

2026



UKRELEKTROAPARAT LLC

TMN ECODESIGN DISTRIBUTION TRANSFORMERS

ECO 1, ECO 2



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UKRELEKTROAPARAT LLC

Reliable, time-tested manufacturer of distribution equipment with extensive experience in the field of electrical engineering, the powerful production and scientific and technical base, and a promising team of specialists.

The most valuable thing for us is the trust of our consumers, as we develop solutions for the energy-efficient operation of power grids, energy facilities and create reliable equipment for a wide variety of projects, ensuring their stable operation for years.



UKRELEKTROAPARAT LLC



OUR EQUIPMENT - YOUR SAFETY, RELIABILITY, DURABILITY!

Many years of experience of the manufacturing enterprise allows us to fulfill orders of any volume and complexity, having our own production facilities, competent labor resources and modern equipment.

We provide full control of the production process at all stages, choose the highest quality components, cooperating with well-known European and global component manufacturers.

The result of the multi-stage work of our specialists is high-quality, reliable equipment, ready for operation for many years.

ECODESIGN TRANSFORMERS APPLICATION FIELDS



UKRELEKTROAPARAT

The modern enterprise,
supplier of high-quality, reliable
and energy efficient equipment



ECODESIGN DISTRIBUTION TRANSFORMERS with power from 1000 to 6300 kV·A

Distribution oil step-down three phase two winding transformers with power of 50 up to 1600 kV·A and voltage to 36 kV are targeted at national economy use, indoor and outdoor type.

The technical regulation was developed on the basis of Commission Regulation (EU) № 548/2014 of May 21, 2014, which supplements Directive 2009/125/EC of the European Parliament and of the Council regarding ecodesign requirements for small, medium and large power transformers.

ADVANTAGES OF ECODESIGN TRANSFORMERS



General
savings



Low
energy loss



CO₂ emission
reducing

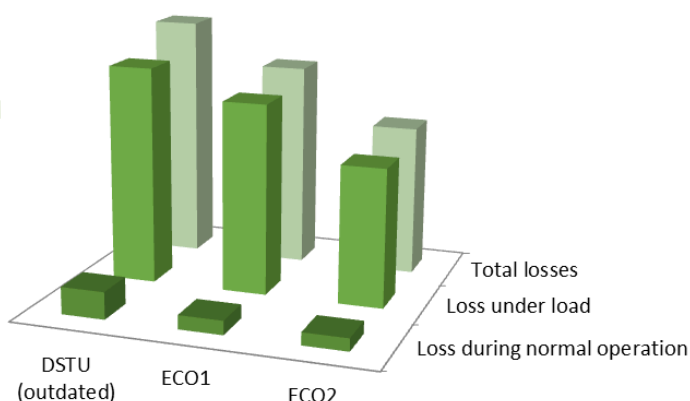


Higher
efficiency



Certified
equipment

■ Loss during normal operation ■ Loss under load ■ Total losses



Our ecological solutions
are aimed at solving the main
energy challenges of today
and the future:

- energy efficiency
- market efficiency
- network reliability
- ecology problems solutions

ECODESIGN POWER TRANSFORMERS OF TMN TYPE ECO1, ECO2

Compliant with IEC-76 standards, COMMISSION REGULATION (EU) No 548/2014, and its amendment EU 2019/1783 on implementing Directive 2009/125/EC of the European Parliament and the Council regarding small, medium and large power transformers (Ecodesign Tier 2).

Three-phase, two-winding, general-purpose oil-filled step-down power transformers with a rated capacity ranging from 1,000 to 6,300 kV·A and a voltage rating of up to 35 kV, equipped with on-load tap changers (OLTC), are designed to meet the needs of the national economy and are suitable for both indoor and outdoor installation.

The technical specifications of the transformers comply with the requirements of the “Technical Regulation on Ecodesign Requirements for Small, Medium, and Large Power Transformers” in accordance with the resolution of the Cabinet of Ministers of Ukraine*



Technical characteristics

TMN-1000 – 6300 kV·A power transformers are produced with the following rated voltages:

- primary winding (high voltage) up to and including 35 kV
- secondary winding (low voltage) – 6, 3, 10, or 10.5 kV.

Other voltage combinations.

- Circuit and connection group – U/D –11.
- Voltage regulation is performed under load.
- On-load tap changers (OLTC) for regulating transformer voltage. OLTCs of the RNT-125/35 U1 type, manufactured in-house, allow voltage to be adjusted in 2.5% steps within a range of $\pm 4 \times 2.5\%$ of the rated value without disconnecting the transformer from the grid. Transformers can be manufactured with voltage regulation within the ranges of $\pm 6 \times 1.5\%$; $\pm 8 \times 1.5\%$; $\pm 9 \times 1.5\%$; $\pm 9 \times 1.78\%$, and others. Such transformers are equipped with on-load tap changers manufactured by Maschinenfabrik Reinhausen GmbH, Germany, or other manufacturers.

Structure of conditional marking

TMN - X/35 Y(XЛ)1 1 ECO1 (ECO2)

- T** three-phase transformer
- M** oil-immersed cooling with natural circulation of air and oil (ONAN)
- N** on-load tap changer (OLTC)
- X** nominal power, kV·A
- 35** HV winding voltage class, kV
- U (CL)1** climate class and installation category according to GOST 15150-69

Operative conditions

Height above sea level - up to 1000 m;
Ambient temperature:

- for temperate climates from -45°F to $+40^{\circ}\text{F}$ (model “U”)
- for cold climates from -60°F to $+40^{\circ}\text{F}$ (model “HL”)

Relative air humidity no more than 100% at $+25^{\circ}\text{C}$.

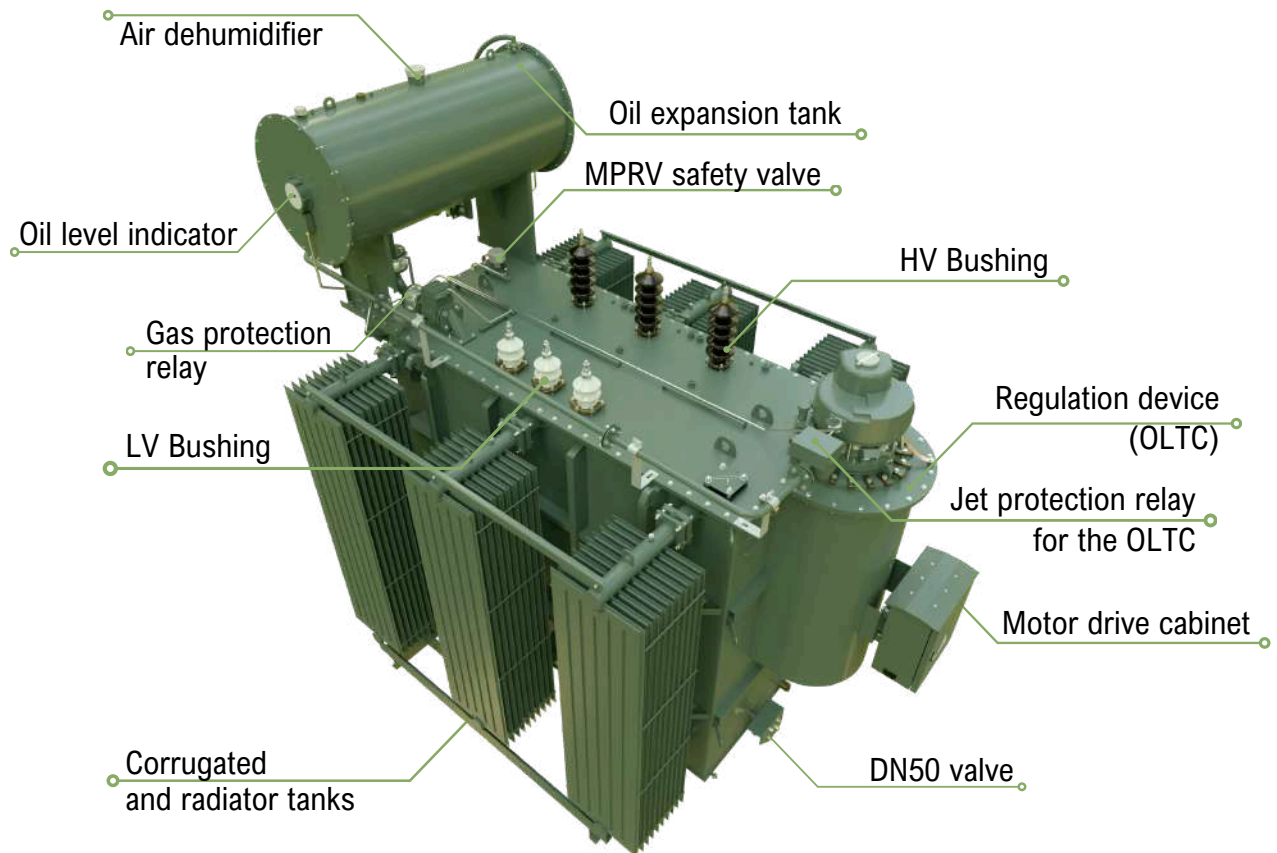
ECO1, ECO2 level of idling and short-circuit losses according to technical regulations*

Not intended for work

- in an explosive, aggressive environment (containing gases, vaporizations, elevated concentration of dust etc.);
- in vibratory operation and jolting.

The technical regulation on eco-design requirements for small, medium and large power transformers was approved by Resolution of the Cabinet of Ministers of Ukraine № 152 dated February 27, 2019

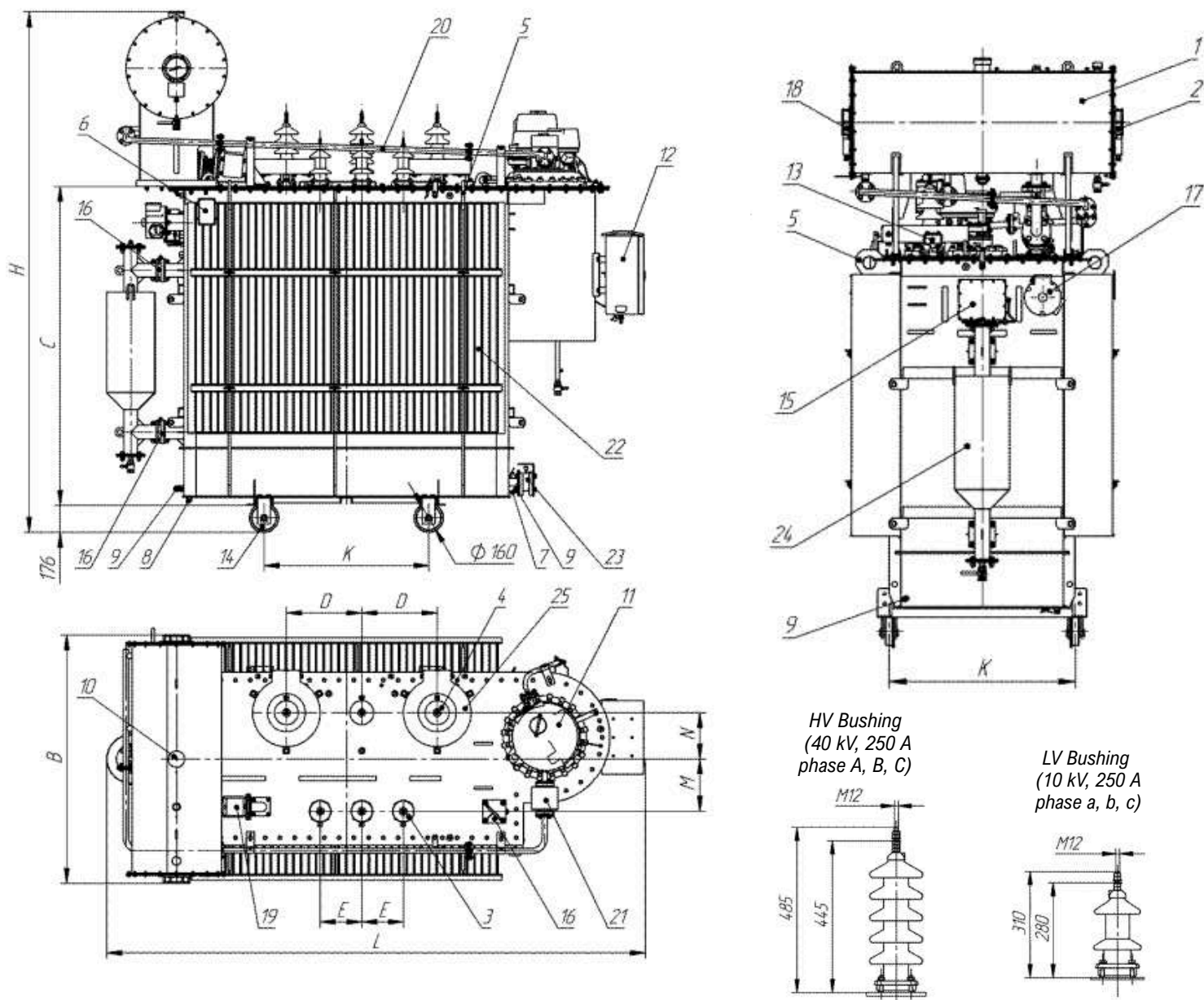
TMN TRANSFORMERS CONSTRUCTION



DESIGN FEATURES

- ▶ Rectangular transformer tanks with corrugated walls (for transformers with a capacity of 1,000–2,500 kV·A) and radiator tanks (for transformers with a capacity of 4,000–6,300 kV·A). Mounting brackets for easy transport of the transformer;
- ▶ The active part consists of a magnetic core made of electrical steel, windings, and an on-load tap changer (OLTC), which provides for local and automatic control of the transformer's voltage regulation process.
- ▶ The high-voltage and low-voltage removable, porcelain bushings of the outdoor unit are located on the cover.
- ▶ The oil expansion tank consists of two compartments: on the left is the oil expansion tank for the on-load tap-changer, and on the right is the oil expansion tank for the transformer.
- ▶ The oil level indicator for monitoring the oil level in the on-load tap-changer is mounted on the left side of the oil tank. The oil level indicator for monitoring the transformer's oil level is mounted on the right side of the pointer-type oil tank.
- ▶ An air dryer filled with a desiccant to protect the oil from the effects of moist air entering the transformer from outside.
- ▶ A temperature indicator (located on the transformer tank cover) for monitoring oil temperature and a thermometer in the on-load tap-changer (OLTC).
- ▶ Gas relays are installed to protect the on-load tap-changer and the transformer itself.
- ▶ A safety valve that activates when the internal pressure suddenly rises above 0.5 atm.
- ▶ Rollers for the longitudinal and transverse movement of transformers.

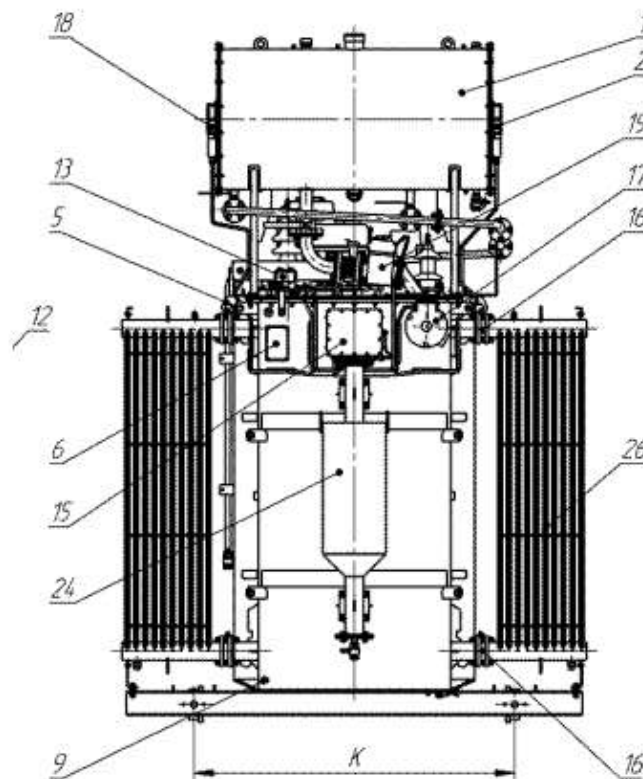
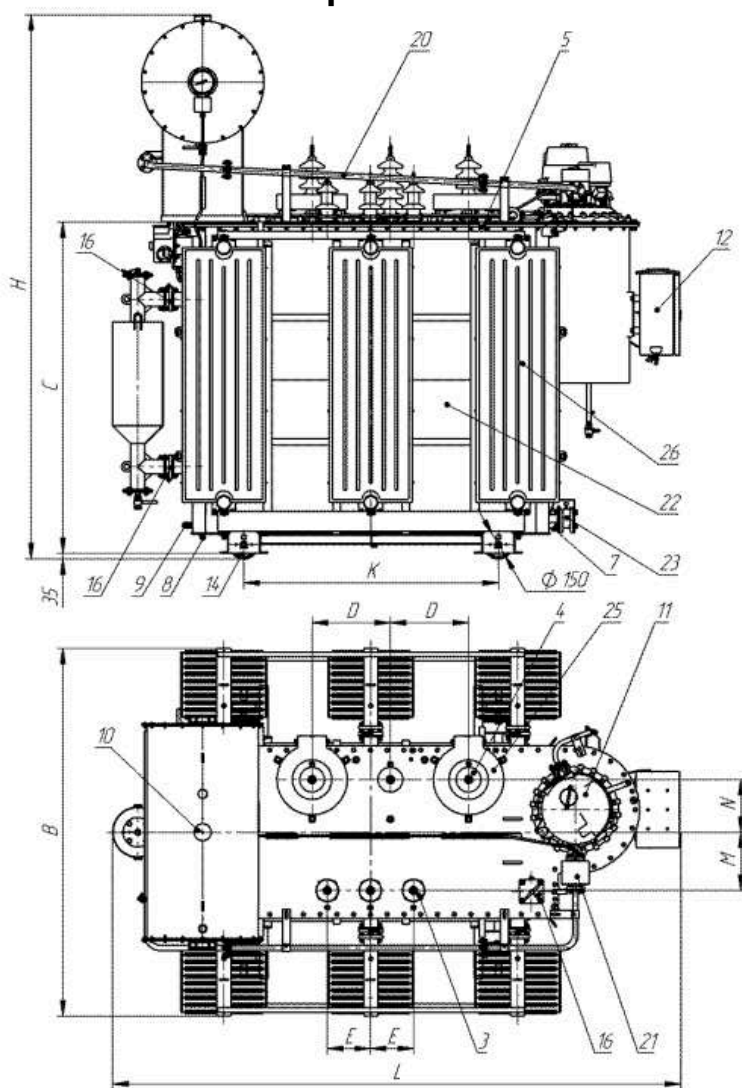
ECODESIGN POWER TRANSFORMERS OF TMN TYPE
with power from 1600 to 2500 kV·A, voltage up to 35 kV



- | | |
|---------------------------------|--|
| 1. Oil expansion tank | 14. Rollers |
| 2. Oil level indicator MOLCA-B2 | 15. Terminal box |
| 3. HV Bushing | 16. Disc valve |
| 4. LV Bushing | 17. MPRV safety valve |
| 5. Transformer lifting lug | 18. MOLCA-B2 on-load tap-changer oil level indicator |
| 6. Nameplate | 19. Transformer gas protection relay |
| 7. Oil sampling cork | 20. Piping |
| 8. Draincock | 21. Jet protection relay for the on-load tap-changer |
| 9. Grounding | 22. Tank |
| 10. Air dehumidifier | 23. DN50 valve |
| 11. Regulation device (OLTC) | 24. Thermosiphon filter |
| 12. Motor drive cabinet | 25. Current transformer |
| 13. HTPRT Thermometer | 26. Radiator |

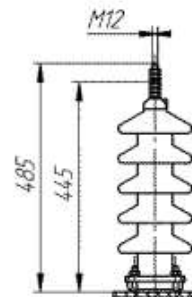
ECODESIGN POWER TRANSFORMERS OF TMN TYPE

with power from 4000 to 6300 kV·A, voltage up to 35 kV

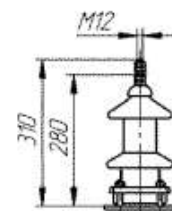


1. Oil expansion tank
2. Oil level indicator MOLCA-B2
3. HV Bushing
4. LV Bushing
5. Transformer lifting lug
6. Nameplate
7. Oil sampling cork
8. Draincock
9. Grounding
10. Air dehumidifier
11. Regulation device (OLTC)
12. Motor drive cabinet
13. HTPRT Thermometer
14. Rollers
15. Terminal box
16. Disc valve
17. MPRV safety valve
18. MOLCA-B2 on-load tap-changer oil level indicator
19. Transformer gas protection relay
20. Piping
21. Jet protection relay for the on-load tap-changer
22. Tank
23. DN50 valve
24. Thermosiphon filter
25. Current transformer
26. Radiator

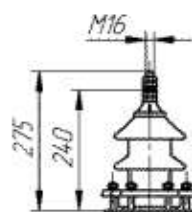
HV Bushing
(40 kV, 250 A)
(A, B, C)



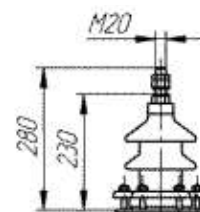
HV Bushing
(10 kV, 250 A)
(a, b, c)



LV Bushing
(10 kV, 400 A)
(a, b, c)



LV Bushing
(10 kV, 630 A)
(a, b, c)



TECHNICAL SPECIFICATIONS OF TMN TYPE TRANSFORMERS
with power from 2500 to 6300 kV·A voltage up to 35 kV
ECO1

Power, kV·A		2500	4000	6300
Rated voltage (HV), kV		35	35	35
Low-voltage rated voltage, kV		6,3 10,5	6,3 10,5	6,3 10,5
Scheme and group of winding connections		Yd11	Yd11	Yd11
No-load losses*, W		3800	-	-
Short-circuit Impedance, %		28500	-	-
Minimum value of the maximum REI efficiency, %		-	99,465	99,51
Short-circuit voltage, %		7,2	7,5	7,5
Measurements**, mm.	L	3700	3560	3825
	B	1780	2305	2415
	H	3100	3150	3715
	D	490	490	490
	A	490	490	490
	E	270	270	270
	F	270	270	270
	M	355	355	365
	N	300	260	365
	K	1594	1594	1594
	C	2370	2330	2400
Oil weight**, kg		3800	4600	4700
Total weight**, kg		9800	12150	15500

*Maximum level of losses
 **Dimensions and weight are given for reference only and are not contractual, they must be discussed when ordering.

CONSULTATION WITH THE MANAGER IS RECOMMENDED!

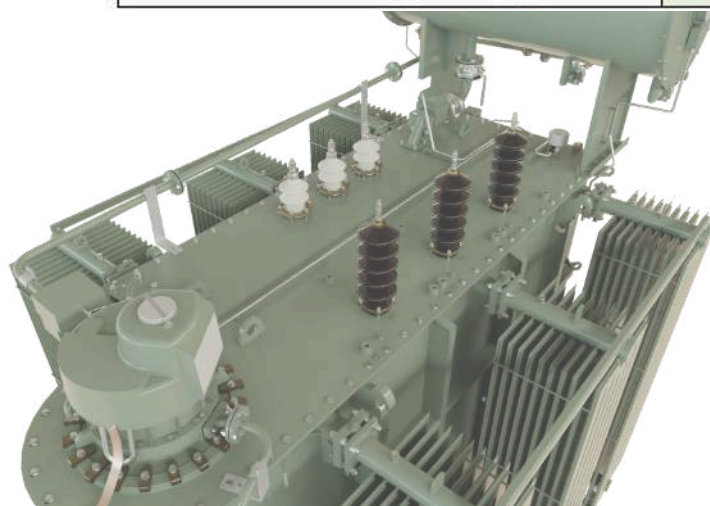


TECHNICAL SPECIFICATIONS OF TMN TYPE TRANSFORMERS

with power from 1600 to 6300 kV·A and voltage up to 35 kV

ECO2

Power, kV·A		1600	2500	4000	6300
Rated voltage (HV), kV		35	35	35	35
Low-voltage rated voltage, kV		6,3 10,5	6,3 10,5	6,3 10,5	6,3 10,5
Scheme and group of winding connections		Yd11	Yd11	Yd11	Yd11
No-load losses*, W		1296	1890	-	-
Short-circuit losses*, W		13800	21275	-	-
Minimum value of the maximum REI efficiency, %		-	-	99,532	99,571
Short-circuit voltage, %		6	6	7,5	7,5
Measurements**, mm.	L	3335	3500	3560	3825
	B	1365	1615	2305	2415
	H	3205	3380	3515	3715
	D	490	490	490	490
	A	490	490	490	490
	E	270	270	270	270
	F	270	270	270	270
	M	330	340	365	365
	N	300	300	330	365
	K	1070	1070	1594	1594
	C	1870	2070	2330	2400
Oil weight**, kg		2500	3300	4600	4700
Total weight**, kg		7570	10300	12300	15500



*Maximum level of losses

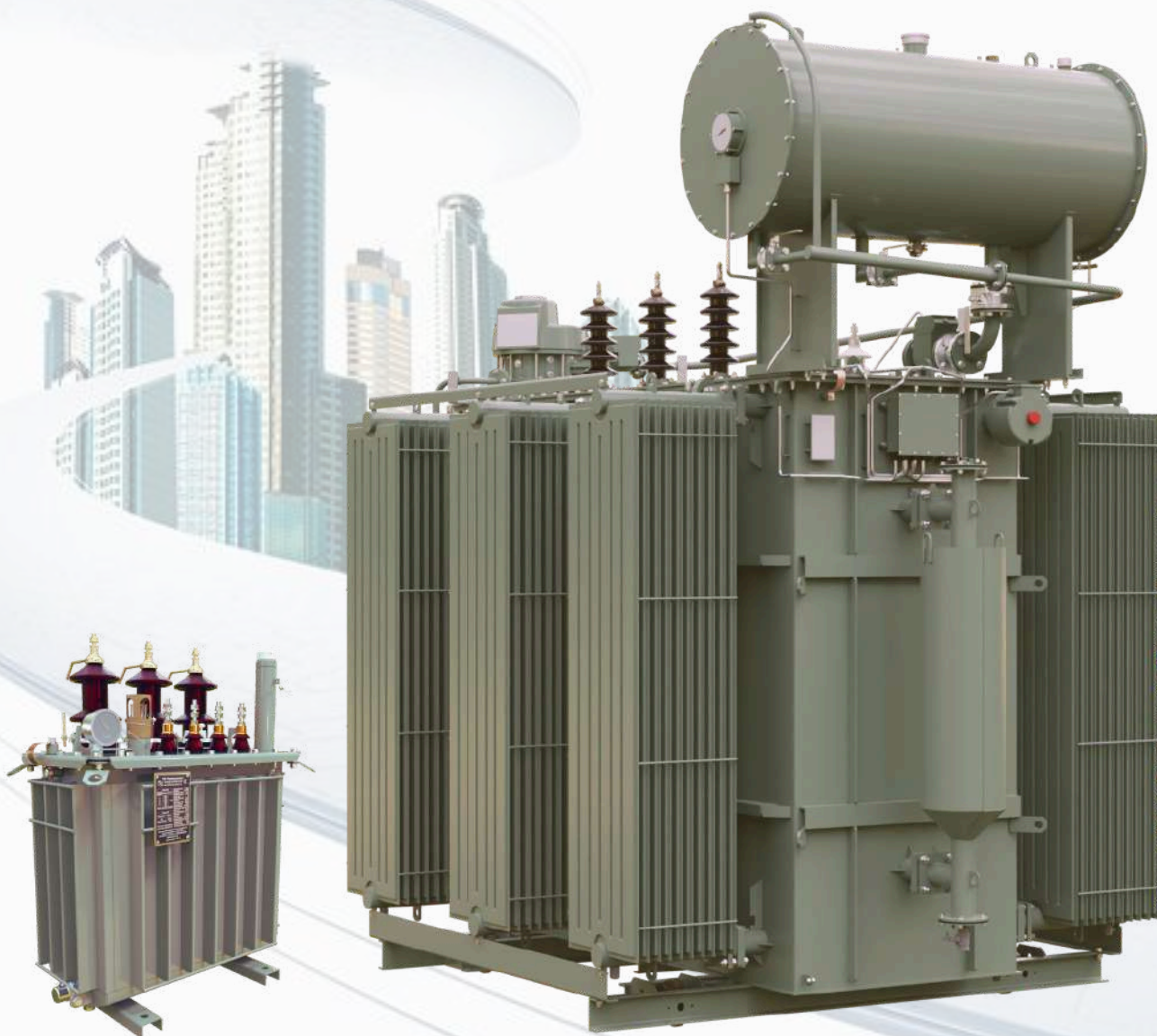
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CONSULTATION WITH THE
MANAGER IS RECOMMENDED!

UKRELEKTROAPARAT LLC - leading manufacturer of power distribution equipment, specializing in production of distribution transformers with power ranging from **10 to 6300 kV·A** an operating voltage of up to **36 kV**

The company produces over 50 types of transformers and more than 20 types of substations.

We develop energy-efficient projects and provide customized solutions tailored to specific project requirements, guaranteeing efficiency, compliance with international standards in order to meet the evolving demands of the energy sector while maintaining reliability and long-term partnerships with consumers worldwide.



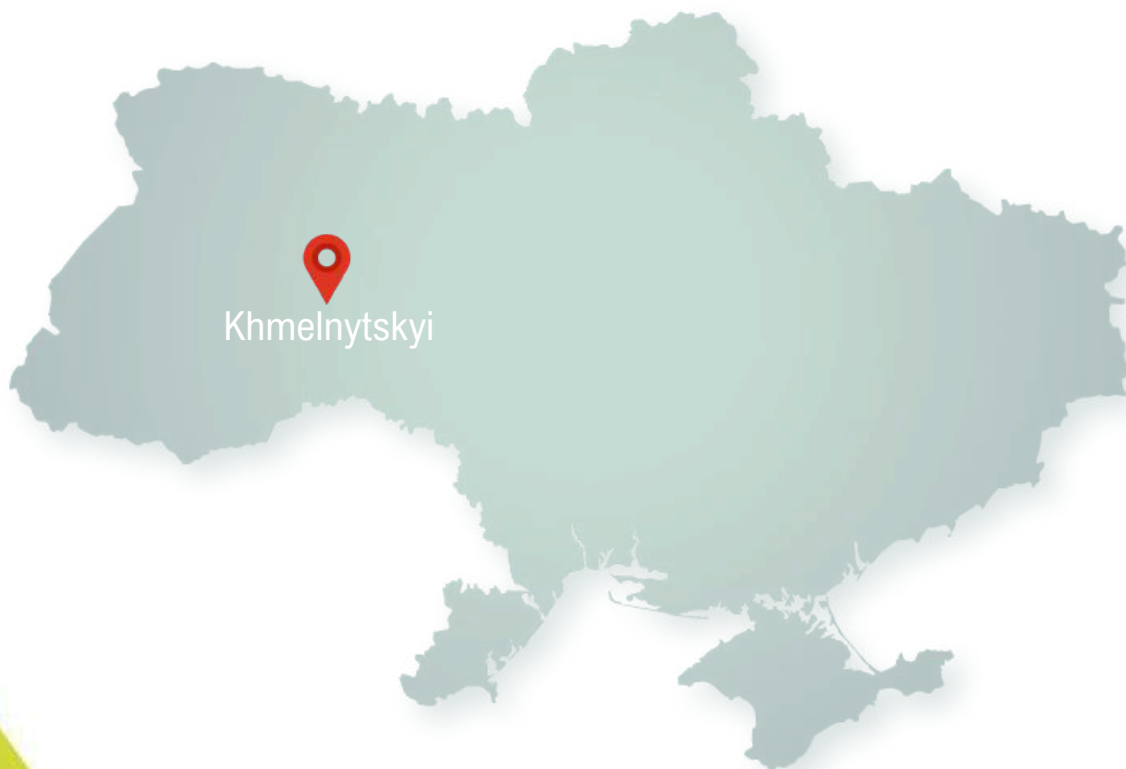
UKRELEKTROAPARAT LLC is driven by the fundamentals of Quality Management System.

It is evidenced by the corresponding ISO Certificates.

We try to go beyond these standards and continuously improve our processes and methods.

All tests and quality control of our products are carried out in our accredited laboratory, which is recognised by the International Laboratory Accreditation Cooperation - ILAC MRA.





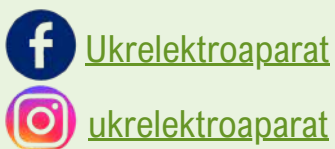
Khmelnytskyi

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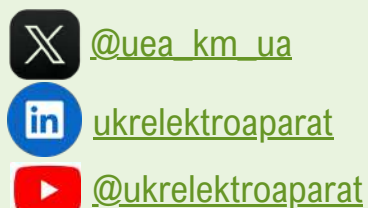


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