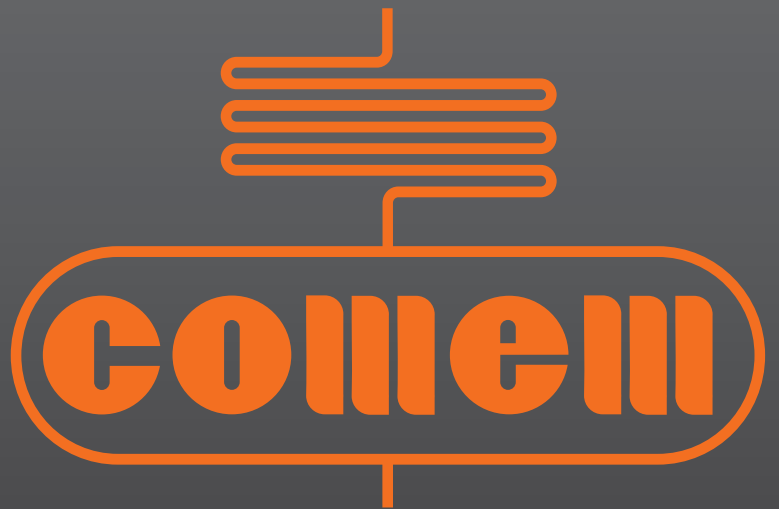




OFF CIRCUIT
"TKC" SERIES
TAP CHANGERS



OFF CIRCUIT "TKC" SERIES TAP CHANGERS



SINGLE-PHASE BRIDGE TYPE
TAP CHANGER



THREE-PHASE FIXED POINT
TAP CHANGER

THREE-PHASE DOUBLE
BRIDGE TYPE
TAP CHANGER



THREE-PHASE BRIDGE TYPE
TAP CHANGER



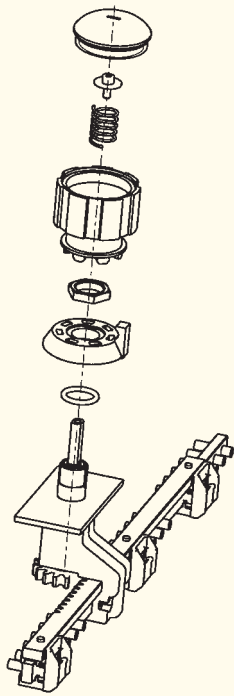
COMBINED
TAP CHANGER

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TKC IS...



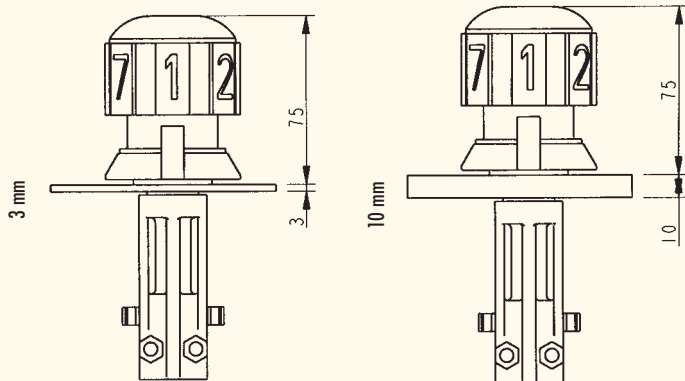
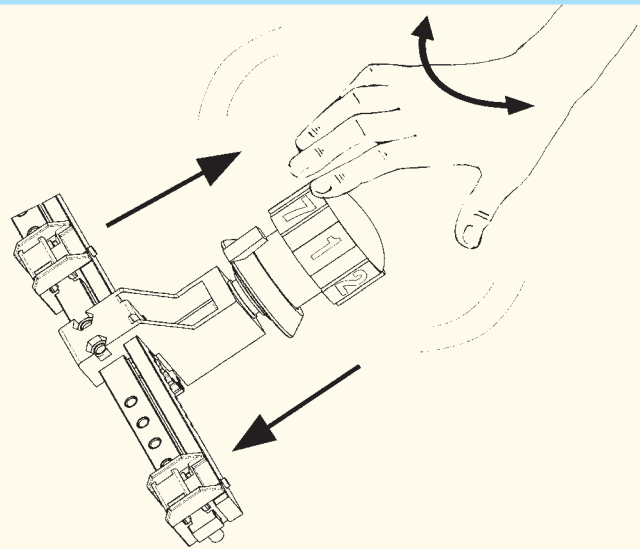
only 8 components

“TKC”

*Is fast assembling operation
(half time assembling labour
compared to other tap changers)*

“TKC”

*means safe and exact
switch movement;*

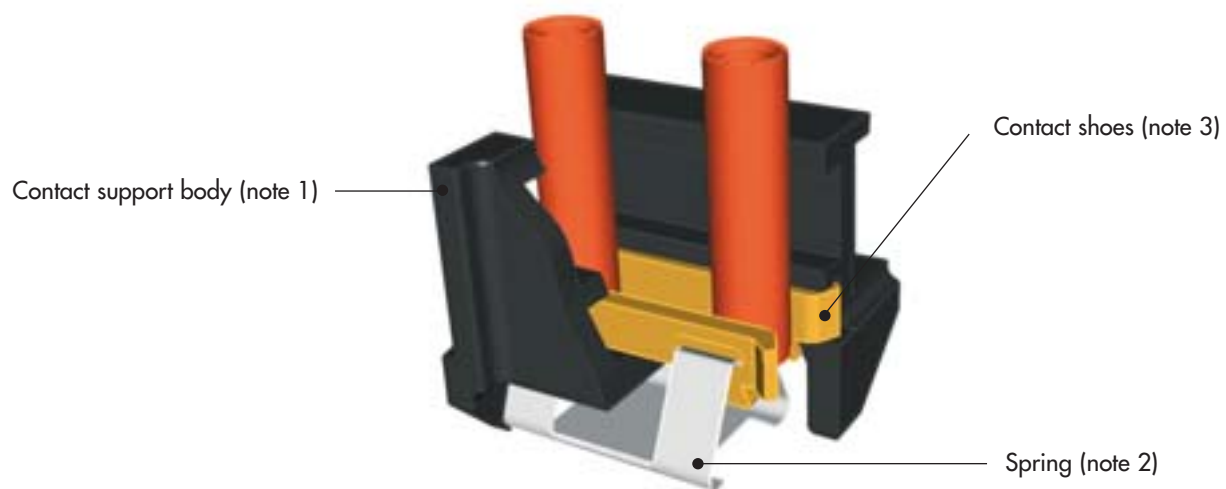


PATENTED

“TKC”

*self adjustment to the
different thickness
of the transformer cover*

CONTACT STRUCTURE



PATENTED

NOTE 1: The contact support body is made of an isolating material to ensure maximum protection for active parts.

NOTE 2: The special spring has 4 independent force levers that apply the same pressure to the contact pins.

As a consequence this system offers lower resistivity to contact.

NOTE 3: The brass contact shoes are made of a special shape that favors sliding on the connection pins.

INTRODUCTION

The main characteristics of this new series of tap changers are:

- Speed of installation;
- Safe and exact switch movement;
- Exact contact positioning after the switching maneuver;
- Compact dimensions;
- Possibility to adapt the TKC to the thickness of the transformer tank.

These units may be used with mineral oil or silicon liquid. They are fixed below the transformer cover by a support. They allow adjustment or combinations according to the diagrams given in the following pages. There is no need for washers during assembly because the tap changer adjusts itself according to the thickness of the transformer tank.

Oil tightness is provided by O-rings.

The catalogue illustrates normally used tap changers and standard accessories. Special tap changers may be designed to meet special requirements.

STRUCTURE AND MATERIALS

The fixed contacts are mounted on one of the two parallel insulating plates perpendicular to the support. The other plate mounts the mobile contacts. The fixed plate is screwed to the support. The mobile plate slides on the support using a rotating gear fastened to the shaft.

Fixed contacts are made of copper with the following inside diameters:

- $\varnothing = 2.1$ mm for 10 A rated,
- $\varnothing = 3.1$ mm for 30 A rated,
- $\varnothing = 5.1$ mm for 60 A rated.

Conductors coming from the coils are clamped on the copper tubes. If they are also soldered be careful not to damage insulation.

Mobile contacts are made of brass.

Metal parts are made of corrosion-proof materials.

On request all metal parts may be made of stainless steel.

The other elements that compose the tap changer are made of polyamide reinforced with glass fibres.

The insulating plates are made of premium quality phenolic resin.

An aluminium alloy knob protection kit may be furnished on request or a complete driving knob made of aluminium.

TAP CHANGING PROCEDURES

Tap changing procedures are very quick and simple.

They must be performed with de-energized transformer in a no-load state.

To switch, just lift the knob, rotating it until the desired number or mark coincides with the colored arrow on the washer (pos. 6 pag 26). Release then the knob and make sure that the orange painted zone is not visible.

TECHNICAL SPECIFICATIONS

Two voltage classes are provided:

Rated voltage	Max voltage test	Voltage to ground (According to 60214-1 Standards)	
		Industrial freq. 50/60 Hz	Pulse 1.2/50 μ s
kV	kV	kV	kV
20	24	50	125
30	36	70	170

Three rated currents are provided:

10 A	30 A	60 A
------	------	------

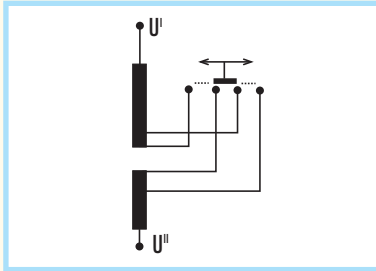
TESTS

COMEM, a company with UNI EN ISO 9001 certification, has internal procedures that include all the tests necessary to guarantee a safe, reliable and quality product.

The following tests have been carried out at CESI labs in accordance with **60214-1 Standards**:

- short circuit current test;
- temperature rise of contacts test;
- dielectric tests

"TKC" TAP CHANGER WIRING DIAGRAMS

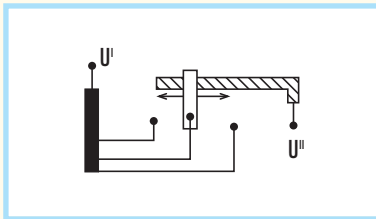


MS-SA: Single-phase bridge type

pag. 11

TS-SA: Three-phase bridge type

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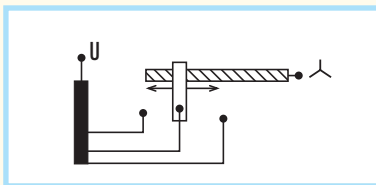


MS-PF: Single-phase fixed point

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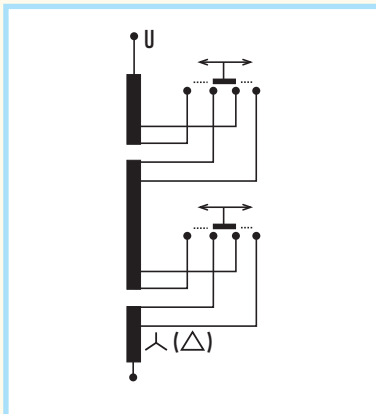
TS-PF: Three-phase fixed point (separated for the 3 phases)

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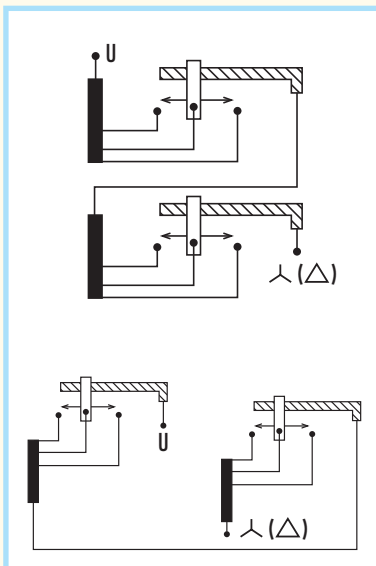
TS-CS: Three-phase fixed point (common for the 3 phases)

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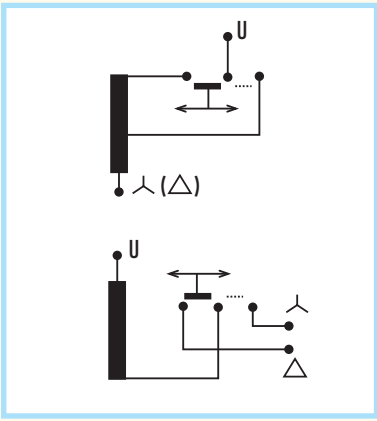
TD-SA: Three-phase double bridge type

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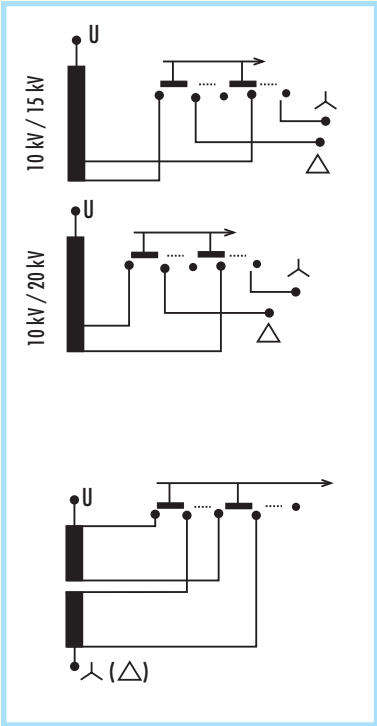
TD-PF: Three-phase double fixed point

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TS-CT3: Coupling star-delta or exclusion of coils

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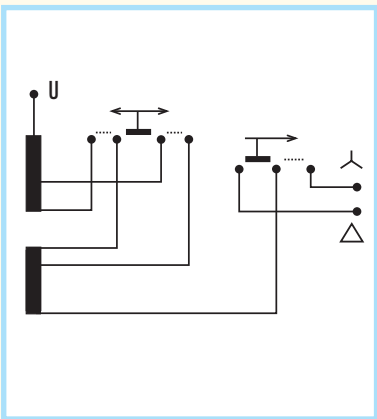


TS-CT5: Coupling star-delta with inclusion or exclusion of coils 10/15 kV or 10/20 kV

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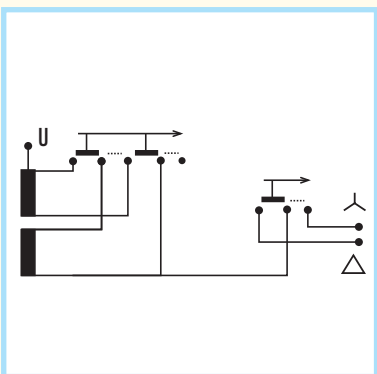
TS-CT5: Series-parallel coupling STAR or DELTA

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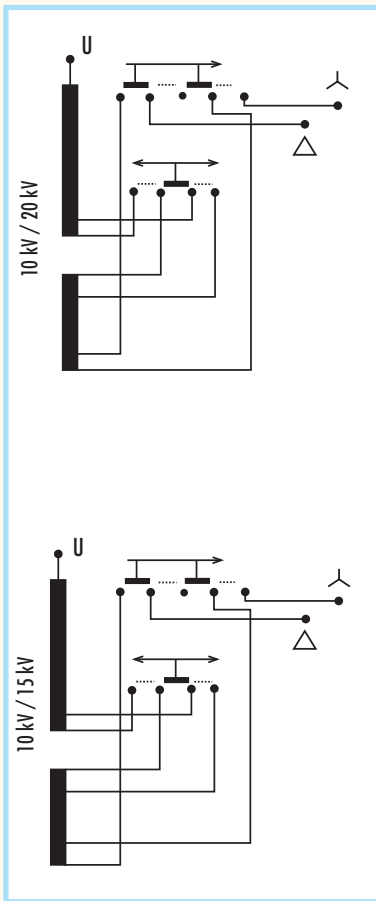
TC-SA/CT3 : Three-phase bridge type + STAR - DELTA

pag. 20



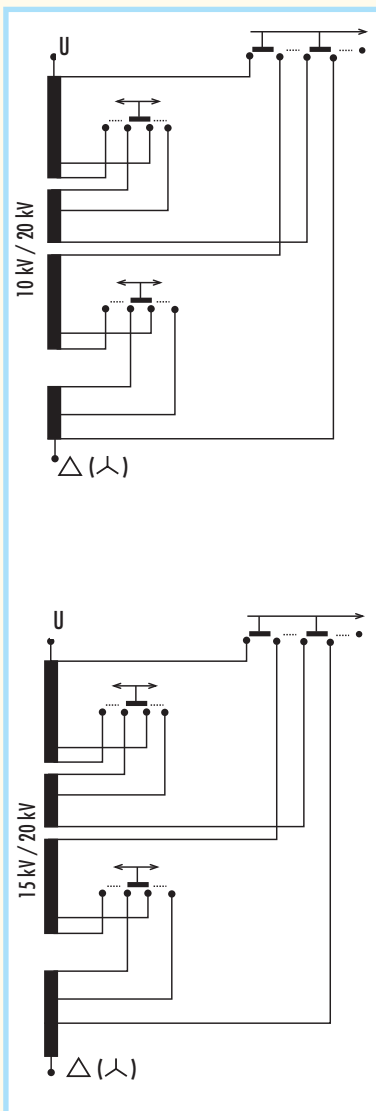
TC-SP/CT3 : Three-phase series-parallel + STAR - DELTA

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TC-SA/CT5 : Three-phase bridge type + star-delta (10/20 kV) with inclusion of coils pag. 21

TC-SA/CT5 : Three-phase bridge type + star-delta (10/15 kV) with exclusion of coils pag. 21



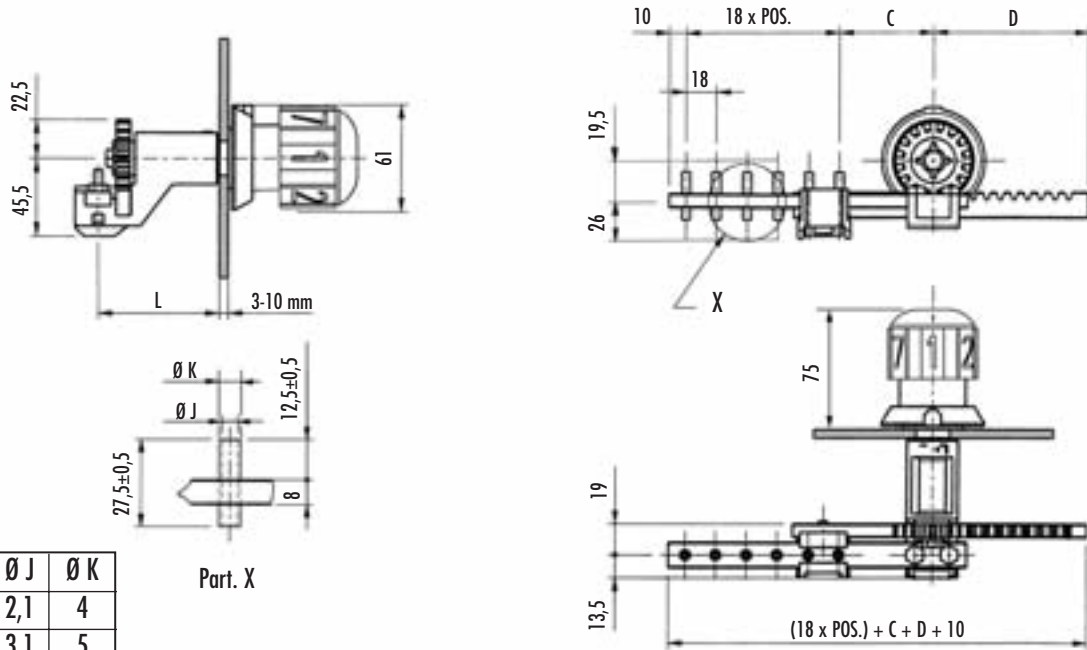
TC-SAD/CT5 : Double three-phase bridge type + series-parallel coupling 10/20 kV pag. 23

TC-SAD/CT5 : Double three-phase bridge type + series-parallel coupling 15/20 kV pag. 23

SINGLE-PHASE BRIDGE TYPE OFF-CIRCUIT TAP CHANGER

- 24 kV and 36 kV
- 10 A, 30 A and 60 A - from 3 to 7 positions
- 2.5% adjustment per position

TYPE TKC • MS-SA

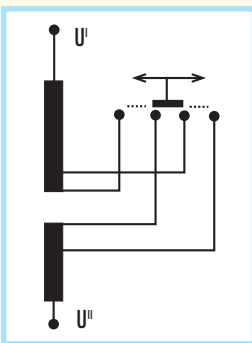


	Ø J	Ø K
10 A	2,1	4
30 A	3,1	5
60 A	5,1	7

Part. X

REF. NC - 157

Fig. 1



L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K1 2A31**0	1K1 2B31**0	1K1 2C31**0			
	4	1K1 2A41**0	1K1 2B41**0	1K1 2C41**0			
	5	1K1 2A51**0	1K1 2B51**0	1K1 2C51**0			
	6	1K1 2A61**0	1K1 2B61**0	1K1 2C61**0			
	7	1K1 2A71**0	1K1 2B71**0	1K1 2C71**0			
70	3	1K1 2A32**0	1K1 2B32**0	1K1 2C32**0	1K1 3A32**0	1K1 3B32**0	1K1 3C32**0
	4	1K1 2A42**0	1K1 2B42**0	1K1 2C42**0	1K1 3A42**0	1K1 3B42**0	1K1 3C42**0
	5	1K1 2A52**0	1K1 2B52**0	1K1 2C52**0	1K1 3A52**0	1K1 3B52**0	1K1 3C52**0
	6	1K1 2A62**0	1K1 2B62**0	1K1 2C62**0	1K1 3A62**0	1K1 3B62**0	1K1 3C62**0
	7	1K1 2A72**0	1K1 2B72**0	1K1 2C72**0	1K1 3A72**0	1K1 3B72**0	1K1 3C72**0
100	3	1K1 2A33**0	1K1 2B33**0	1K1 2C33**0	1K1 3A33**0	1K1 3B33**0	1K1 3C33**0
	4	1K1 2A43**0	1K1 2B43**0	1K1 2C43**0	1K1 3A43**0	1K1 3B43**0	1K1 3C43**0
	5	1K1 2A53**0	1K1 2B53**0	1K1 2C53**0	1K1 3A53**0	1K1 3B53**0	1K1 3C53**0
	6	1K1 2A63**0	1K1 2B63**0	1K1 2C63**0	1K1 3A63**0	1K1 3B63**0	1K1 3C63**0
	7	1K1 2A73**0	1K1 2B73**0	1K1 2C73**0	1K1 3A73**0	1K1 3B73**0	1K1 3C73**0
130	3	1K1 2A34**0	1K1 2B34**0	1K1 2C34**0	1K1 3A34**0	1K1 3B34**0	1K1 3C34**0
	4	1K1 2A44**0	1K1 2B44**0	1K1 2C44**0	1K1 3A44**0	1K1 3B44**0	1K1 3C44**0
	5	1K1 2A54**0	1K1 2B54**0	1K1 2C54**0	1K1 3A54**0	1K1 3B54**0	1K1 3C54**0
	6	1K1 2A64**0	1K1 2B64**0	1K1 2C64**0	1K1 3A64**0	1K1 3B64**0	1K1 3C64**0
	7	1K1 2A74**0	1K1 2B74**0	1K1 2C74**0	1K1 3A74**0	1K1 3B74**0	1K1 3C74**0

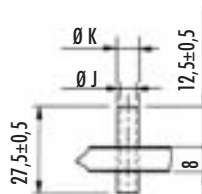
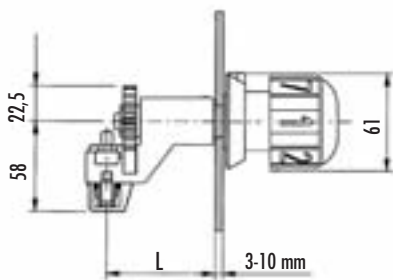
	n. pos.	C	D
24 kV	3	55	54
	4	55	72
	5	55	90
	6	55	108
	7	55	126
36 kV	3	80	54
	4	80	72
	5	80	90
	6	80	108
	7	80	126

** Select knob numbering on page 29.

SINGLE-PHASE FIXED POINT OFF-CIRCUIT TAP CHANGER

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- 2.5% adjustment per position

TYPE TKC • MS-PF



Part. X

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

REF. NC - 158

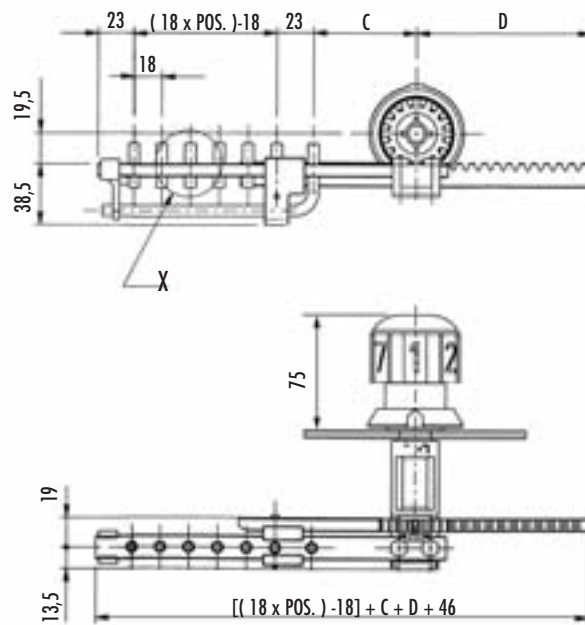
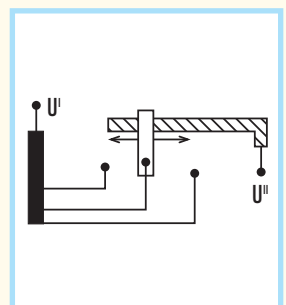


Fig. 2

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K2 2 A 3 1 ** 0	1K2 2 B 3 1 ** 0	1K2 2 C 3 1 ** 0			
	4	1K2 2 A 4 1 ** 0	1K2 2 B 4 1 ** 0	1K2 2 C 4 1 ** 0			
	5	1K2 2 A 5 1 ** 0	1K2 2 B 5 1 ** 0	1K2 2 C 5 1 ** 0			
	6	1K2 2 A 6 1 ** 0	1K2 2 B 6 1 ** 0	1K2 2 C 6 1 ** 0			
	7	1K2 2 A 7 1 ** 0	1K2 2 B 7 1 ** 0	1K2 2 C 7 1 ** 0			
70	3	1K2 2 A 3 2 ** 0	1K2 2 B 3 2 ** 0	1K2 2 C 3 2 ** 0	1K2 3 A 3 2 ** 0	1K2 3 B 3 2 ** 0	1K2 3 C 3 2 ** 0
	4	1K2 2 A 4 2 ** 0	1K2 2 B 4 2 ** 0	1K2 2 C 4 2 ** 0	1K2 3 A 4 2 ** 0	1K2 3 B 4 2 ** 0	1K2 3 C 4 2 ** 0
	5	1K2 2 A 5 2 ** 0	1K2 2 B 5 2 ** 0	1K2 2 C 5 2 ** 0	1K2 3 A 5 2 ** 0	1K2 3 B 5 2 ** 0	1K2 3 C 5 2 ** 0
	6	1K2 2 A 6 2 ** 0	1K2 2 B 6 2 ** 0	1K2 2 C 6 2 ** 0	1K2 3 A 6 2 ** 0	1K2 3 B 6 2 ** 0	1K2 3 C 6 2 ** 0
	7	1K2 2 A 7 2 ** 0	1K2 2 B 7 2 ** 0	1K2 2 C 7 2 ** 0	1K2 3 A 7 2 ** 0	1K2 3 B 7 2 ** 0	1K2 3 C 7 2 ** 0
100	3	1K2 2 A 3 3 ** 0	1K2 2 B 3 3 ** 0	1K2 2 C 3 3 ** 0	1K2 3 A 3 3 ** 0	1K2 3 B 3 3 ** 0	1K2 3 C 3 3 ** 0
	4	1K2 2 A 4 3 ** 0	1K2 2 B 4 3 ** 0	1K2 2 C 4 3 ** 0	1K2 3 A 4 3 ** 0	1K2 3 B 4 3 ** 0	1K2 3 C 4 3 ** 0
	5	1K2 2 A 5 3 ** 0	1K2 2 B 5 3 ** 0	1K2 2 C 5 3 ** 0	1K2 3 A 5 3 ** 0	1K2 3 B 5 3 ** 0	1K2 3 C 5 3 ** 0
	6	1K2 2 A 6 3 ** 0	1K2 2 B 6 3 ** 0	1K2 2 C 6 3 ** 0	1K2 3 A 6 3 ** 0	1K2 3 B 6 3 ** 0	1K2 3 C 6 3 ** 0
	7	1K2 2 A 7 3 ** 0	1K2 2 B 7 3 ** 0	1K2 2 C 7 3 ** 0	1K2 3 A 7 3 ** 0	1K2 3 B 7 3 ** 0	1K2 3 C 7 3 ** 0
130	3	1K2 2 A 3 4 ** 0	1K2 2 B 3 4 ** 0	1K2 2 C 3 4 ** 0	1K2 3 B 3 4 ** 0	1K2 3 C 3 4 ** 0	
	4	1K2 2 A 4 4 ** 0	1K2 2 B 4 4 ** 0	1K2 2 C 4 4 ** 0	1K2 3 A 4 4 ** 0	1K2 3 B 4 4 ** 0	1K2 3 C 4 4 ** 0
	5	1K2 2 A 5 4 ** 0	1K2 2 B 5 4 ** 0	1K2 2 C 5 4 ** 0	1K2 3 A 5 4 ** 0	1K2 3 B 5 4 ** 0	1K2 3 C 5 4 ** 0
	6	1K2 2 A 6 4 ** 0	1K2 2 B 6 4 ** 0	1K2 2 C 6 4 ** 0	1K2 3 A 6 4 ** 0	1K2 3 B 6 4 ** 0	1K2 3 C 6 4 ** 0
	7	1K2 2 A 7 4 ** 0	1K2 2 B 7 4 ** 0	1K2 2 C 7 4 ** 0	1K2 3 A 7 4 ** 0	1K2 3 B 7 4 ** 0	1K2 3 C 7 4 ** 0

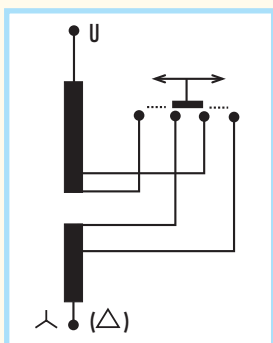
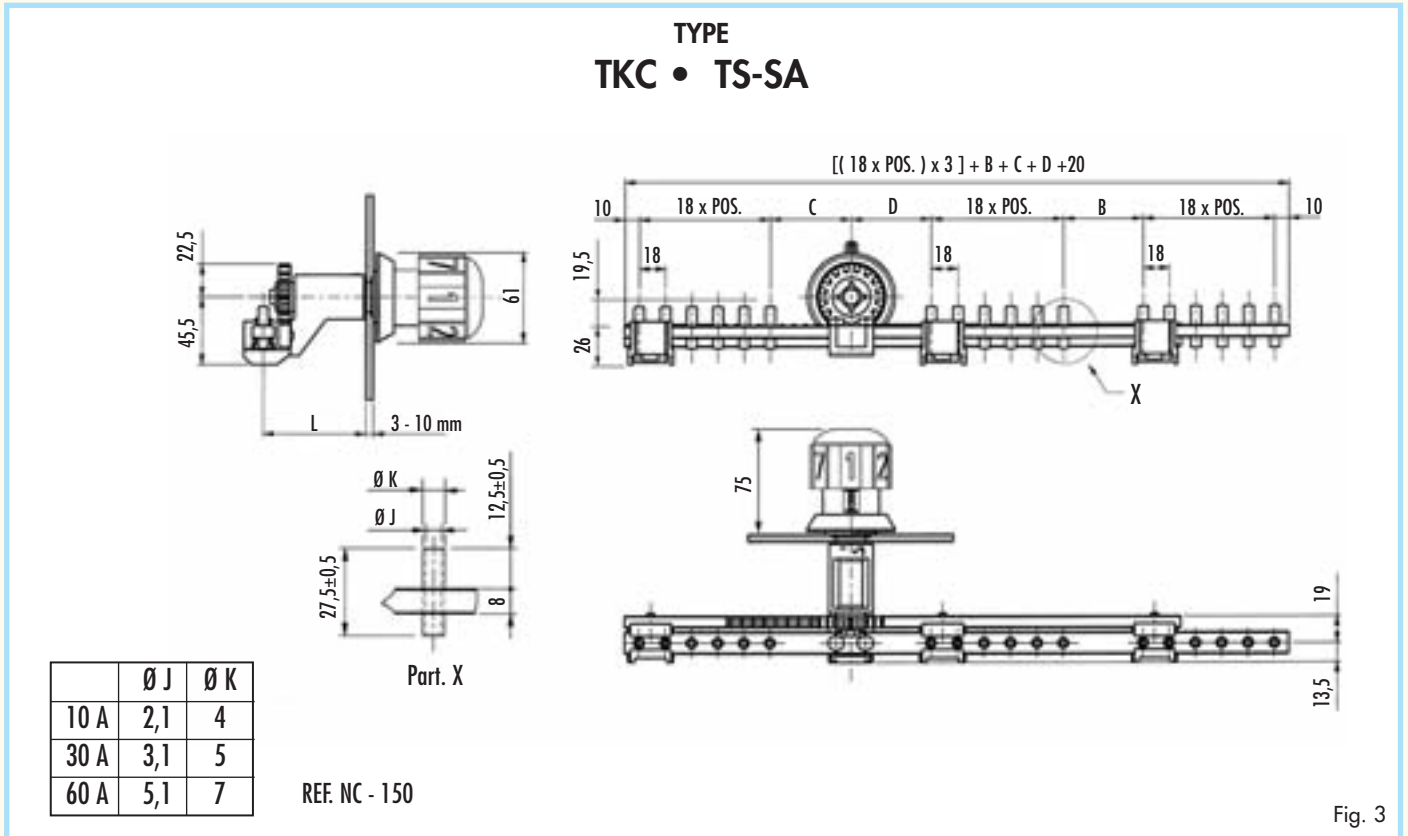


	n. pos.	C	D
24 kV	3	55	54
	4	55	72
	5	55	90
	6	55	108
	7	55	126
36 kV	3	80	54
	4	80	72
	5	80	90
	6	80	108
	7	80	126

** Select knob numbering on page 29.

THREE-PHASE BRIDGE TYPE OFF-CIRCUIT TAP CHANGER

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position
- STAR or DELTA connection



	B	C	D
24 kV	55	55	55
36 kV	80	80	80

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K3 2A31**0	1K3 2B31**0	1K3 2C31**0			
	4	1K3 2A41**0	1K3 2B41**0	1K3 2C41**0			
	5	1K3 2A51**0	1K3 2B51**0	1K3 2C51**0			
	6	1K3 2A61**0	1K3 2B61**0	1K3 2C61**0			
	7	1K3 2A71**0	1K3 2B71**0	1K3 2C71**0			
70	3	1K3 2A32**0	1K3 2B32**0	1K3 2C32**0	1K3 3A32**0	1K3 3B32**0	1K3 3C32**0
	4	1K3 2A42**0	1K3 2B42**0	1K3 2C42**0	1K3 3A42**0	1K3 3B42**0	1K3 3C42**0
	5	1K3 2A52**0	1K3 2B52**0	1K3 2C52**0	1K3 3A52**0	1K3 3B52**0	1K3 3C52**0
	6	1K3 2A62**0	1K3 2B62**0	1K3 2C62**0	1K3 3A62**0	1K3 3B62**0	1K3 3C62**0
	7	1K3 2A72**0	1K3 2B72**0	1K3 2C72**0	1K3 3A72**0	1K3 3B72**0	1K3 3C72**0
100	3	1K3 2A33**0	1K3 2B33**0	1K3 2C33**0	1K3 3A33**0	1K3 3B33**0	1K3 3C33**0
	4	1K3 2A43**0	1K3 2B43**0	1K3 2C43**0	1K3 3A43**0	1K3 3B43**0	1K3 3C43**0
	5	1K3 2A53**0	1K3 2B53**0	1K3 2C53**0	1K3 3A53**0	1K3 3B53**0	1K3 3C53**0
	6	1K3 2A63**0	1K3 2B63**0	1K3 2C63**0	1K3 3A63**0	1K3 3B63**0	1K3 3C63**0
	7	1K3 2A73**0	1K3 2B73**0	1K3 2C73**0	1K3 3A73**0	1K3 3B73**0	1K3 3C73**0
130	3	1K3 2A34**0	1K3 2B34**0	1K3 2C34**0	1K3 3A34**0	1K3 3B34**0	1K3 3C34**0
	4	1K3 2A44**0	1K3 2B44**0	1K3 2C44**0	1K3 3A44**0	1K3 3B44**0	1K3 3C44**0
	5	1K3 2A54**0	1K3 2B54**0	1K3 2C54**0	1K3 3A54**0	1K3 3B54**0	1K3 3C54**0
	6	1K3 2A64**0	1K3 2B64**0	1K3 2C64**0	1K3 3A64**0	1K3 3B64**0	1K3 3C64**0
	7	1K3 2A74**0	1K3 2B74**0	1K3 2C74**0	1K3 3A74**0	1K3 3B74**0	1K3 3C74**0

** Select knob numbering on page 29.

THREE-PHASE DOUBLE BRIDGE TYPE OFF-CIRCUIT TAP CHANGER

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position
- STAR or DELTA connection

TYPE TKC • TD-SA

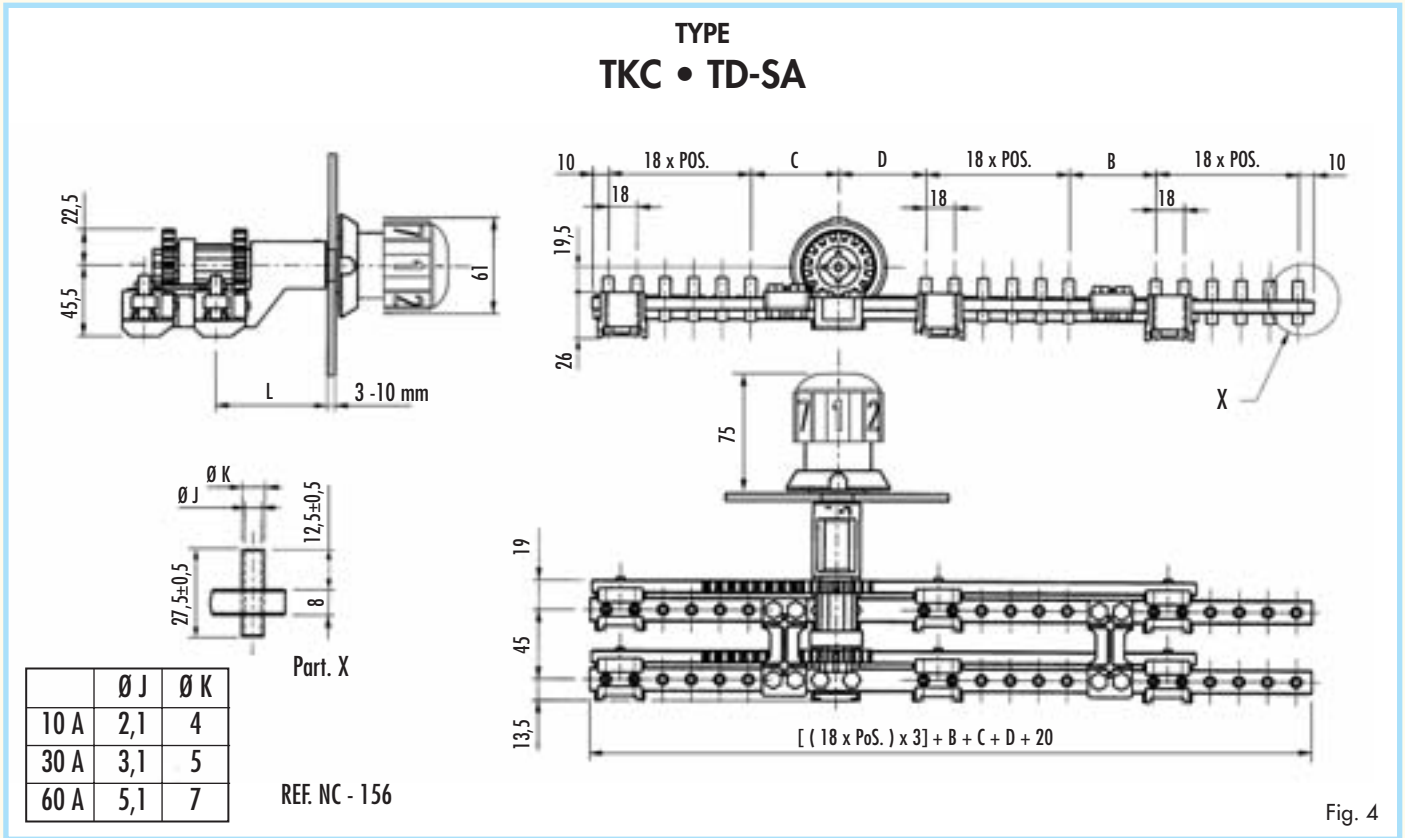
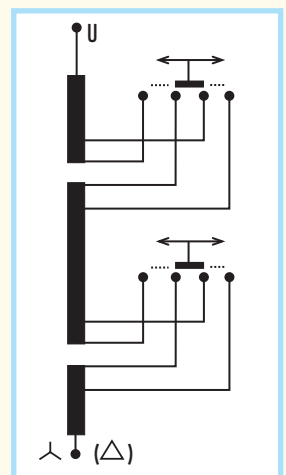


Fig. 4

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K9 2A 31**0	1K9 2B 31**0	1K9 2C 31**0			
	4	1K9 2A 41**0	1K9 2B 41**0	1K9 2C 41**0			
	5	1K9 2A 51**0	1K9 2B 51**0	1K9 2C 51**0			
	6	1K9 2A 61**0	1K9 2B 61**0	1K9 2C 61**0			
	7	1K9 2A 71**0	1K9 2B 71**0	1K9 2C 71**0			
70	3	1K9 2A 32**0	1K9 2B 32**0	1K9 2C 32**0	1K9 3A 32**0	1K9 3B 32**0	1K9 3C 32**0
	4	1K9 2A 42**0	1K9 2B 42**0	1K9 2C 42**0	1K9 3A 42**0	1K9 3B 42**0	1K9 3C 42**0
	5	1K9 2A 52**0	1K9 2B 52**0	1K9 2C 52**0	1K9 3A 52**0	1K9 3B 52**0	1K9 3C 52**0
	6	1K9 2A 62**0	1K9 2B 62**0	1K9 2C 62**0	1K9 3A 62**0	1K9 3B 62**0	1K9 3C 62**0
	7	1K9 2A 72**0	1K9 2B 72**0	1K9 2C 72**0	1K9 3A 72**0	1K9 3B 72**0	1K9 3C 72**0
100	3	1K9 2A 33**0	1K9 2B 33**0	1K9 2C 33**0	1K9 3A 33**0	1K9 3B 33**0	1K9 3C 33**0
	4	1K9 2A 43**0	1K9 2B 43**0	1K9 2C 43**0	1K9 3A 43**0	1K9 3B 43**0	1K9 3C 43**0
	5	1K9 2A 53**0	1K9 2B 53**0	1K9 2C 53**0	1K9 3A 53**0	1K9 3B 53**0	1K9 3C 53**0
	6	1K9 2A 63**0	1K9 2B 63**0	1K9 2C 63**0	1K9 3A 63**0	1K9 3B 63**0	1K9 3C 63**0
	7	1K9 2A 73**0	1K9 2B 73**0	1K9 2C 73**0	1K9 3A 73**0	1K9 3B 73**0	1K9 3C 73**0
130	3	1K9 2A 34**0	1K9 2B 34**0	1K9 2C 34**0	1K9 3A 34**0	1K9 3B 34**0	1K9 3C 34**0
	4	1K9 2A 44**0	1K9 2B 44**0	1K9 2C 44**0	1K9 3A 44**0	1K9 3B 44**0	1K9 3C 44**0
	5	1K9 2A 54**0	1K9 2B 54**0	1K9 2C 54**0	1K9 3A 54**0	1K9 3B 54**0	1K9 3C 54**0
	6	1K9 2A 64**0	1K9 2B 64**0	1K9 2C 64**0	1K9 3A 64**0	1K9 3B 64**0	1K9 3C 64**0
	7	1K9 2A 74**0	1K9 2B 74**0	1K9 2C 74**0	1K9 3A 74**0	1K9 3B 74**0	1K9 3C 74**0

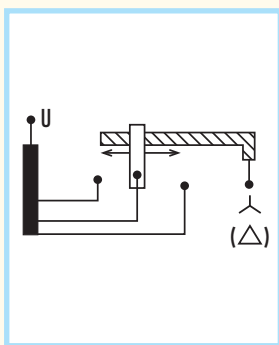
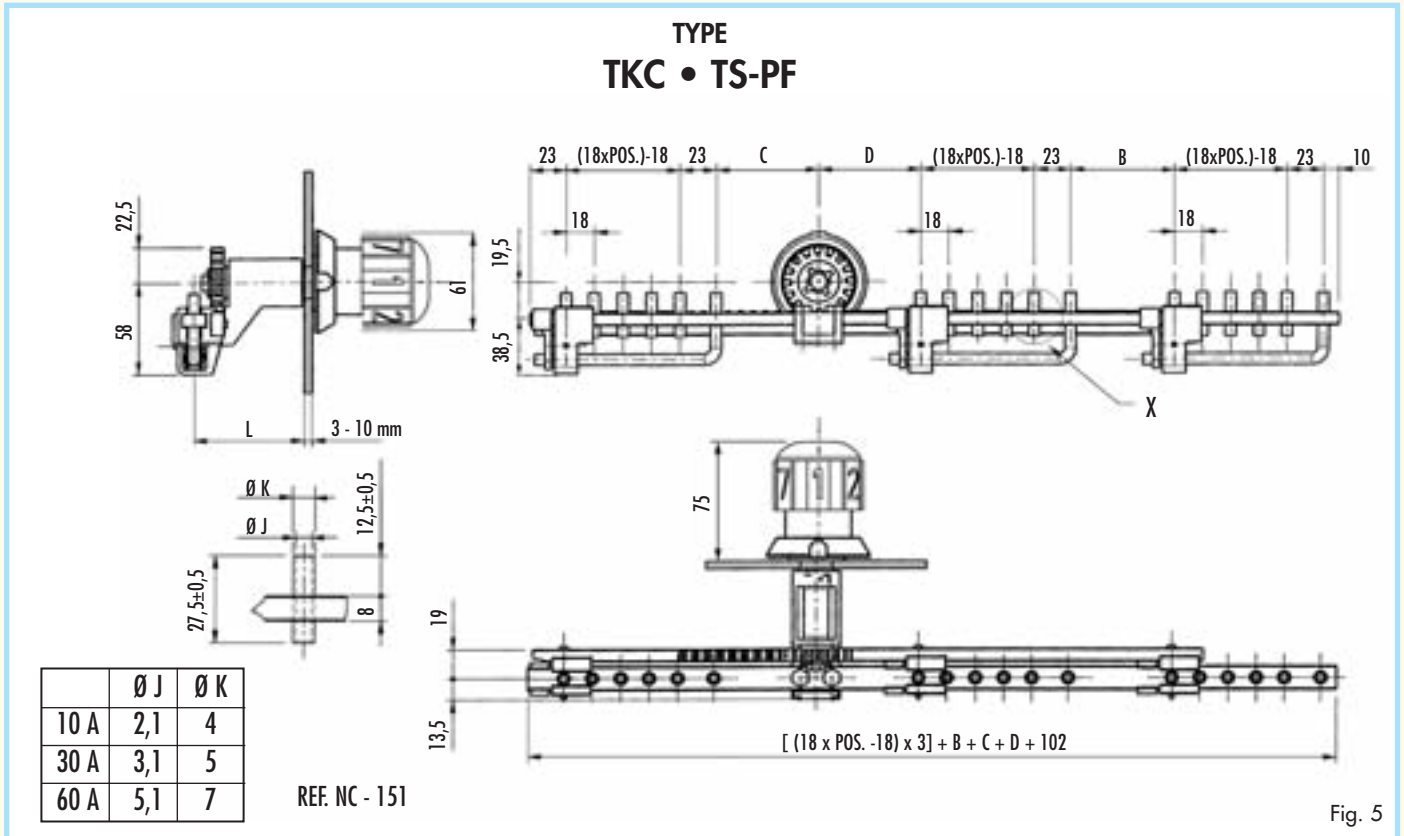


	B	C	D
36 kV	80	80	80
24 kV	55	55	55

** Select knob numbering on page 29.

THREE-PHASE FIXED POINT OFF-CIRCUIT TAP CHANGER SEPARATED FOR THE THREE PHASES

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position
- STAR or DELTA connection



	B	C	D
24 kV	65	65	65
36 kV	90	90	90

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K4 2A31**0	1K4 2B31**0	1K4 2C31**0			
	4	1K4 2A41**0	1K4 2B41**0	1K4 2C41**0			
	5	1K4 2A51**0	1K4 2B51**0	1K4 2C51**0			
	6	1K4 2A61**0	1K4 2B61**0	1K4 2C61**0			
	7	1K4 2A71**0	1K4 2B71**0	1K4 2C71**0			
70	3	1K4 2A32**0	1K4 2B32**0	1K4 2C32**0	1K4 3A32**0	1K4 3B32**0	1K4 3C32**0
	4	1K4 2A42**0	1K4 2B42**0	1K4 2C42**0	1K4 3A42**0	1K4 3B42**0	1K4 3C42**0
	5	1K4 2A52**0	1K4 2B52**0	1K4 2C52**0	1K4 3A52**0	1K4 3B52**0	1K4 3C52**0
	6	1K4 2A62**0	1K4 2B62**0	1K4 2C62**0	1K4 3A62**0	1K4 3B62**0	1K4 3C62**0
	7	1K4 2A72**0	1K4 2B72**0	1K4 2C72**0	1K4 3A72**0	1K4 3B72**0	1K4 3C72**0
100	3	1K4 2A33**0	1K4 2B33**0	1K4 2C33**0	1K4 3A33**0	1K4 3B33**0	1K4 3C33**0
	4	1K4 2A43**0	1K4 2B43**0	1K4 2C43**0	1K4 3A43**0	1K4 3B43**0	1K4 3C43**0
	5	1K4 2A53**0	1K4 2B53**0	1K4 2C53**0	1K4 3A53**0	1K4 3B53**0	1K4 3C53**0
	6	1K4 2A63**0	1K4 2B63**0	1K4 2C63**0	1K4 3A63**0	1K4 3B63**0	1K4 3C63**0
	7	1K4 2A73**0	1K4 2B73**0	1K4 2C73**0	1K4 3A73**0	1K4 3B73**0	1K4 3C73**0
130	3	1K4 2A34**0	1K4 2B34**0	1K4 2C34**0	1K4 3A34**0	1K4 3B34**0	1K4 3C34**0
	4	1K4 2A44**0	1K4 2B44**0	1K4 2C44**0	1K4 3A44**0	1K4 3B44**0	1K4 3C44**0
	5	1K4 2A54**0	1K4 2B54**0	1K4 2C54**0	1K4 3A54**0	1K4 3B54**0	1K4 3C54**0
	6	1K4 2A64**0	1K4 2B64**0	1K4 2C64**0	1K4 3A64**0	1K4 3B64**0	1K4 3C64**0
	7	1K4 2A74**0	1K4 2B74**0	1K4 2C74**0	1K4 3A74**0	1K4 3B74**0	1K4 3C74**0

** Select knob numbering on page 29.

THREE-PHASE DOUBLE FIXED POINT OFF-CIRCUIT TAP CHANGER, SEPARATED FOR THE THREE PHASES

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position
- STAR or DELTA connection

TYPE TKC • TD-PF

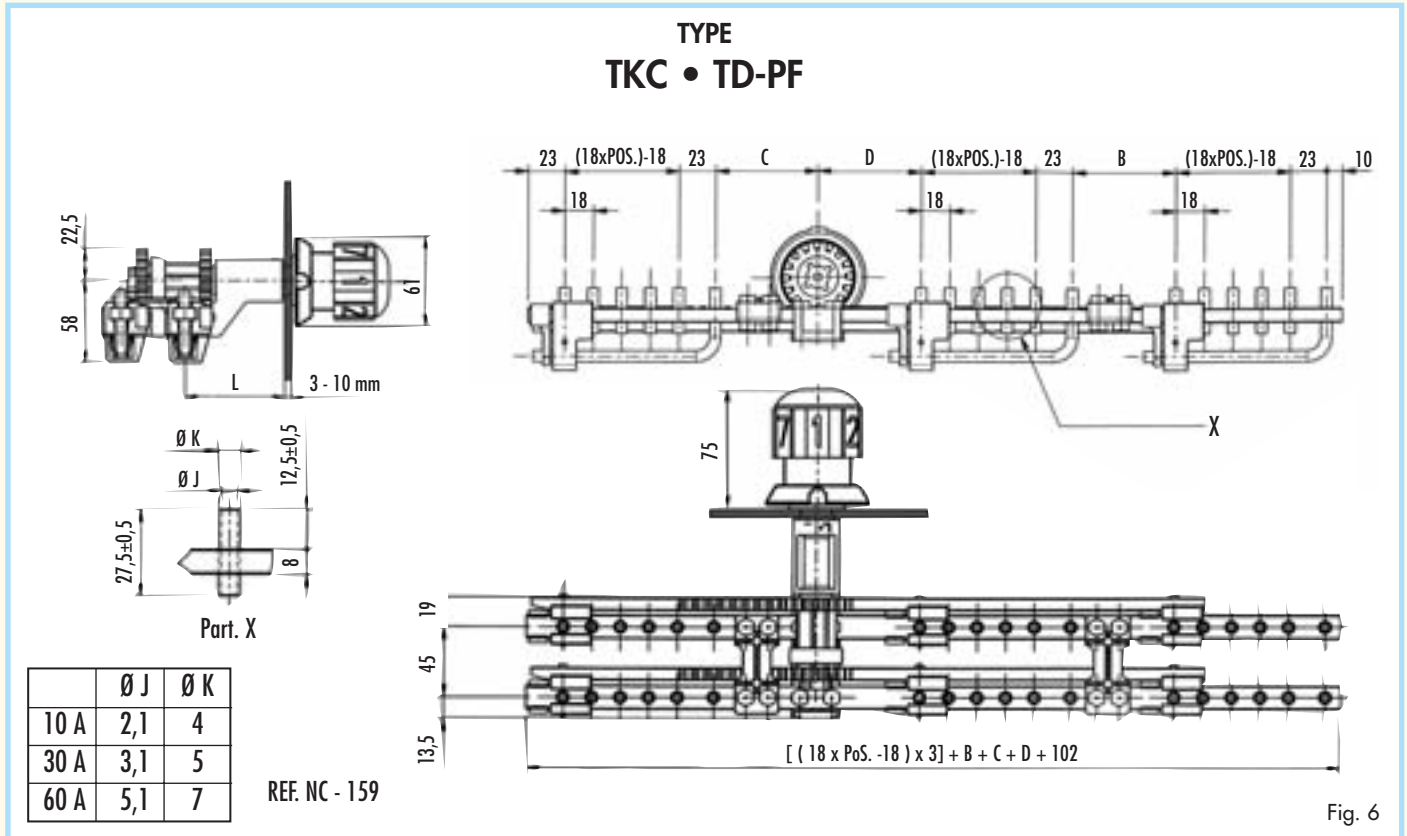
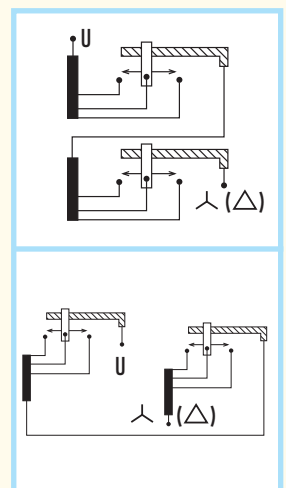


Fig. 6

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1KA 2A31**0	1KA 2B31**0	1KA 2C31**0	/	/	/
	4	1KA 2A41**0	1KA 2B41**0	1KA 2C41**0			
	5	1KA 2A51**0	1KA 2B51**0	1KA 2C51**0			
	6	1KA 2A61**0	1KA 2B61**0	1KA 2C61**0			
	7	1KA 2A71**0	1KA 2B71**0	1KA 2C71**0			
70	3	1KA 2A32**0	1KA 2B32**0	1KA 2C32**0	1KA 3A32**0	1KA 3B32**0	1KA 3C32**0
	4	1KA 2A42**0	1KA 2B42**0	1KA 2C42**0	1KA 3A42**0	1KA 3B42**0	1KA 3C42**0
	5	1KA 2A52**0	1KA 2B52**0	1KA 2C52**0	1KA 3A52**0	1KA 3B52**0	1KA 3C52**0
	6	1KA 2A62**0	1KA 2B62**0	1KA 2C62**0	1KA 3A62**0	1KA 3B62**0	1KA 3C62**0
	7	1KA 2A72**0	1KA 2B72**0	1KA 2C72**0	1KA 3A72**0	1KA 3B72**0	1KA 3C72**0
100	3	1KA 2A33**0	1KA 2B33**0	1KA 2C33**0	1KA 3A33**0	1KA 3B33**0	1KA 3C33**0
	4	1KA 2A43**0	1KA 2B43**0	1KA 2C43**0	1KA 3A43**0	1KA 3B43**0	1KA 3C43**0
	5	1KA 2A53**0	1KA 2B53**0	1KA 2C53**0	1KA 3A53**0	1KA 3B53**0	1KA 3C53**0
	6	1KA 2A63**0	1KA 2B63**0	1KA 2C63**0	1KA 3A63**0	1KA 3B63**0	1KA 3C63**0
	7	1KA 2A73**0	1KA 2B73**0	1KA 2C73**0	1KA 3A73**0	1KA 3B73**0	1KA 3C73**0
130	3	1KA 2A34**0	1KA 2B34**0	1KA 2C34**0	1KA 3A34**0	1KA 3B34**0	1KA 3C34**0
	4	1KA 2A44**0	1KA 2B44**0	1KA 2C44**0	1KA 3A44**0	1KA 3B44**0	1KA 3C44**0
	5	1KA 2A54**0	1KA 2B54**0	1KA 2C54**0	1KA 3A54**0	1KA 3B54**0	1KA 3C54**0
	6	1KA 2A64**0	1KA 2B64**0	1KA 2C64**0	1KA 3A64**0	1KA 3B64**0	1KA 3C64**0
	7	1KA 2A74**0	1KA 2B74**0	1KA 2C74**0	1KA 3A74**0	1KA 3B74**0	1KA 3C74**0

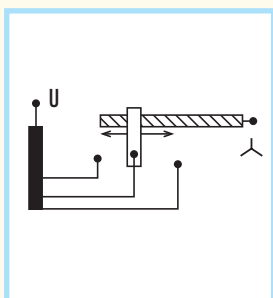
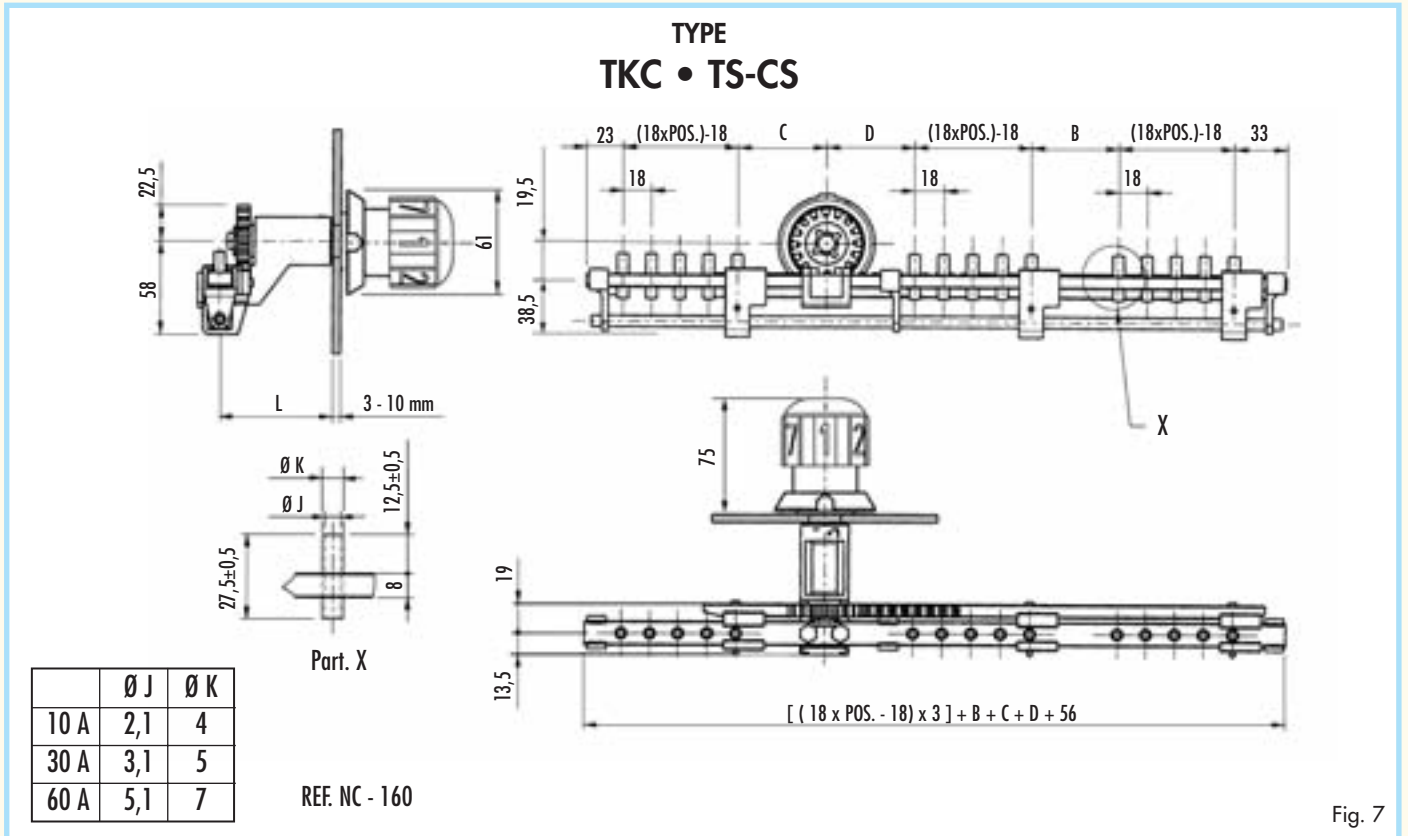


	B	C	D
36 kV	65	65	65
24 kV	90	90	90

** Select knob numbering on page 29.

THREE-PHASE FIXED POINT OFF-CIRCUIT TAP CHANGER COMMON FOR ALL THREE PHASES

- 24 kV and 36 kV
- 10 A, 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position
- STAR connection



	B	C	D
24 kV	55	55	55
36 kV	90	90	90

L	Number of positions	24 kV			36 kV		
		Appliance code			Appliance code		
		10 A	30 A	60 A	10 A	30 A	60 A
50	3	1K8 2A31**0	1K8 2B31**0	1K8 2C31**0			
	4	1K8 2A41**0	1K8 2B41**0	1K8 2C41**0			
	5	1K8 2A51**0	1K8 2B51**0	1K8 2C51**0			
	6	1K8 2A61**0	1K8 2B61**0	1K8 2C61**0			
	7	1K8 2A71**0	1K8 2B71**0	1K8 2C71**0			
70	3	1K8 2A32**0	1K8 2B32**0	1K8 2C32**0	1K8 3A32**0	1K8 3B32**0	1K8 3C32**0
	4	1K8 2A42**0	1K8 2B42**0	1K8 2C42**0	1K8 3A42**0	1K8 3B42**0	1K8 3C42**0
	5	1K8 2A52**0	1K8 2B52**0	1K8 2C52**0	1K8 3A52**0	1K8 3B52**0	1K8 3C52**0
	6	1K8 2A62**0	1K8 2B62**0	1K8 2C62**0	1K8 3A62**0	1K8 3B62**0	1K8 3C62**0
	7	1K8 2A72**0	1K8 2B72**0	1K8 2C72**0	1K8 3A72**0	1K8 3B72**0	1K8 3C72**0
100	3	1K8 2A33**0	1K8 2B33**0	1K8 2C33**0	1K8 3A33**0	1K8 3B33**0	1K8 3C33**0
	4	1K8 2A43**0	1K8 2B43**0	1K8 2C43**0	1K8 3A43**0	1K8 3B43**0	1K8 3C43**0
	5	1K8 2A53**0	1K8 2B53**0	1K8 2C53**0	1K8 3A53**0	1K8 3B53**0	1K8 3C53**0
	6	1K8 2A63**0	1K8 2B63**0	1K8 2C63**0	1K8 3A63**0	1K8 3B63**0	1K8 3C63**0
	7	1K8 2A73**0	1K8 2B73**0	1K8 2C73**0	1K8 3A73**0	1K8 3B73**0	1K8 3C73**0
130	3	1K8 2A34**0	1K8 2B34**0	1K8 2C34**0	1K8 3A34**0	1K8 3B34**0	1K8 3C34**0
	4	1K8 2A44**0	1K8 2B44**0	1K8 2C44**0	1K8 3A44**0	1K8 3B44**0	1K8 3C44**0
	5	1K8 2A54**0	1K8 2B54**0	1K8 2C54**0	1K8 3A54**0	1K8 3B54**0	1K8 3C54**0
	6	1K8 2A64**0	1K8 2B64**0	1K8 2C64**0	1K8 3A64**0	1K8 3B64**0	1K8 3C64**0
	7	1K8 2A74**0	1K8 2B74**0	1K8 2C74**0	1K8 3A74**0	1K8 3B74**0	1K8 3C74**0

** Select knob numbering on page 29.

THREE-PHASE OFF-CIRCUIT TAP CHANGER

- a) coupling star-delta
- b) with exclusion of coils

- 24 kV
- 30 A and 60 A

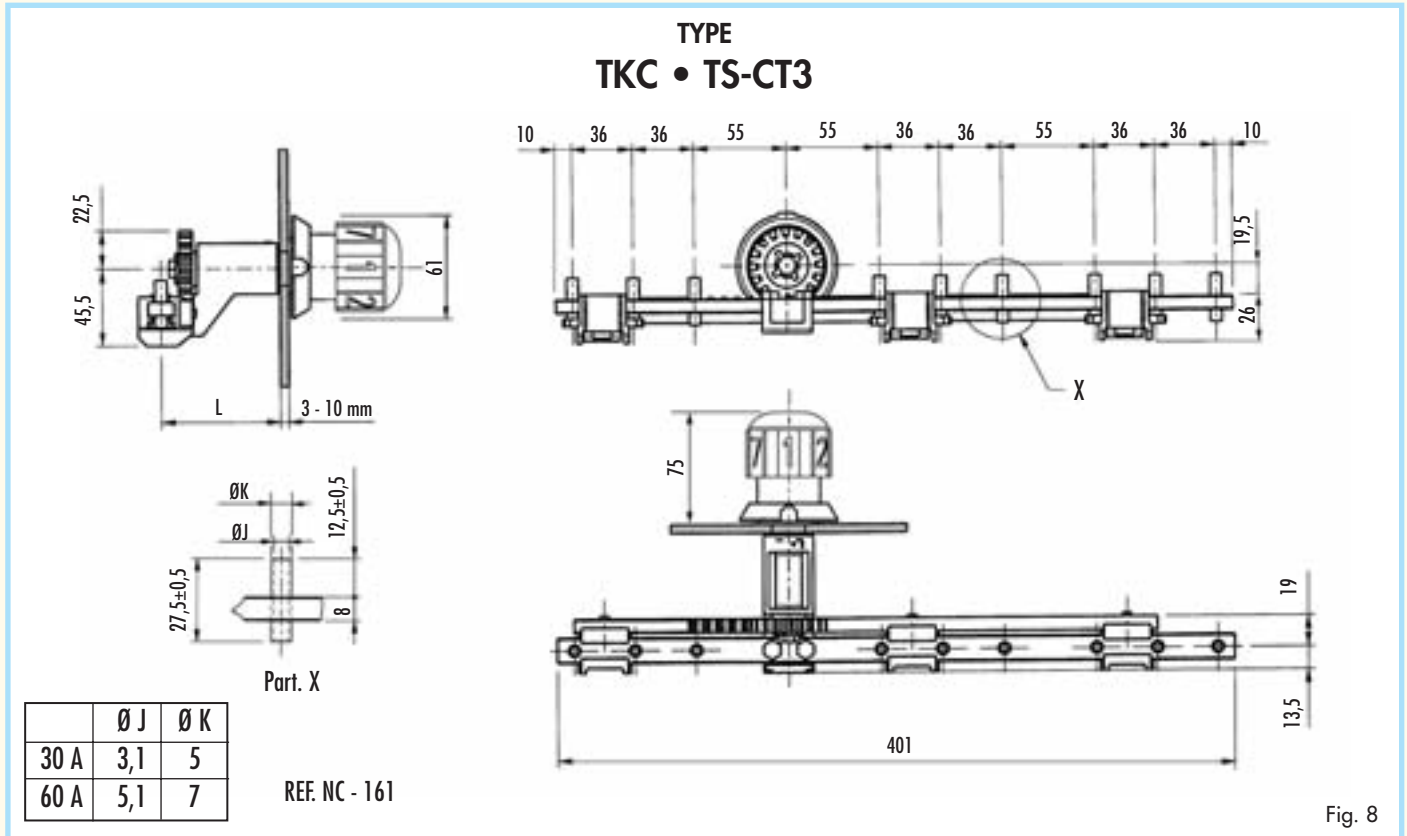
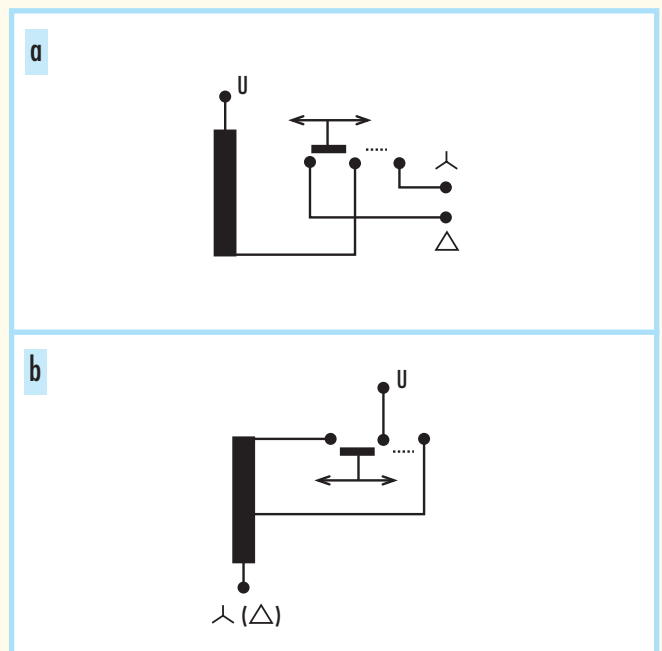


Fig. 8

L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	2	1K6 2 B 21 ** 0	1K6 2 C 21 ** 0
70	2	1K6 2 B 22 ** 0	1K6 2 C 22 ** 0
100	2	1K6 2 B 23 ** 0	1K6 2 C 23 ** 0
130	2	1K6 2 B 24 ** 0	1K6 2 C 24 ** 0



** Select knob numbering on page 29.

THREE-PHASE OFF-CIRCUIT TAP CHANGER

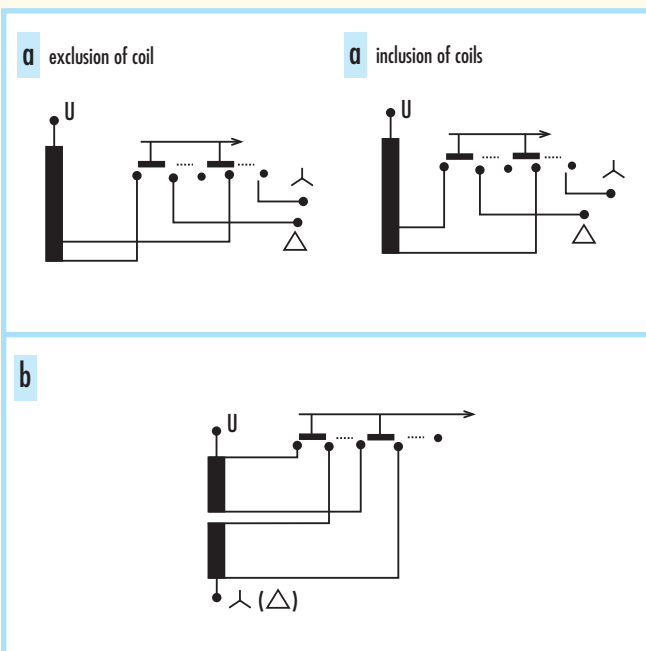
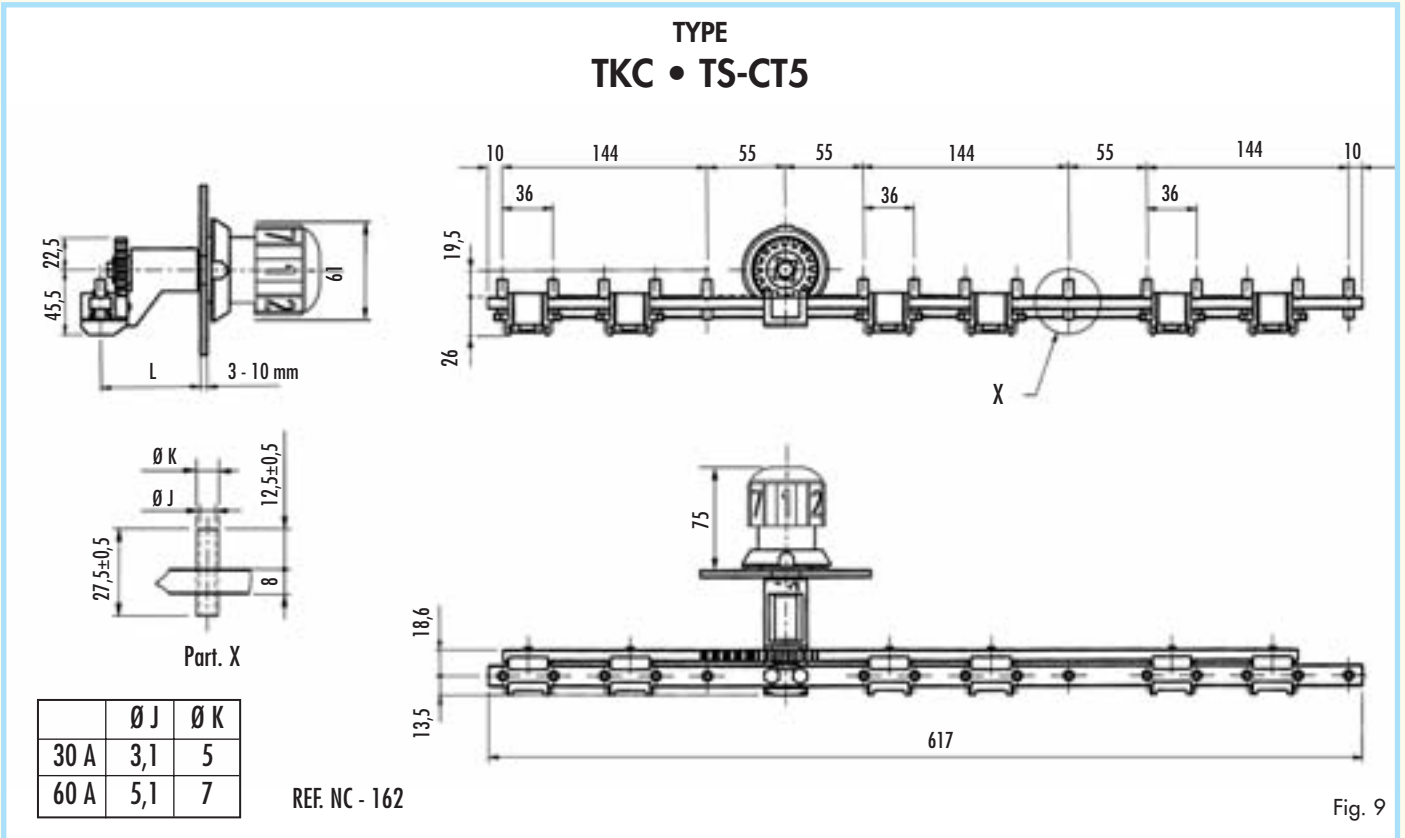
- series-parallel coupling
- STAR or DELTA coupling with inclusion or exclusion of coils

- 24 kV

- 30 A and 60 A

a) coupling star-delta with inclusion or exclusion of coils

b) series-parallel coupling STAR or DELTA



L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	2	1K7 2 B 2 1 ** 0	1K7 2 C 2 1 ** 0
70	2	1K7 2 B 2 2 ** 0	1K7 2 C 2 2 ** 0
100	2	1K7 2 B 2 3 ** 0	1K7 2 C 2 3 ** 0
130	2	1K7 2 B 2 4 ** 0	1K7 2 C 2 4 ** 0

** Select knob numbering on page 29.

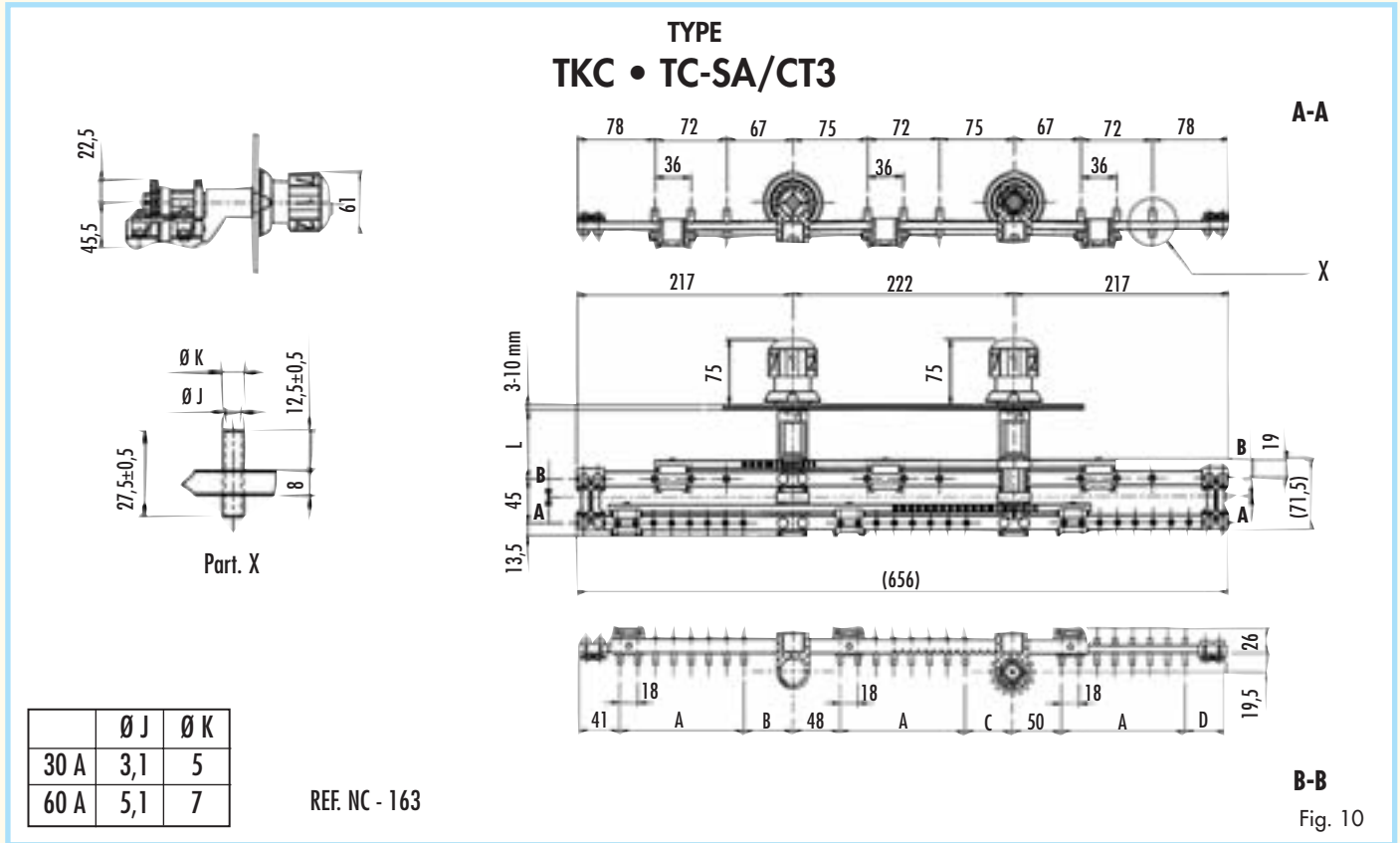
THREE-PHASE OFF-CIRCUIT TAP CHANGER COMPOSED OF:

n° 1 star-delta coupling

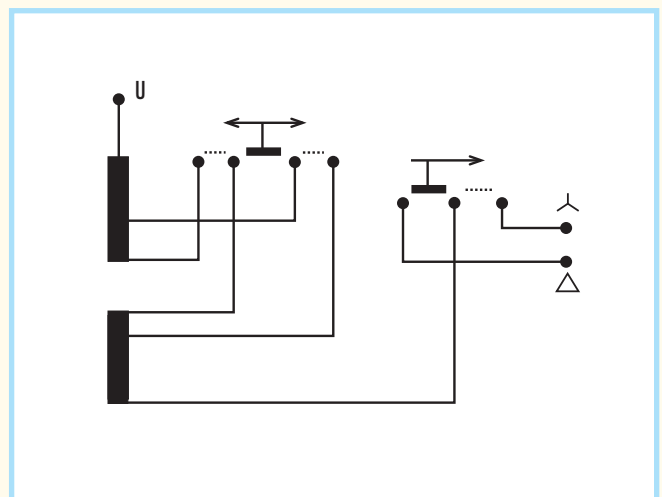
- 24 kV
- 30 A and 60 A

n° 1 bridge type

- 24 kV
- 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position



L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	3	1K5 2 B 3 1 ** 0	1K5 2 C 3 1 ** 0
	4	1K5 2 B 4 1 ** 0	1K5 2 C 4 1 ** 0
	5	1K5 2 B 5 1 ** 0	1K5 2 C 5 1 ** 0
	6	1K5 2 B 6 1 ** 0	1K5 2 C 6 1 ** 0
	7	1K5 2 B 7 1 ** 0	1K5 2 C 7 1 ** 0
70	3	1K5 2 B 3 2 ** 0	1K5 2 C 3 2 ** 0
	4	1K5 2 B 4 2 ** 0	1K5 2 C 4 2 ** 0
	5	1K5 2 B 5 2 ** 0	1K5 2 C 5 2 ** 0
	6	1K5 2 B 6 2 ** 0	1K5 2 C 6 2 ** 0
	7	1K5 2 B 7 2 ** 0	1K5 2 C 7 2 ** 0
100	3	1K5 2 B 3 3 ** 0	1K5 2 C 3 3 ** 0
	4	1K5 2 B 4 3 ** 0	1K5 2 C 4 3 ** 0
	5	1K5 2 B 5 3 ** 0	1K5 2 C 5 3 ** 0
	6	1K5 2 B 6 3 ** 0	1K5 2 C 6 3 ** 0
	7	1K5 2 B 7 3 ** 0	1K5 2 C 7 3 ** 0
130	3	1K5 2 B 3 4 ** 0	1K5 2 C 3 4 ** 0
	4	1K5 2 B 4 4 ** 0	1K5 2 C 4 4 ** 0
	5	1K5 2 B 5 4 ** 0	1K5 2 C 5 4 ** 0
	6	1K5 2 B 6 4 ** 0	1K5 2 C 6 4 ** 0
	7	1K5 2 B 7 4 ** 0	1K5 2 C 7 4 ** 0



n. pos.	A	B	C	D
3	54	122	120	113
4	72	104	102	95
5	90	86	84	77
6	108	68	66	59
7	126	50	48	41

** Select knob numbering on page 29.

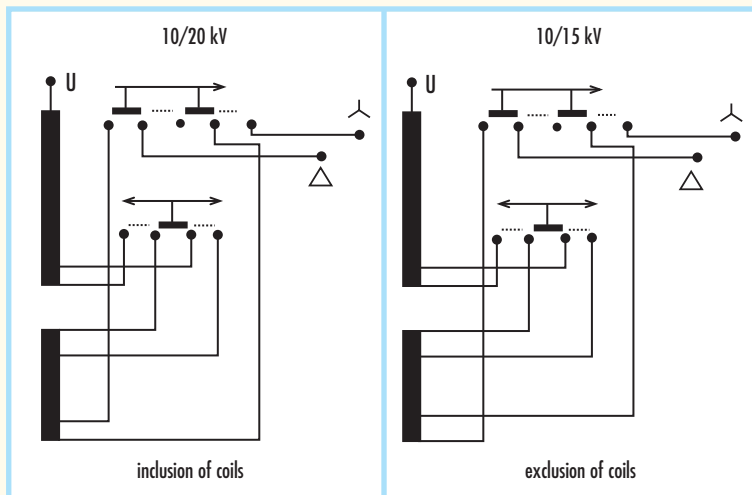
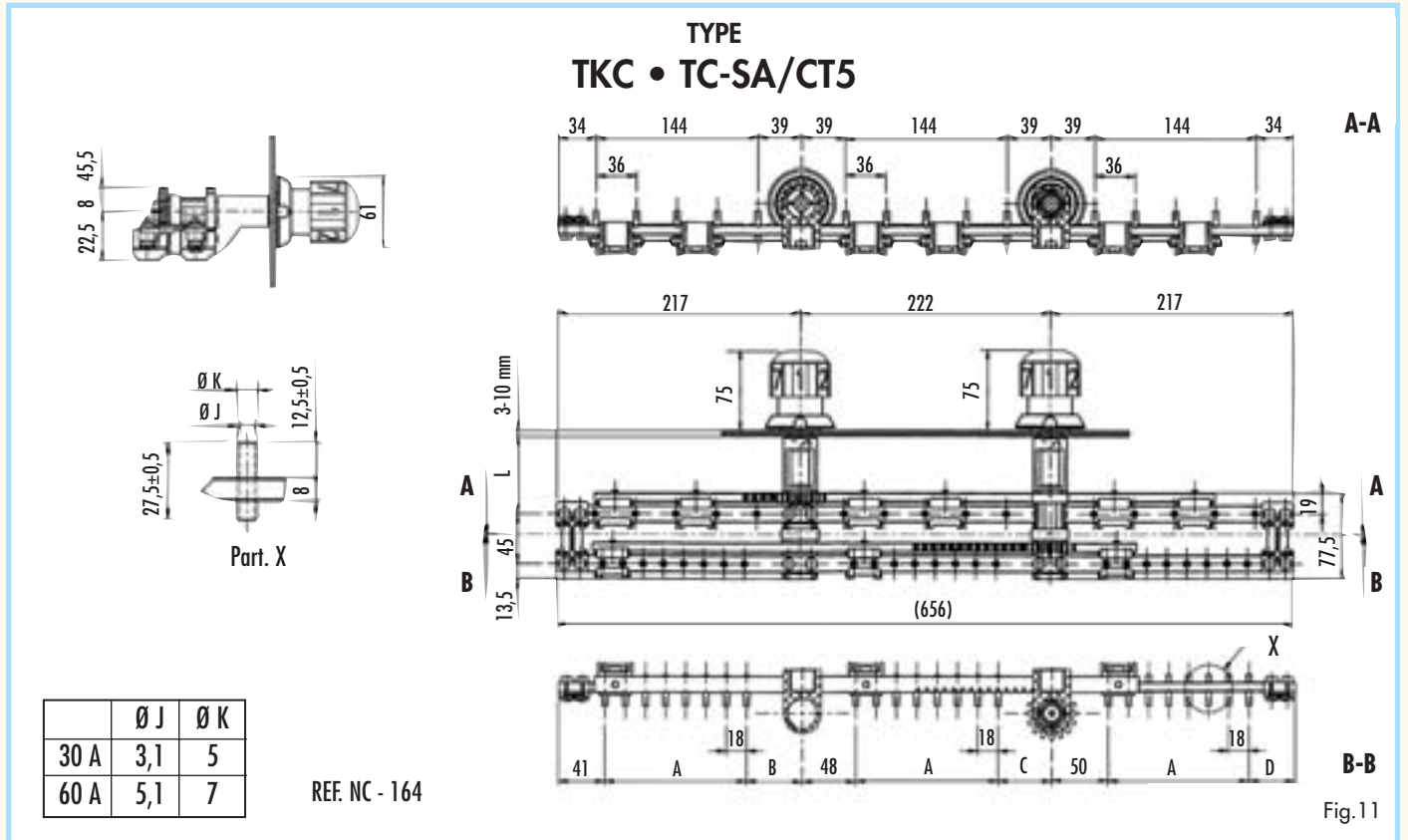
THREE-PHASE OFF-CIRCUIT TAP CHANGER COMPOSED OF:

n° 1 star-delta coupling with inclusion or exclusion of coils

- 24 kV
- 30 A and 60 A

n° 1 pawl adjustment

- 24 kV
- 30 A and 60 A
- from 3 to 7 positions
- regulation 2,5% per position



n. pos.	A	B	C	D
3	54	122	120	113
4	72	104	102	95
5	90	86	84	77
6	108	68	66	59
7	126	50	48	41

L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	3	TK5 2 B 3 1 ** 1	TK5 2 C 3 1 ** 1
	4	TK5 2 B 4 1 ** 1	TK5 2 C 4 1 ** 1
	5	TK5 2 B 5 1 ** 1	TK5 2 C 5 1 ** 1
	6	TK5 2 B 6 1 ** 1	TK5 2 C 6 1 ** 1
	7	TK5 2 B 7 1 ** 1	TK5 2 C 7 1 ** 1
70	3	TK5 2 B 3 2 ** 1	TK5 2 C 3 2 ** 1
	4	TK5 2 B 4 2 ** 1	TK5 2 C 4 2 ** 1
	5	TK5 2 B 5 2 ** 1	TK5 2 C 5 2 ** 1
	6	TK5 2 B 6 2 ** 1	TK5 2 C 6 2 ** 1
	7	TK5 2 B 7 2 ** 1	TK5 2 C 7 2 ** 1
100	3	TK5 2 B 3 3 ** 1	TK5 2 C 3 3 ** 1
	4	TK5 2 B 4 3 ** 1	TK5 2 C 4 3 ** 1
	5	TK5 2 B 5 3 ** 1	TK5 2 C 5 3 ** 1
	6	TK5 2 B 6 3 ** 1	TK5 2 C 6 3 ** 1
	7	TK5 2 B 7 3 ** 1	TK5 2 C 7 3 ** 1
130	3	TK5 2 B 3 4 ** 1	TK5 2 C 3 4 ** 1
	4	TK5 2 B 4 4 ** 1	TK5 2 C 4 4 ** 1
	5	TK5 2 B 5 4 ** 1	TK5 2 C 5 4 ** 1
	6	TK5 2 B 6 4 ** 1	TK5 2 C 6 4 ** 1
	7	TK5 2 B 7 4 ** 1	TK5 2 C 7 4 ** 1

** Select knob numbering on page 29.

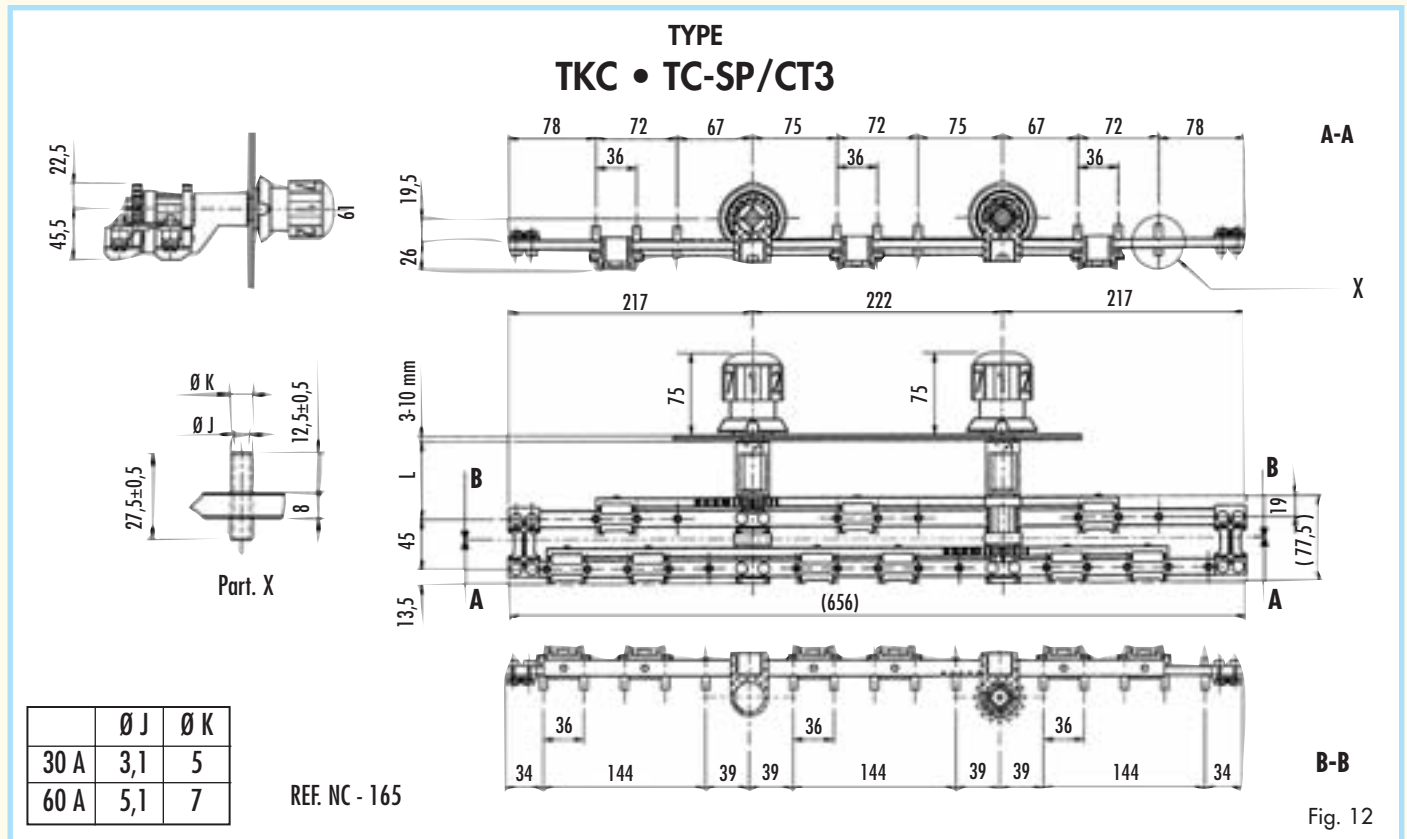
THREE-PHASE OFF-CIRCUIT TAP CHANGER COMPOSED OF:

n° 1 star-delta coupling

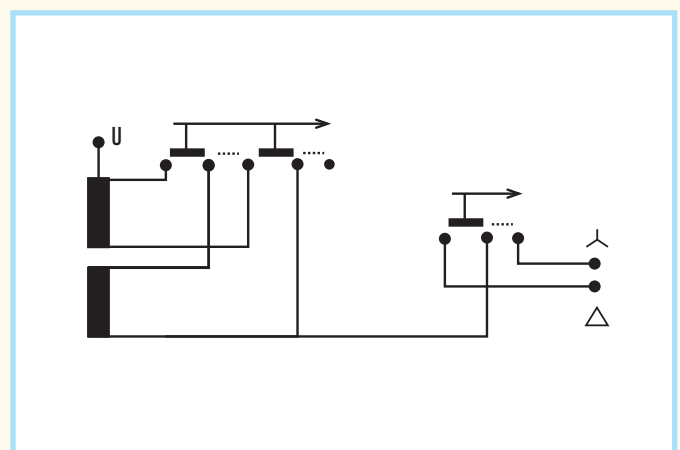
- 24 kV
- 30 A and 60 A

n° 1 series-parallel coupling

- 24 kV
- 30 A and 60 A



L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	2	1K5 2 B 2 1 ** 0	1K5 2 C 2 1 ** 0
70	2	1K5 2 B 2 2 ** 0	1K5 2 C 2 2 ** 0
100	2	1K5 2 B 2 3 ** 0	1K5 2 C 2 3 ** 0
130	2	1K5 2 B 2 4 ** 0	1K5 2 C 2 4 ** 0



** Select knob numbering on page 29.

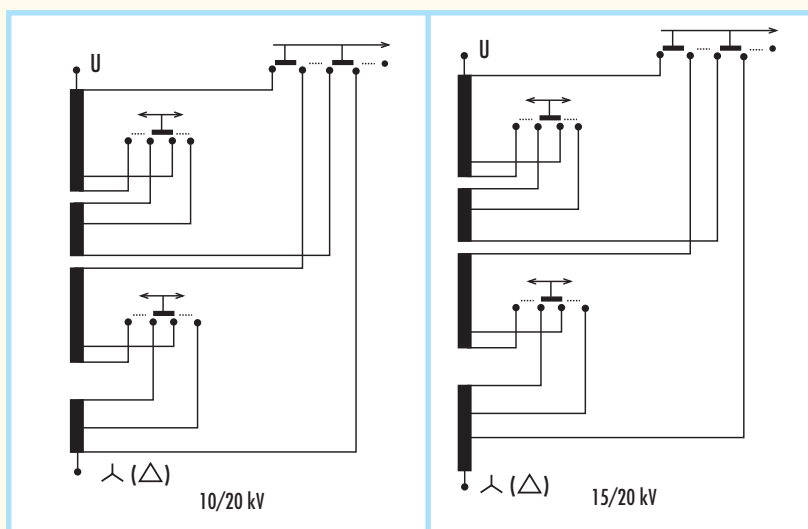
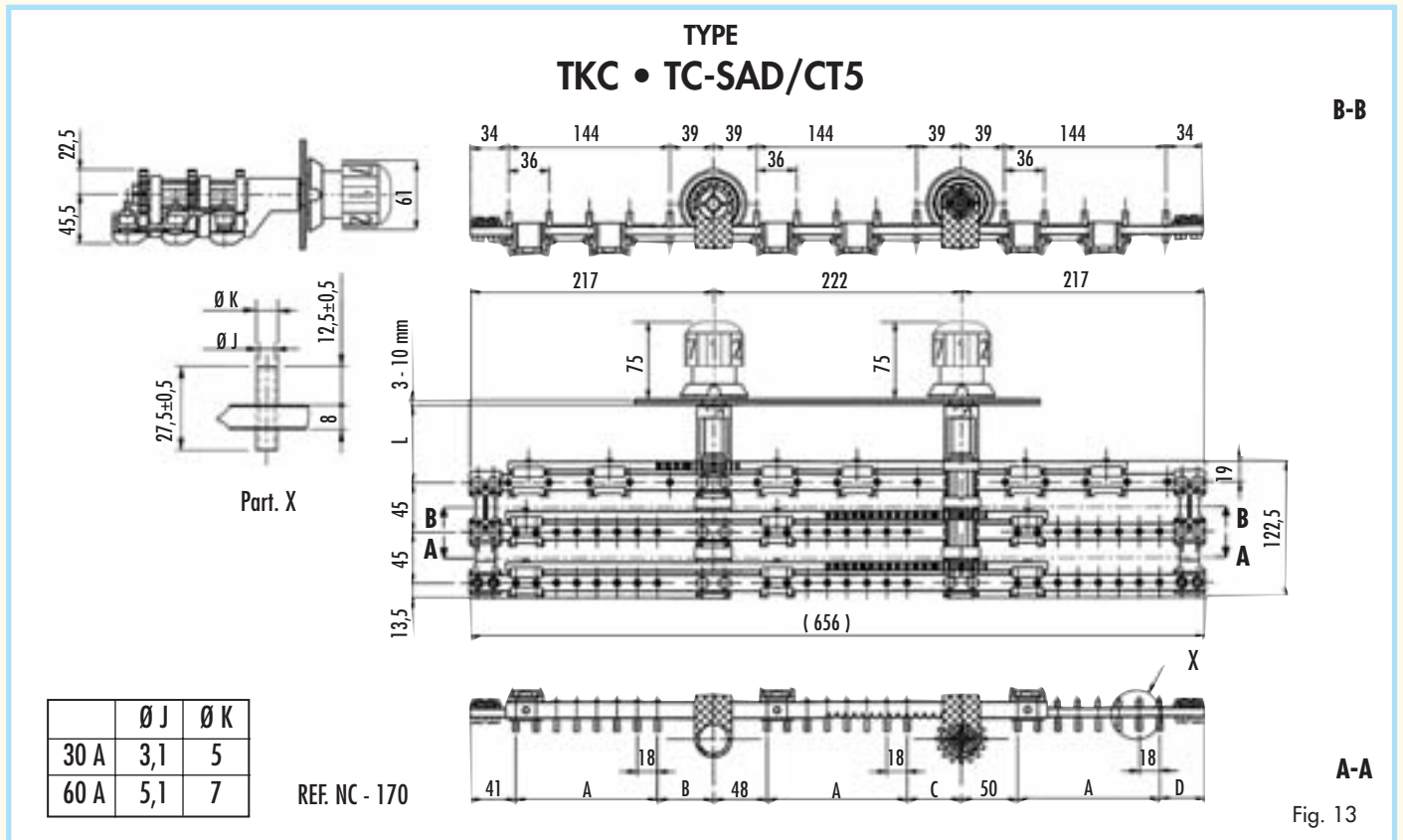
OFF-CIRCUIT THREE-PHASE TAP CHANGER COMPOSED OF:

n° 1 series-parallel coupling

- 24 kV
- 30 A and 60 A

n° 1 double bridge type

- 24 kV
- 30 A and 60 A
- from 3 to 7 positions
- 2.5% adjustment per position



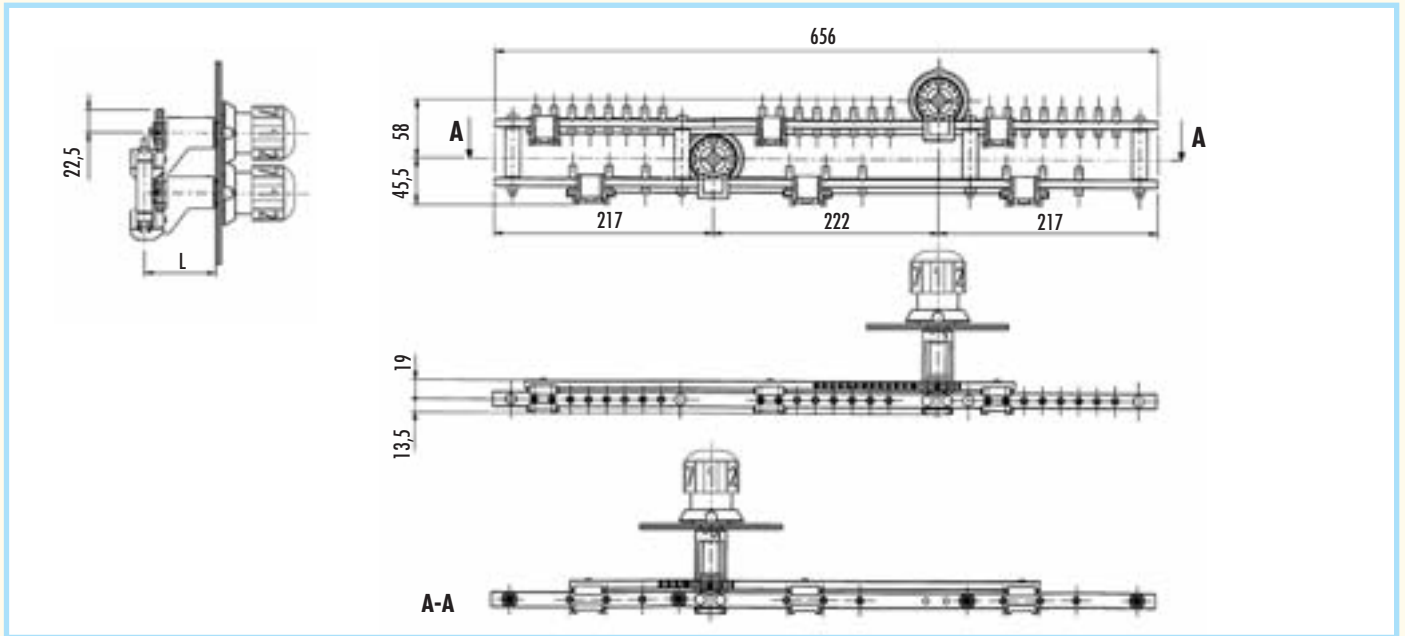
n. pos.	A	B	C	D
3	54	122	120	113
4	72	104	102	95
5	90	86	84	77
6	108	68	66	59
7	126	50	48	41

L	Number of positions	24 kV	
		Appliance code	
		30 A	60 A
50	3	1K5 2 B 3 1 ** 2	1K5 2 C 3 1 ** 2
	4	1K5 2 B 4 1 ** 2	1K5 2 C 4 1 ** 2
	5	1K5 2 B 5 1 ** 2	1K5 2 C 5 1 ** 2
	6	1K5 2 B 6 1 ** 2	1K5 2 C 6 1 ** 2
	7	1K5 2 B 7 1 ** 2	1K5 2 C 7 1 ** 2
70	3	1K5 2 B 3 2 ** 2	1K5 2 C 3 2 ** 2
	4	1K5 2 B 4 2 ** 2	1K5 2 C 4 2 ** 2
	5	1K5 2 B 5 2 ** 2	1K5 2 C 5 2 ** 2
	6	1K5 2 B 6 2 ** 2	1K5 2 C 6 2 ** 2
100	7	1K5 2 B 7 2 ** 2	1K5 2 C 7 2 ** 2
	3	1K5 2 B 3 3 ** 2	1K5 2 C 3 3 ** 2
	4	1K5 2 B 4 3 ** 2	1K5 2 C 4 3 ** 2
130	5	1K5 2 B 5 3 ** 2	1K5 2 C 5 3 ** 2
	6	1K5 2 B 6 3 ** 2	1K5 2 C 6 3 ** 2
	7	1K5 2 B 7 3 ** 2	1K5 2 C 7 3 ** 2
	3	1K5 2 B 3 4 ** 2	1K5 2 C 3 4 ** 2
130	4	1K5 2 B 4 4 ** 2	1K5 2 C 4 4 ** 2
	5	1K5 2 B 5 4 ** 2	1K5 2 C 5 4 ** 2
	6	1K5 2 B 6 4 ** 2	1K5 2 C 6 4 ** 2
	7	1K5 2 B 7 4 ** 2	1K5 2 C 7 4 ** 2

** Select knob numbering on page 29.

HORIZONTAL ASSEMBLY LAYOUTS

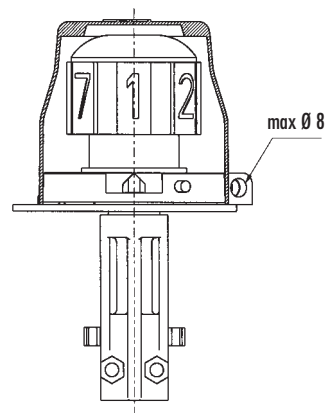
Combined tap changers may be furnished on request with horizontal plate assembly rather than vertical. The figure illustrates an example of this layout.



KNOB PROTECTIVE CAP KIT

COD. 5COK416100
FOR ADJUSTMENT KNOBS

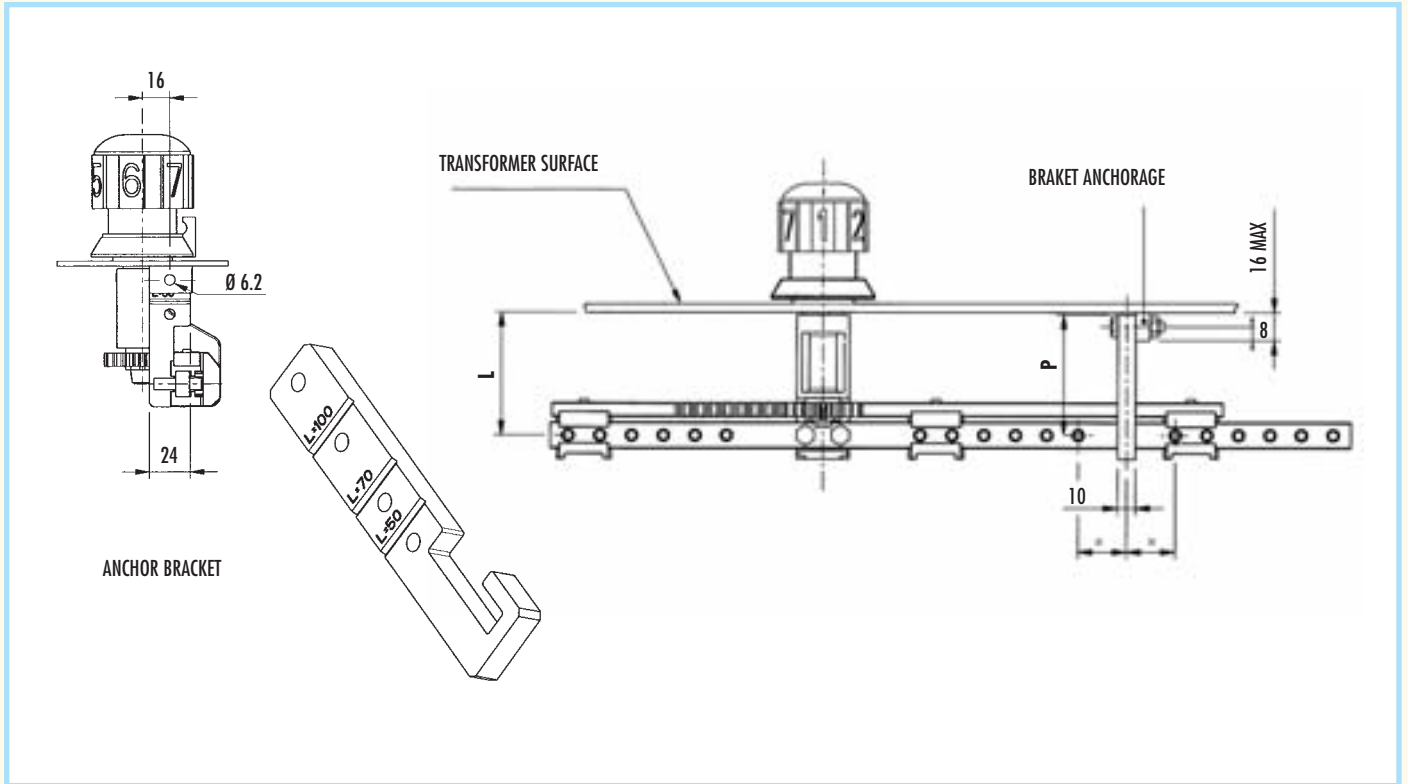
COD. 5COK416200
FOR VOLTAGE CHANGE KNOBS



On request we can deliver a complete knob made of aluminium, having same dimensions and features of those in plastic.

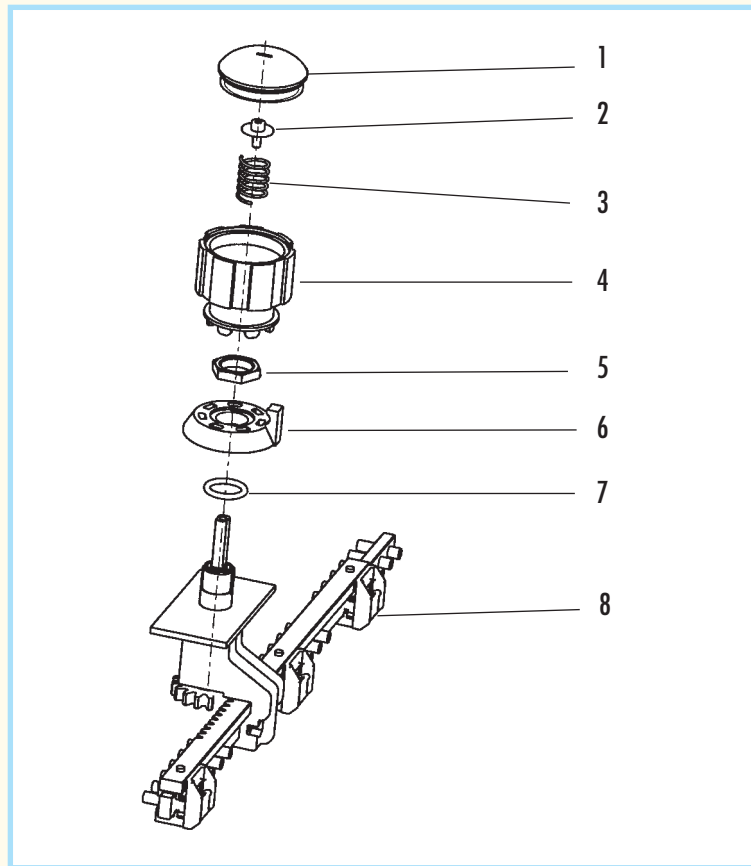
EXTRA SUPPORT BRACKET

A bracket can be furnished on request to anchor the CHANGER-over switches to the cover on the side opposite the knob assembly.



COD.	DESCRIPTION	L	P
5COC407000	ANCHOR BRACKET	50	49
		70	69
		100	99
		130	129

"TKC" TAP CHANGERS ASSEMBLING INSTRUCTIONS



POS.	DESCRIPTION
1	Plug
2	Screw
3	Spring
4	Knob
5	Nut
6	Washer
7	O.R. Seal
8	Tap changer

Proceed as follows in order to install the "TKC" tap changer on the transformer cover:

- a) Insert the tap changer (8) from the inside of the transformer in the hole on the cover with $\varnothing 20 \text{ H12 (+0,2/-0)}$.
- b) Install the O-RING seal (7) and put in the washer (6) and the nut (5).
- c) Tighten the nut (5) at 30 Nm torque while maintaining the tap changer structure locked under the cover so as to avoid its rotation.
- d) Install the knob (4) paying attention to the position of the numbers with respect to the orange coloured sign on washer (6) and to the position of the sliding contact.
- e) Install the spring (3) and fasten the screw (2) at 5 Nm torque.
- f) Check properly the assembly and perform a complete manoeuvre and check that the numbered knob can be freely and exactly placed on each mark/number on the knob. If this is not possible just unscrew the screw (2) turn the knob (4) 180° and then repeat "e" step.
- g) Screw the plug (1).

MANOEUVRE MOVING AND CHECKING



A. Example of correct position no 1.

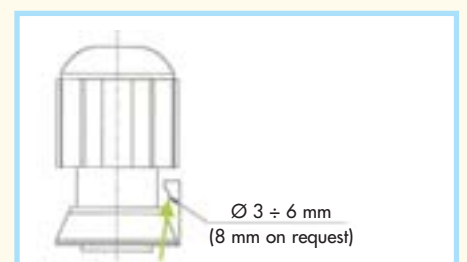


B. Lift the knob, rotate until the needed position and release the knob. The correct position is guaranteed once the orange sign is perpendicular to knob number and the "OFF POSITION" orange alert marks are not visible (see picture "C").

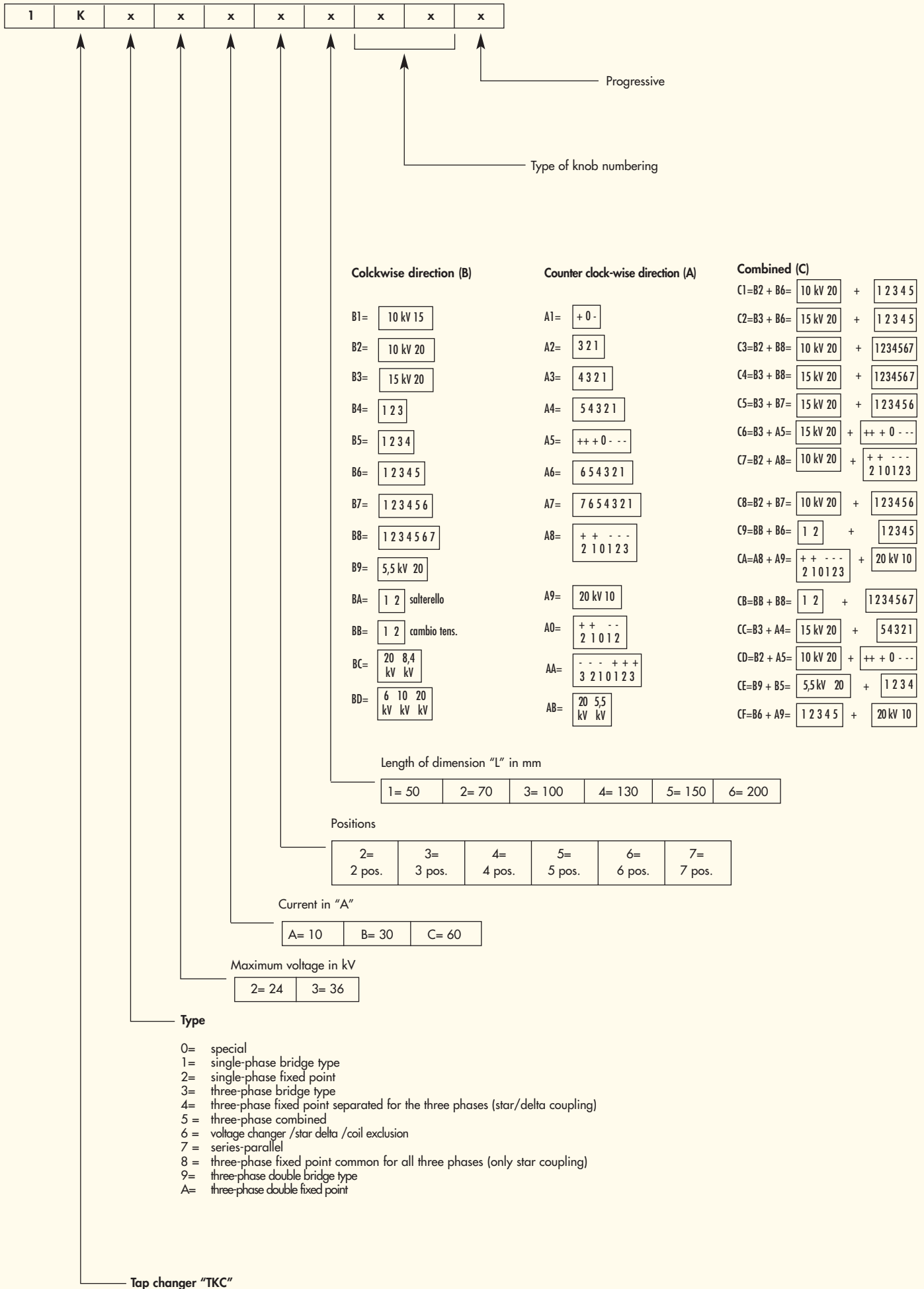
Example of correct position no 2.



C. Example of "OFF POSITION" wrong manoeuvre; the knob is lifted, there is no alignment between orange sign and numbers and the orange alert marks are visible. This condition does not allow to mount any pad lock.



COMEM CODES FOR SERIES "TKC" TAP CHANGERS



COMEM KNOB NUMBERING

Insert a letter and a number, based on the desired type of numbering, in place of the two asterisks in the codes specified in the following pages.

Type of knob numbering:

Clockwise direction (B)

- B1= 10 kV 15 kV
 B2= 10 kV 20 kV
 B3= 15 kV 20 kV
 B4= 1 2 3
 B5= 1 2 3 4
 B6= 1 2 3 4 5
 B7= 1 2 3 4 5 6
 B8= 1 2 3 4 5 6 7
 B9= 5,5 kV 20 kV
 BA= 1 2 △
 BB= 1 2 CT
 BC= 20 kV 8,4 kV
 BD= 6 kV 10 kV 20kV
 BE= 1 2 3 CT
 BF=

-	-	+	+
1	0	1	2

 BG= 12 kV 0 kV 23kV
 BH= 11 kV 15 kV

Counter clockwise direction (A)

- A1= + 0 -
 A2= 3 2 1
 A3= 4 3 2 1
 A4= 5 4 3 2 1
 A5= ++ + 0 - - -
 A6= 6 5 4 3 2 1
 A7= 7 6 5 4 3 2 1
 A8=

+	+	-	-	-	
2	1	0	1	2	3

 A9= 20 kV 10 kV
 A0=

+	+	-	-	
2	1	0	1	2

 AA=

-	-	-	+	+	+	
3	2	1	0	1	2	3

 AB= 20 kV 5,5 kV

Combined (C)

- C1= 10 kV 20 kV + 1 2 3 4 5
 C2= 15 kV 20 kV + 1 2 3 4 5
 C3= 10 kV 20 kV + 1 2 3 4 5 6 7
 C4= 15 kV 20 kV + 1 2 3 4 5 6 7
 C5= 15 kV 20 kV + 1 2 3 4 5 6
 C6= 15 kV 20 kV + ++ + 0 - - -
 C7= 10 kV 20 kV +

+	+	-	-	-	
2	1	0	1	2	3

 C8= 10 kV 20 kV + 1 2 3 4 5 6
 C9= 1 2 + 1 2 3 4 5
 CA=

+	+	-	-	-	
2	1	0	1	2	3

 + 20 kV 10 kV
 CB= 1 2 + 1 2 3 4 5 6 7
 CC= 15 kV 20 kV + 5 4 3 2 1
 CD= 10 kV 20 kV + ++ + 0 - - -
 CE= 5,5 kV 20 kV + 1 2 3 4
 CF= 1 2 3 4 5 + 20 kV 10 kV

COMEM S.p.A.	ORDER FORM FOR SERIES TKC TAP CHANGERS
--------------	--

INSTRUCTIONS: indicate on following boxes the desired TKC

Voltage 24 kV max - 20 kV nominal 36 kV max - 30 kV nominal

Current 10 A 30 A 60 A

NUMBERING ON THE KNOB

Clockwise direction (B)

Counter clockwise direction (A)

	NUMBER OF POSITION	TYPE NUMBERING VOLTAGE MODIFICATION		NUMERO POSIZIONI	TYPE NUMBERING VOLTAGE MODIFICATION													
<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td>10 kV</td><td>15 kV</td></tr> </table>	10 kV	15 kV	<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td>20 kV</td><td>10 kV</td></tr> </table>	20 kV	10 kV									
10 kV	15 kV																	
20 kV	10 kV																	
<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td>10 kV</td><td>20 kV</td></tr> </table>	10 kV	20 kV	<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td> </td><td> </td></tr> </table>											
10 kV	20 kV																	
<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td>15 kV</td><td>20 kV</td></tr> </table>	15 kV	20 kV														
15 kV	20 kV																	
<input type="checkbox"/>	2	<table border="1" style="margin: auto;"> <tr><td> </td><td> </td></tr> </table>																
<input type="checkbox"/>	3	<p style="text-align: center;">ADJUSTMENT</p> <table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td></tr> </table>	1	2	3	<input type="checkbox"/>	3	<p style="text-align: center;">ADJUSTMENT</p> <table border="1" style="margin: auto;"> <tr><td>3</td><td>2</td><td>1</td></tr> </table>	3	2	1							
1	2	3																
3	2	1																
<input type="checkbox"/>	4	<table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> </table>	1	2	3	4	<input type="checkbox"/>	3	<table border="1" style="margin: auto;"> <tr><td>+ 0 -</td></tr> </table>	+ 0 -								
1	2	3	4															
+ 0 -																		
<input type="checkbox"/>	5	<table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> </table>	1	2	3	4	5	<input type="checkbox"/>	4	<table border="1" style="margin: auto;"> <tr><td>4</td><td>3</td><td>2</td><td>1</td></tr> </table>	4	3	2	1				
1	2	3	4	5														
4	3	2	1															
<input type="checkbox"/>	6	<table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr> </table>	1	2	3	4	5	6	<input type="checkbox"/>	5	<table border="1" style="margin: auto;"> <tr><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> </table>	5	4	3	2	1		
1	2	3	4	5	6													
5	4	3	2	1														
<input type="checkbox"/>	7	<table border="1" style="margin: auto;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr> </table>	1	2	3	4	5	6	7	<input type="checkbox"/>	5	<table border="1" style="margin: auto;"> <tr><td>++ + 0 - --</td></tr> </table>	++ + 0 - --					
1	2	3	4	5	6	7												
++ + 0 - --																		
<input type="checkbox"/>		<table border="1" style="margin: auto;"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>								<input type="checkbox"/>	6	<table border="1" style="margin: auto;"> <tr><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> </table>	6	5	4	3	2	1
6	5	4	3	2	1													
<input type="checkbox"/>			<input type="checkbox"/>	6	<table border="1" style="margin: auto;"> <tr><td>+ 2 1 0 1 - 2 3</td></tr> </table>	+ 2 1 0 1 - 2 3												
+ 2 1 0 1 - 2 3																		
<input type="checkbox"/>			<input type="checkbox"/>	7	<table border="1" style="margin: auto;"> <tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td></tr> </table>	7	6	5	4	3	2	1						
7	6	5	4	3	2	1												
<input type="checkbox"/>			<input type="checkbox"/>		<table border="1" style="margin: auto;"> <tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>													

Lenght "L" in mm

50 (only 24 kV) 70 100 130

Type

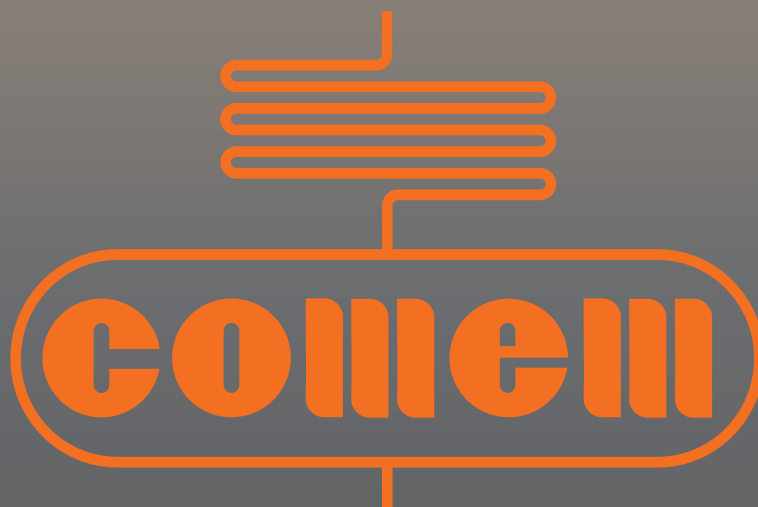
<input type="checkbox"/> Single phase bridge type	<input type="checkbox"/> Single phase-fixed adjustment
<input type="checkbox"/> Three phases bridge type	<input type="checkbox"/> Three phases-fixed point
<input type="checkbox"/> Three phases-double bridge type	<input type="checkbox"/> Three phases-double fixed point

Optional:

<input type="checkbox"/> Bracket	<input type="checkbox"/> Protective cap kit	<input type="checkbox"/> Al knob
<input type="checkbox"/> L= 150	<input type="checkbox"/> L= 200	

NOTES

A series of horizontal dotted lines for writing notes, spanning the width of the page.



comem - S.p.A

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