VOLTAGE TRANSFORMERS
12-38 kV



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SINGLE-POLE VOLTAGE TRANSFORMERS FOR INDOOR MOUNTING

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INTRODUCTION

DESCRIPTION

The transformer cores are made of high-quality cold-rolled magnetic steel sheet with an oriented crystal structure. The primary and secondary windings are cast from epoxy resin filled with quartz sand, resulting in a very solid electrical and mechanical construction.
The special winding construction design ensures an even distribution of surge overvoltages along the winding and on the surface of the insulating part of the transformer.

Due to all these properties, despite their small dimensions, these transformers perform exceptionally well when tested to withstand industrial frequency voltage and surge overvoltage. Since the core is made of high-quality magnetic steel sheet (low specific losses), there is no dangerous overheating of the transformer core, even in cases of earth faults in single-pole insulated transformers when magnetic induction is high.

Single-pole insulated voltage transformers also have an auxiliary residual winding (tertiary) for an open-delta configuration intended for earth-fault protection. When three single-pole insulated voltage transformers are connected in a star circuit in networks with isolated neutral point, their active resistance together with the resistor type ORN-* (delivered upon request) prevent ferroresonant occurrence in the transient modes of the network operation.

We make voltage transformers for all climatic conditions.

APPLICATION

Measuring voltage transformers are used to isolate measuring and protection equipment from high voltage, and to transform the voltage to a level suitable for such equipment. We manufacture single-pole and double-pole insulated voltage transformers for voltage levels up to 38 kV, designed for both indoor and outdoor installation.

VARIANTS

We manufacture transformers for both indoor and outdoor installation. For indoor applications, there are variants with high-voltage fuse holders that can be mounted directly onto the transformer. We also offer switchable (reconnectable) transformer models, which can be used in both 10 kV and 20 kV voltage networks by means of a special switching plate of their primary windings.

HANDLING AND MAINTENANCE

Regular maintenance is not required for these transformers. From time to time, the transformers should be cleaned, especially if they operate in aggressive or dirty environments. Ensure the transformers are de-energized before cleaning them. In the event of any major faults or failures within the installation, the transformers should be inspected to verify that they remain in proper working order.

ACCURACY CLASS SELECTION

The accuracy class of a voltage transformer should be selected according to its intended purpose:

- **Class 0.1**: for high-precision laboratory measurements and calibration;

- **Class 0.2**: for laboratory measurements and testing facilities, for high-precision power measurements in operational settings, and for measuring electricity consumption for billing purposes for large-scale consumers;

- **Class 0.5**: for operational voltage and power measurements, for measuring electricity consumption, and for supplying auxiliary relays;

- **Class 1**: for applications requiring a high rated power of the transformer, not necessarily requiring high-precision measuring.

CONSUMPTION DATA FOR CONNECTING CABLES USED TO DETERMINE THE RATED POWER OF INSTRUMENT TRANSFORMERS

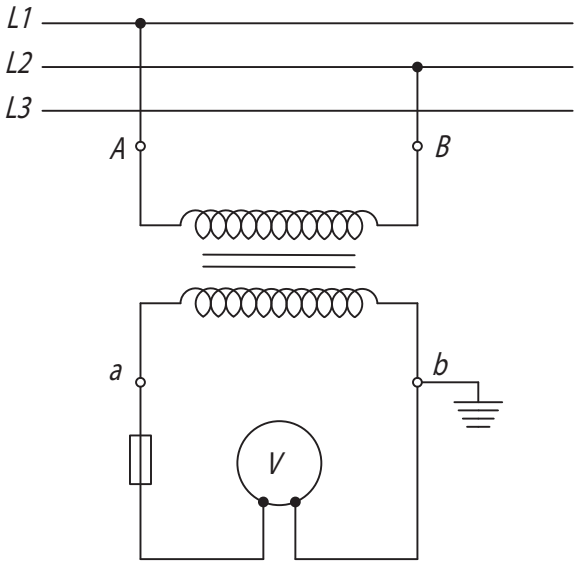
This data must be taken into account when selecting the rated output of measuring transformers, in addition to the consumption data of the connected measuring or protective devices themselves.

Consumer	Power consumption (W/m)
Cu conductor 1m 2,5mm^2 at 5A	0.18
Cu conductor 1m 4mm^2 at 5A	0.11
Cu conductor 1m 2,5mm^2 at 1A	0.007
Cu conductor 1m 4mm^2 at 1A	0.0044

VOLTAGE TRANSFORMERS IN A THREE-PHASE SYSTEM

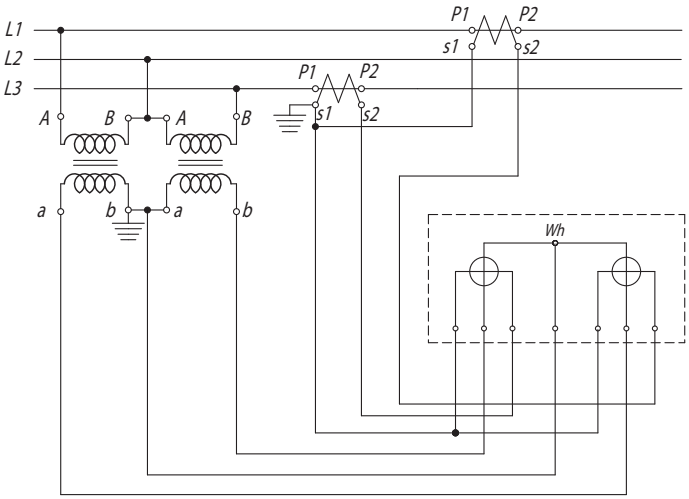
1. A double-pole insulated voltage transformer

is used for connecting voltmeters, frequency meters, synchroscopes, certain types of relays, and similar equipment. It is applied whenever it is necessary to supply power to instruments and devices, regardless of conditions during an earth fault.



2. Two double-pole insulated voltage transformers in a "V" connection.

This connection can be used to supply three-phase wattmeters and meters (the "Aron connection"). In the event of an earth fault, power measurement remains accurate only if the fault occurs on the middle line (L2). If the earth fault involves one of the outer lines (L1 or L3), the measurement results will be either too high or too low.



3. Star connection ("Y" connection) of 3 single-pole insulated voltage transformers for general purposes

This configuration accurately transforms all voltages of a three-phase system. The neutral point on the high-voltage side must be earthed. This connection allows for the measurement of all three phase-to-phase voltages U_{L1L2}, U_{L2L3}, U_{L1L3}, as well as all three phase-to-earth voltages.

In normal operating conditions, the voltage transformer functions at an induction level of 0.8–0.9 T.
In the event of a single-pole earth fault on line L2, the primary winding of the middle voltage transformer becomes short-circuited, while the voltages on the two outer transformers increase by a factor of √3. Their induction levels increase accordingly. The tertiary windings of the three voltage transformers (100/3 V) are connected in an "open delta" configuration.
Under normal operating conditions, there is a negligible voltage across the terminals of the open delta. In the event of a direct earth fault on one of the lines of the three-phase system, the voltage across the open delta terminals rises to 100 V.

Measuring instruments built for phase-to-phase voltage (voltmeter, frequency meter, power-meter, two-system electricity meters, relays, etc.) are connected between the secondary terminals (a and b).

Voltmeters, earth-fault signalizing relays, three-system power meters, three-system electricity meters have to be connected between the secondary terminal (a) and the earth-connected neutral point (n). Three-system instruments measure accurately even in the event of an earth fault on any phase line.

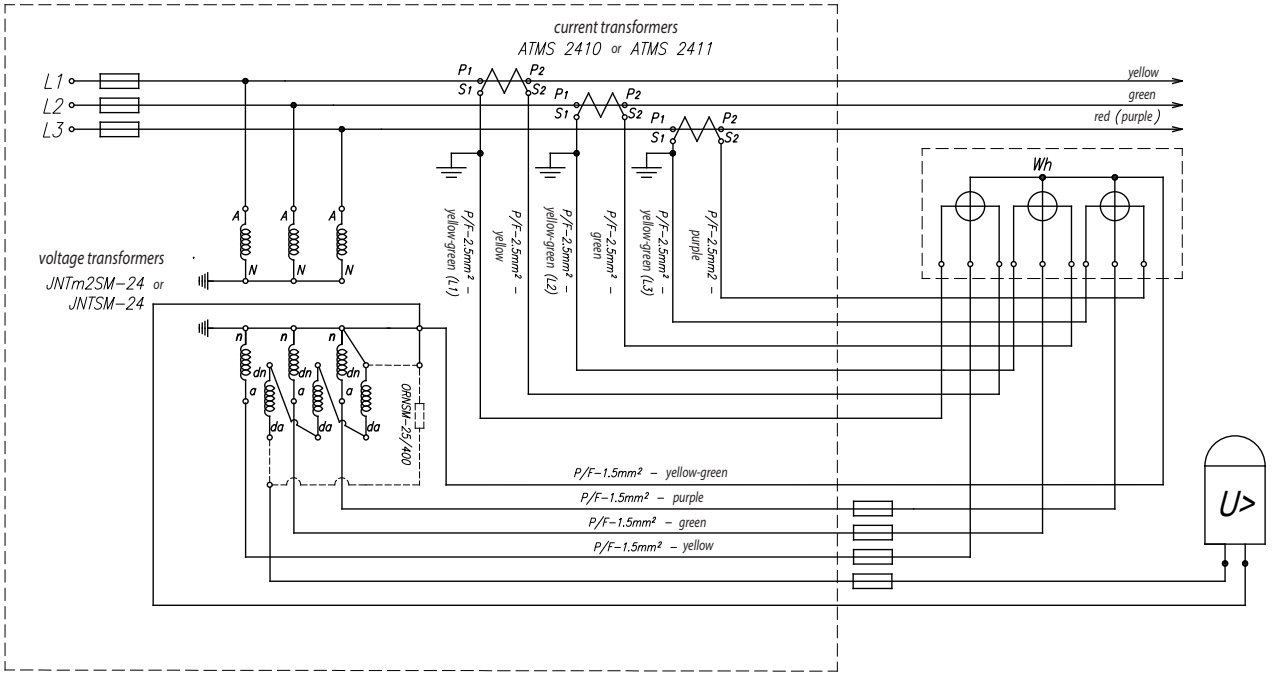
INSTALLATION

Epoxy-insulated voltage transformers can be mounted in any position.

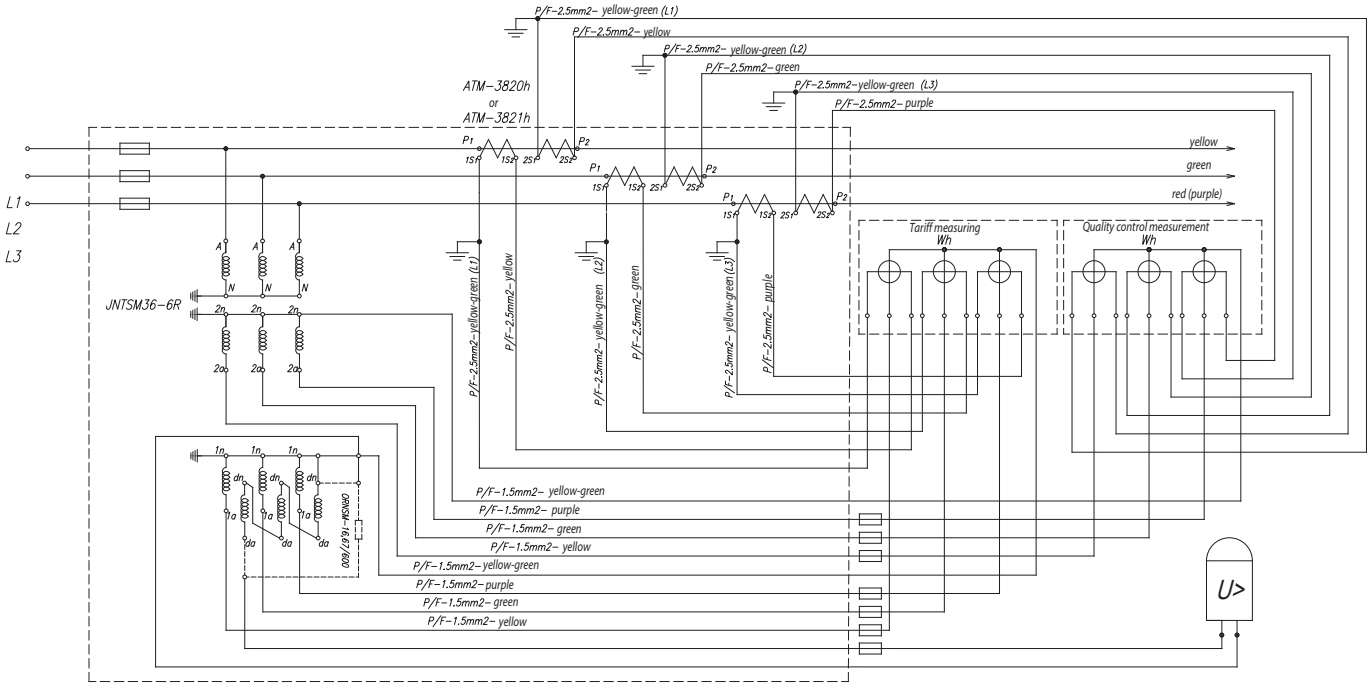
The primary winding of double-pole insulated voltage transformers must be connected between two phases, whereas for single-pole insulated voltage transformers, the primary terminals are connected between a phase and earth.

In the open-delta circuit for voltage levels of 12 kV and 24 kV, a resistor of 25 Ω, 400 W or of higher values should be installed for JNT single-pole voltage transformers (for the voltage level of 38 kV, the values should be at least 16.7 Ω, 600 W).

CONTENTS



Three-system measurement scheme for 10 kV and 20 kV voltage level networks



Three-system measurement scheme for 35 kV voltage level networks

For REL-10 and REL-20 type transformers, a 50 Ω, 200 W resistor is required in the open-delta circuit. All metal parts of the transformer that are not normally live, but could become live in the event of a fault, should be grounded. The transformer is equipped with a fixing strap marked with the grounding symbol.

Depending on the measuring circuit, one secondary terminal also must be earthed. In the case of the single-pole insulated voltage transformers, the secondary terminal "n" is earthed, as well as the primary "N".

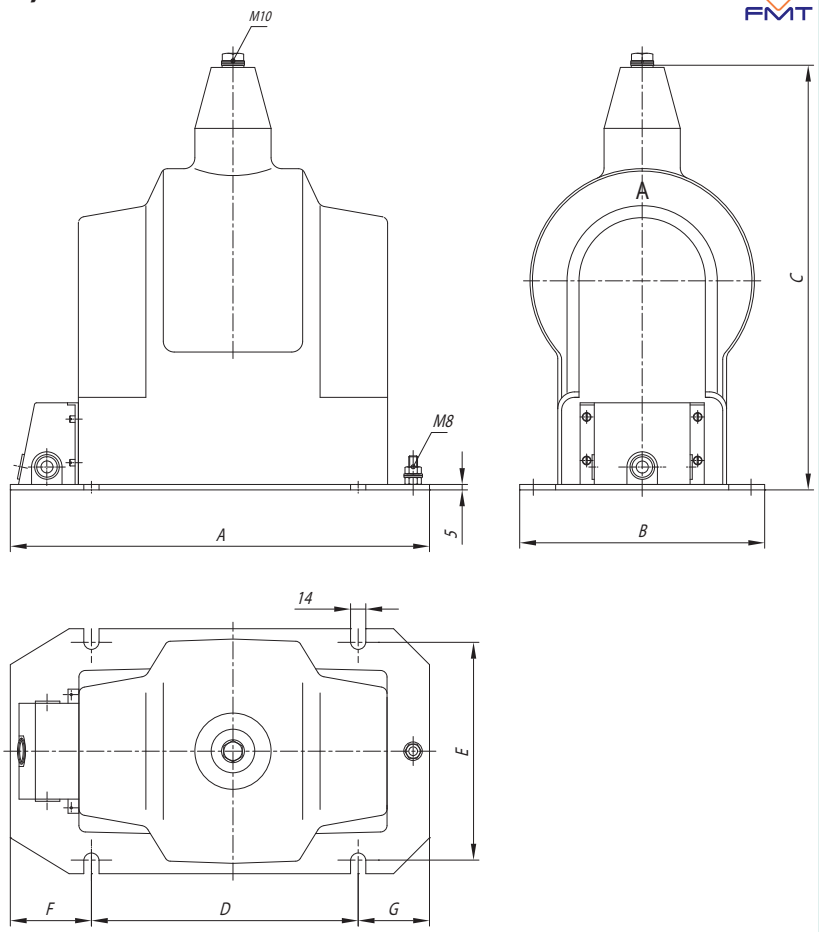
In double-pole insulated voltage transformers, the secondary terminal "b" is usually earthed. In a "V" connection of two double-pole insulated voltage transformers, the central connection which joins the secondary terminal "b" of the first transformer and the secondary terminal "a" of the second transformer is earthed according to electrical schematics on page 3. The secondary terminals of the voltage transformer in operation can stay open or loaded with large-scale consumers of high resistance (voltmeters, voltage circuits of electricity meters and relays).
The secondary terminals must never be short-circuited as this may damage the voltage transformer. For this reason, the secondary lines are secured with fuses. Earth-connected lines are not secured.

CONTENTS

JNT-12, JNT-24, JNT-24/12, JNT-36



JNT-12



SINGLE-POLE VOLTAGE TRANSFORMERS FOR INDOOR MOUNTING **JNT-***

Type of transformer	Dimensions (mm)						
	A	B	C	D	E	F	G
JNT-12	355	180	245	190	155	93	72
JNT-24	375	200	298	210	175	93	72
JNT-24/12	375	200	298	210	175	93	72
JNT-36	385	225	389	245	200	74.5	65.5

TECHNICAL DATA	JNT-12	JNT-24	JNT-24/12	JNT-36
Rated primary voltage (kV)	10/√3	20/√3	20/√3//10/√3	35/√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	24	38(36)
Rated secondary voltage (V)	100/√3 or 110/√3			
Rated tertiary voltage (V)	100/3 or 110/3			
Rated power-frequency withstand voltage (kV)	28	50	50	70
Rated impulse voltage 1.2/50 μs (kV)	75	125	125	170
Rated frequency (Hz)	50/60			
Maximal rated power for accuracy class 0.2 (VA)	25	30	30/10	30
Maximal rated power for accuracy class 0.5 (VA)	75	75	75/25	100
Maximal rated power for accuracy class 1 (VA)	150	150	150/50	200
Rated tertiary power (VA)	25; 50; 100			
Rated tertiary accuracy class	3P; 6P			
Rated voltage factor	1.9/8h			
Additional resistance in the tertiary circuit (W)	25	25	25	16.5
Limiting thermal power (VA)	600	600	600/300	800
Mass (kg)	24.6	31.5	32.5	41
Temperature insulation class	E/B			
Type of basic insulation	Epoxy resin			
Valid standards	IEC 61869-1; IEC 61869-3;			

NOTE:

We can also produce these transformers for the following rated primary voltages: 3/√3; 5/√3; 6/√3; 15/√3; 17.5/√3; 25/√3 and 33/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

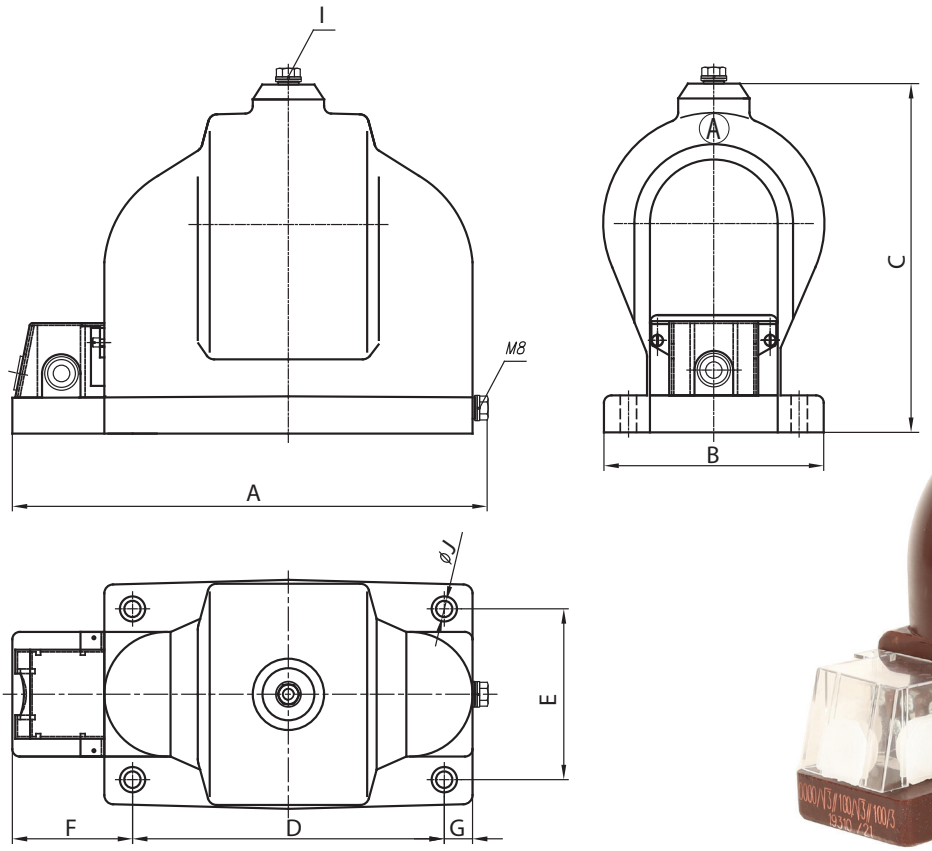
In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

We reserve the right to make changes.

CONTENTS

JNT-10, JNT-10U, JNT-20U, JNT-30U





JNT 10

SINGLE-POLE VOLTAGE TRANSFORMERS OF REDUCED RATED POWER AND DIMENSIONS FOR INDOOR MOUNTING
JNT-10, JNT-10U, JNT-20U, JNT-30U

TECHNICAL DATA	JNT-10	JNT-10U	JNT-20U	JNT-30U
Rated primary voltage (kV)	10/√3	10/√3	20/√3	35/√3
Highest voltage for equipment (r.m.s.) (kV)	12	12	24	36 (42)
Rated secondary voltage (V)	100/√3 or 110/√3			
Rated tertiary voltage (V)	100/3 or 110/3			
Rated power-frequency withstand voltage (kV)	28	28 (42)	50 (65)	70 (95)
Rated impulse voltage1.2/50 μs (kV)	75	75	125	170 (190)
Rated frequency (Hz)	50/60			
Maximal rated power for accuracy class 0.2 (VA)	15	30	30	30
Maximal rated power for accuracy class 0.5 (VA)	50	75	75	75
Maximal rated power for accuracy class 1 (VA)	100	150	150	150
Rated tertiary power (VA)	25; 50; 100	10-50	10-50	10-50
Rated tertiary accuracy class	3P; 6P	3P; 6P	3P; 6P	3P; 6P
Rated voltage factor	1.9/8h	1.9/8h	1.9/8h	1.9/8h
Additional resistance in the tertiary circuit (W)	25	25	25	25
Limiting thermal power (VA)	400	600	600	800
Mass (kg)	17	30	43	60
Temperature insulation class	E/B			
Type of basic insulation	Epoxy resin			
Valid standards	IEC 61869-1; IEC 61869-3	IEC 61869-1; IEC 61869-3; GOST 1983		

Type of transformer	Dimensions (mm)								
	A	B	C	D	E	F	G	I	J
JNT-10	320	148	237	210	115	81	19	M8	11
JNT-10U	275	220	251	215	180	30	30	M10	13
JNT-20U	315	242	290	240	207	37.5	37.5	M10	13
JNT-30U	415	250	390	300	225	90	25	M10	13

NOTE:

We can also produce these transformers for the following rated primary voltages: 3/√3; 5/ √3; 6/√3; 15/√3; 17.5/√3; 25/√3 and 33/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

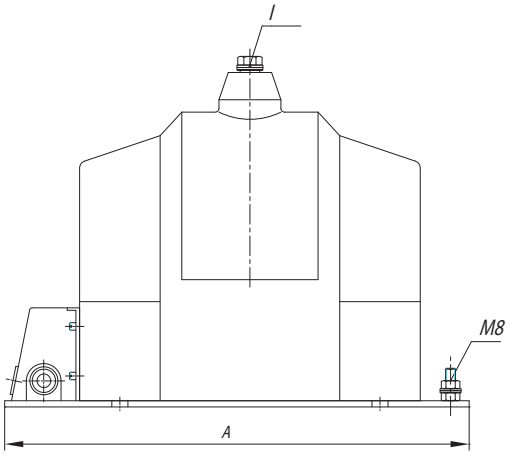
In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

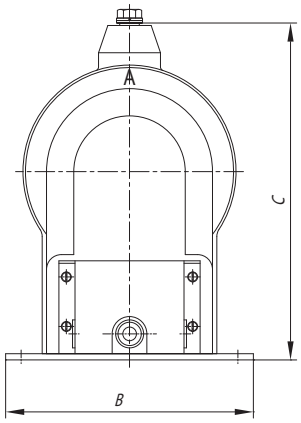
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

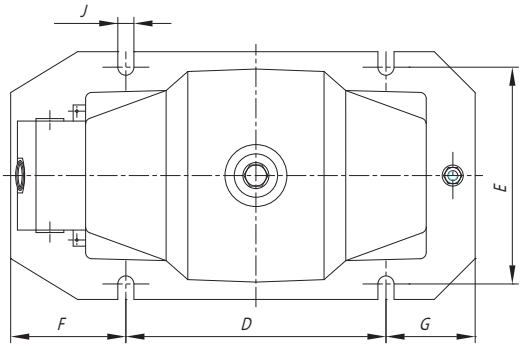
We reserve the right to make changes.

CONTENTS

JNT-10d, JNTm2-24, JNTm2-24/12









JNTm2-24

SINGLE-POLE VOLTAGE TRANSFORMERS OF REDUCED RATED POWER AND DIMENSIONS FOR INDOOR MOUNTING
JNT-10d, JNTm2-24, JNTm2-24/12

Type of transformer	Dimensions (mm)								
	A	B	C	D	E	F	G	I	J
JNT-10d	340	148	220	270	125	53	17	M10	11
JNTm2-24	355	178	271	280	150	53	22	M10	14
JNTm2-24/12	355	178	271	280	150	53	22	M10	14

TECHNICAL DATA	JNT-10d	JNTm2-24	JNTm2-24/12
Rated primary voltage (kV)	10/√3	20/√3	20/√3//10/√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	24
Rated secondary voltage (V)	100/√3 or 110/√3		
Rated tertiary voltage (V)	100/3 or 110/3		
Rated power-frequency withstand voltage (kV)	28	50	50
Rated impulse voltage 1.2/50 μs (kV)	75	125	125
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	15	15	-
Maximal rated power for accuracy class 0.5 (VA)	50	50	50/15
Maximal rated power for accuracy class 1 (VA)	100	100	75/25
Rated tertiary power (VA)	25; 50; 100		
Rated tertiary accuracy class	3P; 6P		
Rated voltage factor	1.9/8h		
Additional resistance in the tertiary circuit (W)	25	25	25
Limiting thermal power (VA)	400	400	400/200
Mass (kg)	21	27	27
Temperature insulation class	E/B		
Type of basic insulation	Epoxy resin		
Valid standards	IEC 61869-1; IEC 61869-3		

NOTE:

We can also produce these transformers for the following rated primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/√3 and 22/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

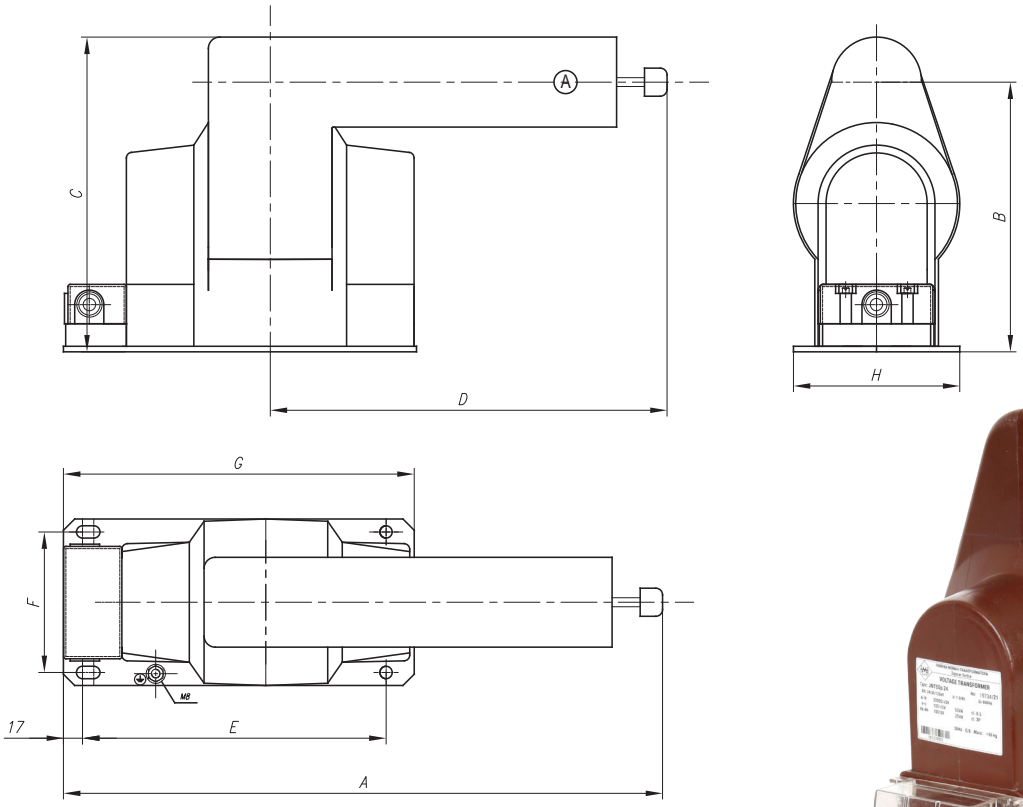
In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

We reserve the right to make changes.

CONTENTS

JNT SOP-12, JNT SOP-24, JNT SOP-24/12



JNT SOP-24



SINGLE-POLE VOLTAGE TRANSFORMERS FOR INDOOR MOUNTING WITH REDUCED POWER AND FUSES **JNT SOP***

Type of transformer	Dimensions (mm)							
	A	B	C	D	E	F	G	H
JNT SOP-12	533	240	280	353	270	125	312	148
JNT SOP-24	606	300	340	416	275	130	325	164
JNT SOP-24/12	606	300	340	416	275	130	325	164

TECHNICAL DATA	JNT SOP-12	JNT SOP-24	JNT SOP-24/12
Rated primary voltage (kV)	10/√3	20/√3	20/√3//10//√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	24
Rated secondary voltage (V)	100/√3 or 110/√3		
Rated tertiary voltage (V)	100/3 or 110/3		
Rated power-frequency withstand voltage (kV)	28	50	50
Rated impulse voltage1.2/50 μs (kV)	75	125	125
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	25	30	30/10
Maximal rated power for accuracy class 0.5 (VA)	75	75	75/25
Maximal rated power for accuracy class 1 (VA)	150	150	150/50
Rated tertiary power (VA)	25; 50; 100		
Rated tertiary accuracy class	3P; 6P		
Rated voltage factor	1.9/8h		
Additional resistance in the tertiary circuit (W)	25	25	25
Limiting thermal power (VA)	600	600	600/300
Mass (kg)	23	29	30.5
Temperature insulation class	E/B		
Type of basic insulation	Epoxy resin		
Valid standards	IEC 61869-1; IEC 61869-3		

NOTE:

JNT SOP transformers are designed for indoor mounting and are suitable for installation in smaller cells up to voltage level of 24 kV. They have fuse enclosures on the high-voltage side. Along with the transformer, we supply the corresponding fuse cartridges, which are extremely easy to assemble and disassemble.

We can also produce these transformers for primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/ √3 and 22/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

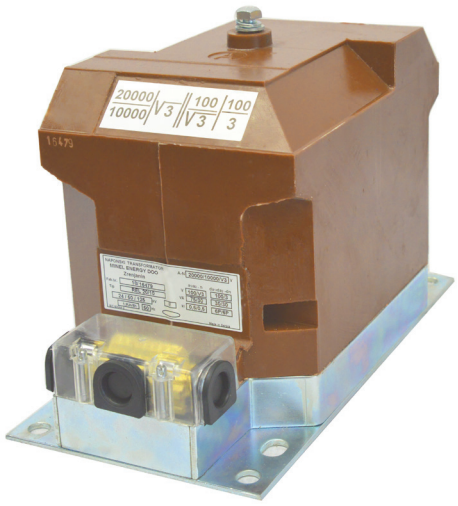
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When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

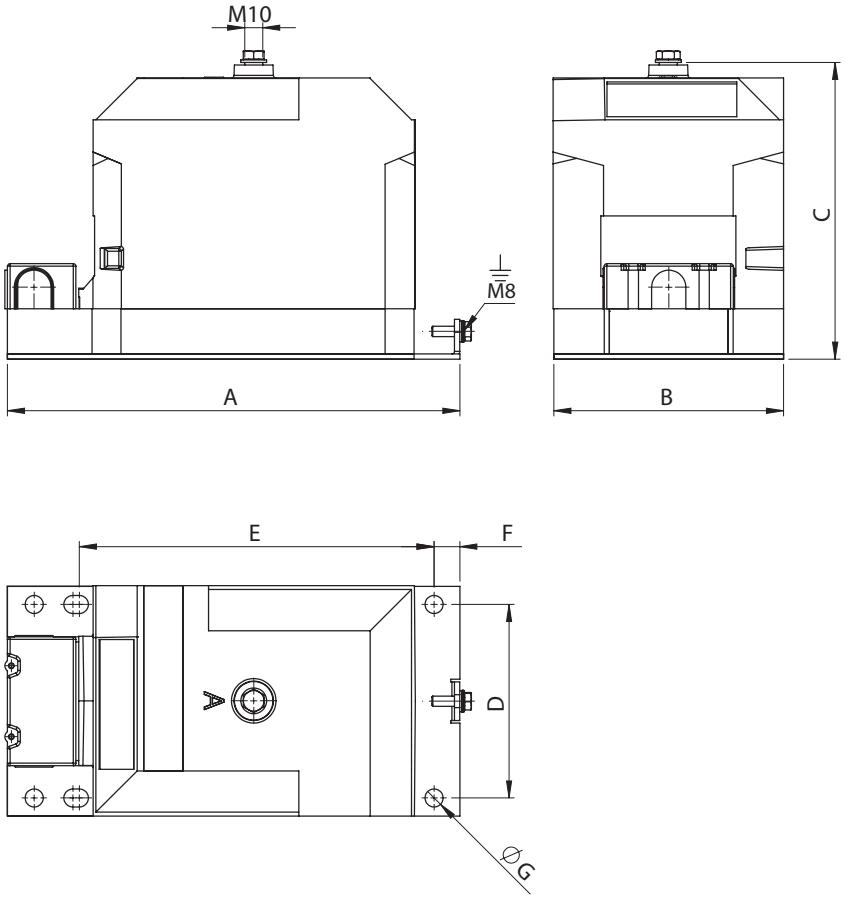
We reserve the right to make changes.

CONTENTS

REL 10, REL 20 and REL 20/10



REL-20



SINGLE-POLE VOLTAGE TRANSFORMERS 12-24 kV OF REDUCED DIMENSIONS - BLOCK TYPE **REL***

Type of transformer	Dimensions (mm)							Mass (kg)
	A	B	C	D	E	F	G	
REL 10	325	148	200	125	260	15	11	~18.5
REL 20	351	178	230	150	275	20	14	~25
REL 20/10	351	178	230	150	275	20	14	~25

TECHNICAL DATA	REL 10	REL 20	REL 20/10
Rated primary voltage (kV)	10/√3	20/√3	20/√3//10/√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	24
Rated secondary voltage (V)	100/√3 or 110/√3		
Rated tertiary voltage (V)	100/3 or 110/3		
Rated power-frequency withstand voltage (kV)	28 (42)	50 (65)	50 (65)
Rated impulse voltage 1.2/50 μs (kV)	75	125	125
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	15	15	10(5)
Maximal rated power for accuracy class 0.5 (VA)	50	50	30(15)
Maximal rated power for accuracy class 1 (VA)	100	120	120(50)
Rated tertiary power (VA)	10-50		
Rated tertiary accuracy class	3P; 6P		
Rated voltage factor	1.9/8h		
Additional resistance in the tertiary circuit (W)	40	40	40
Limiting thermal power (VA)	400	400	400/200
Temperature insulation class	E		
Type of basic insulation	Epoxy resin		
Valid standards	IEC 61869-1; IEC 61869-3 (ГОСТ 1983)		

NOTE:

We can also produce these transformers for primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/√3 and 22/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

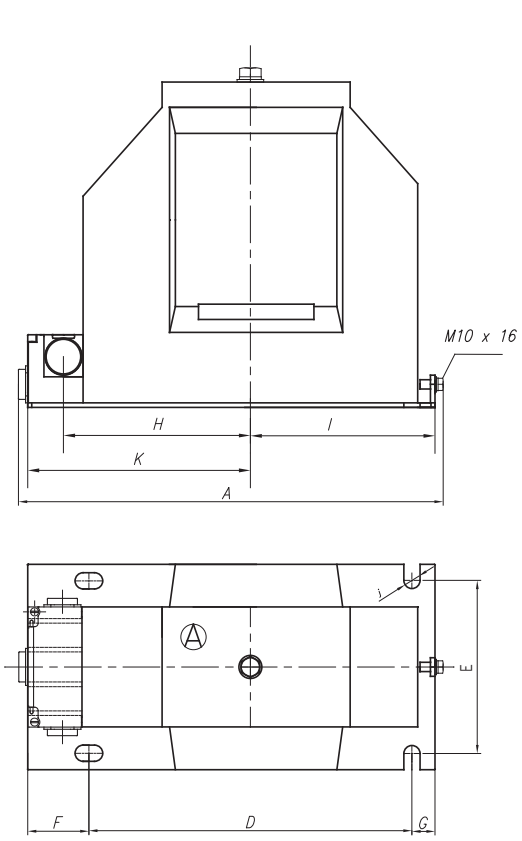
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We reserve the right to make changes.

CONTENTS

JNT-12z, JNT-12d, JNT-24z, JNT-24d, JNT-24/12z, JNT-24/12d





JNT-12z

SINGLE-POLE VOLTAGE TRANSFORMERS 12-24 kV REDUCED DIMENSIONS - BLOCK TYPE **JNT***

Type of transformer	Dimensions (mm)										
	A	B	C	D	B	F	G	H	I	K	j
JNT-12z	348	148	234	270	125	48	15	152	150	183	Ø12,Ø14
JNT-12d	358	148	234	275	125	55	15	162	150	195	Ø12,Ø14
JNT-24z	368	178	293	280	150	53	20	162	160	193	Ø12,Ø14
JNT-24d	392	178	293	275	150	70	32	174	172	205	Ø12,Ø14
JNT-24/12z	368	178	293	280	150	53	20	162	160	193	Ø12,Ø14
JNT-24/12d	392	178	293	275	150	70	32	174	172	205	Ø12,Ø14

TECHNICAL DATA	JNT-12z	JNT-12d	JNT-24z	JNT-24d	JNT-24/12z	JNT-24/12d
Rated primary voltage (kV)	10/√3	10/√3	20/√3	20/√3	20/√3//10/√3	20/√3//10/√3
Highest voltage for equipment (r.m.s.) (kV)	12	12	24	24	24	24
Rated secondary voltage (V)	100/√3 or 110/√3					
Rated tertiary voltage (V)	100/3 or 110/3					
Rated power-frequency withstand voltage (kV)	28	28	50	50	50	50
Rated impulse voltage1.2/50 μs (kV)	75	75	125	125	125	125
Rated frequency(Hz)	50/60					
Maximal rated power for accuracy class 0.2 (VA)	25	25	30	30	30/10	30/10
Maximal rated power for accuracy class 0.5 (VA)	75	75	75	75	75/25	75/25
Maximal rated power for accuracy class 1 (VA)	150	150	150	150	150/50	150/50
Rated tertiary power (VA)	25; 50; 100					
Rated tertiary accuracy class	3P; 6P					
Rated voltage factor	1.9/8h					
Additional resistance in the tertiary circuit (W)	25	25	25	25	25	25
Limiting thermal power (VA)	500	600	600	700	600/300	700/350
Mass (kg)	24.6	24.6	31.5	33	32.5	34.5
Temperature insulation class	E/B					
Type of basic insulation	Epoxy resin					
Valid standards	IEC61869-1; IEC61869-3, DIN 42600-9					

NOTE:

We can also produce these transformers for primary voltages:

3/√3; 5/√3; 6/√3; 11/√3; 15/√3 and 22/√3 kV.

At the customer's request, we can produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

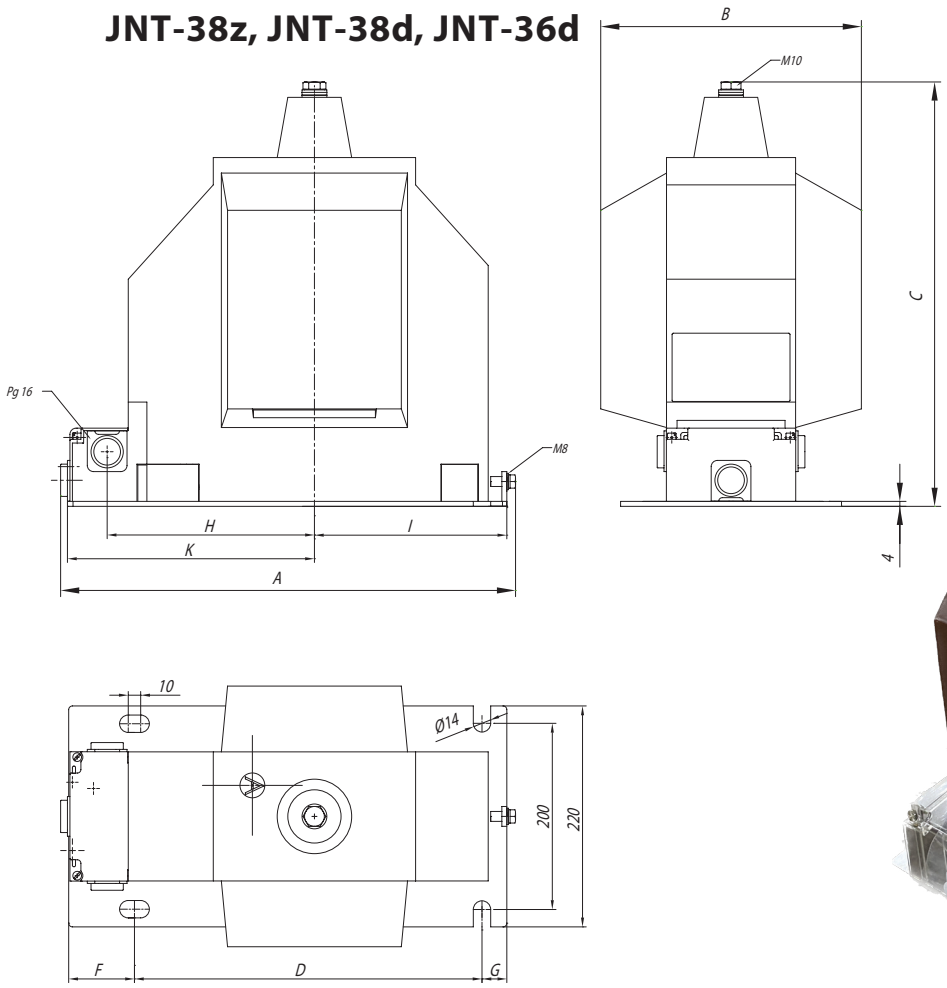
In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

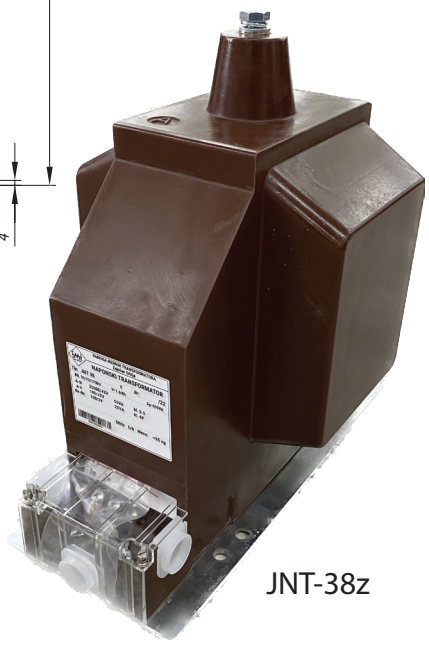
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

We reserve the right to make changes.

CONTENTS

JNT-38z, JNT-38d, JNT-36d





JNT-38z

SINGLE-POLE VOLTAGE TRANSFORMERS 38 kV REDUCED DIMENSIONS - BLOCK TYPE **JNT-38z, JNT-38d, JNT-36d**

Type of transformer	Dimensions (mm)								
	A	B	C	D	F	G	H	I	K
JNT-38z	368	210	342	245	70,5	37,5	162	160	193
JNT-38d	392	220	384	245	82,5	49,5	174	172	205
JNT-36d	443	240	376	300	88	40	207	190	238

TECHNICAL DATA	JNT-38z	JNT-38d	JNT-36d
Rated primary voltage (kV)	35/√3	35/√3	35/√3
Highest voltage for equipment (r.m.s.) (kV)	38	38 (40.5)	36, 38 (40.5)
Rated secondary voltage(V)	100/√3 or 110/√3		
Rated tertiary voltage (V)	100/3 or 110/3		
Rated power-frequency withstand voltage (kV)	70	70 (80)	70 (80)
Rated impulse voltage1.2/50 μs (kV)	170	170 (190)	170 (190)
Rated frequency(Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	25	30	50
Maximal rated power for accuracy class 0.5 (VA)	75	100	150
Maximal rated power for accuracy class 1 (VA)	150	200	300
Rated tertiary power (VA)	25; 50; 100		25; 50; 100; 150
Rated tertiary accuracy class	3P; 6P		
Rated voltage factor	1.9/8h		
Additional resistance in the tertiary circuit (W)	25	25(16.7)	16.7(12,5)
Limiting thermal power (VA)	600	800	1200
Mass (kg)	34	40	72
Temperature insulation class	E/B		
Type of basic insulation	Epoxy resin		
Valid standards	IEC61869-1; IEC61869-3		

NOTE:

We can also produce these transformers for primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/√3; 22/√3 and 30/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

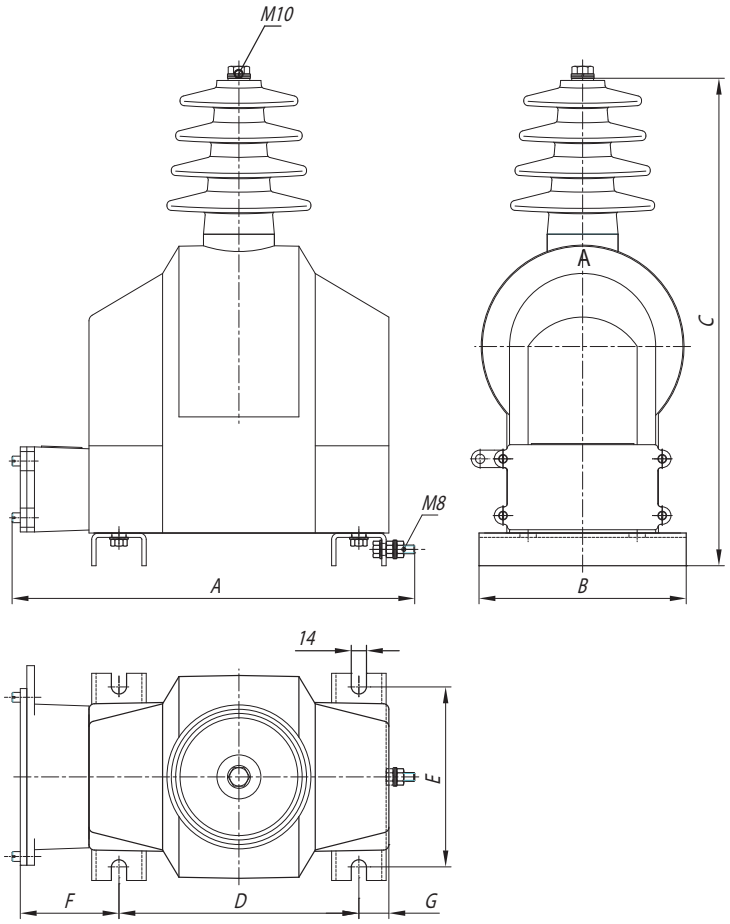
We reserve the right to make changes.

CONTENTS

JNT SM-12, JNT SM-24, JNT SM-24/12, JNT SM-36*



JNT SM-12



SINGLE-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING **JNT SM-***

Type of transformer	Dimensions (mm)							Broj rebara	Creeping distance (mm)
	A	B	C	D	E	F	G		
JNT SM-12	366	190	367	209	165	98	21	3	500
JNT SM-24	370	190	447	220	165	90.5	27.5	4	630
JNT SM-24/12	370	190	447	220	165	90.5	27.5	4	630
JNT SM-36-5R	379	225	549	229	200	92	25	5	855
JNT SM-36-6R	379	225	579	229	200	92	25	6	920
JNT SM-36-8R	379	225	626	229	200	92	25	8	1125
JNT SM-36-10R	379	225	695	229	200	92	25	10	1280

TECHNICAL DATA	JNT SM-12	JNT SM-24	JNT SM-24/12	JNT SM-36*
Rated primary voltage (kV)	10/√3	20/√3	20/√3//10/√3	35/√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	24	38(36)
Rated secondary voltage (V)	100/√3 or 110/√3			
Rated tertiary voltage (V)	100/3 or 110/3			
Rated power-frequency withstand voltage (kV)	28	50	50	70
Rated impulse voltage1.2/50 μs (kV)	75	125	125	170
Rated frequency (Hz)	50/60			
Maximal rated power for accuracy class 0.2 (VA)	25	30	30/10	30
Maximal rated power for accuracy class 0.5 (VA)	75	75	75/25	100
Maximal rated power for accuracy class 1 (VA)	150	150	150/50	200
Rated tertiary power (VA)	25; 50; 100			
Rated tertiary accuracy class	3P; 6P			
Rated voltage factor	1.9/8h			
Additional resistance in the tertiary circuit (W)	25	25	25	16.5
Limiting thermal power (VA)	600	600	600/300	800
Mass (kg)	25.9	31.5	32.5	43
Temperature insulation class	E/B			
Type of basic insulation	Cycloaliphatic resin			
Valid standards	IEC 61869-1; IEC 61869-3			

NOTE:

We can also produce these transformers for primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/√3; 22/√3 and 30/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

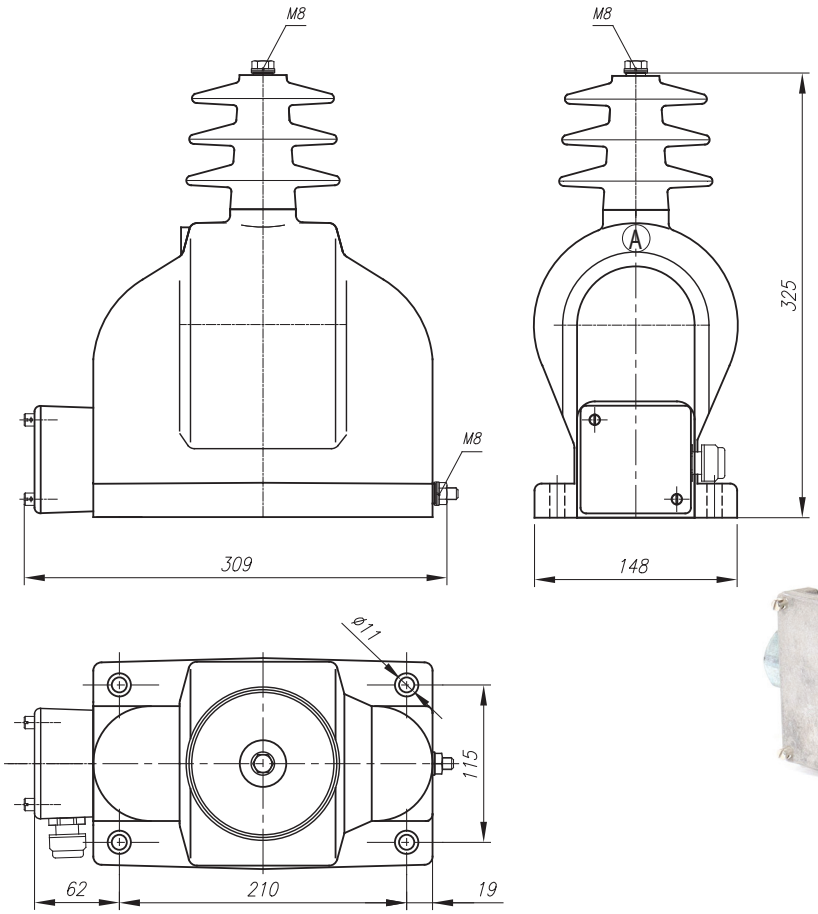
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

We reserve the right to make changes.

* - applies to all models of this type.

CONTENTS

JNT SM-10





JNT SM-10

SINGLE-POLE VOLTAGE TRANSFORMERS OF REDUCED RATED POWER FOR OUTDOOR MOUNTING **JNT SM-10**

TECHNICAL DATA	JNT SM-10
Rated primary voltage (kV)	10/√3
Highest voltage for equipment (r.m.s.) (kV)	12
Rated secondary voltage(V)	100/√3 or 110/√3
Rated tertiary voltage (V)	100/3 or 110/3
Rated power-frequency withstand voltage (kV)	28
Rated impulse voltage1.2/50 μs (kV)	75
Rated frequency(Hz)	50/60
Maximal rated power for accuracy class 0.2 (VA)	15
Maximal rated power for accuracy class 0.5 (VA)	50
Maximal rated power for accuracy class 1 (VA)	100
Rated tertiary power (VA)	25; 50; 100
Rated tertiary accuracy class	3P; 6P
Rated voltage factor	1.9/8h
Additional resistance in the tertiary circuit (W)	25
Limiting thermal power (VA)	400
Creeping distance (mm)	465
Mass (kg)	18.2
Temperature insulation class	E/B
Type of basic insulation	Cycloaliphatic resin
Valid standards	IEC 61869-1; IEC 61869-3

NOTE:

We can also produce these transformers for primary voltages:

3/√3; 5/√3; 6/√3 and 11/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

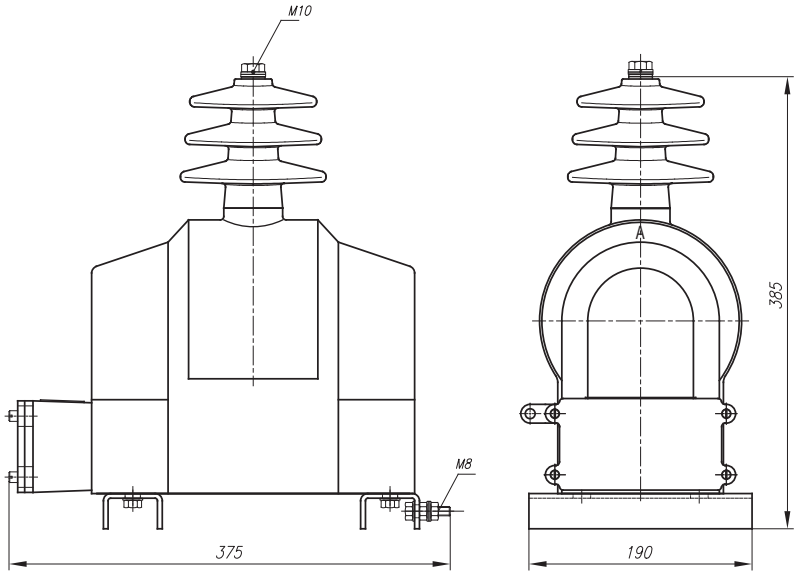
In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

We reserve the right to make changes.

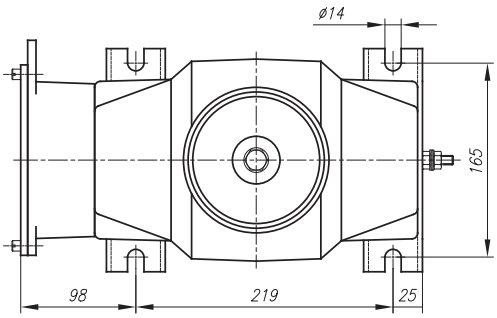
CONTENTS

JNTm2 SM-24, JNTm2 SM-24/12





JNTm2 SM-24



SINGLE-POLE VOLTAGE TRANSFORMERS OF REDUCED RATED POWER FOR OUTDOOR MOUNTING
JNTm2 SM-24, JNTm2 SM-24/12

TECHNICAL DATA	JNTm2 SM-24	JNTm2 SM-24/12
Rated primary voltage (kV)	20/√3	20/√3//10/√3
Highest voltage for equipment (r.m.s.) (kV)	24	
Rated secondary voltage (V)	100/√3 or 110/√3	
Rated tertiary voltage (V)	100/3 or 110/3	
Rated power-frequency withstand voltage (kV)	50	
Rated impulse voltage1.2/50 μs (kV)	125	
Rated frequency (Hz)	50/60	
Maximal rated power for accuracy class 0.2 (VA)	15	-
Maximal rated power for accuracy class 0.5 (VA)	50	50/15
Maximal rated power for accuracy class 1 (VA)	100	75/25
Rated tertiary power (VA)	25; 50; 100	
Rated tertiary accuracy class	3P; 6P	
Rated voltage factor	1.9/8h	
Additional resistance in the tertiary circuit (W)	25	
Limiting thermal power (VA)	400	400/200
Creeping distance (mm)	535	
Mass (kg)	27.5	28
Temperature insulation class	E/B	
Type of basic insulation	Cycloaliphatic resin	
Valid standards	IEC 61869-1; IEC 61869-3	

NOTE:

We can also produce these transformers for primary voltages: 3/√3; 5/√3; 6/√3; 11/√3; 15/√3 and 22/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, an additional resistance must be installed in the open-delta tertiary circuit of the transformers.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

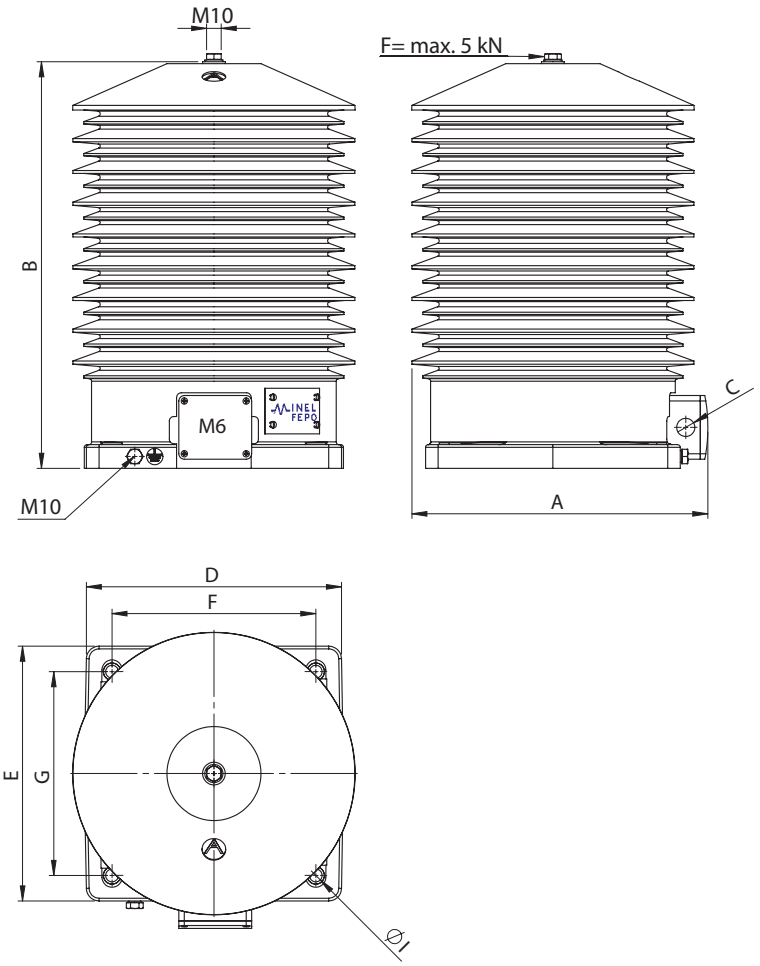
We reserve the right to make changes.

CONTENTS

NTSM-12, NTSM-24, NTSM-38



NTSM-38



SINGLE-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING 12-42 kV - **NTSM-12, NTSM-24, NTSM-38**

Type of transformer	Dimensions (mm)								Mass (kg)
	A	B	C	D	E	F	G	I	
NTSM-12	315	372	Pg16	280	276	224	224		
NTSM-24	315	450	Pg16	280	276	224	224	14	~58
NTSM-38	315	520	Pg16	280	276	224	224	14	~72

TECHNICAL DATA	NTSM-12	NTSM-24	NTSM-38
Rated primary voltage (kV)	10/√3	20/√3	35/√3
Highest voltage for equipment (r.m.s.) (kV)	12	24	36 (42)
Rated secondary voltage (V)	100/√3 or 110/√3		
Rated tertiary voltage (V)	100/3 or 110/3		
Rated power-frequency withstand voltage (kV)	28 (42)	50 (65)	70 (95)
Rated impulse voltage 1.2/50 μs (kV)	75	125	170 (190)
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	15	15	20
Maximal rated power for accuracy class 0.5 (VA)	50	50	75
Maximal rated power for accuracy class 1 (VA)	100	120	150
Rated tertiary power (VA)	10-50		
Rated tertiary accuracy class	3P; 6P		
Rated voltage factor	1.9 / 8h		
Additional resistance in the tertiary circuit (W)	25		
Limiting thermal power (VA)	600		
Temperature insulation class	F		
Type of basic insulation	Cycloaliphatic resin		
Valid standards	IEC 61869-1; IEC 61869-3 (ГОСТ 1983)		

NOTE:

We can also produce these transformers for primary voltages:

3/√3; 5/√3; 6/√3; 11/√3; 15/√3; 22/√3 and 30/√3 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary, secondary and tertiary).

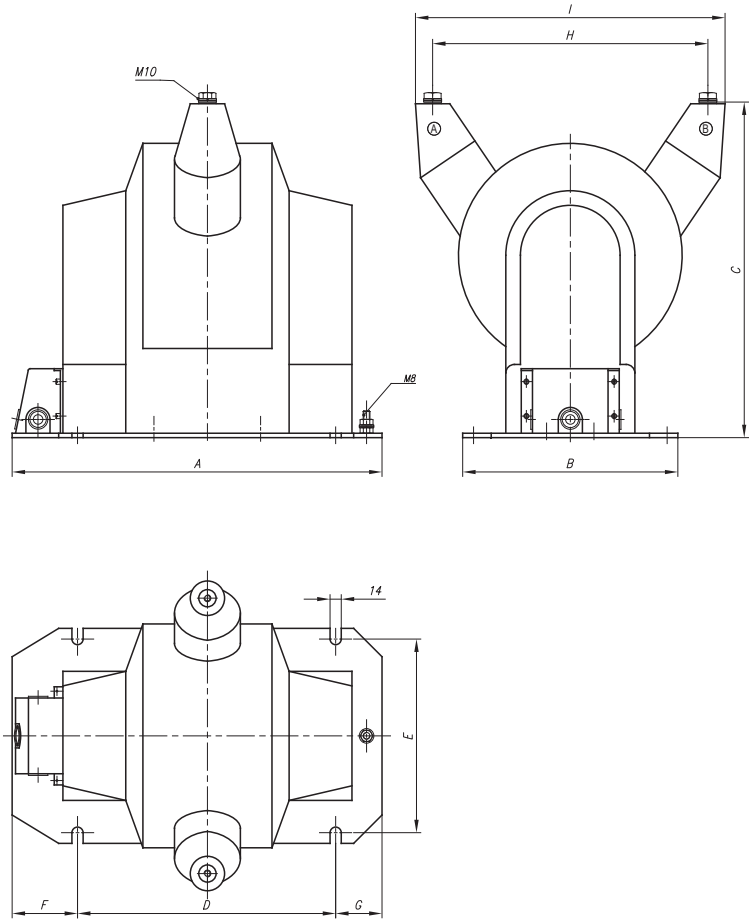
We reserve the right to make changes.

CONTENTS

DNT-12, DNTm1-24, DNT-24, DNT-24/12, DNT-36



DNT-12



DOUBLE-POLE VOLTAGE TRANSFORMERS FOR INDOOR MOUNTING **DNT-***

Type of transformer	Dimensions (mm)								
	A	B	C	D	E	F	G	H	I
DNT-12	355	180	246	190	155	93	72	150	198
DNTm1-24	355	180	300	190	155	93	72	210	246
DNT-24	375	200	300	210	175	93	72	210	246
DNT-24/12	375	200	300	210	175	93	72	210	246
DNT-36	430	250	397	300	225	76	54	320	364

TECHNICAL DATA	DNT-12	DNTm1-24	DNT-24	DNT-24/12	DNT-36
Rated primary voltage (kV)	10	20	20	20/10	35
Highest voltage for equipment (r.m.s.) (kV)	12	24	24	24	38(36)
Rated secondary voltage (V)	100 or 110				
Rated power-frequency withstand voltage (kV)	28	50	50	50	70
Rated impulse voltage1.2/50 μs (kV)	75	125	125	125	170
Rated frequency (Hz)	50/60				
Maximal rated power for accuracy class 0.2 (VA)	25	15	30	30/10	30
Maximal rated power for accuracy class 0.5 (VA)	75	50	75	75/25	100
Maximal rated power for accuracy class 1 (VA)	150	100	150	150/50	200
Rated voltage factor	1.2 permanently				
Limiting thermal power (VA)	600	400	600	600/300	800
Mass (kg)	27.4	28	34.5	35.5	58
Temperature insulation class	E/B				
Type of basic insulation	Epoxy resin				
Valid standards	IEC 61869-1; IEC 61869-3				

NOTE:

The voltage transformer DNTm1-24 is a subtype with reduced power and smaller dimensions and is therefore suitable for smaller cells.

We can also produce these transformers for primary voltages:

3; 5; 6; 11; 15; 22 and 30 kV.

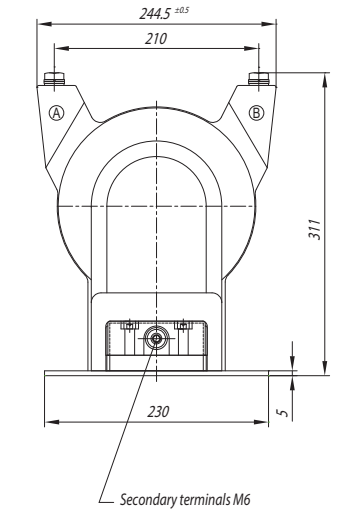
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

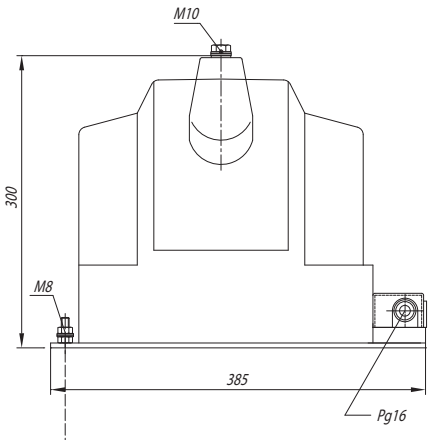
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

We reserve the right to make changes.

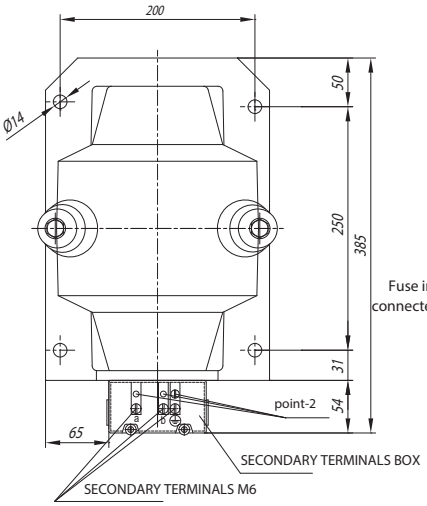
CONTENTS

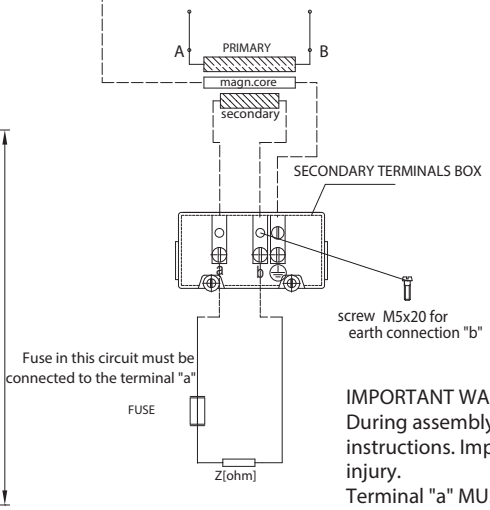
DNT-24E











IMPORTANT WARNING:
During assembly, pay attention to the connection according to these instructions. Improper connection can cause transformer damage and injury.
Terminal "a" MUST NOT be connected to ground - IT CAUSES SHORT CIRCUIT AND DAMAGE to the transformer if terminal "b" in the secondary terminal box is connected with an M5x20 screw at point 2 to the base.

DOUBLE-POLE POWER VOLTAGE TRANSFORMER FOR INDOOR MOUNTING TYPE **DNT-24E**

TECHNICAL DATA	DNT-24E			
Rated primary voltage(kV)	6	10	15	20
Highest voltage for equipment(eff.) (kV)	7.2	12	17.5	24
Rated secondary voltage (V)	220or230			
Rated power-frequency withstand voltage 1 min. (kV)	20	28	38	50
Rated impulse voltage 1.2/50 μs (kV)	60	75	95	125
Rated frequency(Hz)	50/60			
Limiting thermal power (VA)	2500	2500	2000	2000
Rated voltage factor V_f	1.2 permanently			
Mass(kg)	38.5	39	40	40
Temperature class of insulation	E/B			
Type of basic insulation	Epoxy resin			
Valid standards	IEC 60076-1; IEC61869-1; IEC61869-3			

NOTE:

We can produce these transformers for primary voltages: 3; 5; 6; 15; 17.5; 22 kV.

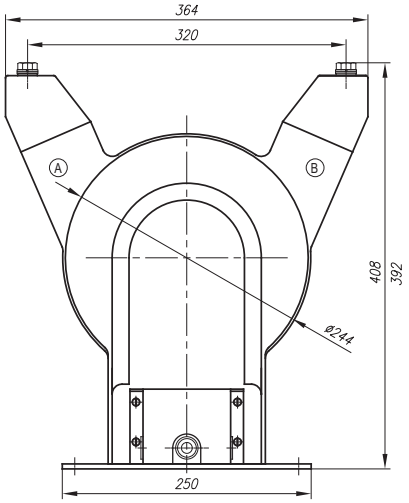
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

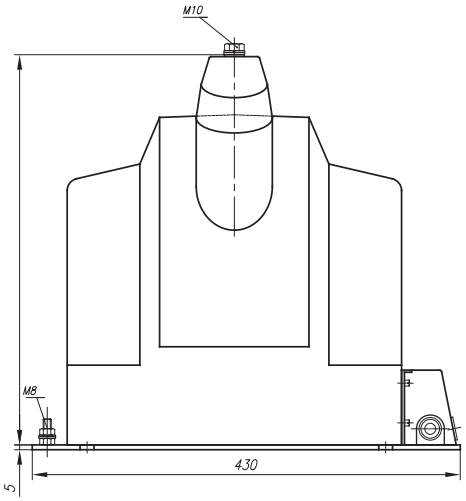
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

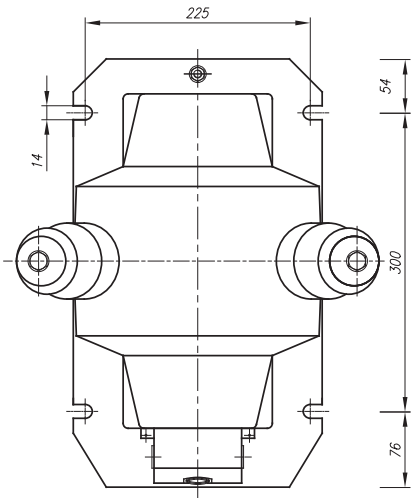
We reserve the right to make changes.

CONTENTS

DNT-36









DOUBLE-POLE POWER VOLTAGE TRANSFORMER FOR INDOOR MOUNTING TYPE **DNT-36**

TECHNICAL DATA	DNT-36			
Rated primary voltage(kV)	6	10	20	35
Highest voltage for equipment(eff.) (kV)	7.2	12	24	36
Rated secondary voltage (V)	220 or 230			
Rated power-frequency withstand voltage, 1 min. (kV)	20	28	50	70
Rated impulse voltage 1.2/50 μs (kV)	60	75	125	170
Rated frequency(Hz)	50/60			
Limiting thermal power (VA)	5000	5000	4000	2500
Rated voltage factor V_f	1.2 permanently			
Mass(kg)	58.5	59	62	64
Temperature class of insulation	E/B			
Type of basic insulation	Epoxy resin			
Valid standards	IEC 60076-1; IEC61869-1; IEC61869-3			

NOTE:

We can produce these transformers for rated voltages: 3; 5; 6; 15; 17.5; 25 and 33 kV.
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

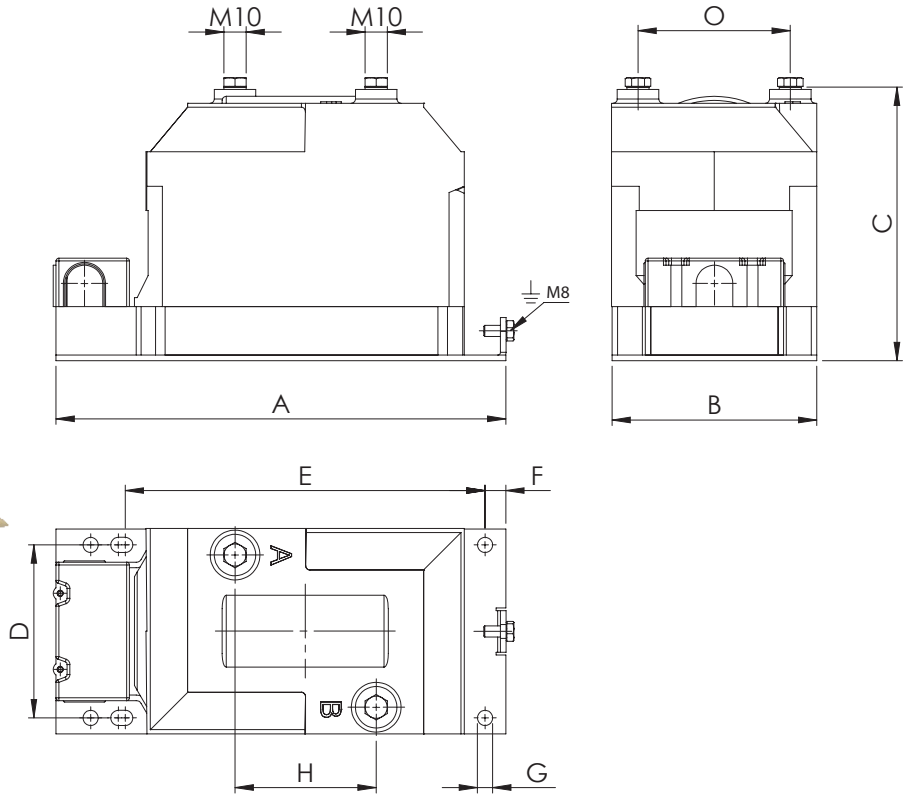
We reserve the right to make changes.

CONTENTS

RZL 10, RZL 20, RZL 20/10



RZL 10



DOUBLE-POLE VOLTAGE TRANSFORMERS FOR INDOOR MOUNTING 12-24 kV REDUCED DIMENSIONS
BLOCK TYPE **RZL**

Type of transformer	Dimensions (mm)									Mass (kg)
	A	B	C	D	E	F	G	H	O	
RZL 10	325	148	200	125	260	15	11	102	110	~18.5
RZL 20	351	178	230	150	275	20	14	165	130	~25
RZL 20/10	351	178	230	150	275	20	14	165	130	~26

TECHNICAL DATA	RZL 10	RZL 20	RZL 20/10
Rated primary voltage (kV)	10	20	20/10
Highest voltage for equipment (r.m.s.) (kV)	12	24	
Rated secondary voltage (V)	100; 110 or 230		
Rated power-frequency withstand voltage (kV)	28 (42)	50 (65)	
Rated impulse voltage 1.2/50 μs (kV)	75	125	
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	10	15	10(5)
Maximal rated power for accuracy class 0.5 (VA)	30	50	30(15)
Maximal rated power for accuracy class 1 (VA)	100	120	120(50)
Rated voltage factor	1.2 x Un / permanently		
Limiting thermal power (VA)	400		
Temperature insulation class	E		
Type of basic insulation	Epoxy resin		
Valid standards	IEC 61869-1; IEC 61869-3 (ГОСТ 1983)		

NOTE:

We can also produce these transformers for primary voltages: 3; 5; 6; 11; 15 and 22 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

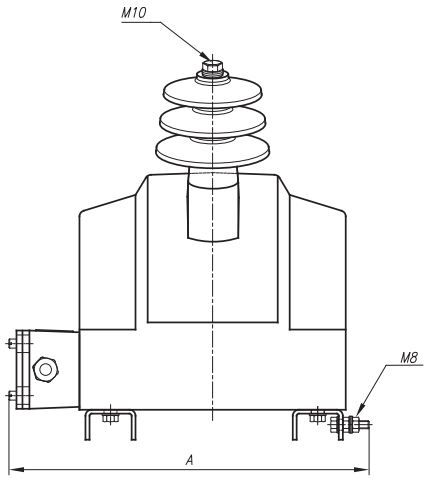
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

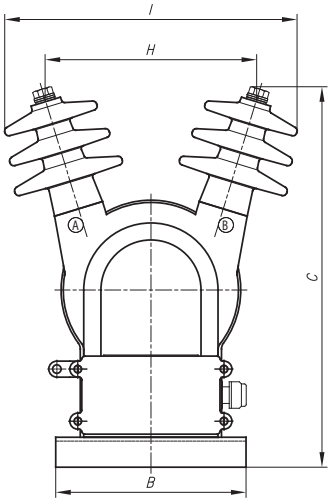
We reserve the right to make changes.

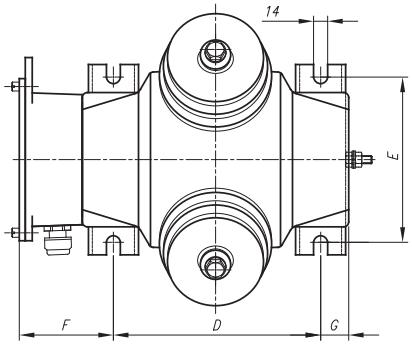
DNT SM-17.5, DNT SM-24, DNT SM-24/12, DNT SM-36, DNT SM-36S, DNT SM-36-8R, DNT SM-36-10R



DNT SM-12







TWO-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING **DNT SM-***

Type of transformer	Dimensions (mm)									Number of ribs	Creeping distance (mm)
	A	B	C	D	E	F	G	H	I		
DNT SM-17.5	360	190	367	207	165	94	28	210	292	3	500
DNT SM-24	373	190	449	220	165	94	31	320	406	4	650
DNT SM-24/12	373	190	449	220	165	94	31	320	406	4	650
DNT SM-36	425	225	551	270	200	96	33	430	520	5	900
DNT SM-36s	410	225	506	260	200	91	28	430	515	6	900
DNT SM-36-8R	425	225	613	270	200	96	33	490	573	8	1152
DNT SM-36-10R	425	225	676	270	200	96	33	536	613	10	1320

TECHNICAL DATA	DNT SM-17.5	DNT SM-24	DNT SM-24/12	DNT SM-36	DNT SM-36s	DNT SM-36-8R	DNT SM-36-10R
Rated primary voltage (kV)	15(10)	20	20/10	35	35	35	35
Highest voltage for equipment (r.m.s.) (kV)	17.5(12)	24	24	38	38	40.5	40.5
Rated secondary voltage (V)	100 or 110						
Rated power-frequency withstand voltage (kV)	38(28)	50	50	70	70	80	80
Rated impulse voltage1.2/50 μs (kV)	95(75)	125	125	170	170	190	190
Rated frequency (Hz)	50/60						
Maximal rated power for accuracy class 0.2 (VA)	25	30	30/10	30	30	30	30
Maximal rated power for accuracy class 0.5 (VA)	75	75	75/25	100	100	100	100
Maximal rated power for accuracy class 1(VA)	150	150	150/50	200	200	200	200
Rated voltage factor	1.2 permanently						
Limiting thermal power (VA)	600	600	600/300	800	800	800-1200	800-1200
Mass (kg)	27.6	36	37	60	53	63	66
Temperature insulation class	E/B						
Type of basic insulation	Cycloaliphatic resin						
Valid standards	IEC61869-1; IEC61869-3						

NOTE:

We can also produce these transformers for primary voltages:

3; 5; 6.3; 11; 15; 22 and 30 kV.

At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

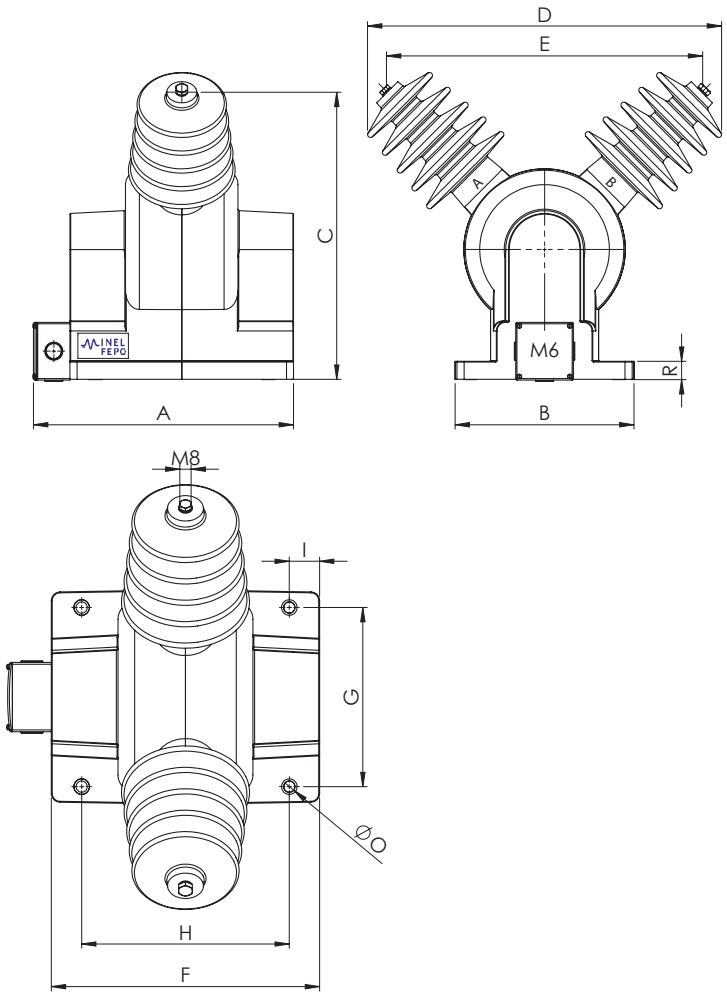
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

We reserve the right to make changes.

* - applies to all models of this type

CONTENTS

NTDSM-12, NTDSM-24, NTDSM-24/12





NTDSM 24

DOUBLE-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING 12-24 kV
NTDSM-12, NTDSM-24, NTDSM-24/12

Type of transformer	Dimensions (mm)											Mass (kg)
	A	B	C	D	E	F	G	H	I	O	R	
NTDSM-12	320	220	315	370	303	270	183	215	27.5	13	25	~32
NTDSM-24	350	242	430	449	368	300	207	240	30	13	25	~48
NTDSM-24/12	350	242	430	449	368	300	207	240	30	13	25	~49

TECHNICAL DATA	NTDSM-12	NTDSM-24	NTDSM-24/12
Rated primary voltage (kV)	10	20	20/10
Highest voltage for equipment (r.m.s.) (kV)	12	24	
Rated secondary voltage (V)	100; 110 or 230		
Rated power-frequency withstand voltage (kV)	28 (42)	50 (65)	
Rated impulse voltage 1.2/50 μs (kV)	75	125	
Rated frequency (Hz)	50/60		
Maximal rated power for accuracy class 0.2 (VA)	15	15	10(5)
Maximal rated power for accuracy class 0.5 (VA)	75	75	30(15)
Maximal rated power for accuracy class 1 (VA)	150	150	120(50)
Rated voltage factor	1.2 permanently		
Limiting thermal power (VA)	600		
Temperature insulation class	F		
Type of basic insulation	Cycloaliphatic resin		
Valid standards	IEC 61869-1; IEC 61869-3 (ГОСТ 1983)		

NOTE:

We can also produce these transformers for primary voltages: 3; 5; 6; 11; 15 and 22 kV.

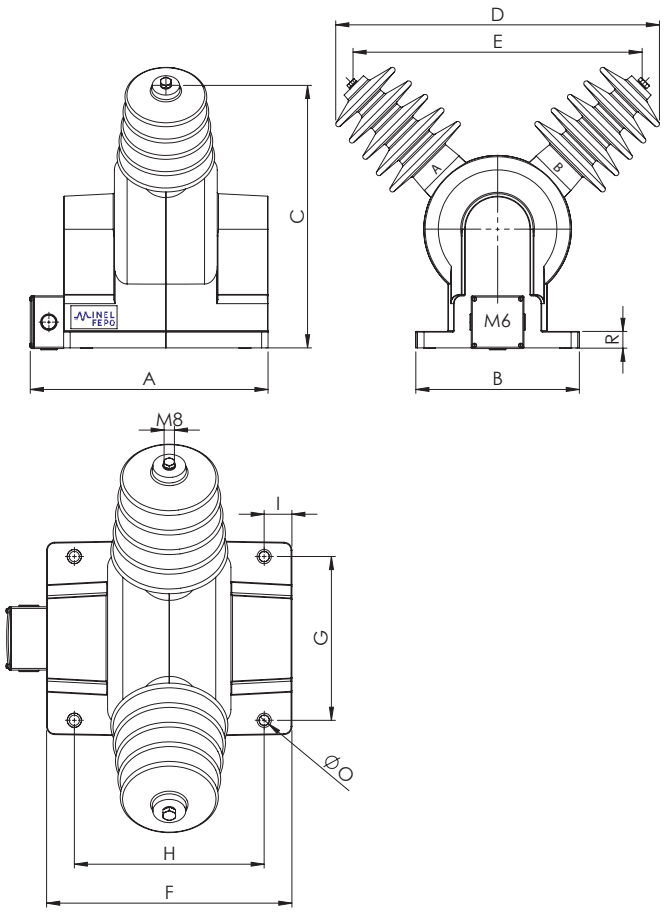
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

We reserve the right to make changes.

CONTENTS

NTDSM-0,63-12, NTDSM-1,25-12
NTDSM-0,63-24, NTDSM-1,25-24





NTDSM 0,63-12

DOUBLE-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING 12-24 kV
NTDSM-0.63-12, NTDSM-1.25-12, NTDSM-0.63-24, NTDSM-1.25-24

Type of transformer	Dimensions (mm)											Mass (kg)
	A	B	C	D	E	F	G	H	I	O	R	
NTDSM-0,63-12	320	220	315	370	303	270	183	215	27,5	13	25	~32
NTDSM-1,25-12	320	220	315	370	303	270	183	215	27,5	13	25	~34
NTDSM-0,63-24	350	242	430	449	368	300	207	240	30	13	25	~48
NTDSM-1,25-24	350	242	430	449	368	300	207	240	30	13	25	~50

TECHNICAL DATA	NTDSM-0,63-12	NTDSM-1,25-12	NTDSM-0,63-24	NTDSM-1,25-24
Rated primary voltage (kV)	3; 6; 10		10; 15; 20	
Highest voltage for equipment (r.m.s.) (kV)	12		24	
Rated secondary voltage (V)	218; 224; 230; 236; 242			
Rated power-frequency withstand voltage (kV)	28		50	
Rated impulse voltage 1.2/50 μs (kV)	75		125	
Rated frequency (Hz)	50/60			
Rated power (VA)	630		1250	
No load losses (W)	50		50	
Short-circuit voltage (%)	4,5		4,5±10	
Load losses (W)	55		50	
Rated voltage factor	1.2 x Un / permanently			
Temperature insulation class	E			
Type of basic insulation	Cycloaliphatic resin			
Valid standards	IEC 61869-1; IEC 61869-3 (ГОСТ 1983)			

NOTE:

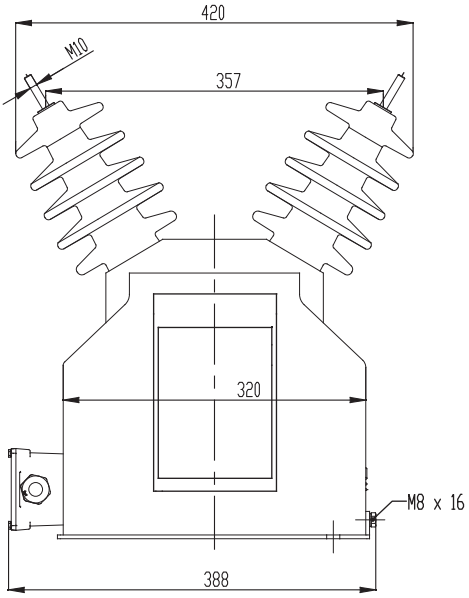
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

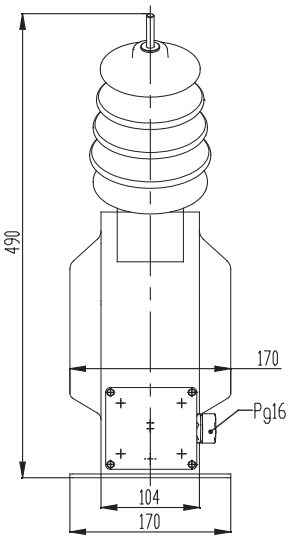
When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

We reserve the right to make changes.

CONTENTS

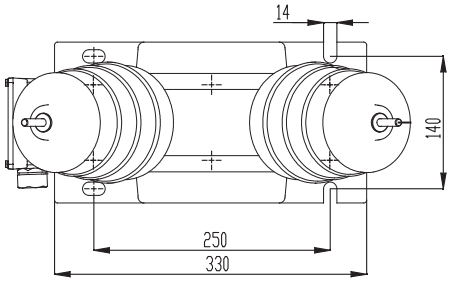
NTDSM-24h, NTDSM-24/12h







NTDSM-24h



DOUBLE-POLE VOLTAGE TRANSFORMERS FOR OUTDOOR MOUNTING **NTDSM-24h, NTDSM-24/12h**

TECHNICAL DATA	NTDSM-24h	NTDSM-24/12h
Rated primary voltage (kV)	20	20/10
Highest voltage for equipment (r.m.s.) (kV)	24	24
Rated secondary voltage (V)	100, 110 or 230	
Rated power-frequency withstand voltage (kV)	50	50
Rated impulse voltage1.2/50 μs (kV)	125	125
Rated frequency (Hz)	50/60	
Maximal rated power for accuracy class 0.2 (VA)	30	30/10
Maximal rated power for accuracy class 0.5 (VA)	75	75/25
Maximal rated power for accuracy class 1 (VA)	150	150/50
Rated voltage factor	1.2 permanently	
Limiting thermal power (VA)	600	600/300
Mass (kg)	36	37
Temperature insulation class	E/B	
Type of basic insulation	Cycloaliphatic resin	
Valid standards	IEC 61869-1; IEC 61869-3	

NOTE:

We can also produce these transformers for primary voltages: 3; 5; 6; 6.3; 11; 15 and 22 kV

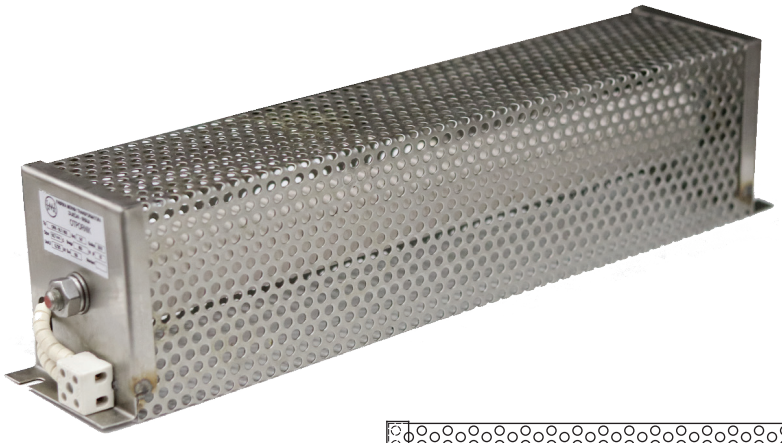
At the customer's request, we can also produce other combinations of indicated transformation ratios, accuracy classes, rated powers and voltage factors.

When ordering, please be sure to specify the rated voltage, accuracy class and rated power for each winding (primary and secondary).

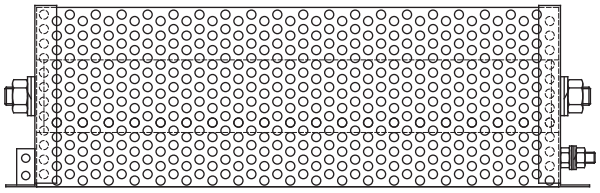
We reserve the right to make changes.

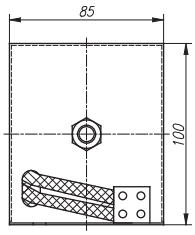
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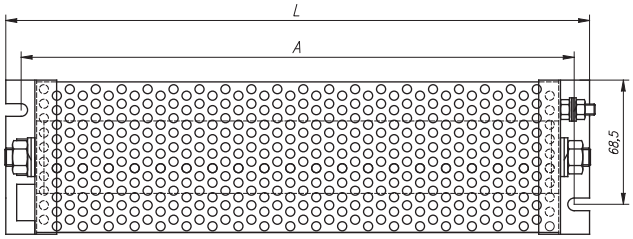
ORN

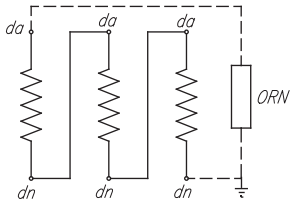


ORN-25/400









Resistor for suppressing ferroresonance
(Connection to open delta tertiary circuit)

FERRORESONANCE PREVENTING RESISTOR **- ORN**

Type of the resistor	For voltage transformers FMT	Power (W)	Resistance (Ω)	L(mm)	A(mm)
ORN-25/400	10 and 20 kV	400W	25Ω	322	305
ORN-16.7/600	35 kV	600W	16.7Ω	432	415

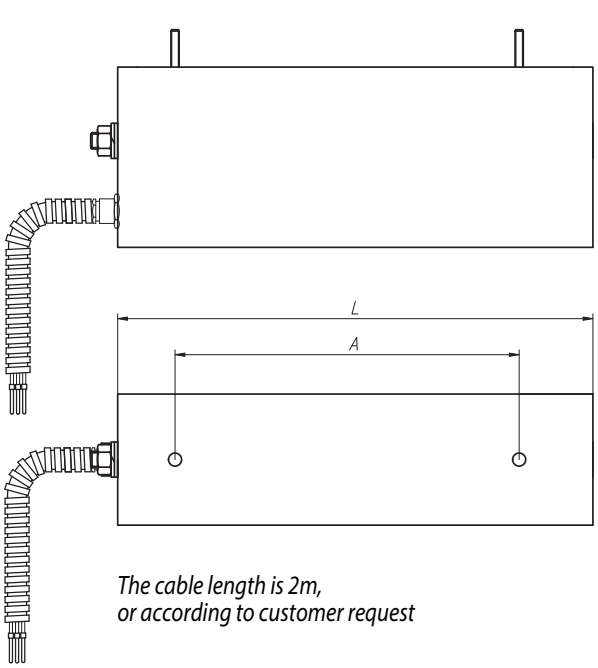
NOTE:

In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, additional resistance must be installed in their tertiary open delta circuit.

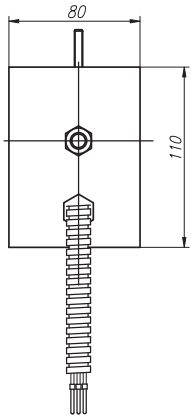
The resistance value is 25 Ω; 400 W for 10 and 20 kV transformers.
For 35 kV transformers, a the resistance is 16-20 Ω; 600 W.

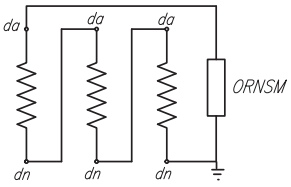
This will significantly reduce the risk of the ferroresonance phenomenon occuring.

ORN SM



The cable length is 2m,
or according to customer request





Resistor for suppressing ferroresonance
(Connection to open delta tertiary circuit)



ORN SM-25/400

FERRORESONANCE PREVENTING RESISTOR FOR OUTDOOR MOUNTING - **ORN SM**

Type of the resistor	For voltage transformers FMT	Power (W)	Resistance (Ω)	L(mm)	A(mm)
ORN SM-25/400	10 and 20 kV	400W	25Ω	290	210
ORN SM-16.7/600	35 kV	600W	16.7Ω	400	320

NOTE:

In order to prevent ferroresonance phenomena, when three single-pole voltage transformers are used in networks with an isolated neutral point, additional resistance must be installed in their tertiary open delta circuit.

The resistance value is 25 Ω; 400 W for 10 and 20 kV transformers.
For 35 kV transformers, a the resistance is 16-20 Ω; 600 W.

This will significantly reduce the risk of the ferroresonance phenomenon occurring.

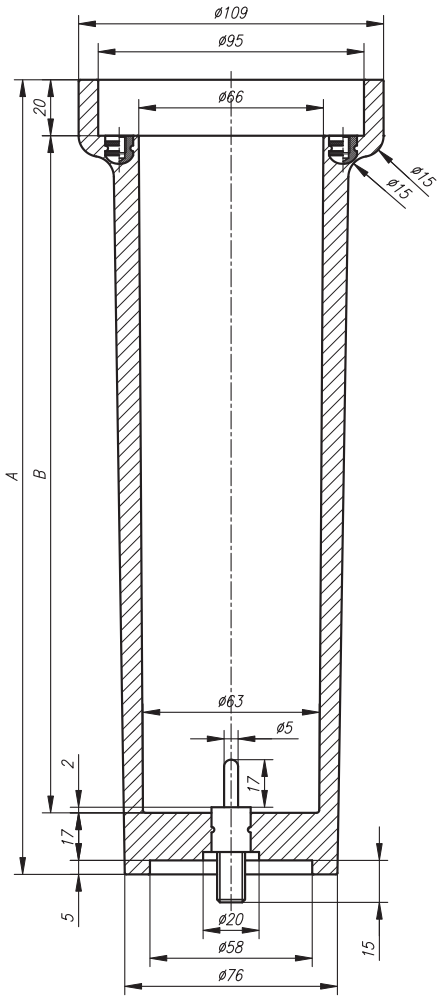
These resistors are standardly installed without on the three-system medium-voltage power measuring assemblies manufactured by FMT.

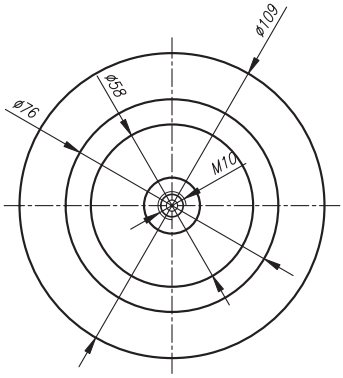
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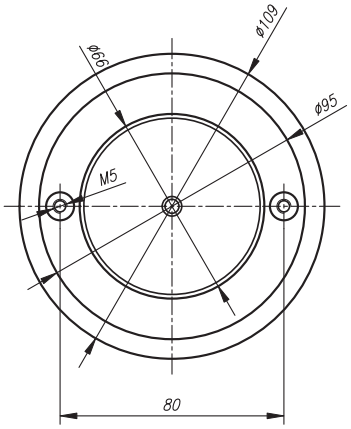
FT-*



FT-12







FUSE HOUSING **FT-***

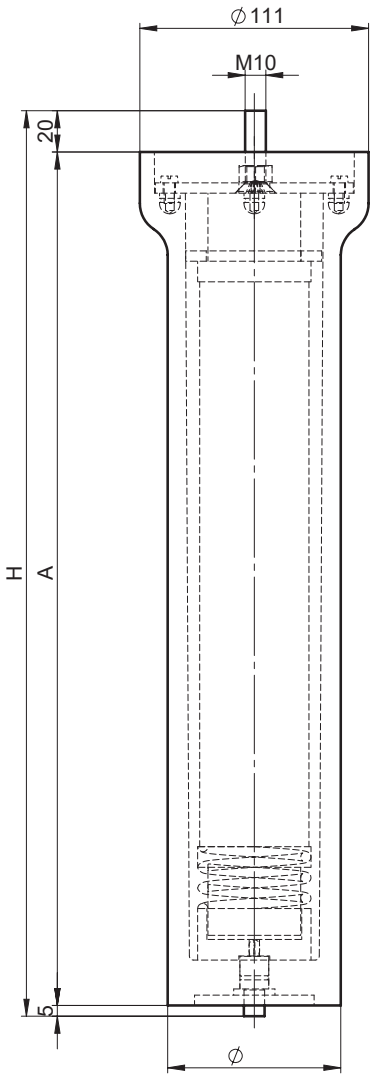
Type of housing	Rated voltage (kV)	A (mm)	B (mm)	Fuse dimensions (mm)	Mass of the enclosure without the fuse (kg)
FT-12	10	179	137	Ø60x160	0.8
FT-24	20	284	242	Ø60x265	1.06
FT-36	35	380	338	Ø60x358	1.44

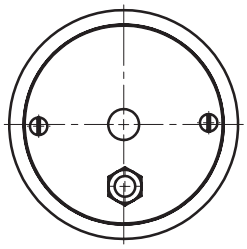
NOTES:

FT fuse housing can be mounted on the voltage transformer in a vertical or horizontal position with the additional element we supply.

We deliver these housings at customer request, with or without fuse cartridges.

VVC-*







KO VVC36kV

FUSE HOUSING **VVC-***

Type of housing	Rated voltage (kV)	A (mm)	H (mm)	Fuse dimensions (mm)	Mass of the enclosure without the fuse (kg)
KO VVC12kV	10	314	339	Ø53x192	1.93
KO VVC24kV	20	414	439	Ø53x292	2.33
KO VVC36kV	35	564	589	Ø53x442	2.88

NOTE:

VVC fuse boxes can only be mounted on a voltage transformer in a vertical position.

We deliver the housings at customer request, with or without fuse cartridges.

CONTENTS







CONTENTS

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