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component supplier

HV1 compound on-load tap-changer

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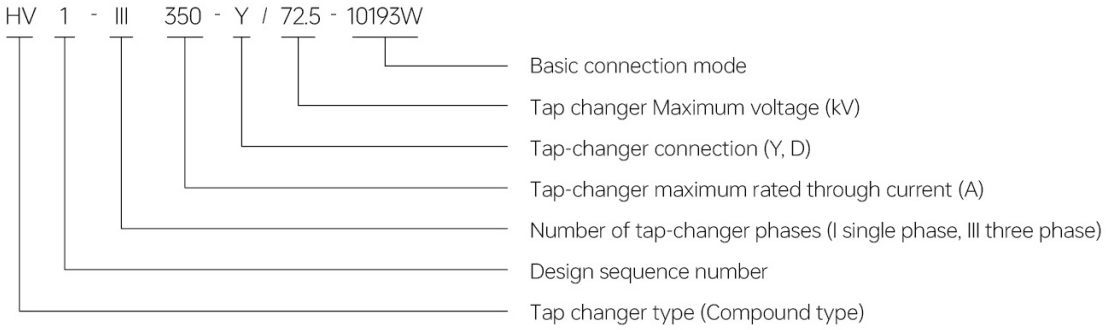
Huaqi Electric Powerr, Made in China

HV1 compound on-load tap-changer

1. HV1 model description

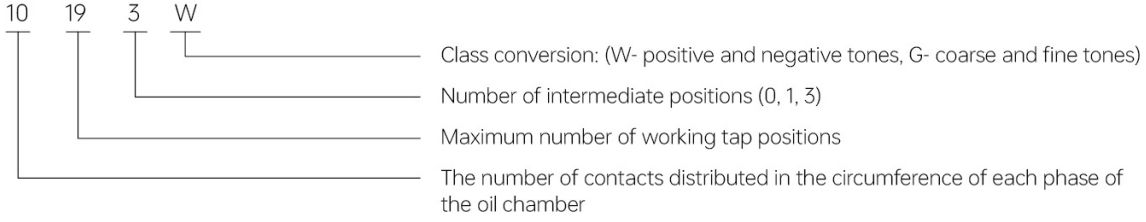
1.1 Model representation

HV1 on-load tap-changer is available in a variety of models and specifications according to different combinations of phase number, maximum rated through current, and maximum voltage connection modes. The meanings of parameters in the model are described as follows:



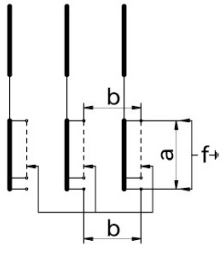
1.2 Basic connection method

Depending on the voltage regulation range of the transformer and the connection mode of the winding, the HV1 switch has a variety of different specifications. The specifications of the HV1 switch are composed of the number of contacts distributed around each phase of the oil chamber, the number of tap positions, the number of intermediate positions and the conversion class. In the basic connection mode, the meanings of parameters are described as follows:

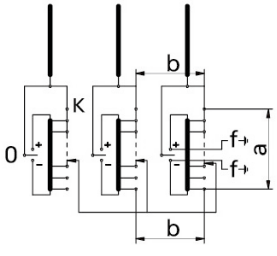


2. HV1 internal insulation level

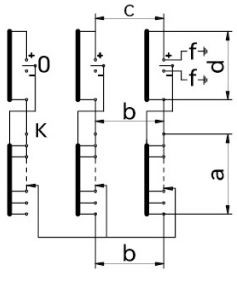
Switch internal insulation according to the structure of the switch is divided into the following forms:



Linear key



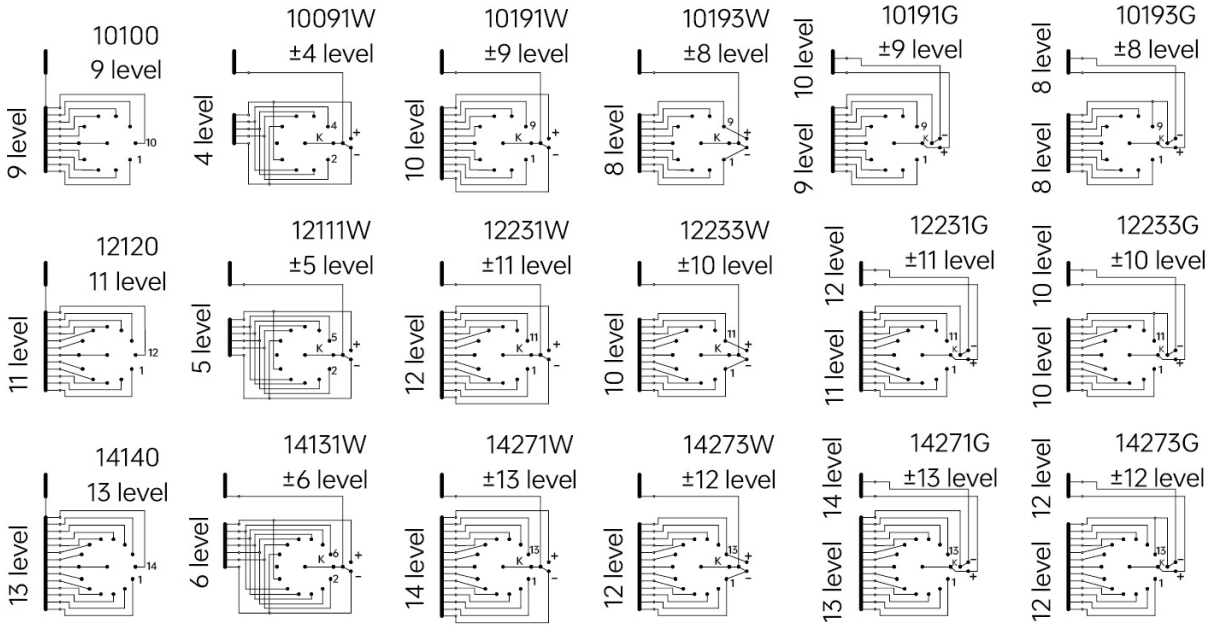
flipflop



Coarse-fine control

Insulation distance symbol		Withstand voltage (kV)	III 350Y III 500Y	III 350D III 500D	I 350 I 700
a	Number of contacts: 10	Impulse test voltage: 1.2/50μs	200		
		Power frequency test voltage: 50Hz/1min	50		
	Number of contacts: 12	Impulse test voltage: 1.2/50μs	180		
		Power frequency test voltage: 50Hz/1min	50		
	Number of contacts: 14	Impulse test voltage: 1.2/50μs	170		
		Power frequency test voltage: 50Hz/1min	50		
b	35kV	Impulse test voltage: 1.2/50μs	200	200	-
		Power frequency test voltage: 50Hz/1min	70	85	-
	66kV	Impulse test voltage: 1.2/50μs	200	360	-
		Power frequency test voltage: 50Hz/1min	70	140	-
c	35kV	Impulse test voltage :1.2/50μs	350	350	-
		Power frequency test voltage: 50Hz/1min	140	140	-
	66kV	Impulse test voltage: 1.2/50μs	350	350	-
		Power frequency test voltage: 50Hz/1min	140	140	-
d		Impulse test voltage: 1.2/50μs	200		
		Power frequency test voltage: 50Hz/1min	53		
f	35kV	Impulse test voltage: 1.2/50μs	200		
		Power frequency test voltage: 50Hz/1min	85		
	66kV	Impulse test voltage: 1.2/50μs	350		
		Power frequency test voltage: 50Hz/1min	140		

3. HV1 basic wiring diagram



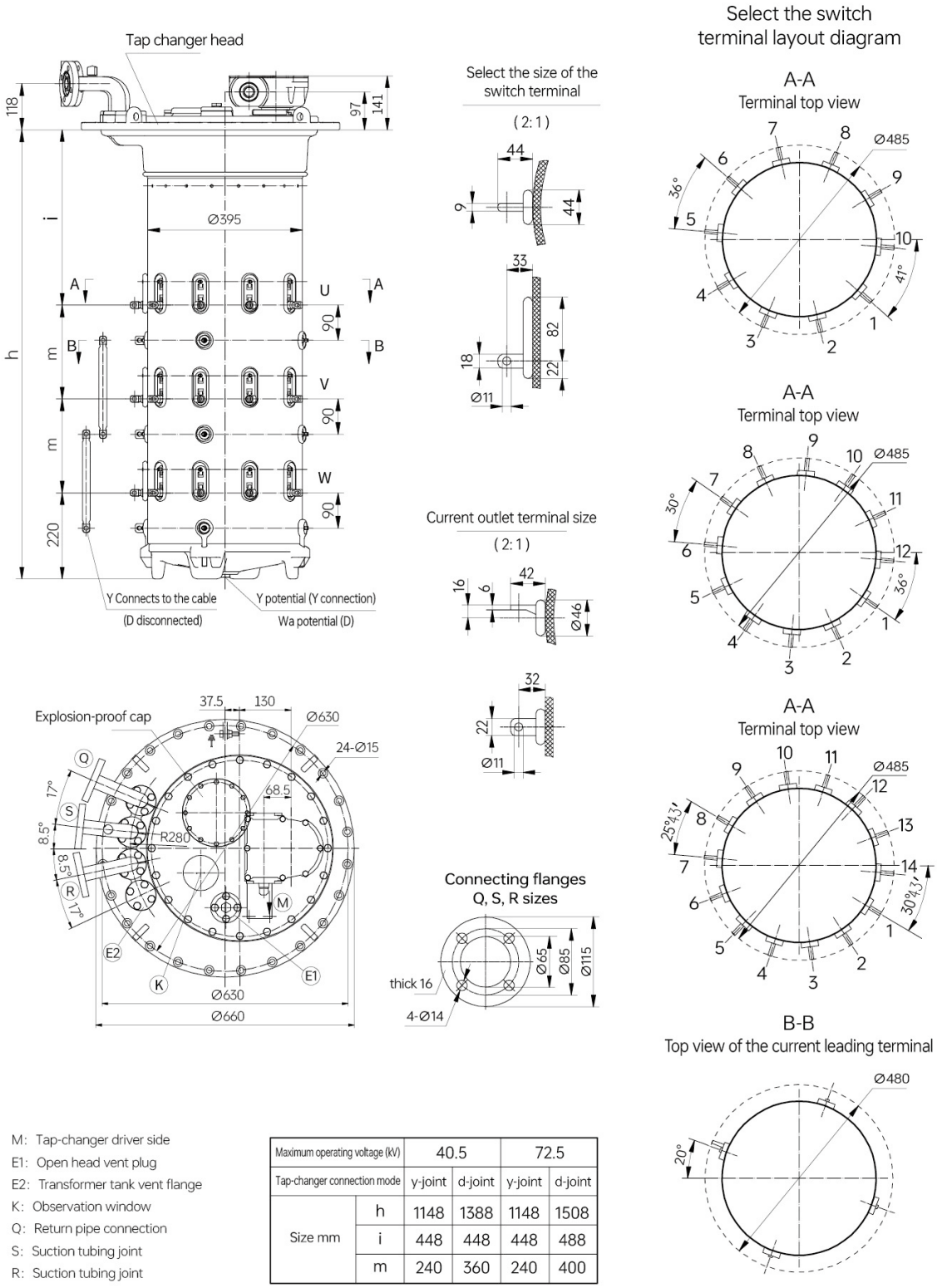
4. HV1 technical parameters

item	Classification feature		III 350Y	III 350D	I 350	I 700	III 500Y	III 500D
1	Maximum rated passing current (A)		350	350	350	700	500	500
2	Number of phases and connection mode		Central point	Arbitrary connection			Central point	Arbitrary connection
3	Rated frequency (Hz)		50 or 60					
4	The largest rating Voltage (V)	Number of contacts: 10	1500					
		Number of contacts: 12	1400					
		Number of contacts: 14	1000				-	
5	Rated capacity (kVA)	Number of contacts: 10	525			660	400-525	
		Number of contacts: 12	420			520	325-420	
		Number of contacts: 14	350			450	-	
6	Withstand short circuit Ability (kA)	Thermal stability (3s RMS)	5			10	7	
		Dynamic stability (peak value)	12.5			25	17.5	
7	Number of working positions	Linear key	Max 14				Max 12	
		Positive and negative tones or coarse and fine tones	±3~±13				±3~±11	
8	tap-changer Insulation level (kV)	Rated voltage	35			66		
		Maximum operating voltage	40.5			72.5		
		Power frequency test voltage (1min)	85			140		
		Impulse test voltage (1.2/50)	200			350		
9	Mechanical life		No less than 800,000 times					
10	Electrical life		No less than 200,000 times					
11	Switch Oil chamber	Working pressure	3×10^4 Pa					
		Sealing performance	6×10^4 Pa 24h no leakage					
		Overpressure protection	Rupture cap $(4\sim5)\times10^4$ Pa					
		Protective relay	QJ4-25 Set oil speed 1.0m/s±10%					
12	Equipped with electric mechanism		HED-200					
13	weight	Switch type	III 350Y	III 350D	I 350	I 700	III 500Y	III 500D
		Weight (kg)	140	150	120	130	190	200
14	Oil discharge (L)	Linear key	135	185	85	120	205	240
		Positive and negative tones or coarse and fine tones	165	220	115	150	235	275

15	Amount of oil charged VS Minimum harmonization Volume DV(L)		Vs	DV	Vs	DV	Vs	DV	Vs	DV	Vs	DV	Vs	DV
		Linear key	105	14	165	21	60	10	85	12	160	20	200	24
		Positive and negative tones or coarse and fine tones	130	17	180	22	85	12	108	15	185	22	225	26

Note: The 500A rated capacity can be increased from 400kVA to 525kYA(10 contacts) and from 325kVA to 420kVA (12 contacts) at reduced rated current.

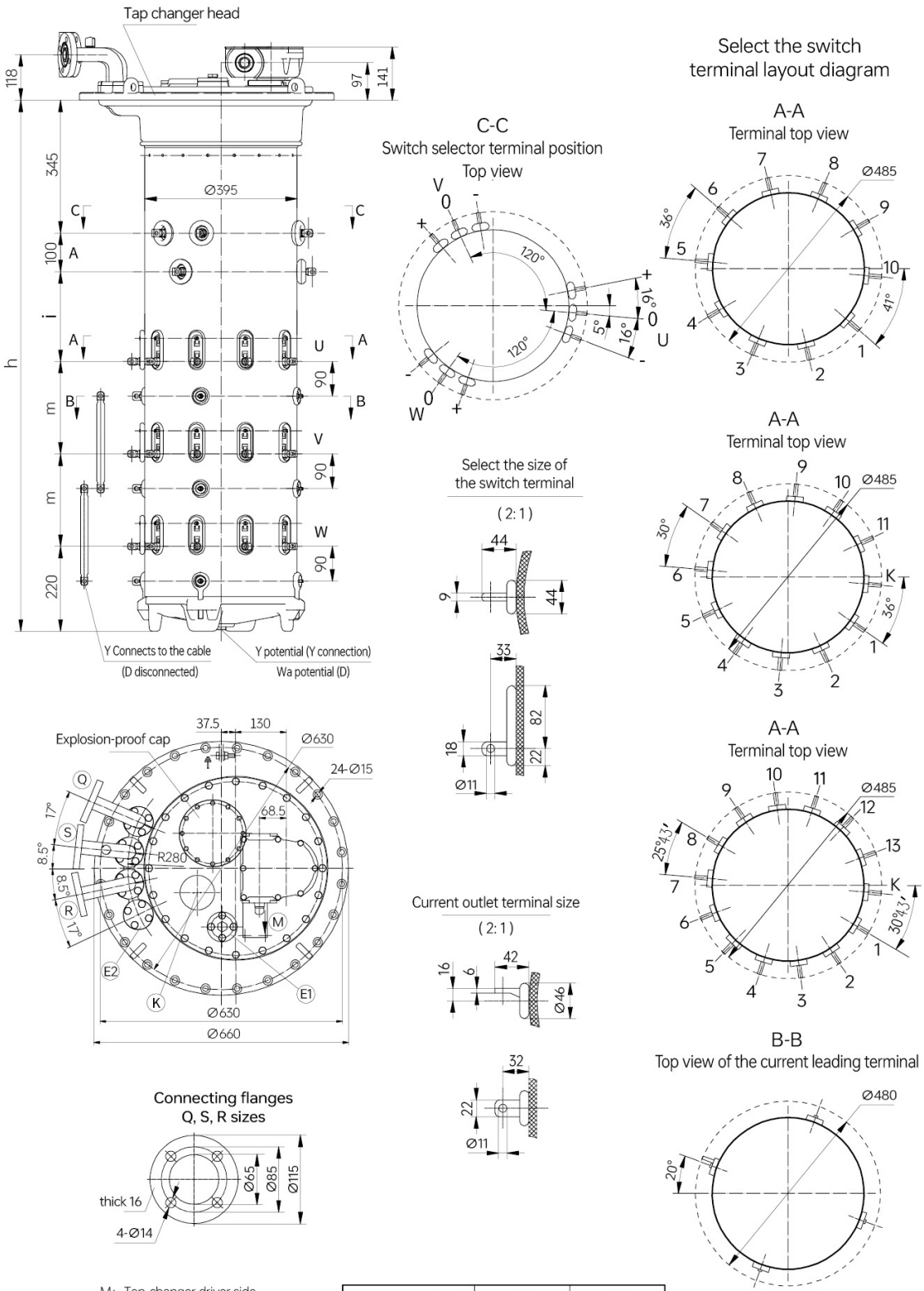
5. HV1 outline size drawing



M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Suction tubing joint

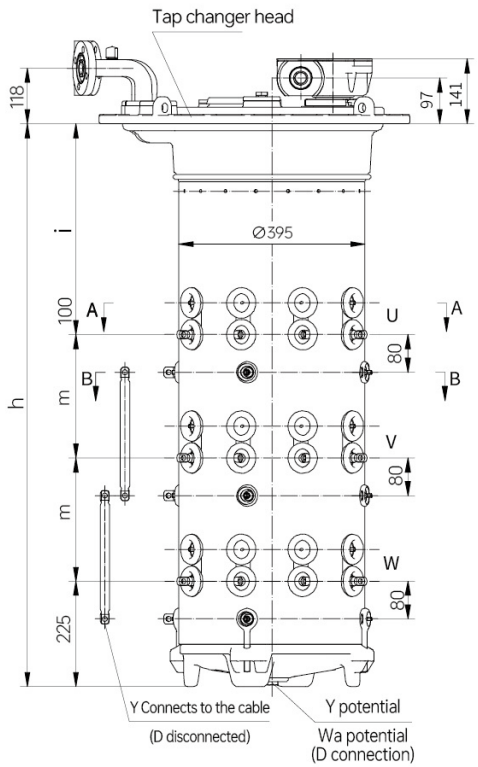
Maximum operating voltage (kV)		40.5		72.5	
Tap-changer connection mode		y-joint	d-joint	y-joint	d-joint
Size mm	h	1148	1388	1148	1508
	i	448	448	448	488
	m	240	360	240	400

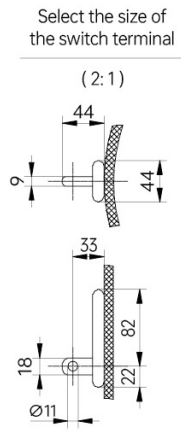
Figure 1 HV1 III350 linear modulation

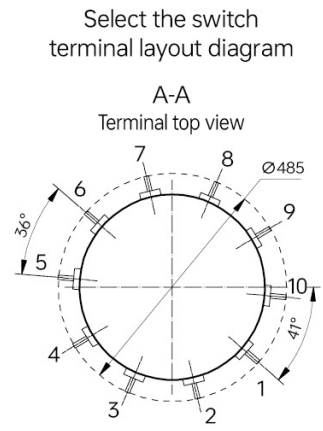


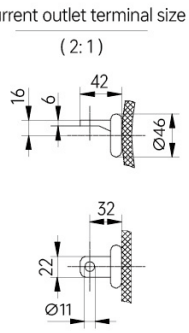
Maximum operating voltage (kV)		40.5		72.5	
Tap-changer connection mode		y-joint	d-joint	y-joint	d-joint
Size mm	h	1378	1618	1378	1732
	i	233	233	233	267
	m	240	360	240	400

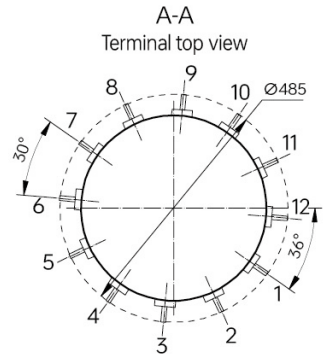
Figure 1 HV1 III350 positive and negative tones/coarse and fine tones

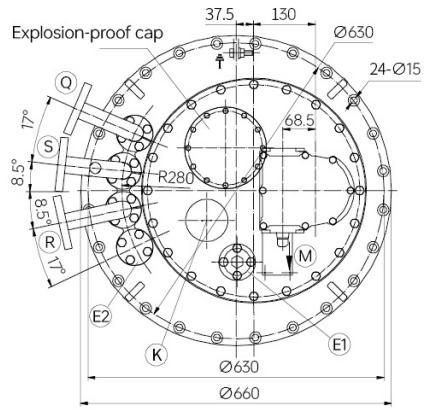


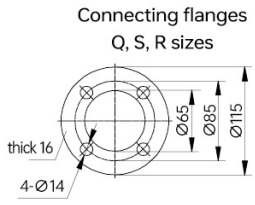


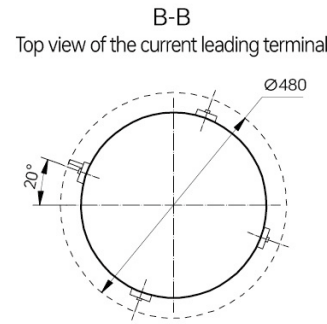








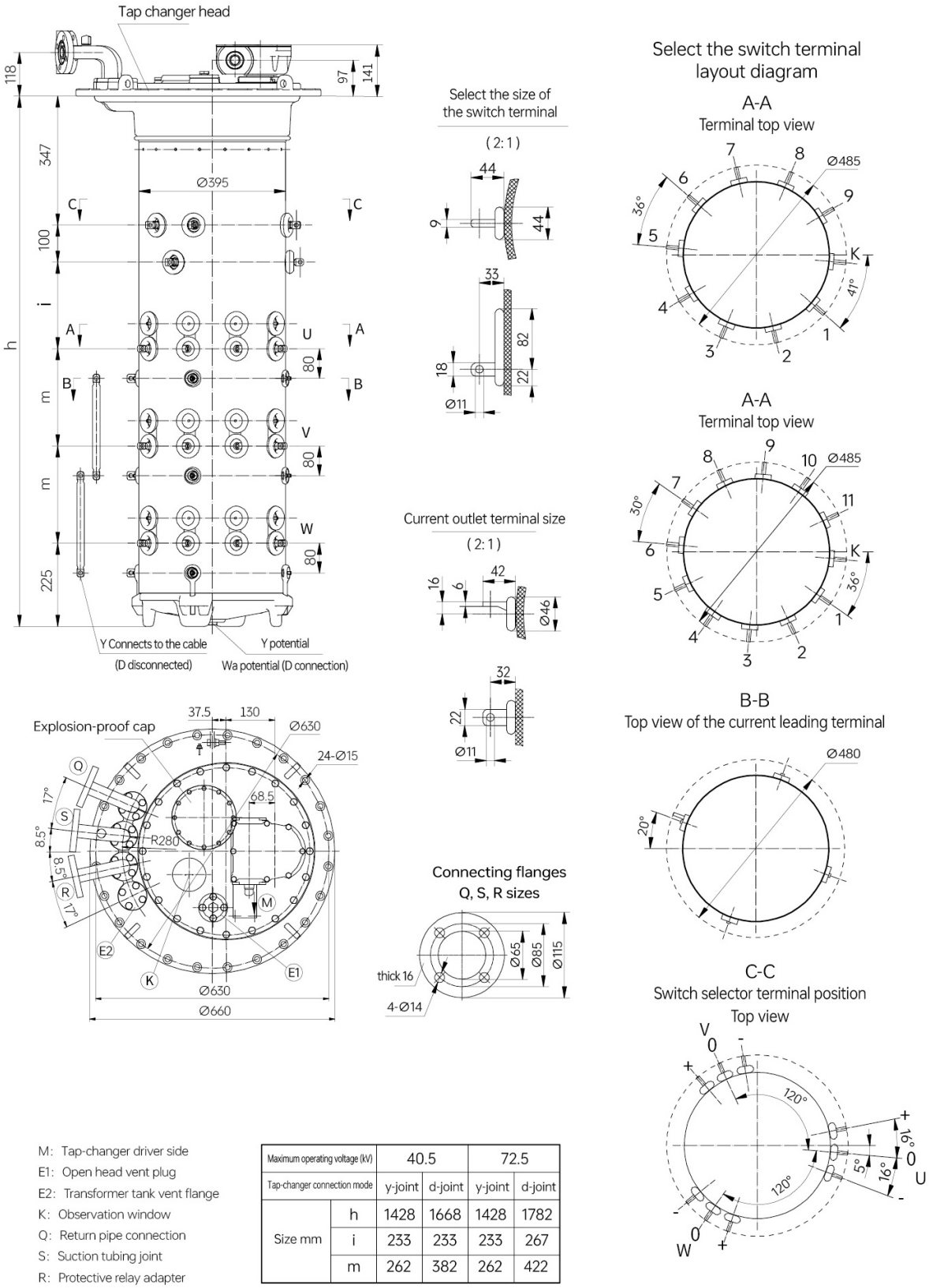




M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Protective relay adapter

Maximum operating voltage (kV)		40.5		72.5	
Tap-changer connection mode		y-joint	d-joint	y-joint	d-joint
Size mm	h	1196	1436	1196	1556
	i	448	448	488	488
	m	262	382	262	422

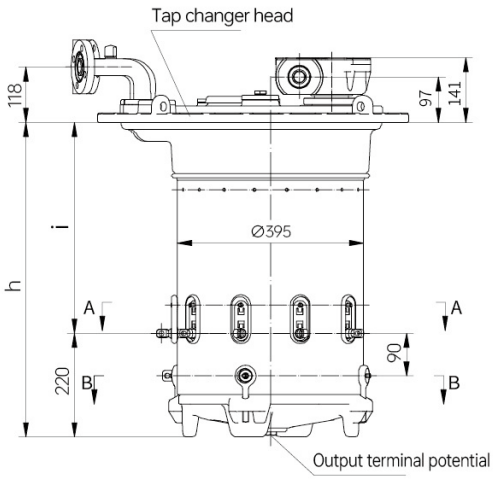
Figure 1 HV1 III500 linear modulation

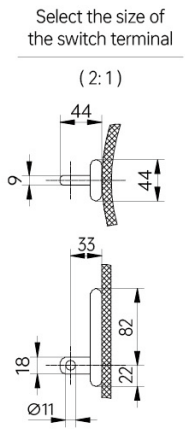


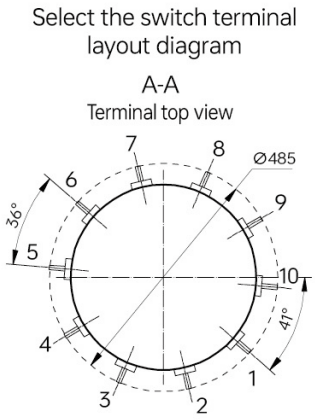
M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Protective relay adapter

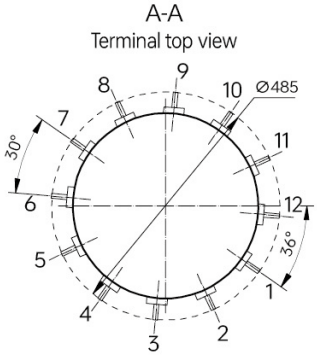
Maximum operating voltage (kV)		40.5		72.5	
Tap-changer connection mode		y-joint	d-joint	y-joint	d-joint
Size mm	h	1428	1668	1428	1782
	i	233	233	233	267
	m	262	382	262	422

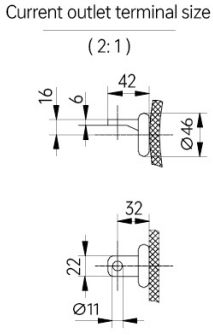
Figure 1 HV1 III500 positive and negative tones/coarse and fine tones

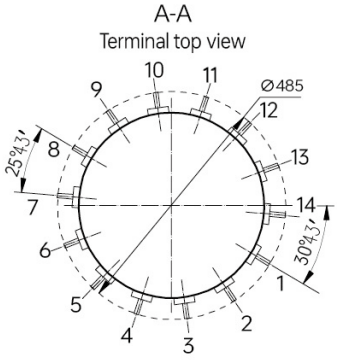


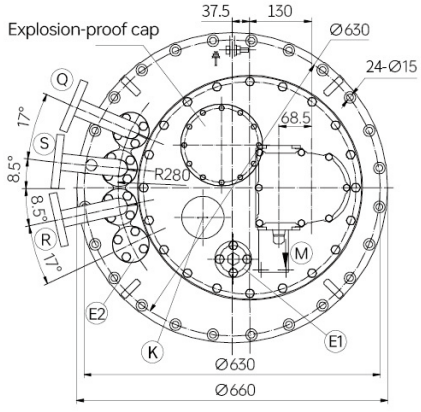


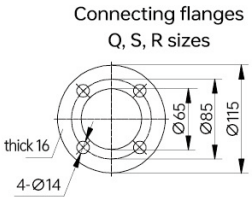


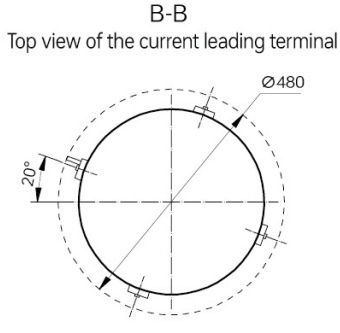








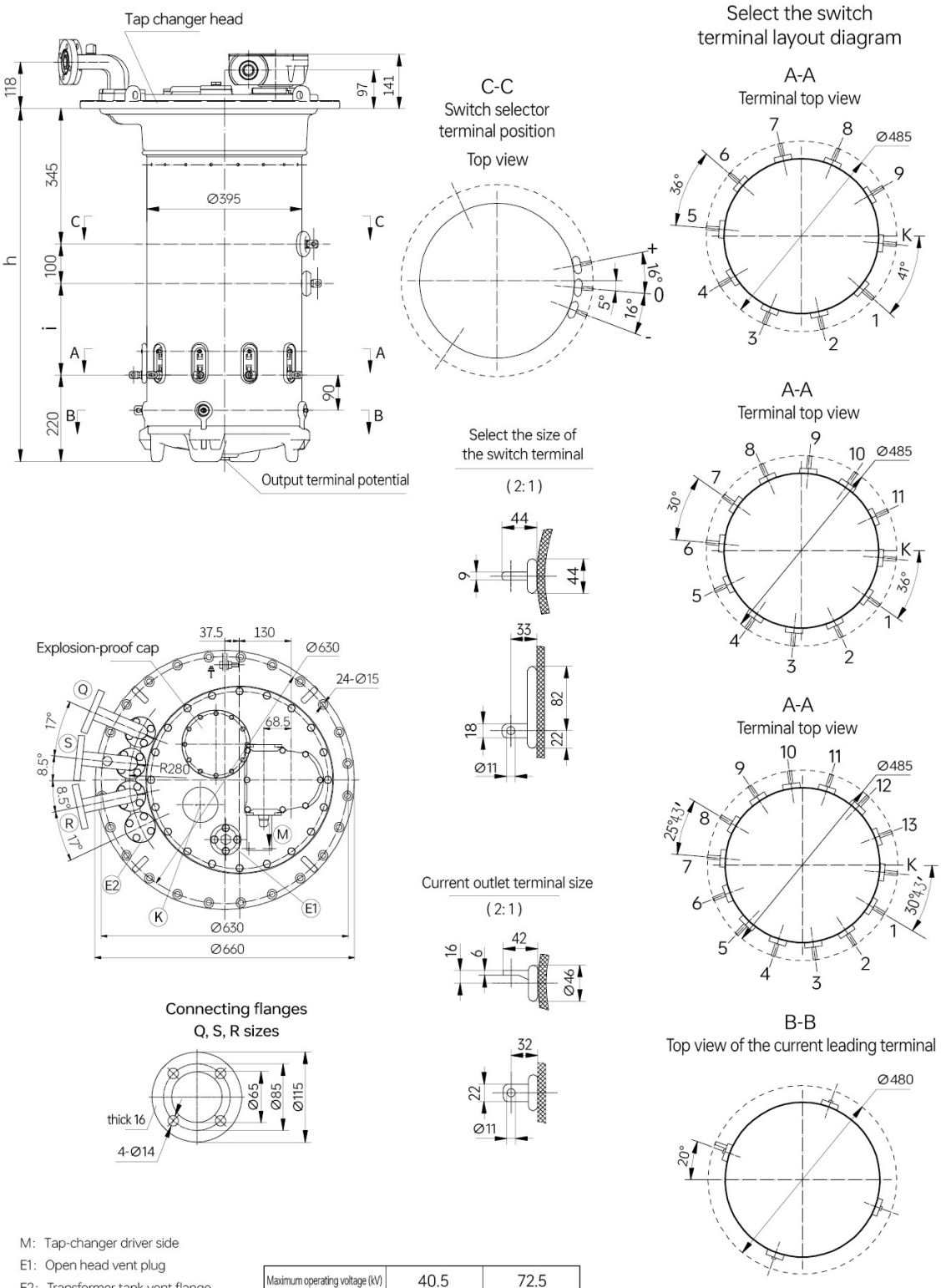




M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Protective relay adapter

Maximum operating voltage (kV)		40.5	72.5
Size mm	h	668	
	i	220	

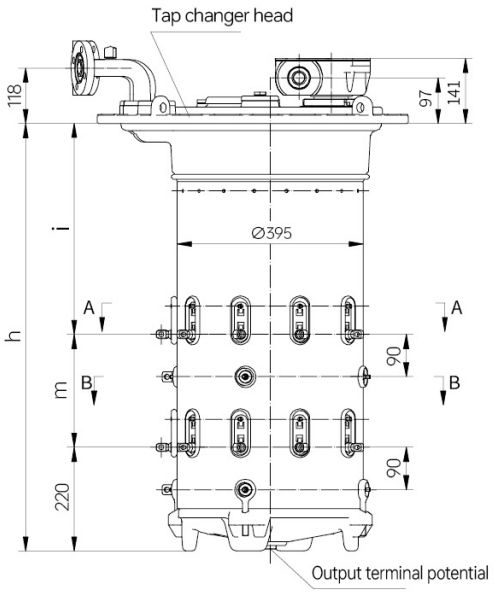
Figure 1 HV1 I 350 linear modulation

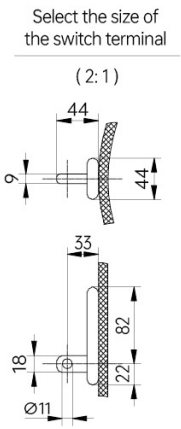


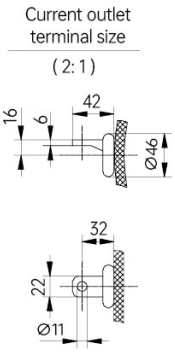
M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Protective relay adapter

Maximum operating voltage (kV)		40.5	72.5
Size mm	h	898	
	i	233	

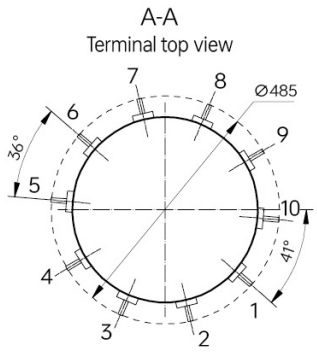
Figure 1 HV1 I 350 positive and negative tones/coarse and fine tones

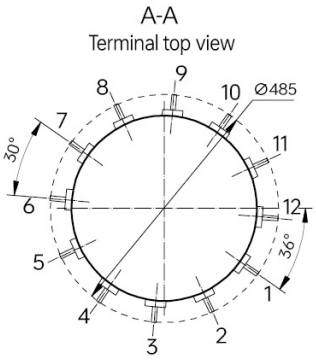


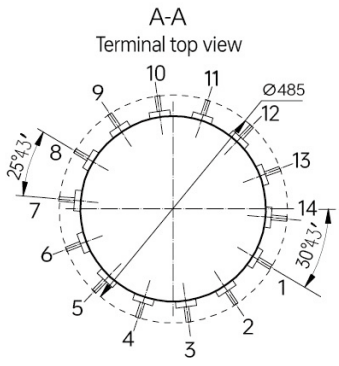


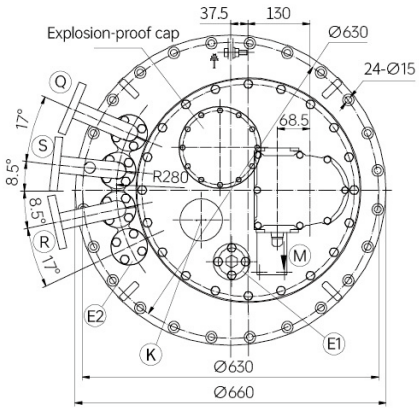


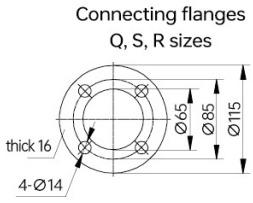
Select the switch terminal layout diagram



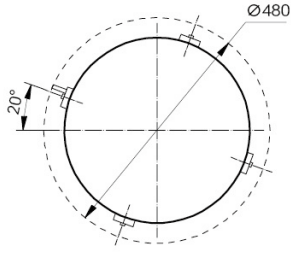








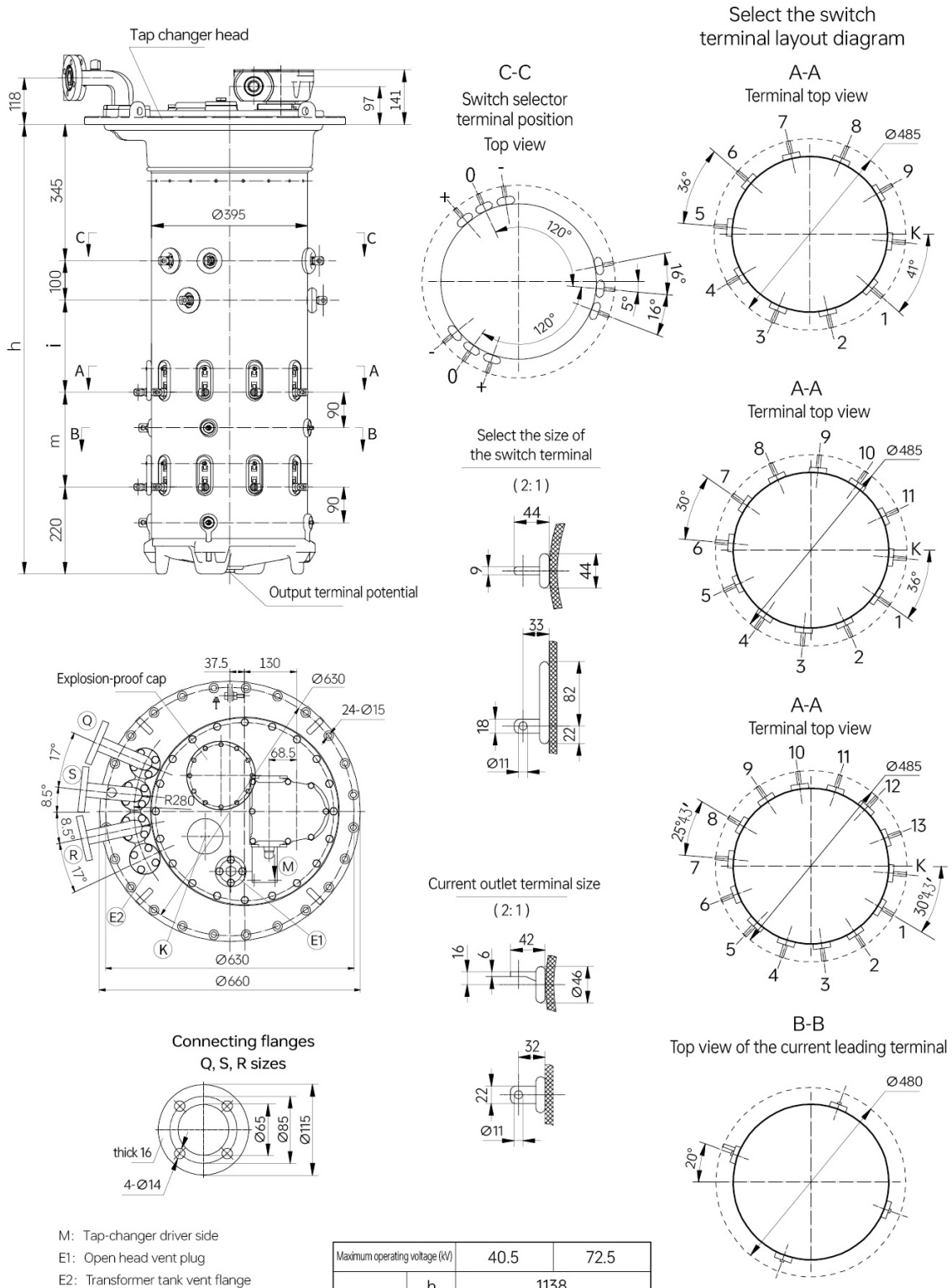
B-B
Top view of the current leading terminalv



M: Tap-changer driver side
E1: Open head vent plug
E2: Transformer tank vent flange
K: Observation window
Q: Return pipe connection
S: Suction tubing joint
R: Protective relay adapter

Maximum operating voltage (kV)		40.5	72.5
Size mm	h	908	
	i	448	
	m	240	

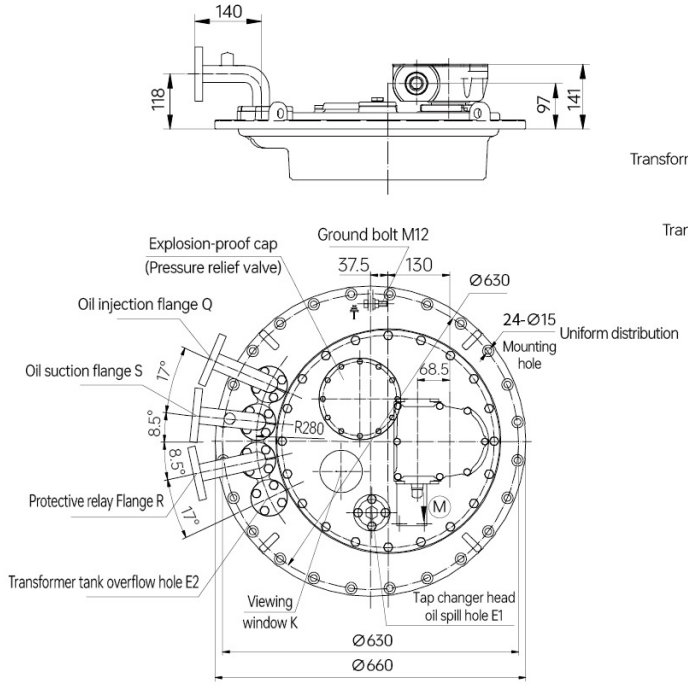
Figure 1 HV1 I 700 linear tone

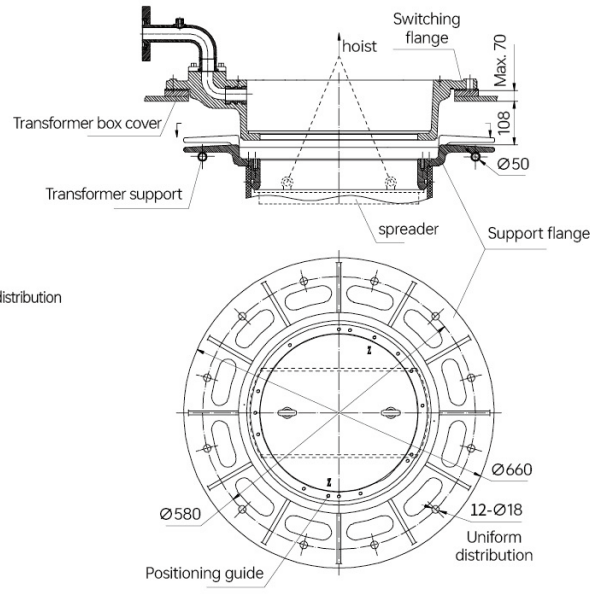


Maximum operating voltage (kV)		40.5	72.5
Size mm	h	1138	
	i	448	
	m	240	

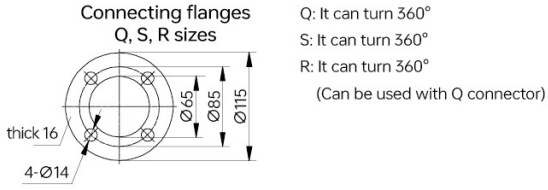
Figure 1 HV1 I 700 positive and negative tones/coarse and fine tones

6. HV1 installation size diagram

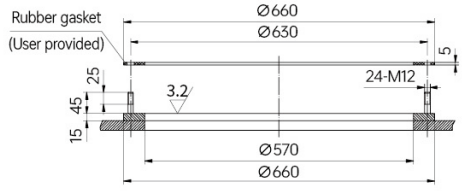




HV1 bell mounted size



HV1 head mounting dimensions



Transformer box cover mounting flange dimensions

7. HV1 head cover layout

In order to meet user requirements, when ordering the HV1 switch head cover, please select the appropriate head cover layout, if the user does not choose to determine, then according to Figure A production. In case of special Angle, please give the solution supplier's confirmation when ordering.

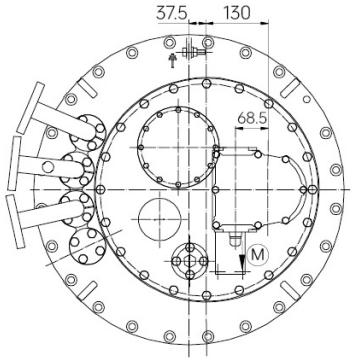
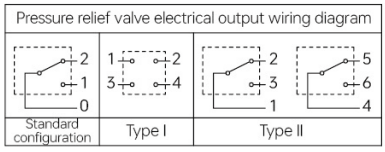
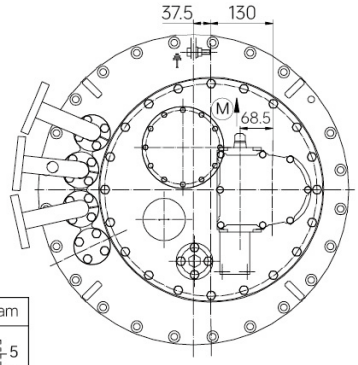


Figure A

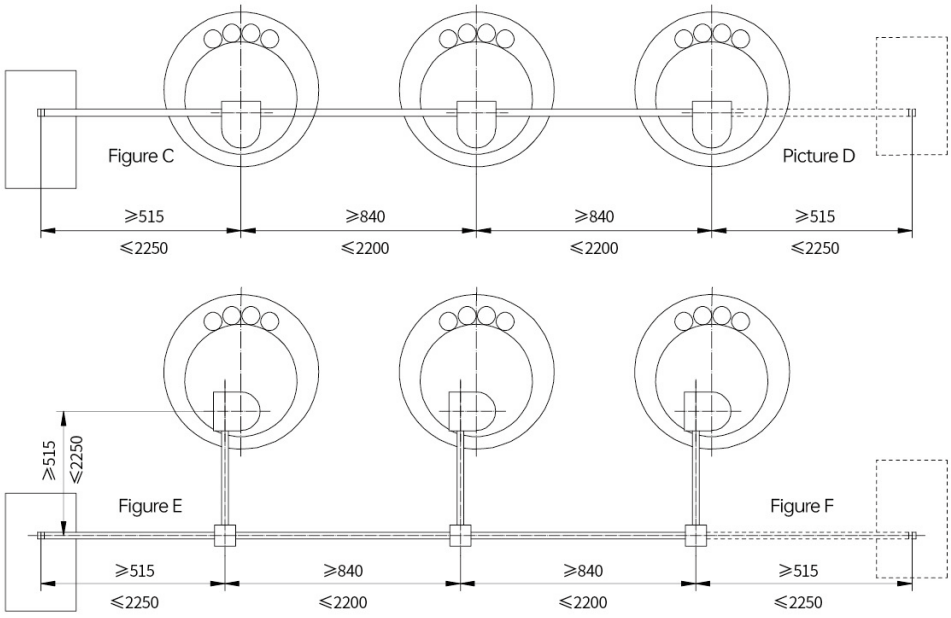




Picture B

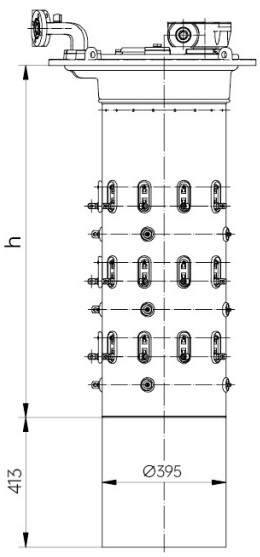
8. HV1 three mechanical linkage layout

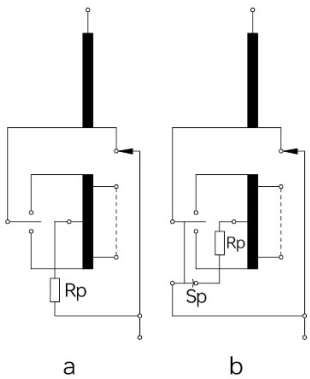
In order to facilitate the user's three mechanical linkage arrangement, HV1 three mechanical linkage gives four schemes, such as Figure C, Figure D, Figure E and Figure F, for the user's reference. If there are other layout parties, as agreed by both parties.



8. HV1 potential resistor and potential switch

The tap-changer winding is "suspended" when the tap-changer selector is in action. Because there is a coupling capacitor C between the main winding and the tap-winding, and a coupling capacitor C between the tap-winding and the box shell, the conversion selector generates spark discharge. In order to reduce the spark discharge gas, the potentiometric resistor is fixed or connected by a potentiometric resistor switch.

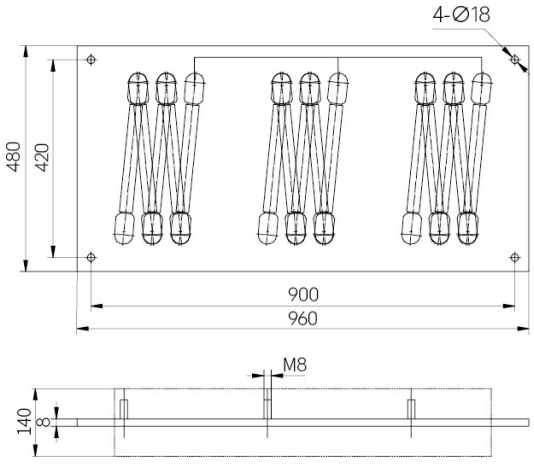




a-Solid potential resistance Rp

b-Borrow potential switch Sp fixed potential resistor Rp

Mounting dimensions of plate potential resistors



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