OUTDOOR DISCONNECTORS
types ONI...-2 and ONIII...-2 for 24 and 36 kV

Catalogue 1YMR611100-en

FEATURES
– Simple design and service.
– Small sizes.
– High mechanical duration and electrical endurance.
– Connected to rigid conductors.
– Operates both in vertical and horizontal position.
– Large range of variants.
– Operating devices: manual or motor.

APPLICATION
One - and three - phase disconnectors are designed for closing and opening not loaded electrical circuits in outdoor A.C. substations.

In open position disconnectors form visible and safe isolating distance which cuts circuit from voltage on the outflow side. Integrated earth switches are intended for shorting and earthing previously disconnected electrical network.

Outdoor manual operating devices are designed for opening and closing medium voltage disconnectors type ONIII and ONI and each one on stroke of a pipe rod 104, 142 and 186 mm.

The manual operating device type NN1 is equipped also with an auxiliary switch to enable monitoring of the actual position of the disconnector.

DEVICE CONDITIONS
The disconnectors type ONI...–2 i ONIII...–2 can be mounted in outdoor substations in following the climatic conditions:
– ambient temperature:
– maximum ..... 313K (+40°C)
– average (within 24 h) ..... up to 308K (+35°C)
– minimum ..... 243K (–30°C)
– altitude above sea level ..... up to 1000 m
– wind pressure ..... up to 700 Pa
– ace coating ..... 1 mm

DESIGNATION OF DISCONNECTOR
Example of designation of disconnectors type.

ON	III	30	W	/	8	UD	-	2
symbol of the type	**Number of phases**	**Rated voltage**	**extended creepage distance**		**Rated current**	**earth switch type**		**next construction version of an isolator**
outdoor disconnector	**I - 1 phase** **III - 3 phases**	**20 - 24 kV** **30 - 36 kV**			**4 - 400 A** **8 - 800 A** **16 - 1600 A**	**UD - lower earthing switch** **UG - upper earthing switch**		

Types of disconnectors designed for service in other environmental condition and fulfil additional exploitation requirements should to be agreed with the producer.

Designation of operating devices:

NN1	or	NN2
Symbol of the type of the operating device		**Symbol of the type of the operating device**

DESIGN
Disconnectors

The outdoor disconnectors type ONI...–2 i ONIII...–2 have secant construction. The base of disconnector is a steel frame in which there is settle (in bearings) the operating shaft ended with operating lever. The operating lever can be over every 10° within full turn. Support isolators with moving and unmoving contacts are fixed into the base. Between moving and unmoving contacts there is a line contact and its proper pressure is achieved via the pressure springs. The disconnector's moving contacts are connected via isolating rods to operating shaft. Rotation move of shaft is carried over via rods on moving contacts putting them in motion within perpendicular to a base plane.

The construction of disconnectors type ONIII...–2 allowed mounting up earthing switches which can be mounted on moving contact side (the up earthing switches) or on unmoving contact side (the down earthing switches). Between operating shaft of disconnector and operating shaft of earthing switch there is mechanical interlocking ensuring proper order of connection.

Disconnectors are suitable for working in horizontal or vertical position and have clamps suitable for connect flat buses mounting parallely in relative to the base.

Disconnectors can be controlled with manual operating devices type NN1 and NN2. Operating devices are coupled with disconnector by adjustable pipe rod.

Operating devices

The base of the kinematic set of operating mechanism is four-bar linkage consists of the following main parts:
– operating lever
– pipe rod
– shaft of disconnector
– pole

Rotation the operating lever trought 188° causes movement of the pipe rod polewise. Stroke of the pipe rod is adjustable and enable its three different values.

Signalling actual position of a disconnector is located on the operating handle.

A padlook fitted to the operating lever prevents undesirable operation of the disconnector.

The basic version manual device type NN1 includes a 10-pole auxiliary switch. Movement of the auxiliary switch is caused by the mechanical set fitted to the manual operating mechanism shaft.

To avoid improper switchings of the disconnectors operating devices are equipped at electro-magnetic lock type BEX or NO5. In the event voltage has not been applied to the lock terminals the operation of the operating mechanism is impossible. Circuit diagram of operating device type NN1 is showed at the drawing NN1/O5.

ACCESORIES
Disconnectors don't have any additional accessories.

TECHNICAL DATA
Technical data concerning disconnectors is given in table 1 on page 5.

Attention: We have the right to change the construction as a consequence of technical development.

AGREEMENT WITH STANDARDS
Outdoor disconnectors type ONI...–2, ONIII...–2 meet requirements of Polish Standards PN–93/E–06107 which are consistent to the International standard IEC 129.

SPARE PARTS
Set of spare parts for outdoor disconnectors type ONI...–2, ONIII...–2 which are used up at normal operation may be found in a mounting and exploitation instructions of a described disconnector.

Technical data of disconnectors ONI...-2 and ONIII...-2

Table 1

Characteristics	Unit	ONIII20/4-2 ONIII20/4UD-2 ONIII20/4UG-2	ONIII20/8-2 ONIII20/8UD-2 ONIII20/8UG-2	ONIII30/4-2 ONIII30/4UD-2 ONIII30/4UG-2	ONIII30/8-2 ONIII30/8UD-2 ONIII30/8UG-2	ONIII30W/4-2 ONIII30W/4UD-2 ONIII30W/4UG-2	ONIII30W/8-2 ONIII30W/8UD-2 ONIII30W/8UG-2	ONIII30W/16-2 ONIII30W/16UD-2 ONIII30W/16UG-2	ONI20/4-2	ONI20/8-2	ONI30/4-2	ONI30/8-2
Rated voltage	kV	24		36					24		36	
Rated power frequency withstand voltage across the isolating distance	kV	55		75					55		75	
Rated power frequency withstand voltage in wet conditions to earth and between phases.	kV	75		100					75		100	
Rated lighting impulse withstand voltage to earth end between phases.	kV	125		170					125		170	
Rated lighting impuls withstand voltage across the isolating distance	kV	145		195					145		195	
Creepage distance	mm	460		610		900			460		610	
Rated current	A	400	800*	400	800	400	800	1600	400	800	400	800
Rated peak withstand current of disconnector	kA	40		50				63	40		50	
Rated short-time withstand current of 1 s disconnector	kA	16		20				25	16		20	
Rated peak withstand current of earthing switch	kA	40		40		50		63	—		—	
Rated short-time withstand current 1 s of earthing switch	kA	16		16		20		25	—		—	
Rated frequency	Hz	50 or 60										
Weight — Without earthing switch	kg	80		105		125		130	27		35	
Weight — with earthing switch	kg	90		120		140		150	—		—	
Max. distance to nearest bracked.	mm	620		800					620		800	
Minimum distance between axes of disconnector andnearest bus bar.	mm	—							310		400	

* 1250 A version on request

Technical data of operating devices NN1 and NN2

Table 2

Pos.	DESIGNATION	NN1	NN2
1.	Max. strength at the operating lever	300 N	
2.	Stroke of operating rode	104/142/186 mm	
3.	Switching angle of the hand lever	188°	
4.	Weight	12 kg	7 kg
5.	Degree of protection	IP 43	–
	Technical data of auxiliary switch type PS-O		
6.	Number of contacts	10	–
7.	Nominal voltage of auxiliary switch	220 V DC; AC	–
8.	Switching capacity at 200 V DC in circuts:		
	almost inductiveless	5 A	–
	inductive T = 20 ms	0,7 A	–
	Inductive T = 20 ms and two microswitches Series instalations	2,2 A	–
	Technical data of auxiliary switch type Łk16R		
9.	Number of contacts	10	–
10.	Rated voltage	220 V DC; AC	–
11.	Switching capacity		
	almost inductive	3 A	–
	Technical data of electro-magnetic interlocking		
12.	Nominal voltage		
	type BEX	24, 48, 60, 110, 220 V DC	–
	type BEXa	110, 125, 220 V AC	–
	type NO5	24, 48, 60, 110, 125, 127, 220 V DC	–

ORDERING

An order should comprise names and types of disconnectors. Operating devices should be ordered according to a proper catalogue sheet.

EXAMPLE OF THE ORDER

One disconnector for 36 kV, 800 A with down/up earthing switch, witch manual operating device (data like in catalogue sheet NN1) - should be marked of follows:

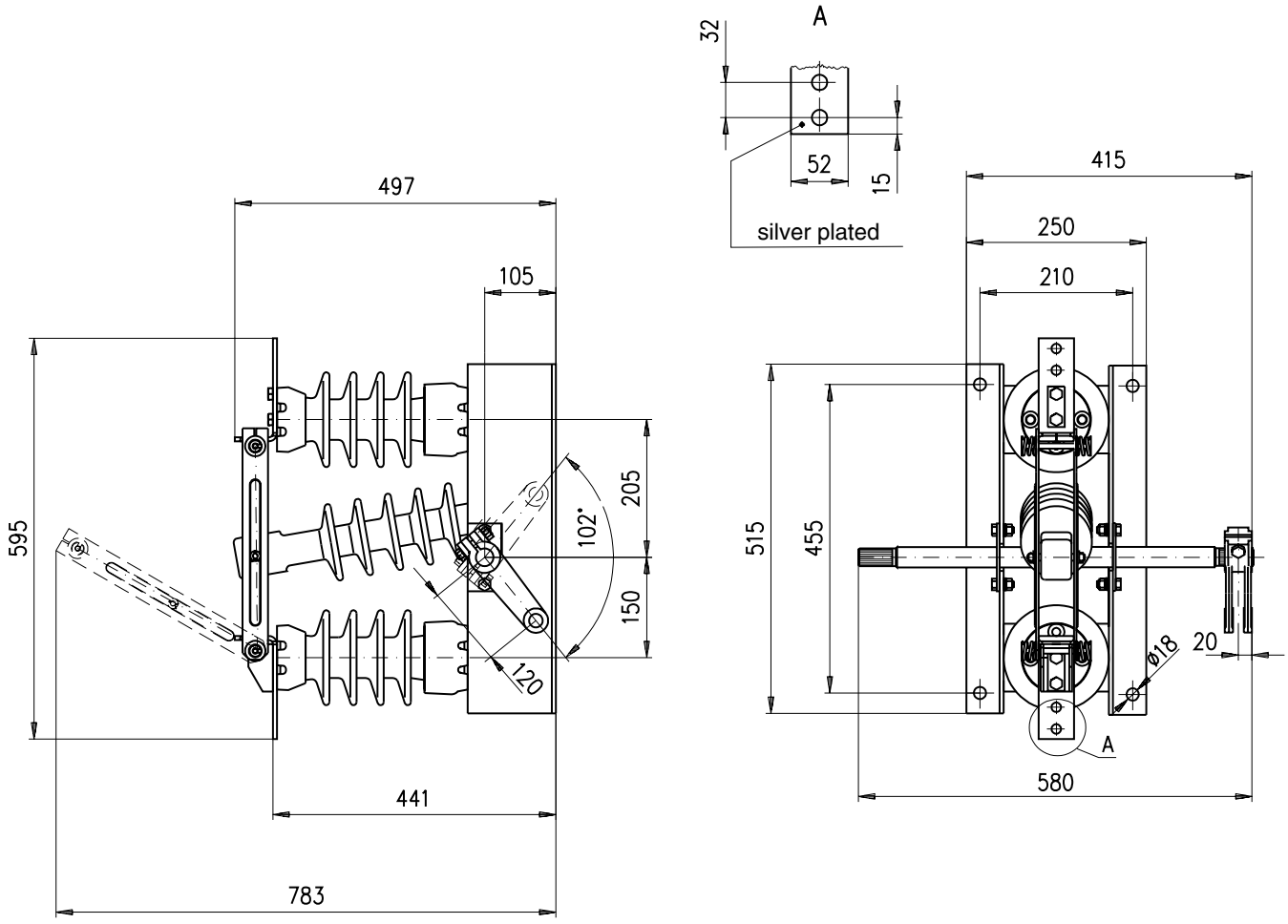
ONIII 30/8UD-2	1 pc.
Manual operating device type NN1	1 pc.

DIMENSIONAL DRAWINGS

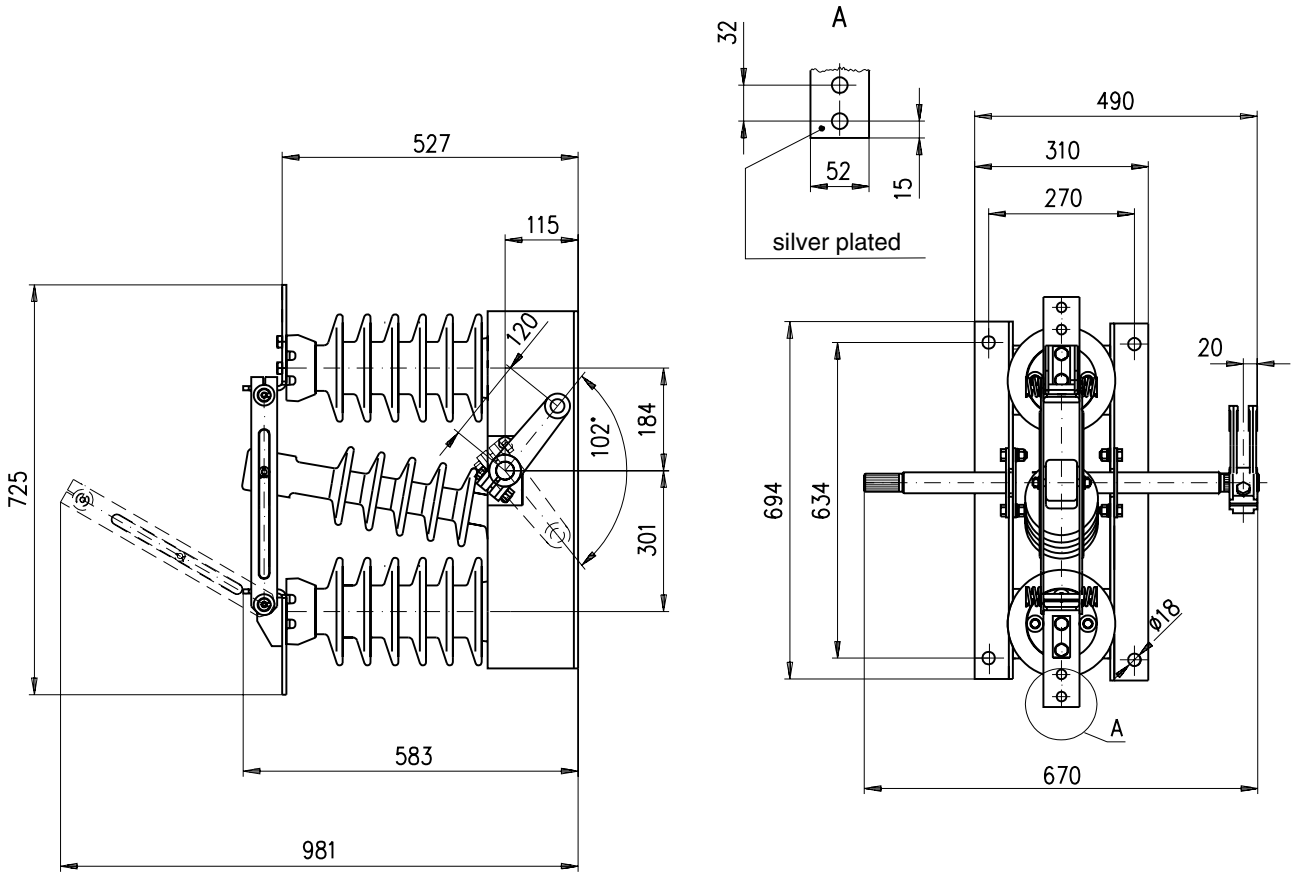
Attached dimensional drawings are as follows:

1. ON1/24.00 – disconnector type ONI 20/4-2; ONI 20/8-2
2. ON1/25.00 – disconnector type ONI 30/4-2; ONI 30/8-2
3. ON3/24.00 – disconnector type ONIII 20/4-2; ONIII 20/8-2
4. ON3/25.00 – disconnector type ONIII 20/4UD-2; ONIII 20/8UD-2
5. ON3/26.00 – disconnector type ONIII 20/4UG-2; ONIII 20/8UG-2
6. ON3/27.00 – disconnector type ONIII 30/4-2; ONIII 30/8-2; ONIII 30W/4-2; ONIII 30W/8-2
7. ON3/28.00 – disconnector type ONIII 30/4UD-2; ONIII 30/8UD-2; ONIII 30W/4UD-2; ONIII 30W/8UD-2
8. ON3/29.00 – disconnector type ONIII 30/4UG-2; ONIII 30/8UG-2; ONIII 30W/4UG-2; ONIII 30W/8UG-2
9. ON3/31.00 – disconnector type ONIII 30W/16-2
10. ON3/32.00 – disconnector type ONIII 30W/16UG-2
11. ON3/33.00 – disconnector type ONIII 30W/16UD-2
12. ON3/34.00 – extension of shaft type PW for disconnectors type ONIII...-2
13. NN2/09 – manual operating device type NN2
14. NN1/10.02 – manual operating device type NN1
15. NN1/05.01 – circuit diagram of operating device type NN1

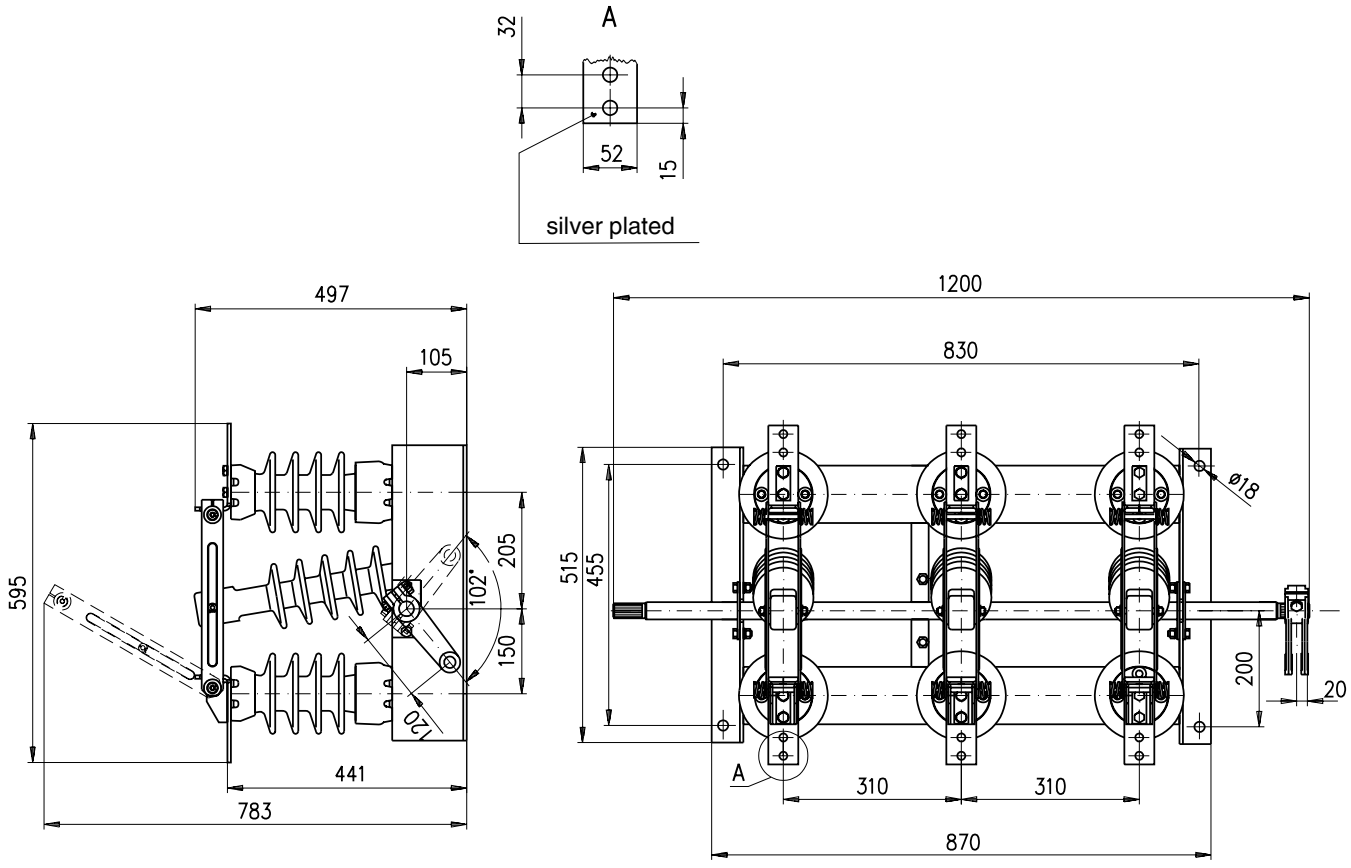
1. ON1/24.00 Disconnector type ONI 20/4–2; ONI 20/8–2



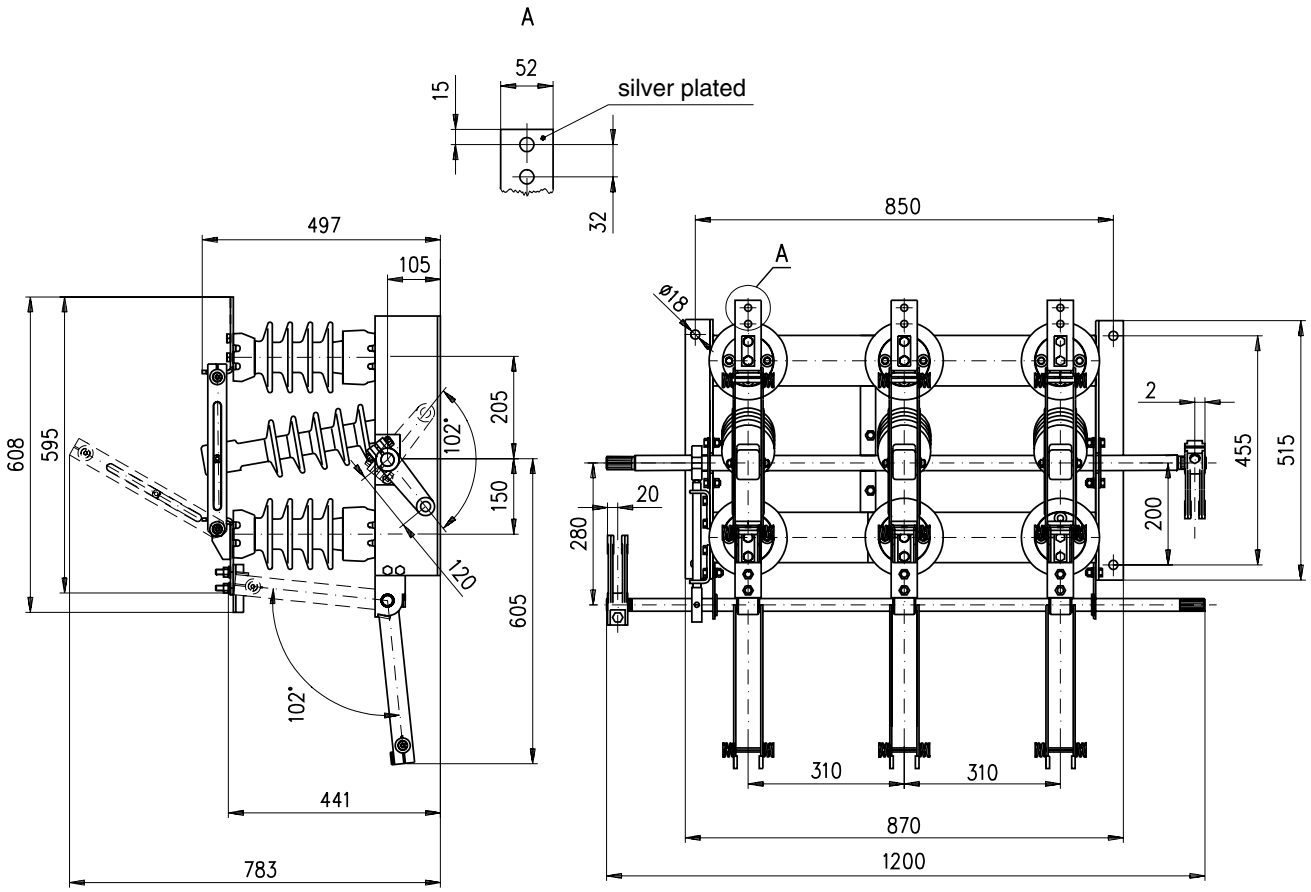
2. ON1/25.00 Disconnector type ONI 30/4–2; ONI 30/8–2



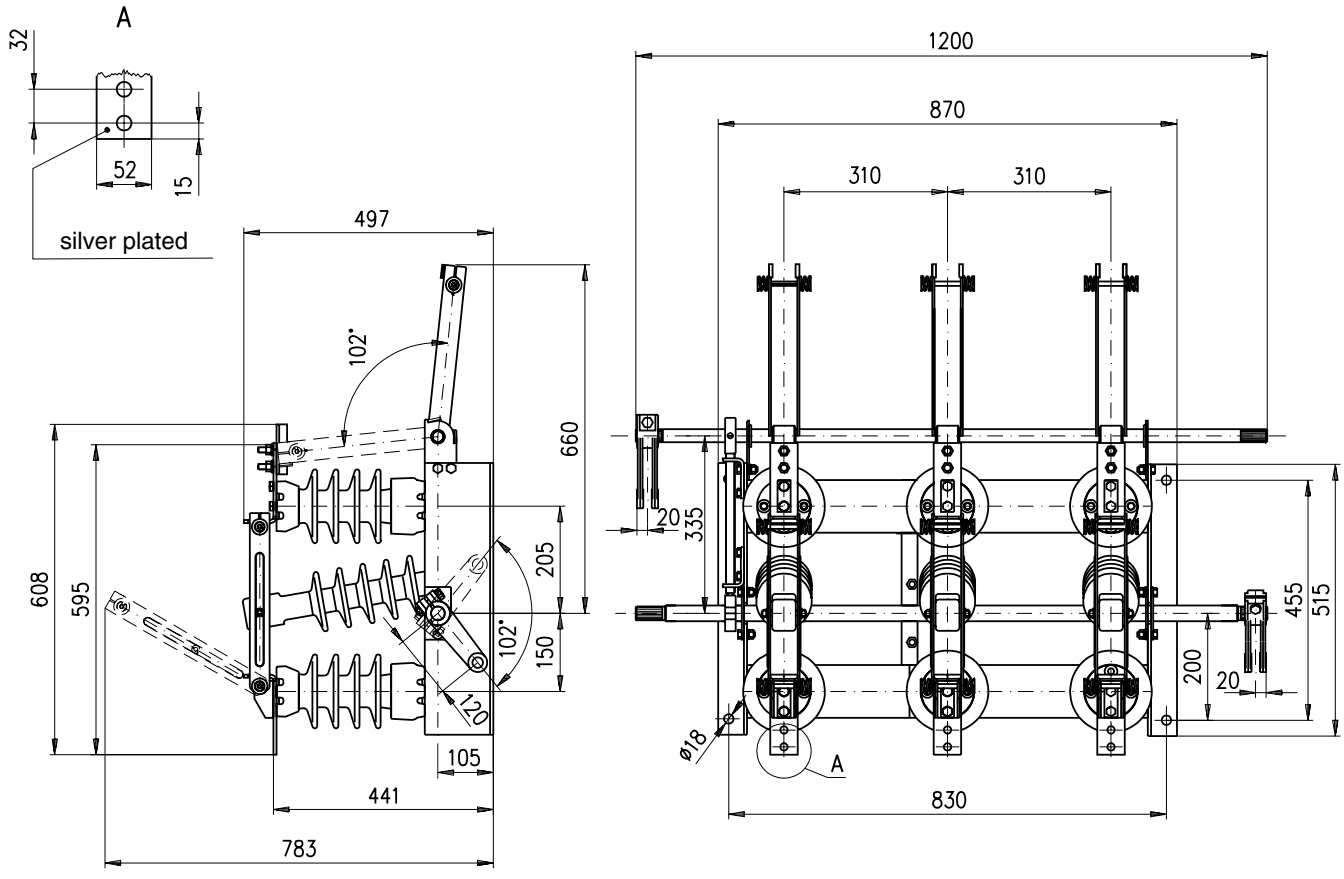
3. ON3/24.00 Disconnector type ONIII 20/4–2; ONIII 20/8–2



4. ON3/25.00 Disconnector type ONIII 20/4UD–2; ONIII 20/8UD–2

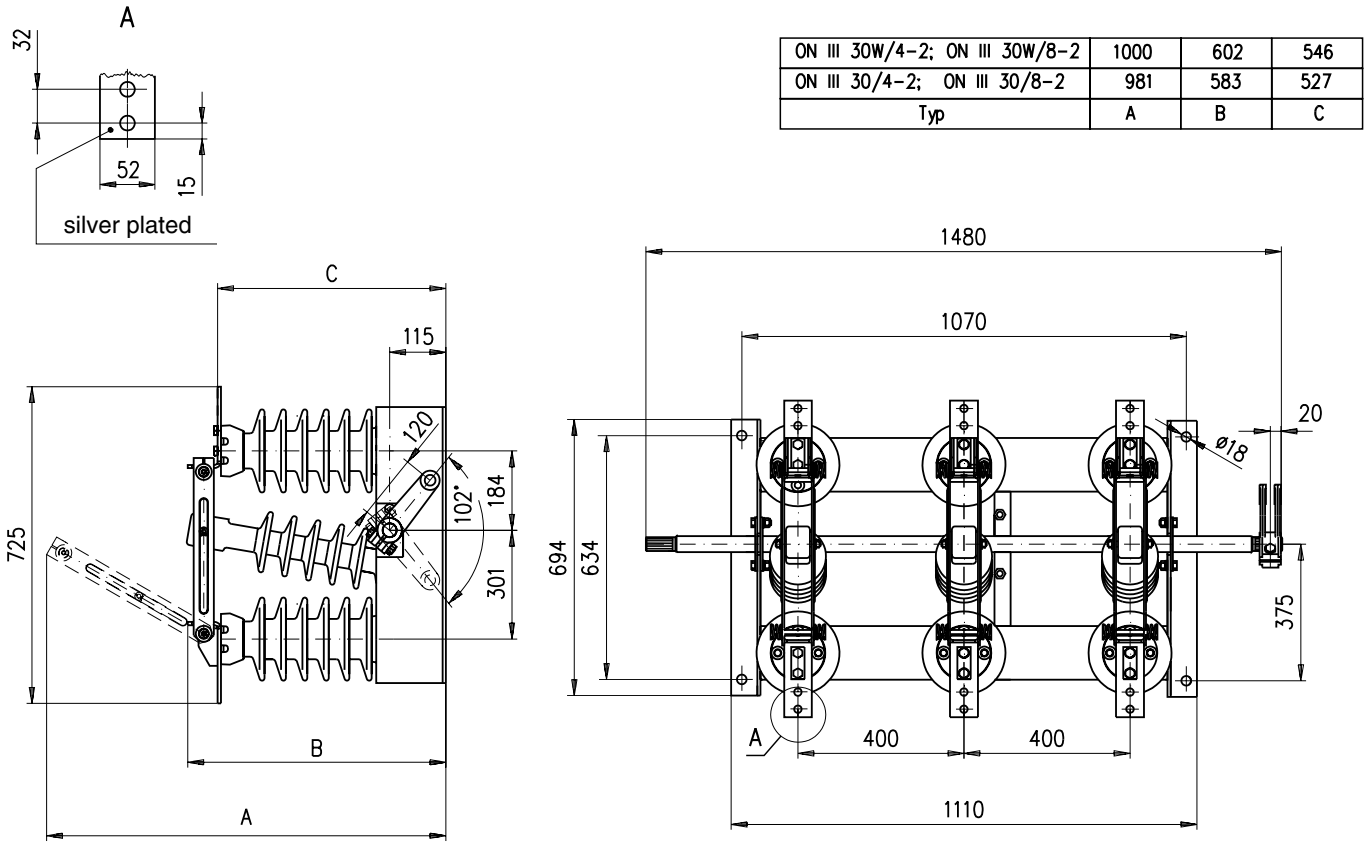


5. ON3/26.00 Disconnector type ONIII 20/4UG–2; ONIII 20/8UG–2



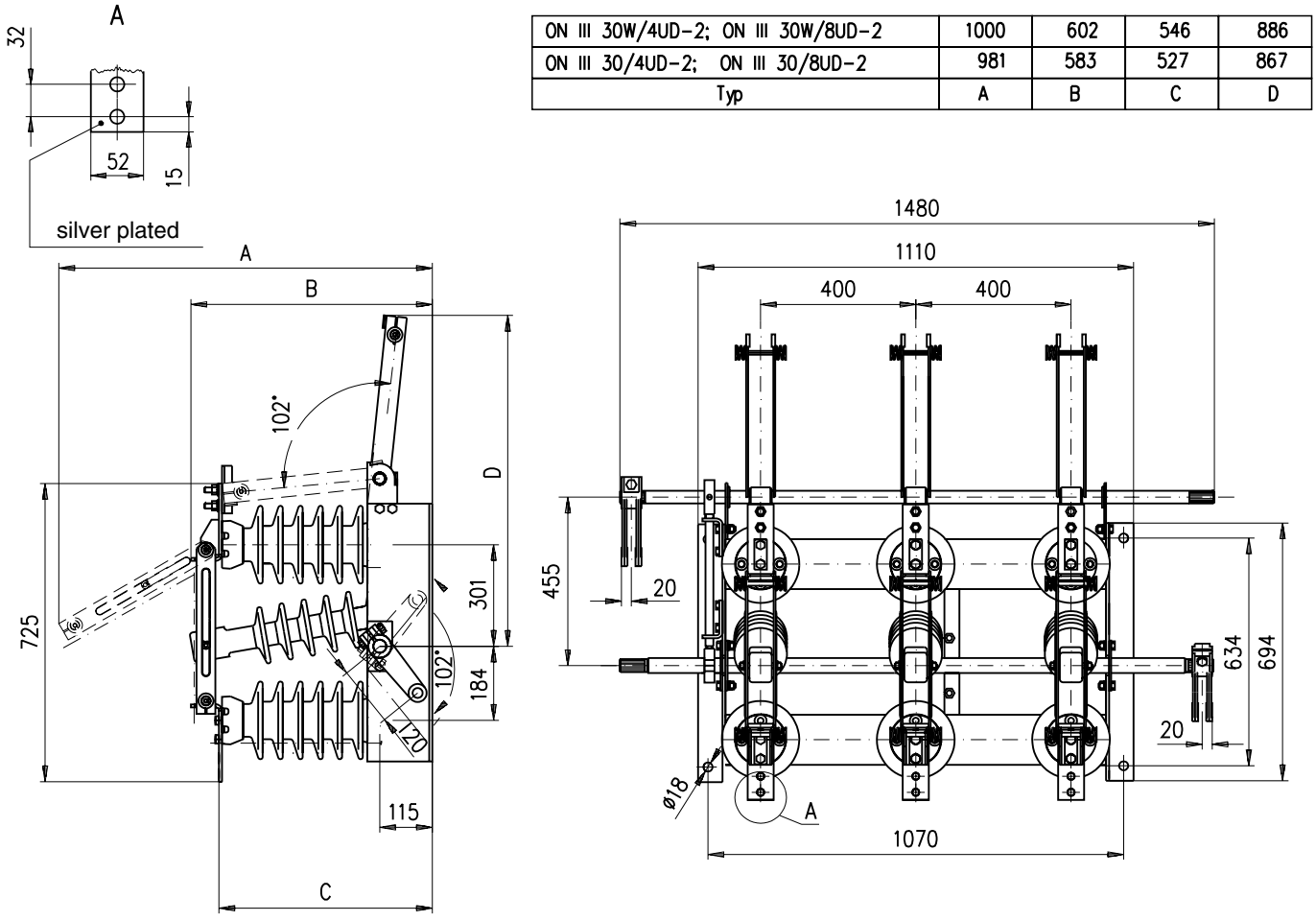
6. ON3/27.00 Disconnector type ONIII 30/4–2; ONIII 30/8–2; ONIII 30W/4–2; ONIII 30W/8–2

ON III 30W/4–2; ON III 30W/8–2	1000	602	546
ON III 30/4–2; ON III 30/8–2	981	583	527
Typ	A	B	C



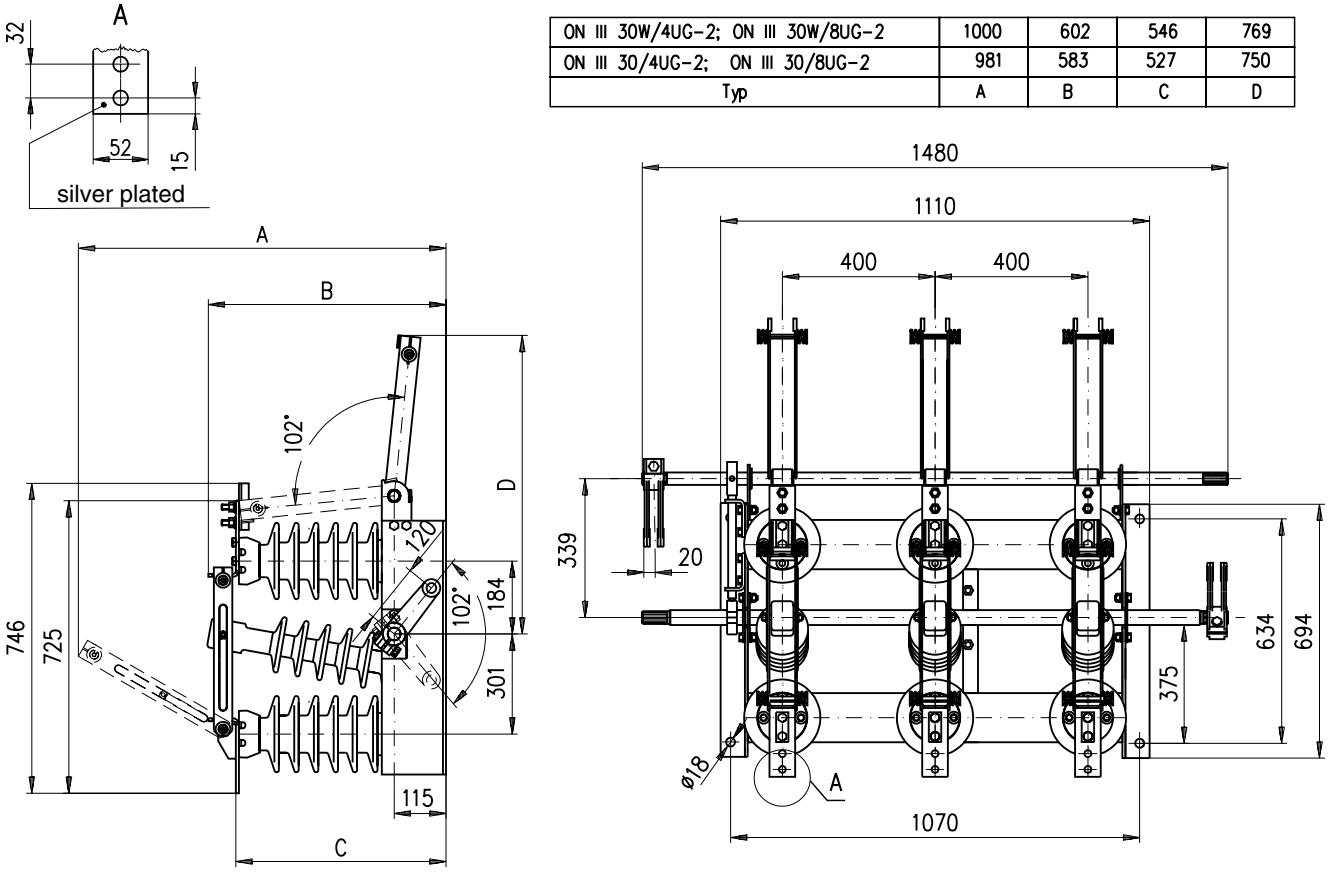
7. ON3/28.00 Disconnector type ONIII 30/4UD–2; ONIII 30/8UD–2; ONIII 30W/4UD–2; ONIII 30W/8UD–2

ON III 30W/4UD–2; ON III 30W/8UD–2	1000	602	546	886
ON III 30/4UD–2; ON III 30/8UD–2	981	583	527	867
Typ	A	B	C	D

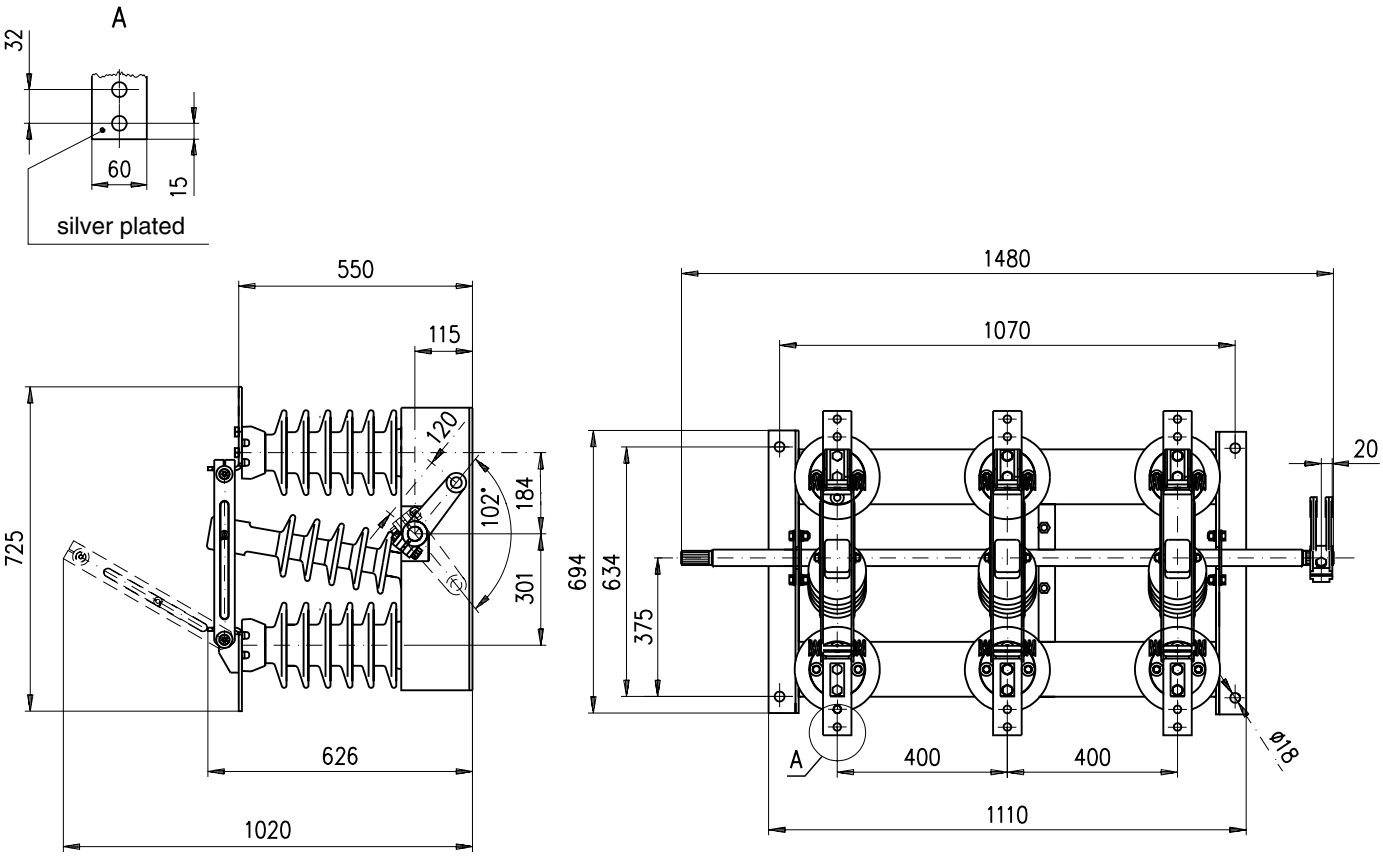


8. ON3/29.00 Disconnector type ONIII 30/4UG–2; ONIII 30/8UG–2; ONIII 30W/4UG–2; ONIII 30W/8UG–2

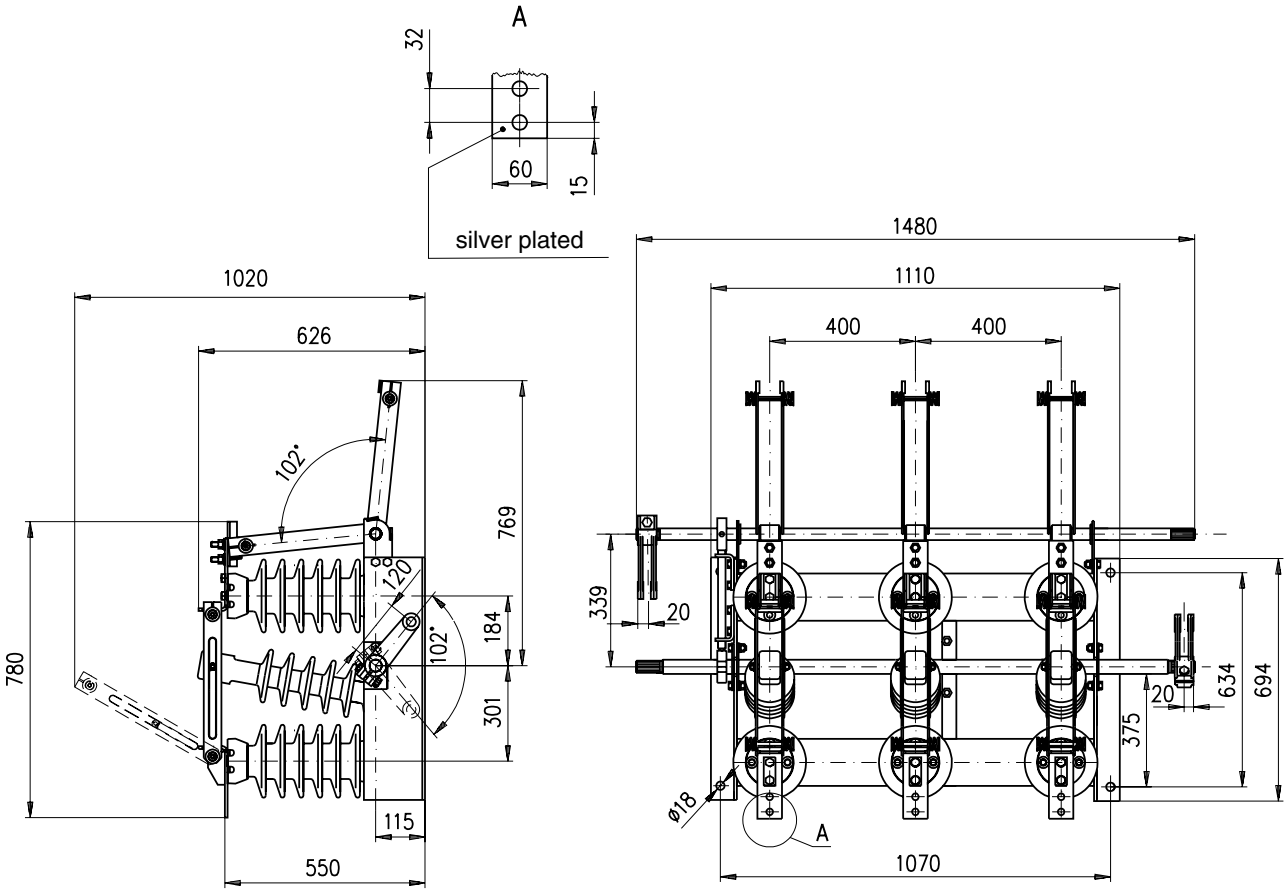
ON III 30W/4UG-2; ON III 30W/8UG-2	1000	602	546	769
ON III 30/4UG-2; ON III 30/8UG-2	981	583	527	750
Typ	A	B	C	D



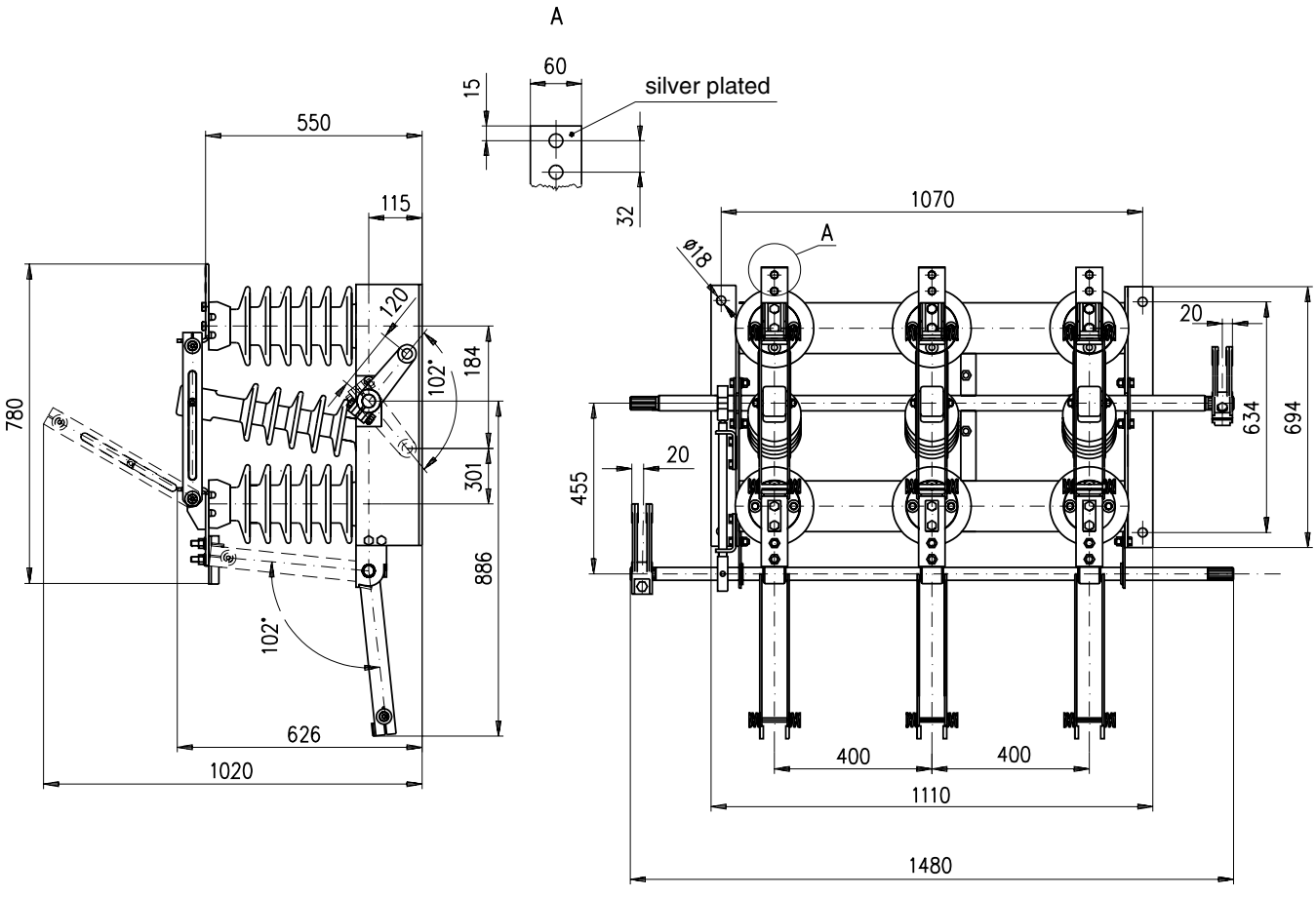
9. ON3/31.00 Disconnector type ONIII 30W/16–2



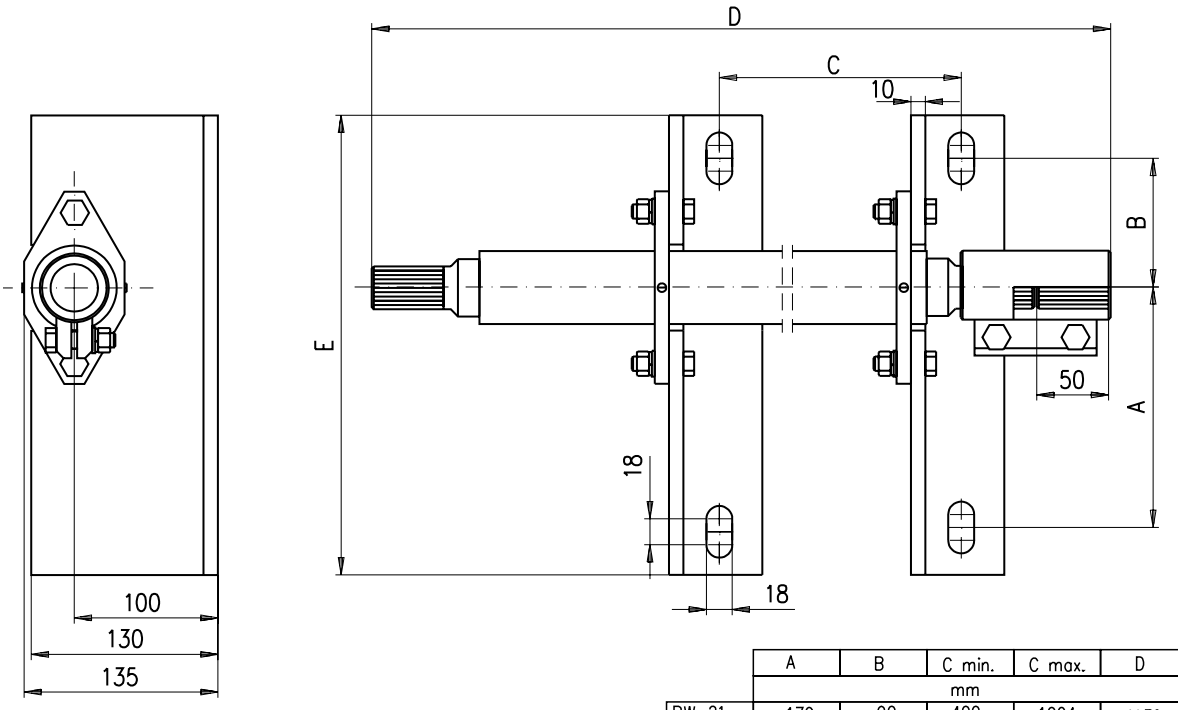
10. ON3/32.00 Disconnector type ONIII 30W/16UG–2



11. ON3/33.00 Disconnector type ONIII 30W/16UD–2

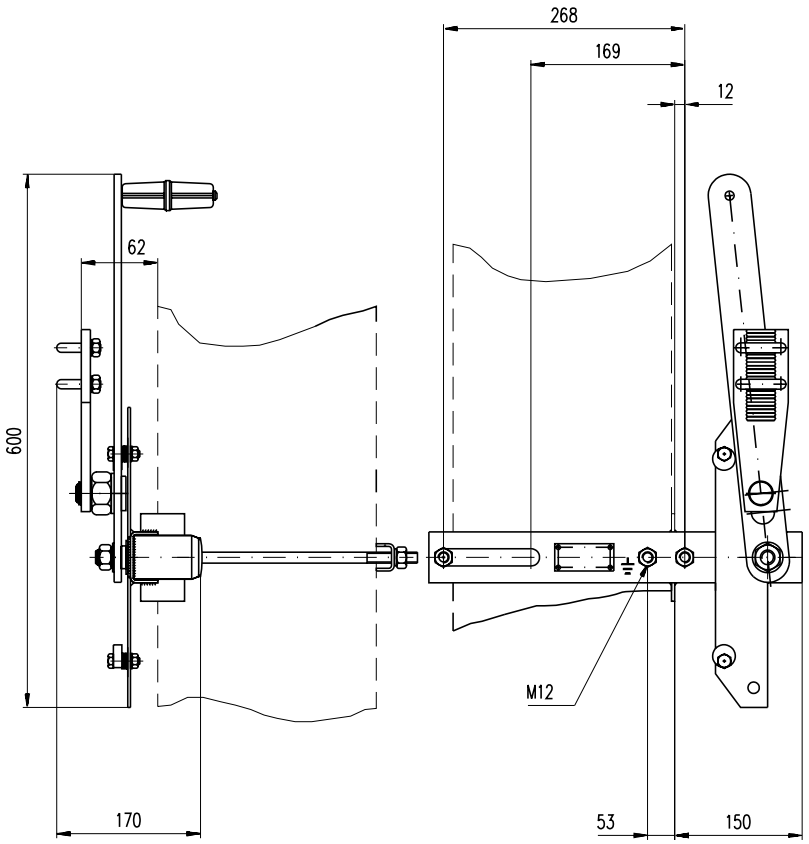


12. ON3/34.00 Extension of shaft type PW for disconnectors type ONIII...–2

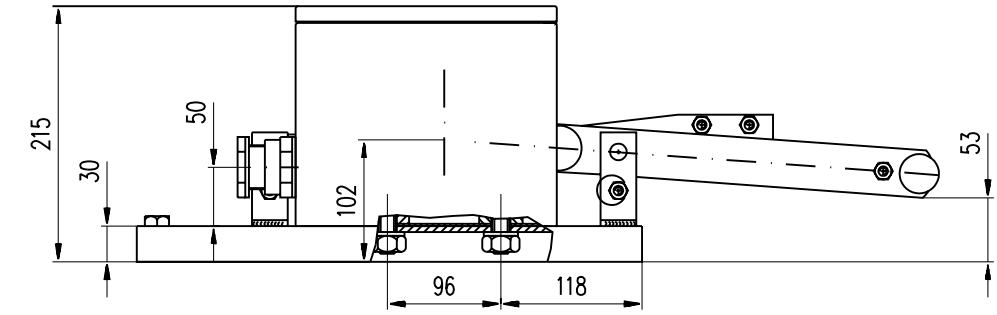


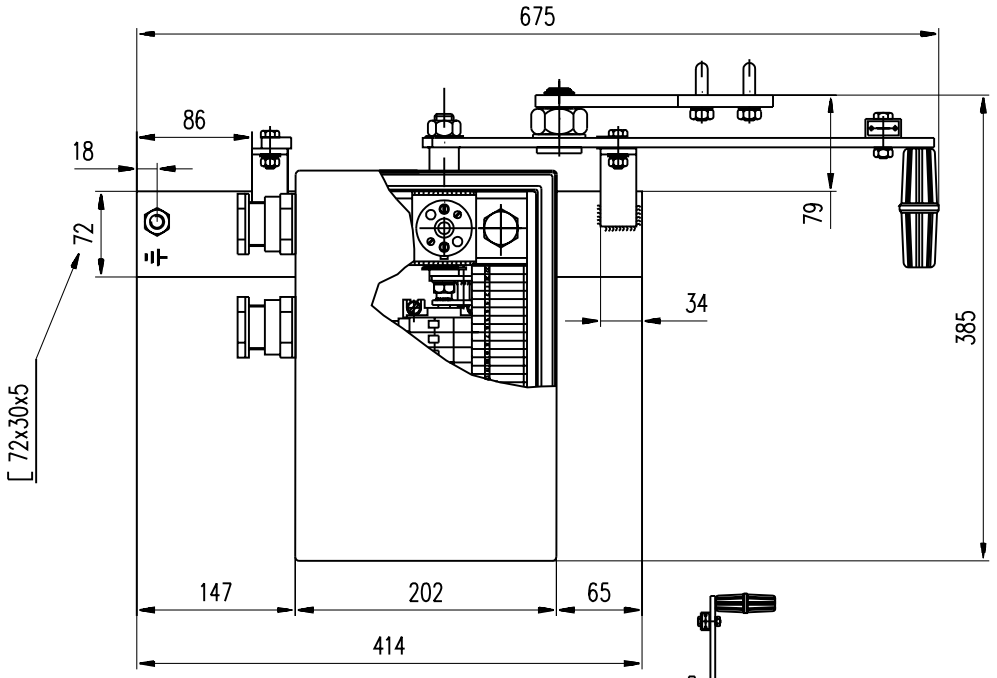
	A	B	C min.	C max.	D	E
	mm					
PW–21	170	90	400	1004	1139	320
PW–22	170	90	400	1015	1150	320
PW–23	242	68	–	–	760	370
PW–24	170	90	400	1065	1200	320
PW–25	170	90	–	–	595	320

13. NN2/09 Manual operating device type NN2

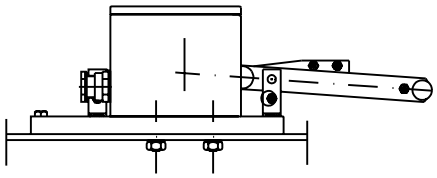


14. NN1/10.02 Manual operating device type NN1

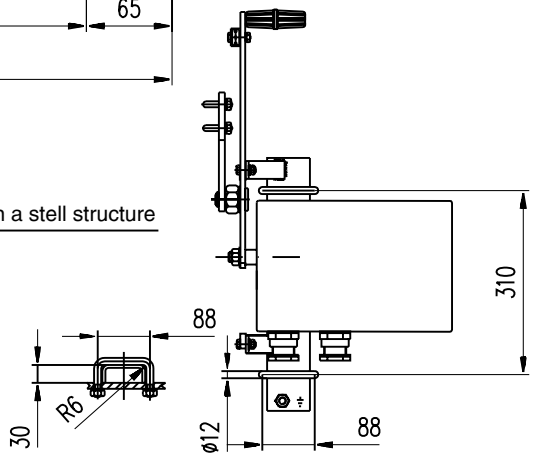




Suggestions directions for assembly on a stell structure

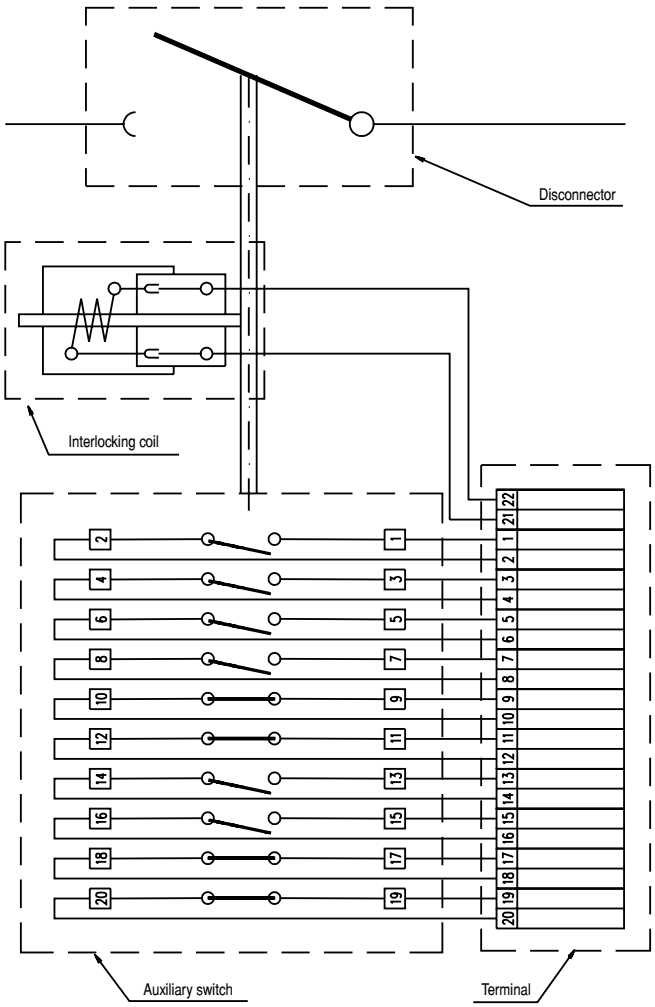


using extended screws M16



using connection clips

15. NN1/05.01 Circuit diagram of operating device type NN1



1. Circuit diagram for disconnectors ONIII 36 kV.
2. For disconnectors ONIII 24 kV configuration of contacts is inverse.

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