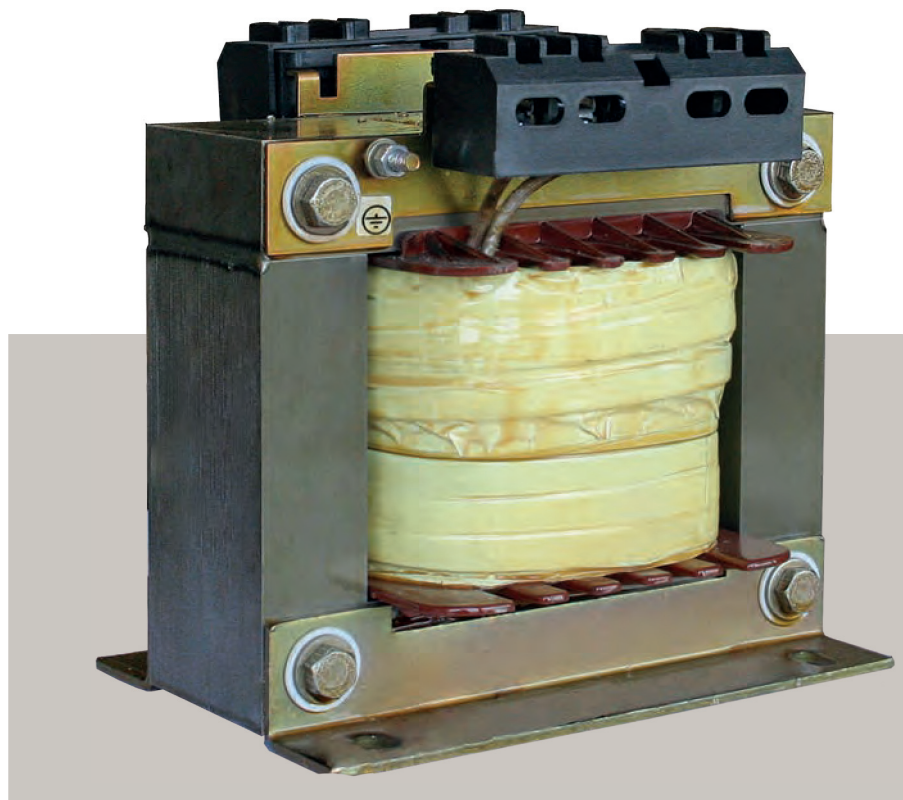




MINSK ELECTROTECHNICAL PLANT NAMED AFTER V. I. KOZLOV

DRY-TYPE LOW-POWER MULTIFUNCTIONAL TRANSFORMERS

OF UP TO 40 kVA POWER RATING



ESTEEMED CUSTOMERS!

We are grateful for your interest to our products. Minsk Electrotechnical Plant named after V. I. Kozlov is one of the biggest producers of electric engineering equipment. History of the Plant started in 1956. Since then we have obtained great experience and tradition. Our basic products are:

- * power transformers (oil-immersed and dry-type, rating up to 2500 kVA);
- * unitized transformers substations;
- * devices and converters for soil-corrosion protection of metal structures;
- * assembled switchgear;
- * multifunctional (low-power) transformers;
- * welding equipment;
- * household electric appliances.

We produce goods ready fully to meet high requirements of the users. When demanded by a Customer the Plant is able to develop and manufacture items with parameters and characteristics differing from those indicated in this data sheet.

In production of low-power multifunctional transformers modern technological equipment is used. Magnetic cores are wound with the help of integrated automatic lines. Assembled transformers are impregnated with wet-strong insulating compound in vacuum impregnation chambers. Transformer parts are painted using powder-coating line of NORDSON Company (USA). Transformer nameplates are prepared employing laser engraving by means of Duet device. Plastic parts are fabricated with the help of automatic molding machines (Japan).

At our Plant great attention is given to development of new updated products. For many years we have been accumulating engineering and manufacturing skills. Design and characteristics are constantly upgraded. Our research and testing labs are equipped with all facilities providing product necessary testing.

Our products meet interstate standards and carry Certificates of conformance (of quality) awarded by national certification bodies of the Republic of Belarus and of the Russian Federation. Quality System of the Plant has got certification in accordance with ISO-9001 Standard from international certification body "DEKRA" (Germany) as well as from the State certification body of the Republic of Belarus

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**As to a Customer's order the Plant
can manufacture transformers
with parameters and characteristics
differing from those given in this data sheet,
of any desirable design version**

OCMP, OCMO, OCMY SERIES TRANSFORMERS

Transformers of OCMP series (O – single-phase, C – dry-type, M – multifunctional, P – isolating) rating 0.063...10 kVA, OCMO series (single-phase, dry-type, multifunctional, O – separating, of general use) rating 0.063...1.0 kVA, OCMY series (single-phase, dry-type, multifunctional, Y – for power supply to control circuits) rating 0.4...1.0 kVA, with rated voltage not more than 1000 V a. c. of industrial frequency, are intended for power supply to control circuits, local lighting circuits, signaling and automation circuits.



Transformers comply with the requirements of STB IEC 61558-1 standard.

OCMO transformers meet IEC 61558-2-1 standard.

OCMY transformers meet IEC 61558-2-2 and STB IEC 61558-2-6 standards.

OCMP transformers meet IEC 61558-2-4 and STB IEC 61558-2-6 standards.

Climatic versions are CT, C and MWDr as to IEC 60721-2-1:2002 standard.

Transformers are designed for indoor operation at altitudes above sea level not more than 1000 m (transformers operation is allowed at altitudes up to 3000 m above sea level, but in such a case the load power shall decrease for 2.5 % every 500 m).

According to their mobility the transformers are stationary ones.

As to installation conditions on worksite, the transformers are incorporated ones.

Transformers with the power of up to 0.4 kVA inclusive are to be mounted on a horizontal or vertical plane (for M9 group of mechanical performance); transformers with the power from 0.4 up to 2.5 kVA inclusive are to be mounted on a horizontal plane (for M9 group of mechanical performance); transformers with the power of 0.63 and 1.0 kVA are to be mounted on a vertical plane (for M8 group of mechanical performance); transformers with the power 4.0; 6.3 and 10 kVA are to be mounted on a horizontal plane (for M1 group of mechanical performance).

Insulation thermal-endurance class – B as to GOST 8865-93.

All the transformer parts made from dielectric materials are resistant against inflammation and flame propagation.

The same type transformers of various climatic versions have completely identical electrical parameters and differ by protective coatings only.

The corrected sound power level of the transformers both under no-load run and under rated load does not exceed 49 dBA for the transformers with the power of up to 2.5 kVA, and 60 dBA for 4.0; 6.3 and 10 kVA transformers.

As to protection against electric-shock hazard the transformers belong to I class in accordance with GOST 12.2.007.0-75 and have IP00 protection degree in accordance with GOST 14254-96. Contact terminals are of IP20 protection degree.

BASIC SPECIFICATIONS OF THE TRANSFORMERS

Transformer type	Rated power, kVA	Short-circuit voltage, U_k , %			Efficiency factor, %, not less than			
		for two-winding transformer	for three-winding transformer					
			for U_{K1-2}	for U_{K1-3}				
OCMO-0.063 OCMP-0.063	0.063	-	-	-	79.0			
OCMO-0.1 OCMP-0.1	0.100				82.4			
OCMO-0.16 OCMP-0.16	0.160				86.0			
OCMO-0.25 OCMP-0.25	0.250				88.1			
OCMO-0.4 OCMY-0.4 OCMP-0.4	0.400				89.5			
OCMO-0.63 OCMY-0.63 OCMP-0.63	0.630				90.7			
OCMO-1.0 OCMY-1.0 OCMP-1.0	1.000				91.8			
OCMP-1.6	1.600				3.05	2.90	2.10	92.2
OCMP-2.5	2.500				2.75	5.85	2.05	93.2
OCMP-4.0	4.000				2.70	-	-	94.5
OCMP-6.3	6.300	2.10	94.8					
OCMP-10	10.000	1.90	95.3					

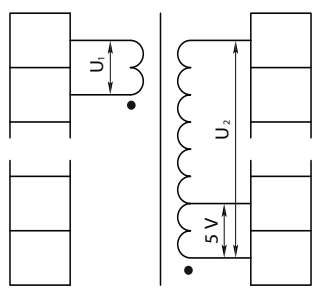
TRANSFORMER CONNECTION DIAGRAMS, WINDING CONNECTION / VECTOR GROUPS AND VOLTAGES

*Three-winding OCMP series transformer with tapplings on secondary winding**

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA		Windings rated voltage, V			Winding connection / vector group
		U_2	U_3	of primary U_1	of secondary		
					U_2	U_3	
	OCMP-0.1	0.075	0.025	220; 380; 400; 415; 440; 660	110; 220; 230	12; 24; 36; 42; 110	1/1/1-0-0
	OCMP-0.16	0.100	0.060				
	OCMP-0.25	0.190					
	OCMP-0.4	0.340					
	OCMP-0.63	0.510	0.120				
	OCMP-1.0	0.880					
	OCMP-1.6	1.350	0.250				
	OCMP-2.5	2.250					

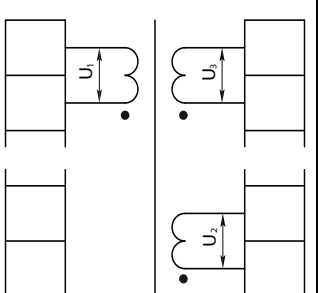
* The power of the transformer secondary winding tapplings decreases against the power of the whole winding proportionally to the voltage decreasing.

*Two-winding OCMP series transformer with tapings on secondary winding**

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA	Windings rated voltage, V		Winding connection / vector group
			of primary, U ₁	of secondary, U ₂	
	OCMP-0.063	0.063	220; 230; 380; 400; 415; 440; 660	10; 12; 14; 24; 29; 36; 42; 56; 110; 130; 220; 230; 260	1/1-0
	OCMP-0.1	0.100		12;14; 24; 29; 36; 42; 56;	
	OCMP-0.16	0.160		110; 130; 220; 230; 260	
	OCMP-0.25	0.250		24; 36; 42; 110; 220	
	OCMP-0.4	0.400			
	OCMP-0.63	0.630			
	OCMP-1.0	1.000			

* The power of the transformer secondary winding tapings decreases against the power of the whole winding proportionally to the voltage decreasing.

OCMP, OCMO series three-winding transformer

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA		Windings rated voltage, V			Winding connection / vector group
		U ₂	U ₃	of primary, U ₁	of secondary*, U ₂ , U ₃		
					for OCMP	for OCMO	
	OCMO-0.063 OCMP-0.063	0.0315	0.0315	110; 220; 380	14; 24;	56; 82	1/1/1-0-0
	OCMO-0.1 OCMP-0.1				29; 56; 82		
	OCMO-0.16 OCMP-0.16	0.080	0.080	110; 220; 230; 380; 660	12;		
	OCMO-0.25 OCMP-0.25				14; 24; 29;		
	OCMO-0.4 OCMP-0.4	0.200	0,200	220; 380	56; 82		
	OCMO-0.63 OCMP-0.63				12		
	OCMO-1.0 OCMP-1.0	0.500	0.500		—		
	OCMP-2.5				1.250		

* Two similar windings.

OCMY series three-winding transformer

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA		Windings rated voltage, V			Winding connection / vector group
		U ₂	U ₃	of primary, U ₁	of secondary		
					control, U ₂	U ₃	
	OCMY-0.4	0.340	0.060	220; 380;	110; 220; 230	12; 24;	1/1/1-0-0
	OCMY-0.63	0.510	0.120	400; 415;		36; 42;	
	OCMY-1.0	0.880	0.120	440; 660		110	

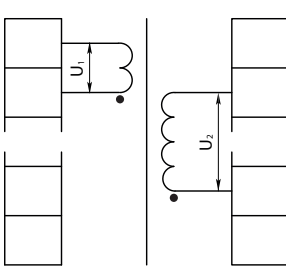
OCMP series four-winding transformer

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA			Windings rated voltage, V				Winding connection / vector group
		U ₂	U ₃	U ₄	of primary, U ₁	of secondary			
						U ₂	U ₃	U ₄	
	OCMP-0.1	0.025	0.050	0.025	220; 380	110	29	12; 24	1/1/1-0-0-0
	OCMP-0.16	0.075	0.060					12; 24; 42	
	OCMP-0.25	0.100	0.090	0.060	220; 380; 415			12; 24; 36; 42	
	OCMP-0.4	0.190	0.150					12; 24; 42	
	OCMP-0.63	0.340	0.230					220; 380	

OCMY series four-winding transformer

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA			Windings rated voltage, V				Winding connection / vector group
		U ₂	U ₃	U ₄	of primary, U ₁	of secondary			
						control, U ₂	control, U ₃	U ₄	
	OCMY-0.4	0.190	0.150	0.060	220; 380; 415;	110	29	12; 24; 42	1/1/1-0-0-0
	OCMY-0.63	0.340	0.230		220; 380;				

Two-winding transformer

Transformer connection diagram	Transformer type	Rated power of secondary winding, kVA	Windings rated voltage, V			Winding connection / vector group			
			of primary, U_1	of secondary					
				U_2			control U_2		
for OCMP	for OCMO	for OCMY							
	OCMO-0.063 OCMP-0.063	0.063	220; 380; 400; 415; 440; 660	12; 14; 24; 29; 36; 42; 56; 110; 130; 220; 260	56; 110; 130; 220; 260	1/1-0			
	OCMO-0.1 OCMP-0.1	0.100							
	OCMO-0.16 OCMP-0.16	0.160							
	OCMO-0.25 OCMP-0.25	0.250							
	OCMO-0.4 OCMY-0.4 OCMP-0.4	0.400					14; 29; 56; 110; 130; 220; 260		
	OCMO-0.63 OCMY-0.63 OCMP-0.63	0.630							
	OCMO-1.0 OCMY-1.0 OCMP-1.0	1.000							
	OCMP-1.6	1.600					220; 380; 660	12; 24; 29; 36; 42; 110; 220	
	OCMP-2.5	2.500						24; 36; 42; 110; 220	
	OCMP-4.0	4.000					220; 230; 380; 400	36; 42; 110; 115; 220; 230; 380; 400	-
	OCMP-6.3	6.300						110; 115; 220; 230; 380; 400	
	OCMP-10	10.000							

OVERALL, MOUNTING DIMENSIONS AND MASS OF THE TRANSFORMERS

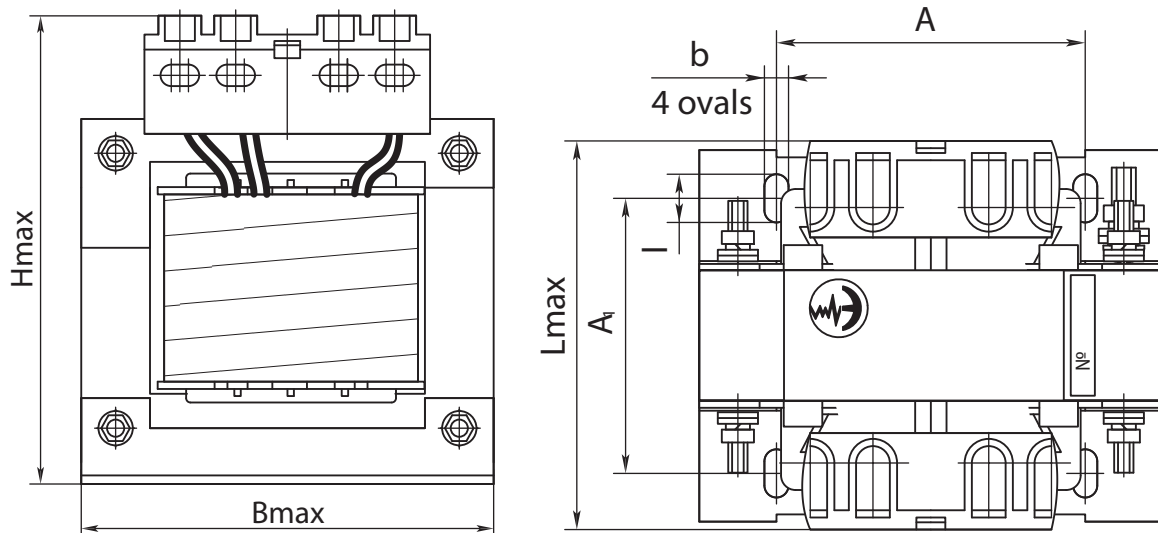


Fig. 1

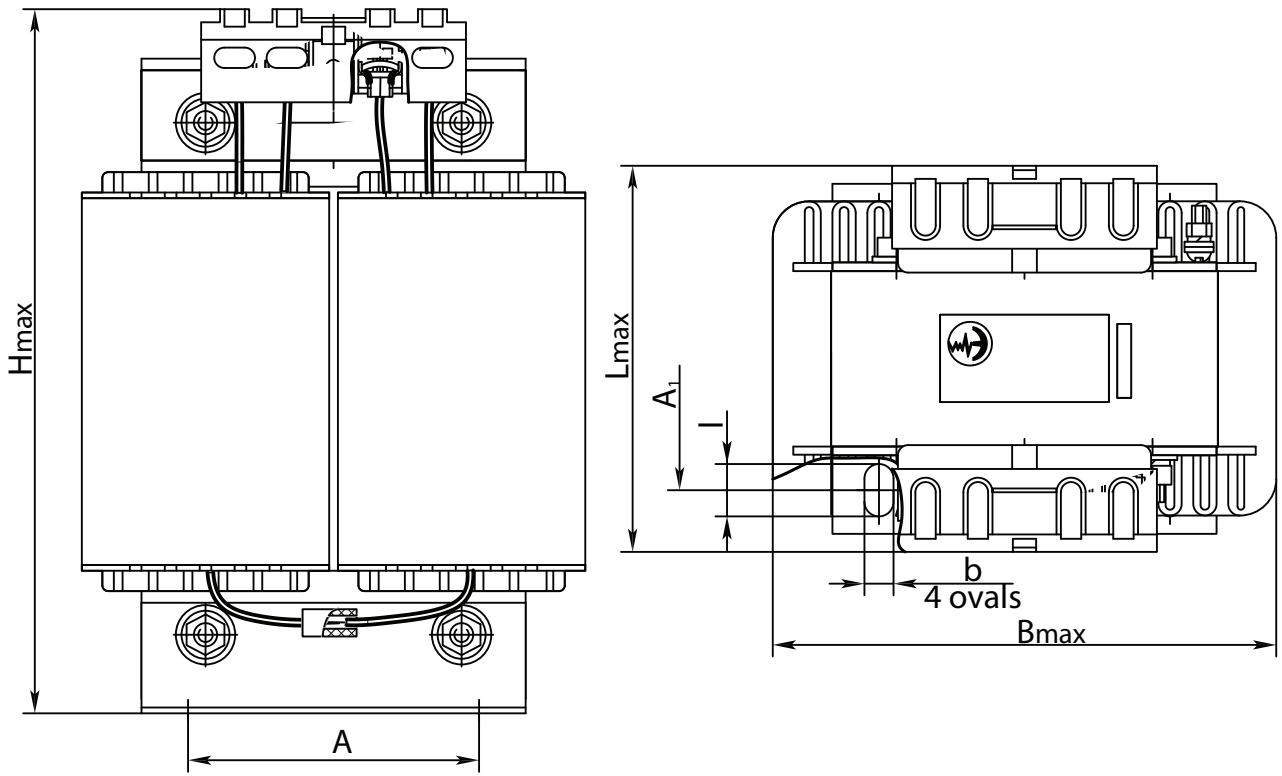


Fig. 2

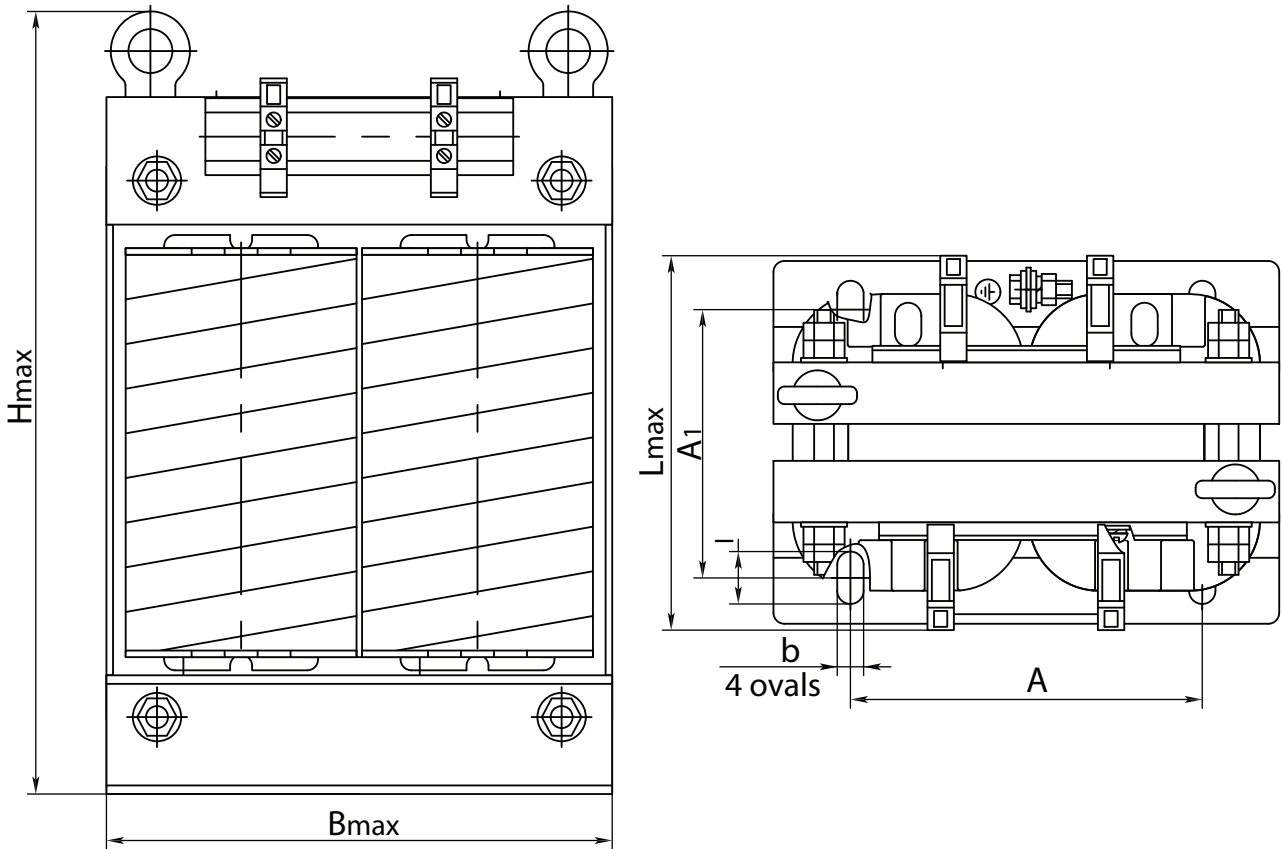


Fig. 3

dimensions in mm

Transformer type	B _{max}	L _{max}	H _{max}	A	A ₁	b	l	Mass, kg	Fig.	
OCMO-0.063 OCMP-0.063	77	95	100	56 ± 1	54 ± 2	5 ⁺¹	10 ⁺¹	1.36	1	
OCMO-0.1 OCMP-0.1	98	90	110	64 ± 1	57 ± 2			1.96		
OCMO-0.16 OCMP-0.16		95		65 ± 2	2.46					
OCMO-0.25 OCMP-0.25	107	100	120	80 ± 1	71 ± 2	6 ⁺¹	12 ⁺¹	3.57		
OCMO-0.4 OCMY-0.4 OCMP-0.4	122	130	140	90 ± 1	85 ± 2		10 ⁺¹	5.44		
OCMO-0.63 OCMY-0.63 OCMP-0.63	152		165	104 ± 1	90 ± 2	7 ⁺¹	12 ⁺¹	8.05		
OCMO-1.0 OCMY-1.0 OCMP-1.0	175	140	180	135 ± 1	101 ± 2		14 ⁺¹	13.10		
OCMP-1.6	175	143	246	100 ± 1	97 ± 1	10 ⁺¹	15 ⁺¹	16.90		2
		158*	260*							
OCMP-2.5	200	134	276	120 ± 1	89 ± 1			20.50		
		150*	283*							
OCMP-4.0	230	183	365	160 ± 1	126 ± 2			12 ^{+0.4}	24 ⁺¹	37.50
OCMP-6.3		221			164 ± 2	53.70				
OCMP-10		320			201	410	214 ± 1			146 ± 2

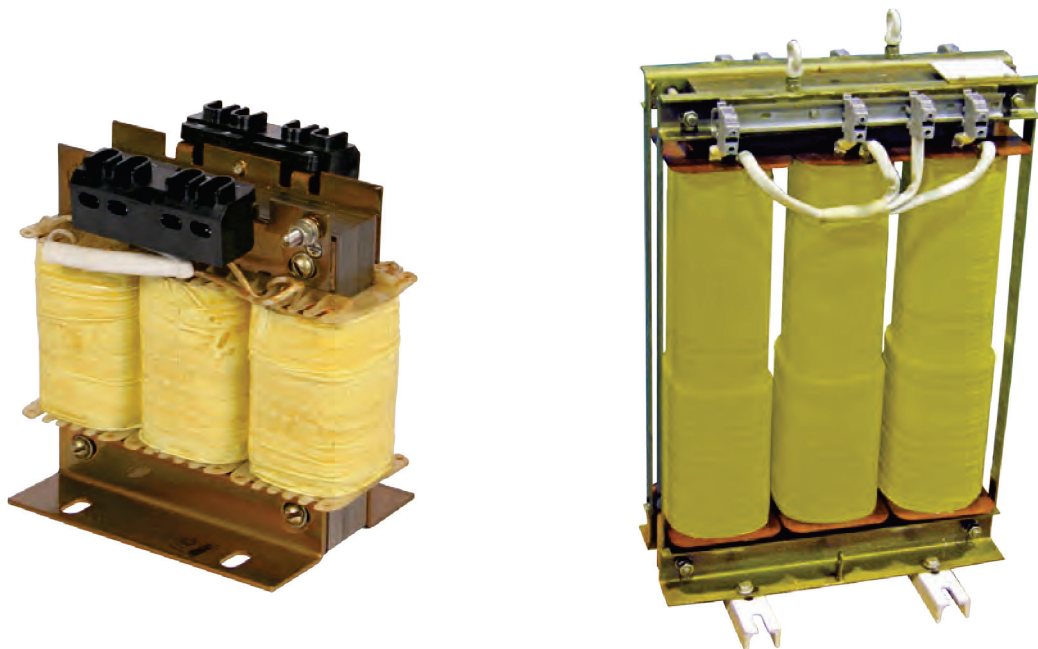
* For versions given in the Tables for three-winding and two-winding transformers with secondary voltage of 40 V max for transformers of 1.6 kVA power, and 62 V max for transformers of 2.5 kVA power.

Sample of notation (to place an order, or to refer to) for OCMP transformer of 0.25 kVA power rating, of 380 V primary winding voltage, of 110 V secondary winding voltage with 5 V and 22 V tappings, of 12 V third winding voltage, of CT climatic version:

Transformer OCMP-0,25 Y3 380/5-22-110/12 TY ПБ 100211261.062-2009
(where TY ПБ = Technical Specifications of the Republic of Belarus).

TCP SERIES TRANSFORMERS

TCP series transformers (three-phase, dry-type, isolating), rating 0.16...40 kVA, are intended for supply of three-phase voltage to rectifier circuits, semiconductor converters of machine-tools and elevators, electrically operated tools and other devices, where separation of circuits by means of reinforced insulation is required.



Transformers comply with the requirements of STB IEC 61558-1-2007 standard.

Isolating transformers of general use, with secondary rated voltage over 50 V and not more than 1000 V, comply with the requirements of IEC 6158-2-4 standard.

Safety isolating transformers – the transformers with secondary rated voltage up to 50 V – shall comply with the requirements of STB IEC 61558-2-6-2006 standard.

Winding connection / vector group – Yn/Yn-0.

Climatic version – C as in accordance with IEC 60721-2-1:2002 standard.

Nominal working values for externally induced mechanical stresses – in accordance with GOST 30631 for mechanical performance groups:

- M8 – for transformers rating 0.16 to 0.63 kVA;
- M3 – for transformers rating 1.0 to 10 kVA, however, the requirements for vibration resistance, vibration strength and shock resistance are only for vertical direction;
- M1 – for transformers rating 16, 26, 40 kVA, however, the requirements for vibration resistance, vibration strength and shock resistance are only for vertical direction.

Operable altitude elevation above sea level is not more than 1000 m.

Transformers versions: as to the installation conditions on worksite the transformers are **incorporated** ones, as to the short-circuit withstandability they are **non-short-circuit proof** transformers.

Insulation thermal-endurance class – in accordance with GOST 8865-93:

- for transformers rating 0.16 to 10 kVA – B class;
- for transformers rating 16 to 40 kVA – F class.

As to protection against electric-shock hazard the transformers belong to I class in accordance with GOST 12.2.007.0-75 and have IP00 protection degree in accordance with GOST 14254-96; contact terminals are of IP20 protection degree.

For transformers with fuse amperage up to 6.3 A inclusive as protective devices shall be used slow-action fuse-links with “T” symbol as in accordance with IEC 60127:

– for transformers of rated power of 0.16...0.63 kVA inclusive with 220...400 V primary voltage, and for transformers of 1.0 kVA rated power with 380 and 400 V primary voltage – miniature fuse-links of increased breaking capacity;

– for transformers of 1.0 kVA rated power with 220 and 230 V primary voltage and for transformers of 1.6...4.0 kVA rated power with 220 and 400 V primary voltage – miniature fuse-links of high breaking capacity.

For transformers with fuse amperage over 6.3 A as protective devices should be used time delay fuse-links with breaking capacity within “gD”-type range in accordance with IEC 60269-1. The fuse-link current rating and time-current characteristic should correspond to the ratings indicated by the transformer marking.

Corrected sound power level of transformers both under no-load run and under rated load shall not exceed:

- 49 dBA for transformers of 0.16...1.0 kVA rated power;
- 60 dBA for transformers of 1.6...40 kVA rated power.

Basic specifications of the transformers

Transformer type	P nom., kVA	Winding voltage, V		Short-circuit voltage, %	Efficiency factor, %
		U _{HV}	U _{LV}		
TCP-0.16 YXJ3	0.16	220; 230; 380; 400	10; 19; 22; 36; 85; 127; 133; 170; 220; 230	10.5	84.0
TCP-0.25 YXJ3	0.25		10; 19; 22; 36; 85; 127; 133; 170; 220; 230	7.6	86.0
TCP-0.4 YXJ3	0.40		10; 19; 22; 36; 42; 85; 127; 133; 170; 220; 230*	6.5	89.0
TCP-0.63 YXJ3	0.63		10; 12; 19; 22; 24; 36; 42; 85; 127; 133; 170; 220; 230*	6.3	91.0
TCP-1.0 YXJ3	1.00		12; 19; 22; 24; 36; 42; 85; 127; 133; 170; 220; 230*	3.9	92.0
TCP-1.6 YXJ3	1.60		12; 19; 22; 24; 36; 42; 85; 127; 133; 170; 220	4.5	94.5
TCP-2.5 YXJ3	2.50		230*; 380**; 400***	3.4	94.0
TCP-4.0 YXJ3	4.00		36; 42; 85; 127; 133; 170; 220; 230*; 380**; 400***	2.8	95.5
TCP-6.3 YXJ3	6.30			2.4	96.0
TCP-10 YXJ3	10.00			1.9	97.0
TCP-16 YXJ3	16.00		220****; 230*; 380**; 400****	2.6	97.0
TCP-25 YXJ3	25.00			2.34	97.2
TCP-40 YXJ3	40.00			2.0	97.8

* Only in case of 230 and 400 V primary winding rated voltage.
 ** Only in case of 380 V primary winding rated voltage.
 *** Only in case of 400 V primary winding rated voltage.
 **** Only in case of 220 and 380 V primary winding rated voltage.

Overall, mounting dimensions and mass

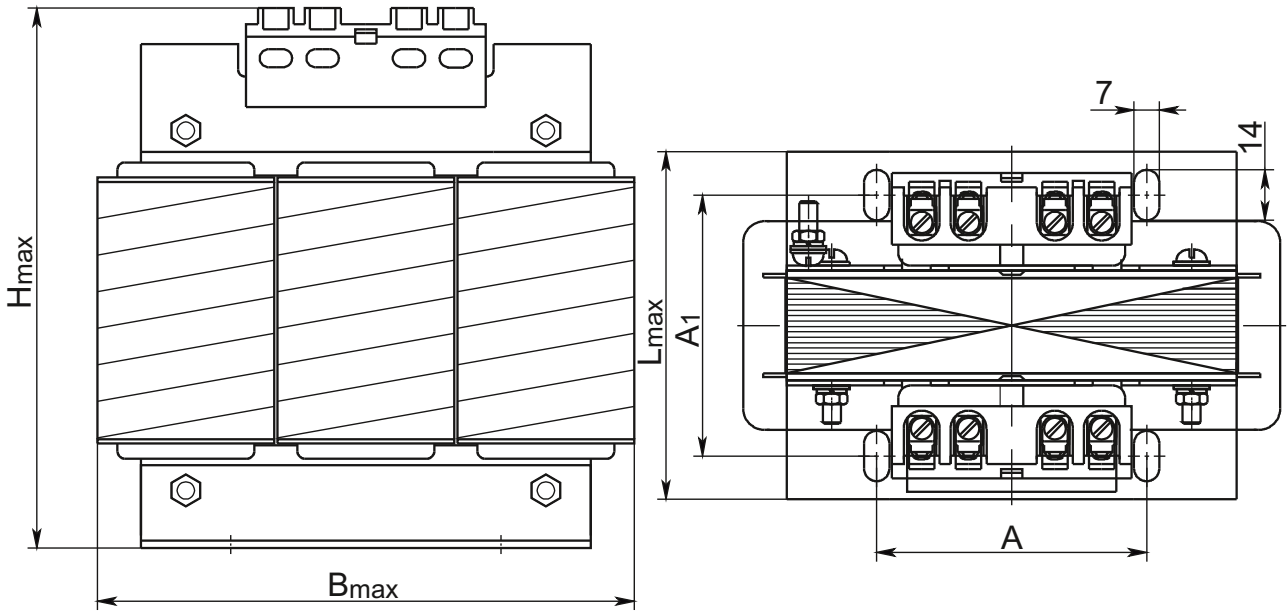


Fig. 1

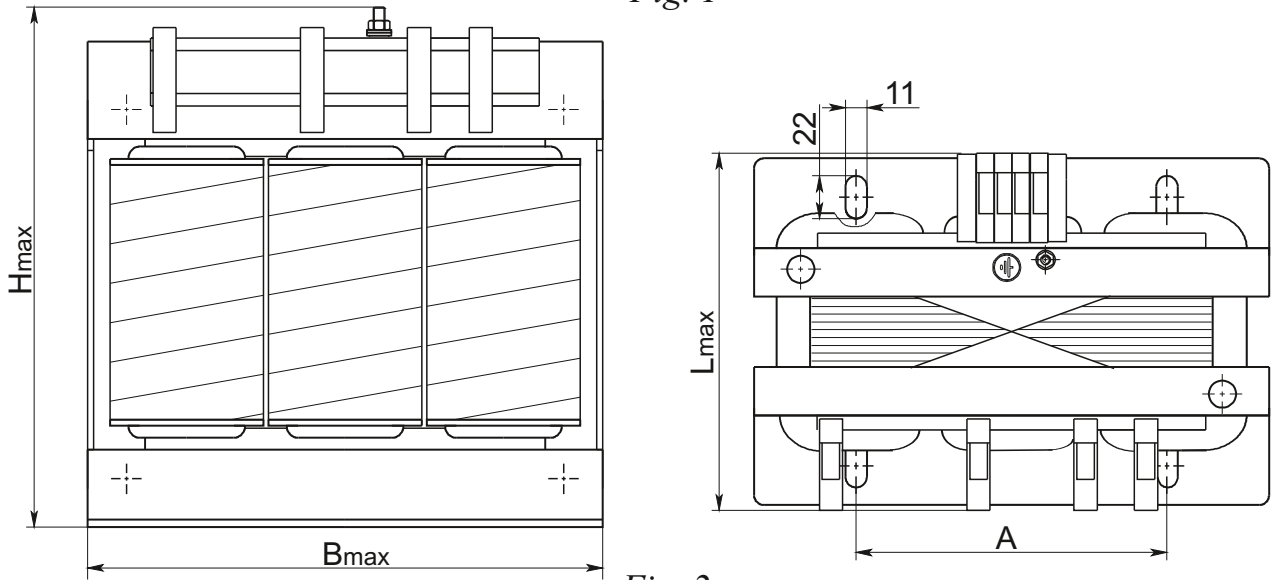


Fig. 2

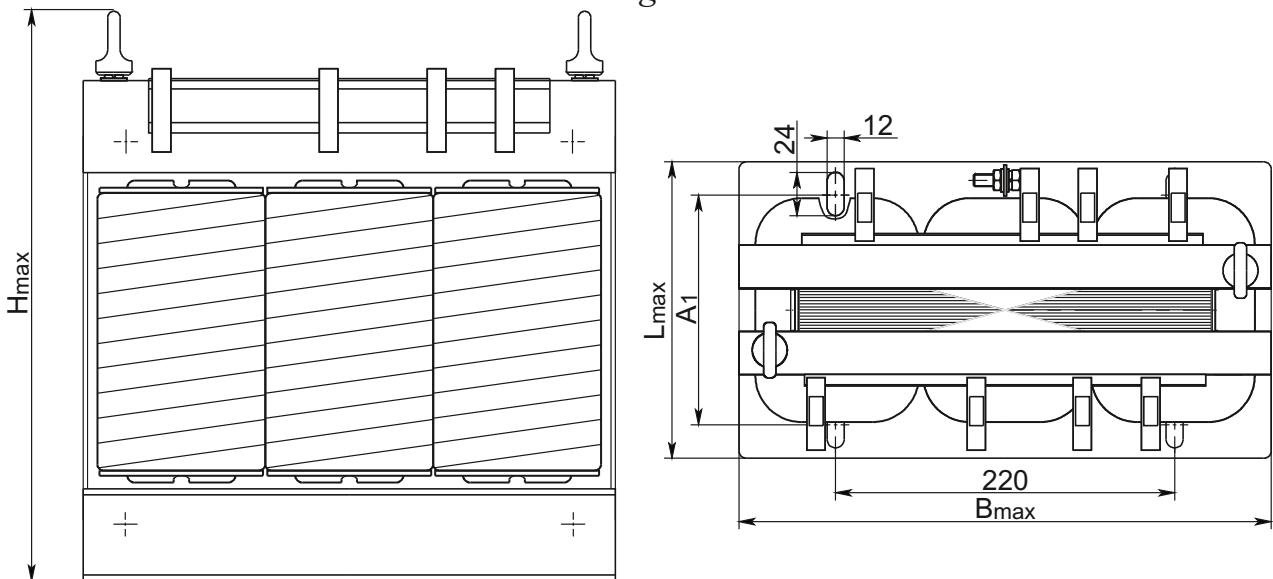


Fig. 3

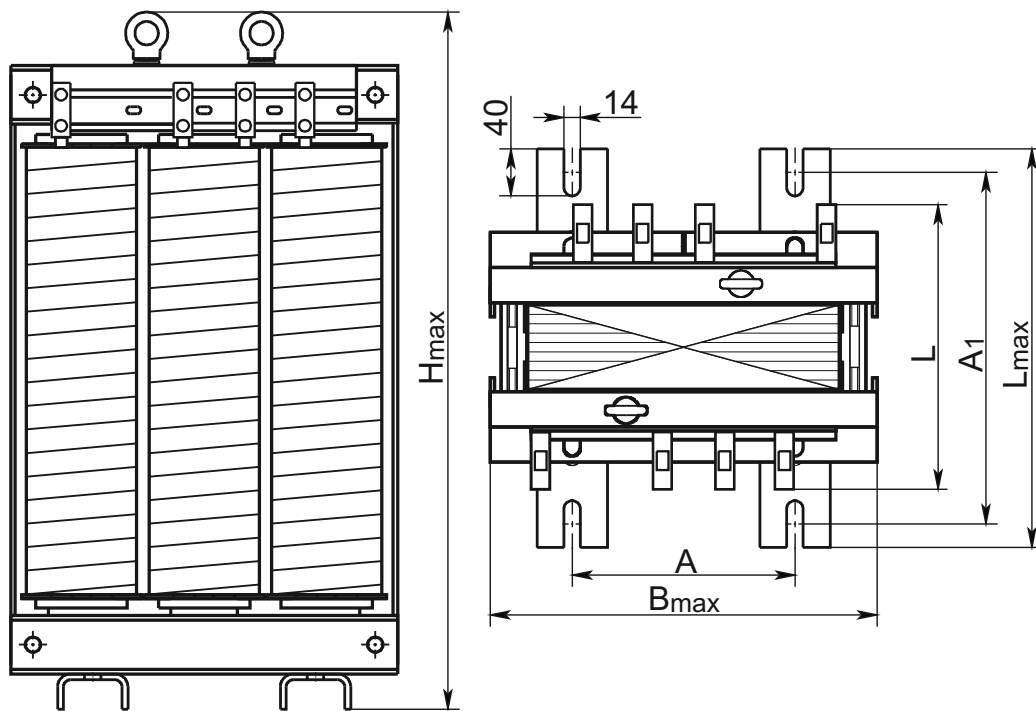


Fig. 4

dimensions in millimeters

Type designation	Fig.	B_{max}	L_{max}	L_1	H_{max}	A	A_1	Mass, kg	
TCP-0.16 УХЛ3	1	152	94	-	155	75 ± 1	66 ± 4	3.9	
TCP-0.25 УХЛ3			104				76 ± 4	4.6	
TCP-0.4 УХЛ3			118				91 ± 4	6.2	
TCP-0.63 УХЛ3			180		130	180	90 ± 1	110 ± 4	9.1
TCP-1.0 УХЛ3					150			110 ± 4	12.7
TCP-1.6 УХЛ3	2	270	165	-	270	160 ± 1	112 ± 2	22.0	
TCP-2.5 УХЛ3			200				140 ± 2	30.5	
TCP-4.0 УХЛ3			345				190	300	143 ± 2
TCP-6.3 УХЛ3	3	350	200	-	375	220 ± 1	152 ± 2	58.0	
TCP-10 УХЛ3					395		181 ± 2	81.0	
TCP-16 УХЛ3	4	396	342	255	600	190 ± 2	300 ± 2	105.0	
TCP-25 УХЛ3				245	735	214 ± 2		148.0	
TCP-40 УХЛ3				260	790	276 ± 2		223.0	

Sample of notation (to place an order, or to refer to) for TCP transformer of 0.25 kVA power rating, of 380 V primary winding voltage, of 36 V secondary winding voltage, with Yn/Yn-0 winding connection/vector group:

Transformer TCP-0,25 УХЛ3 380/36 Ун/Ун-0 ТУ РБ 100211261.060-2008
(where ТУ РБ = Technical Specifications of the Republic of Belarus).

TC3P SERIES TRANSFORMERS

TC3P series transformers (three-phase, dry-type, protected, isolating), rating 1.6...40 kVA, and TC3P(A) (three-phase, dry-type, protected, isolating with aluminium windings), rating 16 ... 40 kV·A, are intended for supply of three-phase voltage to rectifier circuits, semiconductor converters of machine-tools and elevators, electrically operated tools and others devices, where separation of circuits by means of reinforced insulation and not less than IP21 protection degree against external influence for power supply is required.



Transformers comply with the requirements of STB IEC 61558-1-2007 standard.

Isolating transformers of general use with secondary rated voltage over 50 V comply with the requirements of IEC 6158-2-4 standard.

Safety isolating transformers – the transformers with secondary rated voltage up to 50 V – shall comply with the requirements of STB IEC 61558-2-6-2006.

Winding connection / vector group – Yn/Yn-0.

Climatic version – C as in accordance with IEC 60721-2-1:2002 standard.

Nominal working values for externally induced mechanical stresses – in accordance with GOST 30631 for M1 mechanical performance group, however, the requirements for vibration resistance, vibration strength and shock resistance are only for vertical direction.

Operable altitude elevation above sea level is not more than 1000 m.

Transformers versions: as to the installation conditions on worksite the transformers are **independent** ones, as to the short-circuit withstandability they are **non-short-circuit proof** transformers.

Insulation thermal-endurance class – in accordance with GOST 8865-93:

- for transformers rating 1,6 up to 10 kVA – B class;
- for transformers rating 16 up to 40 kVA – F class.

As to protection against electric-shock hazard the transformers belong to I class in accordance with GOST 12.2.007.0-75 and have IP21 protection degree in accordance with GOST 14254-96.

For transformers of 1.6 to 4.0 kVA power, of 220-400 V primary voltage, and with fuse amperage up to 6.3 A inclusive as protective devices shall be used slow-action fuse-links with “T” symbol as in accordance with IEC 60127 – miniature fuse-links of high breaking capacity.

For transformers with fuse amperage over 6.3 A as protective devices should be used time delay fuse-links with breaking capacity within “gD”-type range in accordance with IEC 60269-1. The fuse-link current rating and time-current characteristic should correspond to the ratings indicated by the transformer marking.

Corrected sound power level of transformers both under no-load run and under rated load shall not exceed 60 dBA.

Basic specifications of the transformers

Transformer type	P rated	Voltage of winding, V		Short-circuit voltage, %	Efficiency factor, %
		U _{HV}	U _{LV}		
TC3P-1,6 YXJ12	1,6	220; 230; 380; 400	12; 19; 22; 24; 36; 42; 85; 127; 133; 170; 220; 230*; 380**; 400***	4,5	94,5
TC3P-2,5 YXJ12	2,5		19; 22; 24; 36; 42; 85; 127; 133; 170; 220; 230*; 380**; 400***	3,4	94,0
TC3P-4,0 YXJ12	4,0		36; 42; 85; 127; 133; 170; 220; 230*; 380**; 400***	2,8	95,5
TC3P-6,3 YXJ12	6,3		220****; 230*; 380**; 400***	2,4	96,0
TC3P-10 YXJ12	10			1,9	97,0
TC3P-16 YXJ12	16		220; 230; 380; 400	2,6	97,0
TC3P-25 YXJ12	25			2,34	97,2
TC3P-40 YXJ12	40			2,0	97,8
TC3P-16(A) YXJ12	16	380		3,5	97,0
TC3P-25(A) YXJ12	25		220	2,6	97,2
TC3P-40(A) YXJ12	40		2,2	97,8	

*Only by rated voltages of primary winding 230 and 400 V
 ** Only by rated voltages of primary winding 380 V
 *** Only by rated voltages of primary winding 400 V
 **** Only by rated voltages of primary winding 220 and 380 V

Overall, mounting dimensions and mass of the transformers

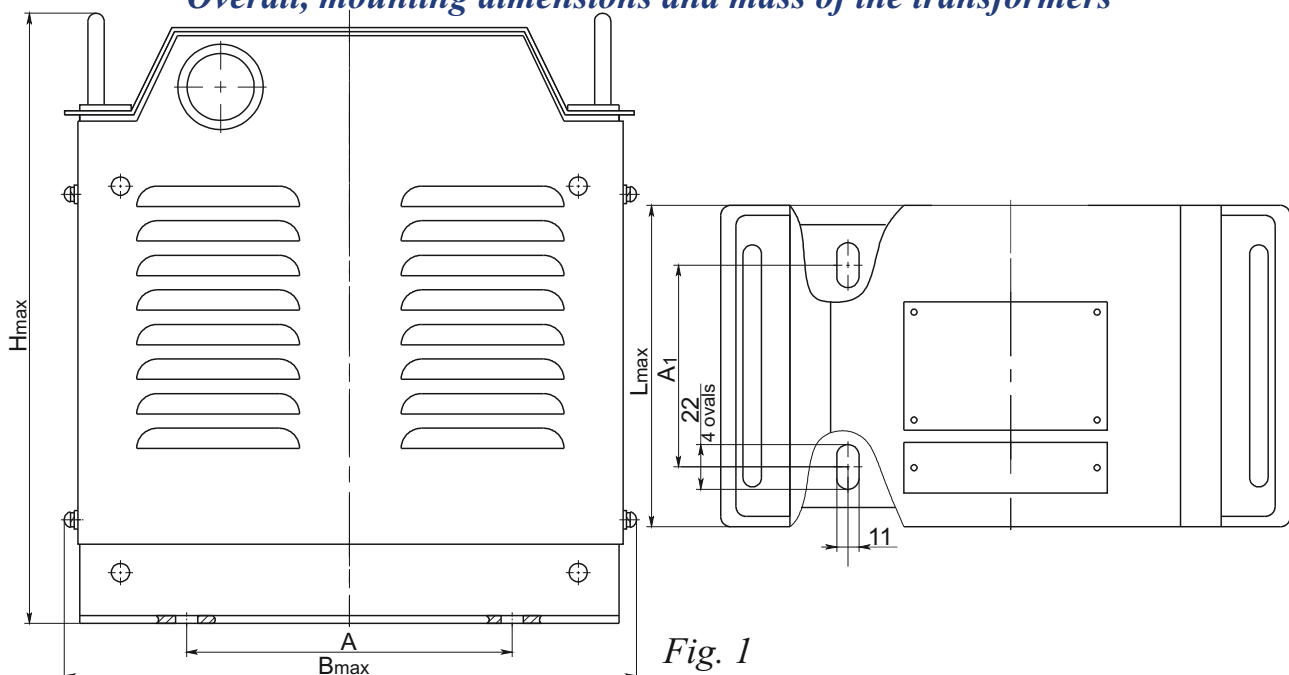


Fig. 1

Overall, mounting dimensions and mass of the transformers

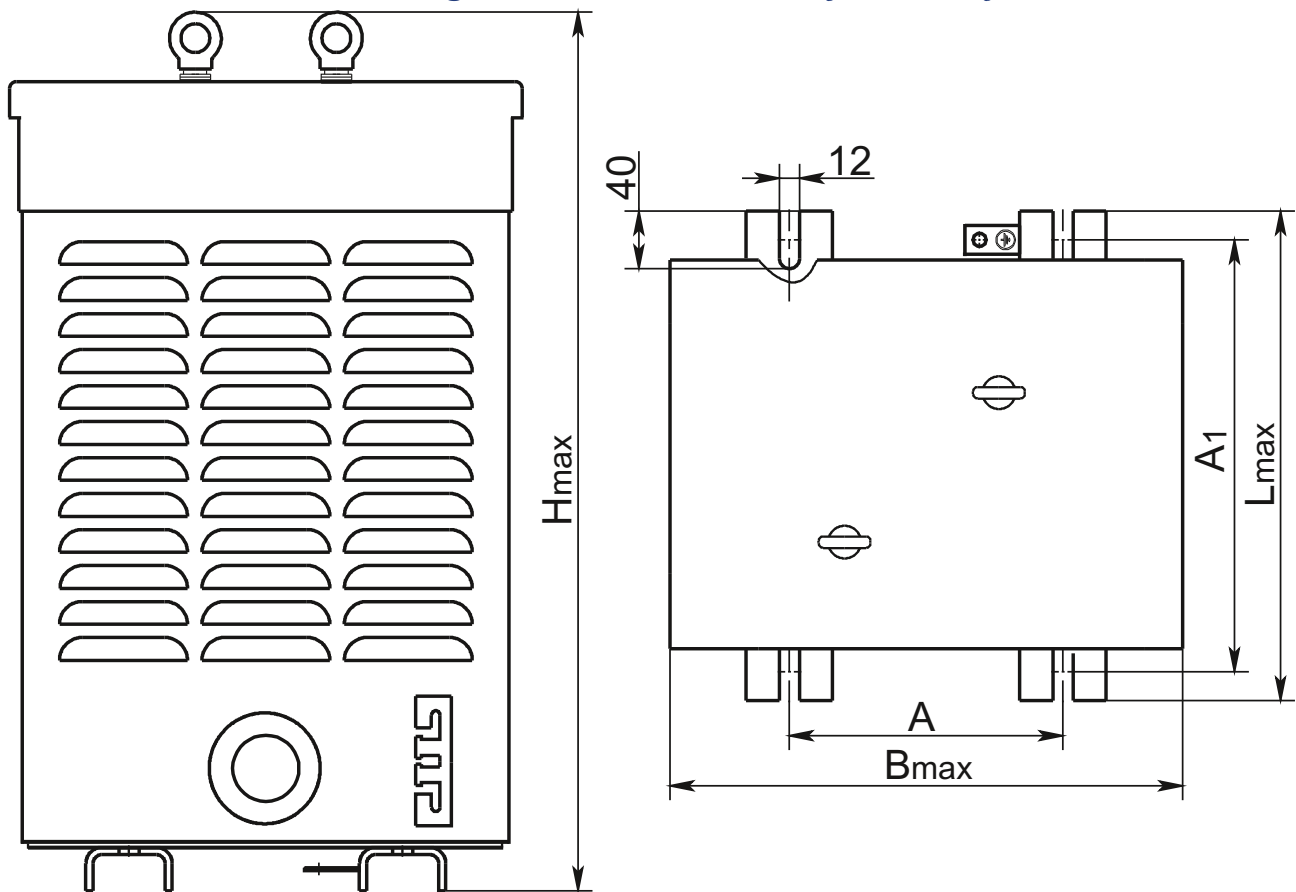


Fig. 2

dimensions in millimeters

Transformer type	Fig.	B _{max}	L _{max}	H _{max}	A	A ₁	Mass, kg
TC3P-1,6 YXJ12	1	290	177	305	160	112	24
TC3P-2,5 YXJ12			205			140	33
TC3P-4,0 YXJ12		365	200	335	220	143	47
TC3P-6,3 YXJ12		355		380		152	61
TC3P-10 YXJ12		380		400		181	85
TC3P-16 YXJ12	2	357	342	620	190	300	114
TC3P-25 YXJ12		420		755	214		160
TC3P-40 YXJ12		521		810	276		238
TC3P-16(A)YXJ12		420		755	214		114
TC3P-25(A)YXJ12		521		810	276		155
TC3P-40(A)YXJ12							186

Sample of notation (to place an order, or to refer to) for TC3P transformer of 25 kVA power rating, of 220 V primary winding voltage, of 36 V secondary winding voltage, with Yn/Yn-0 winding connection/vector group:

Transformer TC3P-25 YXJ12 220/36 Y_H/Y_H-0 TY PB 100211261.060-2008

The same, but with aluminum windings:

Transformer TC3P-25(A) YXJ12 220/36 Y_H/Y_H-0 TY BY 100211261.060-2008.

(where TY PB = Technical Specifications of the Republic of Belarus).

ТОП-0.66 and ТИИИ-0.66 CURRENT TRANSFORMERS

ТОП-0.66 and ТИИИ-0.66 current transformers are intended for transmission of measuring signals to measurement devices and are applied in electricity metering and counting circuits of a.c. installations of 50 Hz frequency and up to 0.66 kV (inclusive) rated voltage.



Transformers comply with the requirements of GOST 7746-2001 standard.
Climatic version – CT as in accordance with IEC 60721-2-1:2002 standard.

Transformers are resistant to externally induced mechanical stresses as for M2 mechanical performance group in accordance with GOST 30631-99 and are rated for installation at the altitude of not more than 1000 m above sea level.

As to installation conditions on worksite, the transformers are incorporated ones and they allow to be installed in whatever attitude position.

Insulation thermal-endurance class – E as to GOST 8865-93.

Magnetic cores of the 0.5S; 0.2 and 0.2S accuracy class current transformers for 10...400 A primary currents are of two designs:

1 - made of electric steel;

2 - composite type – made of electric steel and nanocrystalline alloy. Magnetic cores of 0.2 and 0.2S accuracy class are of the 2nd design – multiple-unit of electric steel and nanocrystalline alloy. Index of magnetic core design variant is included into the transformer designation.

Window type current transformers ТИИИ-0.66 for 400...4000 A primary currents are of two designs depending on window size:

-I - 23x103 mm (current transformers for 800...2000 A primary currents);

-II - 38x81 mm (current transformers for 400...1000 A primary currents);

-III - 60x131 mm (current transformers for 1000...4000 A primary currents).

Magnetic cores of transformers are made of electric steel. The window design variant number also is a part of identification code of current transformer.

Secondary winding contact terminals are covered with a transparent plastic cap, which, if necessary, can be sealed up. Transformers are subject to inspection by the Public Standards Body representatives.

ТОП-0.66 and ТИИИ-0.66 current transformers design provides double contact terminals allowing to carry out control checks at facilities without load-off and, for 0.5S; 0.2 and 0.2S accuracy class – a sealed-up contact terminal for connection to a counter coil, which prevents electricity stealing.

Structural parts of the transformers cases are made of hardly ignitable plastic.

As to protection against electric-shock hazard the transformers belong to 0 class in accordance with GOST 12.2.007.0-75 and have IP00 protection degree in accordance with GOST 14254-96.

Under a Customer's order TIII current transformers for 600 and 800 A primary currents can be fitted with an aluminium busbar of dimensions and mass given in Figure 6, and TIII current transformers for 1000, 1500 and 2000 A primary currents – with a copper or aluminium busbar of dimensions and mass as to Figure 7.

Basic specifications of the transformers

Description	Norm
Rated voltage, kV	0.66
Rated secondary current, A	5
Rated frequency, Hz	50 or 60
Rated primary current, A	10; 20; 30; 40; 50; 75; 100; 150; 200; 300; 400; 500; 600; 800; 1000; 1200; 1500; 2000; 3000; 4000
Rated secondary load, B·A	5; 10; 15; 20; 30
Accuracy class	1; 0.5; 0.5S; 0.2; 0.2S

Overall, mounting dimensions and mass of the transformers

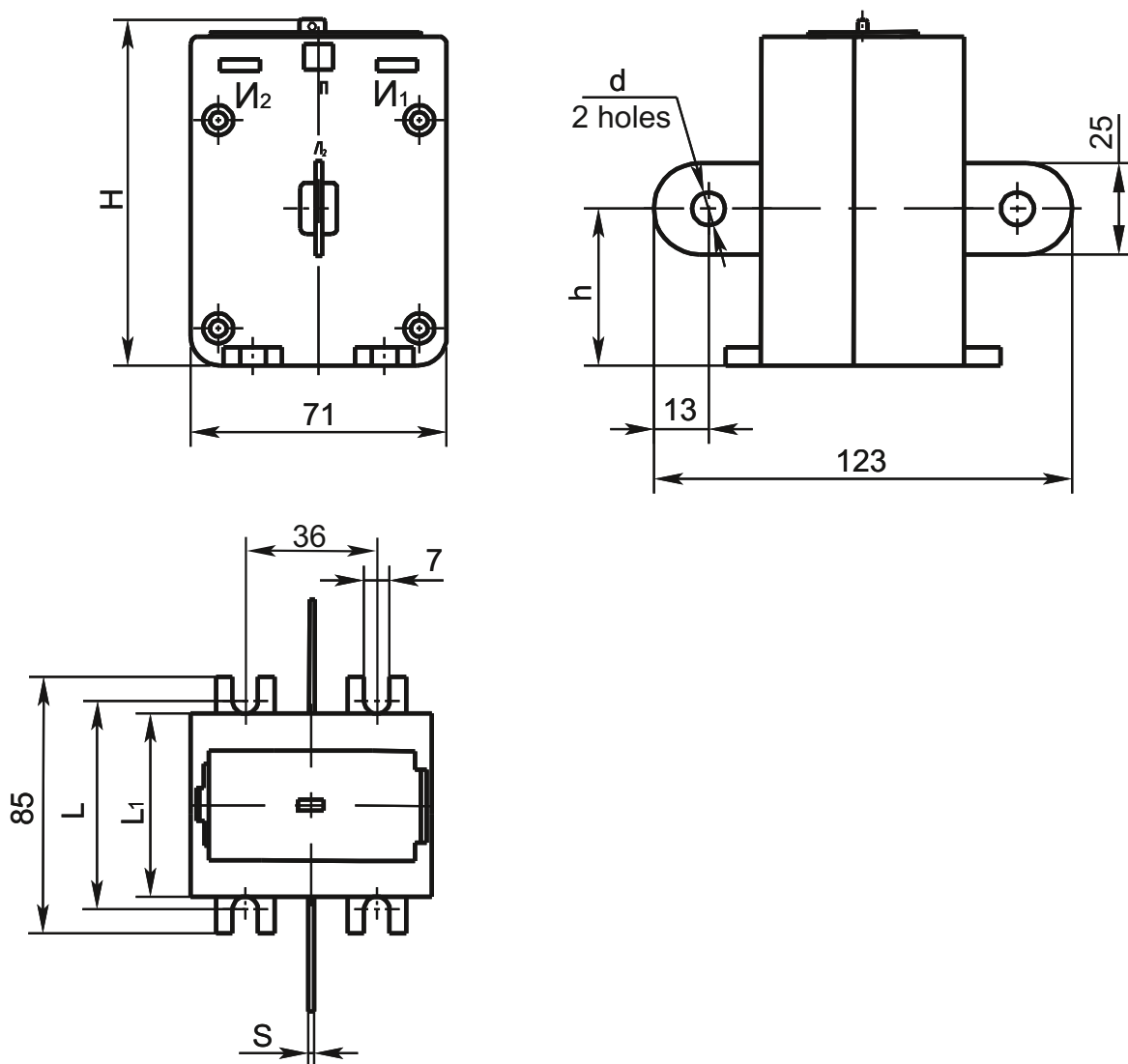


Fig. 1 TOII series transformers for 10...40 A primary currents

Overall, mounting dimensions and mass of the transformers

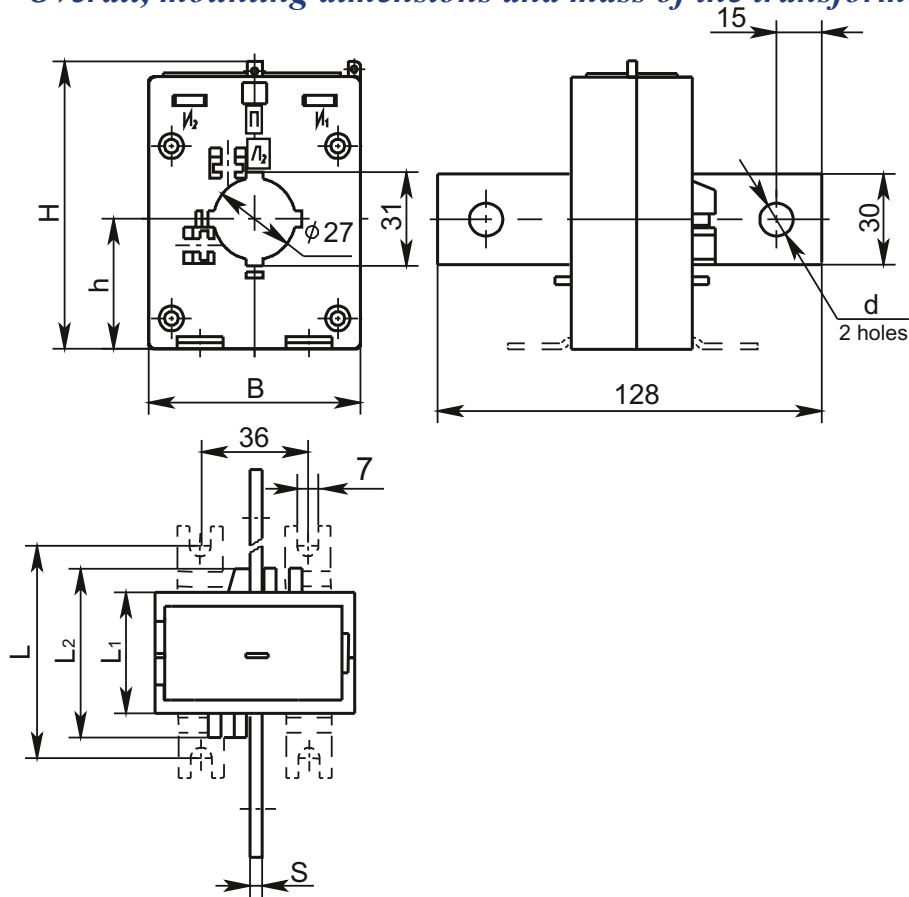


Fig. 2 TOII series transformers for 200, 300 and 400 A primary currents

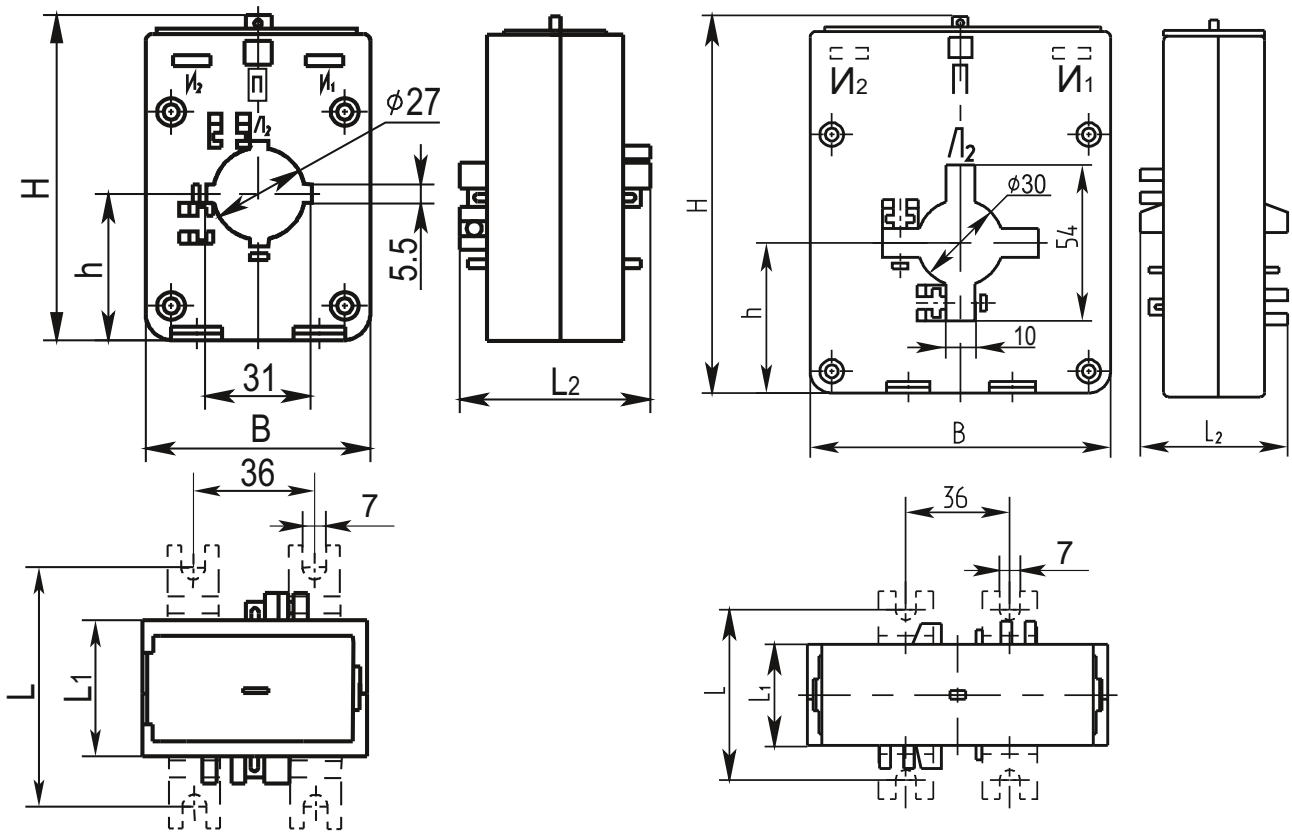


Fig. 3 TIIII series transformers for 200, 300 and 400 A primary currents

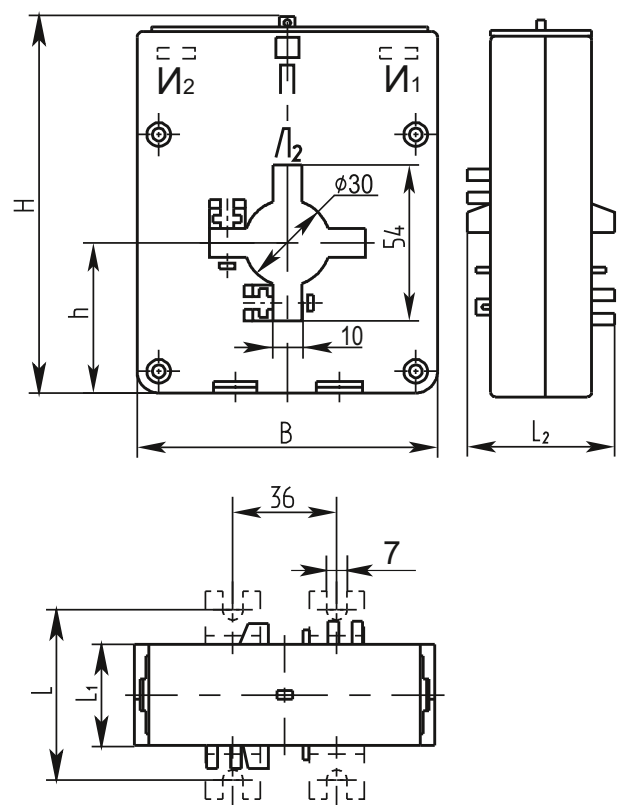


Fig. 4 TIIII series transformers for 600 and 800 A primary currents

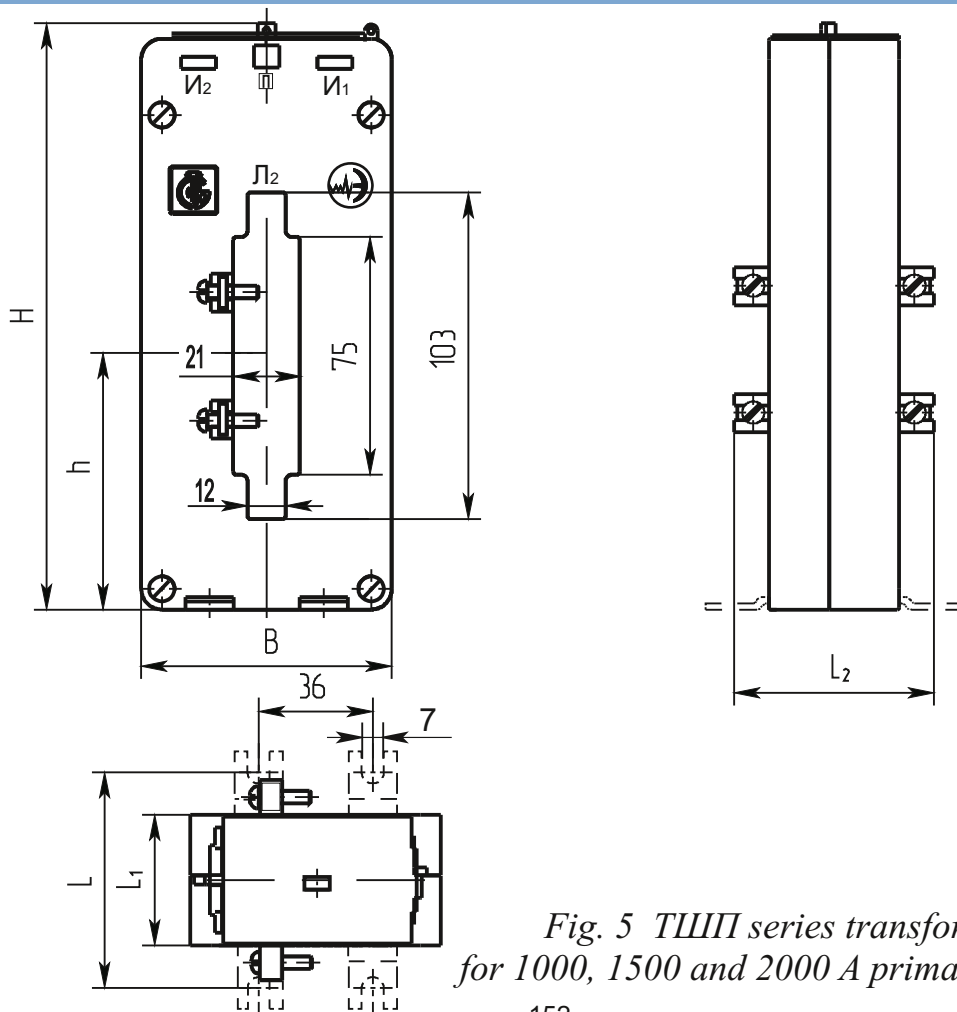


Fig. 5 TIII series transformers
for 1000, 1500 and 2000 A primary currents

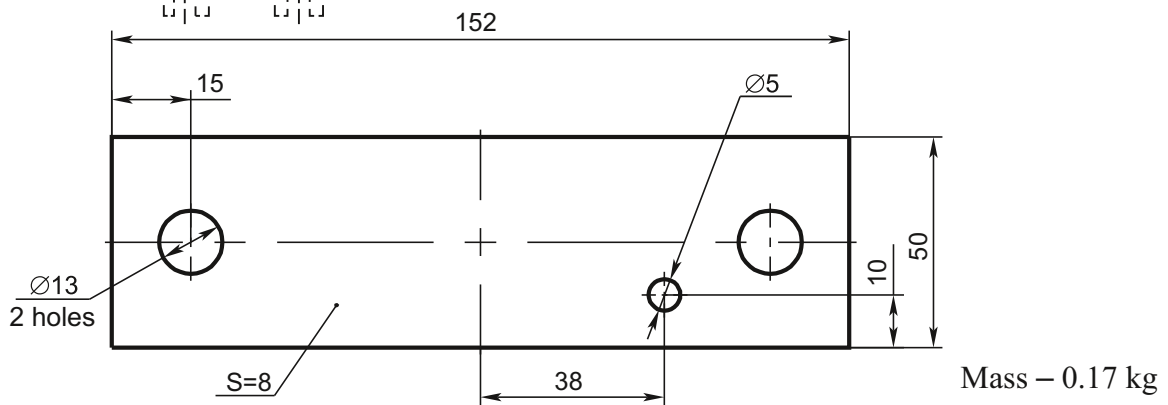
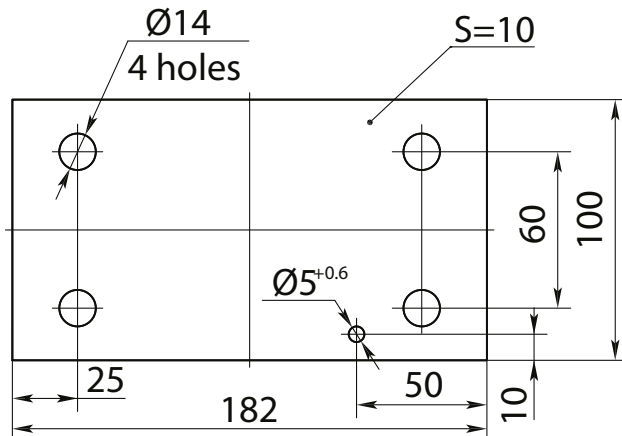


Fig. 6 Busbar for 600 and 800 A primary currents



Mass – 1.58 kg (copper)
– 0.48 kg (aluminium)

Fig. 7 Busbar for 1000, 1500
and 2000 A primary currents

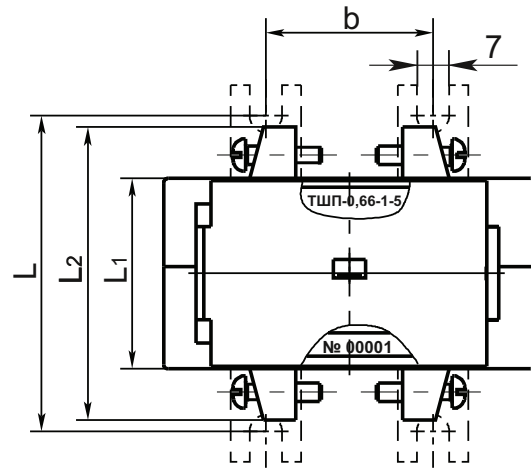
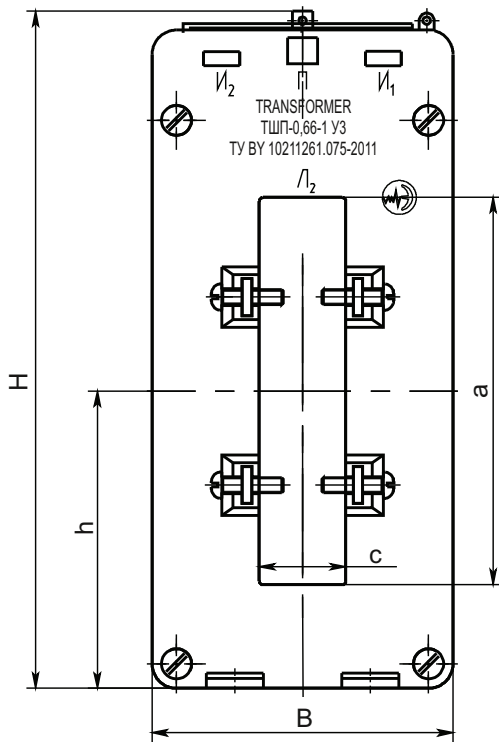


Fig. 8 TШП series transformers for 400...4000 A primary currents

Overall, mounting dimensions and mass of the transformers TШП-0,66

dimensions in millimeters

Type designation	Rated primary current, A	Accuracy class	Rated secondary load, V·A	Fig	B	d	h	H	L ₁	L ₂	L	S	Mass, kg without busbar	Mass, kg with busbar	
ТШП-0.66-1	200	0.5	5	3	71	10.5	43	97	47	70	72	4	0.60	0.65	
	300	0.5; 0.5S				0.55							0.60		
	400	0.5; 0.5S				0.60							0.65		
		400	1; 0.5	10; 15; 20			13.0					5	0.65	0.70	
		600	1; 0.5;	5; 10; 15;	4	105	13.0	52	132	35	60	60	8	0.87	1.04
		800	0.5S	20; 30										0.90	1.07
		1000	0.5	5; 10; 15;	5	80	14	81	187	41	65	68	10	0.97	1.45*
			0.5S											20; 30	1.20
		1500	0.5	5; 10; 15;	5	80	14	81	187	41	65	68	10	0.85	1.33*
			0.5S											20; 30	1.05
	2000	0.5	5; 10; 15;	5	80	14	81	187	41	65	68	10	0.9	1.38*	
		0.5S											20; 30	2.48**	
ТШП-0.66-2	200	0.5S	5	3	71	10.5	43	97	47	70	72	4	0.61	0.66	
	300	0.5S; 0.2;				0.70							0.75		
	400	0.2S				13.0							0.65	0.70	

* with aluminum busbar

** with copper busbar

Overall, mounting dimensions and mass of the transformers TOII-0.66

dimensions in millimeters

Type designation	Rated primary current, A	Accur-acy class	Rated secondary load, V·A	Fig	B	d	h	H	L ₁	L ₂	L	S	Mass, kg without busbar	Mass, kg with busbar												
ТОП-0.66-1	10; 20; 30; 40; 100; 150	0.5; 0.5S	5	1	71	9.0	43	97	55	-	74	15	-	0.65												
	50	0.5; 0.5S												0.70												
	200	0.5S												0.65												
	50	0.5S	10											2	10.5	13.0	47	70	72	4	5	-	-	0.60	0.65	
		0.5	10; 15; 20																							
		1	10; 15; 20; 30																							
	75	0.5S	10											1	9.0	13.0	47	70	72	4	5	-	-	0.60	0.65	
		0.5	10; 15; 20																							
		1	10; 15; 20; 30																							
	150	0.5S	10											1	9.0	13.0	47	70	72	4	5	-	-	0.60	0.65	
		0.5	10; 15; 20																							
		1	10; 15; 20; 30																							
	100; 200	1; 0.5	10; 15; 20											2	10.5	13.0	47	70	72	4	5	-	-	0.60	0.65	
200	0.5	5																								
300	0.5; 0.5S	5																								
400	0.5; 0.5S	5																								
ТОП-0.66-2	10; 20; 30; 40; 75; 100; 150	0.5S	5	1	71	9.0	43	97	55	-	74	15	-	0.60												
	50			2										10.5	0.61	0.66										
	200			1										13.0	0.55	0.60										
	300			1										9.0	0.60	0.65										
	400	1		9.0										0.60	0.65											
	10; 20; 30; 40; 75; 100; 150; 200	0.2; 0.2S		5										1	71	9.0	43	97	55	-	74	1.5	-	0.70		
	50													2										10.5	0.60	0.65
	300													1										13.0	0.65	0.70
	400													1										13.0	0.65	0.70

Overall, mounting dimensions and mass of the transformers

dimensions in millimeters

Type designation	Rated primary current, A	Accuracy class	Rated secondary load, V·A	Fig	B	b	a	c	h	H	L ₁	L ₂	L	Mass, kg	
ТШП-0.66-I	800	1; 0.5	5; 10; 15	8	80		103	23	80	182	41	65	68	0.84	
		0.5S	5; 10											0.87	
	1; 0.5; 0.5S	5; 10; 15	1000											0.91	
			1200											0.95	
			1500											1.03	
2000															
ТШП-0.66-II	400	1	5; 10; 15		90	36					162	50	75	77	1.17
		0.5	5; 10												1.19
		0.5S	5												
	500	1	5; 10; 15												1.21
		0.5	5; 10												
		0.5S	5												
	600	1	5; 10; 15	1.00											
		0.5	5; 10												
		0.5S	5												
	800	1	5; 10; 15	1.03											
		0.5	5; 10												
		0.5S	5												
1000	1	5; 10; 15													
	0.5	5; 10													
	0.5S	5													
ТШП-0.66-III	1000	1; 0.5; 0.5S	5; 10; 15	120	60	131	60	98	222	41	65	68	1.15		
	1200												1.18		
	1500												1.23		
	2000												1.11		
	3000												1.24		
	4000												1.44		

Sample of notation (to place an order, or to refer to) for a typical transformer of 150 A primary current, of 5 A secondary current, of 5 VA secondary load rating, of 0.5S accuracy class:

Current transformer ТШП-0.66-1-5-0.5S-150/5 Y3 ТУ РБ 05544590.020-97

The same, but with a composite magnetic core:

Current transformer ТШП-0.66-2-5-0.5S-150/5 Y3 ТУ РБ 05544590.020-97

Example of reference designation of the busbar design transformer with the II window size (38×81 mm), with rated primary current 800 A, with secondary current 5 A, with accuracy class 0.5S, with secondary load 5 V·A, when ordering and in the documentation of other product:

Current transformer ТШП-0.66-II-5-0.5S-800/5 Y3 ТУ РБ 100211261/075-2012.

(where ТУ РБ = Technical Specifications of the Republic of Belarus).

KEMA Quality

CERTIFICATE

Number: 99536

The management system of:

**Industrial Republican Unitary Enterprise
"MINSK ELEKTROTECHNICAL PLANT
NAMED AFTER V.I. KOZLOV"**

4, Uralskaya str.
220037 Minsk
Belarus

Including the implementation meets the requirements of the standard:

ISO 9001:2008

Scope:
Designing, development, manufacturing and delivery of
- three-phase transformers voltage rating up to 35 kV and power up to 2500 kVA,
- complete transformer substations voltage rating up to 35 kV and power to 2000 kVA,
- low power transformers voltage rating up to 1.5 kV and power up to 16 kVA.

The file that forms the basis of the certificate:
99535-QUA, 2019914-QUA, 2040421-QUA, 2099247-QUA, 3001451-QUA

Certificate expiry date: December 30, 2013
Certificate effective date: December 31, 2010
Certified for the first time: January 1, 2000

KEMA Quality B.V.

G.J. Zoetbrood
Managing Director


Piotr Dabrowski
Certification Manager

It is agreed publication of this certificate and adjoining reports is allowed.

KEMA Quality B.V. Urochowweg 310, 6912 AR Arnhem, P.O. Box 3185, 6602 ED Arnhem, The Netherlands
T +31 26 356 2000 F +31 26 352 6860 www.kemaquality.com Company registration: 09083028



EVPU Electrotechnical Research and Projecting Institute s.r.o.,
SKTC 101 Nová Dubnica, Slovakia

Notified Body/Competent Body
Identification No. 1293

CE

CERTIFICATE OF CONFORMITY

No. 00549/101/1/2005/CE

Manufacturer
EU "Minsk Electrotechnical Plant after V.I. Kozlov"
Uralskaya St., 4, 220037 Minsk, Republic of Belarus

Product
Power Transformer

Type
OCP (power 0.16 - 1 kVA)

The sample meets the essential safety requirements of the following directives:
Low Voltage Directive 73/23/EEC, last amended by 93/68/EEC

A sample of the product was tested and found to be in conformity with following standards and/or technical specifications applied:

EN 61558-2-4: 1997	Test Report No. 1003/2005
EN 61558-2-6: 1997	No. 1004/2005
EN 61558-1: 1997 +A1: 1998 +A11: 2003	

This certificate is the result of test carried out on one sample and does not represent the serial production of this product.

Nová Dubnica, December 22nd, 2005


Signature

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Trenčianska 19,
018 51 Nová Dubnica
Slovakia
003758

Tel: +421 (0)42 4403 600, 4403 500
Fax: +421 (0)42 4403 502
e-mail: sktc101@evpu.sk



РОССИЙСКИЙ МОРСКОЙ РЕГИСТР СУДОВОДАТВА
RUSSIAN MARITIME REGISTER OF SHIPPING 7.1.4.1



СВИДЕТЕЛЬСТВО О ПРИЗНАНИИ ИЗГОТОВИТЕЛЯ RECOGNITION CERTIFICATE FOR MANUFACTURER

Настоящим удостоверяется, что **ПРИ "Минский электротехнический завод им. В.И. Козлова" / IRIE "MINSK ELECTROTECHNICAL PLANT NAMED AFTER V.I. KOZLOV"**,
220037, Республика Беларусь, г. Минск, ул. Уралская, 4,
4, Uralskaya str., Minsk, The Republic of Belarus, 220037

признан Российским морским регистром судоходства как изготовитель:
is recognized by Russian Maritime Register of Shipping as a Manufacturer of:

изделий, указанных в Приложении к настоящему Свидетельству / the products listed in the Annex to this Certificate.

Настоящее Свидетельство о признании действительно при условии полного выполнения требований Российского морского регистра судоходства.
This Recognition Certificate is granted on condition that the requirements of Russian Maritime Register of Shipping are complied with in all respects.

Настоящее Свидетельство о признании действительно до **31.07.2017**
This Recognition Certificate is valid until **31.07.2017**

при условии подтверждения через каждые **12 ± 1** месяцев(ед.)
subject to confirmation each **12 ± 1** month(s)


Настоящее Свидетельство о признании теряет силу в случаях, установленных в Правилах технического надзора за постройкой судов и изготовлением материалов и изделий для судов.
This Recognition Certificate becomes ineffective in cases stipulated in Rules for the Technical Supervision during Construction of Ships and Manufacturing of Products, Materials and Products.

Дата выдачи **31.07.2017** № **12.00071.120**
Date of issue **31.07.2017** № **12.00071.120**

Российский морской регистр судоходства **С.А. Куликов / S. Kulikov**
Russian Maritime Register of Shipping (фамилия, имя отчество)

CERTIFICATE

ISO 14001:2004



hereby certifies that the company


**Industrial Republican Unitary Enterprise
"MINSK ELEKTROTECHNICAL PLANT NAMED
AFTER V.I. KOZLOV"**

business field:
Designing, production and shipment of power transformers rating up to 2500 kVA of up to 35 kV voltage class; complete transformer substations rating up to 2500 kVA of up to 35 kV voltage class; transformers rating up to 16 kVA of up to 1.5 kV voltage class.


location:
4, Uralskaya st. • Minsk 220037
subsidiary:
4, Babuszkina st. • Minsk 220037

has successfully implemented the above mentioned environmental management system according to the standard and applies it effectively. The conformity was inspected during the surveillance audit documented in audit report no. W-A 601311/AS/PT/14001. This certificate is only valid in connection with the successful performance of the surveillance audits.

This certificate is valid from:	2011-04-16	Date of the first certification:	2000-01-01
This certificate is valid until:	2014-04-01	Certificate registration no.:	000411031 duplicate
Last audit day:	2011-04-15		



DEKRA Certification GmbH
Wolfsau, 2011-04-18



UMS-TGA-ZM-05-01-60

