

OIL-IMMERSED SEALED THREE-PHASE TRANSFORMERS



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The transformers are designed for electrical energy transforming in power systems and at consumers by outdoor or indoor installation under temperate (minus 45 to plus 40°C) or cold (minus 60 to plus 40°C) climate. The environment shall be inexplusive, with dust content concentrations not affecting negatively the transformer parameters to inadmissible limits. Transformers should not be operated under conditions of jolting, vibration, shocks and chemically active environment. Operative altitude 1000 m max.

Rated frequency 50 Hz. The voltage regulation within $\pm 5\%$ range is carried out with a fully de-energized transformer through HV–winding tap–changing in 2.5 % steps.

The transformer LV–side neutral input is rated for continuous operation at the current equal to 100 % rated current of LV–winding.

The temperature induced variations of the oil volume are accomodated by the tank wall corrugations flexible deformation.

Oil level control is provided by a float type oil–level indicator.

16 ... 63 kVA transformers are fitted with safety valve for tank overpressure prevention.

As an option it is provided as follows:

- electric–contact pressure–vacuum gage for internal pressure control;

- liquid–in–glass thermometer for oil top layers temperature measurement;

- manometric signaling thermometer for measurement of oil top layers temperature and external electric circuits control.

250 ... 2500 kVA transformers are fitted with carrying rollers for transformer moving (for 160 kVA – as an option)

Table 1

Rated power, kVA	Rated high voltage, kV	Rated low voltage, kV	Winding connection/vector group	Short-circuit loss, W	Short-circuit voltage, %	No-load loss, W	Sound power level, dBA	Length, mm (L)	Width, mm (W)	Height, mm (H)	Weight, kg
16	10	0.4	Yzn11	500	5.0	85	55	800	640	890	230
25	10	0.4	Yzn11	690	4.7	115	55	800	640	930	240
	10	0.4	Yyn0	600	4.5	85	50	810	560	940	240
	15	0.4	Yzn11	690	4.7	115	55	800	640	1000	280
	27.5	0.4	Yyn0	650	6.0	145	55	1100	800	1350	590
40	10	0.4	Yzn11	1000	4.7	155	55	840	680	1000	300
	10	0.4	Yyn0	880	4.5	105	50	850	585	1015	300
	15	0.4	Yzn11	1000	4.7	165	55	840	680	1100	350
63	10	0.4	Yzn11	1470	4.7	220	55	950	730	1020	420
	15	0.4	Yzn11	1470	4.7	220	55	950	730	1100	420
	10	0.4	Yyn0	1280	4.5	170	50	960	725	1015	420
100	10	0.4	Yzn11	2270	4.7	270	59	1020	750	1180	540
	15	0.4	Yzn11	2270	4.7	270	59	1020	750	1240	925
	27.5	0.4	Yyn0	1970	6.5	320	59	1260	840	1780	1215
	35	0.4	Yzn11	2270	6.8	320	59	1260	840	1780	1215
	10	0.4	Yzn11	2270	4.7	290	59	935	730	1060	490
	15	0.4	Yzn11	2270	4.7	290	59	935	730	1140	490
	10	0.4	Yyn0	1970	4.5	220	52	1000	720	1180	540
160	10	0.4	Dyn11	2900	4.5	410	62	1100	780	1180	925
	10	0.4	Yzn11	2900	4.7	410	62	1100	780	1180	925
	15	0.4	Yzn11	2900	4.7	410	62	1100	780	1240	925
	27.5	0.4	Yyn0	2650	6.5	480	62	1350	860	1850	1295
	35	0.4	Yzn11	3100	6.8	480	62	1350	860	1850	1295
	10	0.4	Dyn11	2900	4.5	410	62	1020	755	1185	670
	10	0.4	Yzn11	2900	4.7	410	62	1020	755	1185	670
	10	0.4	Yyn0	2600	4.5	320	54	1120	750	1220	710
	15	0.4	Yzn11	2900	4.7	410	62	1020	755	1245	670
250	10	0.4	Dyn11	4200	4.5	580	65	1220	840	1220	950
	15	0.4	Dyn11	4200	4.5	580	65	1220	840	1280	1160

Table 1 (continuation)

Rated power, kVA	Rated high voltage, kV	Rated low voltage, kV	Winding connection/vector group	Short-circuit loss, W	Short-circuit voltage, %	No-load loss, W	Sound power level, dBA	Length, mm (L)	Width, mm (W)	Height, mm (H)	Weight, kg
250	27.5	0.4	Yyn0	3700	6.5	700	65	1450	950	1880	1550
	35	0.4	Yzn11	4200	6.8	700	65	1450	950	1880	1550
	10	0.4	Dyn11	4200	4.5	570	65	1140	820	1270	920
	15	0.4	Dyn11	4200	4.5	570	65	1140	820	1330	920
	10	0.4	Dyn11	4200	4.5	450	56	1220	840	1320	1020
400	10	0.4	Dyn11	5600	4.5	830	68	1300	860	1350	1360
	15	0.4	Dyn11	5800	4.5	830	68	1300	860	1410	1360
	27.5	0.4	Yyn0	5500	6.5	950	68	1650	1000	1950	2190
	35	0.4	Yyn0	5500	6.5	950	68	1650	1000	1950	2190
	10	0.4	Dyn11	5600	4.5	830	68	1350	855	1415	1255
	15	0.4	Dyn11	5800	4.5	830	68	1300	855	1475	1255
	10	0.4	Ynd11	5400	4.5	830	68	1350	855	1415	1255
	10	0.4	Dyn11	4600	4.5	610	60	1330	850	1635	1370
	15	0.4	Dyn11	4600	4.5	610	60	1330	850	1695	1370
	10	0.4	Dyn11	5600	4.5	600	58	1300	860	1480	1480
630	10	0.4	Dyn11	7600	5.5	1240	70	1540	1060	1470	2000
	20	0.4	Dyn11	7600	5.5	1240	70	1540	1000	1470	2100
	10	0.4	Dyn11	7450	5.5	1060	70	1545	1000	1540	1860
	10	0.4	Dyn11	6750	5.5	800	61	1390	1000	1710	1870
	10	0.4	Dyn11	7600	5.5	940	62	1540	1060	1600	2100
1000	10	0.4	Dyn11	10800	5.5	1600	73	1770	1100	1900	2900
	20	0.4	Dyn11	10800	5.5	1600	73	1770	1100	1900	3100
	10	0.4	Dyn11	10800	5.5	1400	73	1720	1135	1860	2750
	10	0.4	Dyn11	10500	5.5	1100	64	1600	1000	1970	2820
	10	0.4	Dyn11	10800	5.5	1250	65	1770	1100	1900	3000
1250	10	0.4	Dyn11	12400	6.0	1800	75	1770	1100	1900	3600
	20	0.4	Dyn11	12000	6.0	1750	75	1770	1100	1900	3550
	10	0.4	Dyn11	13500	6.0	1650	75	1825	1130	2020	3250
	10	0.4	Dyn11	13250	6.0	1350	65	1800	1110	2100	3630
	15	0.4	Dyn11	13250	6.0	1350	65	1800	1110	2100	3630
1600	10	0.4	Dyn11	16500	6.0	2150	75	2180	1260	2170	4250
2500	10	0.4	Dyn11	26500	6.0	2600	76	2350	1350	2500	7000

At a Customer's order can be manufactured transformers designed for operation under tropical climate conditions at the altitudes over 1000 m above sea level, with no-load and short-circuit losses differing from those indicated in Table 1, having various winding connection/vector groups.

Table 2 lists parameters of the transformers tailored according to specific orders for supplies to Europe, Asia, Africa, Central and Latin America countries.

Table 2

Rated power, kVA	Rated high voltage, kV	Rated low voltage, kV	Temperature rise in windings, °C	Temperature rise in oil, °C	Winding connection/vector group	Short-circuit loss, W	Short-circuit voltage, %	No-load loss, W	Sound power level, dBA	Length, mm (L)	Width, mm (W)	Height, mm (H)	Weight, kg
25	20	0.4	50	45	Dyn11	600	4.0	120	55	860	550	1130	331
	11	0.4	55	50	Dyn11	500	4.0	705	51	290	400	1060	300
40	15.75	0.4	65	60	Yzn5	1000	4.7	165	55	840	680	1100	350
50	22-11	0.433	55	50	Dyn11	840	4.0	105	42	930	710	1350	535
	11	0.4	55	50	Dyn11	1000	4.0	145	55	840	680	1000	370
	11	0.4	55	50	Dyn11	1000	4.0	145	55	840	680	1000	370
63	15.75	0.4	65	60	Yzn5	1470	4.7	220	55	950	730	1100	420
75	20	0.4	55	50	Dyn11	1650	4.5	290	59	935	730	1275	510
	11	0.4	55	50	Dyn11	1350	4.0	200	58	1020	750	1180	575
100	22-11	0.433	55	50	Dyn11	1420	4.0	170	44	1000	790	1450	770
	20	0.4	55	50	Dyn11	1475	4.0	260	57	970	750	1260	600
	20	0.4	55	50	Dyn11	2200	4.5	250	59	1020	750	1360	605
	11	0.4	55	50	Dyn11	1650	4.0	250	59	1020	770	1180	610
	11	0.416	50	45	Dyn11	1750	4.0	230	59	990	760	1255	630
	15.75	0.4	65	60	Yzn5	2270	4.7	290	59	930	780	1155	500
	11	0.4	55	50	Dyn11	1650	4.0	250	59	1020	770	1180	610
120	20	0.4	55	50	Dyn11	2400	4.5	410	62	1020	755	1380	725
160	20	0.4	50	45	Dyn11	2800	4.0	410	62	1235	790	1470	915

Table 2 (continuation)

Rated power, kVA	Rated high voltage, kV	Rated low voltage, kV	Temperature rise in windings, °C	Temperature rise in oil, °C	Winding connection/vector group	Short-circuit loss, W	Short-circuit voltage, %	No-load loss, W	Sound power level, dBA	Length, mm (L)	Width, mm (W)	Height, mm (H)	Weight, kg
160	15-20	0.41	65	60	Dyn11	2300	4.0	425	62	1100	780	1410	810
	11	0.416	50	45	Dyn11	1650	4.0	410	62	1020	755	1185	830
	15.75	0.4	65	60	Yzn5	2900	4.7	410	62	1020	755	1255	670
200	22-11	0.433	55	50	Dyn11	2300	4.0	280	49	1160	880	1550	1265
	20	0.4	55	50	Dyn11	2200	4.0	430	61	1220	840	1450	1160
	11	0.4	55	50	Dyn11	3100	4.0	600	58	1200	820	1470	1010
	11	0.4	55	50	Dyn11	3100	4.0	600	58	1200	820	1470	1010
250	15-20	0.41	65	60	Dyn11	3200	4.0	600	65	1220	840	1480	1130
	11	0.416	50	45	Dyn11	3800	4.0	480	59	1260	800	1360	1060
	11	0.416	50	45	Dyn11	3500	4.0	510	65	1190	860	1240	1030
	15.75	0.4	65	60	Dyn5	4200	4.5	570	65	1140	820	1330	920
	11	0.4	55	50	Dyn11	3250	5.0	500	65	1220	840	1220	1140
400	11	0.416	50	45	Dyn11	4600	4.0	730	68	1270	990	1560	1700
	11	0.416	50	45	Dyn11	4500	4.0	750	68	1060	1190	1450	1470
	15.75	0.4	65	60	Dyn5	5800	4.5	830	68	1350	855	1475	1255
	11	0.22	65	60	Dyn11	5700	8.0	840	68	1400	950	1550	1500
	34.5	0.22	65	60	Yyn0	6000	8.0	870	68	1400	980	1860	1650
500	11	0.4	55	50	Dyn11	5700	5.0	800	66	1380	920	1350	1780
	11	0.4	55	50	Dyn11	5700	5.0	800	66	1380	920	1350	1780
630	20	0.4	55	50	Dyn11	5300	6.0	830	68	1600	1060	1775	2860
	11	0.416	50	45	Dyn11	7250	6.0	1000	70	2070	1230	1515	2200
	15.75	0.4	65	60	Dyn5	7450	5.5	1060	70	1545	1000	1600	1860
	6.3	0.4	55	50	Dyn11	5750	5.5	1270	70	1545	1000	1540	2070
1000	20	0.4	55	50	Dyn11	10500	5.5	1500	72	1830	1180	2035	3280
	11	0.4	55	50	Dyn11	10000	5.5	1550	73	1770	1100	1900	3540
	11	0.416	50	45	Dyn11	10400	6.0	1400	73	2110	1260	1800	3475
	15.75	0.4	65	60	Dyn5	10800	5.5	1400	73	1720	1135	1920	2750
	33	0.48	55	50	Yyn0	11000	5.5	1900	73	2180	1260	2275	3900

Fig. 1. Oil-immersed hermetically sealed three-phase transformers

