



OIL-FILLED EXPANSION TANKS
AND HERMETIC TRANSFORMERS



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OIL-FILLED
EXPANSION TANKS
AND HERMETIC
TRANSFORMERS

2025



To be a pioneer in reliably, efficiently, and sustainably delivering energy to the future.

With our quality, safety, and innovation-focused approach, we aim to be the solution partner at the heart of transformers at every stage, from the production to the consumption of electrical energy. Our goal is not only to meet today's needs but also to shape the future of energy with transformers that are environmentally friendly, long-lasting, and highly efficient, guiding tomorrow's technologies.

In every project, we create lasting value in the industry by producing pioneering solutions in accordance with national and international standards, focusing on customer satisfaction, ensuring continuous technological development, and setting no limits on reliability.

Our vision is to be the leading transformer brand that makes energy safer, more efficient, and more sustainable.

To ensure the uninterrupted, safe, and efficient transmission of electrical energy, we: Our fundamental mission is to manufacture high-quality transformers, provide reliable maintenance, repair, and testing services, develop customized solutions for customer needs, guarantee compliance with national and international standards, create innovative products by investing in R&D and technological development, and support sustainability with an environmentally and socially conscious engineering approach.

Our mission is to be "the most reliable solution partner in the industry, operating safely at the heart of energy, prioritizing quality and innovation at every stage."



DISTRIBUTION AND MEDIUM VOLTAGE POWER TRANSFORMERS

TARFO manufactures transformers of various voltage and power ratings, designed to meet a wide range of special requirements in line with customer needs.

TARFO's product range is as follows:

- Distribution Transformers (oil-immersed with conservator tank or hermetically sealed types) from 25 kVA to 2500 kVA, up to 36 kV voltage level
- Medium-Voltage Power Transformers from 2500 kVA to 31,500 kVA
- On-Load Tap Changer Transformers
- Auto-Transformers
- Step-Up and Step-Down Power Transformers for power generation facilities
- Electrostatic Shielded Transformers and Earthing (Grounding) Transformers

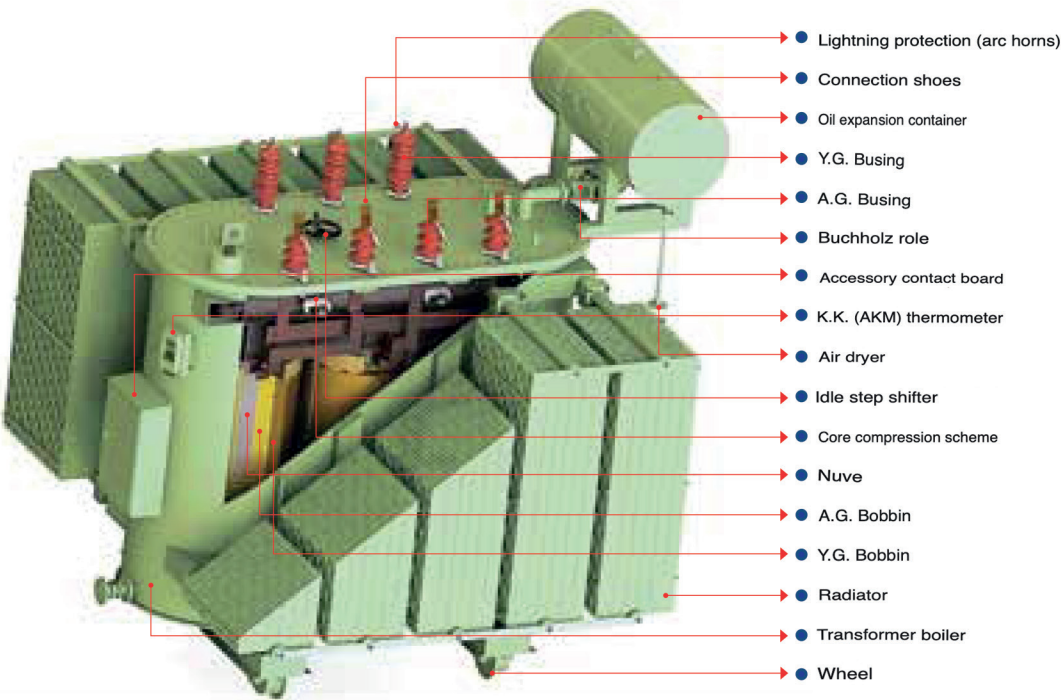
Compliance with International Standards:

TARFO transformers are manufactured in accordance with TS EN 60076, TS EN 50464-1, IEC 60354, IEC 60076, 42500 DIN, and other relevant international norms and standards.



GENERAL FEATURES OF STANDARD TRANSFORMERS

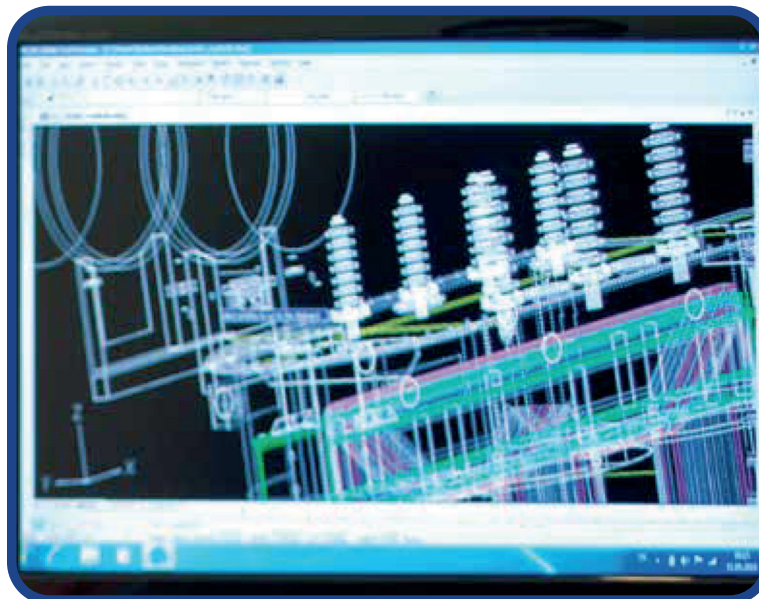
GENERAL CHARACTERISTICS OF STANDARD TRANSFORMERS	
The thriller genre	3-phase alternative
Operating frequency	50 Hz
Type of service	Continuous service
From the sea level of the facility location height	Below 1000 m unless otherwise stated
Voltage adjustment	With 5-position, idle adjustable commutator by HV
Overvoltage	Ability to work continuously at 5% overvoltage
Temporarily overload	In accordance with IEC 60354
The form of cooling	Natural with oil(YT) (ONAN)
Winding heating limit	65K in accordance with TS EN 60076
Connection type and group	Yzn or Dyn at powers up to 200 kVA, 250 kVA and in the greater powers Dyn. Connection group 5 or 1 1
Iron and copper losses, short circuit voltage, idle current	As stipulated by TS and International standards



DESIGN

With its experienced project and product development team, TARFO designs transformers that are highly efficient and durable enough to provide service for many years, in line with customer requirements and specifications.

High efficiency is fundamental to our products. To ensure this, advanced technological systems and high-quality materials are used throughout the design and manufacturing processes. Our research and development team works on tailor-made designs for customers, developing new products with high quality and durability.



TECHNICAL SPECIFICATIONS

CORE

The core, which is the main component of transformers and is also defined as the core, is produced from oriented magnetic silicon steel sheets. TARFO manufactures cores using conventional or high magnetic permeability (HB) materials, depending on the project specifications. TARFO always has a high level of HB material in stock. This enables TARFO to design and manufacture transformers that are rational, low-loss, and resistant to high magnetic induction. TARFO provides the basic infrastructure for core production with its Western-made coil slitting and cutting machines. Any potential damage during the processes of uncoiling, slitting, and cutting of rolled magnetic silicon steel sheets is remedied by additional heat treatment. This system and application, found in very few transformer manufacturers, is available and used at the TARFO factory. As a result of appropriate design and the meticulous work of experienced production personnel, the production of transformer cores with low losses and high magnetic flux density is achieved.



TECHNICAL SPECIFICATIONS

WINDING

In power and distribution transformers, cylindrical/elliptical coils, which are more resistant to the forces generated during short circuits, are used. With the exception of HV coils in small distribution transformers, LV and HV conductors are insulated using insulation materials with high insulation properties on the wire insulation machines in our factory.

Cellulose-based insulation materials that do not harm the environment are used in coil production. The conductors used are subjected to additional insulation according to their functions. The use of wires insulated with horizontal and vertical conductor insulation machines ensures that the transformers are resistant to atmospheric overvoltages. TARFO creates a difference by paying special attention to these aspects. In distribution transformers, LV coils are produced from strip or tape material, while HV coils are produced from flat or round conductors. In power transformers, various winding shapes such as layered winding, inverted winding, radial channel winding, etc. are applied.



TECHNICAL SPECIFICATIONS

TANK AND COVER

The production of tanks and covers for power and distribution transformers, excluding radiators and wave walls, is carried out in our factory. Cases and covers are manufactured in a short time and with high quality, in accordance with the drawings and technical specifications of the projects, using our modern machinery. Weld leak tests are performed on completed transformer cases before the primer coat is applied. Upon customer request, bushing housings or cable boxes can be manufactured in accordance with IEC and BS standards.

PAINT

After transformers successfully pass testing, they must be cleaned of oil, dirt, dust, and metal residues to enhance paint adhesion to the metal surface. To achieve this, the tanks and all metal parts undergo sandblasting. Metal parts are painted with one or more coats of special protective primer paint. Knowing that transformer tanks will be exposed to harsh weather conditions for many years, they are painted with a special paint that can withstand these harsh conditions, with a minimum thickness of 105 microns.



TECHNICAL SPECIFICATIONS

ASSEMBLY AND DRYING

The components that form the active part of the transformers are assembled in the assembly section. The coils are placed on the cores. The commutators, bushings, and all connections are made. Some sections are subjected to additional insulation against possible overvoltages. The active part is reinforced with additional supports to ensure its mechanical strength. The active part, once assembled, is subjected to a drying process in a solvent-vapor vacuum oven. The conventional drying process takes five times longer than drying in a solvent vapor vacuum oven. The long duration ages the insulation materials used in transformers. The short drying time in a solvent vapor vacuum oven prevents the aging of the insulation.

During the process, any unwanted objects such as oil, dirt, dust, or rust found anywhere in the transformer are cleaned by solvent spraying. The use of solvent vapor vacuum ovens capable of achieving high-grade vacuum in the production of hermetic and power transformers is very important for product quality.

TARFO uses solvent vapor vacuum ovens in all transformers it manufactures and repairs. Transformers that have completed the drying process are automatically filled with purified transformer oil under high vacuum (below 0.1 millibars).



ACCESSORIES



MAGNETIC AND CONTACT OIL LEVEL INDICATOR

These instruments are used to monitor the oil level in transformers, where transformer oil is filled for cooling and insulation purposes.

They are available in three types: prismatic indicator, magnetic indicator, and magnetic indicator with contact. In hermetically sealed transformers, the oil level is monitored pointwise.

For distribution transformers with expansion tanks, indicator-only type instruments are used as standard, while for power transformers, indicators with alarm and trip contacts are standard.

AIR BREATHER

In order to maintain the properties of the transformer oil, it must be kept free from moisture.

Air breathers are mounted on the surface of the expansion tank to absorb the moisture present in the air entering the transformer.

For high-capacity power transformers, upon customer request, a rubber-based elastic "Atmoseal" application can be implemented, which completely prevents the transformer oil from coming into contact with air.



PRESSURE RELIEF VALVE

In the event of sudden overloading and short-circuit conditions in transformers, the internal pressure of the tank increases. To prevent the tank pressure from exceeding the designed values, hermetic distribution transformers and power transformers are equipped with a "Pressure Relief Valve" as standard. Contact-type valves (dual-contact alarm and shut-off) are used in power transformers, while non-contact valves are used in small-capacity hermetic-type transformers. Distribution transformers used as internal-type with expansion tanks can also be equipped with a "Pressure Relief Valve" according to customer requirements.

ACCESSORIES



BUCHHOLZ RELAY

Sudden temperature increases caused by overloads in the active part, or temperature rises due to faults within the active part, generate gas inside the transformer tank.

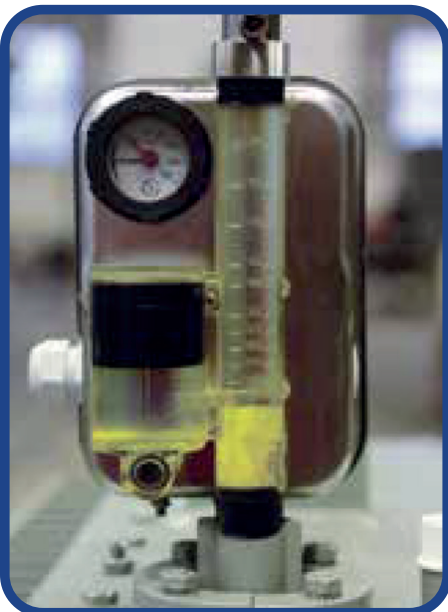
The Buchholz (Gas) Relay, which is installed between the tank and the expansion tank connection, provides either an alarm signal or a trip signal depending on the amount of gas formed.

This prevents the fault from progressing to a more severe level.

CONTACT-TYPE OIL TEMPERATURE THERMOMETER

Transformer oil should not exceed a certain temperature.

If the oil exceeds the appropriate temperature level for any reason, this device ensures that no other faults occur by signaling the unsuitable oil temperature with a level 1 contact and disconnecting the transformer's energized circuit with a level 2 contact. This equipment is standard on transformers with expansion tanks rated at 630 kVA and above. It can also be installed on transformers with lower power ratings upon request.



MULTIFUNCTIONAL HERMETIC PROTECTION DEVICE

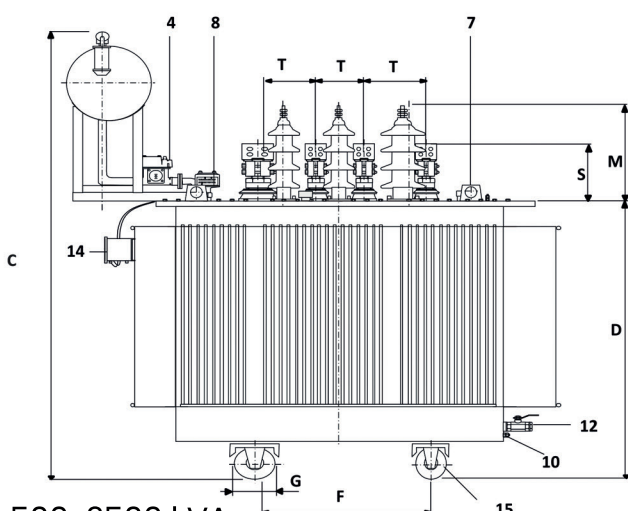
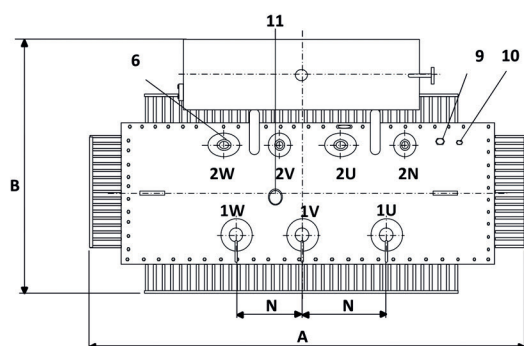
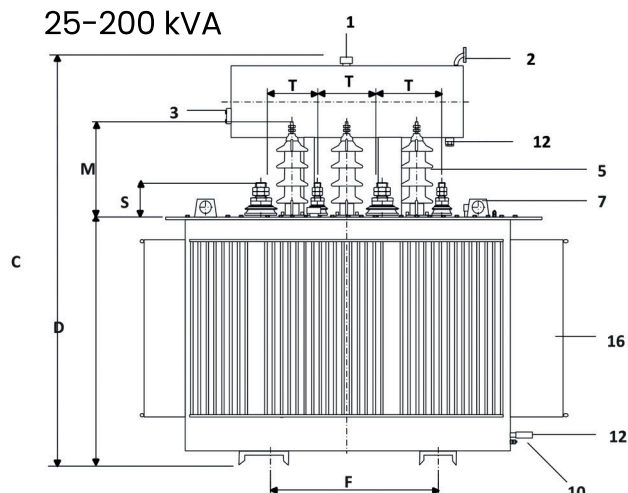
This is a compact protection and safety device that combines and performs all essential protection functions—such as oil level monitoring, pressure control, temperature measurement, and gas detection—in a single unit.

It is mounted on the cover of hermetic type transformers with power ratings from 630 kVA up to 2500 kVA, and can also be installed on transformers of lower ratings upon request.

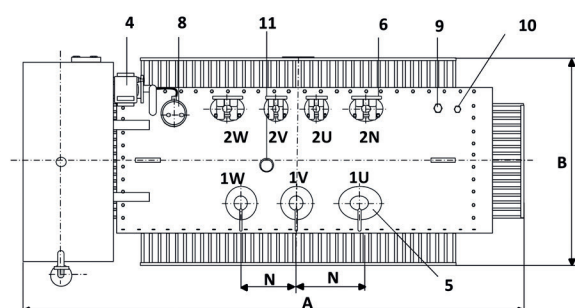
TECHNICAL SPECIFICATIONS OF OIL-FILLED
EXPANSION TANK AND HERMETIC TYPE STANDARD
TARFO DISTRIBUTION TRANSFORMERS

Power	Rated Voltage	No-Load Current I ₀	Load Losses	No-Load Losses	Impedance Voltage	CosØ = 0,8		CosØ = 1	
						Full-Load Voltage Drop	Full-Load Efficiency	Full-Load Voltage Drop	Full-Load Efficiency
kVA	kV	%	W	W	%U _k	%	%	%	%
25	6,3-10,5	2,50	550	65	4	3,773	97,02	2,255	97,60
	15,8	2,50	550	65	4	3,773	97,02	2,255	97,60
	33	3,15	700	110	4,5	4,360	96,11	2,862	96,86
40	6,3-10,5	2,40	650	80	4	3,512	97,77	1,691	98,21
	15,8	2,40	650	80	4	3,512	97,77	1,691	98,21
	33	2,92	900	135	4,5	4,153	96,87	2,325	97,48
50	6,3-10,5	2,30	750	90	4	3,446	97,94	1,568	98,35
	15,8	2,30	750	90	4	3,446	97,94	1,568	98,35
	33	2,76	1050	160	4,5	4,086	97,06	2,179	97,64
63	6,3-10,5	2,25	900	110	4	3,407	98,04	1,498	98,42
	15,8	2,25	900	110	4	3,407	98,04	1,498	98,42
	33	2,62	1225	195	4,5	4,012	97,26	2,026	97,80
80	6,3-10,5	2,20	1050	125	4	3,342	98,20	1,383	98,55
	15,8	2,20	1050	125	4	3,342	98,20	1,383	98,55
	33	2,50	1400	225	4,5	3,913	97,52	1,835	98,01
100	6,3-10,5	2,10	1250	145	4	3,306	98,29	1,322	98,62
	15,8	2,10	1250	145	4	3,306	98,29	1,322	98,62
	33	2,27	1650	270	4,5	3,859	97,66	1,737	98,12
125	6,3-10,5	2,00	1475	175	4	3,264	98,38	1,253	98,70
	15,8	2,00	1475	175	4	3,264	98,38	1,253	98,70
	33	2,14	1900	330	4,5	3,787	97,82	1,609	98,25
160	6,3-10,5	1,90	1700	210	4	3,193	98,53	1,136	98,82
	15,8	1,90	1700	210	4	3,193	98,53	1,136	98,82
	33	2,00	2150	390	4,5	3,686	98,05	1,435	98,44
200	6,3-10,5	1,90	2025	255	4	3,162	98,58	1,087	98,87
	15,8	1,90	2025	255	4	3,162	98,58	1,087	98,87
	33	1,90	2575	470	4,5	3,652	98,10	1,380	98,50
250	6,3-10,5	1,60	2350	300	4	3,117	98,69	1,015	98,95
	15,8	1,60	2350	300	4	3,117	98,69	1,015	98,95
	33	1,80	3000	550	4,5	3,600	98,26	1,294	98,60
315	6,3-10,5	1,50	2800	365	4	3,084	98,76	0,964	99,01
	15,8	1,50	2800	365	4	3,084	98,76	0,964	99,01
	33	1,70	3575	670	4,5	3,559	98,34	1,229	98,67
400	6,3-10,5	1,50	3250	430	44	3,034	98,86	0,889	99,09
	15,8	1,50	3250	430	4	3,034	98,86	0,889	99,09
	33	1,70	4150	790	4,5	3,498	98,48	1,133	98,78
500	6,3-10,5	1,40	3950	520	4	3,020	98,89	0,866	99,11
	15,8	1,40	3950	520	4	3,020	98,89	0,866	99,11
	33	1,60	4850	950	4,5	3,455	98,56	1,066	98,85
630	6,3-10,5	1,40	4600	600	4	2,980	98,98	0,807	99,18
	15,8	1,40	4600	600	4	2,980	98,98	0,807	99,18
	33	1,60	5500	1100	4,5	3,392	98,71	0,970	98,96
800	6,3-10,5	1,30	6000	650	6	4,264	98,97	0,927	99,18
	15,8	1,30	6000	650	6	4,264	98,97	0,927	99,18
	33	1,50	7000	1300	6	4,350	98,72	1,051	98,97
1000	6,3-10,5	1,20	7600	770	6	4,271	98,96	0,937	99,17
	15,8	1,20	7600	770	6	4,271	98,96	0,937	99,17
	33	1,40	8900	1450	6	4,360	98,72	1,066	98,98
1250	6,3-10,5	1,20	9500	950	6	4,271	98,97	0,937	99,17
	15,8	1,20	9500	950	6	4,271	98,97	0,937	99,17
	33	1,40	11500	1750	6	4,381	98,69	1,095	98,95
1600	6,3-10,5	1,10	12000	1200	6	4,264	98,98	0,927	99,18
	15,8	1,10	12000	1200	6	4,264	98,98	0,927	99,18
	33	1,30	14500	2200	6	4,371	98,71	1,082	98,97
2000	6,3-10,5	1,10	15000	1450	6	4,264	98,98	0,927	99,18
	15,8	1,10	15000	1450	6	4,264	98,98	0,927	99,18
	33	1,20	18000	2700	6	4,367	98,72	1,075	98,98
2500	6,3-10,5	1,0	18500	1750	6	4,257	99,00	0,917	99,20
	15,8	1,0	18500	1750	6	4,257	99,00	0,917	99,20
	33	1,1	22500	3200	6	4,367	98,73	1,075	98,98

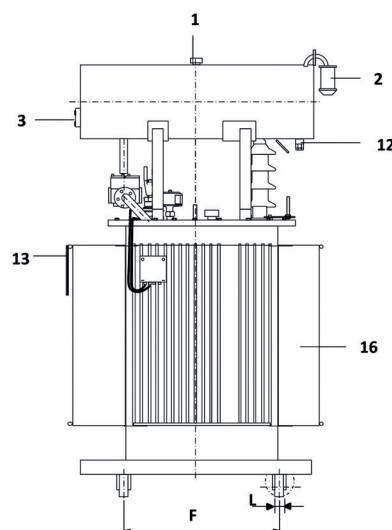
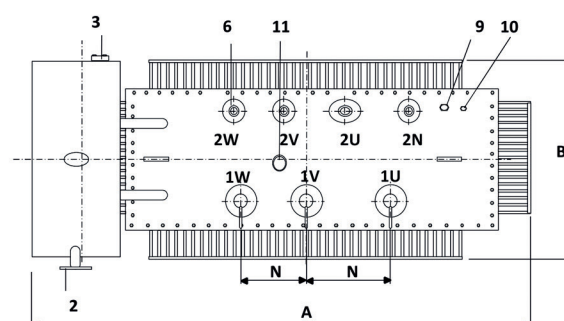
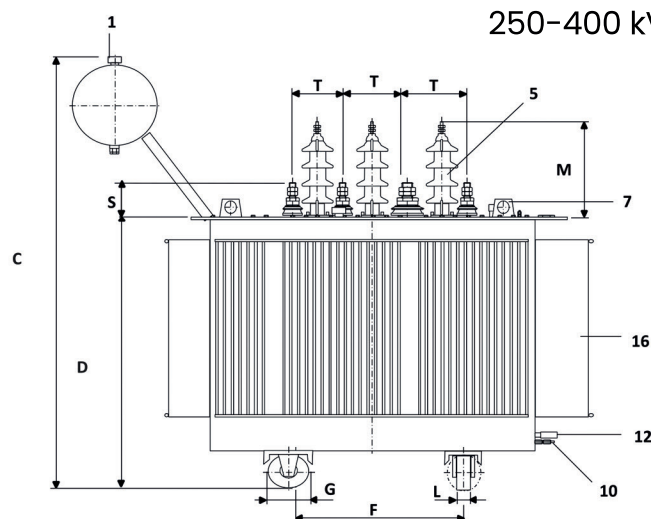
25-200 kVA



500-2500 kVA



250-400 kVA



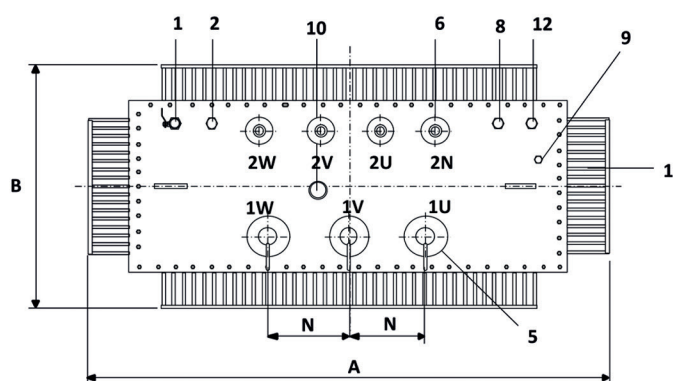
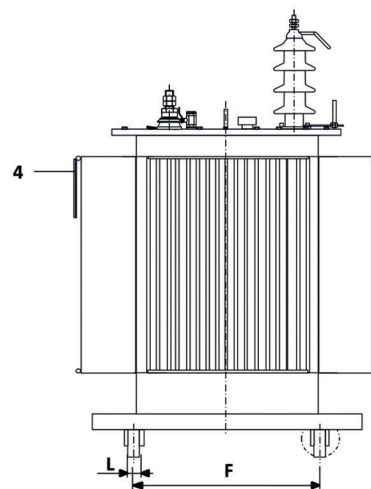
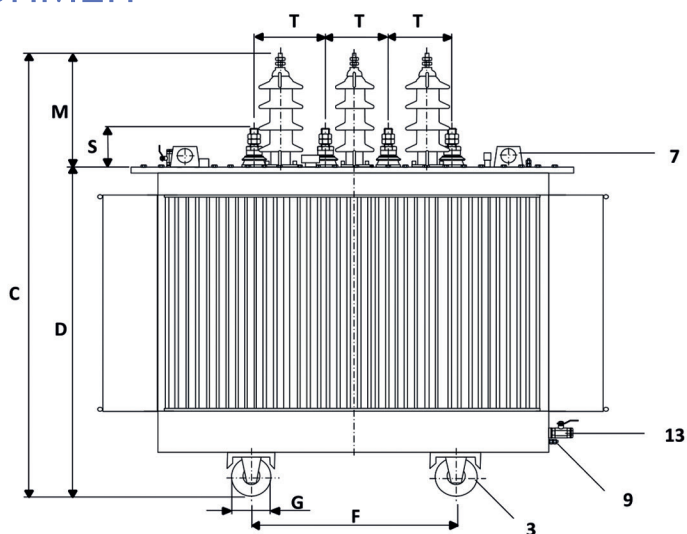
Oil Expansion Tank
Three-Phase,
25-2500 kVA
Transformers

- | | |
|-------------------------|----------------------------------|
| 1 - Oil Filling Mouth | 9 - Alcoholic Thermometer Pocket |
| 2 - Air Dryer | 10- Grounding Bolt |
| 3 - Oil Level Indicator | 11- Idle Stage Changer |
| 4 - Buchholz Relay | 12- Oil Drain Plug |
| 5 - Y.G. Bushing | 13- Sign Plate |
| 6 - A.G. Bushing | 14- Terminal Box |
| 7 - Lifting Ring | 15- Wheel |
| 8 - Contact Thermometer | 16- Wave Wall |

MAIN DIMENSIONS OF STANDARD EXPANSION TANK TYPE TRANSFORMERS (25–2500 KVA)

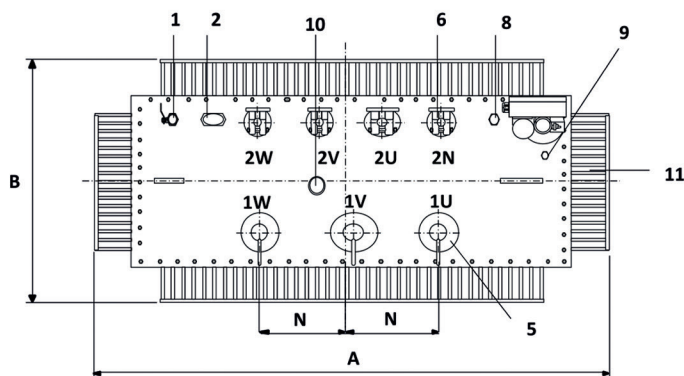
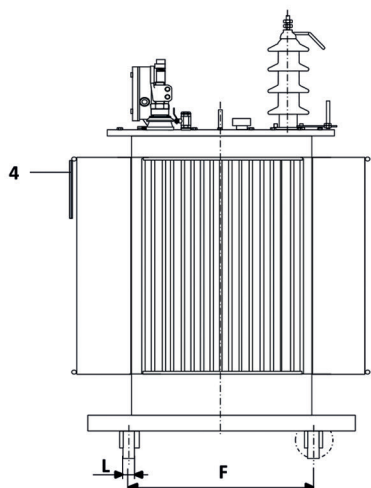
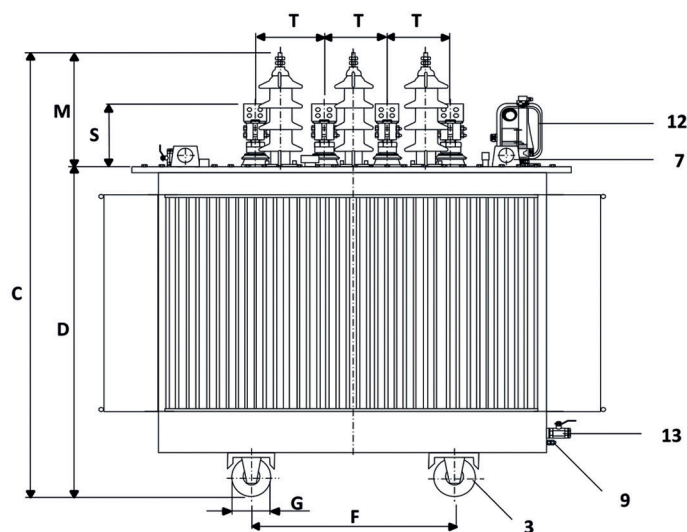
Power	Rated Voltage	Oil Weight	Active Part Weight	Total Weight	Length A	Width B	Height C	D	F	ØG	L	M	N	S	T
kVA	kV	kg	kg	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
25	6,3-10,5	130	295	540	935	680	1170	700				310	210		
	15,8	130	295	540	935	680	1245	700	520			385	220	138	150
	33	120	225	410	920	730	1365	720				485	290		
40	6,3-10,5	150	400	650	975	730	1230	760				310	265		
	15,8	150	400	650	975	730	1305	760	520			385	265	138	150
	33	145	305	540	905	785	1450	805				485	330		
50	6,3-10,5	170	440	685	1000	750	1240	770				310	265		
	15,8	170	440	685	1000	750	1315	770	520			385	265	138	150
	33	155	345	570	920	800	1470	825				485	330		
63	6,3-10,5	190	495	760	1025	750	1280	810				310	265		
	15,8	190	495	760	1025	750	1355	810	520			385	265	138	150
	33	165	380	625	935	800	1490	845				485	330		
80	6,3-10,5	210	555	840	1055	750	1325	850				310	265		
	15,8	210	555	840	1055	750	1400	850	520			385	265	138	150
	33	180	420	685	955	810	1510	865				485	330		
100	6,3-10,5	240	665	980	1100	750	1385	910				310	265		
	15,8	240	665	980	1100	750	1460	910	520			385	265	138	150
	33	200	480	780	980	815	1540	895				485	350		
125	6,3-10,5	255	800	1155	1150	750	1425	950				310	265		
	15,8	255	800	1155	1150	750	1500	950	520			385	265	138	150
	33	220	555	890	1010	820	1575	930				485	350		
160	6,3-10,5	280	975	1345	1210	750	1480	1000				310	265		
	15,8	280	975	1345	1210	750	1555	1000	520			385	265	138	150
	33	245	650	1015	1060	830	1620	970				485	350		
200	6,3-10,5	300	1050	1450	1275	780	1525	1050				310	265		
	15,8	300	1050	1450	1275	780	1600	1050	520			385	265	178	150
	33	270	730	1130	1250	830	1645	990				485	350		
250	6,3-10,5	325	1140	1580	1355	700	1625	1105				310	265		
	15,8	325	1140	1580	1355	700	1700	1105	520			385	265	178	150
	33	295	815	1250	1550	700	1710	1015				485	350		
315	6,3-10,5	390	1405	1975	1500	720	1690	1170				310	330		
	15,8	390	1405	1975	1500	720	1765	1170	670	150	50	385	330	178	150
	33	360	995	1555	1590	765	1805	1105				485	350		
400	6,3-10,5	465	1700	2390	1660	740	1820	1250				310	330		
	15,8	465	1700	2390	1660	740	1895	1250	670	150	50	385	330	178	150
	33	440	1190	1875	1640	840	1950	1220				485	350		
500	6,3-10,5	510	1955	2750	1680	915	1835	1300				310	330		
	15,8	510	1955	2750	1680	915	1910	1300	670	150	50	385	330	263	200
	33	520	1440	2250	1700	895	2020	1270				485	350		
630	6,3-10,5	570	2235	3115	1700	1100	1875	1360				310	330		
	15,8	570	2235	3115	1700	1100	1950	1360	670	150	50	385	330	263	200
	33	605	1720	2650	1700	970	1950	1320				485	350		
800	6,3-10,5	630	2360	3245	1800	950	1980	1375				310	330		
	15,8	630	2360	3245	1800	950	2055	1375	820	150	50	385	330	263	220
	33	730	1980	3100	1840	1050	2155	1370				485	350		
1000	6,3-10,5	755	2890	4120	1950	980	2155	1545				310	330		
	15,8	755	2890	4120	1950	980	2230	1545	820	200	70	385	330	340	230
	33	770	2275	3525	2005	1035	2210	1425				485	350		
1250	6,3-10,5	810	3425	4700	1900	1100	2190	1580				310	330		
	15,8	810	3425	4700	1900	1100	2265	1580	820	200	70	385	330	340	240
	33	885	2440	3880	2000	1170	2255	1470				485	350		
1600	6,3-10,5	900	3395	4845	1900	1140	2215	1605				310	330		
	15,8	900	3395	4845	1900	1140	2290	1605	820	200	70	385	330	372	240
	33	1000	2825	4645	2070	1330	2410	1580				485	350		
2000	6,3-10,5	1100	4065	6030	2205	1300	2285	1625				310	330		
	15,8	1100	4065	6030	2205	1300	2360	1625	1000	200	70	385	330	372	250
	33	1085	3100	5240	2100	1385	2465	1630				485	350		
2500	6,3-10,5	1335	4765	7145	2150	1400	2315	1655				310	330		
	15,8	1335	4765	7145	2150	1400	2390	1655	1000	200	70	385	330	450	260
	33	1330	3915	6720	2270	1575	2485	1650				485	350		

25-400 kVA



- 1 - Oil filling valve
- 2 - Pressure Safety Valve
- 3 - Wheel
- 4 - Sign Plate
- 5 - Y.G. Bushing
- 6 - A.G. Bushing
- 7 - Lifting Ring
- 8 - Alcohol Thermometer Pocket
- 9 - Grounding Bolt
- 10 - Idle Step Changer
- 11 - Wave Wall
- 12 - Oil Level Indicator
- 13 - Oil Draining and tas. Valve

500-2500 kVA

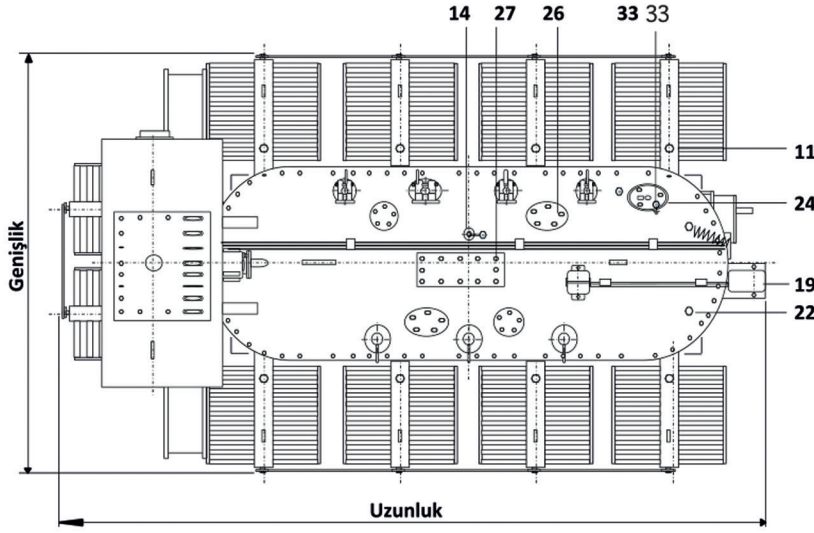
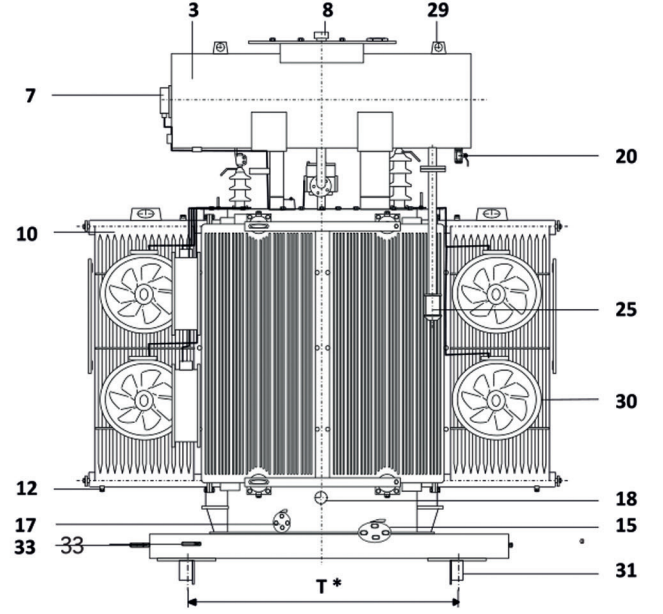
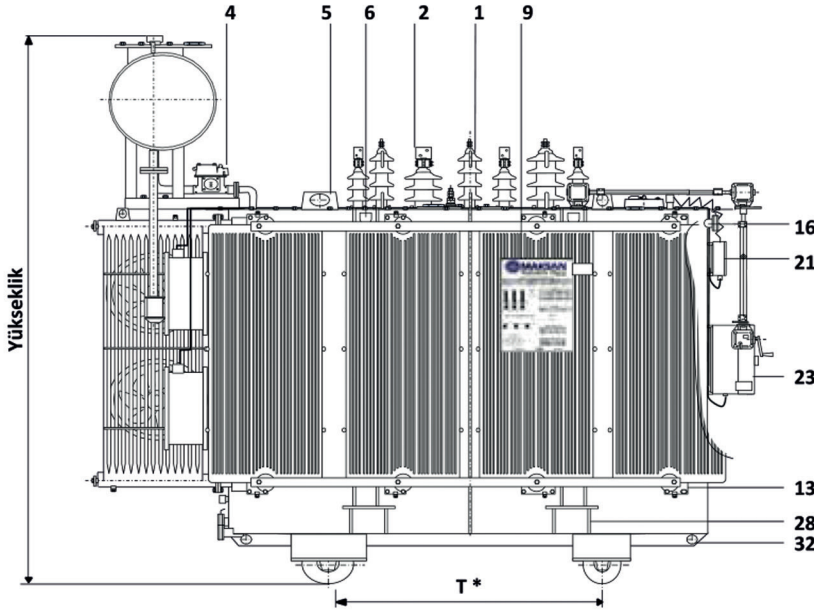


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- 2 - Pressure Safety Valve
- 3 - Wheel
- 4 - Sign Plate
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- 6 - A.G. Bushing
- 7 - Lifting Ring
- 8 - Alcohol Thermometer Pocket
- 9 - Grounding Bolt
- 10 - Idle Step Changer
- 11 - Wave Wall
- 12 - Multifunctional Protection Relay
- 13 - Oil Draining and tas. Valve

Hermetic Type
Three-Phase,
25-2500 kVA
Transformers

MAIN DIMENSIONS OF HERMETIC TYPE STANDARD TRANSFORMERS (25–2500 KVA)

Power	Rated Voltage	Oil Weight	Active Part Weight	Total Weight	Length A	Width B	Height C	D	F	ØG	L	M	N	S	T
kVA	kV	kg	kg	kg	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
25	6,3-10,5	130	295	530	900	670	1010	700				310	210		
	15,8	130	295	530	900	670	1085	700	520			385	220	138	150
	33	120	225	410	840	660	1205	720				485	290		
40	6,3-10,5	155	395	650	980	670	1070	760				310	265		
	15,8	155	395	650	980	670	1145	760	520			385	265	138	150
	33	145	310	545	895	680	1290	805				485	330		
50	6,3-10,5	175	435	705	995	690	1080	770				310	265		
	15,8	175	435	705	995	690	1155	770	520			385	265	138	150
	33	155	335	580	910	670	1310	825				485	330		
63	6,3-10,5	190	495	790	1020	695	1120	810				310	265		
	15,8	190	495	790	1020	695	1195	810	520			385	265	138	150
	33	165	375	635	925	675	1330	845				485	330		
80	6,3-10,5	215	565	880	1050	700	1160	850				310	265		
	15,8	215	565	880	1050	700	1235	850	520			385	265	138	150
	33	180	415	700	950	680	1350	865				485	330		
100	6,3-10,5	240	665	1030	1100	705	1220	910				310	265		
	15,8	240	665	1030	1100	705	1295	910	520			385	265	138	150
	33	195	480	780	975	690	1380	895				485	350		
125	6,3-10,5	255	810	1210	1145	715	1260	950				310	265		
	15,8	255	810	1210	1145	715	1335	950	520			385	265	138	150
	33	210	555	885	1015	700	1415	930				485	350		
160	6,3-10,5	275	975	1405	1200	725	1310	1000				310	265		
	15,8	275	975	1405	1200	725	1385	1000	520			385	265	138	150
	33	235	645	1010	1060	720	1455	970				485	350		
200	6,3-10,5	290	1055	1505	1210	730	1360	1050				310	265		
	15,8	290	1055	1505	1210	730	1435	1050	520			385	265	178	150
	33	255	720	1135	1090	760	1475	990				485	350		
250	6,3-10,5	310	1150	1635	1180	735	1415	1105				310	265		
	15,8	310	1150	1635	1180	735	1490	1105	520			385	265	178	150
	33	285	810	1275	1135	810	1500	1015				485	350		
315	6,3-10,5	385	1390	1995	1275	790	1480	1170				310	330		
	15,8	385	1390	1995	1275	790	1555	1170	670	150	50	385	330	178	150
	33	350	990	1570	1200	855	1590	1105				485	350		
400	6,3-10,5	465	1675	2390	1400	865	1560	1250				310	330		
	15,8	465	1675	2390	1400	865	1635	1250	670	150	50	385	330	178	150
	33	425	1190	1880	1280	915	1705	1220				485	350		
500	6,3-10,5	510	1920	2700	1425	930	1610	1300				310	330		
	15,8	510	1920	2700	1425	930	1685	1300	670	150	50	385	330	263	200
	33	495	1395	2200	1370	940	1755	1270				485	350		
630	6,3-10,5	560	2200	3045	1455	1005	1670	1360				310	330		
	15,8	560	2200	3045	1455	1005	1745	1360	670	150	50	385	330	263	200
	33	580	1710	2660	1445	1010	1805	1320				485	350		
800	6,3-10,5	615	2355	3300	1560	1020	1685	1375				310			
	15,8	615	2355	3300	1560	1020	1760	1375	820	150	50	385	400	263	220
	33	715	1980	3120	1570	1100	1860	1370				485			
1000	6,3-10,5	750	2875	4120	1600	1060	1855	1545				310			
	15,8	750	2875	4120	1600	1060	1930	1545	820	200	70	385	400	340	230
	33	750	2245	3550	1685	1095	1910	1425				485			
1250	6,3-10,5	790	3420	4700	1690	1090	1890	1580				310			
	15,8	790	3420	4700	1690	1090	1965	1580	820	200	70	385	400	340	240
	33	870	2465	4020	1760	1210	1955	1470				485			
1600	6,3-10,5	875	3390	4840	1790	1160	1915	1605				310			
	15,8	875	3390	4840	1790	1160	1990	1605	820	200	70	385	400	372	240
	33	970	2765	4570	1810	1330	2065	1580				485			
2000	6,3-10,5	1080	4060	6035	1880	1340	1935	1625				310			
	15,8	1080	4060	6035	1880	1340	2010	1625	1000	200	70	385	400	372	250
	33	1095	3100	5415	1860	1465	2120	1630				485			
2500	6,3-10,5	1305	4755	7165	2080	1440	1965	1655				310			
	15,8	1305	4755	7165	2080	1440	2040	1655	1000	200	70	385	400	450	260



1. H.V. Bushing
2. L.V. Bushing
3. Oil Expansion Tank
4. Buchholz Relay
5. Lifting Lug (for Active Part)
6. Lifting Lug (for Complete Unit)
7. Oil Level Indicator
8. Oil Filling Cap
9. Nameplate
10. Radiator
11. Radiator Air Vent Plug
12. Radiator Oil Drain Valve
13. Bolted Flange
14. Earthing Bushing
15. Oil Drain Valve
16. Oil Filtering Valve (Upper)
17. Oil Filtering Valve (Lower)
18. Oil Sampling Valve
19. Operating Mechanism at Chest Level
20. Oil Expansion Tank Drain Valve
21. Contact Thermometer
22. Pocket for Contact Thermometer
23. Control Panel
24. Pressure Relief Valve
25. Air Breather
26. Inspection Holes
27. Viewing Window
28. Jack Support Point
29. Expansion Tank Lifting Lug
30. Fan
31. Wheel
32. Transformer Pulling Lug
33. Earthing Bolt

*(T) Wheelbase: 1440mm. Center-to-center distance, for 8 MVA and smaller capacities: 1490mm. For transformers with capacities above 8 MVA, center-to-center distance: 1505mm.

TECHNICAL DATA TABLE
OF POWER TRANSFORMERS

Rated Power	Rated Voltage	Vector Group	Impedance	Losses		No-Load Current	Noise Level	Length	Width	Height	Oil Weight	Active Part Weight	Total Weight	Efficiency
MVA ONAN(ONAF)	kV/kV		% Uk	Boşta kW	Yükte kW	I ₀ %	dB	mm	mm	mm	kg	kg	kg	tam yük
3,15	33/15,8	Dyn5	6	4,5	28	1	75	2650	2250	2750	1700	4600	8250	98,97
4	33/15,8	Dyn5	6	5,5	33	1	77	2950	2600	2900	2050	5400	10100	99,04
4(5)	33/15,8	Dyn5	7	6,5	38	0,9	78	3050	2500	3050	2200	6000	10400	99,11
5	33/15,8	Dyn5	7	6,5	38	0,9	78	3050	2650	3050	2400	6000	11050	99,11
5(6,25)	33/15,8	Dyn5	7	7,7	45	0,9	80	3200	2650	3100	2650	8150	13700	99,16
8	33/15,8	Dyn5	7	9,5	54	0,9	82	3300	2650	3250	2850	9100	14650	99,21
8(10)	33/15,8	Dyn5	7	11	63	0,8	84	3350	2650	3400	3000	9700	15500	99,26
10	33/15,8	Dyn5	7	11	63	0,8	84	3350	2850	3400	3300	9700	16800	99,26
10(12,5)	33/15,8	Dyn5	10	10	65	0,5	79	3650	2650	3650	3850	13050	20400	99,40
16	33/15,8	Dyn5	10	12	80	0,5	80	3900	3100	3850	4650	15700	25750	99,43
16(20)	33/15,8	Dyn5	10	14	95	0,5	83	3900	3000	4000	5050	16750	26800	99,46
20	33/15,8	Dyn5	10	14	95	0,4	83	3900	3500	4000	5500	16750	29000	99,46
20(25)	33/15,8	Dyn5	10	16	110	0,4	85	4100	3600	4600	8250	22500	38500	99,46
25	33/15,8	Dyn5	10	16	110	0,4	85	4250	4150	4600	9000	22500	42000	99,46
31,5	33/15,8	Dyn5	10	25	150	0,4	90	4400	4250	4900	9500	26000	44000	99,44

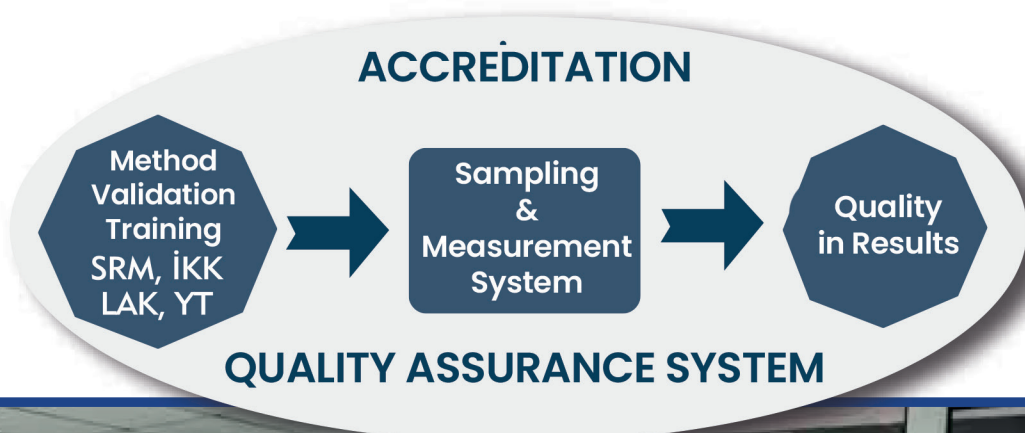


TEST

The TARFO Test Laboratory was accredited by TÜRKAK in 2011 after meeting the requirements of the ISO 17025 standard.

In our test laboratory, all tests required by the IEC and TS EN 60076-1 standards can be performed, except for mechanical strength testing against short circuits. Tests applied to transformers are classified into three main categories: routine tests, type tests, and special tests.

TARFO Inc. Test Laboratory has taken an important step towards becoming an “Element of Trust in the Global Market” through its accreditation.



ROUTINE TESTS

In accordance with TS EN 60076-1 and IEC standards, the following tests are applied to every transformer after production is completed:

- 1. Measurement of Turns Ratio and Determination of Vector Group**
- 2. Measurement of Winding Resistance**
- 3. Applied Voltage Test (Separate Source AC Withstand Voltage Test)**
- 4. Induced Voltage Test (Short Duration Induced AC Voltage Withstand Test)**
- 5. Measurement of No-Load Losses and No-Load Current**
- 6. Measurement of Load Losses and Short-Circuit Voltage**
- 7. Measurement of Loss Angle ($\tan \delta$) and Capacitance**
- 8. Measurement of DC Insulation Resistance**
- 9. Tests on On-Load Tap Changers (if present)**
- 10. Pressure Leakage Test**

TYPE TESTS

These tests are carried out on one transformer from a group of transformers with the same specifications, based on customer request:

- 1. Temperature Rise Test**
- 2. Lightning Impulse Test**
- 3. Sound Level Measurement Test**
- 4. Measurement of No-Load Losses and Current at 90% and 110% of Rated Voltage**
- 5. Measurement of Power Consumption of Fans and Oil Pump Motors**

SPECIAL TESTS

These tests are determined in mutual agreement with the customer:

- 1. Measurement of Zero-Sequence Impedance**
- 2. Measurement of No-Load Current and Harmonic Components**
- 3. Measurement of Oil Dielectric Strength and Power Factor**
- 4. Functional Tests of Protection, Alarm, and Control Equipment**
- 5. Paint Thickness and Quality Control Test**

Our Test Laboratory is dedicated to providing reliable and timely results in accordance with national and international standards.

Using modern equipment, valid test methods, and experienced personnel, we ensure the highest level of accuracy and quality.

We strictly maintain confidentiality, impartiality, and reliability in all testing processes.

All transformer test reports are securely archived, and thanks to our advanced system, reports from the past 25 years can be retrieved upon customer request.

QUALITY CONTROL SYSTEM

TARFO began implementing Quality Management Systems institutionally as one of the first companies in the country to be certified under the (now obsolete) TS 1055 and TS 267 standards. Although these were product standards, they formed the basis for management system documentation.

Adopting the policy of producing transformers that not only meet but exceed customer expectations, TARFO manufactures in compliance with legal regulations and national and international standards, using modern technology. The company first received its ISO 9001 Quality Certificate in 1995, and later added the ISO 14001 Environmental Management System Certificate in 2003, continually improving both systems since then.

In recognition of its efforts in quality, TARFO was awarded the “50th Year Quality Award” by TSE in 2004. Short-circuit mechanical withstand type tests, which determine product quality, have been conducted and certified for all product groups by internationally recognized laboratories such as ICMET and CESI.

At TARFO, quality control activities are carried out at every stage of production. In addition to the awareness and participation of all employees, inspections are performed by trained quality control personnel at input, process, and final stages to ensure compliance with quality plans, technical drawings, and specifications.

All management systems at TARFO are continuously improved using tools such as internal audits, management review meetings, data analysis, and corrective/preventive action programs.

With a customer-oriented approach and over 40 years of experience, TARFO continues to move confidently toward the future.

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