

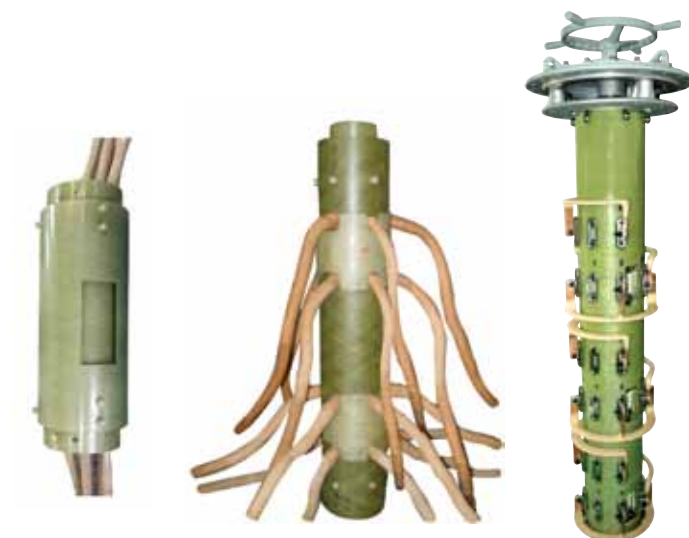


TECHNICAL DATA

TYPE WDG/WLG/WSG

OFF- CIRCUIT TAP CHANGER

HM0.154.6001



SHANGHAI HUAMING POWER EQUIPMENT CO., LTD.

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1. General

Type WDG/WLG/WSG Off-Circuit Tap Changer (herein referred as tap changer) is a drum structure off-circuit tap changer applicable for power transformer and industry transformer as well as traction transformer.

It can only be operated when the transformer is de-energized.

By number of phase, tap changer can be divided into three-phase, single plus two-phase and single phase.

By leads output terminal location, it is divided into middle output leads, two ends output leads and without fixed leads.

Type A and Type B tap changers can be mounted between the coils of the transformer; and type C is to be mounted at one side of the transformer coils.

The operations of the tap changer are top manual, side manual from top transmission or from bottom transmission or motor driving at side.

There are 6 regulation connections as standard design: linear, single-bridging, double-bridging, Y-D change-over, series-parallel change-over and reversing. Refer to table 2 for the basic connection methods code and Fig.2 for connection schematic diagrams. For special requirement, please contact us with details.

2. Technical specifications

Type WDG/WLG/WSG off-circuit tap changer complies with IEC 60214-1:2003 .Tap changer technical data is listed in Table 1 below.

Table 1-1 Drum Series Off-Circuit Tap Changer Technical Data

Item	Type	WDG (single phase), WLG (2-phases), Type A										
1	No. of Phase	1-phase / 2-phase										
2	Max. rated through current(A)	250	300	400	500	600	800	1000	1250	1600	2000	
3	Short circuit current test (kA)	Thermal (3s)	5	5.4	6	7	8	10	12	14	16	20
		Dynamic (Peak)	12.5	13.5	15	17.5	20	25	30	35	40	50
4	Connection	Linear (IV), single-bridging (V), Y-D change-over (VI), Double-bridging (VII), series-parallel (VIII), reversing (II)										
5	Rated frequency (Hz)	50 or 60										
6	Maximum operation positions	5(IV) 7(V,VII) 2(VI, VIII) 7(II)										
7	Insulation to earth(kV)	The highest voltage for equipment	12		40.5		72.5		126			
		Rated separate source AC withstand voltage(50Hz, 1min)	35		85		140		230			
		Rated lightning impulse withstand voltage (1.2/50)	75		200		350		550			
8	Internal insulation	Refer to clause 4.4										
9	Operation method	Manual operation on top or at side, motor driving at side										

Remark: 1. For linear (IV) and single-bridging (V), the max.rated through current is up to 2000A and the highest voltage for equipment is up to 126kV
2. For Y-D change-over (VI) and series-parallel (VIII), the max.rated through current is up to 1000A and the highest voltage for equipment is 40.5kV
3. For double-bridging (VII), the max.rated through current is up to 1000A and the highest voltage for equipment is up to 126kV
4. For reversing (II), the max.rated through current is up to 1600A and the highest voltage for equipment is up to 126kV

Table 1-2 Drum Series Off-Circuit Tap Changer Technical Data

Item	Type	WSG (3 phases), Type A										
1	No. of Phase	3-phase										
2	Max. rated through current(A)	250	300	400	500	600	800	1000				
3	Short circuit current test (kA)	Thermal (3s)	5	5.4	6	7	8	10	12			
		Dynamic (Peak)	12.5	13.5	15	17.5	20	25	30			
4	Connection	Linear (IV), single-bridging (V), reversing (II)										
5	Rated frequency (Hz)	50 or 60										
6	Maximum operation positions	5 (IV) 7 (V,II)										
7	Insulation to earth(kV)	The highest voltage for equipment	12		40.5		72.5		126			
		Rated separate source AC withstand voltage(50Hz, 1min)	35		85		140		230			
		Rated lightning impulse withstand voltage (1.2/50)	75		200		350		550			
8	Internal insulation	Refer to clause 4.4										
9	Operation method	Manual operation on top or at side, motor driving at side										

Table 1-3 Drum Series Off-Circuit Tap Changer Technical Data

Item	Type		WDG (single phase), Type B									
1	No. of Phase		Single phase									
2	Max. rated through current(A)		250	300	400	500	600	800	1000	1250	1600	2000
3	Short circuit current test (kA)	Thermal (3s)	5	5.4	6	7	8	10	12	14	16	20
		Dynamic (Peak)	12.5	13.5	15	17.5	20	25	30	35	40	50
4	Connection		Linear (IV), single-bridging (V)									
5	Rated frequency (Hz)		50 or 60									
6	Maximum operation positions		5									
7	Insulation to earth(kV)	The highest voltage for equipment	12		40.5		72.5		126		252	
		Rated separate source AC withstand voltage(50Hz, 1min)	35		85		140		230		460	
		Rated lightning impulse withstand voltage (1.2/50)	75		200		350		550		1050	
8	Internal insulation		Refer to clause 4.4									
9	Operation method		Manual operation on top or at side, motor driving at side									

Table 1-4 Drum Series Off-Circuit Tap Changer Technical Data

Item	Type		WSG (3 phases), Type C								
1	No. of Phase		3-phase								
2	Max. rated through current(A)		250	300	400	500	600	800	1000	1250	1600
3	Short circuit current test (kA)	Thermal (3s)	5	5.4	6	7	8	10	12	14	16
		Dynamic (Peak)	12.5	13.5	15	17.5	20	25	30	35	40
4	Connection		reversing (II)								
5	Rated frequency (Hz)		50 or 60								
6	Maximum operation positions		7								
7	Insulation to earth(kV)	The highest voltage for equipment	12		40.5		72.5		126		
		Rated separate source AC withstand voltage(50Hz, 1min)	35		85		140		230		
		Rated lightning impulse withstand voltage (1.2/50)	75		200		350		550		
8	Internal insulation		Refer to clause 4.4								
9	Operation method		Manual operation on top or at side, motor driving at side								

3. Type designation

3.1. Type explanation

Due to the different combinations of number of phases, maximum rated through current, the highest voltage for equipment and connections, type WDG/WLG/WSG off-circuit tap changer comes with various models. The type designation provides the above mentioned parameters as below:

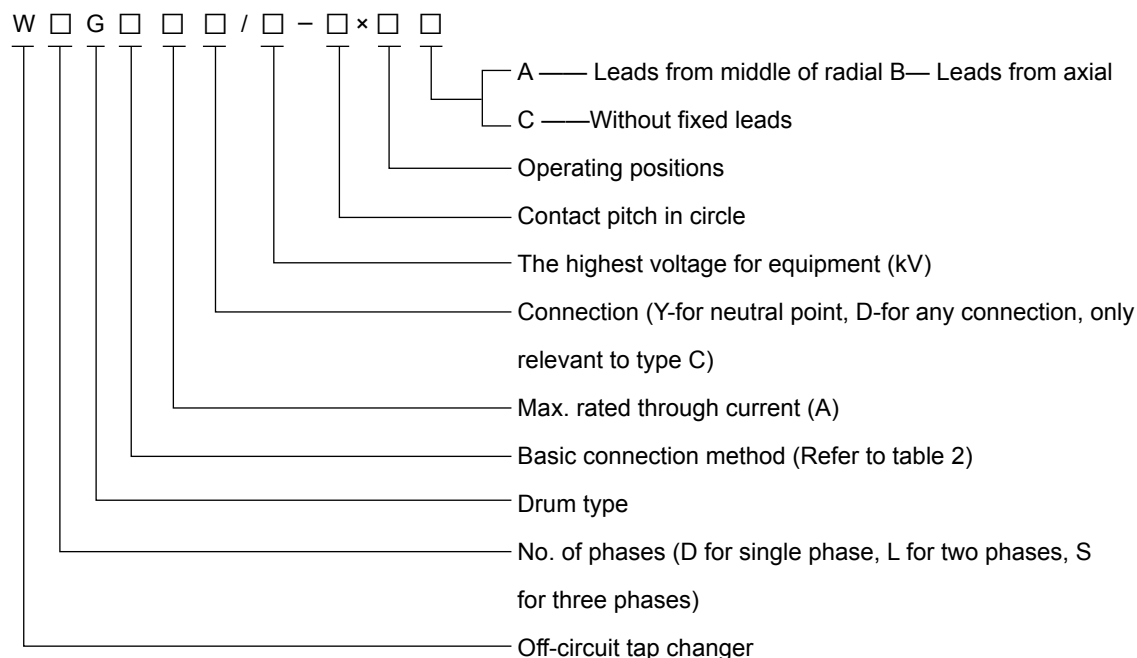


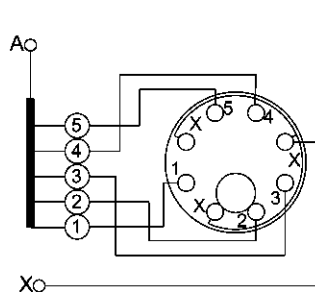
Fig. 1 Tap Changer Model Explanation

3.2. Tap changer basic connection

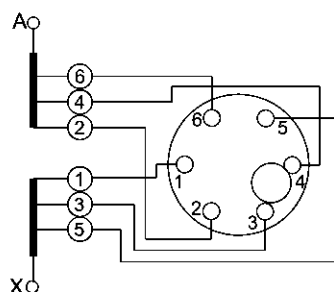
Different transformer winding tapping corresponds to different tap changer basic connection diagram. Fig.2 shows commonly used connections. It can also be specially designed as per customer requirement.

Table 2 Tap Changer Basic Connection

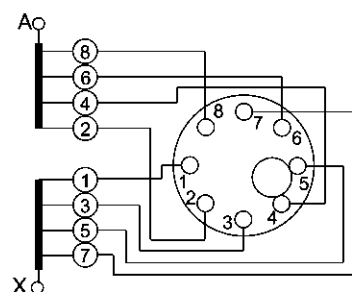
Code	IV	V	VI	VII	V III	II
Connection	Linear	Single-bridging	Y-D change-over	Double-bridging	Series-paralle Change-over	Reversing



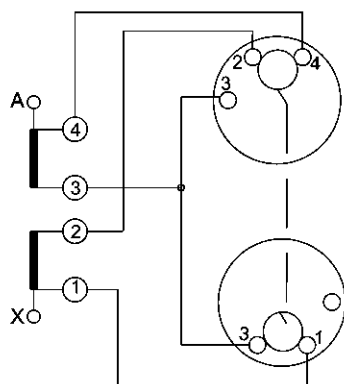
IV-- Linear 5×5



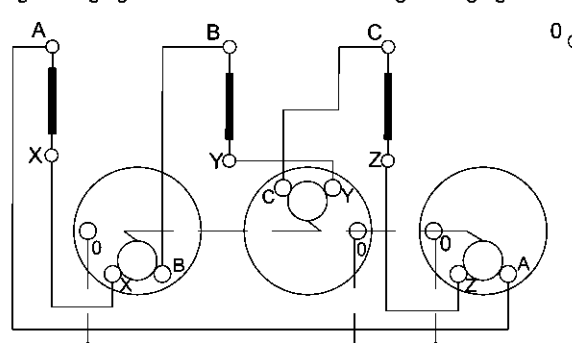
V--Single-bridging 6×5



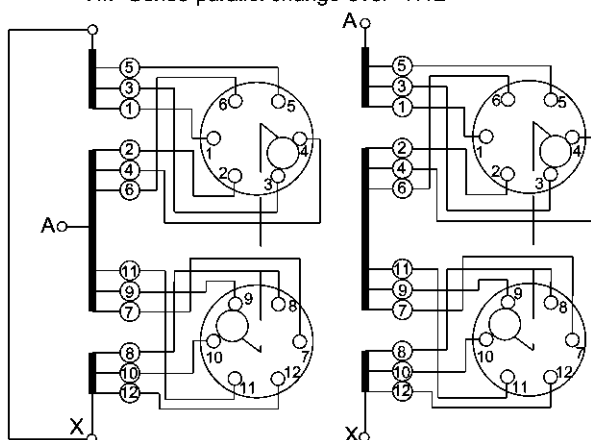
V--Single-bridging 8×7



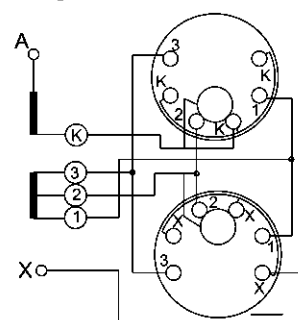
VIII--Series-parallel change-over 4×2



VI--Y-D change-over 3×2



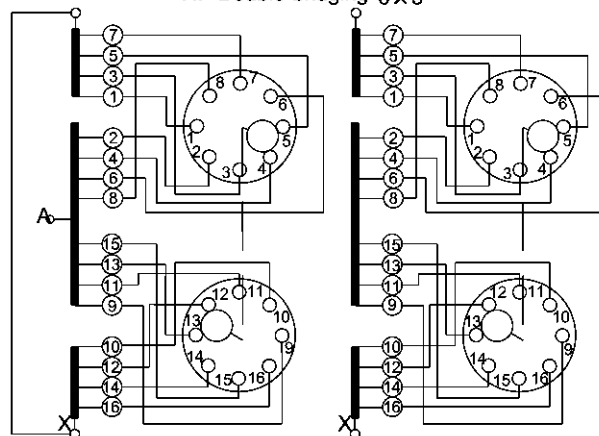
VII--Double-bridging 6×5



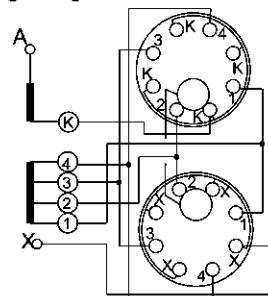
II--Reversing

Operation position number	1	2	3	4	5
Tap changer position	+2	+1	0	-1	-2
Connection method	K-3	K-2	K-2	K-1	K-1
Connection method	1-X	1-X	2-X	2-X	3-X

Reversing regulating connection table 4×5 (±2)



VII--Double-bridging 8×7



Operation position number	1	2	3	4	5	6	7
Tap changer position	+3	+2	+1	0	-1	-2	-3
Connection method	K-4	K-3	K-3	K-2	K-2	K-1	K-1
Connection method	1-X	1-X	2-X	2-X	3-X	3-X	4-X

Reversing regulating connection table 5×7 (±3)

Remark: 1. All connections have been made interior of the tap changer, only tap leads should be connected to the transformer winding (except special design)
2. The connection diagram is taken one phase as example except from Y-D change-over.

Table 2 Tap Changer Basic Connection

4. Terms and definitions

4.1 Rated through-current

Rated through current I_u : The current flowing through the tap changer toward the external circuit, which can be carried continuously while meeting the requirement.

The maximum rated through current I_{um} : The highest rated through current for which the tap changer is designed for and which forms the basis for all current related tests.

4.2. Short circuit current test

According to IEC 60214-1: 2003, all contacts continuously carrying the current shall be able to withstand 2s ($\pm 10\%$) short circuit test current without melting, deformation or mechanical damage. Meanwhile the starting peak current value shall be 2.5 ($\pm 5\%$) times of the root means square value of rated short circuit test current. Refer the short circuit test current values to Table 1-1/1-2/1-3/1-4 Drum Series Off-Circuit Tap Changer Technical Data.

4.3. Service condition of tap changers

4.3.1. Service temperature range of tap changer in oil is $-25^{\circ}\text{C} \sim +100^{\circ}\text{C}$.

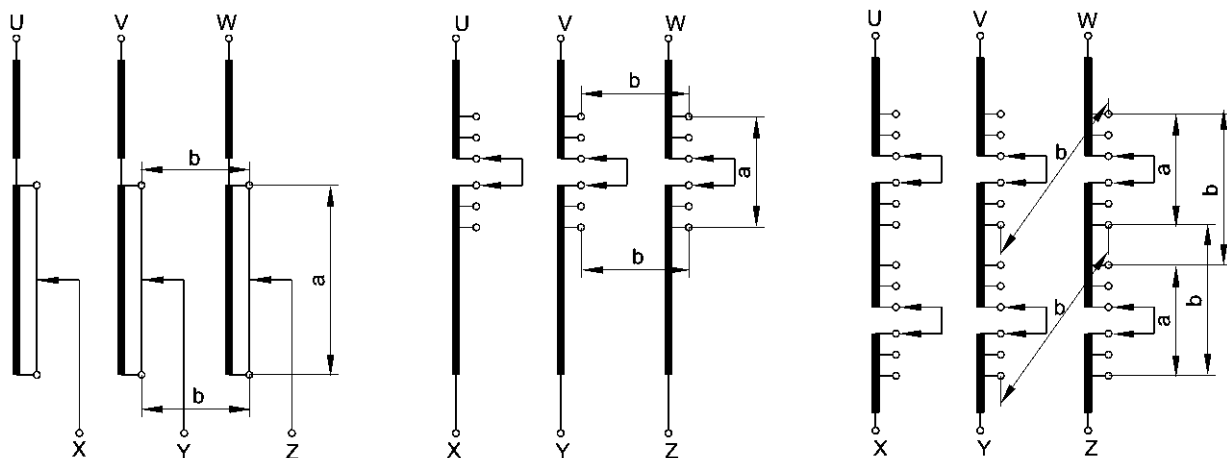
4.3.2. Service ambient air temperature range of tap changer is $-25^{\circ}\text{C} \sim +40^{\circ}\text{C}$. Relative humidity is less than 85%.

4.3.3. Perpendicular deflection between ground and tap changer after being mounting on transformer shall be less than 2%.

4.3.4. There shall be no serious dust, explosive gas or corrosive gas on service site. Remark: Please contact us if special application required.

4.4. Internal insulation of tap changer

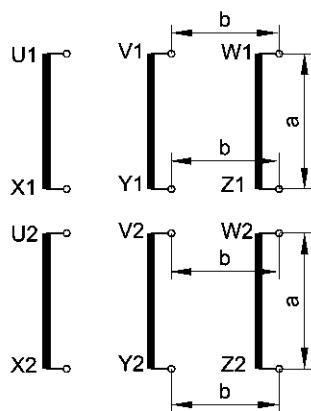
The internal insulation of the tap changer is mainly depending on the rated withstand voltage of actual required gradient. Voltage gradient of tap changer internal insulation usually occurs during the transformer lightning impulse test and inductive withstand voltage test. It changes with the tap positions. Refer to table 3 for the internal insulations and fig. 3 for basic connection diagram and insulation distance mark. It must be checked when selecting the tap changer to ensure the conformity with insulation requirement.



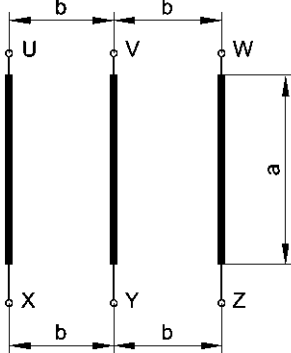
Linear (IV)

Single-bridging (V)

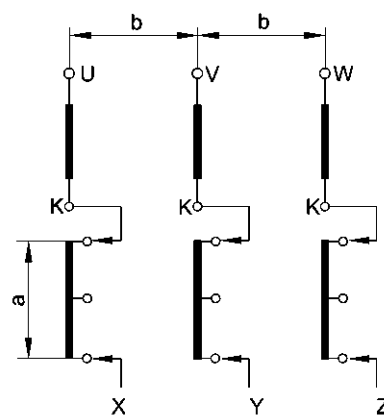
Double-bridging (VII)



Series-parallel (VIII)



Y-D (VI)



Reversing (II)

- a: Between max. and min. taps of the same phase
b: Between any winding taps of different phases or between start and end of the same tap winding for double-bridging

Fig. 3 Basic Connection Diagram and Insulation Distance Mark

Table 3 Tap Changer Internal Insulation Level

(Unit:kV)

Model	WDG,WLG (A type)									
Connection	Linear(IV) , Single-bridging(V), Y-D change-over(VI), Double-bridging(VII), Series-parallel(VIII), Reversing(II)									
The highest voltage for equipment	12		40.5		72.5		126			
Insulation distance mark	a	b	a	b	a	b	a	b		
Rated lightning impulse withstand voltage (1.2/50 μ s)	54	75	90	200	140	325	175	550		
Rated separate source AC withstand voltage(50Hz, 1min)	18	35	30	85	45	140	55	230		
Model	WSG (A type)									
Connection	Linear(IV) , Single-bridging(V), Reversing(II)									
The highest voltage for equipment	12		40.5		72.5		126			
Insulation distance mark	a	b	a	b	a	b	a	b		
Rated lightning impulse withstand voltage (1.2/50 μ s)	54	75	90	200	140	325	175	550		
Rated separate source AC withstand voltage(50Hz, 1min)	18	35	30	85	45	140	55	230		
Model	WDG (B type)									
Connection	Linear(IV) , Single-bridging(V)									
The highest voltage for equipment	12		40.5		72.5		126		252	
Insulation distance mark	a	b	a	b	a	b	a	b	a	b
Rated lightning impulse withstand voltage (1.2/50 μ s)	54	75	90	200	140	325	175	550	285	1050
Rated separate source AC withstand voltage(50Hz, 1min)	18	35	30	85	45	140	55	230	90	460
Model	WSG (C type)									
Connection	Reversing(II)									
The highest voltage for equipment	12		40.5		72.5		126			
Insulation distance mark	a	b	a	b	a	b	a	b	a	b
Rated lightning impulse withstand voltage (1.2/50 μ s)	54	75(D)	90	200(D)	140	325(D)	175	550(D)		
		65(Y)		120(Y)		150(Y)		150(Y)		
Rated separate source AC withstand voltage(50Hz, 1min)	18	35(D)	30	85(D)	45	140(D)	55	230(D)		
		30(Y)		40(Y)		50(Y)		50(Y)		

Please contact us when required technical parameter is more strictly and excluding in above table.

4.5. Tap changer insulation to earth

The tap changer insulation to earth, that is insulation between tap changer live parts and grounding part, it is determined by dielectric tests according to IEC-60214-1-2003, please refer to table 4 below.

Table 4 Tap changer Insulation Level to Earth

(Unit:kV)

The highest voltage for equipment (kV)	Rated separate source AC withstand voltage (kV/50Hz, 1min)	Rated lightning impulse withstand voltage (kV, 1.2/50μs)
12	35	75
40.5	85	200
72.5	140	325
126	230	550
252	460	1050

4.6. Tap changer mounting method

4.6.1. Type A and type B off-circuit tap changer is suitable for installing between adjacent transformer coils.

4.6.2. Type C off-circuit tap changer is mounted at one side of transformer winding, it could be either standard tank mounting or bell-type mounting, please refer to appendices for dimensions.

5. Special design

This technical data contains the information of the standard design; special design will be according to the requirements of the customers, please contact us if you have any special demands.

6. Operation method

WDG/WLG/WSG Off-Circuit Tap Changer can be operated by either manually or motor driving. For manual operation, it has models of top manual, side manual from top transmission or from bottom transmission.

6.1 Manual operation

6.1.1. Top manual operation:

Operating method and installation schematic diagram is shown in the appendix.

6.1.2. Side manual operation from top transmission

SL manual drive mechanism is mounted at side of the transformer, transmission from the top of the tap changer via drive shaft, worm wheelbox, it is suitable for A type and B type.

6.1.3 Side manual operation from bottom transmission

SL manual drive mechanism is mounted at side of the transformer, transmission from the bottom of the tap changer via drive shaft, worm wheelbox; it is suitable for A type and B type.

6.2 Operated by motor drive unit

CMA7 motor drive unit (or per required MDU)can be used for operating the tap changer. Refer to TAP CHANGER TYPE SELECTING MANUAL for overall dimensions. Table 5 gives technical data of motor drive unit. Motor drive unit is mounted on the side of transformer wall, driving the tap changer through driving shaft and worm wheelbox, It is suitable for the tap changer requires frequently operation.

Table 5 Motor Drive Unit Technical Data

Motor drive unit		CMA7	
Motor	Rated power (W)	750	1100
	Rated voltage (V)	380/3AC	
	Rated current (A)	2.0	2.8
	Rate frequency(Hz)	50 or 60	
	Rotate speed (r.p.m.)	1400	
Rated torque on drive shaft (Nm)		18	26
Revolution of the drive shaft per switching operation		33	
Revolution of the hand crank per switching operation		33	
Running time per switching operation (S)		About 5	
Max. operation positions		107	
Voltage for control circuit and heater circuit (V)		220/AC	
Heater power (W)		50	
A.C. voltage test to ground (kV/50Hz, 1min)		2	
Approx. weight (kg)		90	
Protective degree		IP56	
Mechanical endurance (operations)		Not less than 800,000	

7. Position indicator

7.1 HMC-3W off-circuit tap changer position indicator

HMC-3W OCTC position indicator is a support fitting for CMA7 motor drive unit, it can be used to indicate the OCTC position in the control room.

HMC-3W technical data is as below.

Working voltage: 220V AC

Power frequency: 50Hz/60Hz

Maximum operation positions: 39

Environment temperature: -10°C to 40°C Indoor

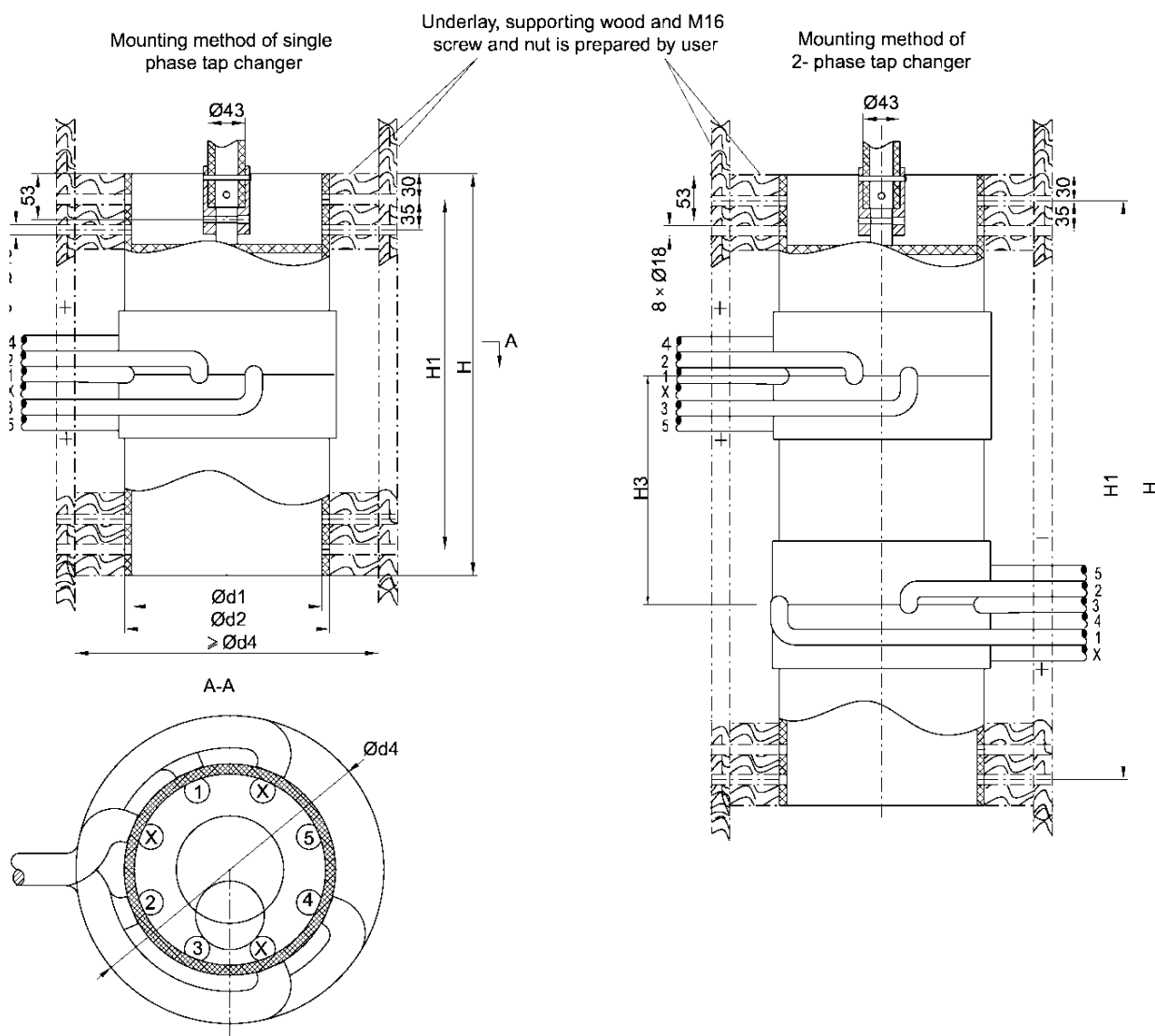
Note: for special power supply please inform when ordering.

8. Accessories

Worm wheelbox is used connect the horizontal shaft of the tap changer and vertical shaft of the motor drive unit, by which transferring the driving torque from manual drive mechanism or motor drive unit to the tap changer.

9. Appendices

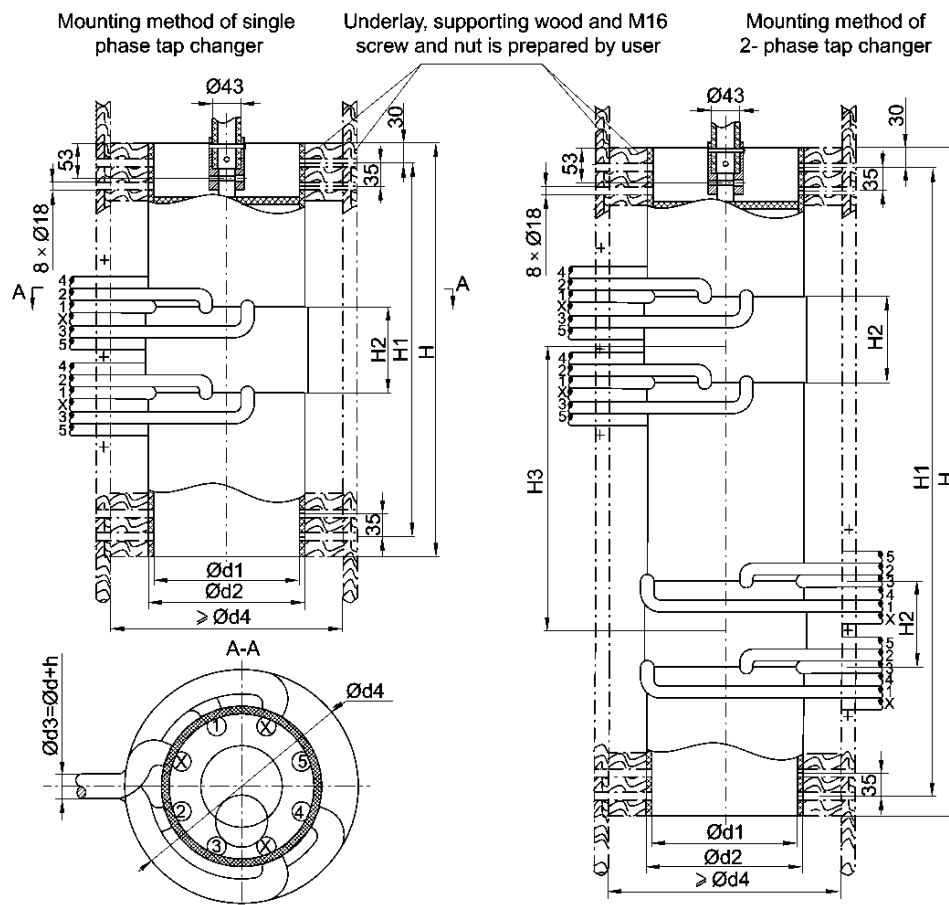
Appendix 1 (WDG+WLG) IV-250-600A overall dimensions, linear regulation, A type



Type	Dimensions (mm)								operation position(n)
	H	H1	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGIV-250~300/12~40.5-5×5A	505	445	-	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185	200	217	d4=d2+2d3+ δ (δ ≥60) Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5	
WLGIV-250~300/12~40.5-5×5A	770	710	295		220	237			
WDGIV-400~600/12~40.5-5×5A	505	445	-						
WLGIV-400~600/12~40.5-5×5A	770	710	265		200	217			
WDGIV-250~300/72.5~126-5×5A	505	445	-						
WLGIV-250~300/72.5~126-5×5A	920	860	445		220	237			
WDGIV-400~600/72.5~126-5×5A	505	445	-						
WLGIV-400~600/72.5~126-5×5A	960	900	455						

- All connections have been made interior of the tap changer, only tap leads should be connected to the transformer winding(except special design)
- Length of tap lead is one meter.

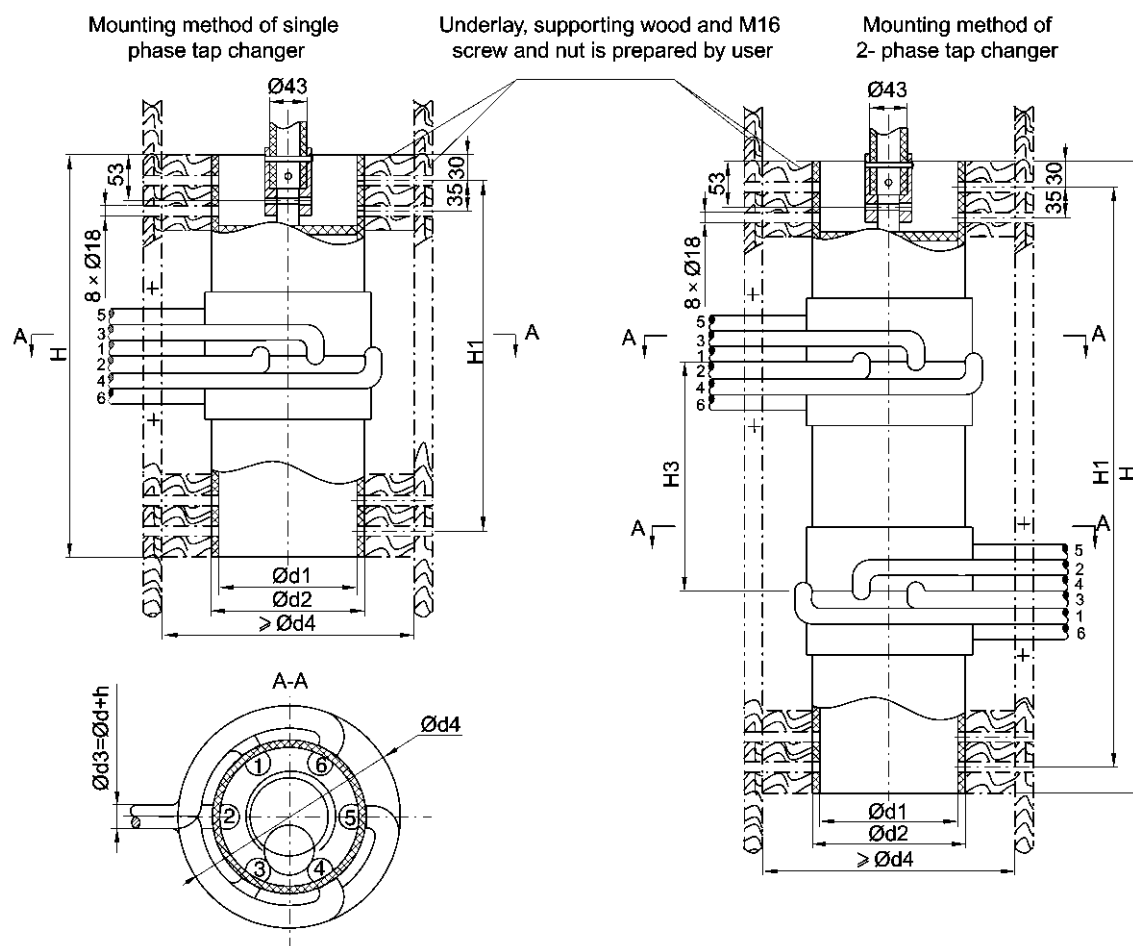
Appendix 2 (WDG+WLG) IV-800-2000A overall dimensions, linear regulation, A type



Type	Dimensions (mm)									operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGIV-800~1000/12~40.5-5×5A	550	490	110	-	800A:17.5/120 1000A:18.7/150 1250A:21.7/185 1600A:24.7/240 2000A:26/300	220	237	d4=d2+2d3+ δ (δ ≥60)	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5
WLGIV-800~1000/12~40.5-5×5A	860	800		310						
WDGIV-1250/12~40.5-5×5A	625	565	130	-						
WLGIV-1250/12~40.5-5×5A	1010	950		430						
WDGIV-1600/12~40.5-5×5A	625	565	175	-						
WLGIV-1600/12~40.5-5×5A	1010	950		385						
WDGIV-2000/12~40.5-5×5A	670	610	220	-						
WLGIV-2000/12~40.5-5×5A	1100	1040		430						
WDGIV-800~1000/72.5~126-5×5A	550	490	110	-						
WLGIV-800~1000/72.5~126-5×5A	1050	990		500						
WDGIV-1250/72.5~126-5×5A	625	565	130	-						
WLGIV-1250/72.5~126-5×5A	1160	1100		580						
WDGIV-1600/72.5~126-5×5A	625	565	175	-						
WLGIV-1600/72.5~126-5×5A	1200	1140		575						
WDGIV-2000/72.5~126-5×5A	670	610	220	-						
WLGIV-2000/72.5~126-5×5A	1290	1230		620						

- All connections have been made interior of the tap changer, only tap leads should be connected to the transformer winding(except special design)
- Length of tap lead is one meter.

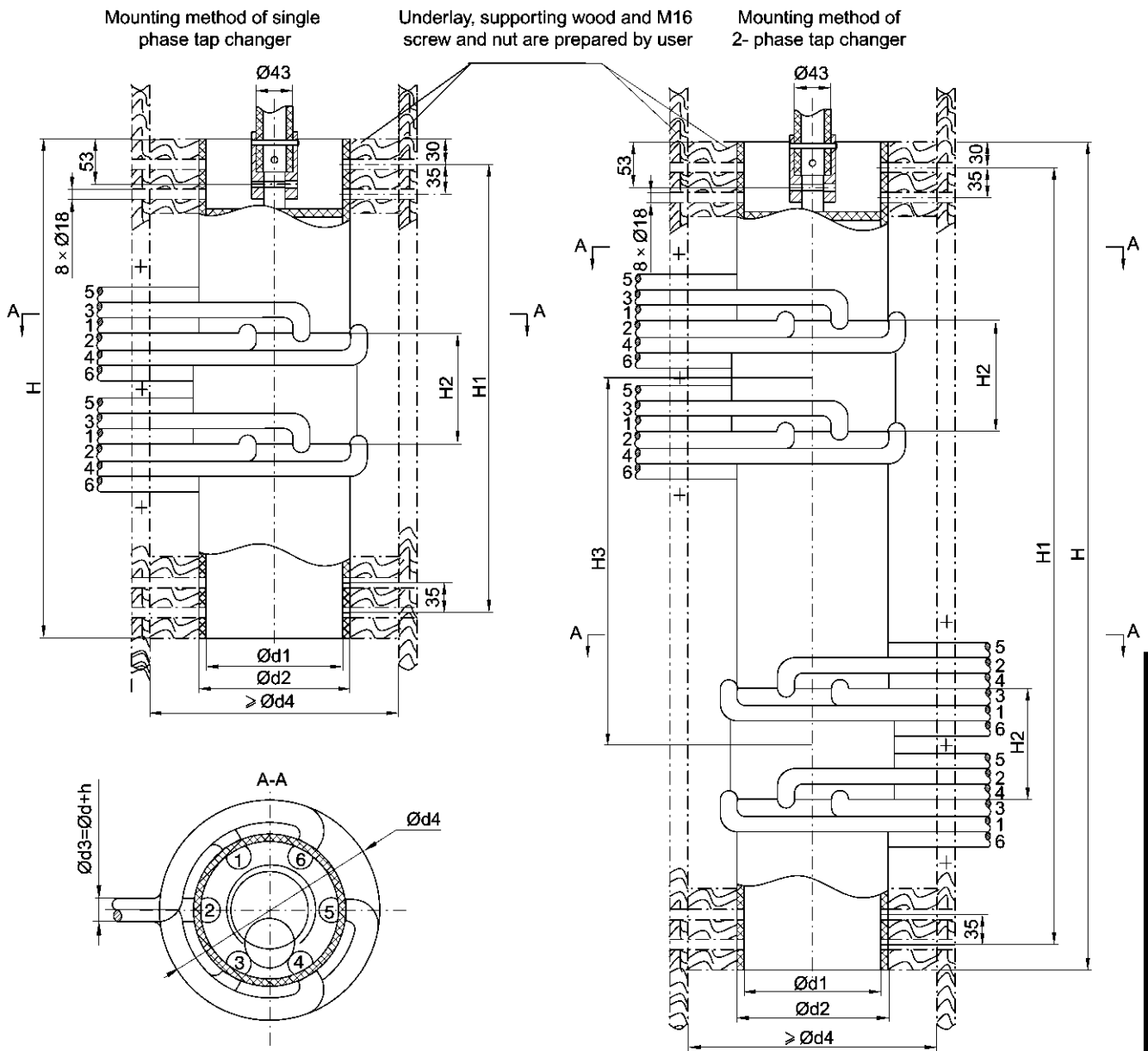
Appendix 3 (WDG+WLG) V-250-600A overall dimensions, single-bridging regulation, A type



Type	Dimensions (mm)								operation position(n)
	H	H1	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGV-250~300/12~40.5-6×5(4×3)A	465	405	-	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185	160	177	ød4=ød2+2ød3+ δ (δ ≥60) Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5	
WLGv-250~300/12~40.5-6×5(4×3)A	730	670	295						
WDGV-250~300/12~40.5-8×7A	465	405	-		220	237			
WLGv-250~300/12~40.5-8×7A	730	670	295						
WDGV-400~600/12~40.5-6×5(4×3)A	465	405	-		160	177			
WLGv-400~600/12~40.5-6×5(4×3)A	730	670	265						
WDGV-400~600/12~40.5-8×7A	465	405	-		220	237			
WLGv-400~600/12~40.5-8×7A	730	670	265						
WDGV-250~300/72.5~126-6×5(4×3)A	465	405	-		160	177			
WLGv-250~300/72.5~126-6×5(4×3)A	880	820	445						
WDGV-250~300/72.5~126-8×7A	465	405	-		220	237			
WLGv-250~300/72.5~126-8×7A	880	820	445						
WDGV-400~600/72.5~126-6×5(4×3)A	465	405	-		160	177			
WLGv-400~600/72.5v126-6×5(4×3)A	930	870	465						
WDGV-400~600/72.5~126-8×7A	465	405	-		220	237			
WLGv-400~600/72.5~ 126-8×7A	930	870	465						

1. Length of tap lead is one meter.

Appendix 4-1(WDG+WLG) V-800-2000A overall dimensions, single-bridging regulation, A type

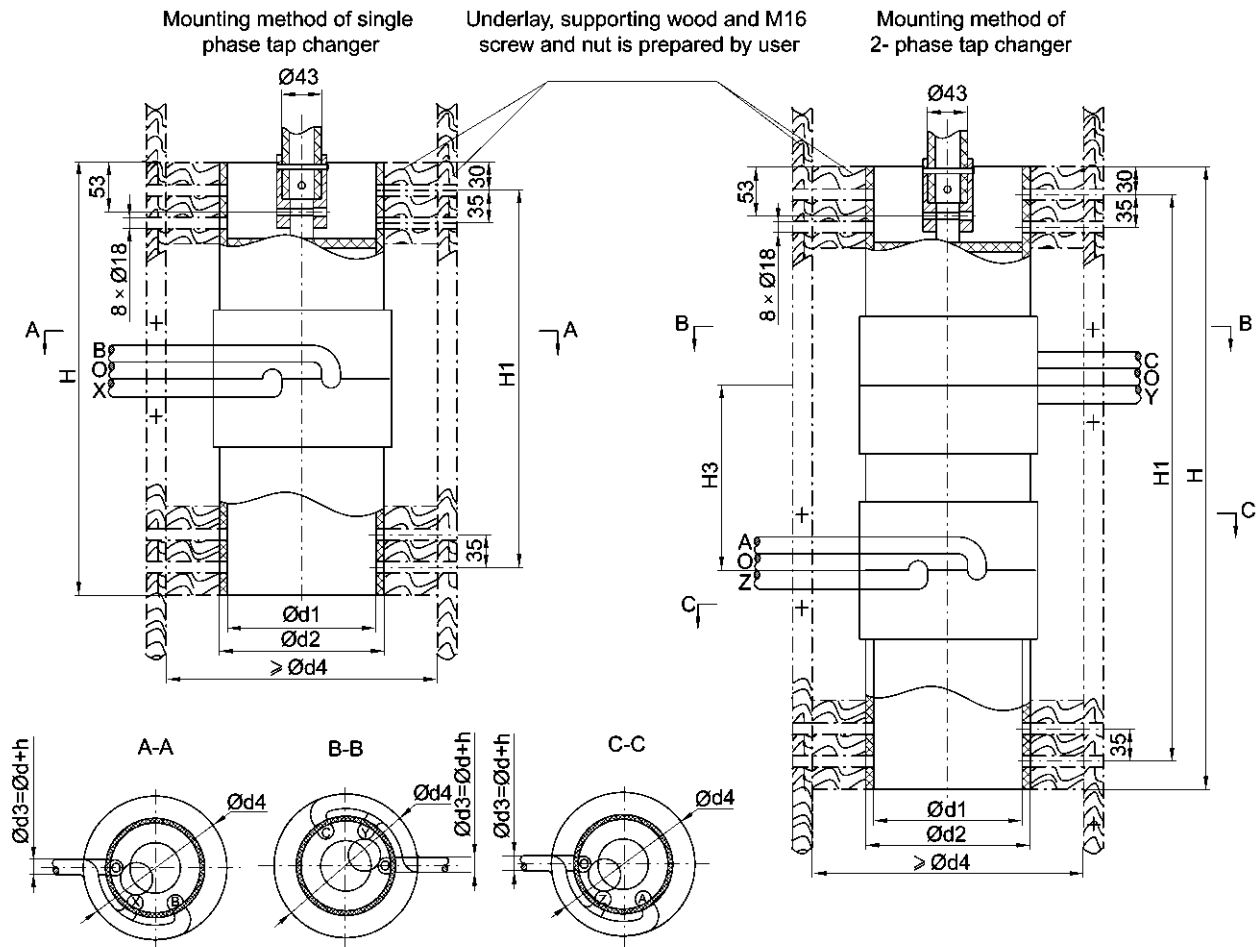


**Appendix 4-2(WDG+WLG) V-800-2000A overall dimensions table,
single-bridging regulation, A type**

Type	Dimensions (mm)									operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGV-800~1000/12~40.5-6×5(4×3)A	510	450	110	-	800A:17.5/120 1000A:18.7/150 1250A:21.7/185 1600A:24.7/240 2000A:26/300	160	177	d4=d2+2ø3+δ (δ ≥60)	h=12(72.5kV-126kV) h=6(12kV-40.5kV)	5
WLGv-800~1000/12~40.5-6×5(4×3)A	820	760		310						
WDGV-800~1000/12~40.5-8×7A	510	450	110	-		220	237			
WLGv-800~1000/12~40.5-8×7A	820	760		310						
WDGV-1250/12~40.5-6×5(4×3)A	585	525	130	-		160	177			
WLGv-1250/12~40.5-6×5(4×3)A	970	910		430						
WDGV-1250/12~40.5-8×7A	585	525	130	-		220	237			
WLGv-1250/12~40.5-8×7A	970	910		430						
WDGV-1600/12~40.5-6×5(4×3)A	585	525	175	-		160	177			
WLGv-1600/12~40.5-6×5(4×3)A	970	910		385						
WDGV-1600/12~40.5-8×7A	585	525	175	-		220	237			
WLGv-1600/12~40.5-8×7A	970	910		385						
WDGV-2000/12~40.5-6×5(4×3)A	630	570	220	-		160	177			
WLGv-2000/12~40.5-6×5(4×3)A	1060	1000		430						
WDGV-2000/12~40.5-8×7A	630	570	220	-		220	237			
WLGv-2000/12~40.5-8×7A	1060	1000		430						
WDGV-800~1000/72.5~126-6×5(4×3)A	510	450	110	-		160	177			
WLGv-800~1000/72.5~126-6×5(4×3)A	1020	960		510						
WDGV-800~1000/72.5~126-8×7A	510	450	110	-		220	237			
WLGv-800~1000/72.5~126-8×7A	1020	960		510						
WDGV-1250/72.5~126-6×5(4×3)A	585	525	130	-		160	177			
WLGv-1250/72.5~126-6×5(4×3)A	1120	1060		580						
WDGV-1250/72.5~126-8×7A	585	525	130	-		220	237			
WLGv-1250/72.5~126-8×7A	1120	1060		580						
WDGV-1600/72.5~126-6×5(4×3)A	585	525	175	-		160	177			
WLGv-1600/72.5~126-6×5(4×3)A	1170	1110		585						
WDGV-1600/72.5~126-8×7A	585	525	175	-		220	237			
WLGv-1600/72.5~126-8×7A	1170	1110		585						
WDGV-2000/72.5~126-6×5(4×3)A	630	570	220	-		160	177			
WLGv-2000/72.5~126-6×5(4×3)A	1260	1200		630						
WDGV-2000/72.5~126-8×7A	630	570	220	-		220	237			
WLGv-2000/72.5~126-8×7A	1260	1200		630						

1. Length of tap lead is one meter.

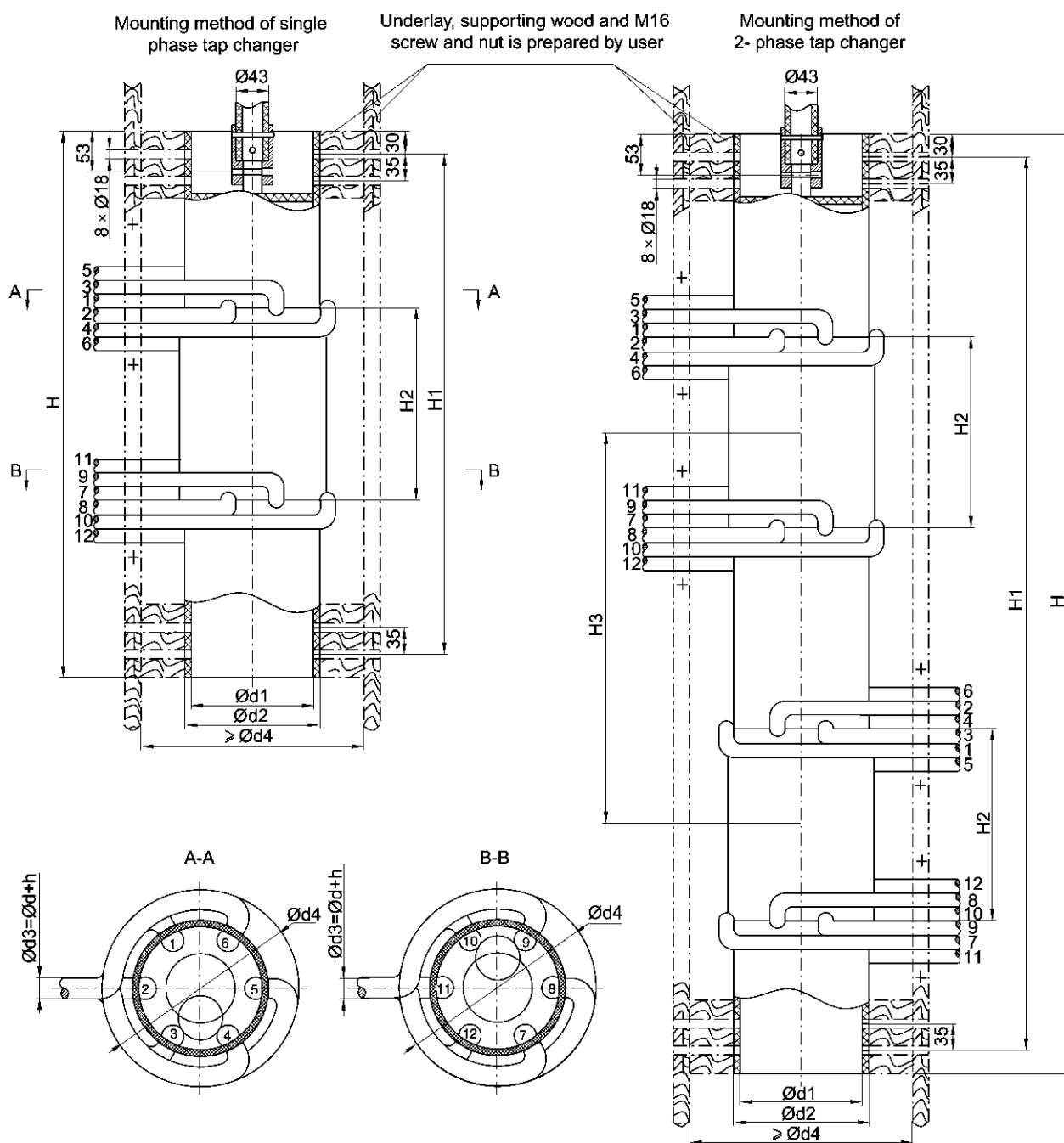
Appendix 5 (WDG+WLG) VI-250-1000A overall dimensions, Y-D change-over, A type



Type	Dimensions (mm)								operation position(n)
	H	H1	H3	$\phi d/S$ (sectional area)	$\phi d1$	$\phi d2$	$\phi d4$	h	
WDGVI-250-300/12-3×2A	465	405	-	250A:12.5/70	160	177	$d4=d2+2d3+\delta$ ($\delta \geq 60$)	Thickness of papering $h=6(12kV-40.5kV)$	2
WLGVI-250-300/12-3×2A	670	610	235	300A:14.5/95					
WDGVI-400-600/12-3×2A	465	405	-	400A:17.5/120					
WLGVI-400-600/12-3×2A	670	610	205	500A:18.7/150					
WDGVI-800-1000/12-3×2A	510	450	-	600A:21.7/185					
WLGVI-800-1000/12-3×2A	760	700	250	800A:24.7/240					
				1000A:26/300					

- for 3 phase "O" is the neutral point which is connected by user (Otherwise specified).
- Length of tap lead is 1 meter.

Appendix 6-1(WDG+WLG) VII-250-1000A overall dimensions, double-bridging regulation, A type



**Appendix 6-2(WDG+WLG) VII-250-1000A overall dimensions
table, double-bridging regulation, A type**

Type	Dimensions (mm)									operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGVII-250~300/12~40.5-6×5(4×3)A	715	655	220	-	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185 800A:24.7/240 1000A:26/300	160	177	d4=d2+2d3+δ (δ ≥60)	Thickness of papering h=12(72.5kV-126kV) h=6(12kV-40.5kV)	5(3)
WLGVII-250~300/12~40.5-6×5(4×3)A	1230	1170		575						
WDGVII-400~600/12~40.5-6×5(4×3)A	715	655	250	-						
WLGVII-400~600/12~40.5-6×5(4×3)A	1230	1170		515						
WDGVII-250~300/12~40.5-8×7A	715	655	220	-		200	217			
WLGVII-250~300/12~40.5-8×7A	1230	1170		575						
WDGVII-400~600/12~40.5-8×7A	715	655	250	-		220	237			
WLGVII-400~600/12~40.5-8×7A	1230	1170		515						
WDGVII-800~1000/12~40.5-6×5(4×3)A	805	745	295	-						
WLGVII-800~1000/12~40.5-6×5(4×3)A	1410	1350		605						
WDGVII-800~1000/12~40.5-8×7A	805	745		-						
WLGVII-800~1000/12~40.5-8×7A	1410	1350		605						
WDGVII-250~300/72.5~126-6×5(4×3)A	790	730	295	-		160	177			
WLGVII-250~300/72.5~126-6×5(4×3)A	1530	1470		800						
WDGVII-400~600/72.5~126-6×5(4×3)A	790	730	325	-						
WLGVII-400~600/72.5~126-6×5(4×3)A	1580	1520		790						
WDGVII-250~300/72.5~126-8×7A	790	730	295	-		200	217			
WLGVII-250~300/72.5~126-8×7A	1530	1470		800						
WDGVII-400~600/72.5~126-8×7A	790	730	325	-		220	237			
WLGVII-400~600/72.5~126-8×7A	1580	1520		790						
WDGVII-800~1000/72.5~126-6×5(4×3)A	880	820	370	-						
WLGVII-800~1000/72.5~126-6×5(4×3)A	1760	1700		880						
WDGVII-800~1000/72.5~126-8×7A	880	820		-						
WLGVII-800~1000/72.5~126-8×7A	1760	1700		880						

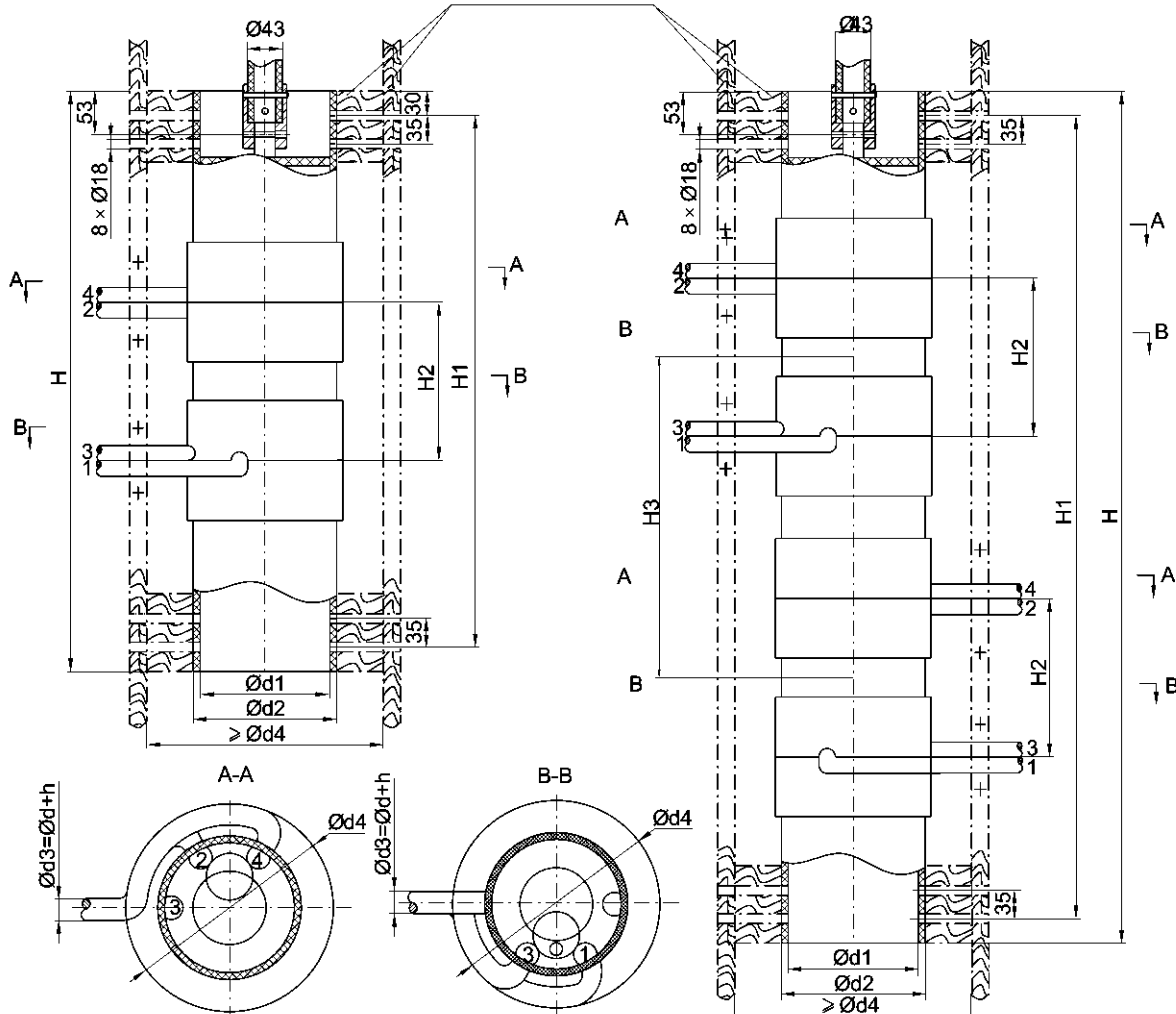
1. Length of tap lead is one meter.

Appendix 7 (WDG+WLG) VIII-250-1000A overall dimensions, series-parallel change-over, A type

Mounting method of single
phase tap changer

Underlay, supporting wood and M16
screw and nut is prepared by user

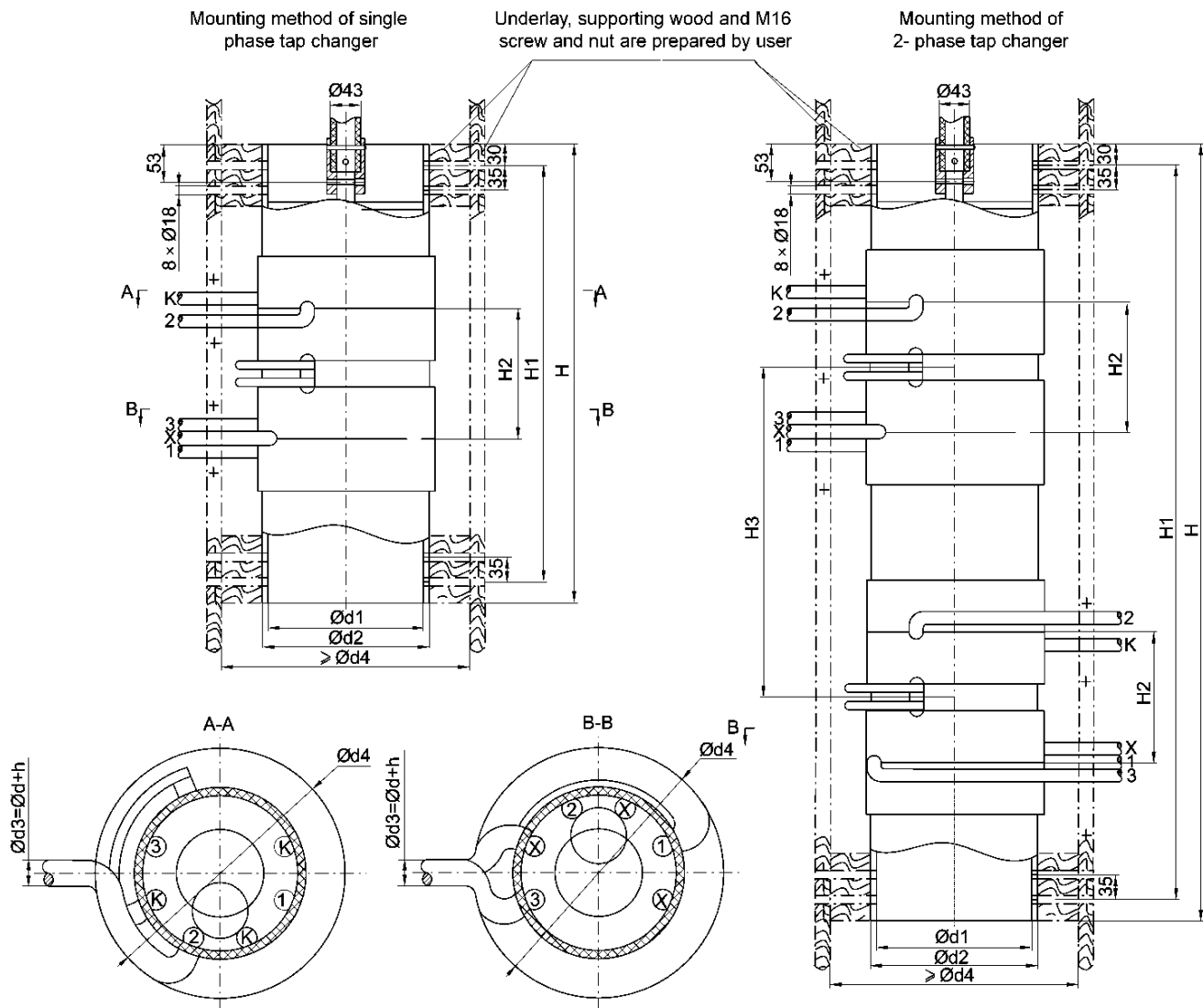
Mounting method of
2- phase tap changer



Type	Dimensions (mm)									operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGVIII-250~300/12-3×2A	655	595	160	-	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185 800A:24.7/240 1000A:26/300	160	177	d4=d2+2d3+ δ (δ ≥60)	Thickness of papering h=6(12kV-40.5kV)	2
WLGVIII-250~300/12-3×2A	1050	990		455						
WDGVIII-400~600/12-3×2A	655	595	190	-						
WLGVIII-400~600/12-3×2A	1050	990		395						
WDGVIII-800~1000/12-3×2A	745	685	235	-						
WLGVIII-800~1000/12-3×2A	1230	1170		485						
WDGVIII-250~300/40.5-3×2A	730	670	235	-						
WLGVIII-250~300/40.5-3×2A	1260	1200		590						
WDGVIII-400~600/40.5-3×2A	730	670	265	-						
WLGVIII-400~600/40.5-3×2A	1260	1200		530						
WDGVIII-800~1000/40.5-3×2A	820	760	310	-						
WLGVIII-800~1000/40.5-3×2A	1440	1380		620						

- All connections have been made interior of the tap changer, only tap leads should be connected to the transformer winding(except special design)
- Length of tap leads is 1m

Appendix 8 (WDG+WLG) II-250-600A overall dimensions, reversing regulation, A type

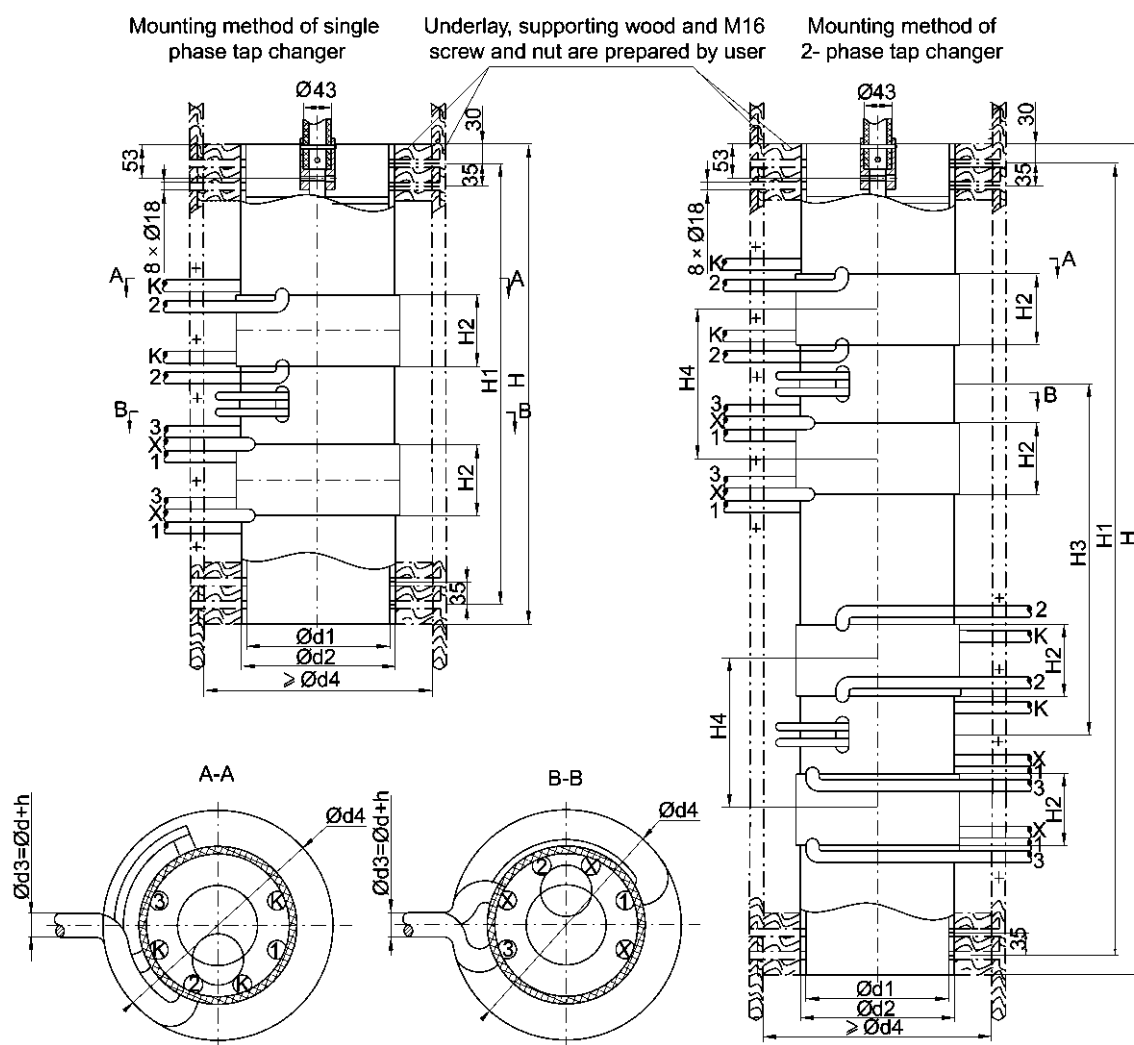


Type	Dimensions (mm)										operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h		
WDGII-250~300/12~40.5-4×5(5×7)A	650	590	155	-	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185	200	217	d4=d2+2d3+ δ (δ ≥60) Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5(7)		
WLGII-250~300/12~40.5-4×5(5×7)A	1100	1040		510							
WDGII-400~600/12~40.5-4×5(5×7)A	650	590	185	-							
WLGII-400~600/12~40.5-4×5(5×7)A	1100	1040		450		220	237				
WDGII-250~300/72.5~126-4×5(5×7)A	650	590	155	-		200	217				
WLGII-250~300/72.5~126-4×5(5×7)A	1250	1190		660							
WDGII-400~600/72.5~126-4×5(5×7)A	650	590	185	-							
WLGII-400~600/72.5~126-4×5(5×7)A	1290	1230		640		220	237				

1. Length of tap leads is 1m.

2. Take $4 \times 5 (\pm 2)$ as an example in above drawing, 5×7 is ± 3 steps

Appendix 9 (WDG+WLG) II-800-1600A overall dimensions, reversing regulation, A type



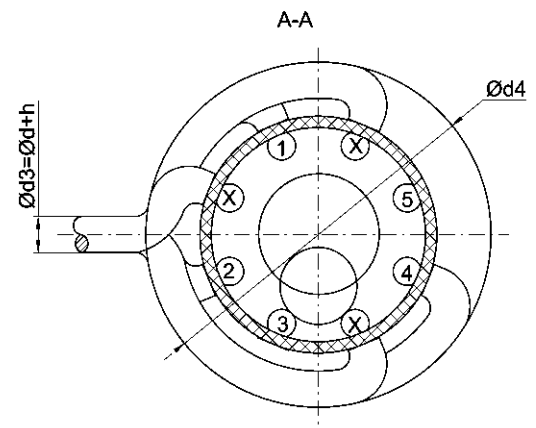
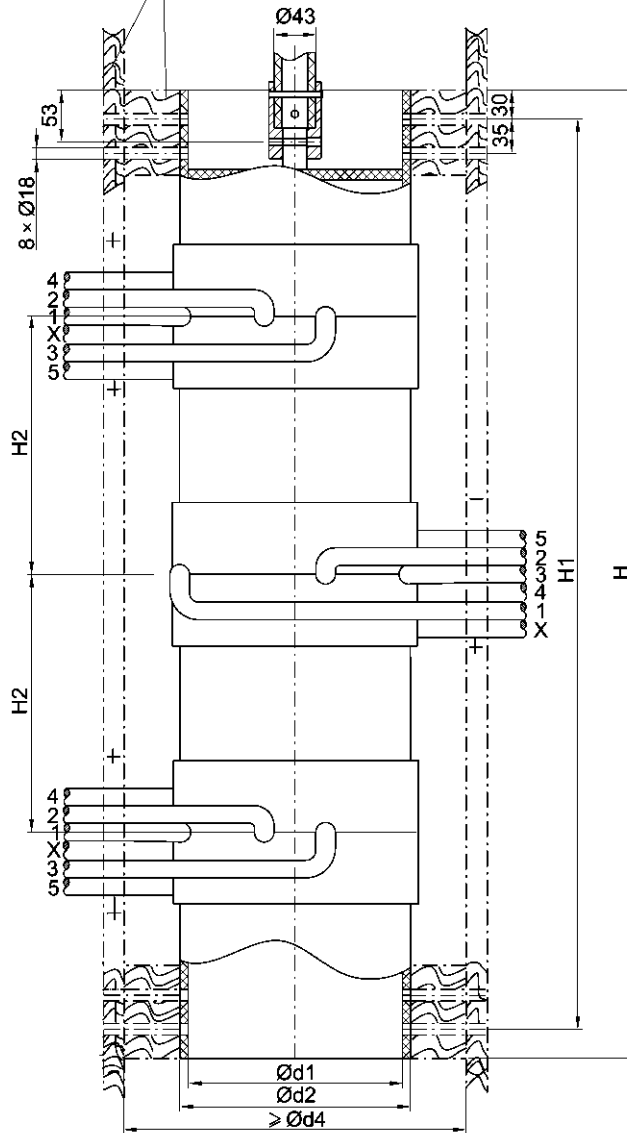
Type	Dimensions (mm)										operation position(n)
	H	H1	H2	H3	H2	Ød/S(sectional area)	Ød1	Ød2	Ød4	h	
WDGII-800~1000/12~40.5-4×5(5×7)A	740	680	110	-	230	800A:17.5/120 1000A:18.7/150 1250A:21.7/185 1600A:24.7/240 2000A:26/300	220	237	d4=d2+2d3+δ (δ ≥ 60)	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5(7)
WLGII-800~1000/12~40.5-4×5(5×7)A	1280	1220		540	230						
WDGII-1250/12~40.5-4×5(5×7)A	800	740	130	-	260						
WLGII-1250/12~40.5-4×5(5×7)A	1400	1340		600	260						
WDGII-1600/12~40.5-4×5(5×7)A	890	830	175	-	305						
WLGII-1600/12~40.5-4×5(5×7)A	1580	1520		690	305						
WDGII-800~1000/72.5~126-4×5(5×7)A	740	680	110	-	230						
WLGII-800~1000/72.5~126-4×5(5×7)A	1470	1410		730	230						
WDGII-1250/72.5~126-4×5(5×7)A	800	740	130	-	260						
WLGII-1250/72.5~126-4×5(5×7)A	1590	1530		790	260						
WDGII-1600/72.5~126-4×5(5×7)A	890	830	175	-	305						
WLGII-1600/72.5~126-4 × 5(5×7)A	1770	1710		880	305						

1. Length of tap leads is 1m.

2. Take 4 × 5(± 2) as an example in above drawing , 5 × 7 is ± 3 steps

Appendix 10 WSG IV-250-1000A overall dimensions, linear regulation, A type

Underlay, supporting wood and M16
screw and nut is prepared by user

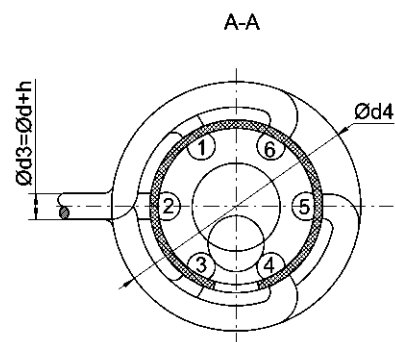
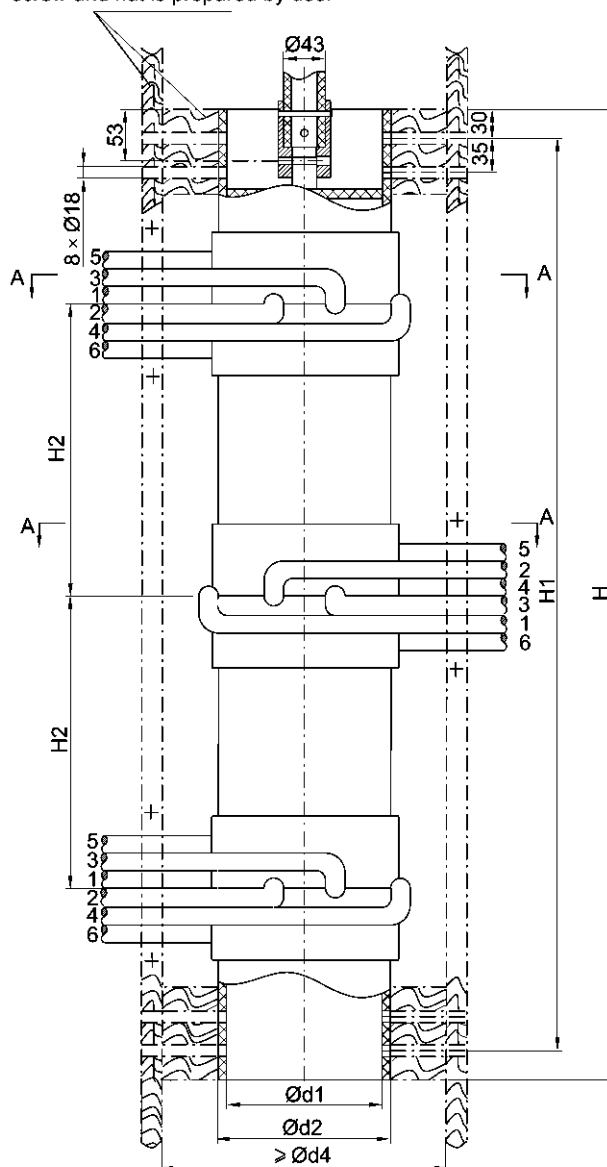


Type	Dimensions (mm)								operation position(n)
	H	H1	H2	ød/S(sectional area)	ød1	ød2	ød4	h	
WSGIV250~300/12~40.5-5×5A	1035	975	280	250A:12.5/70 300A:14.5/95 400A:17.5/120 500A:18.7/150 600A:21.7/185 800A:24.7/240 1000A:26/300	220	200	d4=d2+2d3+δ (δ ≥60) Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5	
WSGIV400~600/12~40.5-5×5A	1035	975	265		220	237			
WSGIV800~1000/12~40.5-5×5A	1170	1110	310		200	200			
WSGIV250~300/72.5~126-5×5A	1335	1275	430		220	237			
WSGIV400~600/72.5~126-5×5A	1415	1355	455						
WSGIV800~1000/72.5~126-5×5A	1550	1490	500						

- All connections have been made interior of the tap changer, only tap leads should be connected to the transformer winding(except special design)
- Length of tap lead is one meter.

Appendix 11 WSG V-250-1000A overall dimensions, single-bridging regulation, A type

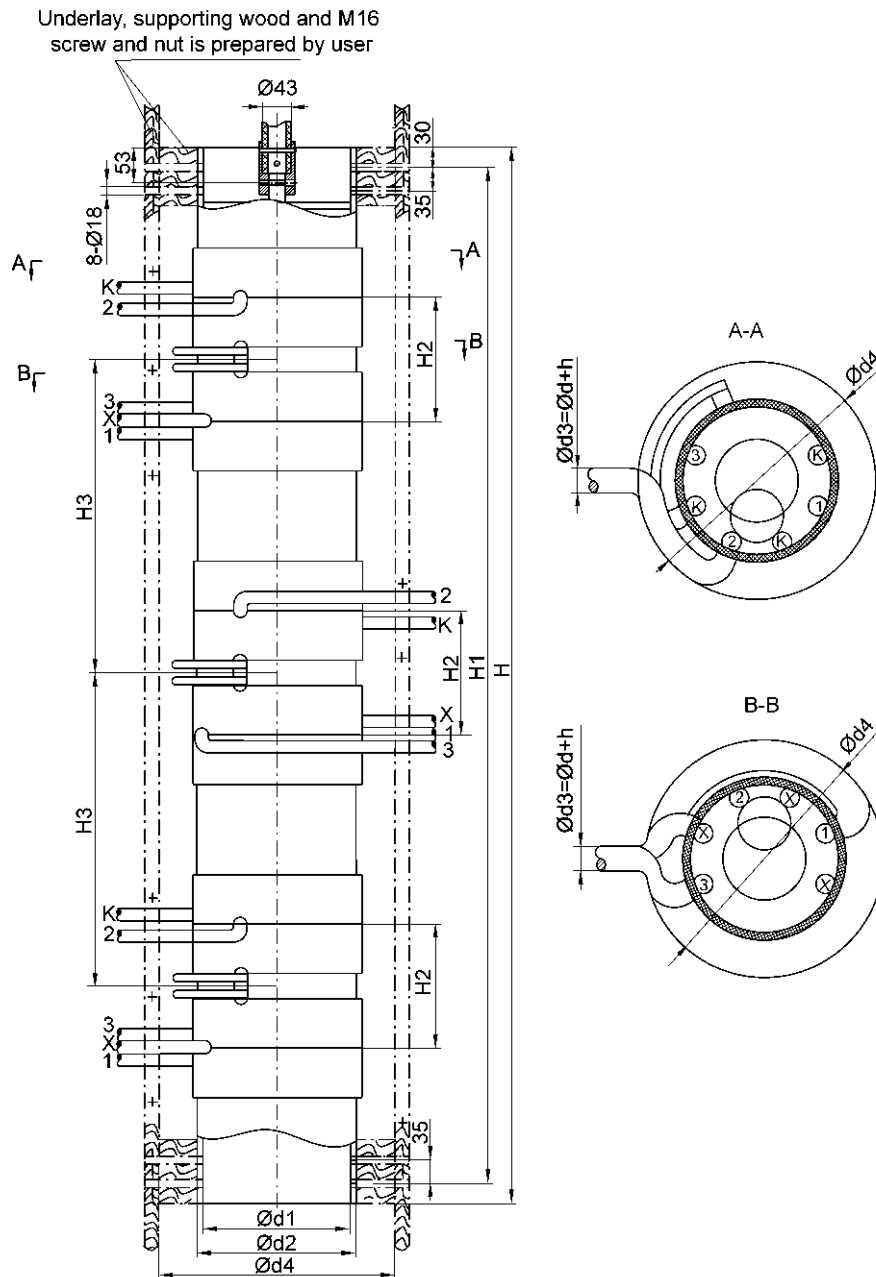
Underlay, supporting wood and M16
screw and nut is prepared by user



Type	Dimensions (mm)								operation position(n)
	H	H1	H2	Ød/S(sectional area)	Ød1	Ød2	Ød4	h	
WSGV-250~300/12~40.5-6×5A	995	935	280	250A:12.5/70	160	177	Ød4=d2+2d3+δ (δ≥60)	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5
WSGV-400~600/12~40.5-6×5A	995	935	265	300A:14.5/95					
WSGV-800~1000/12~40.5-6×5A	1130	1070	310	400A:17.5/120					
WSGV-250~300/72.5~126-6×5A	1295	1235	430	500A:18.7/150					
WSGV-400~600/72.5~126-6×5A	1395	1335	465	600A:21.7/185					
WSGV-800~1000/72.5~126-6×5A	1530	1470	510	800A:24.7/240					
				1000A:26/300					

1. Length of tap lead is one meter.

Appendix 12 WSG II-250-1000A overall dimensions, reversing regulation, A type

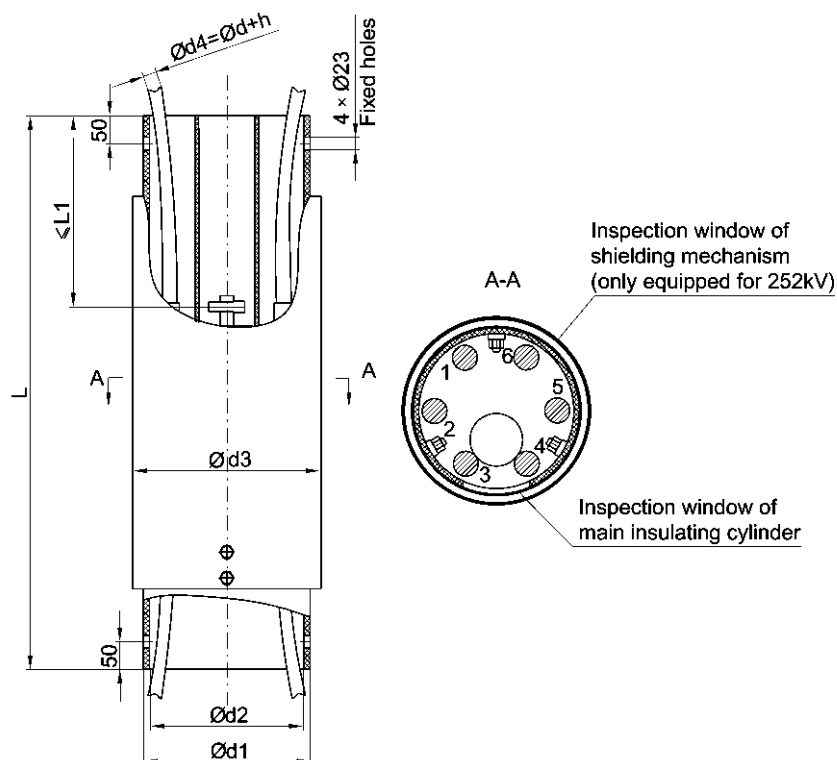


Type	Dimensions (mm)									operation position(n)
	H	H1	H2	H3	ød/S(sectional area)	ød1	ød2	ød4	h	
WDGII-250~300/12~40.5-4×5(5×7)A	1550	1490	155	480	250A:12.5/70	200	217	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV)	5(7)	
WDGII-400~600/12~40.5-4×5(5×7)A	1550	1490	185	450	300A:14.5/95	220	237			
WDGII-800~1000/12~40.5-4×5(5×7)A	1820	1760	230	540	400A:17.5/120	220	237			
WDGII-250~300/72.5~126-4×5(5×7)A	1910	1850	155	660	500A:18.7/150	200	217			
WDGII-400~600/72.5~126-4×5(5×7)A	1930	1870	185	640	600A:21.7/185	220	237			
WDGII-800~1000/72.5~126-4×5(5×7)A	2200	2140	230	730	800A:24.7/240	220	237			
					1000A:26/300	220	237			

1. Length of tap leads is 1m.

2. Take 4 × 5(± 2) as an example in above drawing , 5 × 7 is ± 3 steps

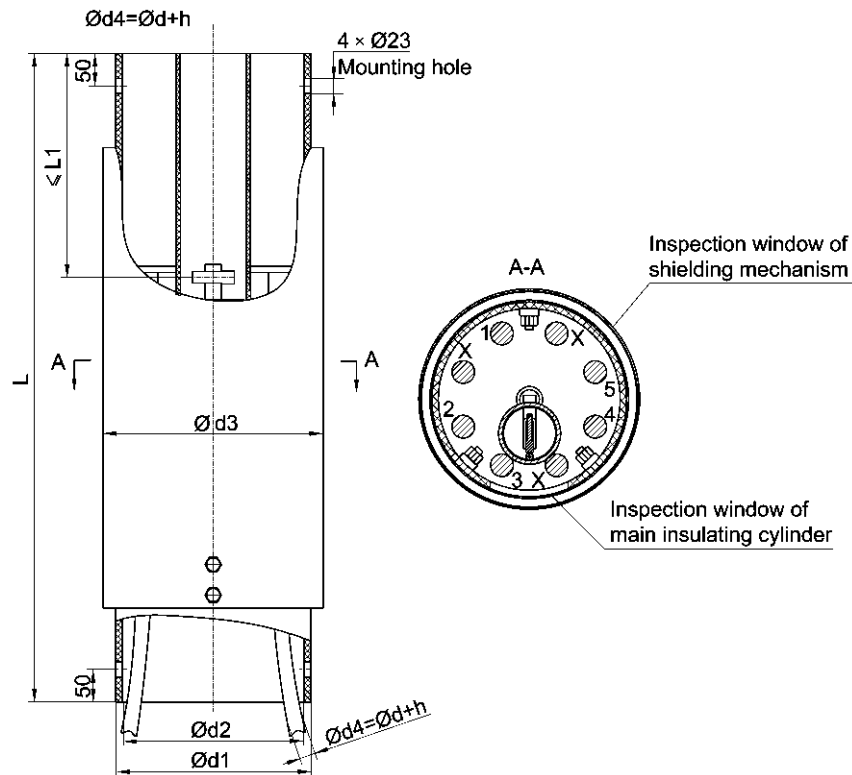
Appendix 13 WDG V-250-2000A overall dimensions, single-bridging regulation, B type



Type	Dimensions (mm)							operation position(n)	Lead come out
	L	L1	ød/S(sectional area)	ød1	ød2	ød3	h		
WDGV-250~300/12~40.5-6×5B	600		250A:12.5/70 300A:14.5/95	237	220	250	h=12(72.5kV-126kV) h=20(252kV)	5	from bottom
WDGV-400~600/12~40.5-6×5B			400A:17.5/120 500A:18.7/150 600A:21.7/185						
WDGV-800/12~40.5-6×5B	700	≤178	17.5/120						from two ends
WDGV-1000/12~40.5-6×5B			18.7/150						
WDGV-1250/12~40.5-6×5B			21.7/185						
WDGV-1600/12~40.5-6×5B			24.7/240						
WDGV-2000/12~40.5-6×5B			26/300						
WDGV-250~300/72.5~126-6×5B	700	≤207.5	250A:12.5/70 300A:14.5/95						from bottom
WDGV-400~600/72.5~126-6×5B			400A:17.5/120 500A:18.7/150 600A:21.7/185						
WDGV-800/72.5~126-6×5B			17.5/120						
WDGV-1000/72.5~126-6×5B			18.7/150						
WDGV-1250/72.5~126-6×5B			21.7/185						
WDGV-1600/72.5~126-6×5B	800		24.7/240						from two ends
WDGV-2000/72.5~126-6×5B			26/300						
WDGV-250~300/252-6×5B	1000	≤372.5	250A:12.5/70 300A:14.5/95	300	280	340	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV) h=20(252kV)	5	from bottom
WDGV-400~600/252-6×5B			400A:17.5/120 500A:18.7/150 600A:21.7/185						
WDGV-800/252-6×5B			17.5/120						
WDGV-1000/252-6×5B			18.7/150						from two ends
WDGV-1250/252-6×5B			21.7/185						
WDGV-1600/252-6×5B			24.7/240						
WDGV-2000/252-6×5B			26/300						

1. Length of tap lead is one meter.

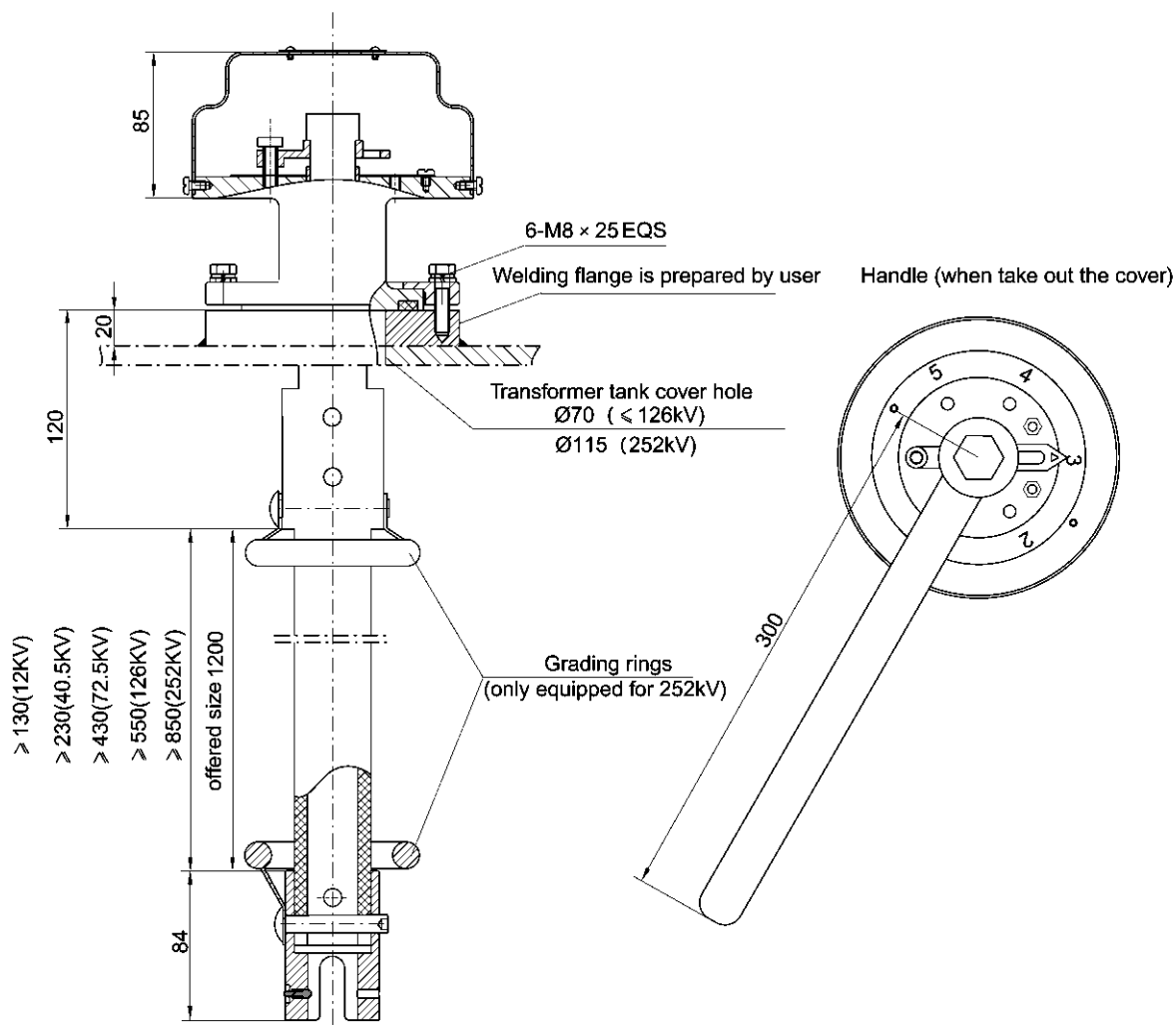
Appendix 14 WDG IV-250-2000A overall dimensions, linear regulation, B type



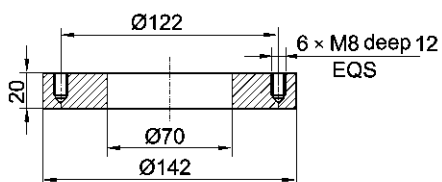
Type	Dimensions (mm)							operation position(n)	Lead come out
	L	L1	$\varnothing d/S(\text{sectional area})$	$\varnothing d1$	$\varnothing d2$	$\varnothing d3$	h		
WDGIV-250~300/252-5×5B	1000	≤ 372.5	250A:12.5/70,300A:14.5/95	300	280	340	Thickness of papering h=6(12kV-40.5kV) h=12(72.5kV-126kV) h=20(252kV)	5	from bottom
WDGIV-400~600/252-5×5B			400A:17.5/120 500A:18.7/150 600A:21.7/185						
WDGIV-800/252-5×5B			17.5/120						
WDGIV-1000/252-5×5B			18.7/150						from two ends
WDGIV-1250/252-5×5B			21.7/185						
WDGIV-1600/252-5×5B			24.7/240						
WDGIV-2000/252-5×5B			26/300						

1. Length of tap lead is one meter.

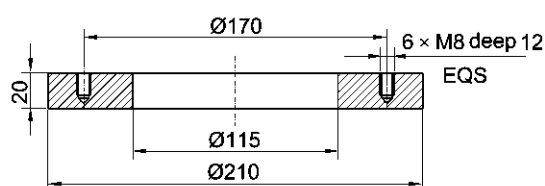
Appendix 15 Top manual driving mechanism, overall dimensions, for A and B type



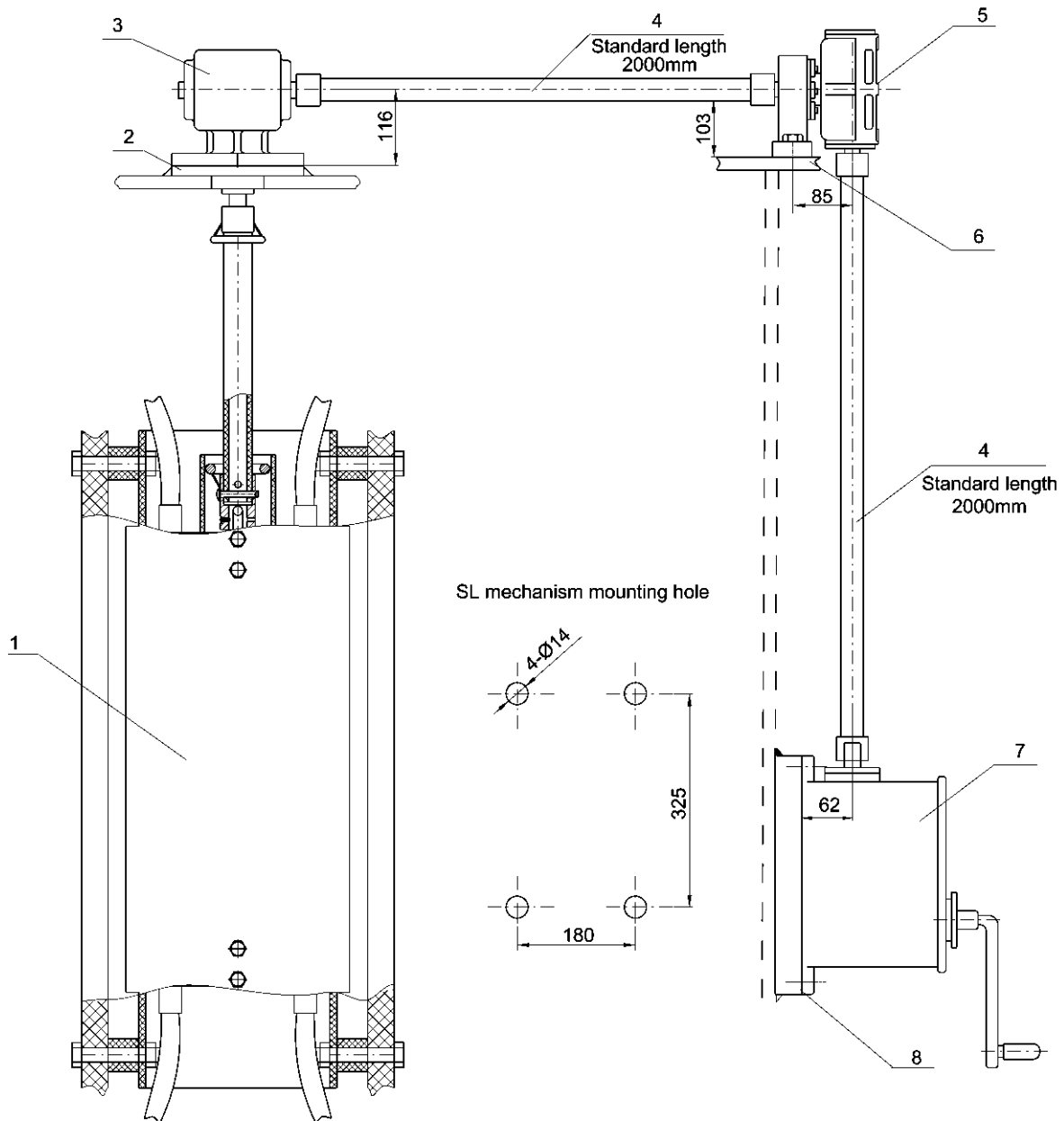
Welding flange (< 126kV)



Welding flange (252kV)

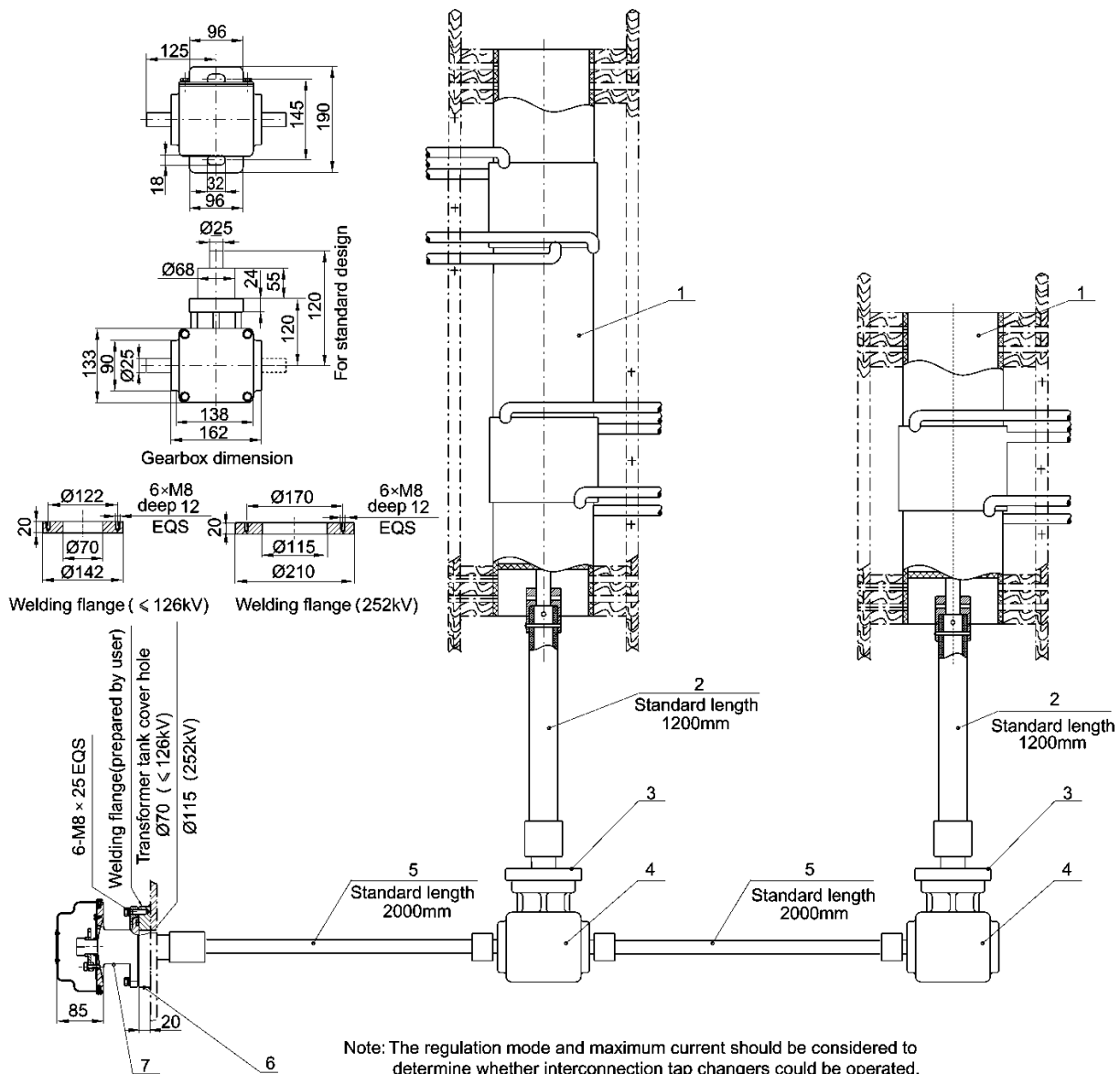


Appendix 16 Installation dimension for side manual driving, transmission from the top, for A and B type



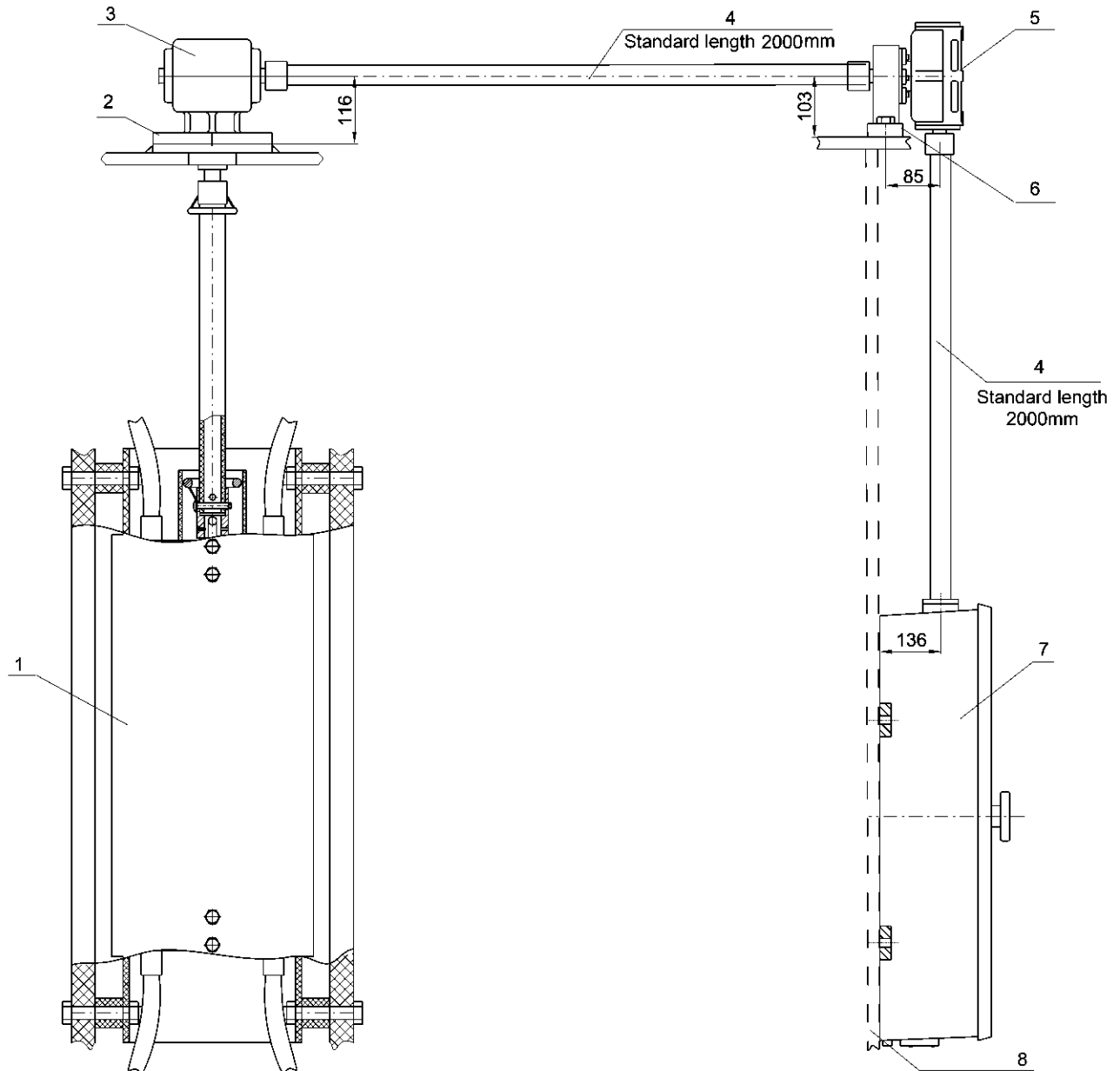
- | | | |
|---|-------------------------------------|---------------------|
| 1. Tap changer active part | 2. Welding flange(prepared by user) | 3. Geneva mechanism |
| 4. Transmission shaft | 5. Worm wheel box and its steady | |
| 6. Installation supporting plate (prepared by user) | 7. SL mechanism | |
| 8. Installation supporting plate (prepared by user) | | |

Appendix 17 (WDG+WLG) installation dimension for side manual driving, transmission from the bottom, for A and B type



- | | | |
|---------------------|---------------------|---------------------------------------|
| 1. Tap changer body | 2. Insulation shaft | 3. Supporting frame(prepared by user) |
| 4. Gearbox | 5. Drive shaft | 6. Welding flange(prepared by user) |
| 7. Flange | | |

Appendix 18 Installation dimensions of motor driving tap changer, for A and B type

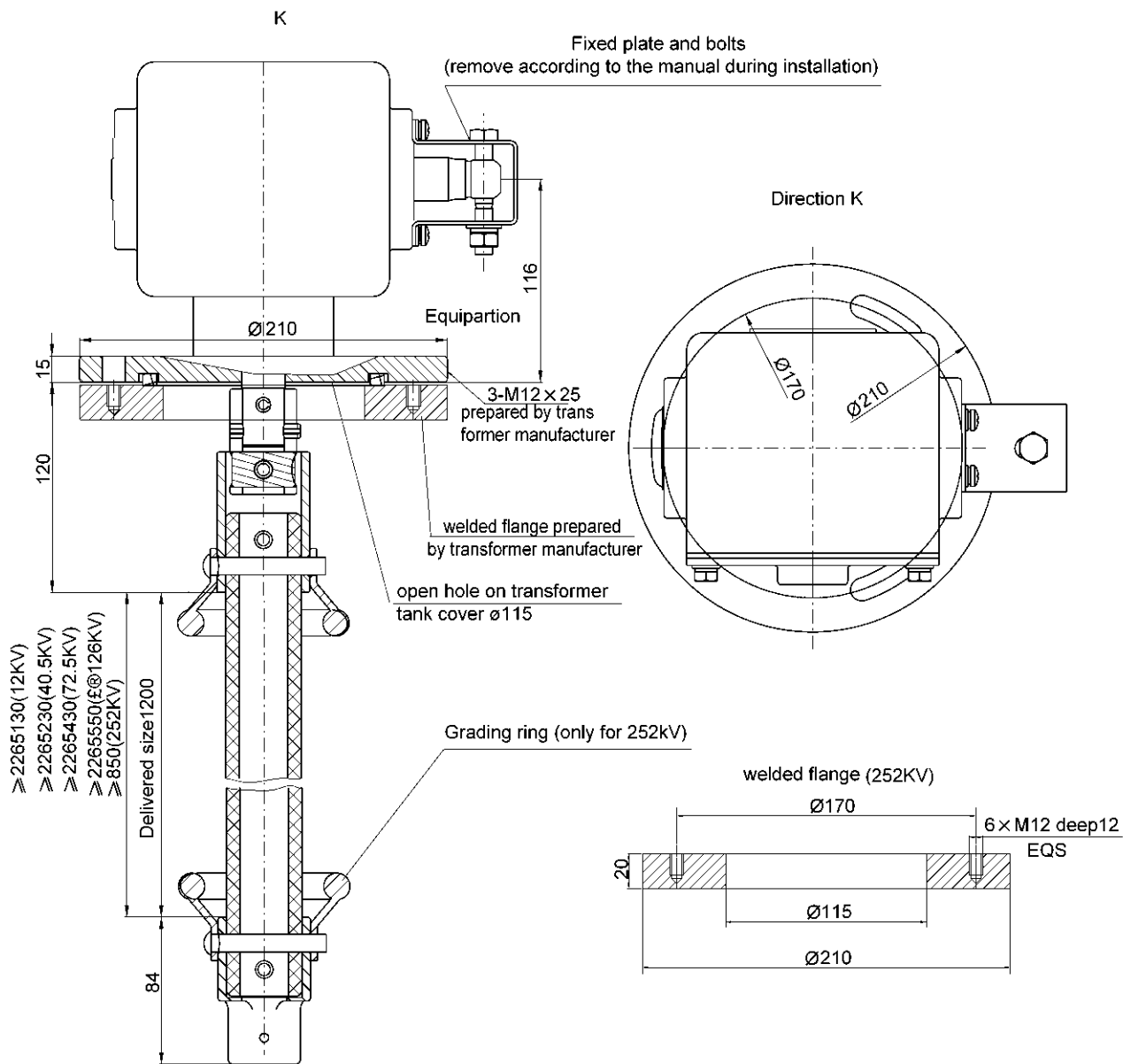


- | | | |
|---|-------------------------------------|--------------------|
| 1. Tap changer active part | 2. Welding flange(prepared by user) | 3. Geneva wheelbox |
| 4. Transmission shaft | 5. Worm wheel box and its steably | |
| 6. Installation supporting plate (prepared by user) | 7. CMA7 motor drive unit | |
| 8. Inatallation supporting plate (prepared by user) | | |

Remark: According to users' different requirements, offer relative operation mechanism and matched indicator & controller

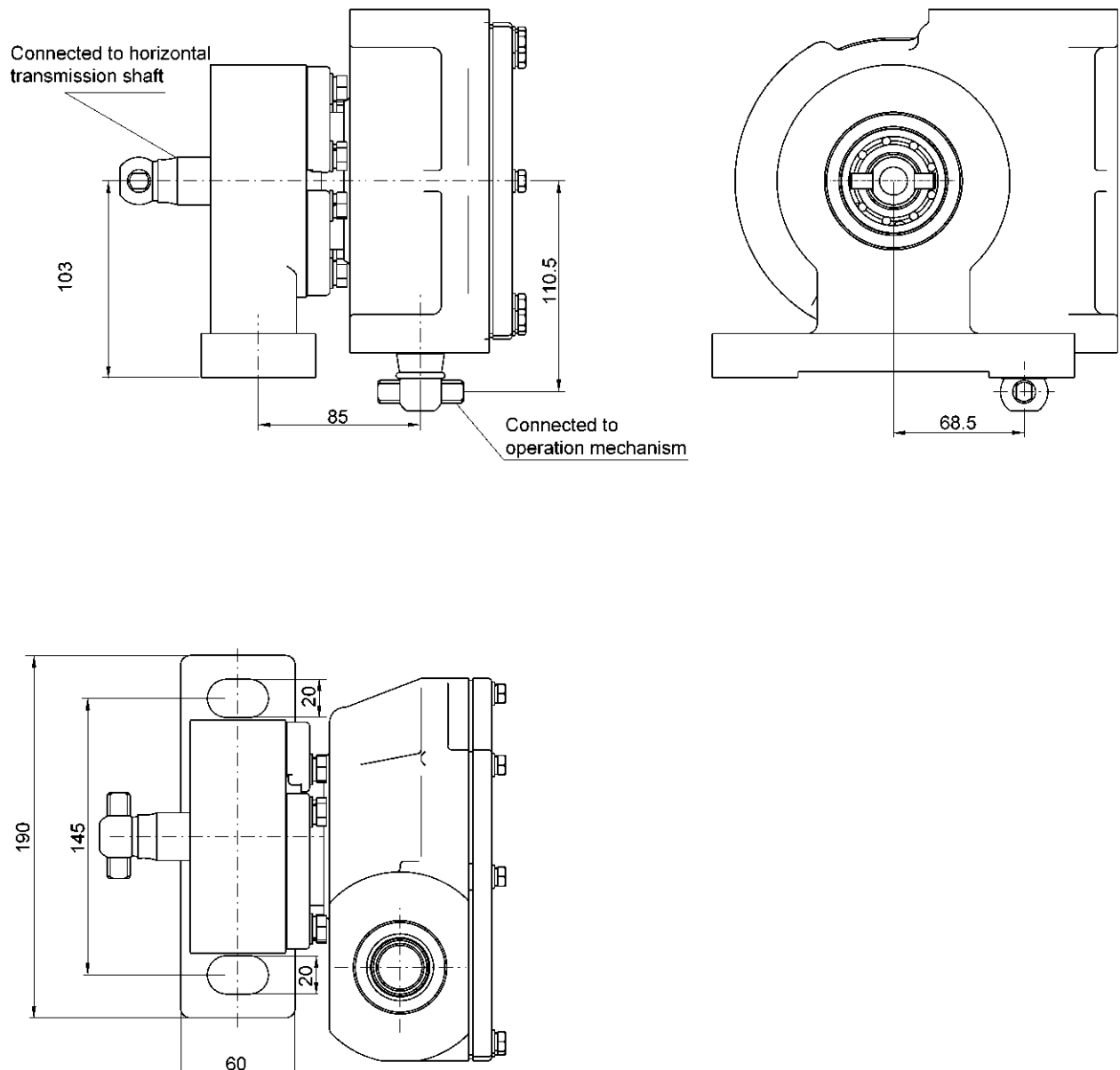
Unit: mm

Appendix 19 Overall dimension of geneva mechanism

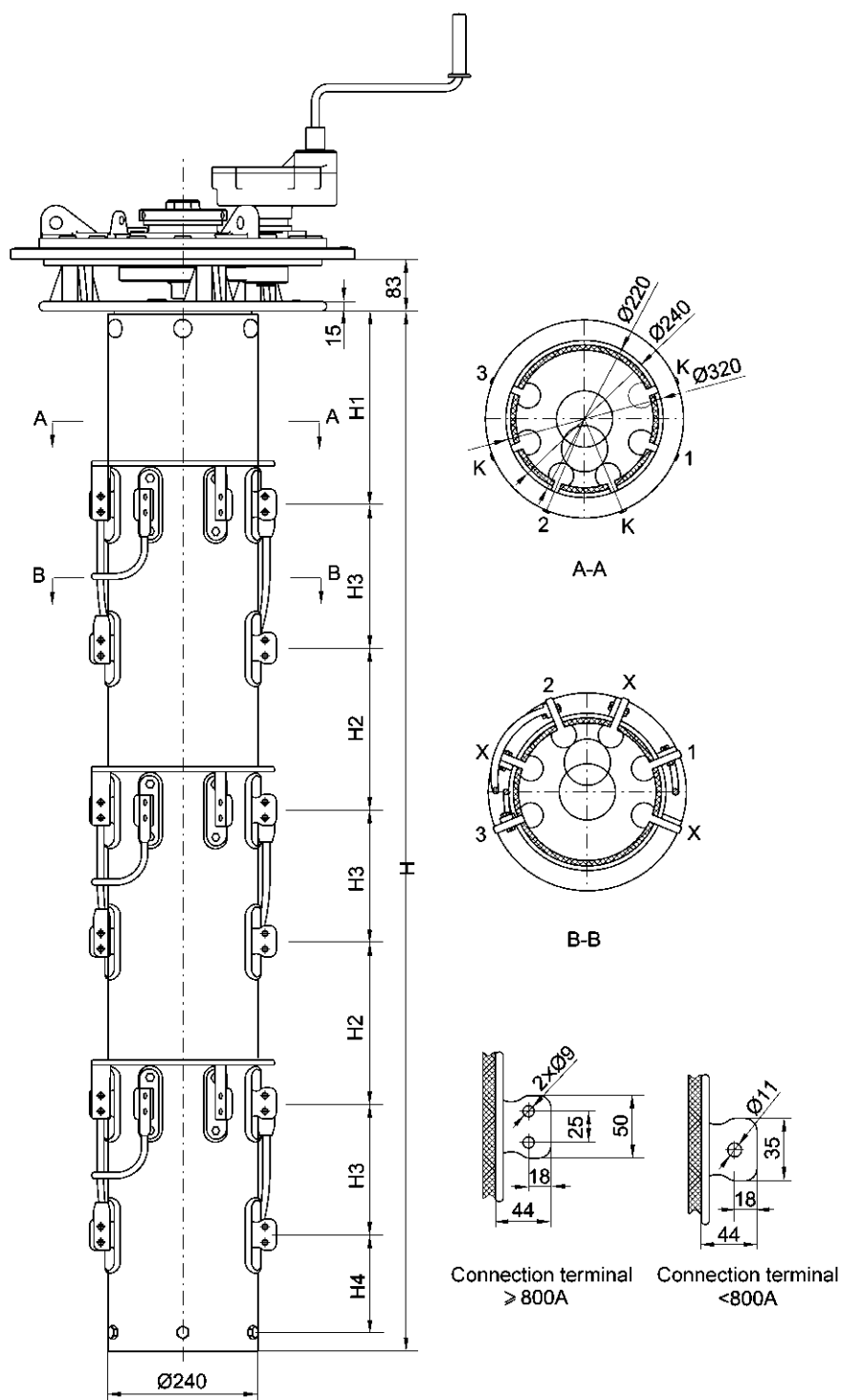


Remark: welded flange has directional property during welding. Make sure two holes of 6 \times M12 are on the axis of transmission shaft (5)

Appendix 20 Installation dimension of worm wheel box and its steady (suitable for type A and type B)

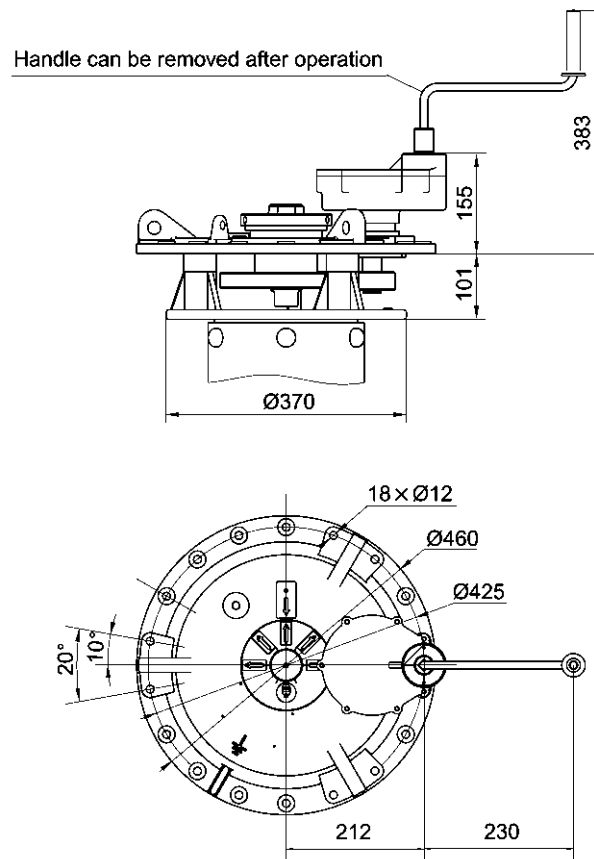


Appendix 21 WSG II-400-1600A overall dimensions, reversing regulation, C type

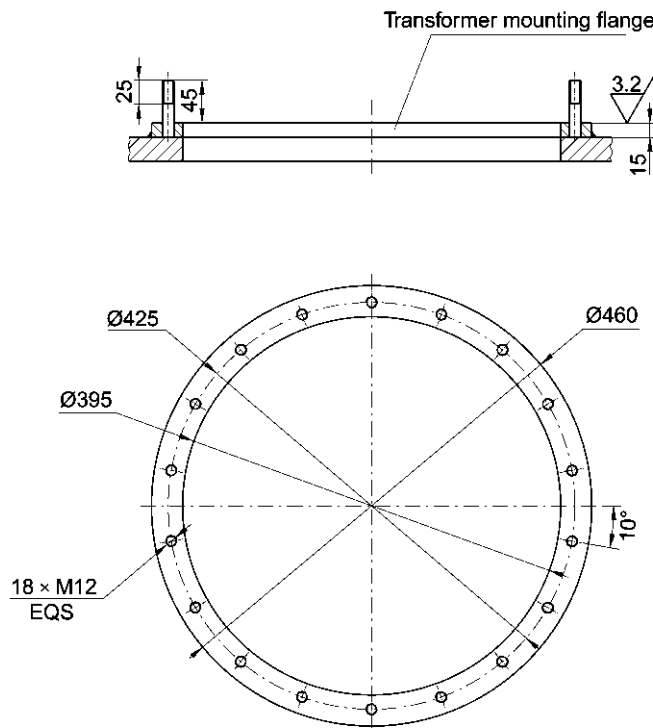


Type	Dimensions (mm)					operation position(n)
	H	H1	H2	H3	H4	
WSGII-400~600/12~40.5-4×5C(5×7)C	1418	285.5	215	185	132.5	5(7)
WSGII-800~1000Y/12~40.5-4×5C(5×7)C	1688	308	260	230	155	
WSGII-1250Y/12~40.5-4×5C(5×7)C	1868	323	290	260	170	
WSGII-1600Y/12~40.5-4×5C(5×7)C	2138	345.5	335	305	192.5	
WSGII-400~600Y/72.5~126-4×5C(5×7)C	1652	400	270	185	137.5	

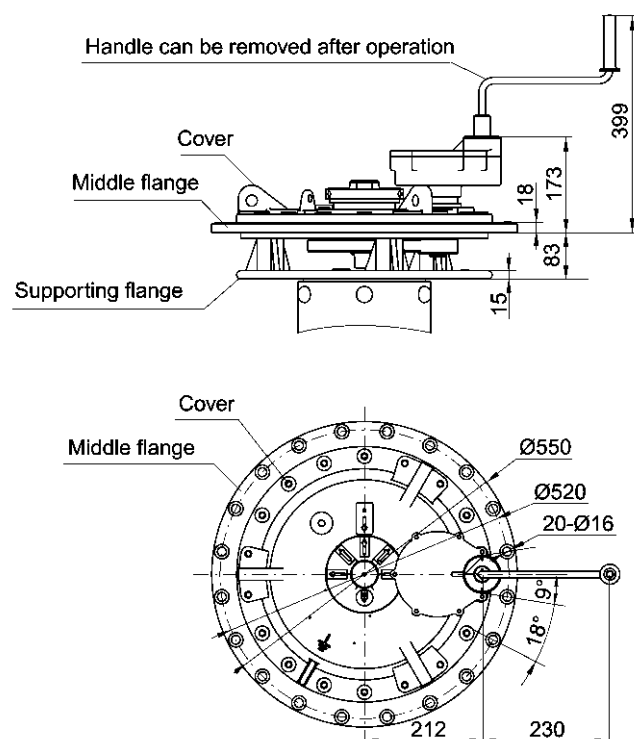
Appendix 22 Head flange for standard tank, overall dimension, hand wheel operating on top, C type



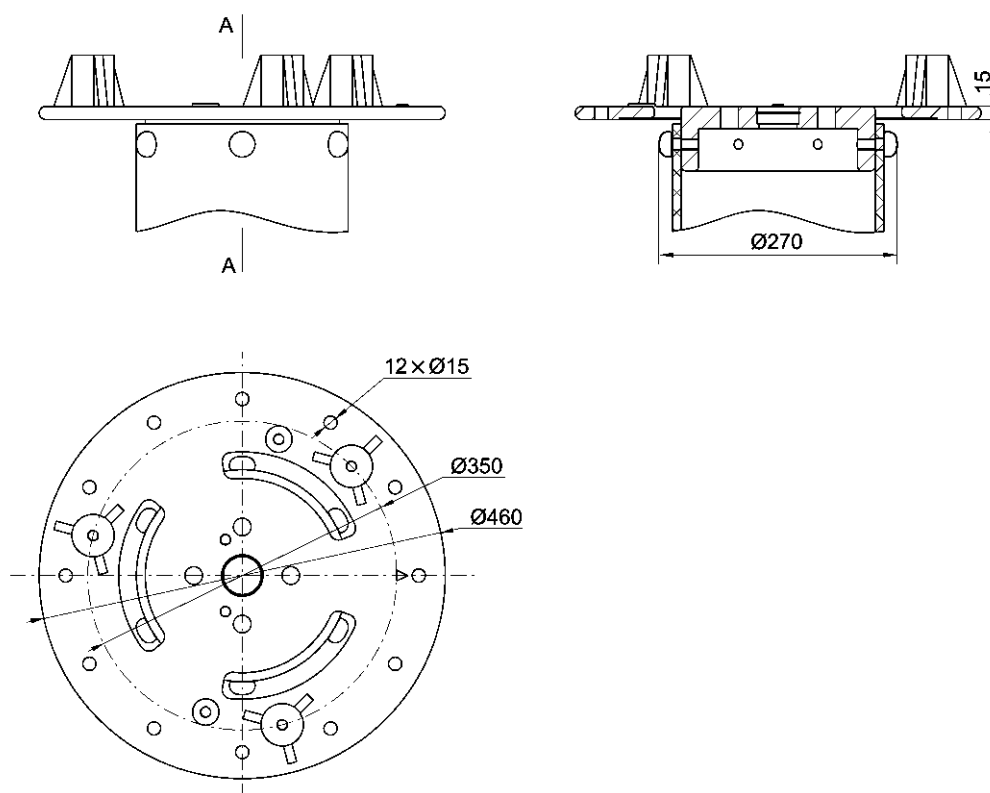
Appendix 23 Transformer mounting flange for standard tank, overall dimension, C type



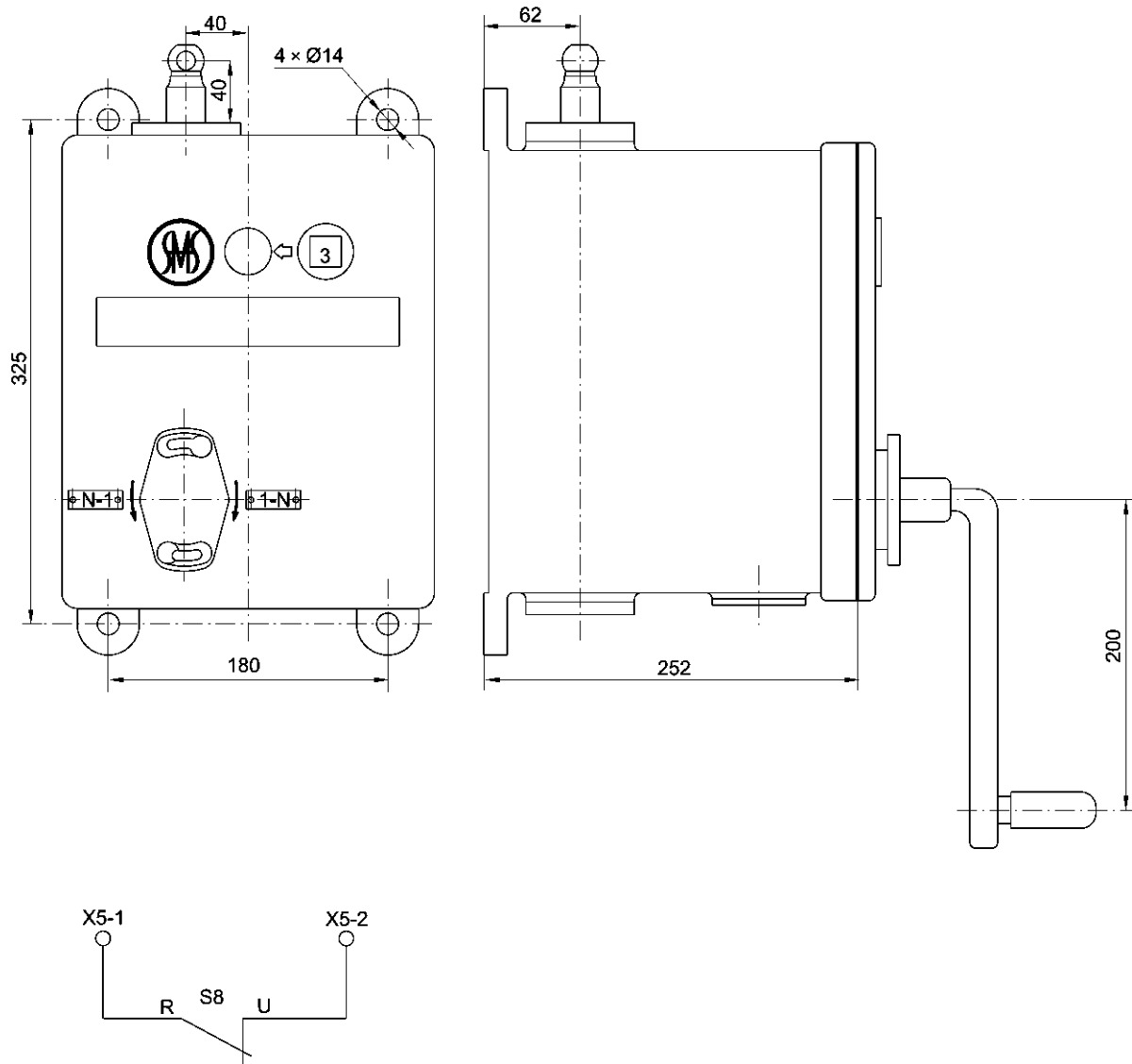
Appendix 24 Head flange for bell-type, overall dimension, hand wheel operating on top, C type



Appendix 25 Bell-type supporting flange, overall dimension, C type



Appendix 26 SL manual drive mechanism, overall dimensions



S8-R and S8-U are for the operation in progress signals, they are connected to terminal X5-1 and X5-2. If hand crank is inserted for manual operation, then the X5-1, X5-2 are disconnected so that the contacts will open. If hand crank is removed, then the X5-1, X5-2 are connected. The signals are used for interlock between the tap changer and the transformer circuit breaker.



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