



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

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THREE-PHASE OIL IMMERSED DISTRIBUTION TRANSFORMERS



63-2500 kVA
6-20 kV

Catalogue Sheet No.

61

Application

The TOd series oil-immersed transformers are applied in distribution of electric energy in industrial, municipal and country distribution networks.

Operational condition

Transformers in basic execution are suitable to operate in moderate climates.

They can operate outdoors in location of altitudes up to 1,000 metres above sea level or indoors with sufficient ventilation, where ambient air is free from dust and chemically active or explosive gases.

Ambient temperature range is from -25°C to +40°C (248°K to 313°K), annual average temperature should not exceed +20°C (293°K).

Transformers are provided for continuous operation at load condition stated in PN-71/E-81000 Polish Standard and IEC Publication No. 354.

Tolerances:

In accordance with binding Standards tolerance for transformer ratings are as follows:

- No-load loss: +15%
- Load loss: +15%
- Total loss: +10%
- No-load current: +30%
- Impedance voltage: ±10%

Design description

Transformer core of three columns is made of cold-rolled electromagnetic steel sheet covered with non-organic insulation. Core sheet are diagonalized to ensure low no-load loss and reduced noise level. Transformer windings are made of electrolytic copper. Conductors are round enamel insulated or profile insulated with insulating paper, or of copper strip for LV winding. There are oil ducts among winding which provide oil circulation and proper cooling. Winding fastening and design ensure very high dielectric and impulse insulation, and short-circuit capacity. HV winding has taps for voltage regulation.

Tap changer is installed in transformers main tank and it has manual regulation wheel on tank cover. Regulation of transformer ratio (by means of changing taps) is made after switching transformer off-voltage.

Transformer main tank is manufactured from special corrugated steel. It is welded construction, reinforced by means of supports increasing rigidity and proper mechanical withstand. Transformer main tank has undercarriage with bi-directional wheels.

Standards and International Requirements

PN-EN 60076-1– Transformers. General Requirements

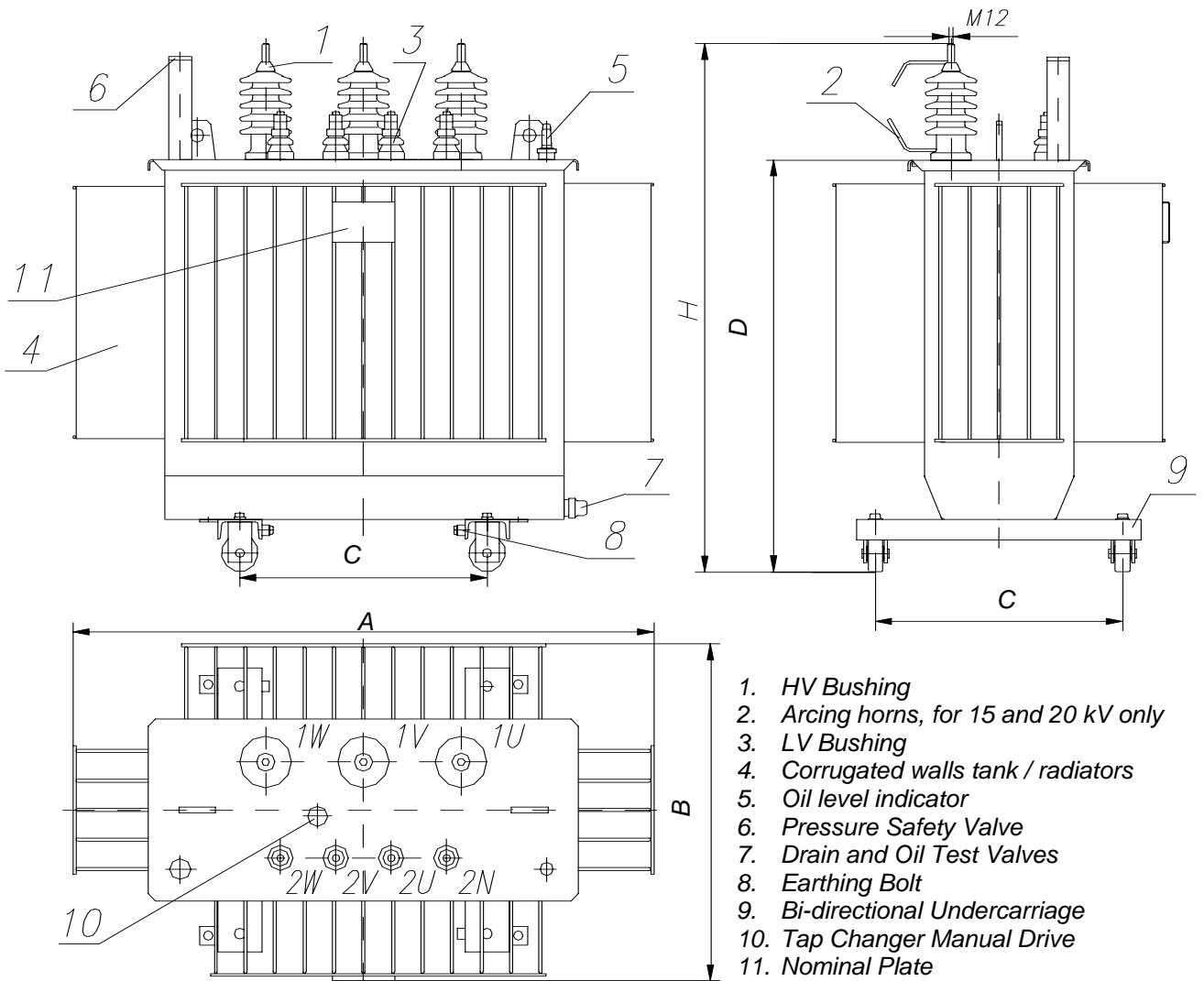
EN 60076-1– Power Transformers (IEC Publication No. 76.1)

Technical Specifications

Type	Power	Voltage		Regulation Range	Vector Group	Imped. Voltage	Loss		Mass		Dim. H
		HV	LV				No-load	Load	Total	Oil	
	kVA	V	V	%	%	W	W	kg	kg	mm	
<i>TOd 25/6</i>	25	6300	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	125	560	380	90	1071
<i>TOd 25/10</i>	25	10500	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	125	560	380	90	1071
<i>TOd 25/15</i>	25	15750	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	125	560	380	90	1071
<i>TOd 25/20</i>	25	21000	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	125	560	380	90	1071
<i>TOd 40/6</i>	40	6300	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	145	840	415	90	1071
<i>TOd 40/10</i>	40	10500	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	145	840	415	90	1071
<i>TOd 40/15</i>	40	15750	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	145	840	415	90	1091
<i>TOd 40/20</i>	40	21000	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	145	840	415	90	1091
<i>TOd 63/6</i>	63	6300	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	150	1200	510	100	1158
<i>TOd 63/10</i>	63	10500	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	150	1200	515	100	1158
<i>TOd 63/15</i>	63	15750	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	150	1200	515	100	1178
<i>TOd 63/20</i>	63	21000	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	150	1200	515	100	1178
<i>TOd 100/6</i>	100	6300	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	210	1750	615	110	1184
<i>TOd 100/10</i>	100	10500	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	210	1750	610	110	1184
<i>TOd 100/15</i>	100	15750	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	210	1750	610	110	1204
<i>TOd 100/20</i>	100	21000	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	210	1750	610	110	1204
<i>TOd 160/6</i>	160	6300	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	300	2350	835	145	1253
<i>TOd 160/10</i>	160	10500	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	300	2350	820	145	1253
<i>TOd 160/15</i>	160	15750	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	300	2350	825	145	1273
<i>TOd 160/20</i>	160	21000	400	+2.5 -3x2.5	<i>Yzn5</i>	4.5	300	2350	825	145	1273
<i>TOd 250/6</i>	250	6300	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	425	3250	1165	200	1400
<i>TOd 250/10</i>	250	10500	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	425	3250	1160	200	1400
<i>TOd 250/15</i>	250	15750	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	425	3250	1165	200	1426
<i>TOd 250/20</i>	250	21000	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	425	3250	1165	200	1426
<i>TOd 400/6</i>	400	6300	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	610	4600	1495	240	1405
<i>TOd 400/10</i>	400	10500	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	610	4600	1495	240	1405
<i>TOd 400/15</i>	400	15750	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	610	4600	1485	240	1430
<i>TOd 400/20</i>	400	21000	400	+2.5 -3x2.5	<i>Dyn5</i>	4.5	610	4600	1480	240	1430
<i>TOd 630/6</i>	630	6300	400	+2.5 -3x2.5	<i>Dyn5</i>	6	800	6750	2015	330	1476
<i>TOd 630/10</i>	630	10500	400	+2.5 -3x2.5	<i>Dyn5</i>	6	800	6750	2000	330	1476
<i>TOd 630/15</i>	630	15750	400	+2.5 -3x2.5	<i>Dyn5</i>	6	800	6750	2000	330	1496
<i>TOd 630/20</i>	630	21000	400	+2.5 -3x2.5	<i>Dyn5</i>	6	800	6750	2010	330	1496
<i>TOd 800/6</i>	800	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1050	8500	2430	410	1545
<i>TOd 800/10</i>	800	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1050	8500	2430	410	1545
<i>TOd 800/15</i>	800	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1050	8500	2430	410	1570
<i>TOd 800/20</i>	800	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1050	8500	2430	410	1570
<i>TOd 1000/6</i>	1000	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2800	450	1700
<i>TOd 1000/10</i>	1000	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2800	450	1700
<i>TOd 1000/15</i>	1000	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2800	450	1720
<i>TOd 1000/20</i>	1000	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2800	450	1720

Dimension Specifications

Type	Dim. A (mm)	Dim. B (mm)	Dim. C (mm)	Dim. D (mm)
TOd 25/6÷20	870	641	420	781
TOd 40/6÷20	870	641	420	781
TOd 63/6÷20	884	673	420	868
TOd 100/6÷20	936	678	420	894
TOd 160/6÷20	1016	733	520	963
TOd 250/6÷20	1112	828	520	1111
TOd 400/6÷20	1485	815	670	1115
TOd 630/6÷20	1500	896	670	1186
TOd 800/6÷20	1685	930	670	1260
TOd 1000/6÷20	1900	1020	820	1380

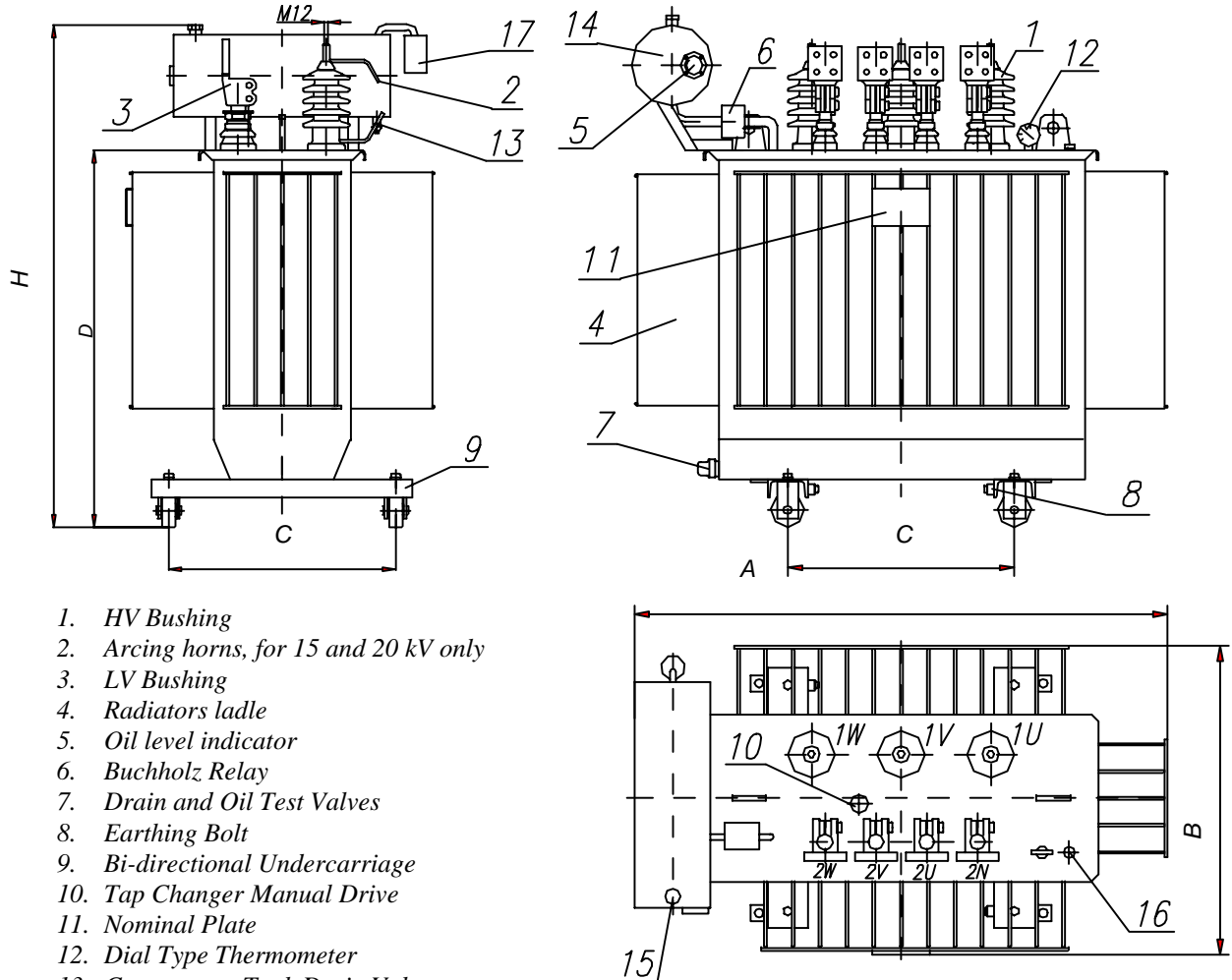


Technical Specifications

Type	Power	Voltage		Regulation Range	Vector Group	Imped. Voltage	Loss		Mass		Dim. H
		HV	LV				No-load	Load	Total	Oil	
	kVA	V	V	%		%	W	W	kg	kg	mm
<i>TOd 1000/6</i>	1000	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2865	430	1940
<i>TOd 1000/10</i>	1000	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2865	430	1940
<i>TOd 1000/15</i>	1000	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2865	430	1940
<i>TOd 1000/20</i>	1000	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1400	9500	2865	430	1940
<i>TOd 1250/6</i>	1250	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1700	12800	3400	620	2040
<i>TOd 1250/10</i>	1250	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1700	12800	3400	620	2040
<i>TOd 1250/15</i>	1250	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1700	12800	3400	620	2040
<i>TOd 1250/20</i>	1250	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	1700	12800	3400	620	2040
<i>TOd 1600/6</i>	1600	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	2000	15000	3880	660	2150
<i>TOd 1600/10</i>	1600	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	2000	15000	3880	660	2150
<i>TOd 1600/15</i>	1600	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	2000	15000	3880	660	2150
<i>TOd 1600/20</i>	1600	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	2000	15000	3880	660	2150
<i>TOd 2500/6</i>	2500	6300	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	3000	22000	5900	1000	2476
<i>TOd 2500/10</i>	2500	10500	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	3000	22000	5850	1000	2476
<i>TOd 2500/15</i>	2500	15750	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	3000	22000	5855	1000	2476
<i>TOd 2500/20</i>	2500	21000	400	$\pm 2 \times 2.5$	<i>Dyn5</i>	6	3000	22000	5805	1000	2476

Dimension Specifications

Type	Dim. A (mm)	Dim. B (mm)	Dim. C (mm)	Dim. D (mm)
TOd 1000/6÷20	1950	1020	820	1380
TOd 1250/6÷20	2030	1160	820	1505
TOd 1600/6÷20	2126	1258	820	1572
TOd 2500/6÷20	2240	1410	1070	1833



1. HV Bushing
2. Arcing horns, for 15 and 20 kV only
3. LV Bushing
4. Radiators ladle
5. Oil level indicator
6. Buchholz Relay
7. Drain and Oil Test Valves
8. Earthing Bolt
9. Bi-directional Undercarriage
10. Tap Changer Manual Drive
11. Nominal Plate
12. Dial Type Thermometer
13. Conservator Tank Drain Valve
14. Conservator
15. Conservator Filling Valve
16. Main Tank Cover Filling Valve
17. Air Breather

The Manufacturer reserves right to change catalogue technical data in the course of product modernisation.

Other design execution to be consulted with the Manufacturer.