



FABRYKA TRANSFORMATORÓW w Żychlinie

Spółka z ograniczoną odpowiedzialnością

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ISO 9001:2000
ISO 14001:2004
PN-N-18001:2004

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DRY-TYPE EARTHING TRANSFORMERS

(WITH RESIN-ROVING INSULATION)

AND VOLTAGE REGULATION IN DE-ENERGISED STATE



Applications

Earthing transformers are used in electric power grids and their purpose is to create an artificial neutral point to which an arc suppressing coil or a resistor can be connected. Transformers are manufactured as three-phase devices and if there is no earth fault in the system, they feed the substation with auxiliary power. During fault of power grid the transformer is fed with line phase voltage in neutral point. During operation of the transformer the upper winding terminals are connected to power grid, and the neutral point 1N is connected with the 1A terminal of arc suppressing coil or with the resistor. The transformers can be permanently loaded with auxiliary power demand. The upper voltage winding can be loaded with earth-fault compensating current while the secondary winding is loaded with continuous rated power. The windings of earthing transformers are connected to form the Znyn11 vector group, therefore in case of earth fault allows to distribute short-circuit current over all phases, thus reducing the value of earth fault current in the damaged line.

Operating conditions

The transformers in standard version are designed for operation in the conditions of moderate climate.

Maximum installation height for the transformer: 1000 m a.s.l.

Operating place: Depending on the protection level of IP-00 ÷ IP-54: Open space or the room with sufficient ventilation; atmosphere free of dust and chemically active or explosive gases.

Ambient temperature range: -25°C up to +40°C (248°K up to 313°K), average annual temperature not exceeding +20°C (293°K).

Rated frequency: 50 Hz

Load conditions are specified in the table below:

Compensating current expressed in % of rated current	Operating time, hours
100	2
87.5	4
75	8
62.5	continuous operation
50	continuous operation

NOTE:

Transformer in special version complying with other requirements is available on request.

Design

<i>Transformer cores:</i>	Three-legged cores made of cold-rolled transformer plates covered with inorganic insulating material.
<i>Transformer windings:</i>	The windings of transformers are made of electrolytic copper or, on special request, of aluminium. The windings are wound from a wire or strip.
<i>Voltage regulation:</i>	Upper voltage winding is equipped with taps for voltage regulation. Voltage regulation can be effected within the range of $\pm 5\%$. The transformer ratio can be changed by selecting of desired taps after de-energizing of the transformer.
<i>Tanks:</i>	Tanks are made of steel. Tanks are made in the form of bolted steel structure ensuring the required level of mechanical strength. For evacuation of heat the panels or filters with fans featuring with a specified IP protection degree are used. The tank is equipped with the undercarriage with wheels that can be positioned for longitudinal and transversal travel.

Tolerances:

- no-load losses +15%
- load losses +15%
- total losses +10%
- no-load current +30%
- short-circuit voltage +20%

International standards and requirements:

PN-EN 60076-6	- Power transformers. Reactors
PN-EN 60076-2	- Power transformers
PN-83/E-06040	- Transformers. General requirements
PN-EN 60076-11	- Power transformers - Part 11. Dry-type transformers
PN-EN 60076-1	- Power transformers. General requirements
PN-EN 60529	- Degrees of protection provided by enclosures (IP code)

Specifications:

Item	Type	Compensating power	Auxiliary power	Upper side voltage	Lower side voltage	Compensating current
		kVAr	kVA	V	V	A
1.	TZU 273/15,75	273	100	15750	400	30-15
2.	TZU 364/15,75	364	100	15750	400	40-20
3.	TZU 546/15,75	546	100	15750	400	60-30
4.	TZU 727/15,75	727	100	15750	400	80-40
5.	TZU 1091/15,75	1091	100	15750	400	120-60
6.	TZU 1637/15,75	1637	100	15750	400	180-90
7.	TZU 2182/15,75	2180	100	15750	400	240-120
8.	TZU 364/21	364	100	21000	400	30-15
9.	TZU 485/21	485	100	21000	400	40-20
10.	TZU 727/21	727	100	21000	400	60-30
11.	TZU 970/21	970	100	21000	400	80-40
12.	TZU 1455/21	1455	100	21000	400	120-60
13.	TZU 1940/21	1940	100	21000	400	160-80

Transformer type coding:

Example:

TZUra 546/15, where:

TZU - cast-resin earthing transformer

r - for transformer with voltage regulation insert this character in the type code

α - add this character for aluminium windings, if this character is absent, windings will be made of copper

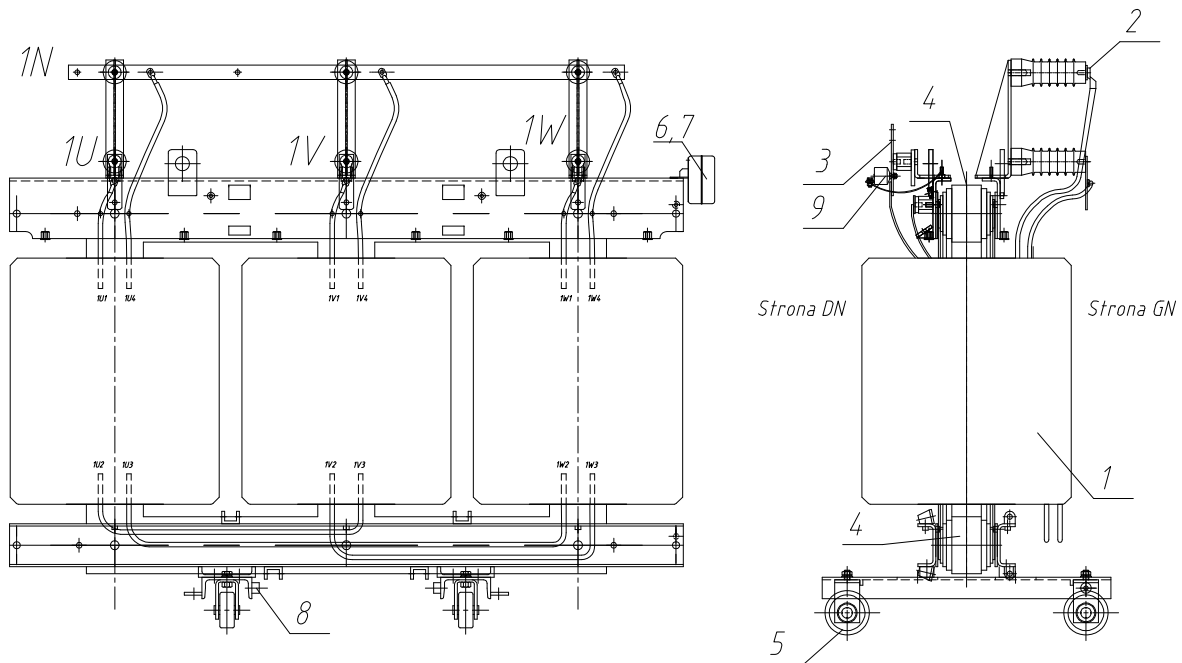
546 - compensation power [kVAr]

15.75 - upper voltage (15.75-15,750 V; 21-21,000 V; 31.5-31,500 V and so on).

NOTE:

- Upon individual order we can build the transformer with:
 - aluminium windings (type TZUa and TZUra);
 - voltage regulation (type TZUr or TZUra).
- On Customer request we can build the transformer with auxiliary power rating of 160kVA, 315kVA or other rating.
- The transformer can be made for the voltage complying with the standard: 6.3, 10, 15.75, 21kV or other (from the range of 1-37kV), as well as for other compensation current ranges.
- It is also possible to build the transformer equipped with:
 - enclosure with protection degree from IP-20 to IP-54;
 - accessories (PT temperature sensors, surge arresters, transformer terminals, anti-vibration pads and so on).

Pictorial drawing :



1. Winding assembly
2. Upper voltage leads
3. Lower voltage leads
4. Core
5. Undercarriage
6. Protecting circuit
7. Rating plates
8. Earthing
9. Surge arrester

The Customer will receive dimensions of units after contacting the factory and specifying the parameters of transformer.

NOTE:

The manufacturer reserves the right to change specifications presented in the catalogue and resulting from technical progress.