261	130	130	28	95	72°	TCM32D43A	TCM32D43B
	4	725	289	130	130	28	95	72°	TCM32D44A	TCM32D44B
	5	809	317	130	130	28	95	72°	TCM32D45A	TCM32D45B



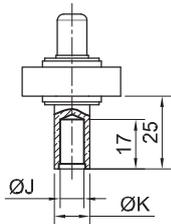
CONTACT DETAIL



Voltage class kV	Number of positions	A	B	C	E	F	&°	Unit No	
								120A J:8.1 K:12	
								L=91 X=85	L=131 X=120
20	3	630	256	82	90	28	72°	TCM34C43A	TCM34C43B
	4	714	284	82	90	28	72°	TCM34C44A	TCM34C44B
	5	798	312	82	90	28	72°	TCM34C45A	TCM34C45B
30	3	790	336	122	130	28	72°	TCM34D43A	TCM34D43B
	4	874	364	122	130	28	72°	TCM34D44A	TCM34D44B
	5	958	392	122	130	28	72°	TCM34D45A	TCM34D45B



CONTACT DETAIL



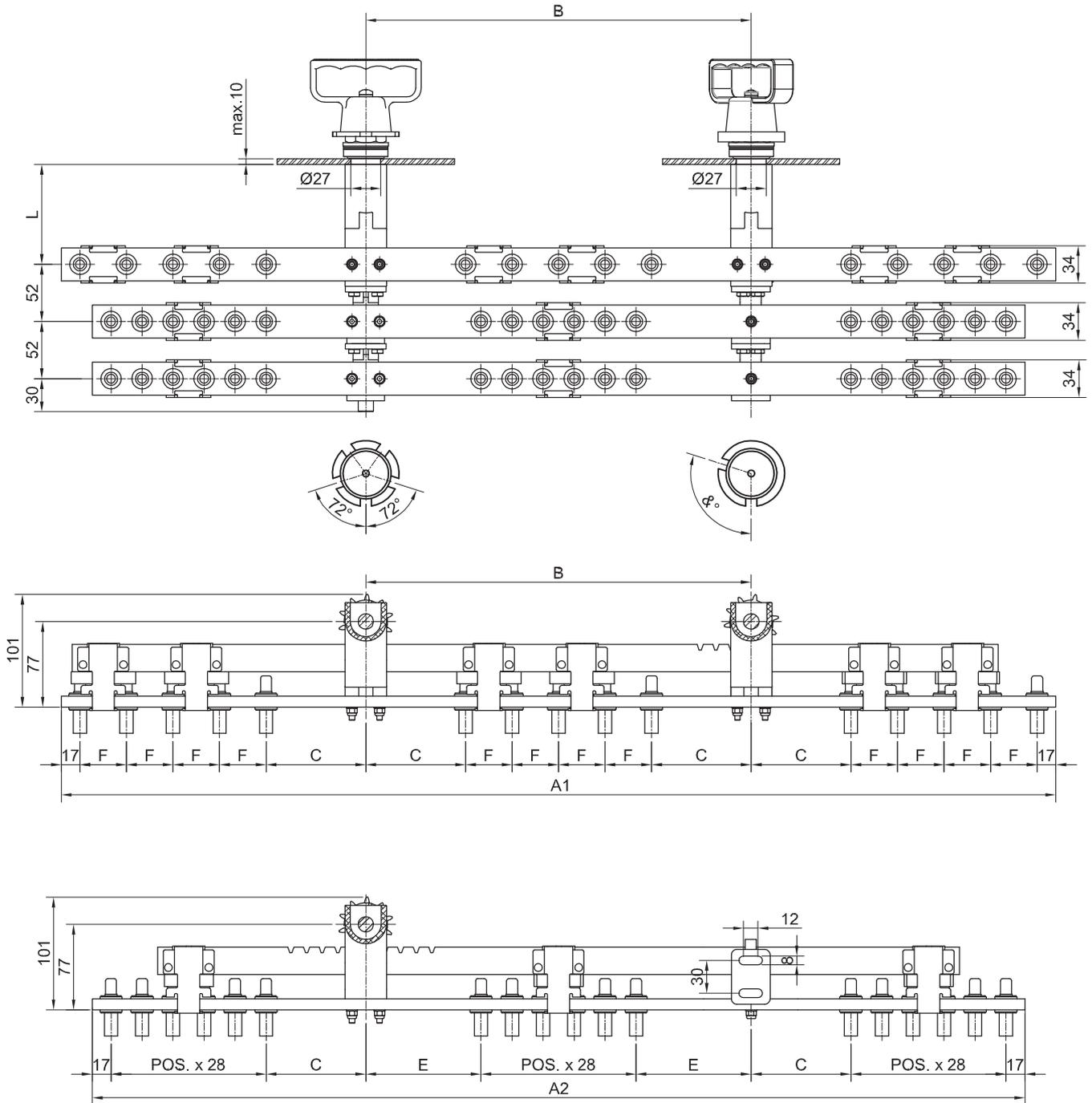
Voltage class kV	Current A	A	B	C	E	F	&°	Unit No 120A J:8.1 K:12	Unit No 120A J:8.1 K:12
								L=91	L=131
10-20	120	882	340	82	90	42	108°	TCM64F42A	TCM64F42B
25-30		1126	448	122	130	49	126°	TCM64I42A	TCM64I42B



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BEST COMPLEMENT OF TRANSFORMERS

TYPE PDM THREEPHASE TAP CHANGER

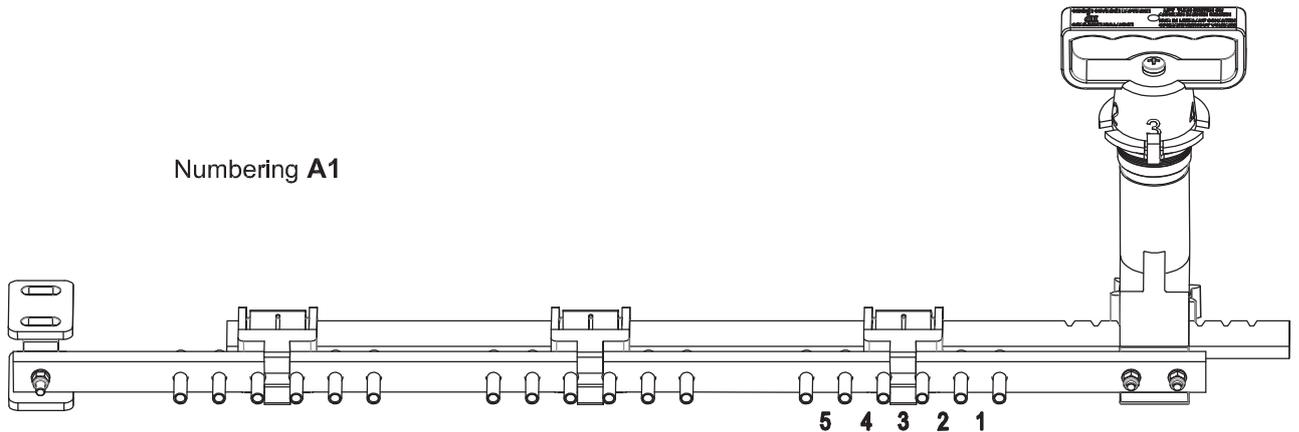
Off-circuit operation can be used in oil 1. Series parallel coupling
10-20/25-30kV 120A 2. Delta settings 20-30kV120A.



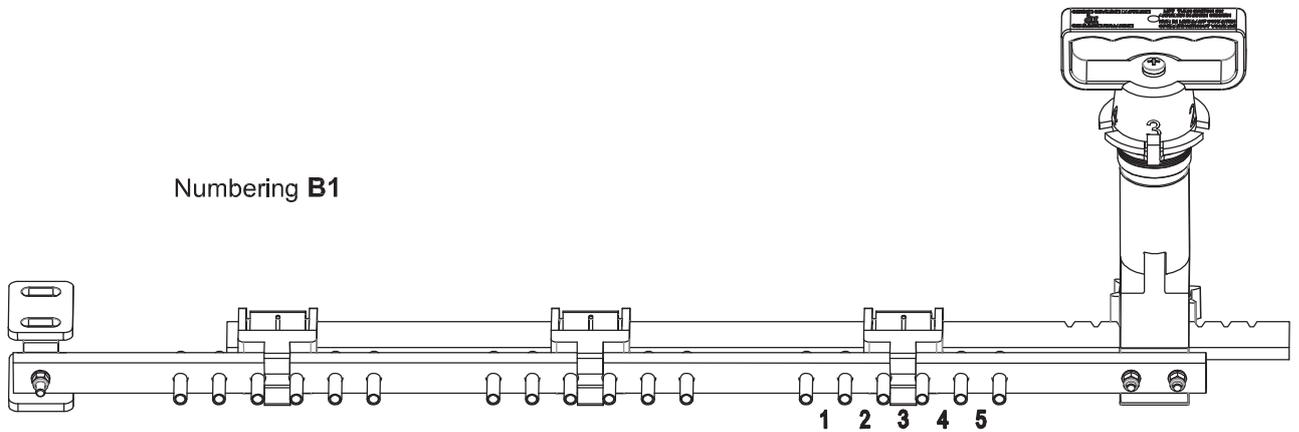
Voltage Class kV		Number of Positions	A1	A2	B	C	E	F	°rees	Unit No 120A J:8.1 K:12	
Series Parallel	Delta									L:91	L:131
10-20	20	3	898	730	348	90	132	42	108°	TCMD4F43A	TCMD4F43B
		4	898	786	348	90	118	42	108°	TCMD4F44A	TCMD4F44B
		5	898	842	348	90	104	42	108°	TCMD4F45A	TCMD4F45B
25-30	30	3	1142	918	456	130	186	49	126°	TCMD4I43A	TCMD4I43B
		4	1142	974	456	130	172	49	126°	TCMD4I44A	TCMD4I44B
		5	1142	1030	456	130	158	49	126°	TCMD4I45A	TCMD4I45B



Numbering A1



Numbering B1



All type PDM tap changers can be paired by superimposing several tap changers whose purpose-built steel brackets are assembled by nuts and bolts.

Depending on the diagram adopted, the user can:

- either operate the tap changers with one shaft,
- or operate part of the tap changers with one shaft, and the other part with another

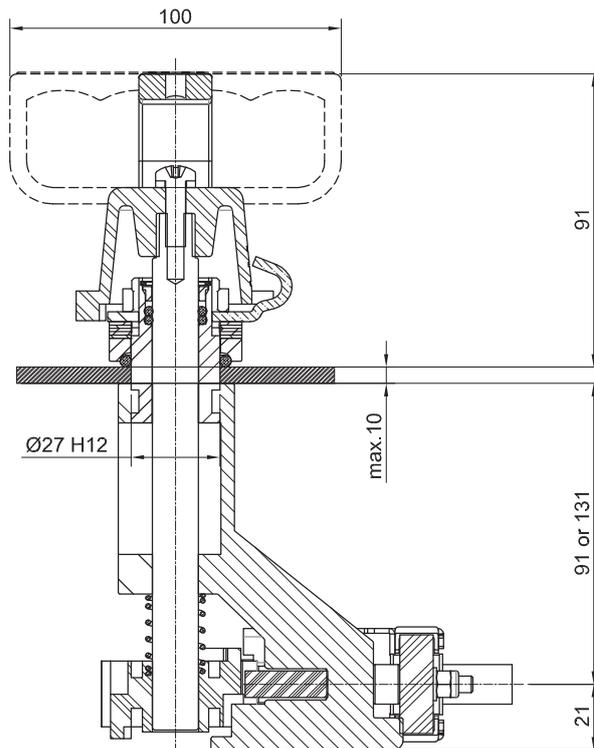
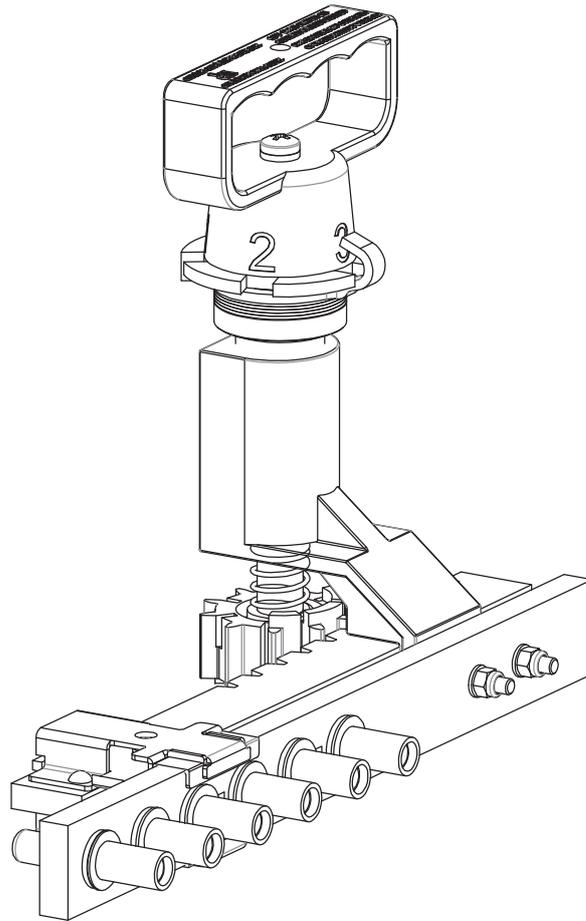
If doing so, specify the position of the coupling taps shaft and the position of the setting taps shaft.

Note :It is essential, when ordering, to quote dimension "W" the minimum of which to be set in each case depends on the insulation conditions and on the position of the different tap changers.

WHEN ORDERING PLEASE QUOTE

- 1- The 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)
- 7- Dimensions of the fixed contacts (J and K)
- 8- L,e,X,W dimensions from the tables

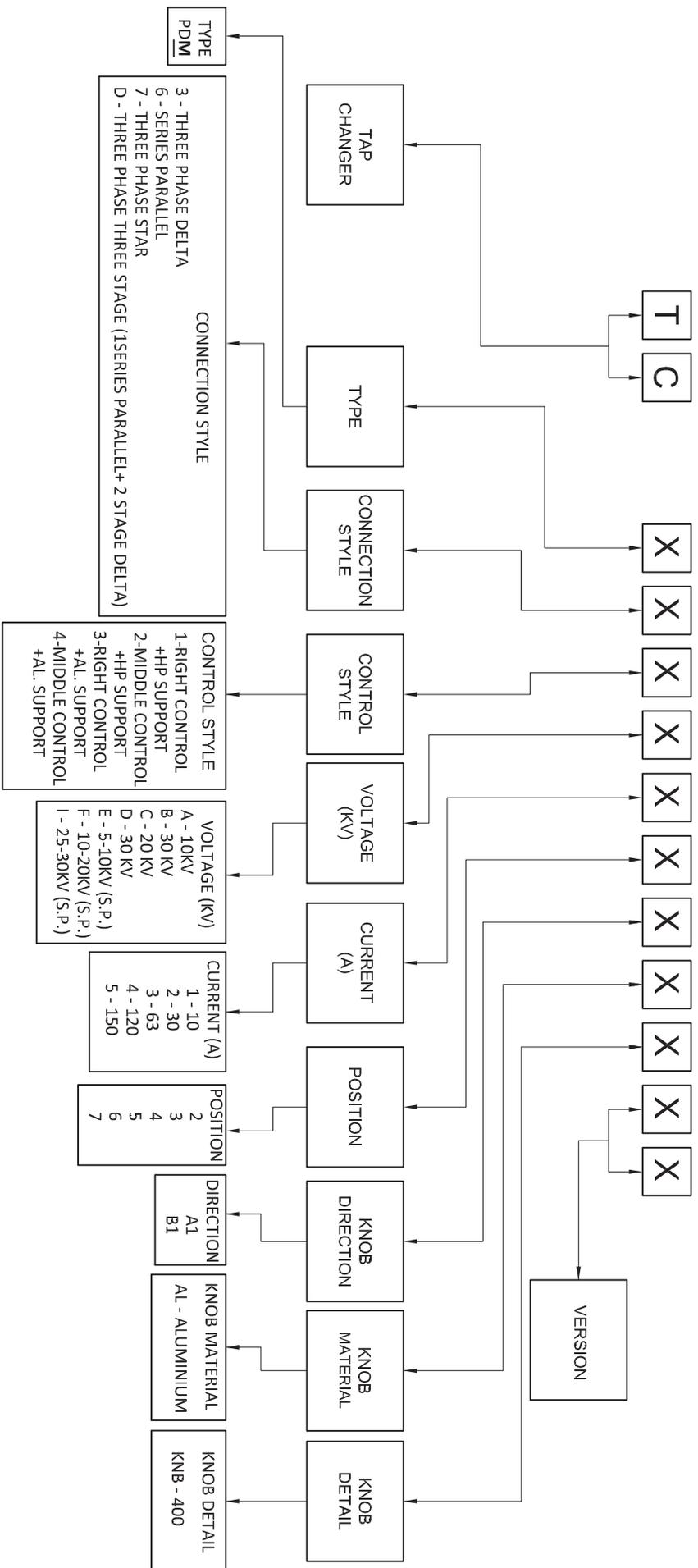
For special setups not shown in the catalogue please consult us.



Control Device
KNB400



PDM CODE PLAN





GENERAL SPECIFICATION

These tap changers are available in one, two or three phase applications. Multi layer types are also available.
The shaft length is variable.

Connection diagrams in page PDf II 2 can be applied in any variation to all types.
These tap changers are bolted on to the supports, welded under transformer cover and allow strong construction.

ASSEMBLY

A notch is provided to mark each position. For operation, the notch must be released by applying an axial pull on the control knob. Once the knob is in the desired position it will drop into the respective space by the help of a high tension spring. This process is clearly marked on control knob as;

“ LIFT – TURN – 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.

Aluminum Parts : GAlSi12Cu

Brass Parts : CuZn40Pb2 Ms 60 F34 DIN 17673

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.

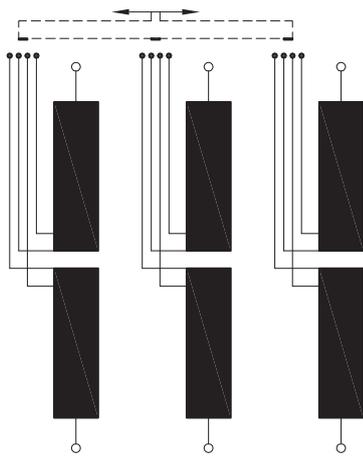
CURRENT

Up to 400A
See page PDF II 24 for the types and dimensions of the contacts.

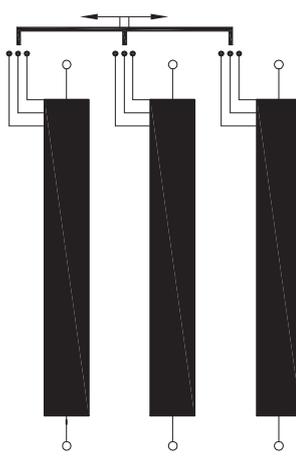
VOLTAGE CLASS

VOLTAGE CLASS	B.I.L.
20 kV	125 kV
30 kV	170 kV
60 kV	325 kV

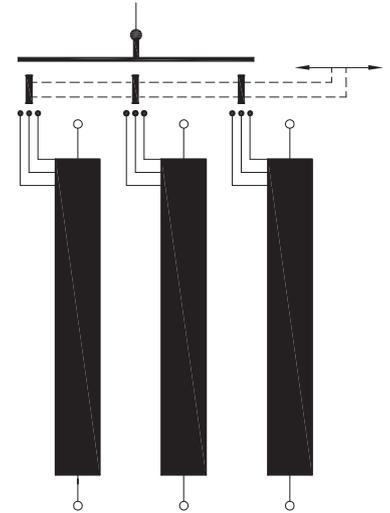
Other B.I.L. values are also available upon customer request.



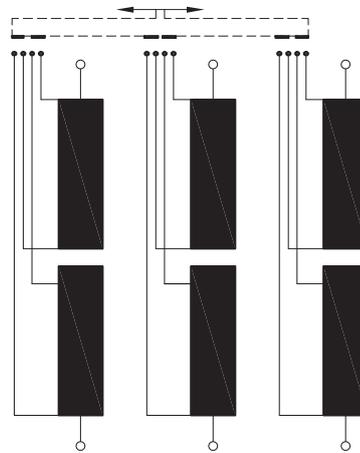
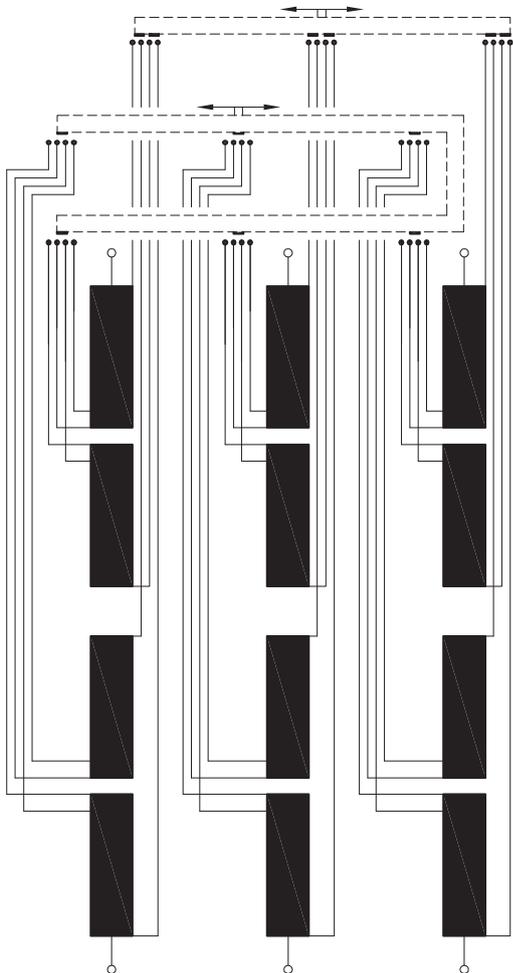
Setting for delta transformer



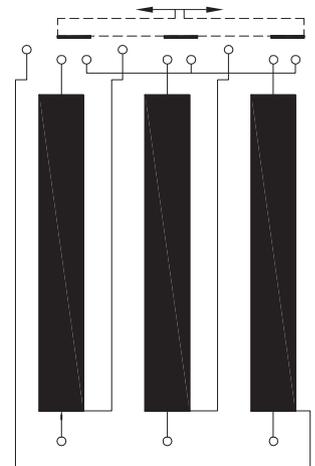
Setting for star transformer



Setting for star with outer earthed conductor transformer



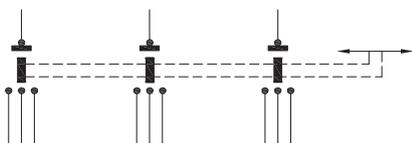
Series - parallel coupling



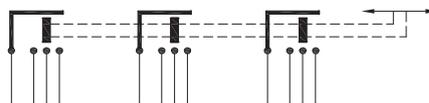
Star - delta coupling

Typical combination :

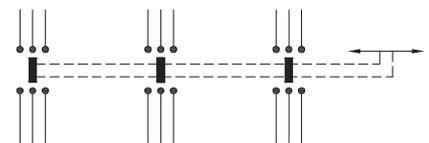
- 1 stage, series - parallel coupling
- 2 stage, delta diagram - setting $\pm 2,5\%$.



Common output per phase



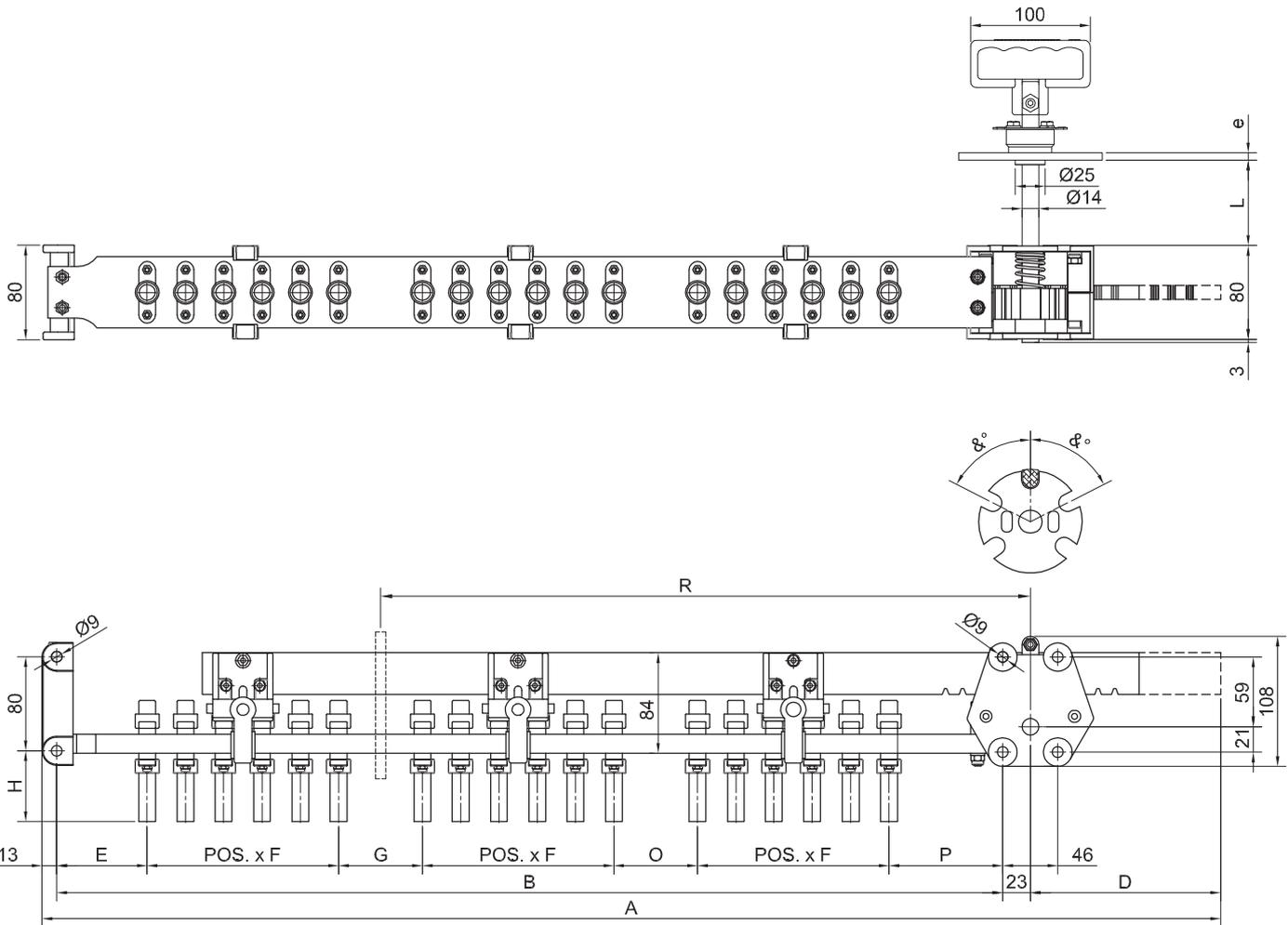
Common output per phase



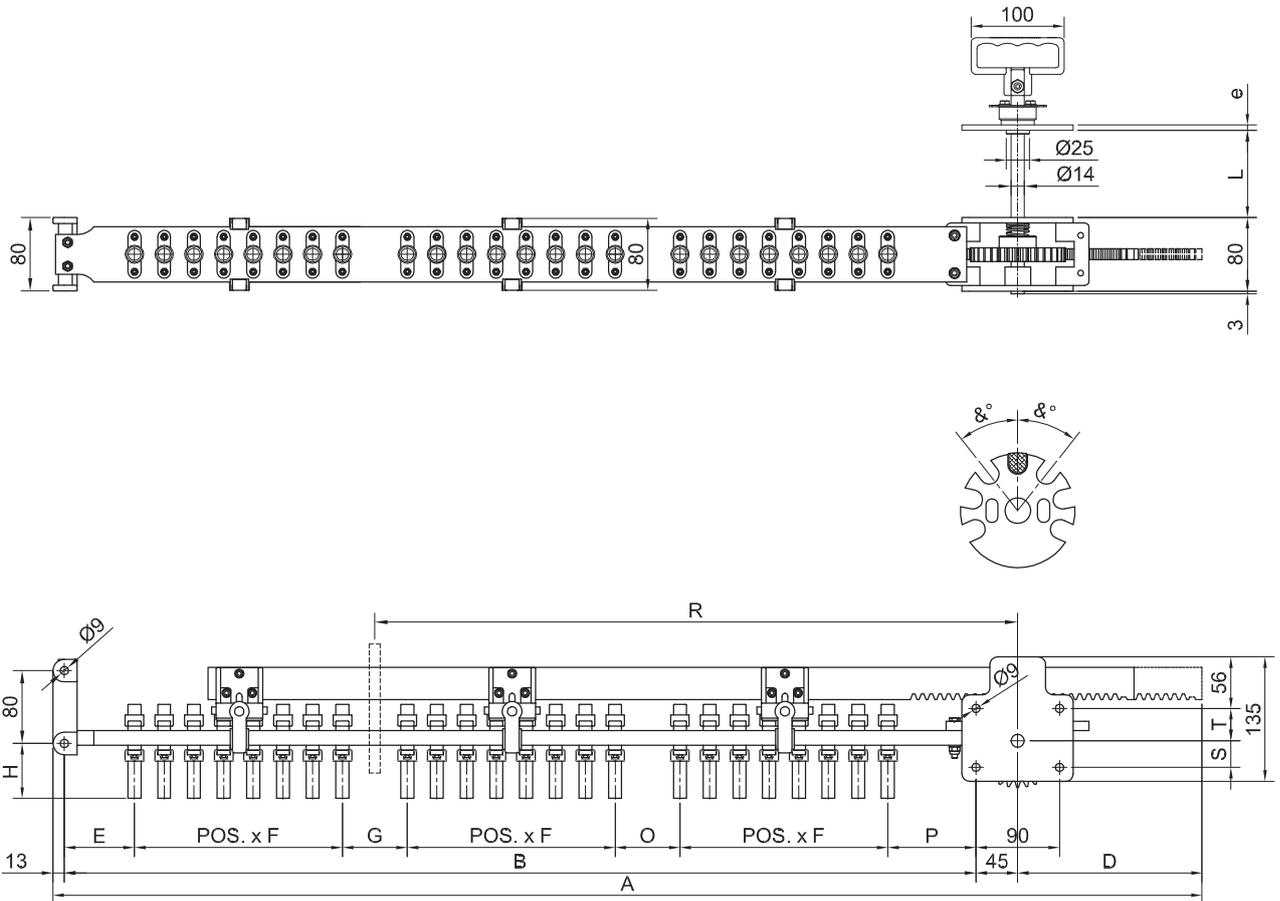
opposite contacts



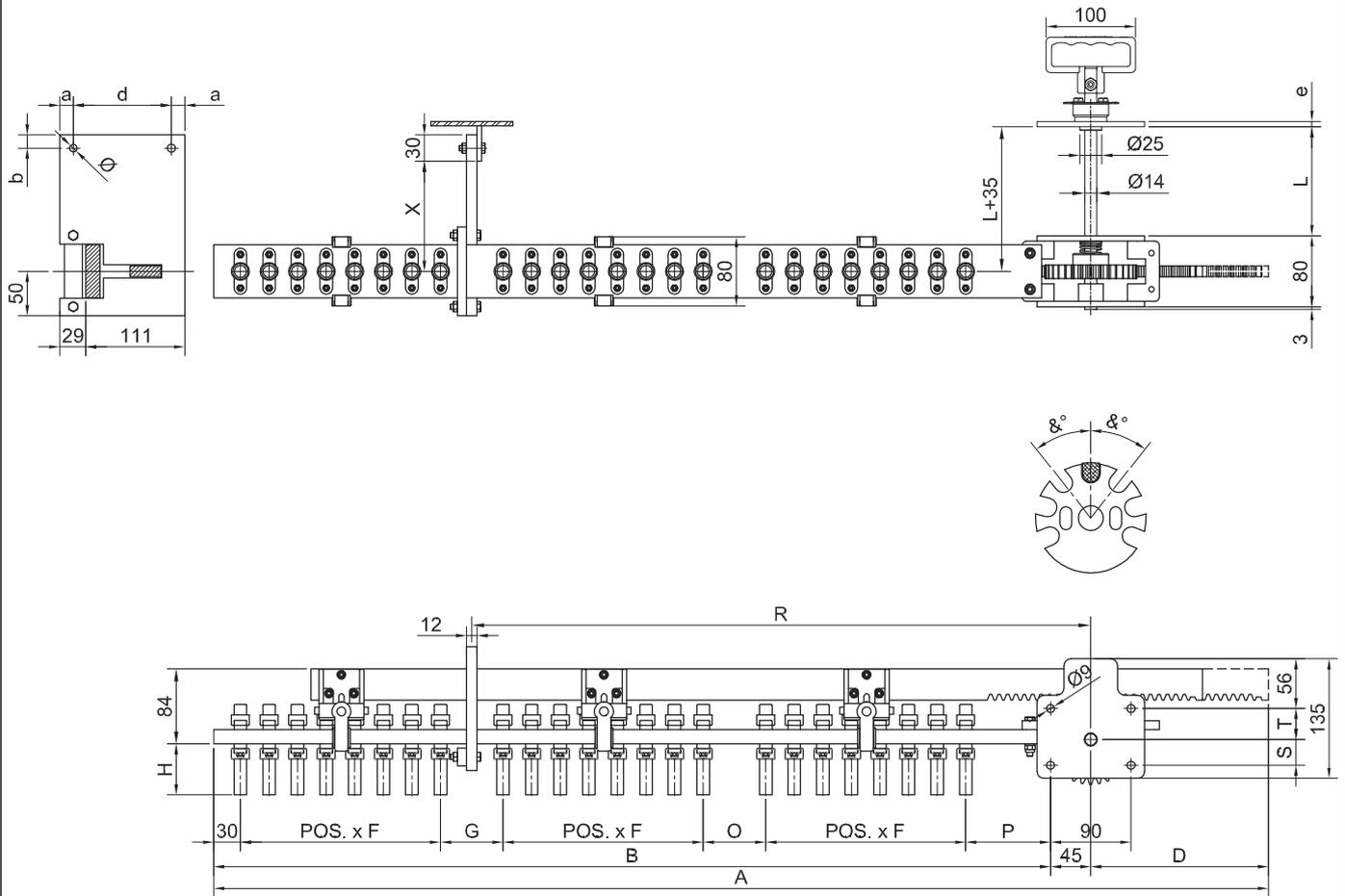
TYPE PDF II THREE PHASE TAP CHANGER
Off- circuit operation can be used in oil Delta diagram
20-60kV 150-400A 3-6 positions(With Aluminium Support)



Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	R	&°	L	e	Unit No
20	3	729	599	94	76	32	70	Depending on fixed contacts	70	95	415	63°	Please quote when ordering		TCF33C53
	4	857	695	126	76	32	70		70	95	479	63°			TCF33C54
	5	985	791	158	76	32	70		70	95	543	63°			TCF33C55
	6	1113	887	190	76	32	70		70	95	607	63°			TCF33C56
30	3	849	719	94	106	32	100	Depending on fixed contacts	100	125	490	63°	Please quote when ordering		TCF33D53
	4	977	815	126	106	32	100		100	125	554	63°			TCF33D54
	5	1105	911	158	106	32	100		100	125	618	63°			TCF33D55
	6	1233	1007	190	106	32	100		100	125	682	63°			TCF33D56
60	3	1612	1460	116	267	43	260	Depending on fixed contacts	260	286	957	84°	Please quote when ordering		TCF33J53
	4	1784	1589	159	267	43	260		260	286	1043	84°			TCF33J54
	5	1956	1718	202	267	43	260		260	286	1129	81°			TCF33J55



Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	R	S	T	&°	L	e	Unit No
20	7	1263	983	222	76	32	70	Depending on fixed contacts	70	95	693	29	35	38°	Please quote when ordering		TCF33C57
	8	1391	1079	254	76	32	70		70	95	757	29	35	38°			TCF33C58
	9	1519	1175	286	76	32	70		70	95	821	29	35	38°			TCF33C59
30	7	1383	1103	222	106	32	100	100	125	768	29	35	38°	TCF33D57			
	8	1511	1199	254	106	32	100	100	125	832	29	35	38°	TCF33D58			
	9	1639	1295	286	106	32	100	100	125	896	29	35	38°	TCF33D59			
60	6	2150	1847	245	267	43	260	260	286	1237	29	35	51°	TCF33J56			
	7	2322	1976	288	267	43	260	260	286	1323	29	35	51°	TCF33J57			

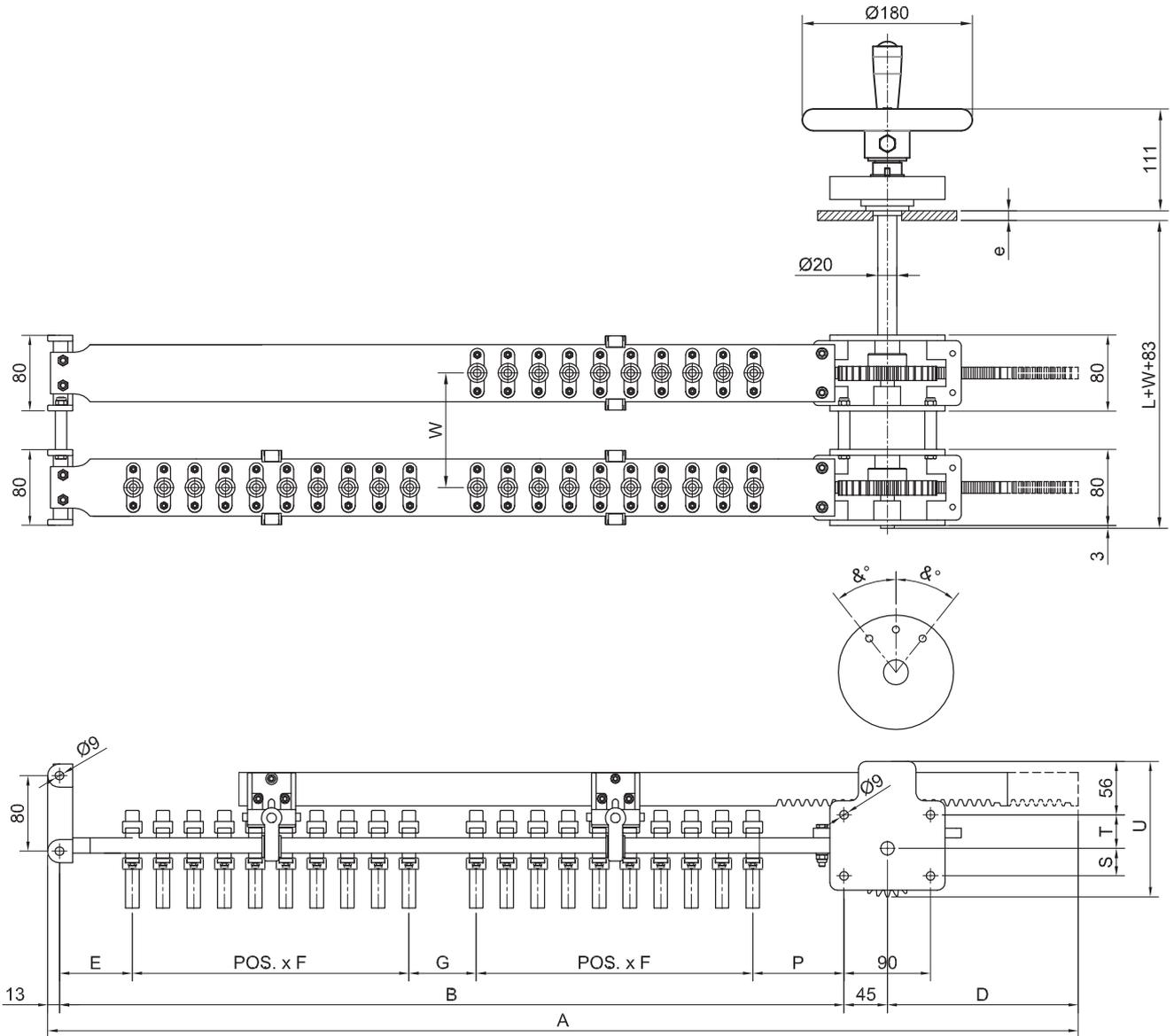


Voltage class kV	Number of positions	A	B	D	F	G	H	O	P	R	S	T	X min.	&°	L	e	Unit No
20	7	1204	937	222	32	70	Depending on fixed contacts	70	95	693	29	35	70	38°	Please quote when ordering		TCF31C57
	8	1332	1033	254	32	70		70	95	757	29	35	70	38°			TCF31C58
	9	1460	1129	286	32	70		70	95	821	29	35	70	38°			TCF31C59
30	7	1294	1027	222	32	100		100	125	768	29	35	130	38°			TCF31D57
	8	1422	1123	254	32	100		100	125	832	29	35	130	38°			TCF31D58
	9	1550	1219	286	32	100		100	125	896	29	35	130	38°			TCF31D59
60	6	1900	1610	245	43	260		260	286	1237	29	35	250	51°			TCF31J56
	7	2072	1739	288	43	260		260	286	1323	29	35	250	51°			TCF31J57



TYPE PDF II THREE PHASE TAP CHANGER

Off- circuit operation can be used in oil Delta diagram 20-60kV
150-400A 7-11 position (With Aluminium Support)

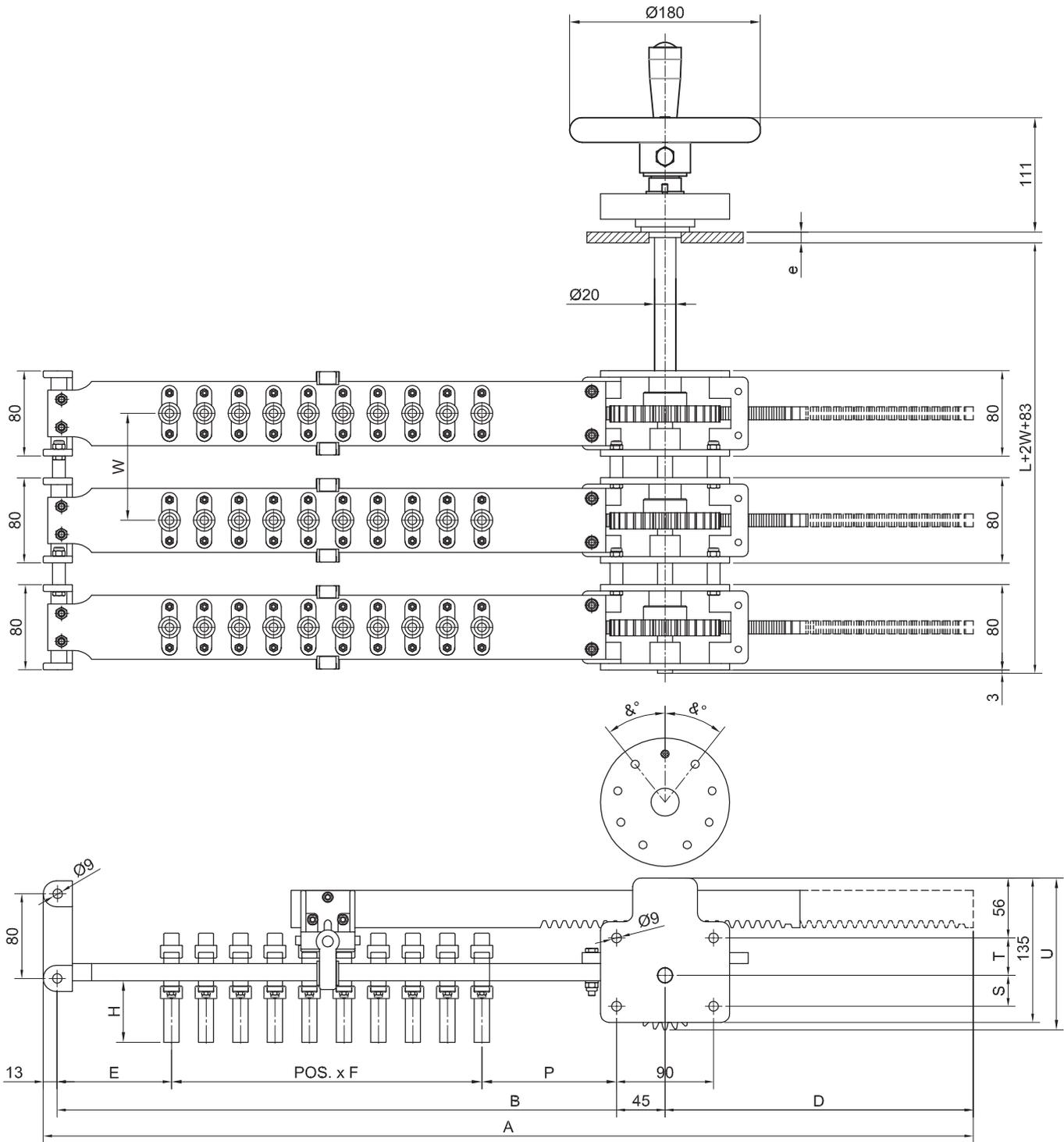


Voltage class kV	Number of positions	A	B	D	F	E	H	G	P	S	T	U	&°	L	e	Unit No
20	7	969	689	222	32	76	Depending on fixed contacts	70	95	29	35	143	38°	Please quote when ordering		TCF83C57
	8	1065	753	254	32	76		70	95	29	35	143	38°			TCF83C58
	9	1161	817	286	32	76		70	95	29	35	143	38°			TCF83C59
	10	1271	881	332	32	76		70	95	20	44	160	32°			TCF83C5A
	11	1367	945	364	32	76		70	95	20	44	160	32°			TCF83C5B
30	7	1059	779	222	32	106		100	125	29	35	143	38°			TCF83D57
	8	1155	843	254	32	106		100	125	29	35	143	38°			TCF83D58
	9	1251	907	286	32	106		100	125	29	35	143	38°			TCF83D59
	10	1361	971	332	32	106		100	125	20	44	160	32°			TCF83D5A
	11	1457	1035	364	32	106		100	125	20	44	160	32°			TCF83D5B



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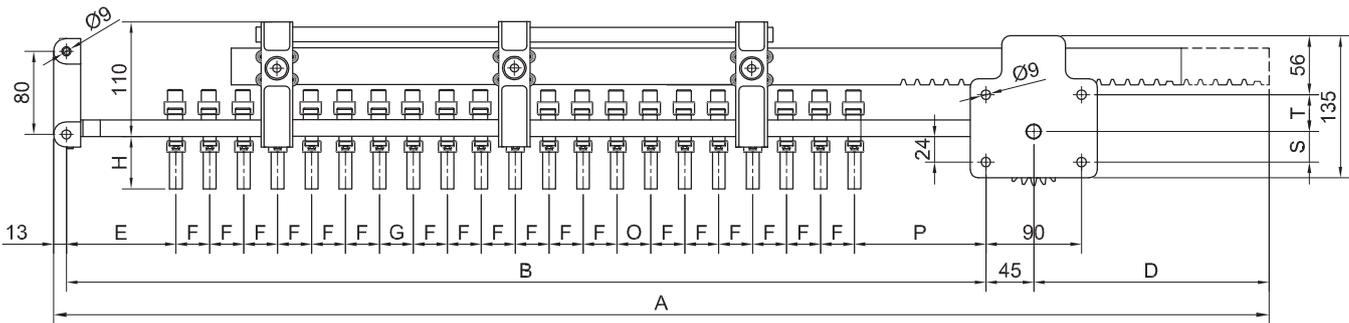
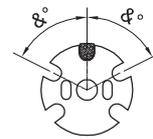
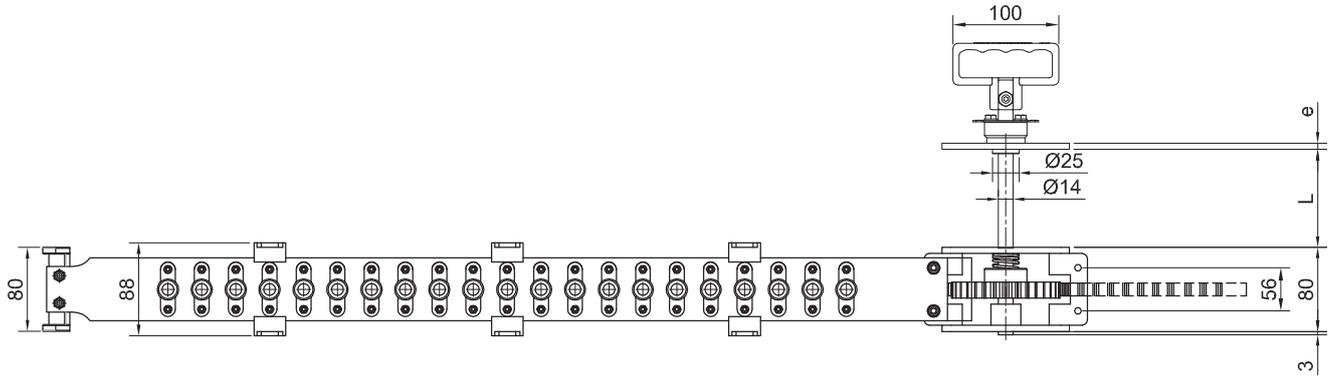
TYPE PDF II THREEPHASE TAP CHANGER
Off-circuit operation can be used in oil Delta diagram 20-30kV
150A-400A 7-11 positions. (With Aluminium Support)



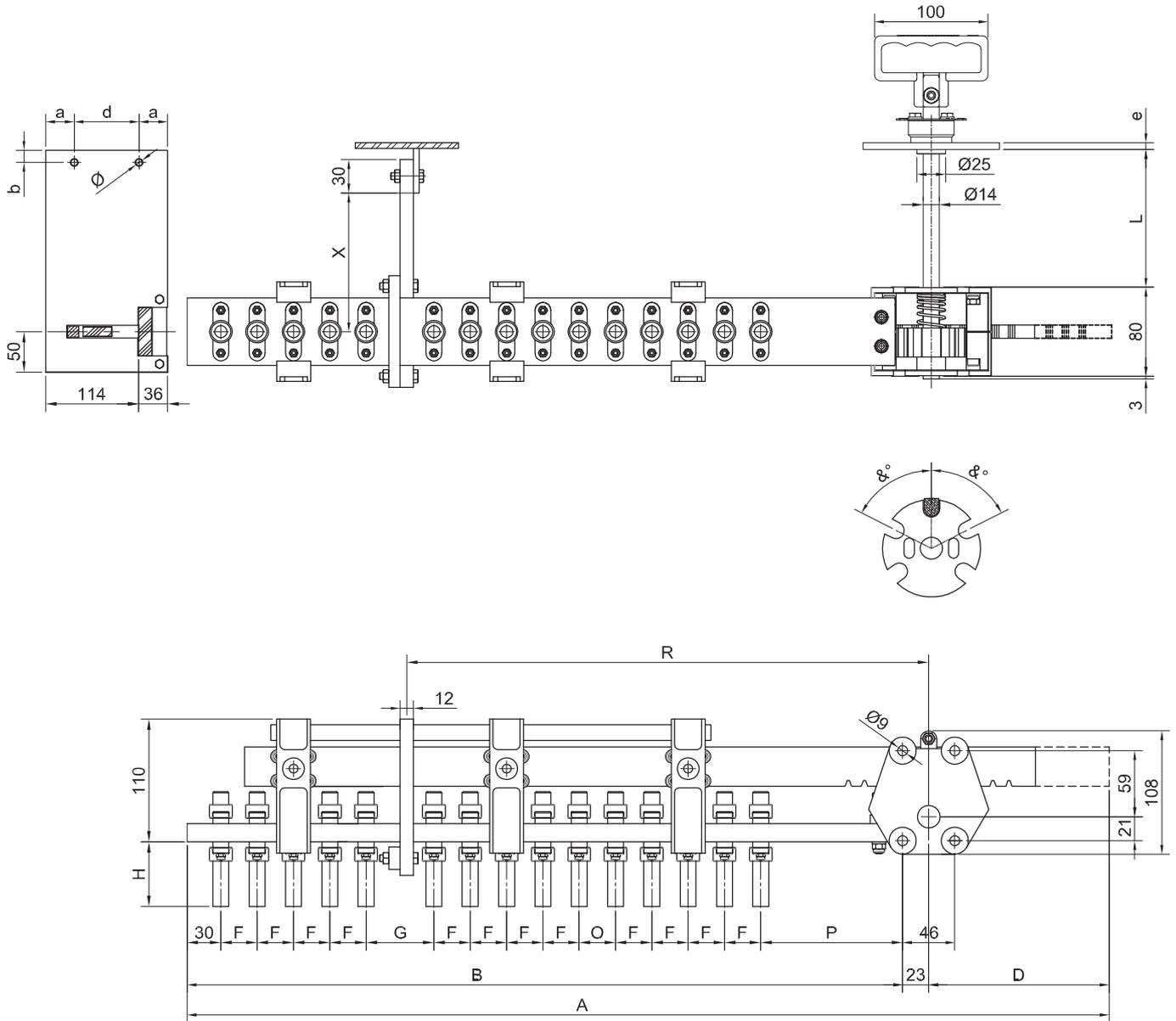
Voltage class kV	Number of positions	A	B	D	F	E	H	P	S	T	U	&°	L	e	Unit No
20	7	675	395	222	32	76	Depending on fixed contacts	95	29	35	143	38°	Please quote when ordering		TCF3X13C57
	8	739	427	254	32	76		95	29	35	143	38°			TCF3X13C58
	9	803	459	286	32	76		95	29	35	143	38°			TCF3X13C59
	10	881	491	332	32	76		95	20	44	160	32°			TCF3X13C5A
	11	945	523	364	32	76		95	20	44	160	32°			TCF3X13C5B
30	7	735	455	222	32	106	Depending on fixed contacts	125	29	35	143	38°	Please quote when ordering		TCF3X13D57
	8	799	487	254	32	106		125	29	35	143	38°			TCF3X13D58
	9	863	519	286	32	106		125	29	35	143	38°			TCF3X13D59
	10	941	551	332	32	106		125	20	44	160	32°			TCF3X13D5A
	11	1005	583	364	32	106		125	20	44	160	32°			TCF3X13D5B



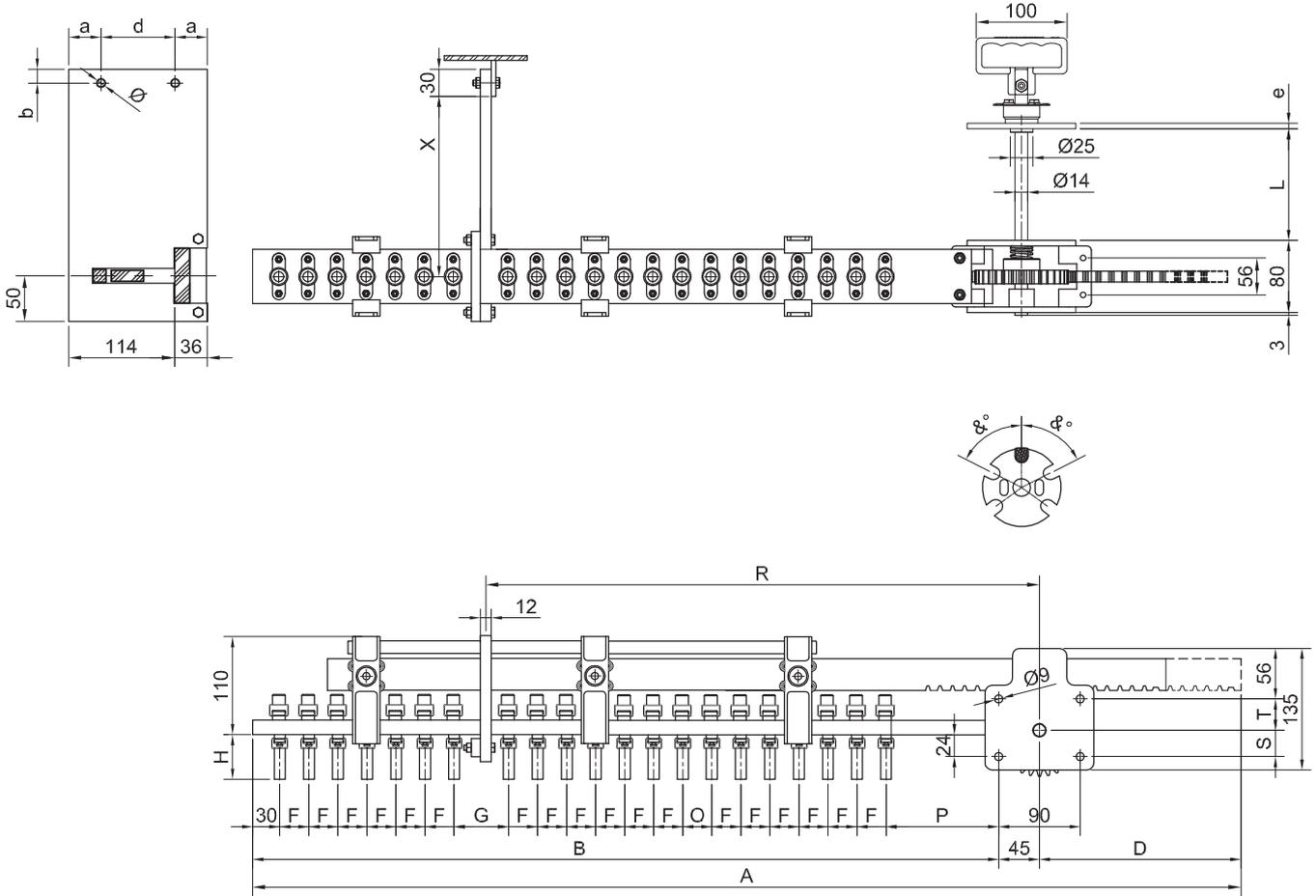
TYPE PDF II THREEPHASE TAP CHANGER
Off-circuit operation can be used in oil Star diagram
20-60kV 150-400A 7-9 positions.(With Aluminium Support)



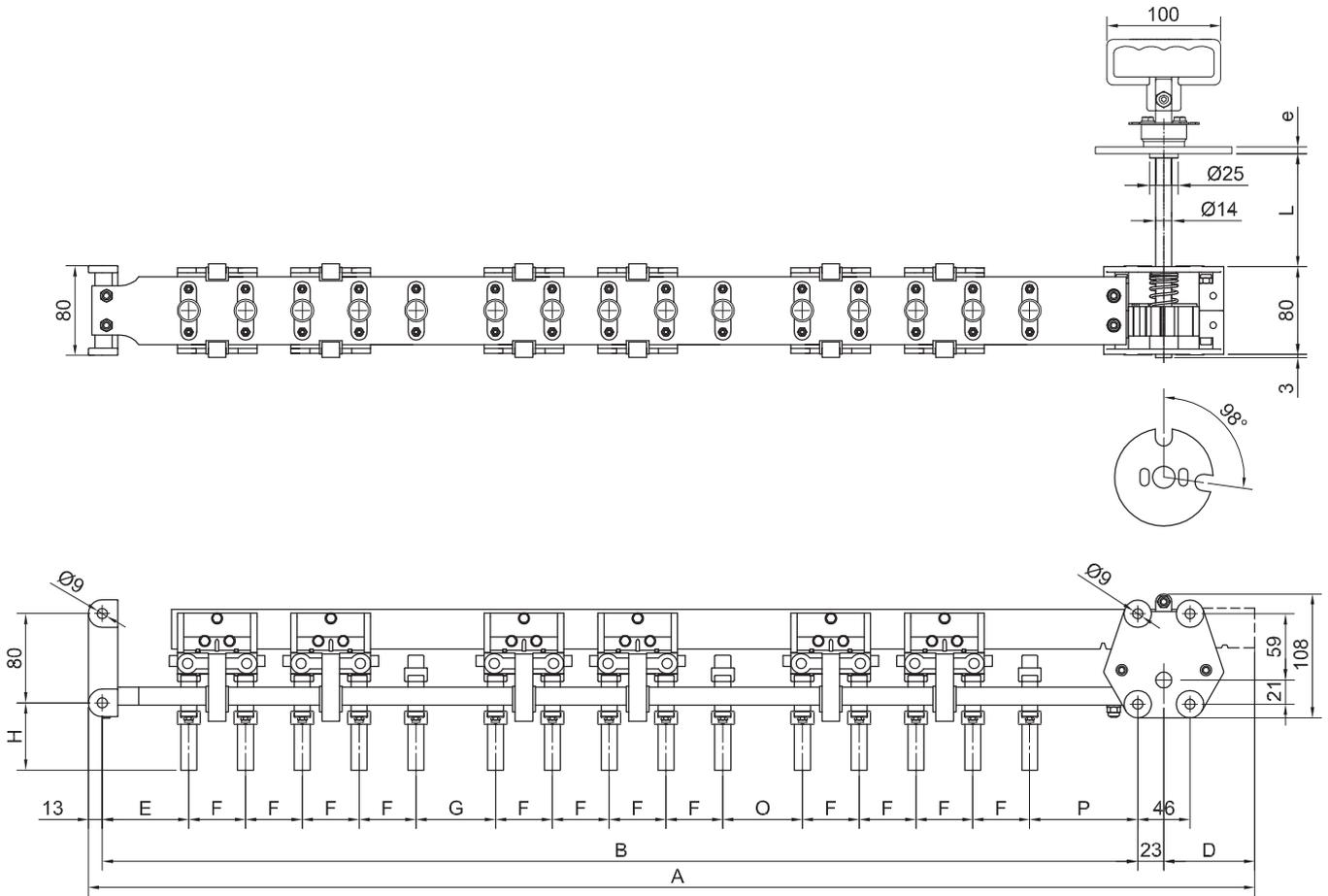
Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	7	1091	811	222	76	32	32	Depending on fixed contacts	32	95	29	35	38°	Please quote when ordering		TCF73C57
	8	1219	907	254	76	32	32		32	95	29	35	38°			TCF73C58
	9	1347	1003	286	76	32	32		32	95	29	35	38°			TCF73C59
30	7	1151	871	222	106	32	32		32	125	29	35	38°			TCF73D57
	8	1279	967	254	106	32	32		32	125	29	35	38°			TCF73D58
	9	1407	1063	286	106	32	32		32	125	29	35	38°			TCF73D59
60	6	1641	1338	245	267	43	70		70	286	29	35	51°			TCF73J56
	7	1813	1467	288	267	43	70		70	286	29	35	51°			TCF73J57



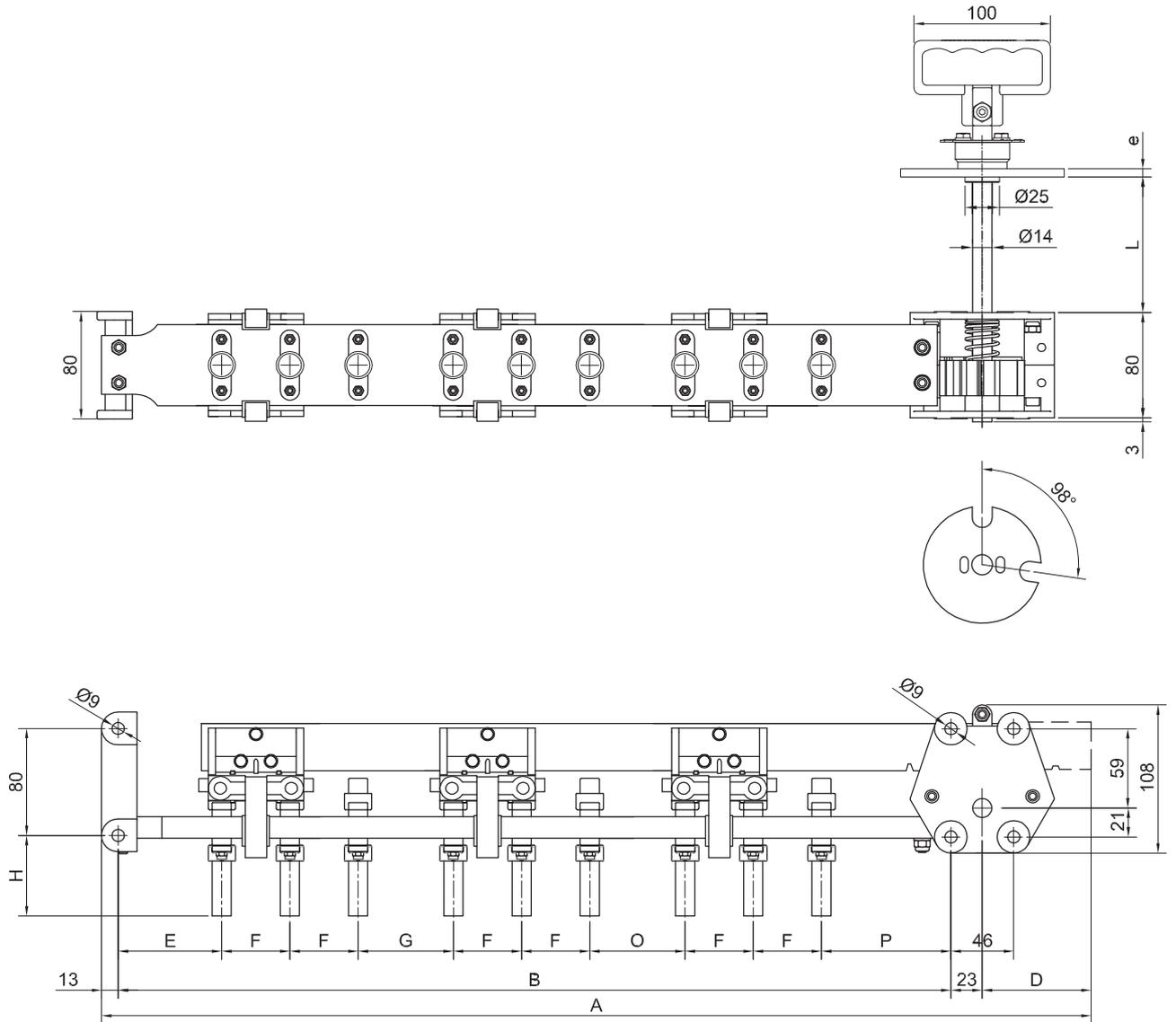
Voltage class kV	Number of positions	A	B	D	F	G	H	O	P	R	X min.	&°	L	e	Unit No
20	3	526	409	94	32	60	Depending on fixed contacts	32	95	308	70	63°	Please quote when ordering		TCF71C53
	4	654	505	126	32	60		32	95	372	70	63°		TCF71C54	
	5	782	601	158	32	60		32	95	436	70	63°		TCF71C55	
	6	910	697	190	32	60		32	95	500	70	63°		TCF71C56	
30	3	556	439	94	32	60		32	125	338	130	63°		TCF71D53	
	4	684	535	126	32	60		32	125	402	130	63°		TCF71D54	
	5	812	631	158	32	60		32	125	466	130	63°		TCF71D55	
	6	940	727	190	32	60		32	125	530	130	63°		TCF71D56	
60	3	853	714	116	43	70		70	286	586	250	84°		TCF71J53	
	4	1025	843	159	43	70		70	286	672	250	84°		TCF71J54	
	5	1197	972	202	43	70		70	286	758	250	81°		TCF71J55	



Voltage class kV	Number of positions	A	B	D	F	G	H	O	P	R	S	T	X min.	&°	L	e	Unit No
20	7	1060	793	222	32	60	Depending on fixed contacts	32	95	586	29	35	70	38°	Please quote when ordering		TCF71C57
	8	1188	889	254	32	60		32	95	650	29	35	70	38°			TCF71C58
	9	1316	985	286	32	60		32	95	714	29	35	70	38°			TCF71C59
30	7	1090	823	222	32	60		32	125	616	29	35	130	38°			TCF71D57
	8	1218	919	254	32	60		32	125	680	29	35	130	38°			TCF71D58
	9	1346	1015	286	32	60		32	125	744	29	35	130	38°			TCF71D59
60	6	1391	1101	245	43	70		70	286	866	29	35	250	51°			TCF71J56
	7	1563	1230	288	43	70		70	286	952	29	35	250	51°			TCF71J57



Voltage class kV	A	B	D	E	F	G	H	O	P	&°	L	e	Unit No
10-20	1027	911	80	76	50	70	Depending on fixed contacts	70	95	98°	Please quote when ordering		TCF63F52
15-30	1227	1111	80	126	50	120		120	145	98°			TCF63I52

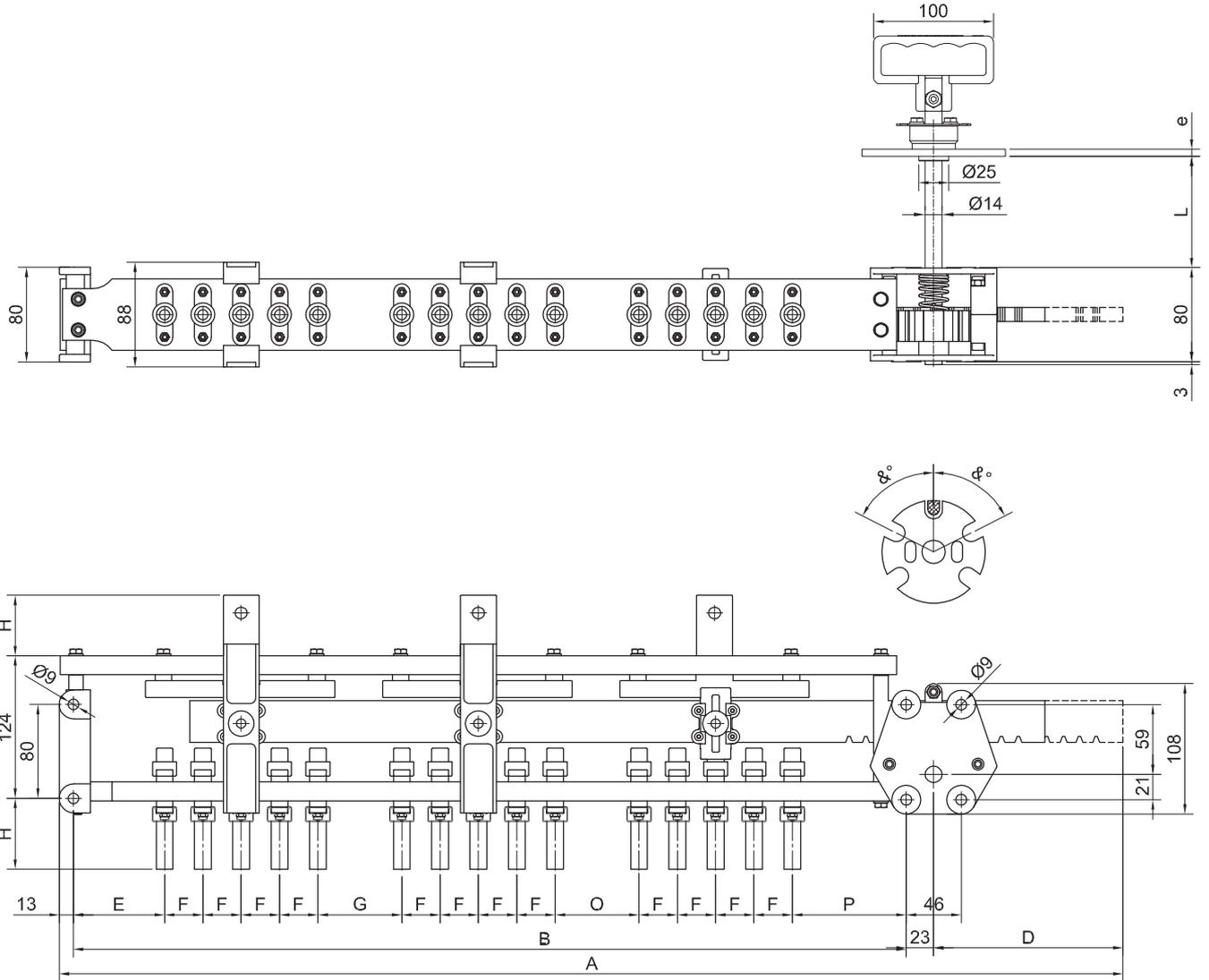


Voltage class kV	A	B	D	E	F	G	H	O	P	&°	L	e	Unit No
20	727	611	80	76	50	70	Depending on fixed contacts	70	95	98°	Please quote when ordering		TCF53C52
30	1029	887	106	106	76	100		100	125	149°			TCF53D52



TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Common output per phase
20-60kV 150-400A 3-6 positions.(With Aluminium Support)



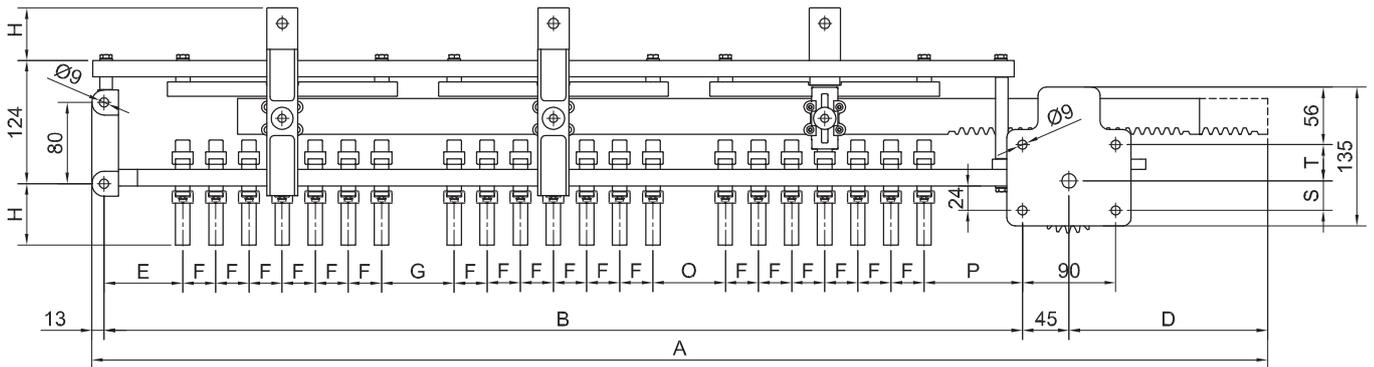
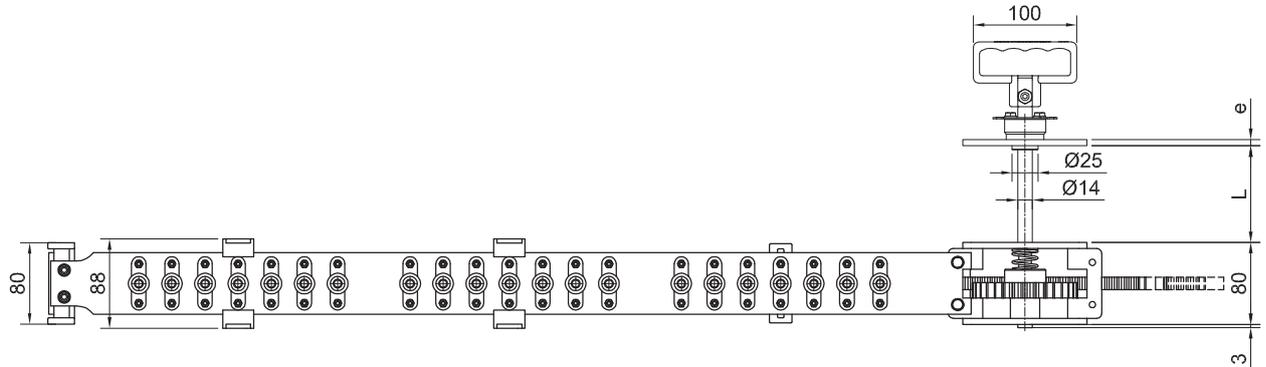
Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	&°	L	e	Unit No
20	3	633	503	94	76	32	70	Depending on fixed contacts	70	95	63°	Please quote when ordering		TCF43C53
	4	761	599	126	76	32	70		70	95	63°			TCF43C54
	5	889	695	158	76	32	70		70	95	63°			TCF43C55
	6	1017	791	190	76	32	70		70	95	63°			TCF43C56
30	3	753	623	94	106	32	100	Depending on fixed contacts	100	125	63°	Please quote when ordering		TCF43D53
	4	881	719	126	106	32	100		100	125	63°			TCF43D54
	5	1009	815	158	106	32	100		100	125	63°			TCF43D55
	6	1137	911	190	106	32	100		100	125	63°			TCF43D56
60	3	1483	1331	116	267	43	260	Depending on fixed contacts	260	286	84°	Please quote when ordering		TCF43J53
	4	1655	1460	159	267	43	260		260	286	84°			TCF43J54
	5	1827	1589	202	267	43	260		260	286	81°			TCF43J55



DEMIRMAKINE
BEST COMPLEMENT OF TRANSFORMERS

TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Common output per phase
20-60kV 150-400A 7-9 positions.(With Aluminium Support)

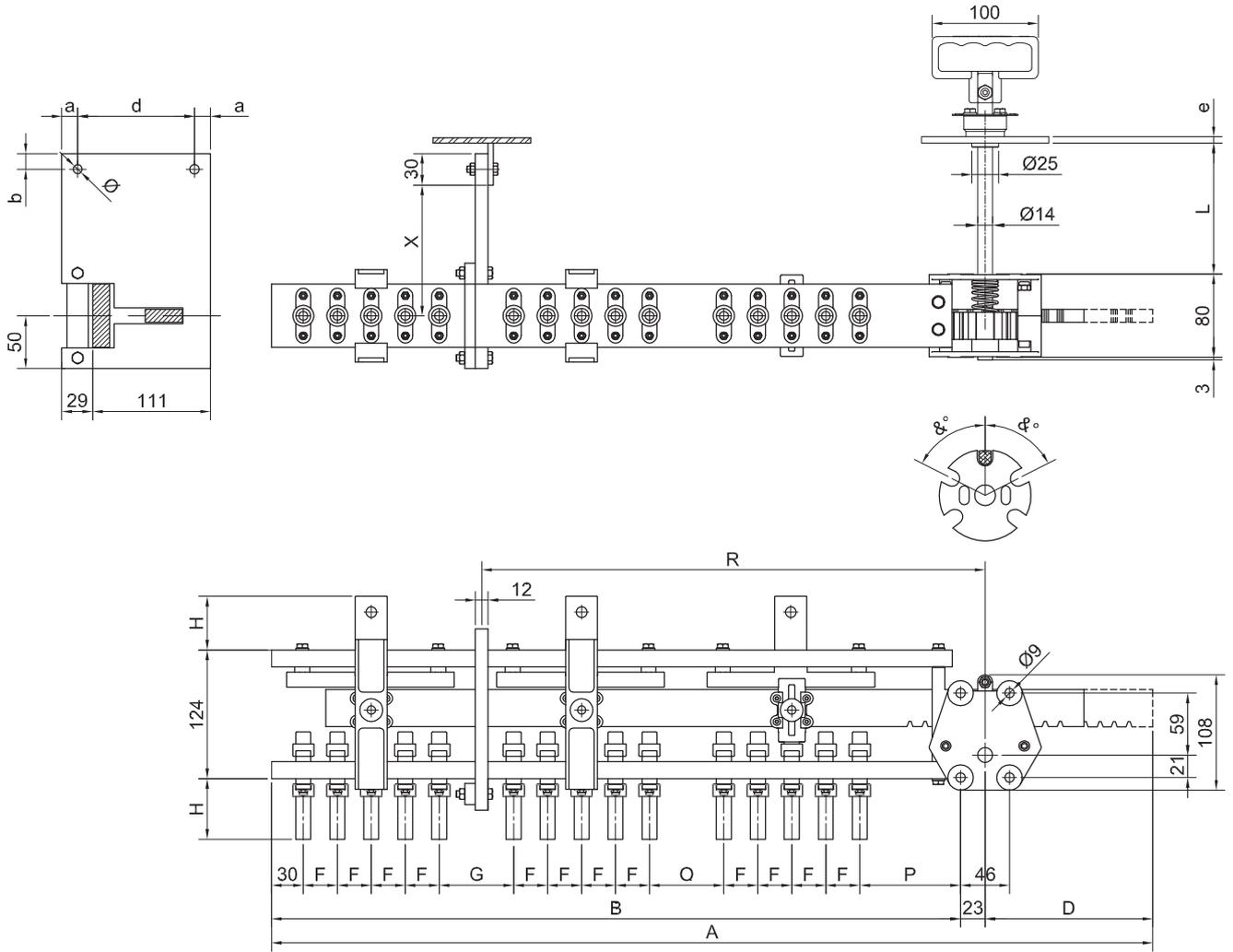


Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	7	1167	887	222	76	32	70	Depending on fixed contacts	70	95	29	35	38°	Please quote when ordering		TCF43C57
	8	1295	983	254	76	32	70		70	95	29	35	38°			TCF43C58
	9	1423	1079	286	76	32	70		70	95	29	35	38°			TCF43C59
30	7	1287	1007	222	106	32	100	100	125	29	35	38°	TCF43D57			
	8	1415	1103	254	106	32	100	100	125	29	35	38°	TCF43D58			
	9	1543	1199	286	106	32	100	100	125	29	35	38°	TCF43D59			
60	6	2021	1718	245	267	43	260	260	286	29	35	51°	TCF43J56			
	7	2193	1847	288	267	43	260	260	286	29	35	51°	TCF43J57			



TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Common output per phase
20-60kV 150-400A 3-6 positions.(With HP Support)

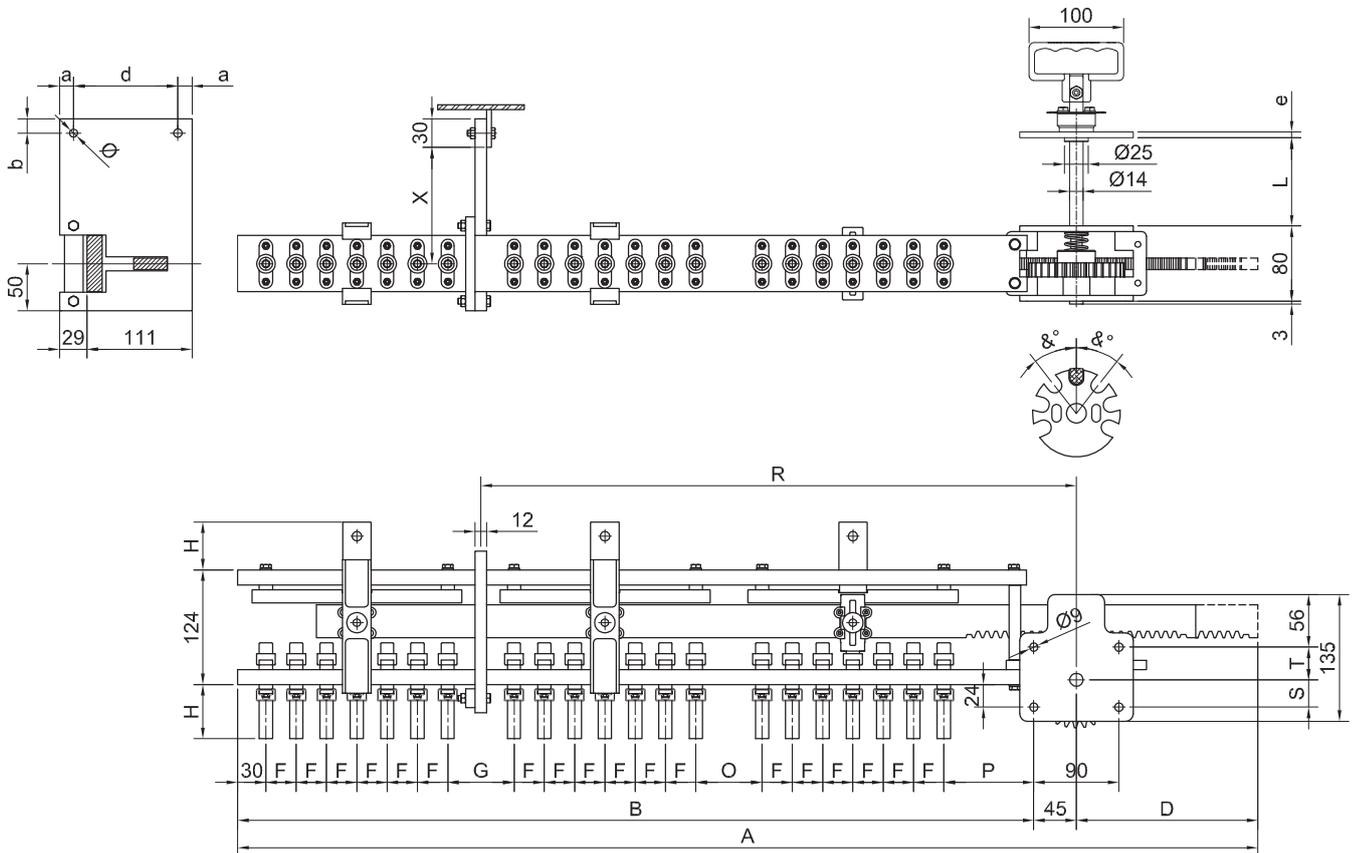


Voltage class kV	Number of positions	A	B	D	F	G	H	O	P	R	X min.	&°	L	e	Unit No
20	3	574	457	94	32	70	Depending on fixed contacts	70	95	351	70	63°	Please quote when ordering		TCF41C53
	4	702	553	126	32	70		70	95	415	70	63°		TCF41C54	
	5	830	649	158	32	70		70	95	479	70	63°		TCF41C55	
	6	958	745	190	32	70		70	95	543	70	63°		TCF41C56	
30	3	664	547	94	32	100		100	125	426	130	63°		TCF41D53	
	4	792	643	126	32	100		100	125	490	130	63°		TCF41D54	
	5	920	739	158	32	100		100	125	554	130	63°		TCF41D55	
	6	1048	835	190	32	100		100	125	618	130	63°		TCF41D56	
60	3	1233	1094	116	43	260		260	286	871	250	84°		TCF41J53	
	4	1405	1223	159	43	260		260	286	957	250	84°		TCF41J54	
	5	1577	1352	202	43	260		260	286	1043	250	81°		TCF41J55	



TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Common output per phase
20-60kV 150-400A 7-9 positions.(With HP Support)

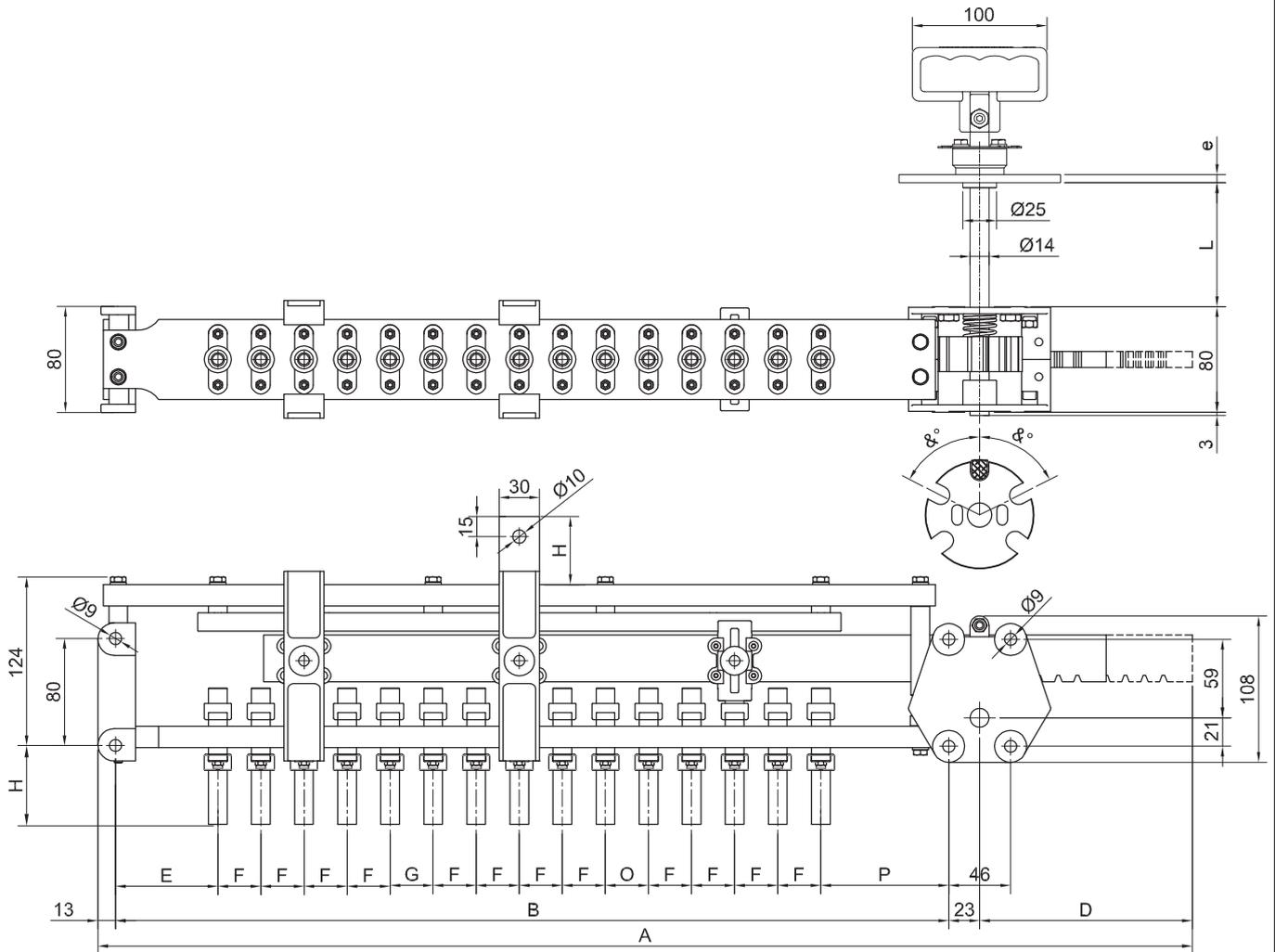


Voltage class kV	Number of positions	A	B	D	F	G	H	O	P	R	S	T	X min.	&°	L	e	Unit No
20	7	1108	841	222	32	70	Depending on fixed contacts	70	95	629	29	35	70	38°	Please quote when ordering		TCF41C57
	8	1236	937	254	32	70		70	95	693	29	35	70	38°			TCF41C58
	9	1364	1033	286	32	70		70	95	757	29	35	70	38°			TCF41C59
30	7	1198	931	222	32	100	100	125	704	29	35	130	38°	TCF41D57			
	8	1326	1027	254	32	100	100	125	768	29	35	130	38°	TCF41D58			
	9	1454	1123	286	32	100	100	125	832	29	35	130	38°	TCF41D59			
60	6	1771	1481	245	43	260	260	286	1151	29	35	250	51°	TCF41J56			
	7	1943	1610	288	43	260	260	286	1237	29	35	250	51°	TCF41J57			



TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Star diagram whit outer-earthed conductor 20-60kV 150-400A 3-6 positions.(With Aluminium Support)

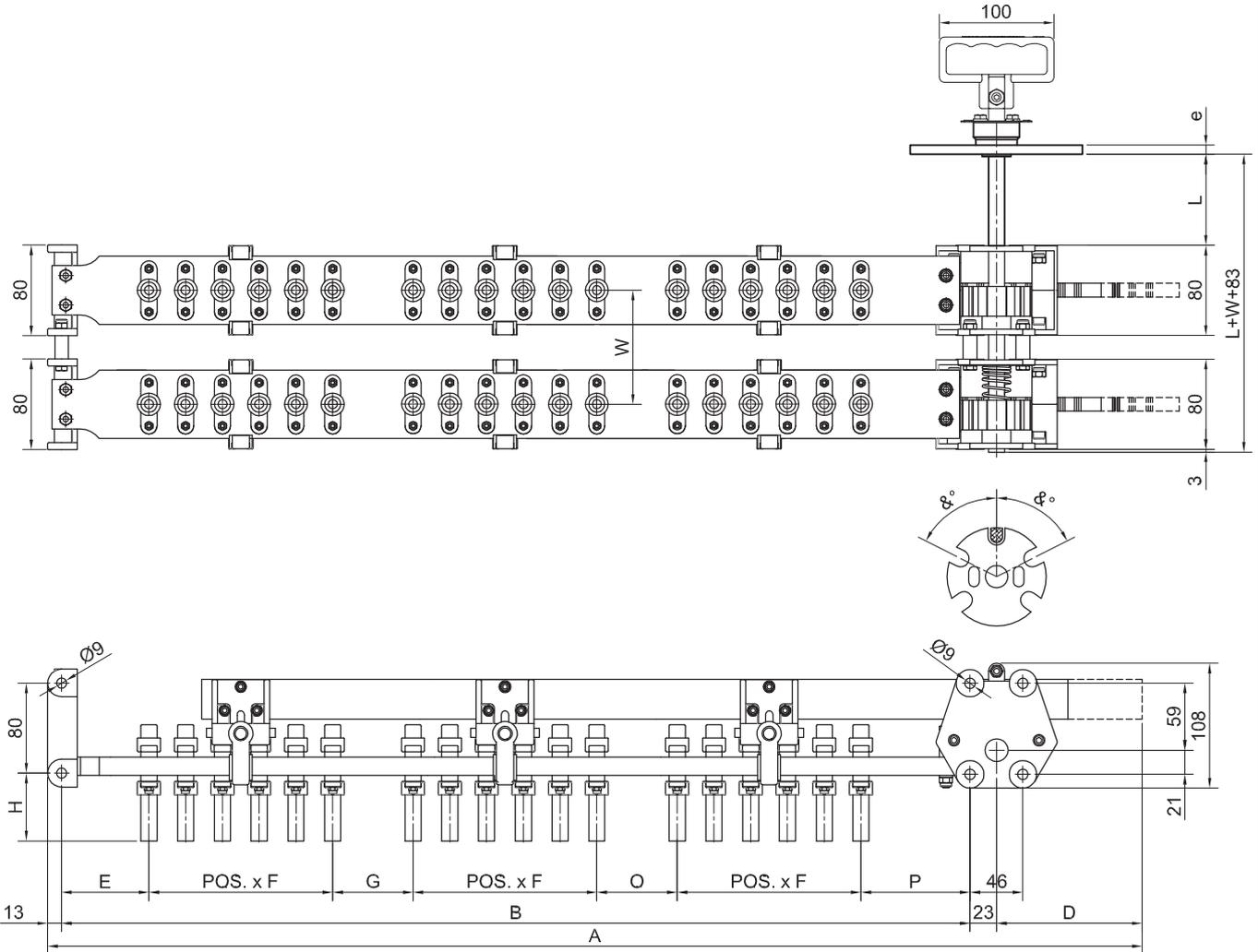


Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	&°	L	e	Unit No
20	3	557	427	94	76	32	32	Depending on fixed contacts	32	95	63°	Please quote when ordering	TCFE3C53	
	4	685	523	126	76	32	32		32	95	63°			TCFE3C54
	5	813	619	158	76	32	32		32	95	63°			TCFE3C55
	6	941	715	190	76	32	32		32	95	63°			TCFE3C56
30	3	617	487	94	106	32	32		32	125	63°		TCFE3D53	
	4	745	583	126	106	32	32		32	125	63°		TCFE3D54	
	5	873	679	158	106	32	32		32	125	63°		TCFE3D55	
	6	1001	775	190	106	32	32		32	125	63°		TCFE3D56	
60	3	1103	951	116	267	43	70		70	286	84°		TCFE3J53	
	4	1275	1080	159	267	43	70		70	286	84°		TCFE3J54	
	5	1447	1209	202	267	43	70		70	286	81°		TCFE3J55	



TYPE PDF II THREEPHASE TAP CHANGER

Off-circuit operation can be used in oil Two stage tap changer Delta diagram 20-60kV 150-400A 3-6 positions.(With Aluminium Support)

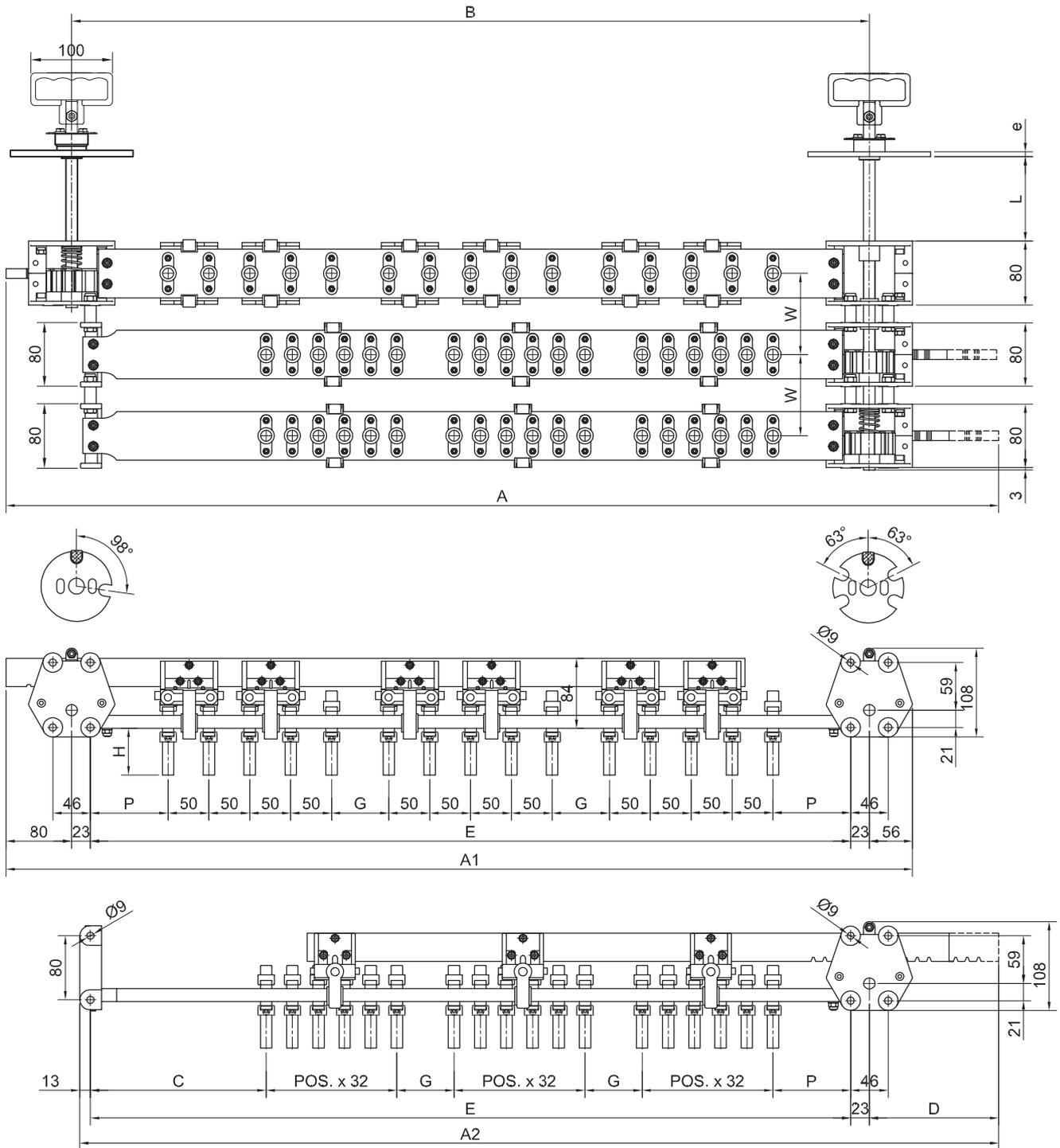


Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	R	&°	L	e	Unit No
20	3	729	599	94	76	32	70	Depending on fixed contacts	70	95	415	63°	Please quote when ordering		TCF2x33C53
	4	857	695	126	76	32	70		70	95	479	63°			TCF2x33C54
	5	985	791	158	76	32	70		70	95	543	63°			TCF2x33C55
	6	1113	887	190	76	32	70		70	95	607	63°			TCF2x33C56
30	3	849	719	94	106	32	100	Depending on fixed contacts	100	125	490	63°	Please quote when ordering		TCF2x33D53
	4	977	815	126	106	32	100		100	125	554	63°			TCF2x33D54
	5	1105	911	158	106	32	100		100	125	618	63°			TCF2x33D55
	6	1233	1007	190	106	32	100		100	125	682	63°			TCF2x33D56
60	3	1612	1460	116	267	43	260	Depending on fixed contacts	260	286	957	84°	Please quote when ordering		TCF2x33J53
	4	1784	1589	159	267	43	260		260	286	1043	84°			TCF2x33J54
	5	1956	1718	202	267	43	260		260	286	1129	81°			TCF2x33J55



TYPE PDF II THREEPHASE TAP CHANGER

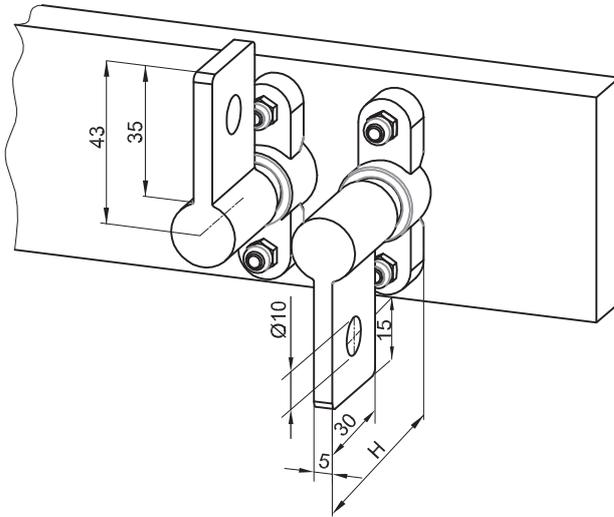
Off-circuit operation can be used in oil 1. Stage 10-20/15-30 kV 150-400A
 2. Stage delta diagram 20-30 kV 150-400A 3-5 positions. (With Aluminium Support)



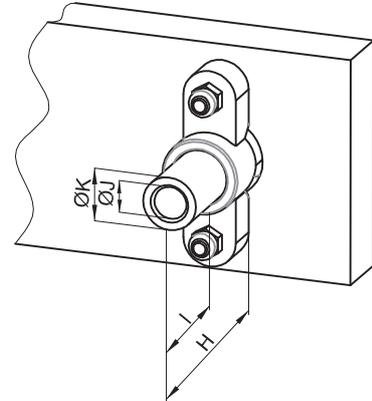
Voltage class kV		Number of positions	A	A1	A2	B	C	H	D	E	P	G	L	W	e	Unit No
Series	Parallel		Delta													
10 - 20	20	3	1150	1112	1060	976	407	Depending on fixed contacts	94	930	95	70	Please quote when ordering			TCFD3C53
		4	1182	1112	1092	976	311		126	930	95	70				TCFD3C54
		5	1214	1112	1124	976	215		158	930	95	70				TCFD3C55
15 - 30	30	3	1350	1312	1260	1176	457	Depending on fixed contacts	94	1130	145	120	Please quote when ordering			TCFD3D53
		4	1382	1312	1292	1176	361		126	1130	145	120				TCFD3D54
		5	1414	1312	1324	1176	265		158	1130	145	120				TCFD3D55



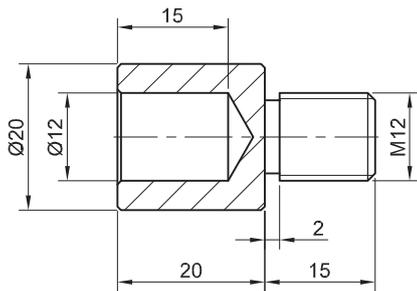
Fixed Contacts



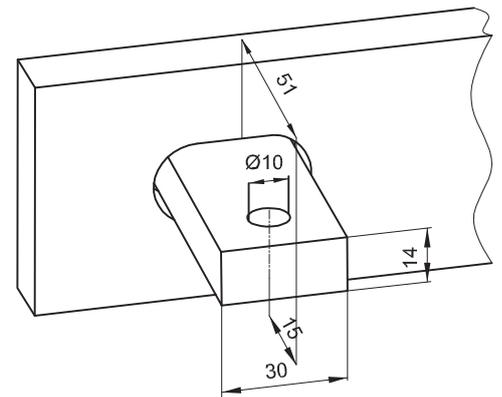
Flag type contacts



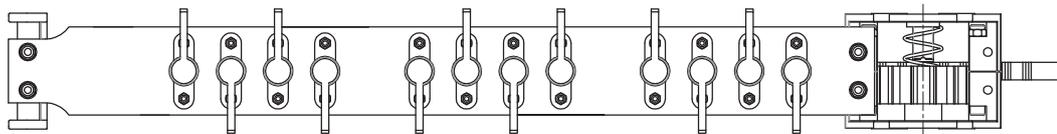
Tubular contact



Fixed contact adapter for cable connection
FCT033

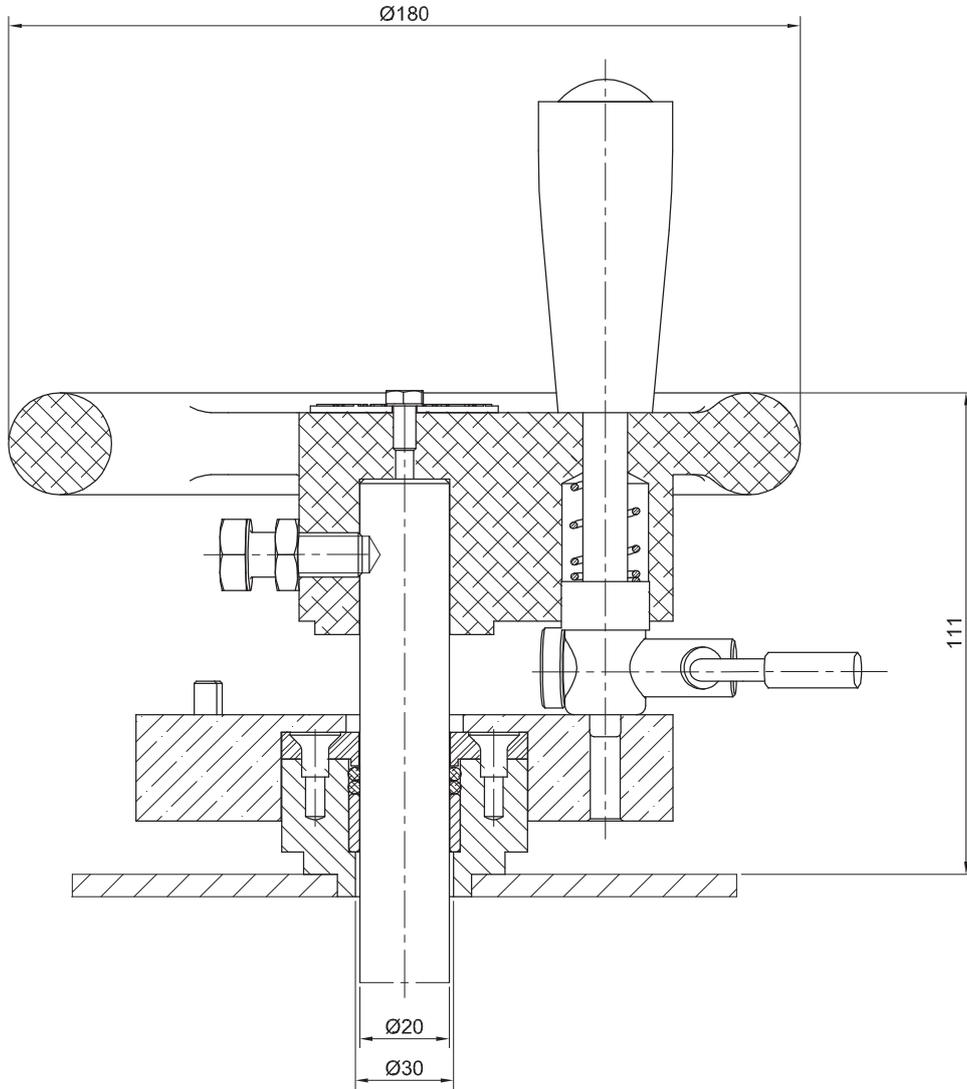


Common contact with straight flat shape



Unless otherwise specified by the customer, flag type contacts are positioned as in the diagram above.
The contact situated near the operating device is facing downwards.

	Contact Numbers	ØJ	ØK	I	H
150A Tubular Contact	FCT008	7	14	20	37
220A Tubular Contact	FCT052	8.5	14	20	37
150A Tubular Contact	FCT024	9.5	13.5	30	56
220A Tubular Contact	FCT009	13.5	17.4	30	56
315A Tubular Contact	FCT041	15.2	20	30	56
315A Tubular Contact (Optional)	FCT033	M12	20	30	56
400A Flag Type	FCT010	-	30 x 30 x 5		51

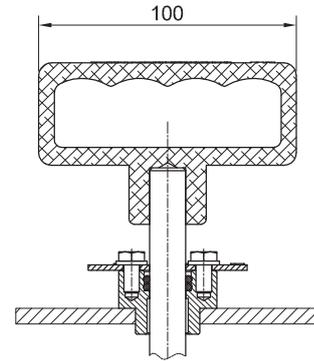
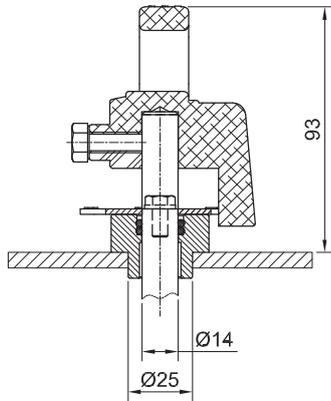


KNBV002

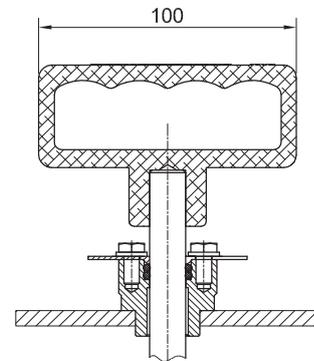
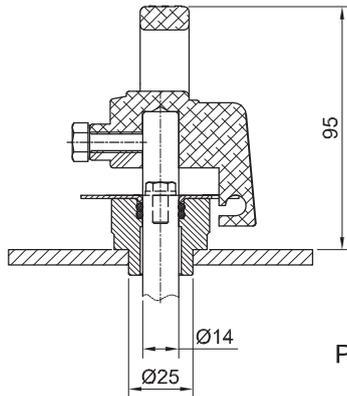
Unlocking by padlockable pull
knob for axis dia. 20 mm



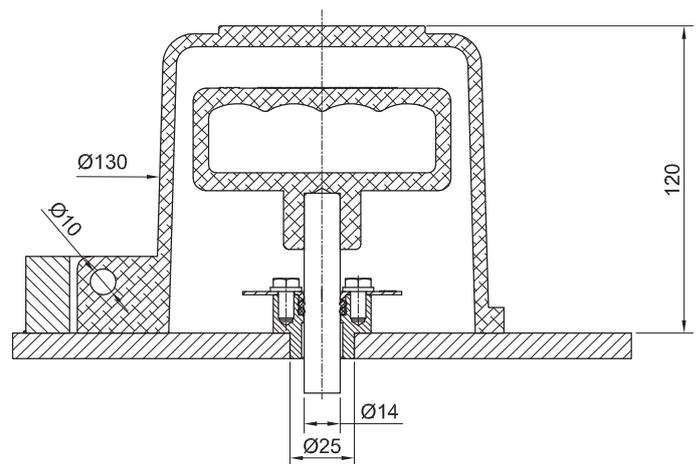
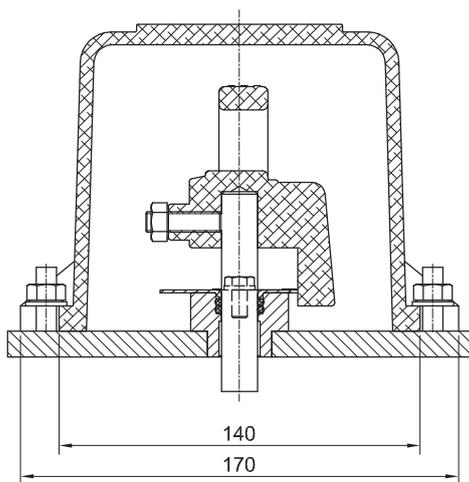
TYPE PDF II THREEPHASE TAP CHANGER
Control devices incorporating a handle unlocking
by axial displacement of the control shaft



KNB 301
Standart for axis dia. 14 mm.



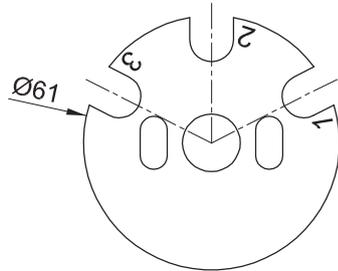
KNB 302
Padlockable model for axis dia. 14mm.



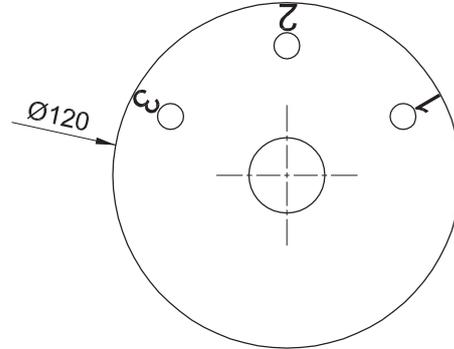
KNB 304
With padlockable protective cover for axis dia.14 mm.



Repeaters for rack and pinion operated controls.



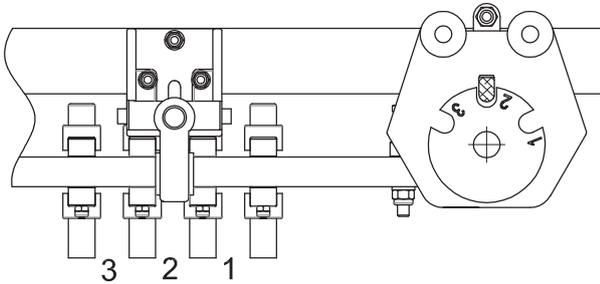
PSC Type 1



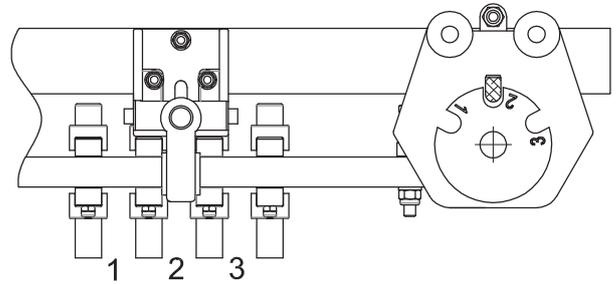
PSC Type 2

Numbering of the repeaters for rack and pinion operated control.

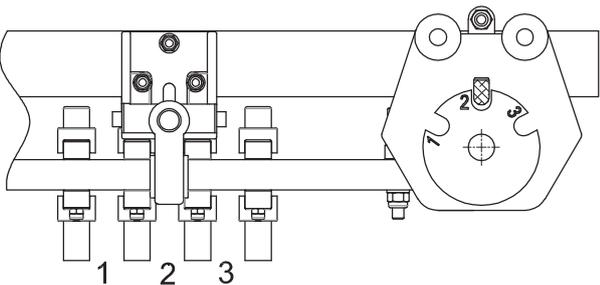
A1



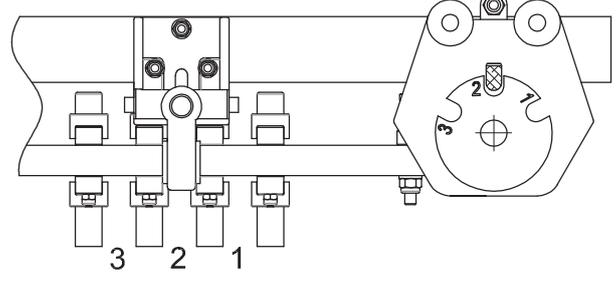
B1

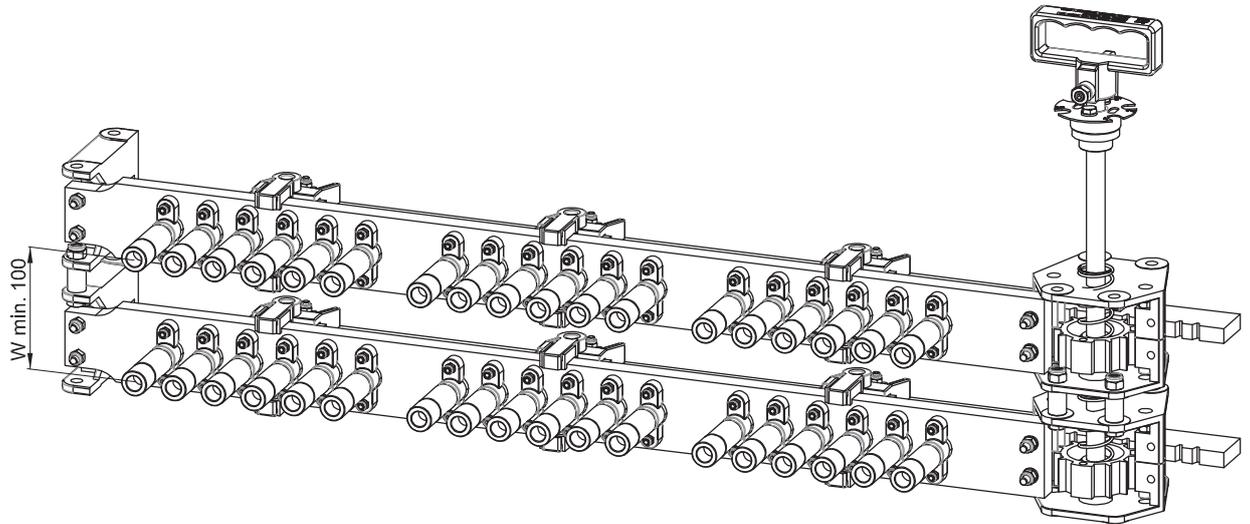


C1



D1





All the horizontal tap changers in the PDF II reinforced series can be paired by superimposing several tap changers whose purpose-built steel brackets are assembled by nuts and bolts.

Depending on the diagram adopted, the user can:

- either operate the tap changers with one shaft,
 - or operate part of the tap changers with one shaft, and the other part with a second shaft.
- In this case, please quote the position of the coupling shaft and that of the setting shaft.

Note: It is essential to quote dimension "W" in the order. The minimum value of this dimension to be set in each case depends on the isolating conditions and on the layout of the various tap changers.

WHEN ORDERING PLEASE QUOTE:

- 1- The 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. (\emptyset , b, a, d) for hanger
- 9- The numbers of the fixed contacts

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



GENERAL SPECIFICATION

These tap changers are available in one, two or three phase applications.
The shaft length is variable.

Connection diagrams in page PDF III 2 can be applied in any variation to all types.
These tap changers are bolted on to the supports, welded under transformer cover and allow strong construction.

ASSEMBLY

A fraction of turn on the control head is necessary to switch from one position to another. A notch is provided to mark each position precisely. For each operation, the notch must first be released by pulling the padlockable pul rod. After being turned to the desired position, the device locks into the respective notch under the action of a spring. Refer to page PDF III 11 for the choice of an operating device matching the tap changer fitting.

The numbering of the positions is engraved on the repeater disc of the control head.

See page PDF III 12 for the various directions of numbering.

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.

Aluminum Parts : GAISi12Cu

Brass Parts : CuZn40Pb2 Ms 60 F34 DIN 17673

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.

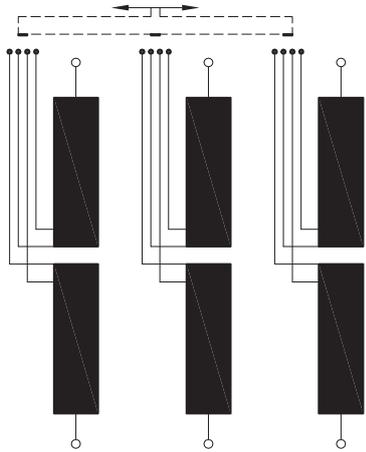
CURRENT

Up to 800A.
See page PDF III 10 for the types and dimensions of the contacts.

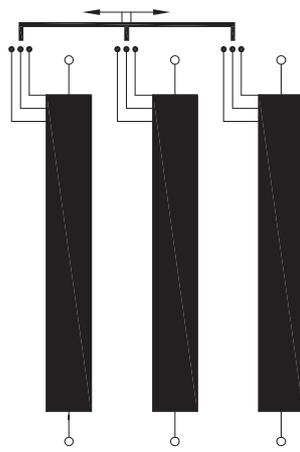
VOLTAGE CLASS

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

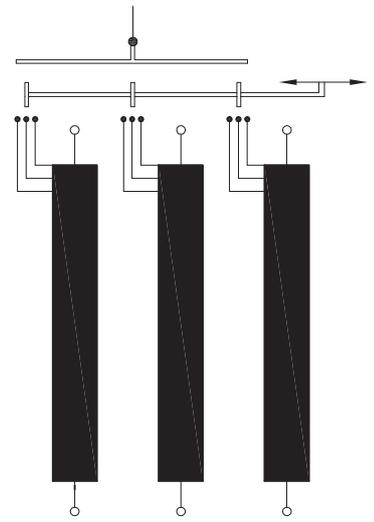
Other B.I.L. values are also available upon customer request.



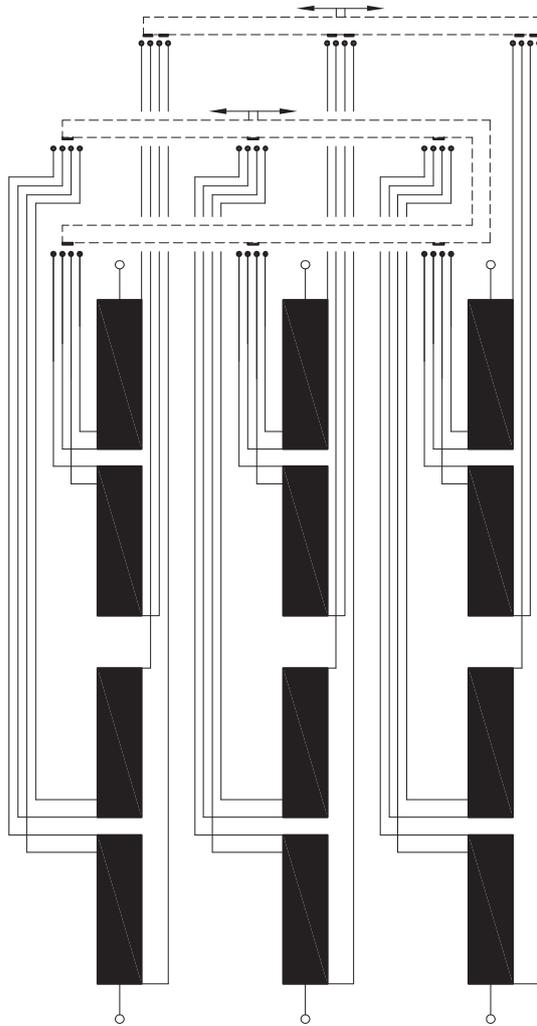
Setting for delta transformer



Setting for star transformer

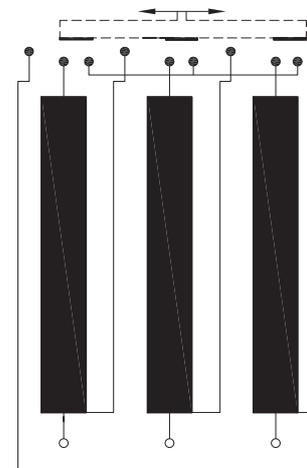


Setting for star with outer earthed conductor transformer

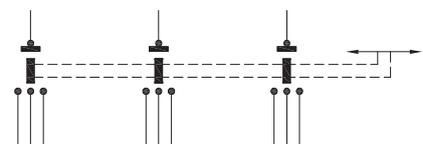


Typical combination :

- 1 stage, series - parallel coupling
- 2 stage, delta diagram - setting $\pm 2,5\%$.



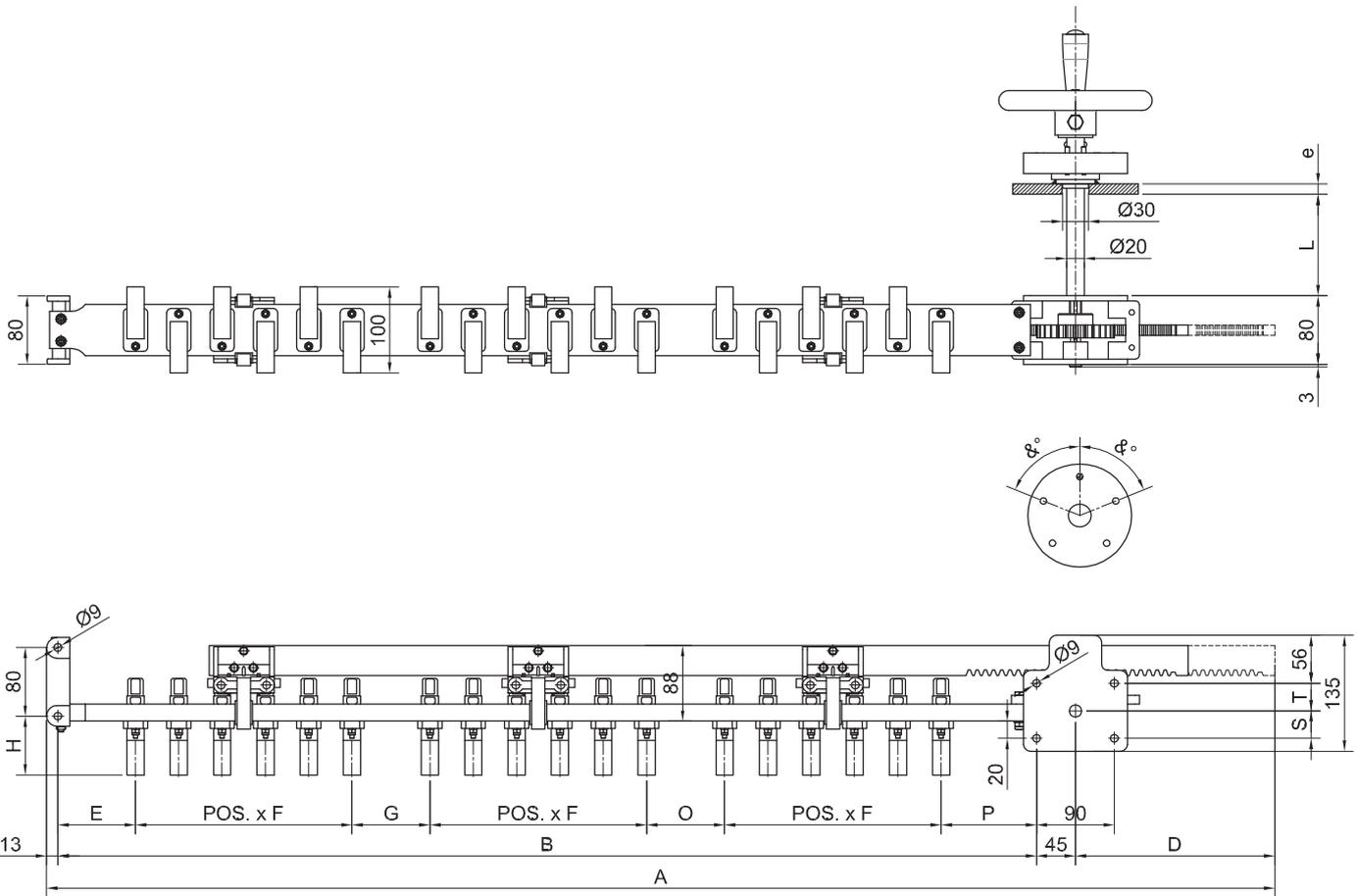
Star - delta coupling



Common output per phase

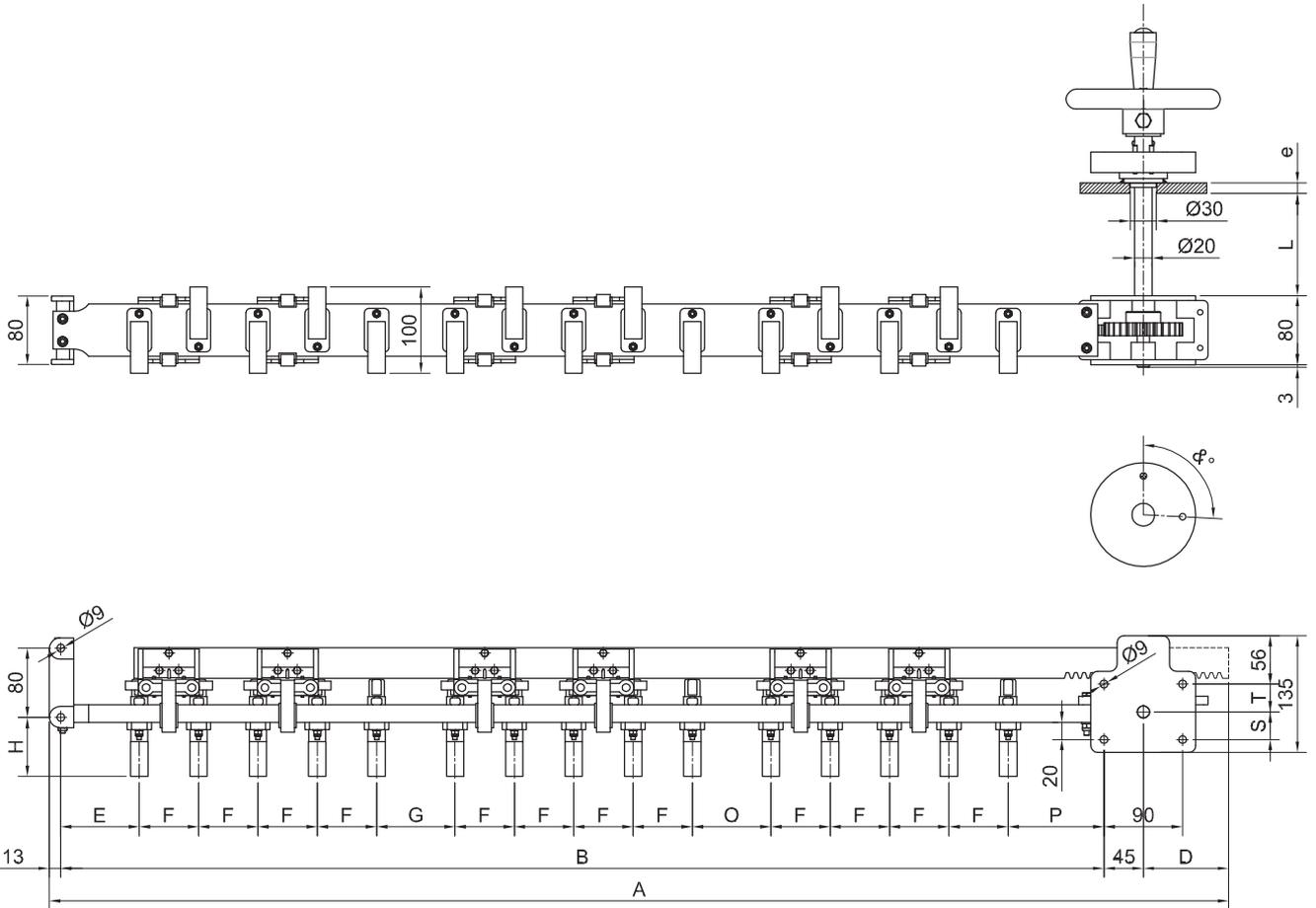


TYPE PDF III THREE PHASE TAP CHANGER
Off - circuit operation can be used in oil Delta diagram
20-30kV 400-800A 3-6 positions(With Aluminium support)



Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	3	1018	830	130	90	50	90	Depending on fixed contacts	90	110	32	32	68°	Please quote when ordering		TCF33C83
	4	1218	980	180	90	50	90		90	110	32	32	68°			TCF33C84
	5	1418	1130	230	90	50	90		90	110	32	32	68°			TCF33C85
	6	1618	1280	280	90	50	90		90	110	30	34	64°			TCF33C86
30	3	1138	950	130	120	50	120		120	140	32	32	68°			TCF33D83
	4	1338	1100	180	120	50	120		120	140	32	32	68°			TCF33D84
	5	1538	1250	230	120	50	120		120	140	32	32	68°			TCF33D85
	6	1738	1400	280	120	50	120		120	140	30	34	64°			TCF33D86

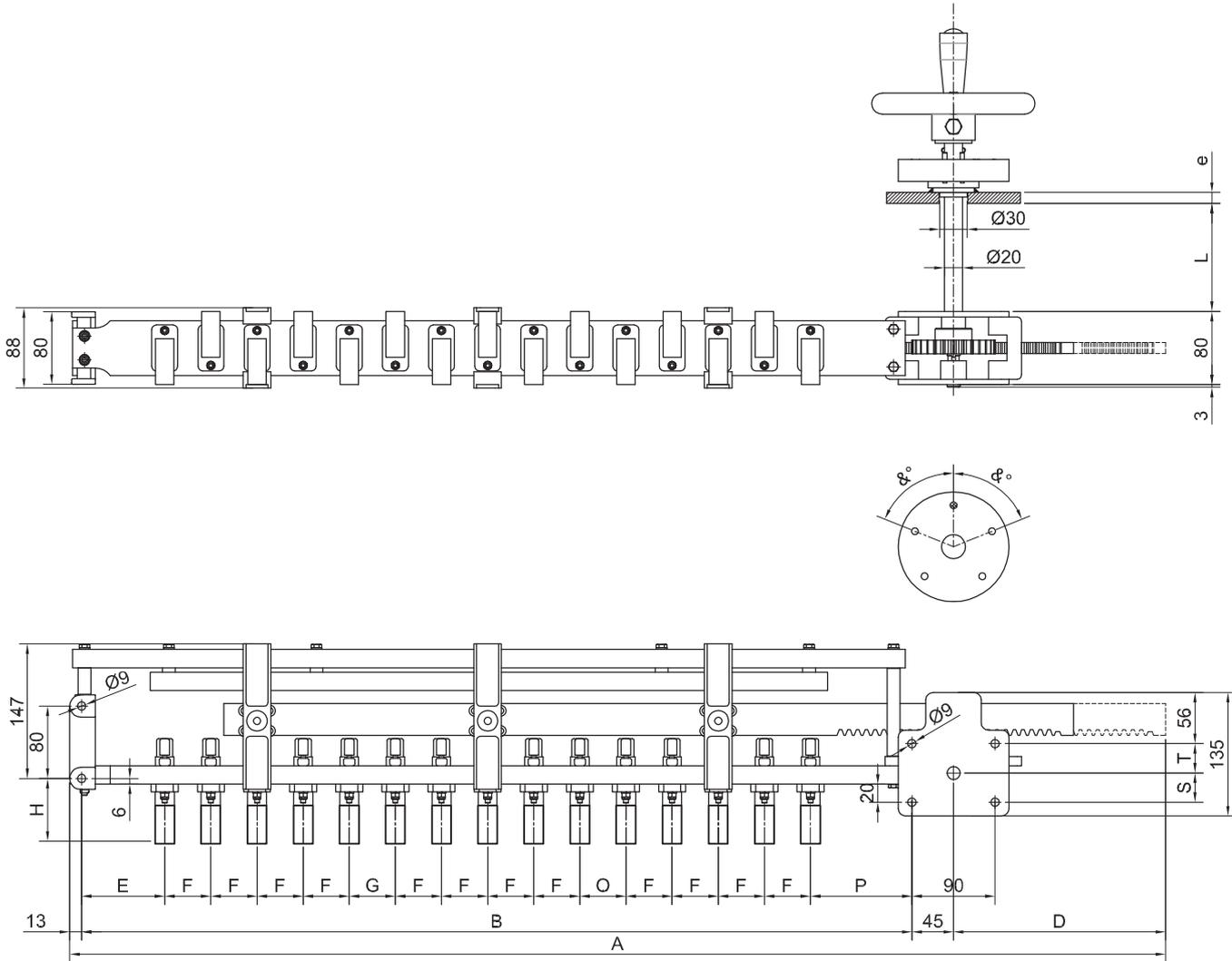
* L min. 95 for KNBV001 control devices



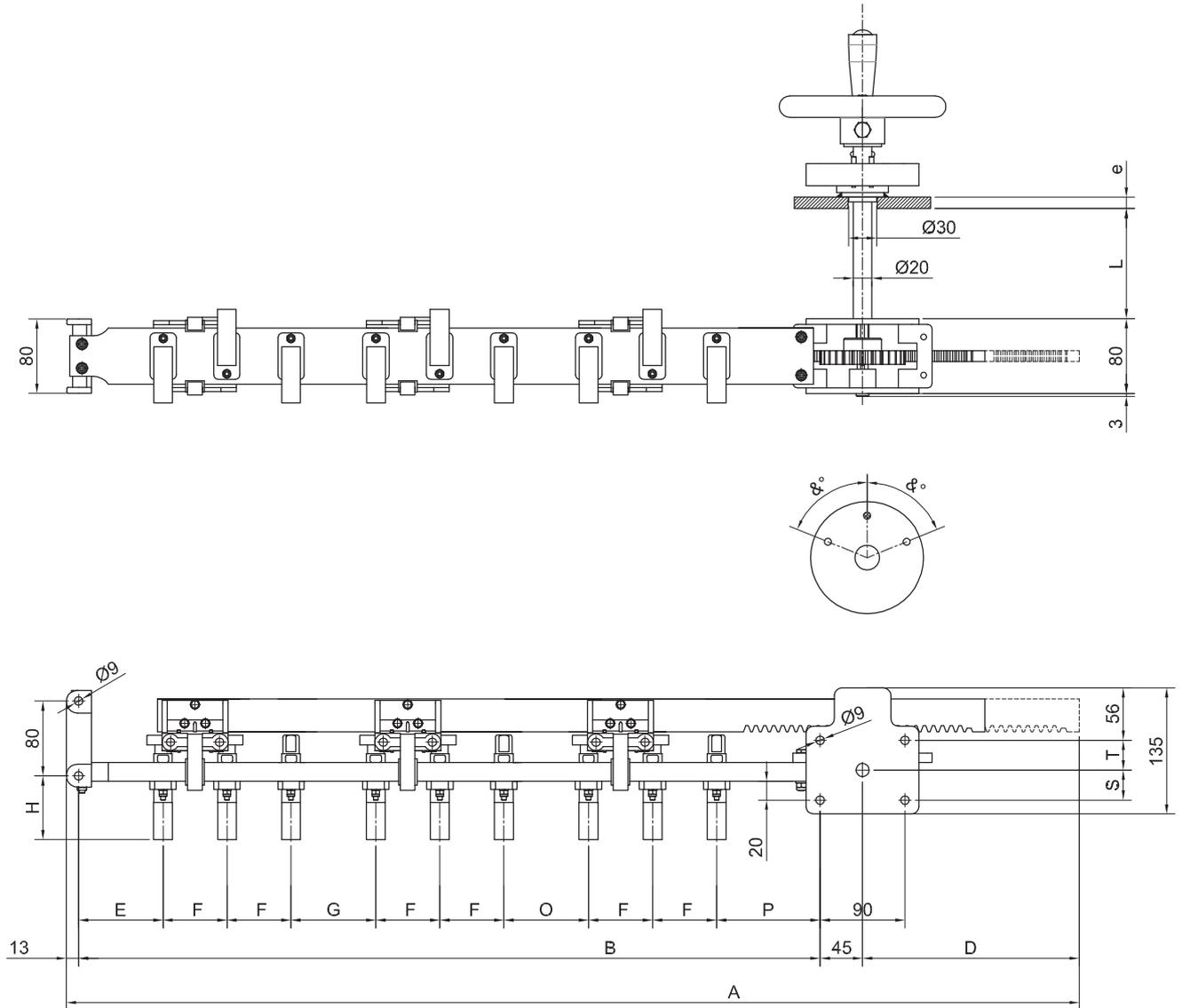
Voltage class kV	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
10-20	1352	1196	98	90	68	90	Depending on fixed contacts	90	110	32	32	93°	Please quote when ordering		TCF63F82
15-30	1472	1316	98	120	68	120		120	140	32	32	93°			TCF63I82



TYPE PDF III THREE PHASE TAP CHANGER
Off - circuit operation can be used in oil Star diagram
20-30kV 400-800A 3-6 position. (With Aluminium support)



Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	3	788	600	130	90	50	50	Depending on fixed contacts	50	110	32	32	68°	Please quote when ordering		TCF73C83
	4	988	750	180	90	50	50		50	110	32	32	68°			TCF73C84
	5	1188	900	230	90	50	50		50	110	32	32	68°			TCF73C85
	6	1388	1050	280	90	50	50		50	110	30	34	64°			TCF73C86
30	3	848	660	130	120	50	50	Depending on fixed contacts	50	140	32	32	68°	Please quote when ordering		TCF73D83
	4	1048	810	180	120	50	50		50	140	32	32	68°			TCF73D84
	5	1248	960	230	120	50	50		50	140	32	32	68°			TCF73D85
	6	1448	1110	280	120	50	50		50	140	30	34	64°			TCF73D86

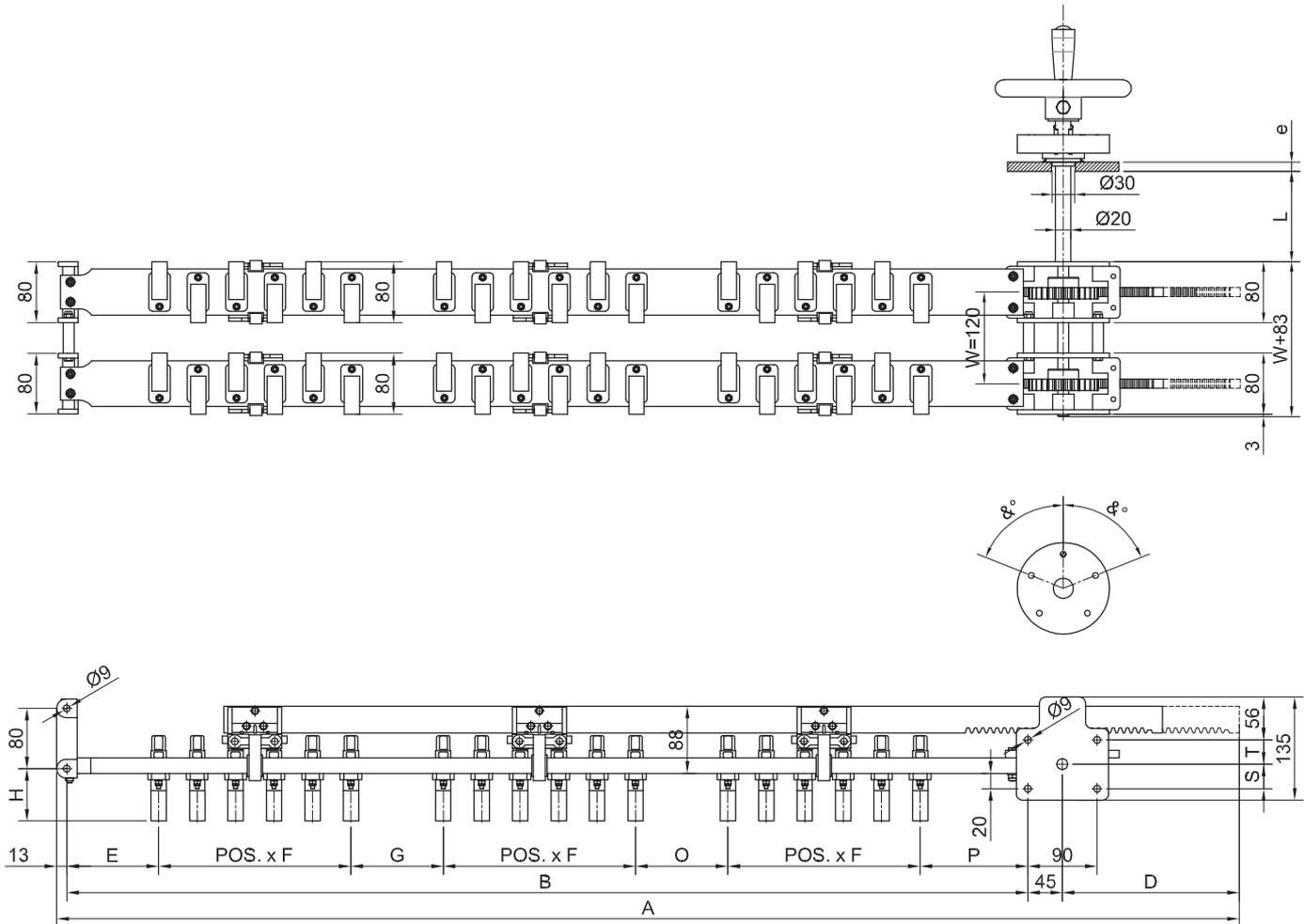


Voltage class kV	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	944	788	98	90	68	90	Depending on fixed contacts	90	110	32	32	93°	Please quote when ordering		TCF53C82
30	1246	1064	124	120	94	120		120	140	32	32	126°			TCF53D82

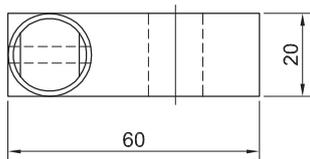
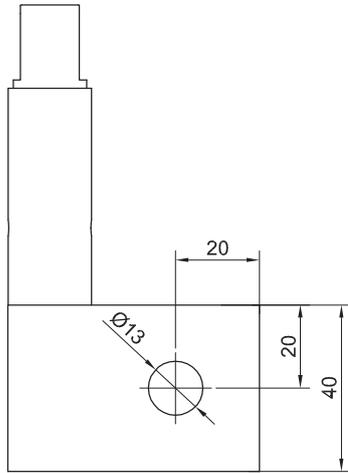


TYPE PDF III THREE PHASE TAP CHANGER

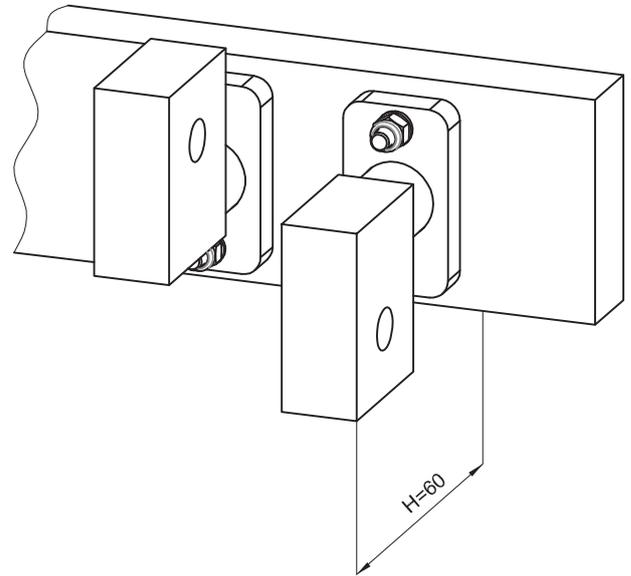
Off - circuit operation can be used in oil Two stage tap changer Delta diagram 20-30kV 400-800A 3-6 position. (With Aluminium support)



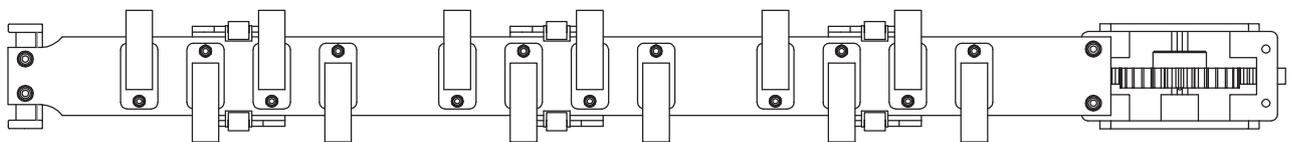
Voltage class kV	Number of positions	A	B	D	E	F	G	H	O	P	S	T	&°	L	e	Unit No
20	3	1018	830	130	90	50	90	Depending on fixed contacts	90	110	32	32	68°	Please quote when ordering		TCF2X33C83
	4	1218	980	180	90	50	90		90	110	32	32	68°			TCF2X33C84
	5	1418	1130	230	90	50	90		90	110	32	32	68°			TCF2X33C85
	6	1618	1280	280	90	50	90		90	110	30	34	64°			TCF2X33C86
30	3	1138	950	130	120	50	120		120	140	32	32	68°			TCF2X33D83
	4	1338	1100	180	120	50	120		120	140	32	32	68°			TCF2X33D84
	5	1538	1250	230	120	50	120		120	140	32	32	68°			TCF2X33D85
	6	1738	1400	280	120	50	120		120	140	30	34	64°			TCF2X33D86



CONTACT DETAIL

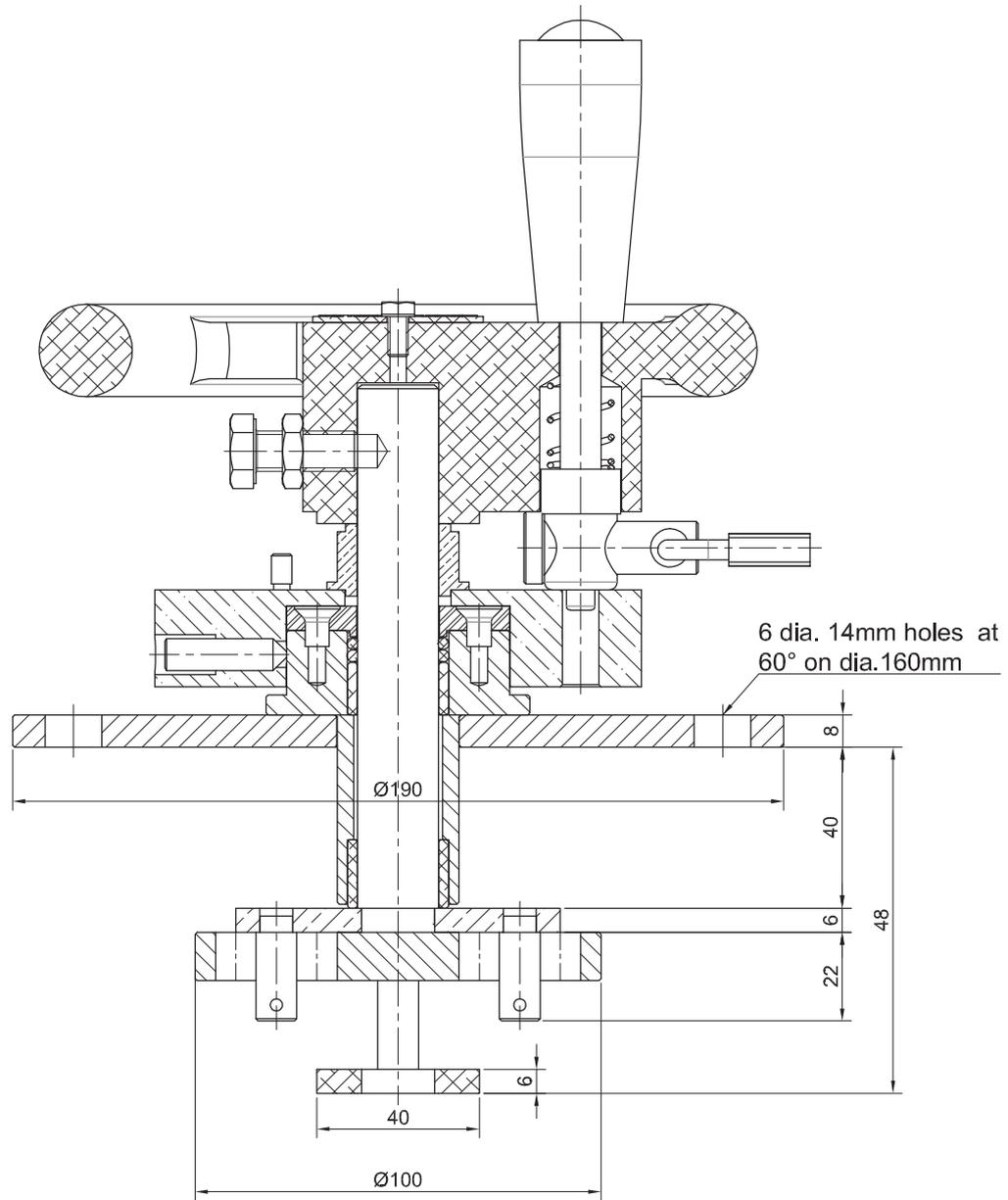


Flag type contact
FCT040



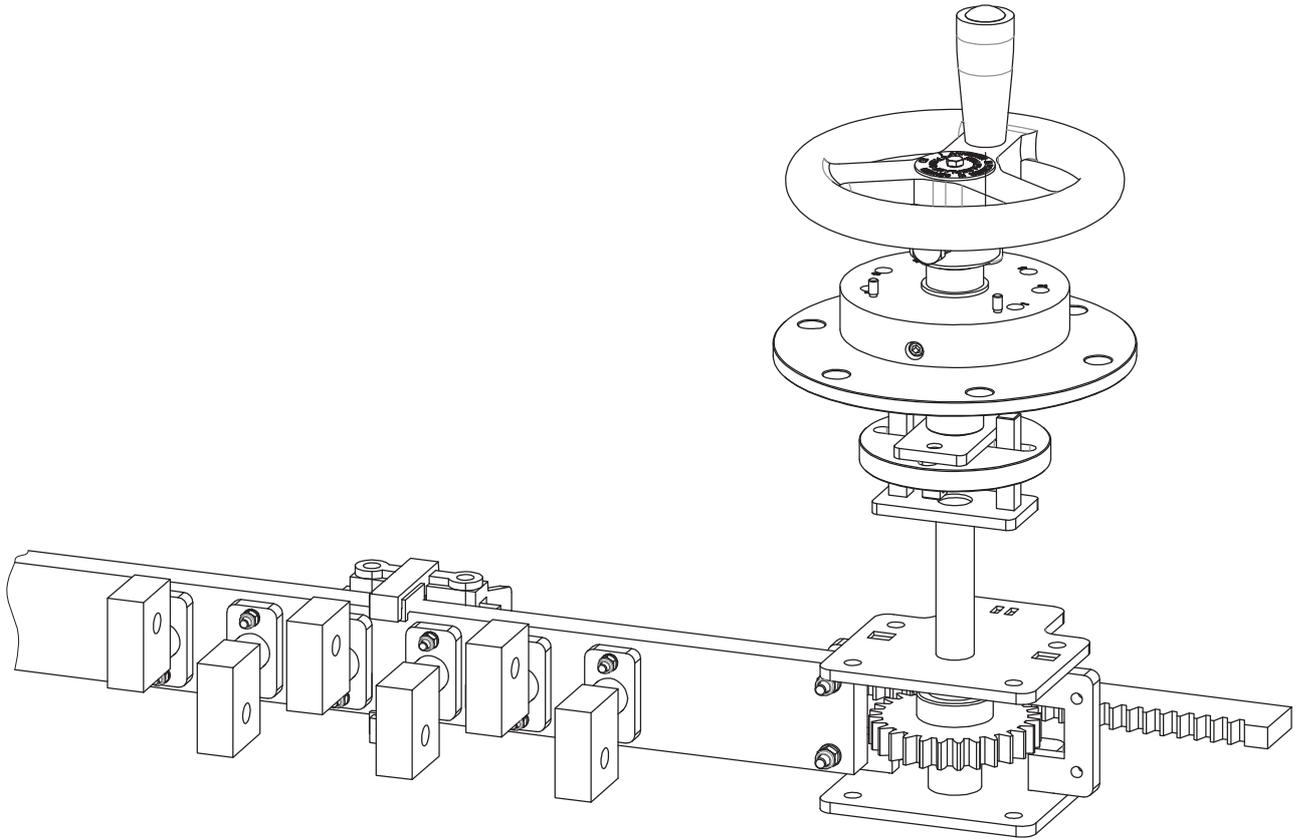
Unless otherwise specified by the customer, flag type contacts faced as shown in the above diagram.

The contact situated near the operating device face downwards



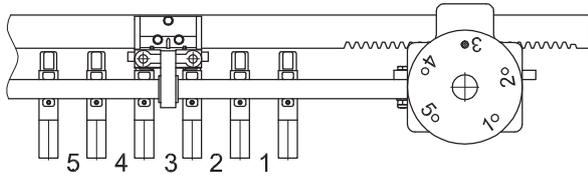
plug - in standart type
Flange - mounted
Permitted angular variation : 3°
permitted alignment variation : 8mm

Code no : **KNBV001**

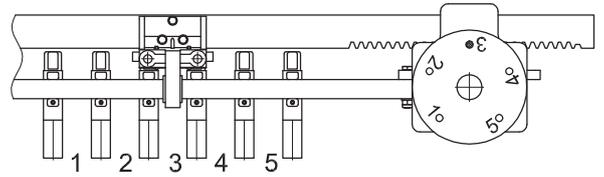


Numbering of the repeaters for rack and pinion drive

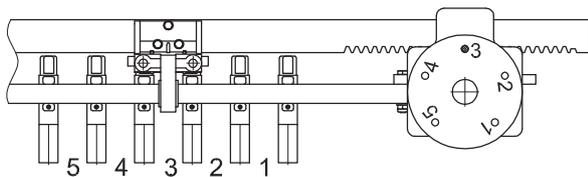
A1



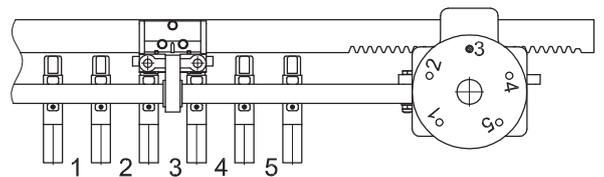
B1

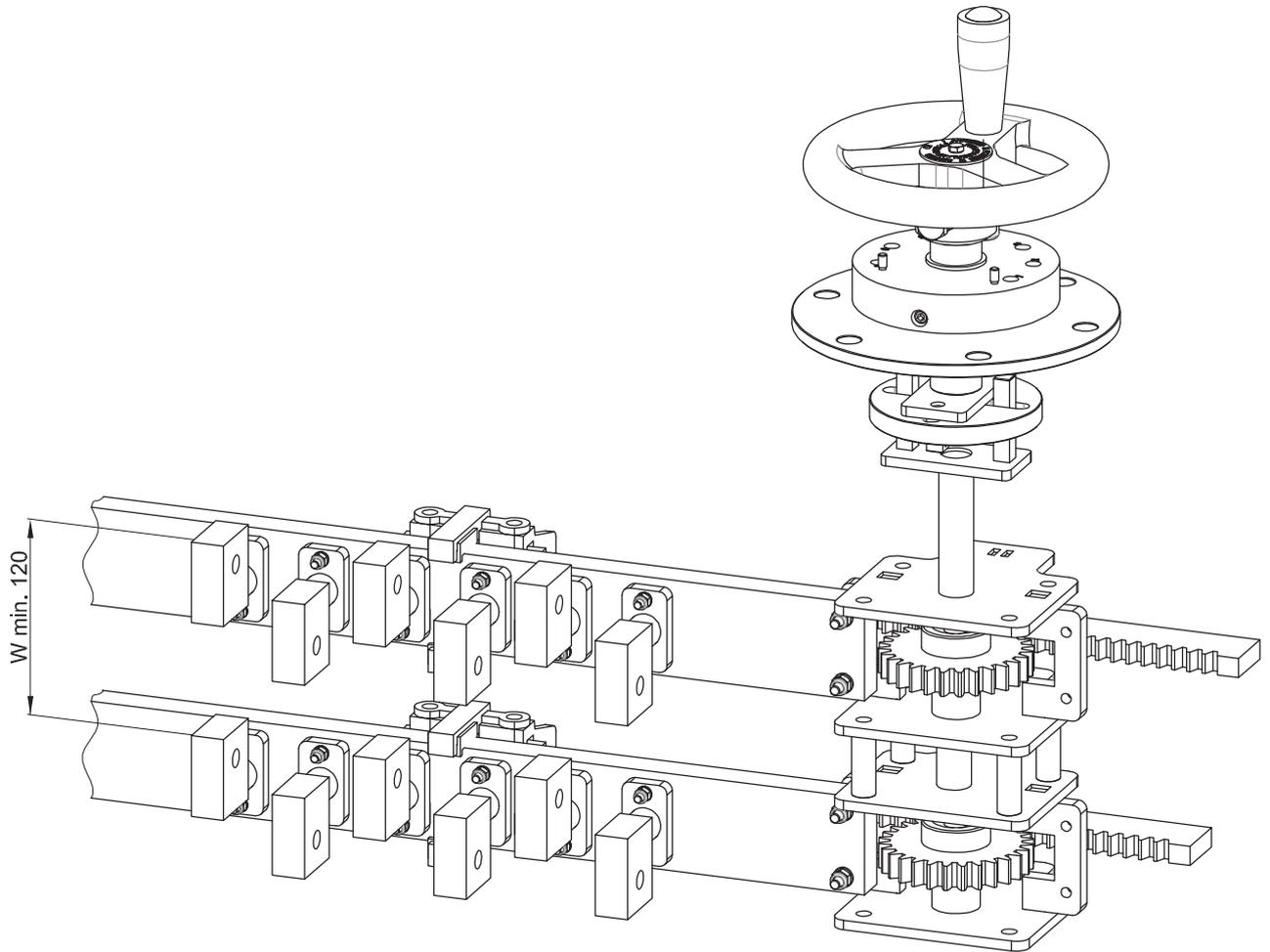


D1



C1





All type PDF III tap changers may be paired by superimposing several tap changers whose purpose-built steel brackets are assembled by nuts and bolts.

According to the diagram adopted, the user can:

- either operate the tap changers with one shaft,
- or operate part of the tap changers with one shaft, and the other part with another shaft.

In this case, please quote the position of the coupling shaft and the setting shaft

Note: It is essential to quote dimension "W" in the order. The minimum value of this dimension to be set in each case depends on the insulation conditions and on the position of the different tap changers.

WHEN ORDERING PLEASE QUOTE:

- 1- The 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, W dimensions from the tables.

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

