



TECHNICAL DATA

TYPE WSL

HEAD MOTORIZED OFF-CIRCUIT TAP CHANGER

HM0.154.603



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1. General

Type WSL Head Motorized Off-Circuit Tap Changer (herein referred as tap changer) is of in-tank cage structure, it is mounted to transformer tank by a tap changer head flange. It is operated by remote controller HMWK-1 via motor mechanism on the top of the tap changer.

Type tap changers with linear and single-bridging regulations are available. Refer to fig.2 for the basic connection diagrams. Please contact us for special requirements.

2. Technical specification

Type WSL Head Motorized Off-Circuit Tap Changer complies with IEC 60214-1:2003. Tap changer technical data is listed in Table 1 below.

Table 1 Type WSL Head Motorized Off-Circuit Tap Changer Technical Data

Item	type			WSL	
1	Maximum operation positions			13	
	Max. rated through current(A)			600	
2	No. of Phases			3-phase	
3	Short circuit current test (kA)	Thermal (3s)		9	
		Dynamic (Peak)		22.5	
4	Rated frequency (Hz)			50 or 60	
5	Regulation method			Single-bridging, linear	
6	Insulation to ground (kV)	The highest voltage for equipment		12	40.5
		Rated separate source AC withstand voltage(50Hz, 1min)		35	85
		Rated lightning impulse withstand voltage (1.2/50)		75	200
	Internal insulation (kV)	Between phases	Rated separate source AC withstand voltage (50Hz, 1min)	35	85
			Rated lightning impulse withstand voltage (1.2/50)	75	200
		Between Max. and Min. taps	Rated separate source AC withstand voltage (50Hz, 1min)	18	45
			Rated lightning impulse withstand voltage (1.2/50)	35	105
		Between adjacent taps	Rated separate source AC withstand voltage (50Hz, 1min)	10	10
			Rated lightning impulse withstand voltage (1.2/50)	30	30
7	Mechanical life			Not less than 200,000 operations	
8	Drying			Vapor:125℃ Vacuum 110℃	
9	Controller type			HMWK-1	

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, the tap changer has various models designated as below:(refer to Fig. 1).

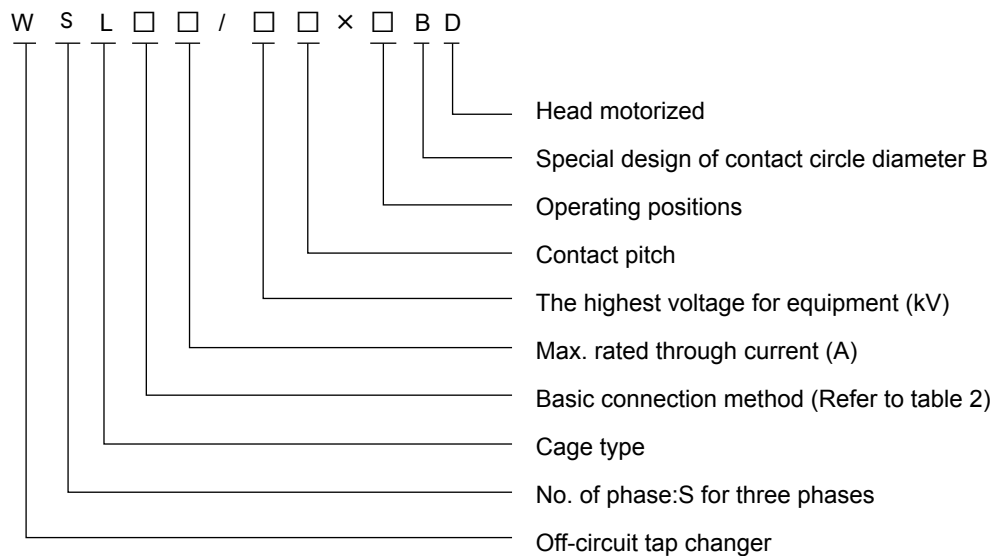


Fig. 1 Tap Changer Model Explanation

Table 2 Tap Changer Basic Connection Method and Mark

Code	IV	V
Connection	Linear	Single-bridging

3.2. Tap changer basic connection diagram

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.

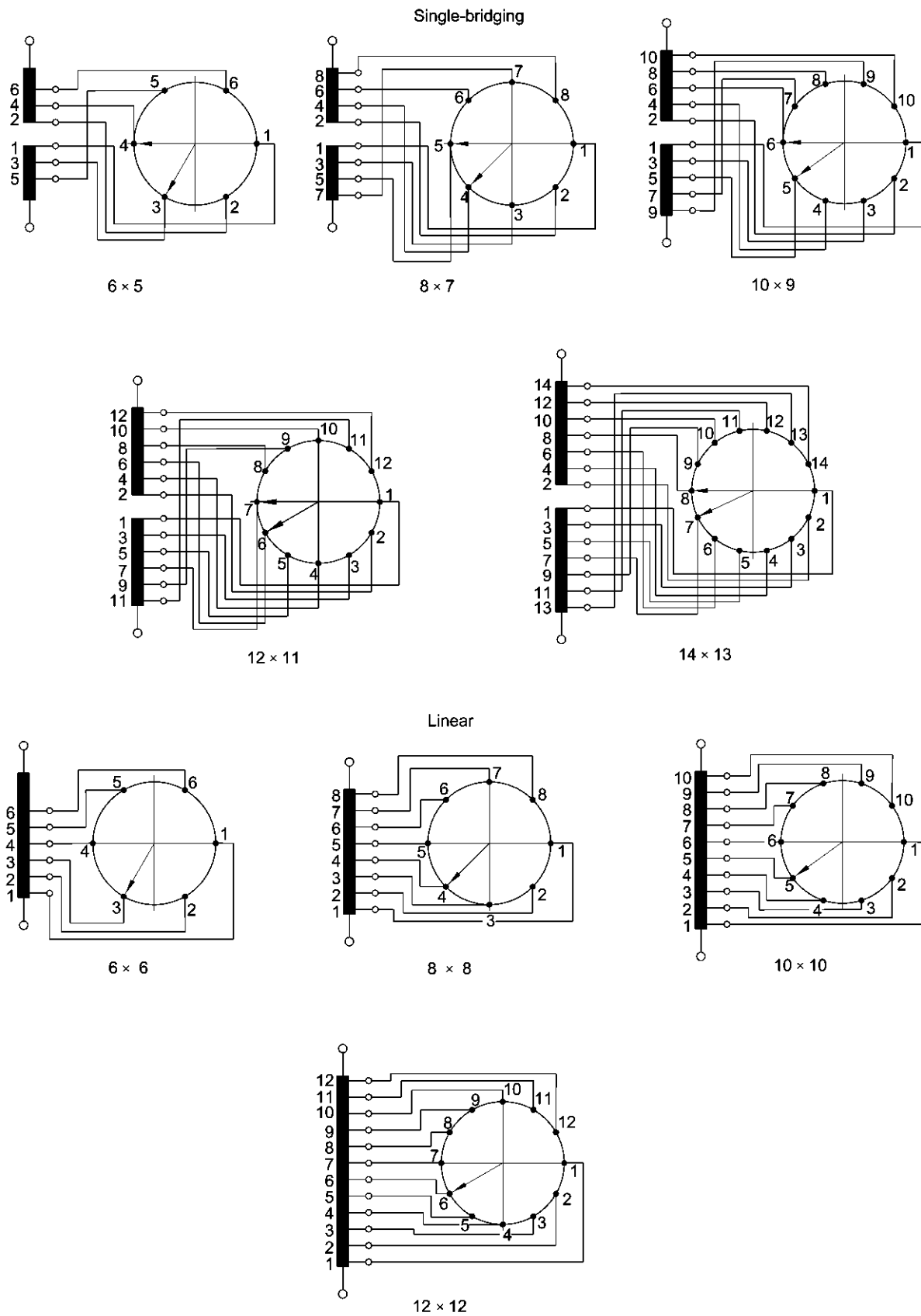


Fig. 2 Tap Changer Basic Connection Diagram

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. Type WSL Head Motorized Off-Circuit Tap Changer Technical Data.

4.3. Service condition of tap changers

4.3.1. Service temperature range of the 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. Tap changer insulation to earth

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

Table 3 Tap changer Insulation Level to Earth

(unit: kV)

The highest voltage for equipment U_m	Rated separate source AC withstand voltage (kV/50Hz, 1min)	Rated lightning impulse withstand voltage (kV, 1.2/50 μ s)
12	35	75
40.5	85	200

4.5. Tap changer mounting method

Type WSL Head Motorized Off-Circuit Tap Changer is a cage design and to be mounted on the transformer tank top by a head flange. A mounting flange shall be provided by the transformer, refer to Appendix for dimension details.

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

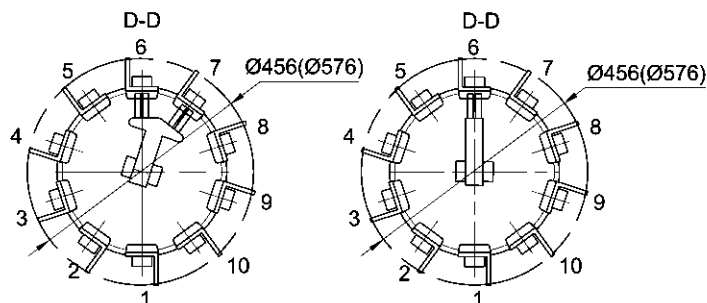
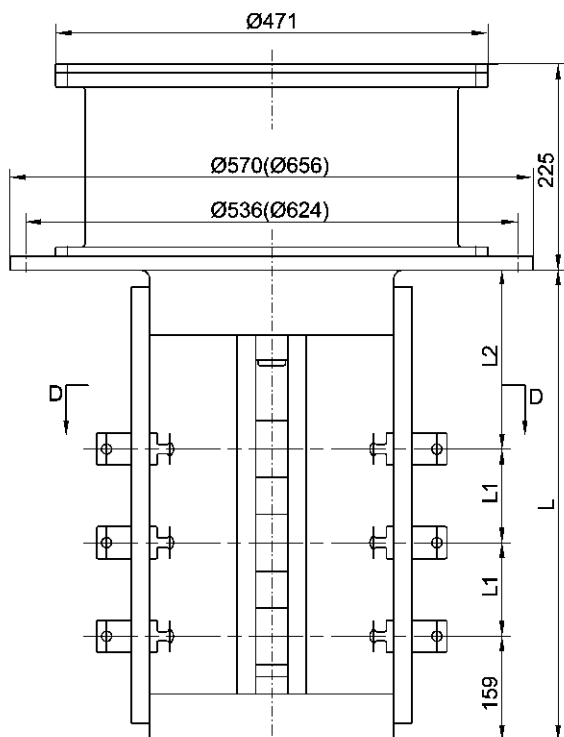
Type WSL Head Motorized Off-Circuit Tap Changer is to be operated by the motor on the top of the tap changer and controlled by HMWK-1 controller.

7. Tap changer

Controller HMWK-1 controller is designed for WSL Head Motorized Off-Circuit Tap Changer; it has the functions of position indication and operation control of the tap changer.

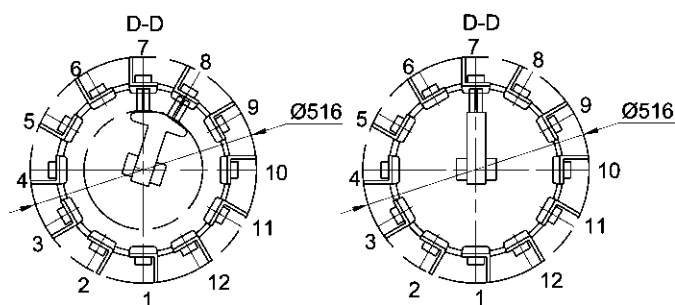
8. Appendices

Appendix 1 Overall dimensions of WSL head motorized OCTC



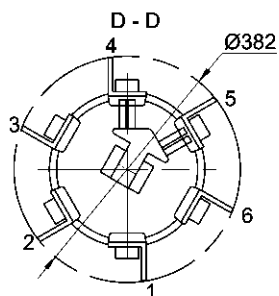
Single-bridging 10 × 9D(BD)

Linear 10 × 10D(BD)

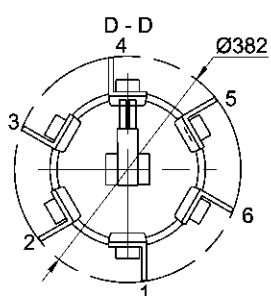


Single-bridging 12 × 11D

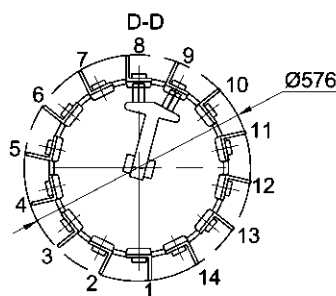
Linear 12 × 11D



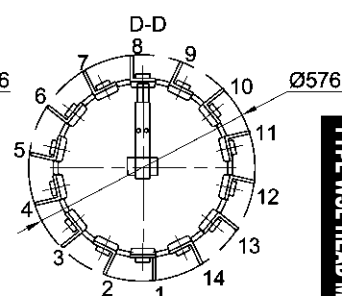
Single-bridging 6 × 5D



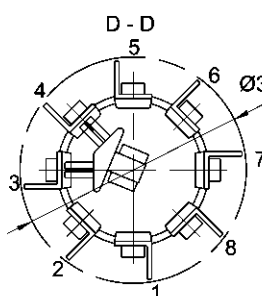
Linear 6 × 5D



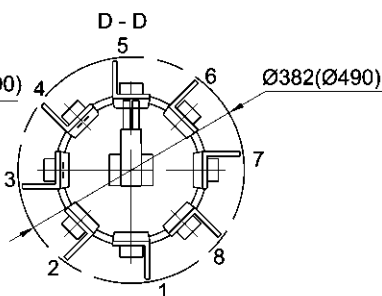
Single-bridging 14 × 13D



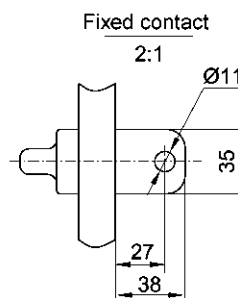
Linear 14 × 13D



Single-bridging 8 × 7D(BD)

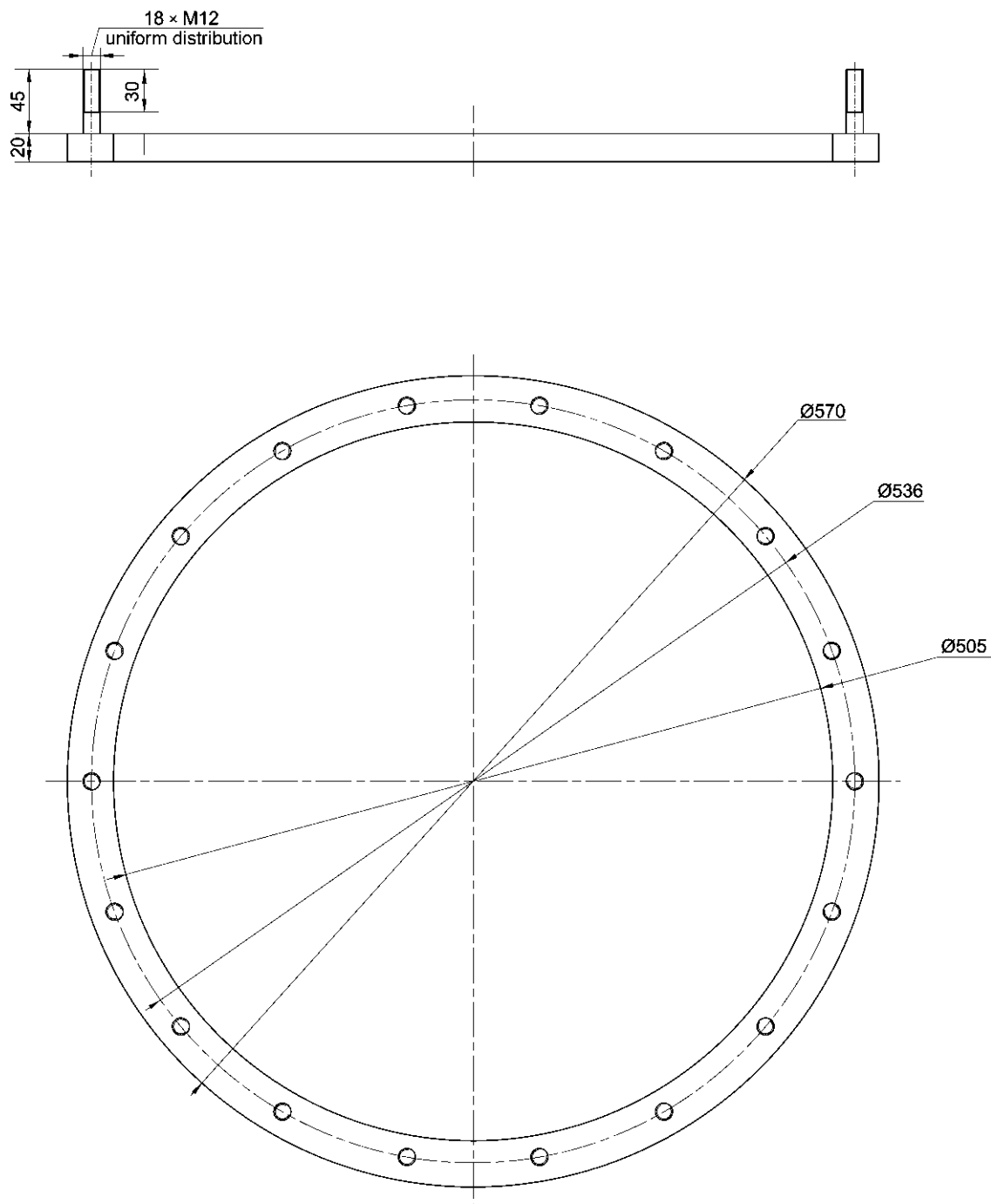


Linear 8 × 8D(BD)



Model	L1	L2	L
WSL V(IV)-600/12	102	195	558
WSL V(IV)-600/40.5	179	280	797

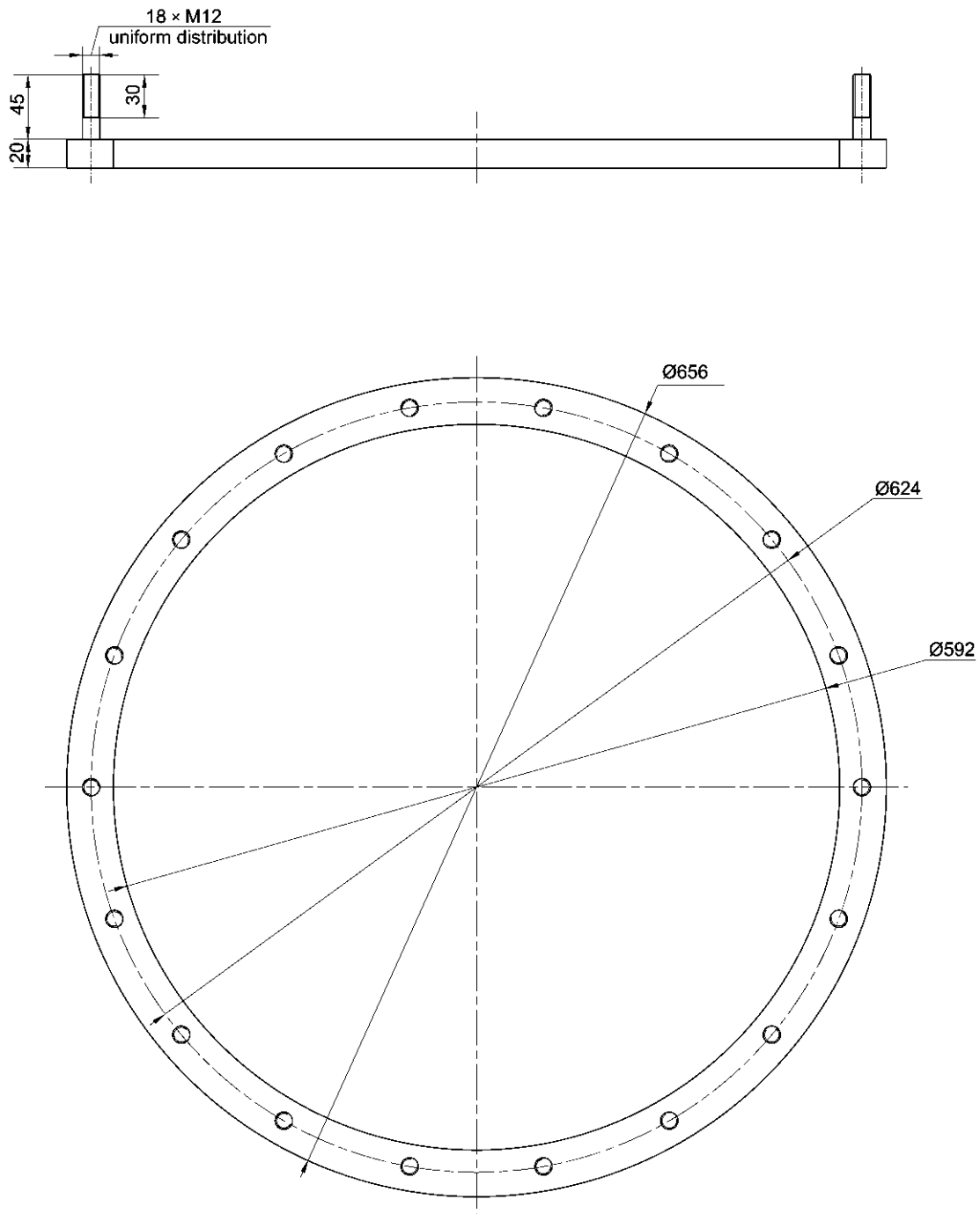
Appendix 2 Overall dimensions of transformer mounting flange I



Remark: This flange is for the following models:

WSLV-600/12-6 × 5D	WSLV-600/40.5-6 × 5D	WSLIV-600/12-6 × 5D	WSLIV-600/40.5-6 × 5D
WSLV-600/12-8 × 7D	WSLV-600/40.5-8 × 7D	WSLIV-600/12-8 × 8D	WSLIV-600/40.5-8 × 8D
WSLV-600/12-8 × 7BD	WSLV-600/40.5-8 × 7BD	WSLIV-600/12-8 × 8BD	WSLIV-600/40.5-8 × 8BD
WSLV-600/12-10 × 9D	WSLV-600/40.5-10 × 9D	WSLIV-600/12-10 × 10D	WSLIV-600/40.5-10 × 10D

Appendix 3 Overall dimensions of transformer mounting flange II



Remark: This flange is for the following models:

WSLV-600/12-10 x 9BD	WSLV-600/40.5-10 x 9BD	WSLIV-600/12-10 x 10BD	WSLIV-600/40.5-10 x 10BD
WSLV-600/12-12 x 11D	WSLV-600/40.5-12 x 11D	WSLIV-600/12-12 x 11D	WSLIV-600/40.5-12 x 11D
WSLV-600/12-14 x 13D	WSLV-600/40.5-14 x 13D	WSLIV-600/12-14 x 13D	WSLIV-600/40.5-14 x 13D



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