NEWS AND MODIFICATIONS

TAP CHANGERS SERIES 086

MEMBER OF REINHAUSEN GROUP

SUMMARY

TAP CHANGERS TYPE 086

REF.	REV.	DESCRIPTION	CONNECTION	CURRENT	VOLTAGE	N° POS.	PAG.
086	01	Introduction					3 , 4
086-01	00	Code construction					5
086-04-01	02	Three phase tap changer	Bridge	150 A / 200 A	24 kV	2-7	6
086-04-02	02	Three phase tap changer	Bridge	300 A	24 kV	2-7	7
086-04-03	02	Three phase tap changer	Bridge	150 A / 200 A	36 kV	2-7	8
086-04-04	00	Three phase tap changer	Bridge	300 A	36 kV	2-7	9
086-02	00	Fixed contacts		150 A / 200 A / 300 A			10
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086-120-02	02	Assembling sequence diagram					12
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INTRODUCTION

TAP CHANGERS TYPE 086

MAIN CHARATERISTIC
This is a de-energized three-phase tap changer. It means all switching manoeuvre must be performed after disconnecting transformer by the electrical net opening the sectionalizing switches, both HV and LV side, so transformer becomes off-circuit.
In the catalogue are performed the standard appliances and devices.
On request is possible to satisfy special requirements as:
- Single-phase tap changer
- Multi-stage tap changers.

DIMENSION
All dimension reported in the following pages are in millimeters (mm).

MODIFICATIONS
In case we need to modify some particulars, in order to improve the quality of our products, C.A.P.T. firma reserve an option to change without a previous warning. Substantial modification will be surely communicated.

TRANSFORMER OIL
All our tap changers are suitable to work in oil immersed transformers according to standard IEC 60296. In case user need to use specific oil (silicon, synthetic or vegetal) it is necessary consulted C.A.P.T. technical office who verify the functionality of tap in all the mechanicals, electrical and chemical characteristics.

INSULATION MATERIAL
The insulating materials used are:
Bakelized paper for the 3 boards and epoxy fiberglass pipe for shaft drive.

GASKET
The standard gaskets supplied by C.A.P.T. for all drives are suitable for use in mineral oil according to IEC 60296 at operating temperatures between -25°C and +105°C and in air at temperatures between -25°C and +40°C.
On request, depending on the conditions of use C.A.P.T. can provide gaskets suitable for lower temperatures up to -60°C or higher up to +200°C.

MECHANICAL CHARACTERISTICS
On this rotary tap-changer type 086 fixed contacts are mounted in three insulating boards, parallel to the drive shaft; moving contacts are installed on the cylindrical drive shaft. The three boards are fixed to the base aluminium support.

CHANGING OVER
A numbering disk is provided to mark each position with precision. For any operation is necessary to lift the blocking pin and turn the knob to the new position; after that once the knob is facing its new one position, it drops automatically into the respective hole by the action of a spring. The control knob is marked with the inscription:
"WARNING: DO NOT OPERATE WHILE THE TRANSFORMER IS ENERGIZED".

POSITION:
Standard from 2 to 7 positions

VOLTAGES
Voltage classes are allowed:

Voltage class	*Earth withstand voltage*	
	Industrial frequency 50 Hz	*Impulse 1/50*
kV	*kV*	*kV*
24 *36*	*50* *70*	*125* *170*

INTRODUCTION

TAP CHANGERS TYPE 086

CURRENT
150 A / 200 A / 300 A.

METALLIC PARTS
The metal components of drive can be supplied on request with GEOMET® treatment.

FIXED CONTACTS
Copper fixed contacts type M8 for 150 A, M10 for 200 A and M12 for 300 A.
On request contacts can be silver-plated or tin-plated.

MOVING CONTACTS
They are made of copper. On request, contacts can be supplied silver plated or tin-plated.

CODES
To identify tap changer type by series and code, proceed like example below reported:
SERIES: 086 CODE: 04.110.215

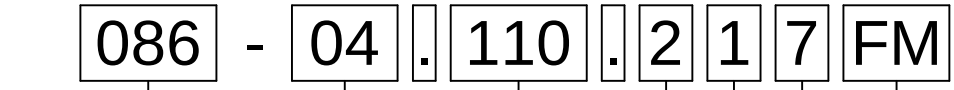
086-	***.04***	***.110***	***.2***	***1***	***5***
Family	*Type*	*Distance between phases*	*Voltage 24 kV*	*Current 150 A*	*Number of positions N°5*

L = has to be determined with order
Please also specify type of control knob.

DRYING PROCESS
Different drying treatment can be process by customer: oven, in a vacuum autoclave, vapour-phase or other. In this process is normally included tap changer too. The maximum temperature suggested by C.A.P.T. for our tap changers is 100°C-120°C for 24-36 hours.

WHEN CONTACT C.A.P.T.
In the following cases please contact C.A.P.T.
- *for temperature condition higher/lower then suggest*
- *for hard environment conditions, with possibility of snow or sand storming, or in potential seismic area.*

- CODE CONSTRUCTION



SERIES

TAP CHANGER TYPE

NUMBERS OF DECKS	
.	Simple three-phase
D	Double three-phase
T	Triple three-phase

VOLTAGE	
2	x 24 kV (BIL= 125 kV)
3	x 36 kV (BIL= 170 kV)

CURRENT	
1	x 150 A
2	x 200 A
3	x 300 A
4	x 400 A

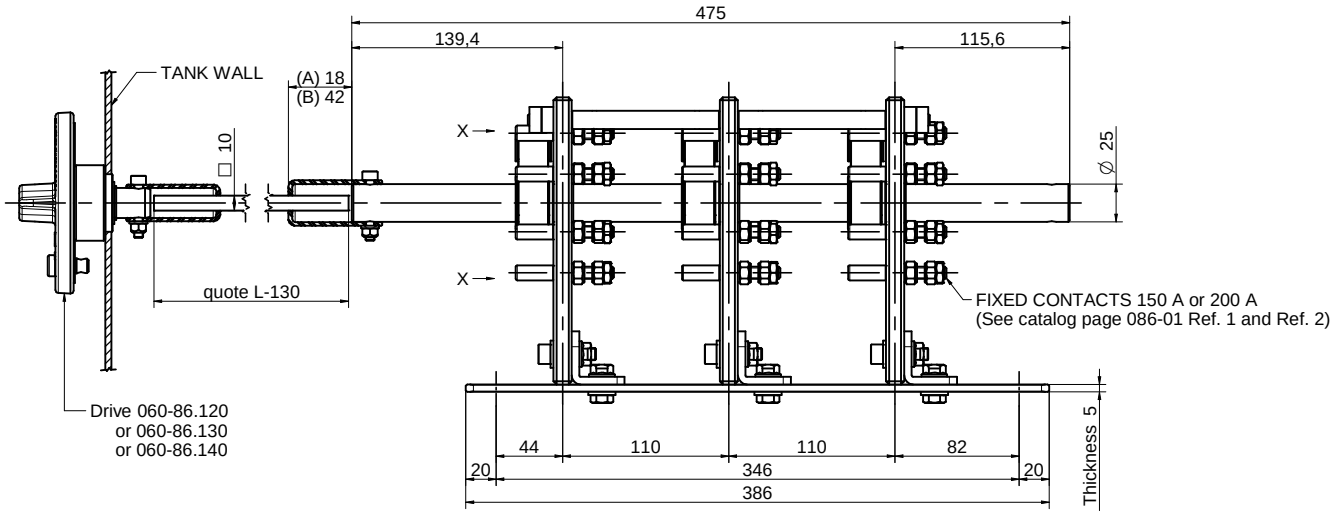
NUMBER OF POSITIONS
From 2 to maximum 7 positions.

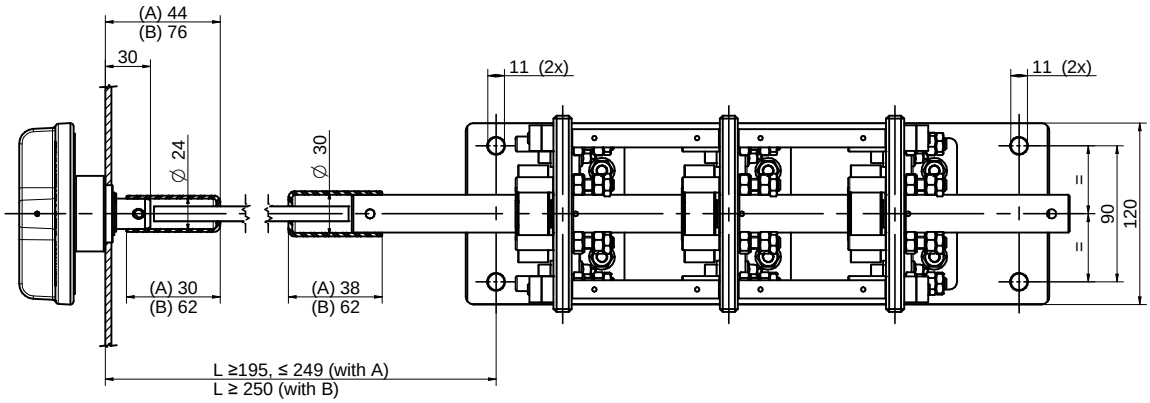
CONTACTS SURFACE TREATMENT	
F	Fixed contacts silver plated
M	Moving contacts silver plated
FM	Fixed and moving contacts silver plated
FS	Fixed contacts tin plated
MS	Moving contacts tin plated
FMS	Fixed and moving contacts tin plated

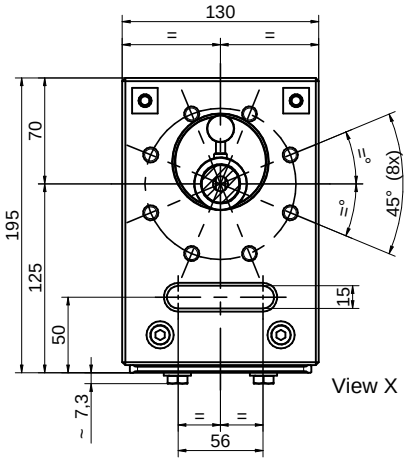
DETC ROTARY THREE-PHASE TAP CHANGERS SERIES 086 TYPE 04.110

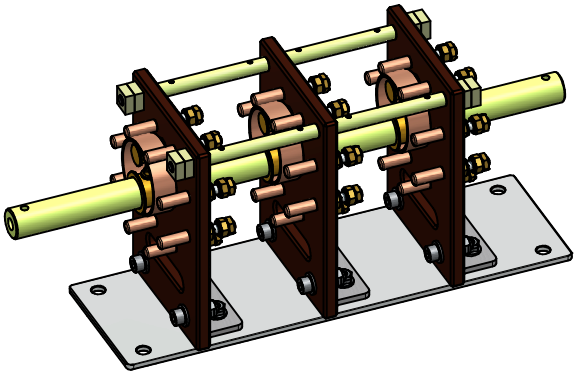
- *De-energized operation*
- *For oil immersed transformer*
- *Bridge connection*
- *24 kV*
- *150 A / 200 A*
- *From 2 to 7 positions*
- *Regulation 2,5% per position*

Dimension in mm





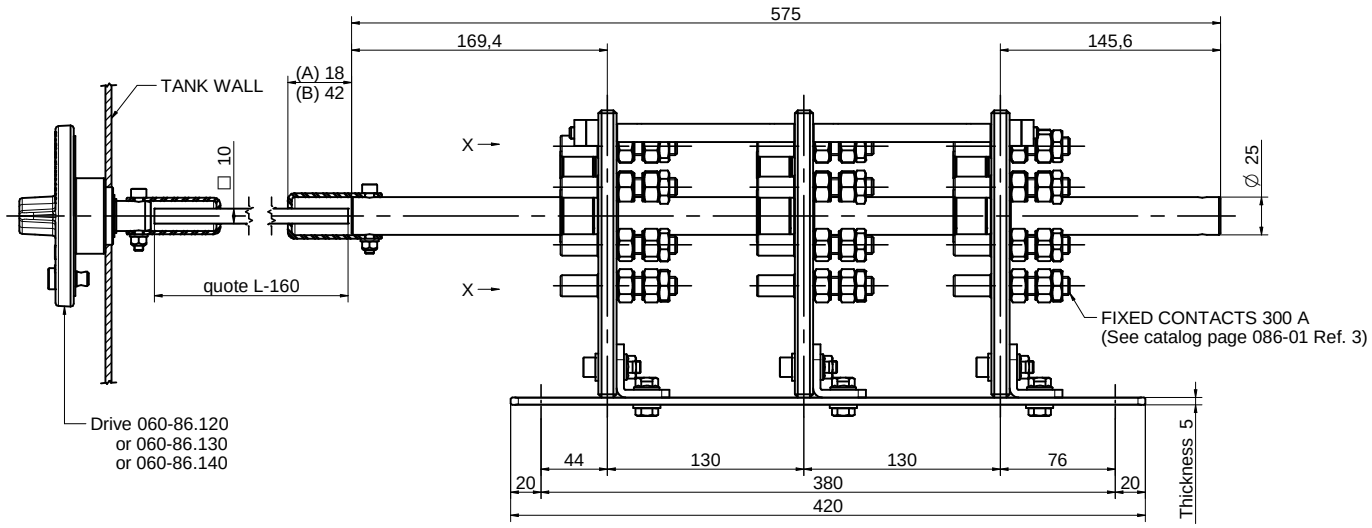


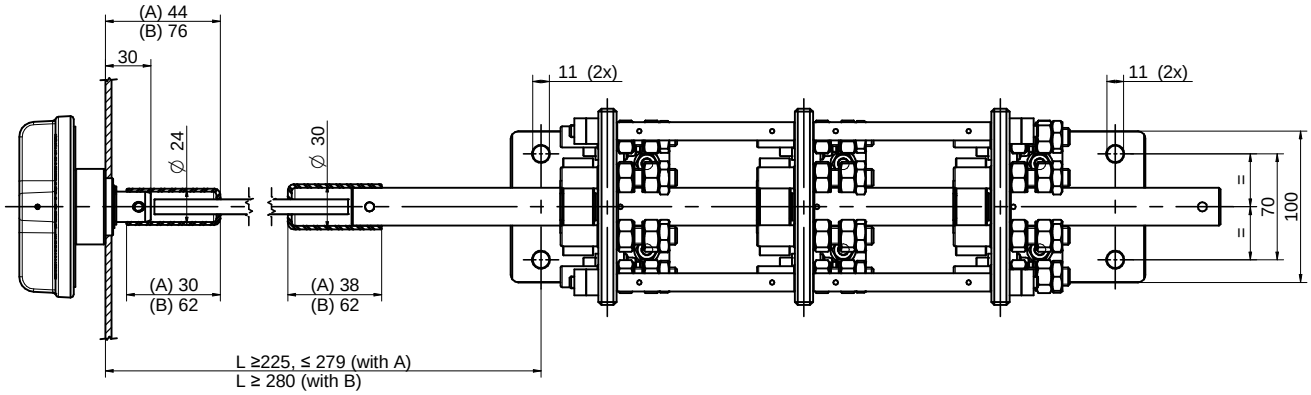


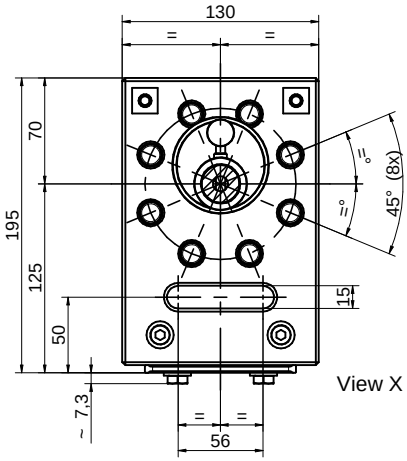
DETC ROTARY THREE-PHASE TAP CHANGERS SERIES 086 TYPE 04.130

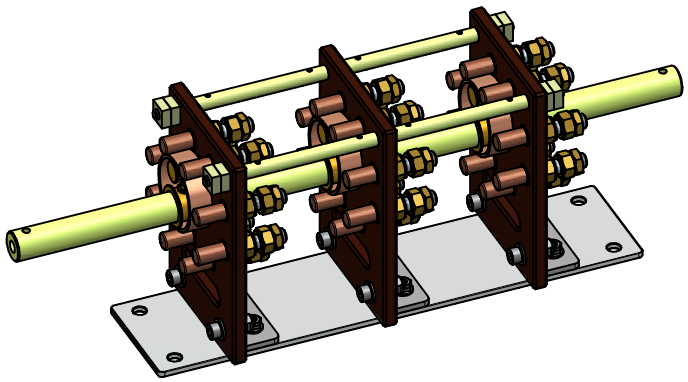
- *De-energized operation*
- *For oil immersed transformer*
- *Bridge connection*
- *24 kV*
- *300 A*
- *From 2 to 7 positions*
- *Regulation 2,5% per position*

Dimension in mm





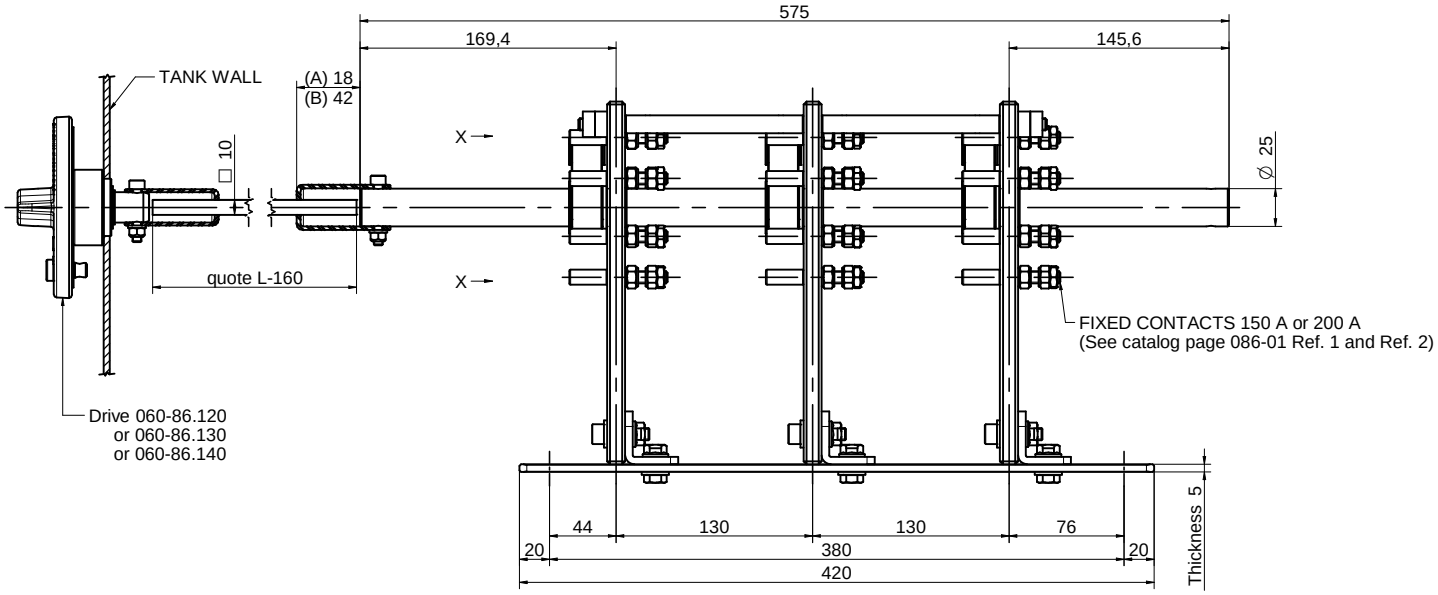


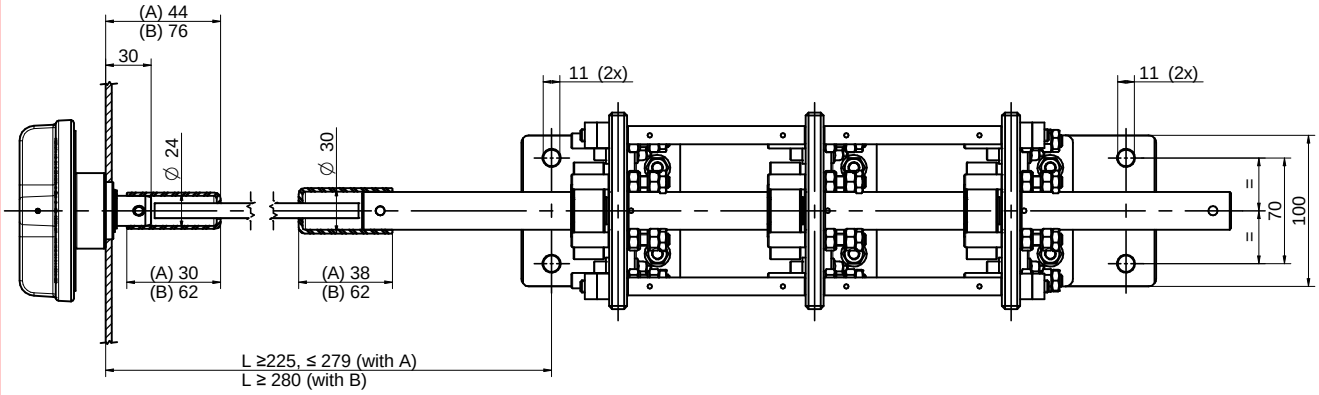


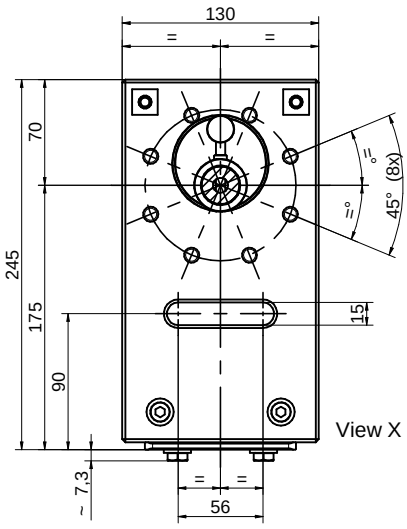
DETC ROTARY THREE-PHASE TAP CHANGERS SERIES 086 TYPE 04.130

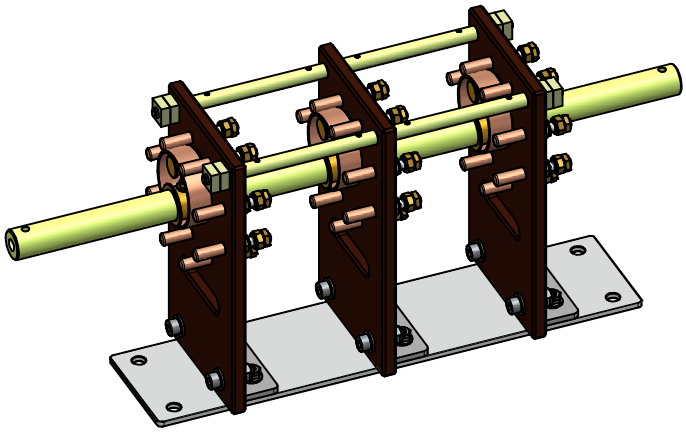
- *De-energized operation*
- *For oil immersed transformer*
- *Bridge connection*
- *36 kV*
- *150 A / 200 A*
- *From 2 to 7 positions*
- *Regulation 2,5% per position*

Dimension in mm





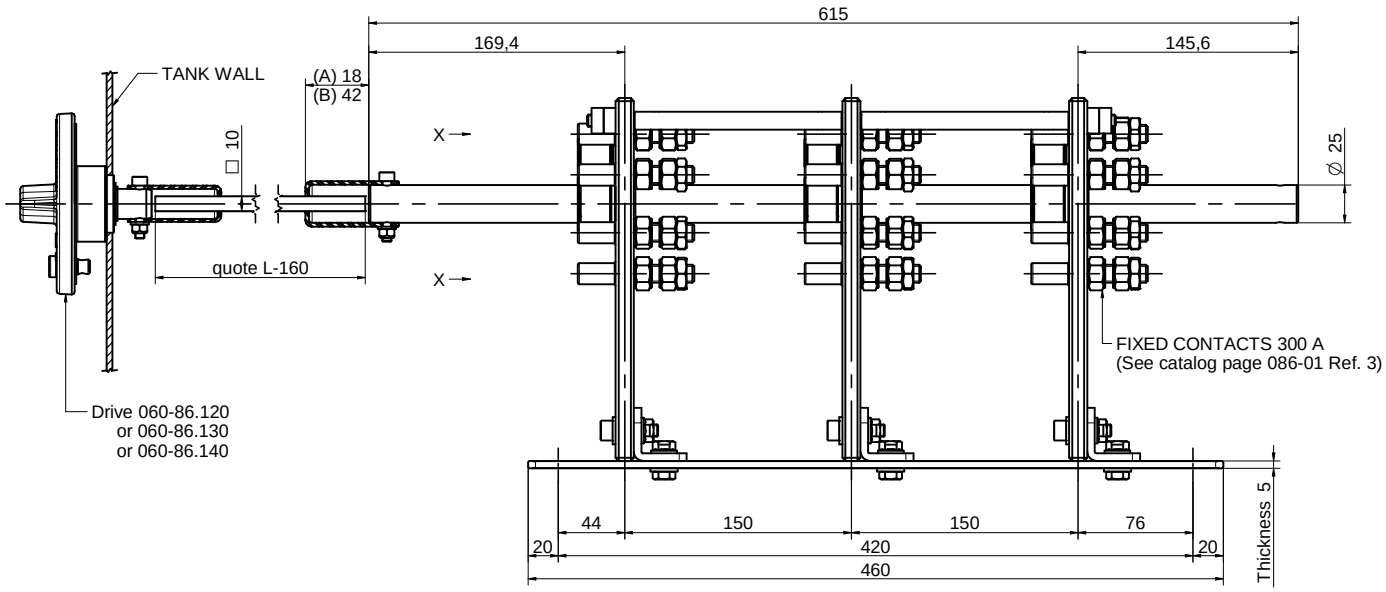


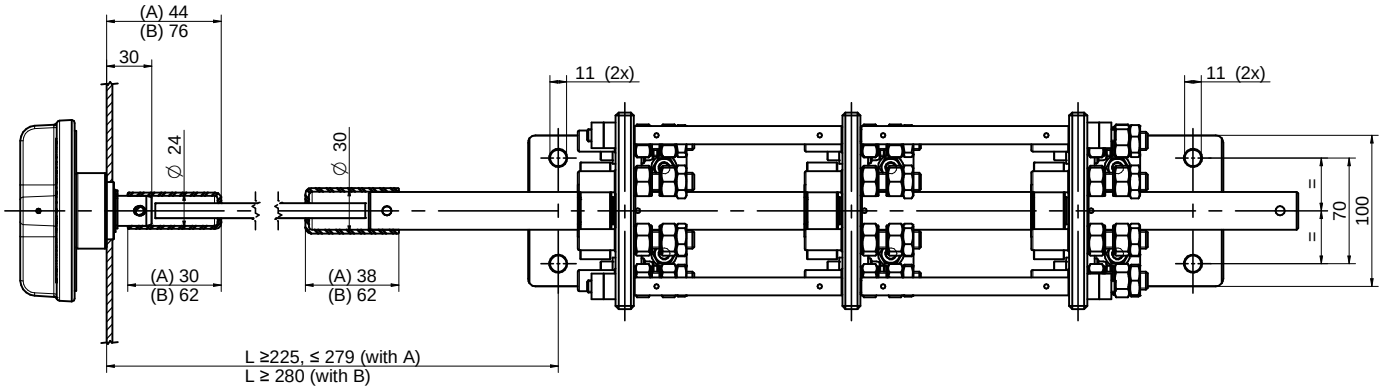


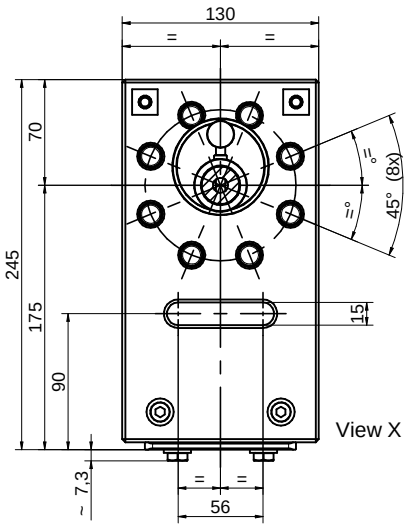
DETC ROTARY THREE-PHASE TAP CHANGERS SERIES 086 TYPE 04.150

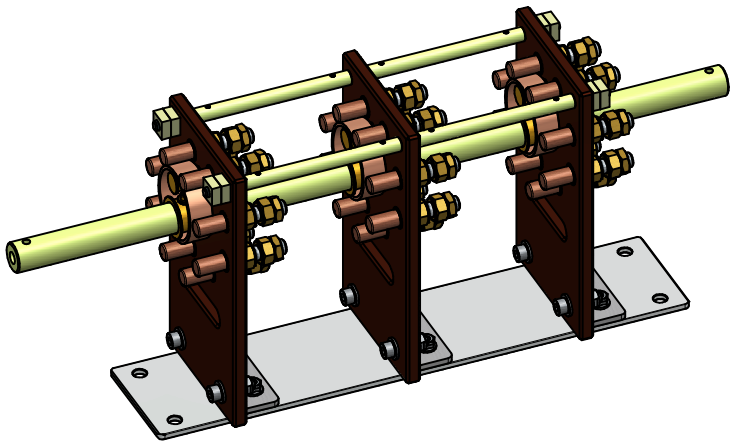
- *De-energized operation*
- *For oil immersed transformer*
- *Bridge connection*
- *36 kV*
- *300 A*
- *From 2 to 7 positions*
- *Regulation 2,5% per position*

Dimension in mm



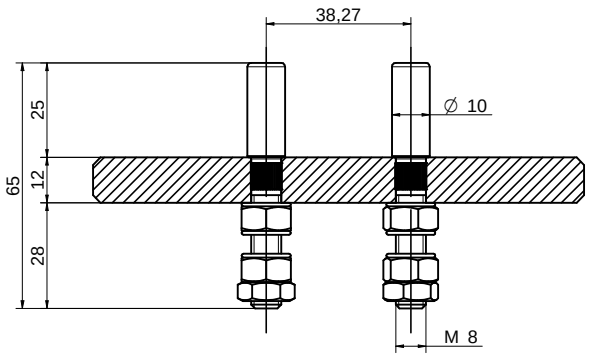




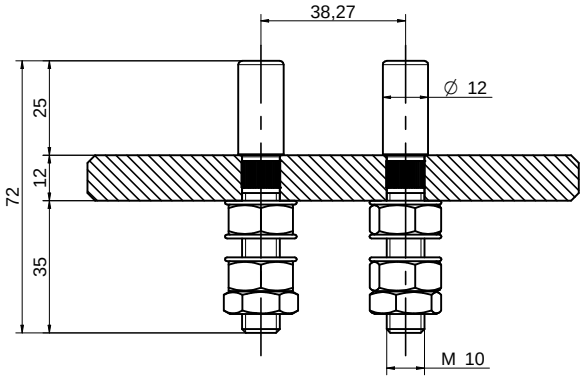


- 150 A / 200 A / 300 A

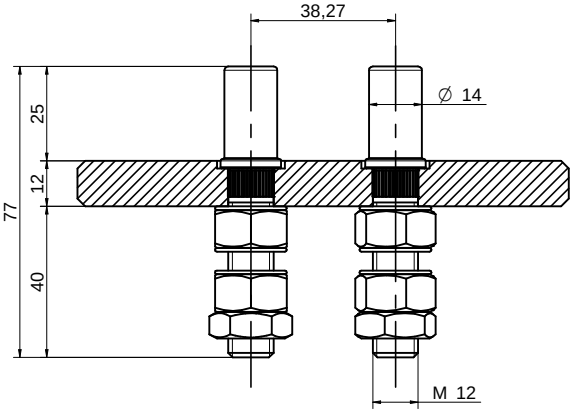
Dimension in mm



Threaded contact **150 A**, (Ref. **1**)



Threaded contact **200 A**, (Ref. **2**)

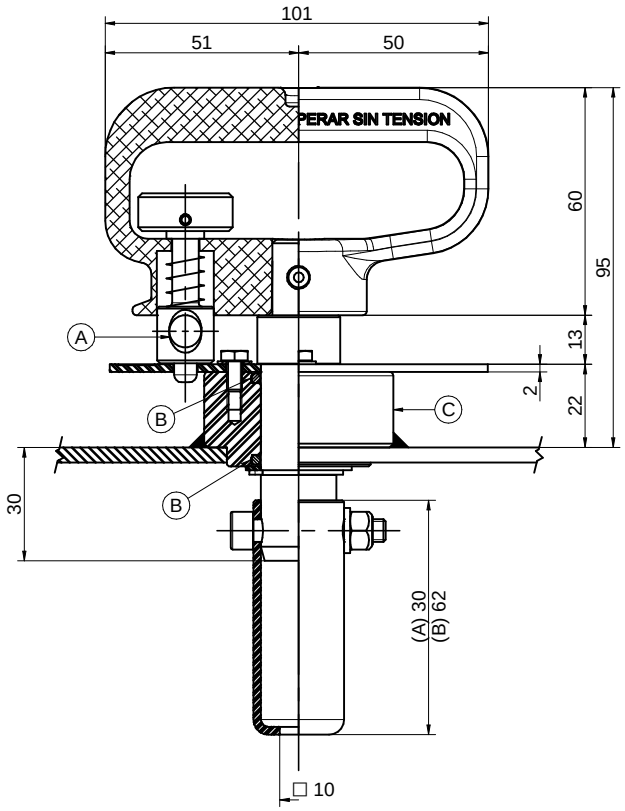


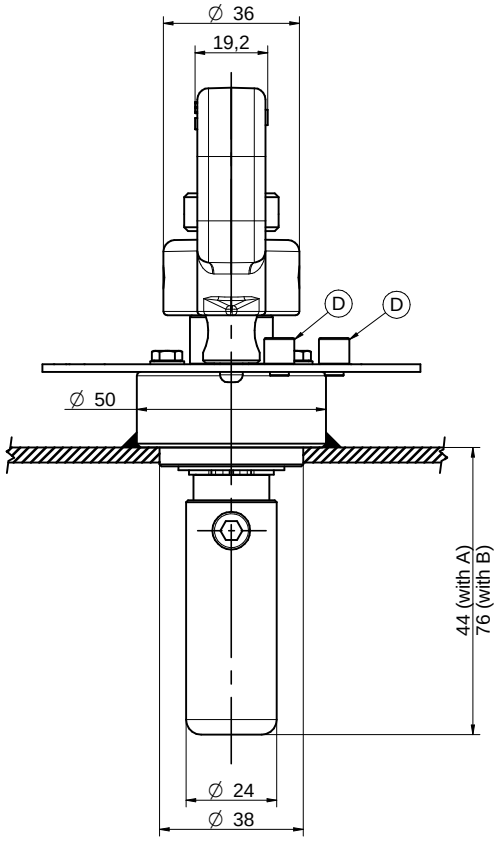
Threaded contact **300 A**, (Ref. **3**)

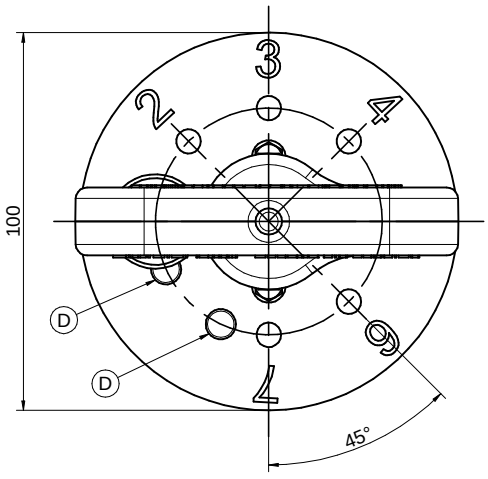
DRIVE TYPE 060-86.120

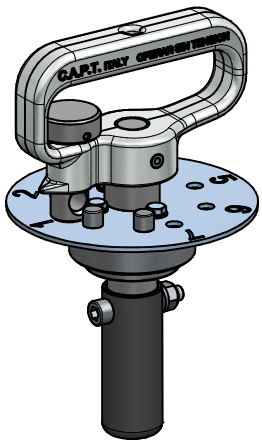
- Drive handle on tank wall
- From 2 to 7 positions

Dimension in mm









***A**) Hole ø8,5 for padlock.*

***B**) N°2 gasket OR 3081*

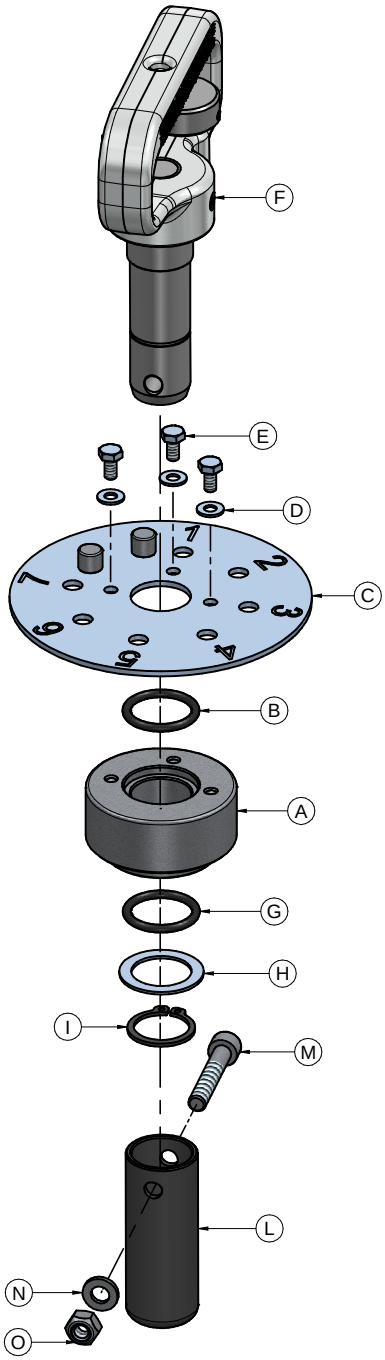
***C**) Steel 11SMnPb37 stuffing box to be welded to the transformer tank wall.*

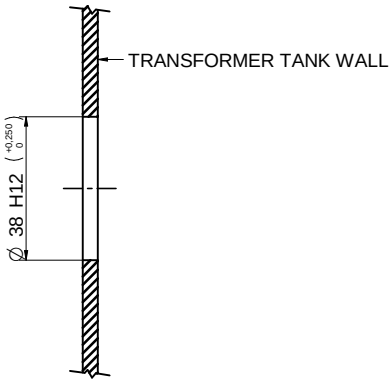
***D**) N°2 Pin stopper*

- Handle is composed by stuffing box, inox-steel index disc and aluminium handle with mechanical block on the position.

- Assembling sequence diagram
- Drive handle on tank wall
- From 2 to 7 positions

Dimension in mm





LIST COMPONENTS IN THE ASSEMBLY ORDER

A) Stuffing box to be welded on the transformer tank wall. Made in steel 11SMnPb37

B) N°1 O-ring 3081

C) Stainless steel numbering disk with N°2 pin stopper

D) N° 3 stainless steel washers M4 ISO7089

E) N° 3 stainless steel screws M4x8 ISO4017

F) Knob group supplied already assembled

G) N°1 O-ring 3081

H) Washer for shaft ø20 DIN 988

I) Seeger for shaft ø20 UNI 7435

L) Joint for connection of the square shaft

M) N°1 stainless steel screw M6x35 ISO4762

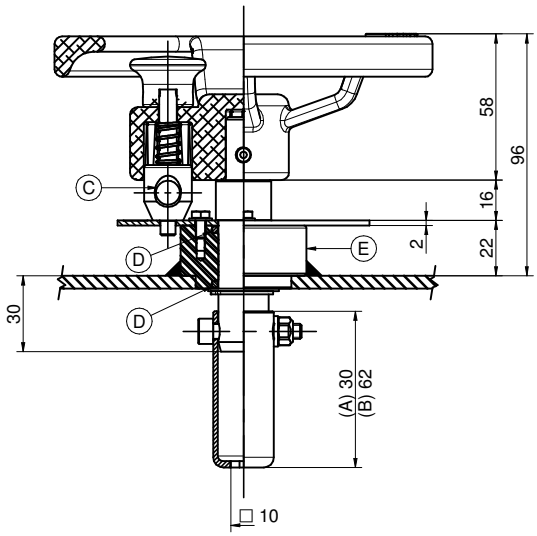
N) N°1 stainless steel washer M6 ISO7089

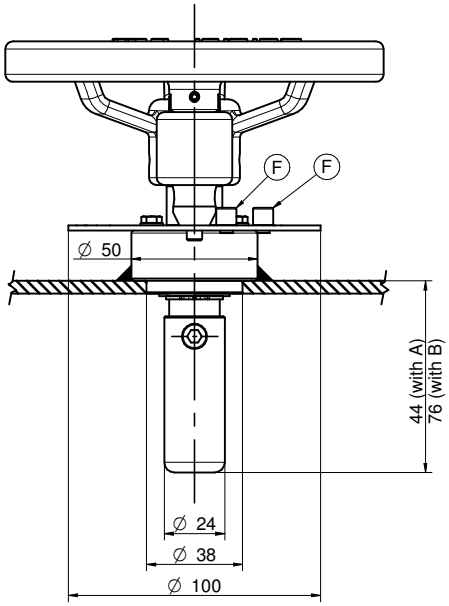
O) N°1 metal-block nut M6 DIN 980V

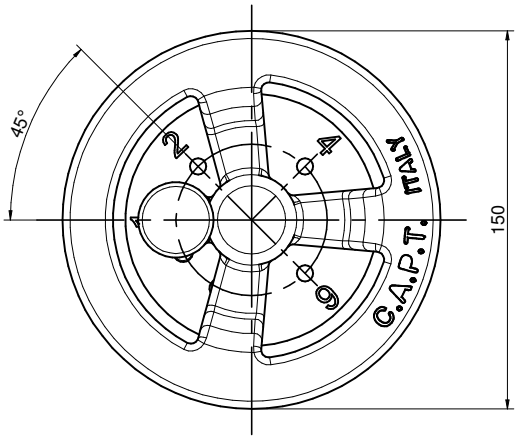
DRIVE TYPE 060-86.130

- *DRIVE WHEEL ON TANK WALL*
- *FROM 2 TO 7 POSITIONS*

Dimension in mm







C) Hole Ø9,5 for padlock with shackle thickness Ø min: 5, Ø Max: 9.

D) N°2 gasket OR 3081

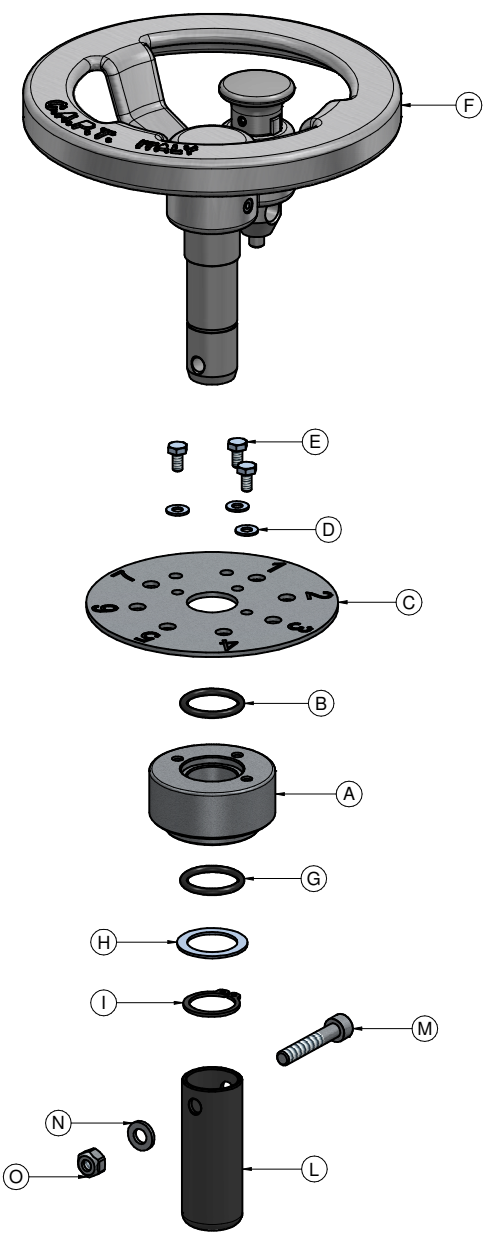
E) Steel 11SMnPb37 stuffing box to be welded to the transformer tank wall.

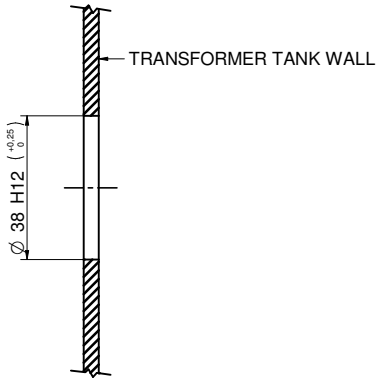
F) N°2 Pin stopper

- Handle is composed by stuffing box, inox-steel index disc and aluminium handle with mechanical block on the position.

- ASSEMBLING SEQUENCE DIAGRAM
- DRIVE WHEEL ON TANK WALL
- FROM 2 TO 7 POSITIONS

Dimension in mm





LIST COMPONENTS IN THE ASSEMBLY ORDER

A) Stuffing box to be welded on the transformer tank wall. Made in steel 11SMnPb37

B) N°1 O-ring 3081

C) Stainless steel numbering disk with N°2 pin stopper

D) N° 3 stainless steel washers M4 ISO7089

E) N° 3 stainless steel screws M4x8 ISO4017

F) Knob group supplied already assembled

G) N°1 O-ring 3081

H) Washer for shaft ø20 DIN 988

I) Seeger for shaft ø20 UNI 7435

L) Joint for connection of the square shaft

M) N°1 stainless steel screw M6x35 ISO4762

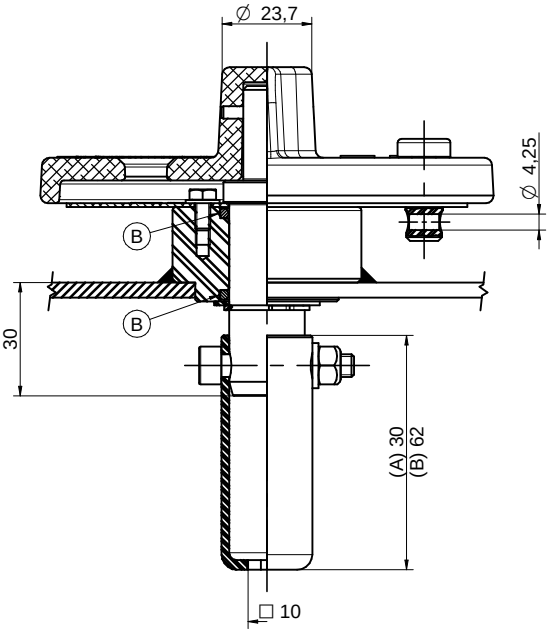
N) N°1 stainless steel washer M6 ISO7089

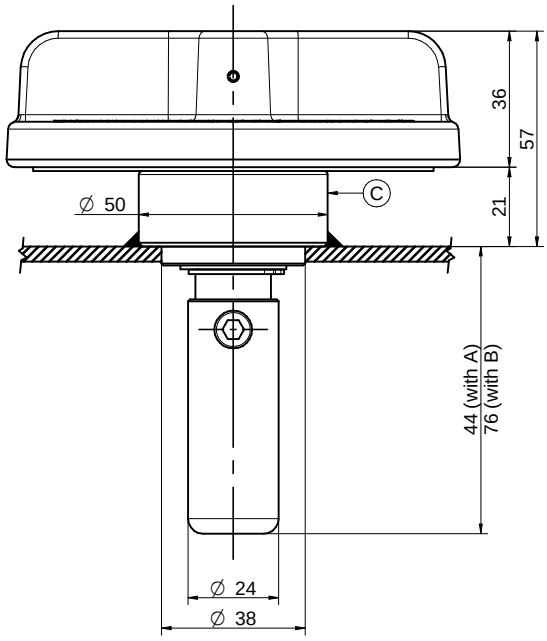
O) N°1 metal-block nut M6 DIN 980V

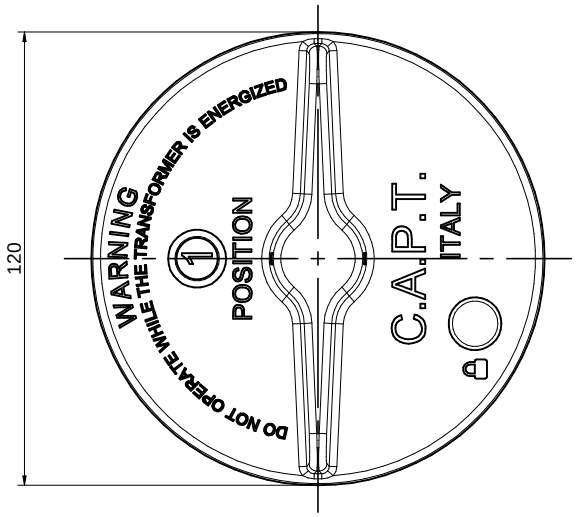
DRIVE TYPE 060-86.140

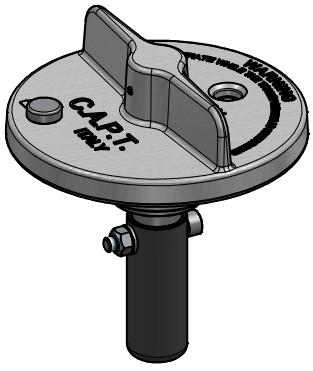
- Drive handle on tank wall
- From 2 to 7 positions

Dimension in mm









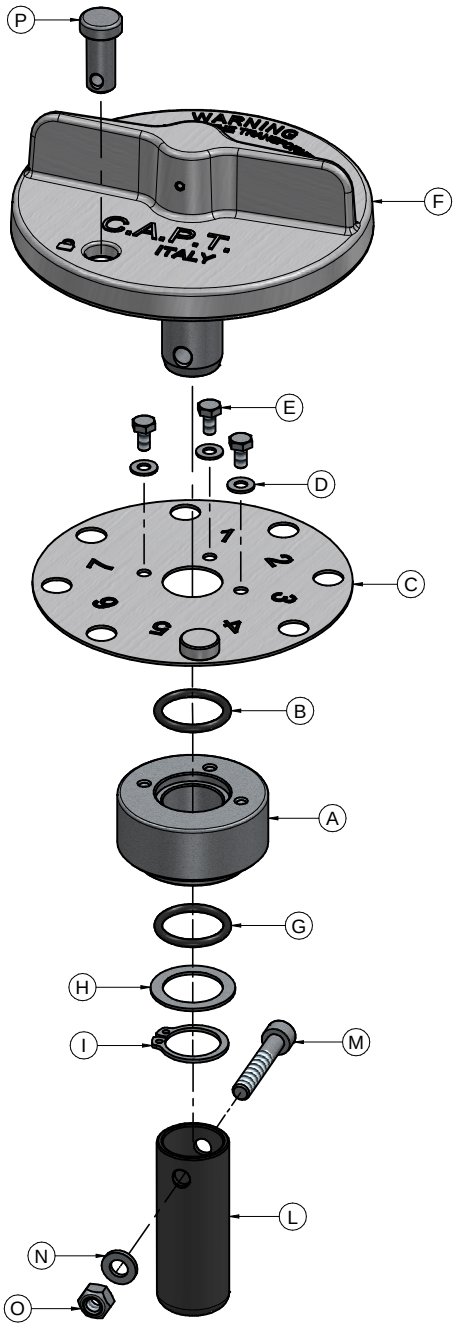
***B**) N°2 gasket OR 3081*

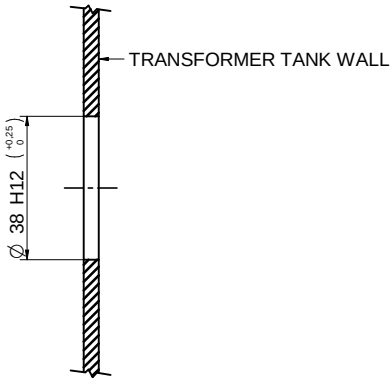
***C**) Steel stuffing box to be welded to the transformer tank wall.*

- Handle is composed by stuffing box, aluminium index disc and aluminium handle with mechanical block on the position.

- Assembling sequence diagram
- Drive handle on tank wall
- From 2 to 7 positions

Dimension in mm





LIST COMPONENTS IN THE ASSEMBLY ORDER

A) Stuffing box to be welded on the transformer tank wall. Made in steel 11SMnPb37

B) N°1 O-ring 3081

C) Aluminium numbering disk with N°2 pin stopper

D) N° 3 stainless steel washers M4 ISO7089

E) N° 3 stainless steel screws M4x8 ISO4017

F) Knob group supplied already assembled

G) N°1 O-ring 3081

H) Washer for shaft ø20 DIN 988

I) Seeger for shaft ø20 UNI 7435

L) Joint for connection of the square shaft

M) N°1 stainless steel screw M6x35 ISO4762

N) N°1 stainless steel washer M6 ISO7089

O) N°1 metal-block nut M6 DIN 980V

P) Stainless steel lock pin