CAST RESIN DRY TYPE TRANSFORMERS

UP TO 4 MVA

www.alfanar.com

الفنار alfanar

safety...
durability

Contents

1 – General Information

A. Standard

alfanar Dry Type Transformers are manufactured according to:

- **IEC 60076-11 – Power transformers – Part. 11: Dry – type**
- **IEC 60076-12 – Power transformers – Part. 12: Loading guide for dry-type power transformers**
- **IEC 60076-1 – Power transformers – Part. 1: General**
- **IEC 60076-2 – Power transformers – Part. 2: Temperature rise**
- **IEC 60076-3 – Power transformers – Part. 3: Insulation levels, dielectric test and external clearances in air**
- **IEC 60076-5 – Power transformers – Part. 5: Ability to withstand short circuit**
- **IEC 60076-10 – Power transformers – Part. 10: Determination of sound levels**
- **IEC 60085 – Thermal evaluations and designation**
- **IEC 60270 – High-voltage techniques – Partial discharge measurement**
- **IEC 60529 – Degree of protection provided by enclosures (IP code)**

B. Quality

alfanar Electrical Systems is certified by renowned international evaluation companies for their Quality Management according to ISO 9001:2015.

alfanar is also certified for Environmental Management according to ISO 14001:2015.

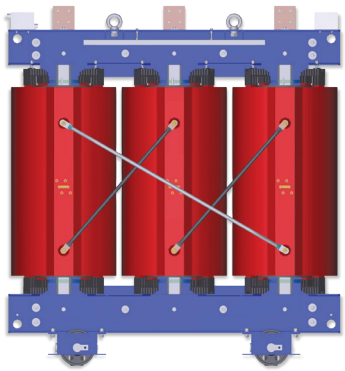
C. Climatic, environmental and fire behaviour classes

alfanar products are designed to withstand the toughest environmental conditions and offer an extremely high level of reliability even under the toughest conditions.

According to the highest environmental, climate, and fire specifications, alfanar Dry Type Transformers are manufactured according to international standard IEC 60076-11 Edition 2.0 2018-08.

• Climatic classes

At alfanar, we redefine excellence in power distribution with our Dry-Type Cast Resin Transformers, ensuring optimal performance in diverse climatic conditions with world recognized certification up to C2 level can withstand -25 degrees and up to C4 level -40 degrees.



C1	The transformer is suitable for operation	**-5 C**	The transformer is suitable for transport and storage	**-25**
C2	The transformer is suitable for operation	**-25 C**	The transformer is suitable for transport and storage	**-25 C**
C3	The transformer is suitable for operation	**-25**	The transformer is suitable for transport and storage	**-40**
C4	The transformer is suitable for operation	**-40**	The transformer is suitable for transport and storage	**-50**
C5	The transformer is suitable for operation	**-50**	The transformer is suitable for transport and storage	**-60**

• Fire behaviour classes

Two fire behaviour classes are defined:

- alfanar transformers have F1 class certification for fire withstand from KEMA Lab. Our transformers are engineered to withstand fires in hazardous areas, providing a robust and reliable solution for critical applications.

- With a classification of Restricted Flammability, the emission of toxic substances and opaque smokes are minimized.. This advanced feature ensures a safer environment in the event of a fire, aligning with the highest standards of safety and compliance.

• Environmental classes

alfanar Dry-Type Cast Resin Transformers, ensuring optimal performance in diverse Environmental class conditions with world-recognizing certification up for E4 level can withstand heavy pollution.

E0	No condensation occurs on the transformers and pollution is negligible. This is commonly achieved in a clean, dry indoor installation
E1	Occasional condensation can occur on the transformer (for example, when the transformer is de-energized). Limited pollution is possible
E2	Frequent Condensation or light pollution or combination of both as Examples: area without industries and with low density of house equipped with heating plants; area with low density of industries or housing but subjected to frequent winds and/or rainfall; agricultural area or mountainous area. All of these areas are situated at least at 15 km from the sea and are not exposed to winds directly from the sea
E3	Frequent condensation or medium pollution or combination of both as Examples: area with industries not producing particularly polluting smoke and/or with average density of houses equipped with heating plants area with high density of housing and/or industries but subjected to frequents winds and or rainfall areas exposed to wind from the sea but not too close to the coast (at least several kilometres distant)
E4	Frequent condensation or heavy pollution or combination of both as Examples: area with high density of industries and suburbs of large cities with high density of heating plants producing pollution area close to the sea or in any case exposed to relatively strong wind from the sea

Environmental classes

	Feature	Advantage	Benefit
3	High Insulation Class (Class H)	Offers superior thermal endurance, allowing the transformer to operate efficiently at higher temperatures.	Increases the lifespan of the transformer by preventing thermal degradation, leading to lower total ownership costs and enhanced reliability over time.
	Class H Solid Insulation material Withstand up to 180 degree give extra superior performance for the product The solid insulation is classified as inti ageing material and Give extra lifetime expectancy of the product. the Insulation material used is with very high level of anti ageing absorption which demonstrate by the external certification		

D. Cooling code and classes of insulation

For dry type transformers there are two types of cooling methods:

- Air natural (AN)
- Air forced (AF)

The main features of insulation are to provide dielectric strength and be able to withstand certain thermal limits.

The insulation class is either F or H.

- 180°C for Class H insulation
- 155°C for Class F insulation

E. Short circuit impedance

The short circuit impedance is the transformer's impedance, usually between 4% and 6% for distribution transformers and higher than 7% for power transformers. The short circuit impedance is the percentage of the primary rated voltage that must be applied at the transformer primary winding when the secondary winding is shorted in order to have the rated currents in the primary and secondary windings. If the short circuit impedance increases, it will result in an unnecessary voltage drop across the power transformer and will limit its ability to deliver power to the secondary-connected equipment.

• Transformers working in parallel should have identical short circuit impedance.

F. Altitude

The transformers are suitable for operation at altitudes of up to 1000m above sea level. Site altitudes above 1000m require the use of special designs and should be mentioned in the order.

alfanar Dry-type, Cast Resin Transformer

alfanar's cutting edge Dry-Type Cast Resin Transformers: Powering diverse needs with precision and reliability, engineered to meet the highest industry standards to cater to different applications.

Airports
Hotels
Underground applications
Factories
Hospitals
High rise buildings
Shopping centers
Data centers
Schools

alfanar Dry-type, Cast Resin Transformer

Technical Data			
	General offering aspect		Market offering
1	Rated Power	kVA	Up to 4000
2	Primary Voltage	kV	Up to 33
3	Secondary Voltage	kV	0.4 Standard up to 13.8
4	Frequency	Hz	60 & 50
5	Vector Group		Dyn11, alternatives are available
6	Winding Material		Alu (Cu is optional)
7	Standard		IEC 60076
8	Type		Cast Resin, HV encapsulated & LV pre-impregnated
9	Installation		Indoor
10	Enclosure Ingress Protection		IEC 60529 (IP21, IP31, IP23, IP 44, IP 54)
11	Insulation Class		Class F (155°C) & Class H (180°C)
12	Cooling Method		AN & AF
13	Climate - Environmental - Fire	C	C4, E4, F1
14	Max. Ambient Temp.	C	50, 40, up to 55, alternatives are available
15	Temp. Rise _ avg. Winding	C	Class F (90°C) & Class H (115°C) alternatives are available
16	Altitude (max.)	m	Up to 3000

Roller & Vibration Pads

- Our cutting-edge design allows transformers to be effortlessly relocated within their location, providing unparalleled convenience for your operational needs.
- 360-Degree Mobility: The incorporation of rollers in our CRT design ensures seamless movements in both longitudinal and transverse directions. This unparalleled flexibility enables relocation to any desired location with utmost ease.
- Vibration Reduction : As part of our commitment to optimal performance, alfanar offers an additional set of anti-vibration pads to further enhance the transformer's stability. These pads effectively decrease vibrations, ensuring a smooth and uninterrupted operation.

Temperature Control Relay

- alfanar's transformers are fortified with the latest Temperature Control Relay, offering unparalleled protection and reliability. Trust in the advanced features that safeguard your investment.
- With alfanar's control system, you have the flexibility to overload your transformer up to 125%, 130%, and even 140% of the rated nominal power. This innovative AF mode enables emergency loading, ensuring your transformer can handle unexpected demand spikes with ease.

2 – Manufacturing Process

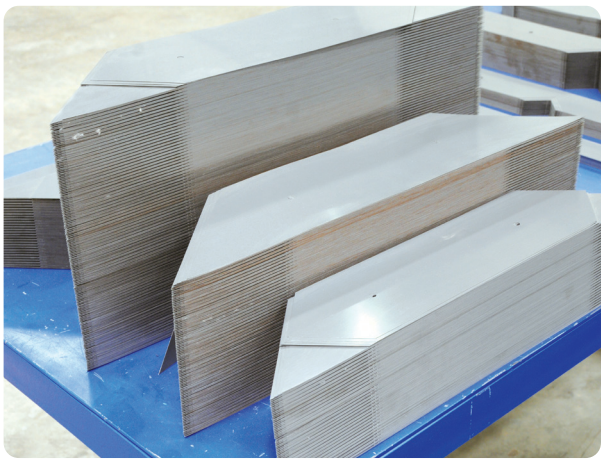
Magnetic core

The purpose of the core is to provide a low reluctance path for the magnetic flux linking primary and secondary windings. The magnetic circuit in a transformer is made of steel lamination sheets whose basic components are iron and approximately 3% silicon as an alloy element.

alfanar uses high-quality, low-hysteresis Cold-Rolled Grain-Oriented Steel Sheet (CRGO) transformer laminations complying with the IEC 60404-8-7 standard. Both sides of the lamination have a thin inorganic, oil-resistant and rustproof insulation coating of at least 100Ω.mm^2 insulation resistivity.

As most of the losses in transformer cores arise from the yoke-limb joints, alfanar transformers have the ends of the yokes and limbs mitered and stacked together by a simple overlapping arrangement (step-lapped joints). This arrangement allows for the gradual and smooth transfer of flux through the joints ultimately lowering the corner losses. The advantages for using the step-lapped technology are the reduction in no-load current, no-load losses and sound level.

For precise core cutting and step-lap core cutting alfanar uses sophisticated LAE's model TE40 and TE60 core cutting machines, respectively. During the tilting and unloading phase of production, our highly-skilled operators precisely and firmly assemble the cores using special assembly benches by perfectly aligning the cores to the right positioning references.



Windings

The windings consist of current-carrying conductors wound over the sections of cores. alfanar transformers are made of high-conductivity windings made of electrolytic copper or aluminium conductors. In a transformer, the right type of windings is particularly significant for space saving and minimization of load losses.

- **Low voltage windings**
  Low voltage windings are made of a foil copper or aluminium sheet and insulated with multiple layers of insulation materials. The windings are multi-layered helical type, a characteristic that provides the highest mechanical stability during short circuit stress.The greatest advantages of using a foil copper/aluminium conductor are the "No Effect" of axial short circuit compressing forces and to reduce losses resulting from the skin effect.

- **High voltage windings**
  Depending on the rated current of a transformer, the high voltage windings are either made of enameled round copper/aluminium wires or strips. The windings are multi-layer helical/desk type and the inter-layer insulation is made of high quality insulation materials class F or H as per customer requirements.

3 – Applications

alfanar Dry transformers are widely used in the following applications:

A. High rise buildings

B. Hospitals

C. Hotels

D. Underground

E. Factories

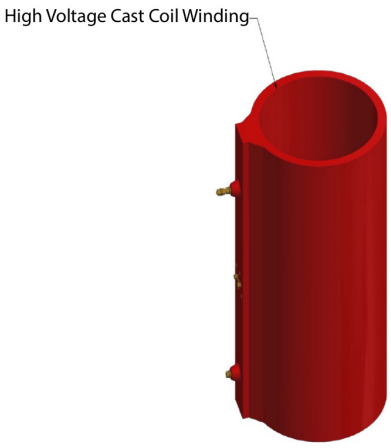
F. Shopping centers

Main Characteristics of Cast Resin Transformers

- alfanar's Cast Resin Transformers, a technological marvel designed for peak efficiency and reliability. Meeting the latest IEC standards for energy-saving, alfanar transformers ensure optimal performance while minimizing environmental impact.
- Lower partial discharge levels in windings contribute to an extended lifespan, guaranteeing longevity and sustained efficiency.
- Robust construction, providing stability under varying conditions. Alfanar transformers withstand the rigors of demanding environments, ensuring durability and consistent operation.
- With an exceptional impulse withstand capability, our transformers guarantee reliability in the face of sudden voltage fluctuations.
- Operating seamlessly in cold ambient environments, alfanar transformers demonstrate high resistance, making them ideal for diverse climates
- Efficient cooling distribution is a hallmark feature, promoting consistent and reliable performance under various load conditions.
- Operational stability, alfanar transformers incorporate advanced vibration reduction technology, ensuring a smooth and quiet performance.

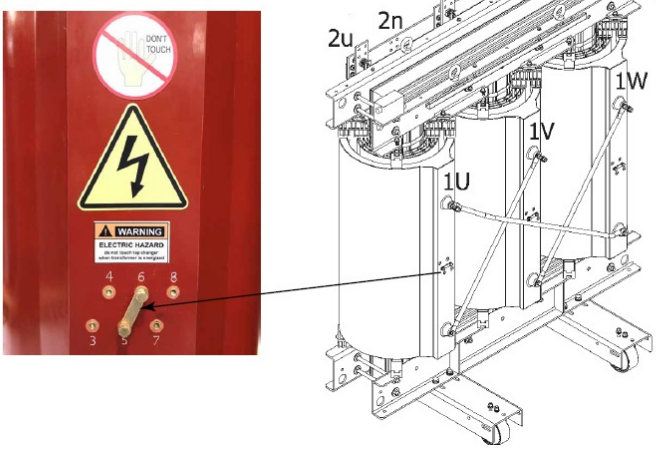
HV Winding

- Depending on the rated current of the transformer, our high-voltage windings are meticulously crafted using copper or aluminum wires/strips according to customer specification.
- Multi-layer helical & desk-type design, ensures optimal performance under various operating conditions. The inter-layer insulation is carefully chosen from high-quality materials of class F or H, tailored to meet specific customer requirements.
- HV windings have continuous turns distributed along the coil, promoting consistent and efficient energy flow.
- HV coil design ensures excellent linear impulse distribution, enhancing the transformer's overall performance.
- The windings are designed to be ideal for filling with cast resin, providing additional insulation and protection.
- Our transformers exhibit very low partial discharge levels (guaranteed ≤10 Pc), a decisive factor influencing the transformer's lifespan and its ability to withstand lightning impulses.



HV Voltage Tappings

- HV tapping points allow connections to be made without the need for a contact interface, such as grease or a bi-metallic strip. This not only simplifies installation but also ensures reliable and maintenance-free operation over the transformer's lifespan.
- To be adjusted with transformer de-energized
- Typical regulation of HV voltage is with 5 steps
- Usually these steps are ± 2 x 2,5%



Tap Position	Tapping Link	%	HV Line - (V)
1	8-7	+ 5	14490
2	6-7	+ 2.5	14145
3	6-5	0	13800
4	4-5	-2.5	13455
5	4-3	-5	13110

CRT Enclosure

- Elevate the safety and efficiency of your electrical installations with alfanar's comprehensive range of protective enclosures. Our offerings cater to different sizes and types, covering the entire CRT rating range, making them ideal for inside installations. Whether you require IP 21, IP 23, IP 31, or any other special IP protection, alfanar has you covered.

- alfanar's protective enclosures are designed to safeguard CRTs across various rating ranges. The diversity in sizes and types ensures a perfect fit for your specific requirements.

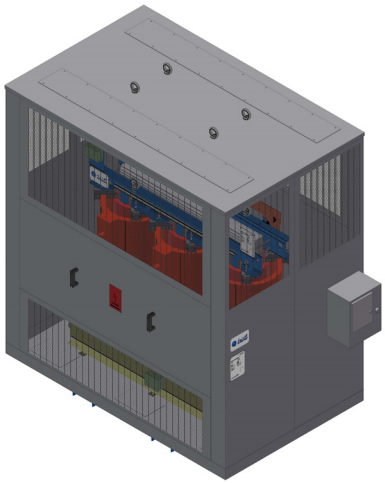
- alfanar enclosures are engineered to guarantee sufficient natural ventilation, facilitating the CRT's natural cooling process. This not only optimizes performance but also extends the lifespan of the active components.

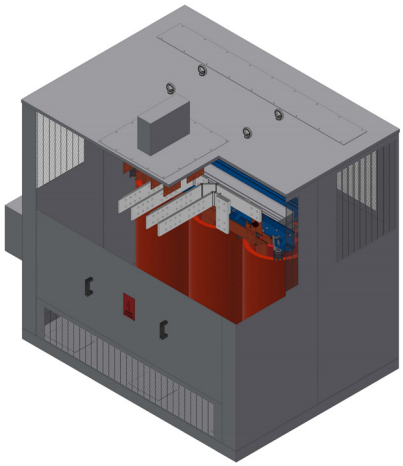
- Our enclosures feature a robust steel frame, offering durability and strength. To meet diverse customer needs, we provide different aspects, including:

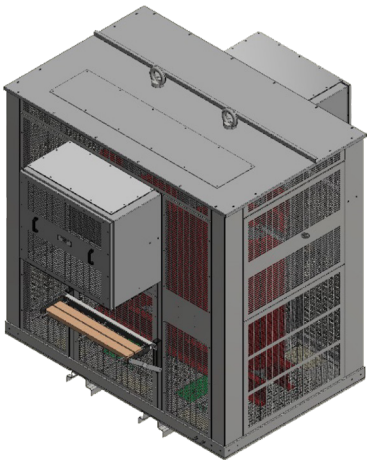
- Top Entry Module with Cable: A user-friendly design that facilitates easy cable entry, ensuring a hassle-free installation process.

  Top Entry with Bus Duct: Tailored for applications requiring bus ducts, providing a seamless integration solution.

- Bottom Entry with Cable Box: Ideal for projects where a bottom entry is preferred, equipped with a cable box for added convenience.

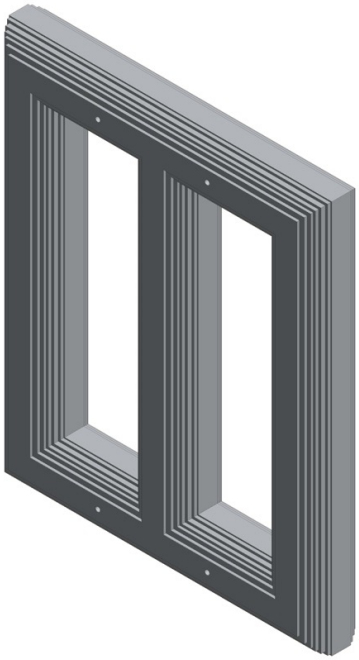






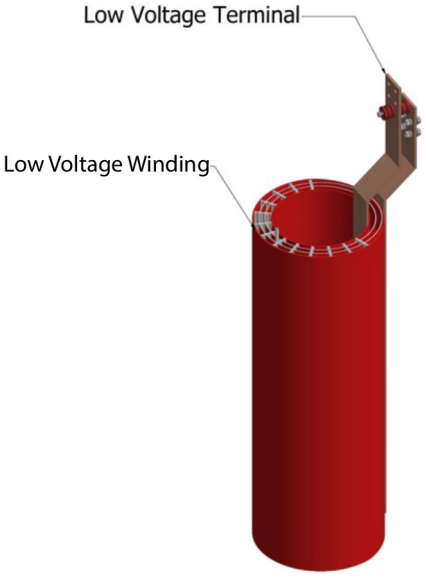
Core

- At Alfanar, excellence meets innovation in the manufacturing of CRT magnetic cores.
- Our cores are meticulously crafted using high-permeability and low-loss grain-oriented silicon steel sheets, meeting the highest standards for efficiency and reliability.
- Precision in every detail, 45° mitre cut joints ensure seamless connectivity, minimizing stray-flux losses, and eliminating joint vibrations.
- Step-Lap lamination stacking maximizes efficiency by minimizing no load losses, providing optimum performance in electromagnetic applications. Designed for peak efficiency and reduced energy waste.
- The overlap of each single lamination enhances mechanical strength, significantly reducing noise levels, making it the ideal choice for noise-sensitive applications.
- CRT core with high resistance to corrosion with full coating of bi-component epoxy resin.

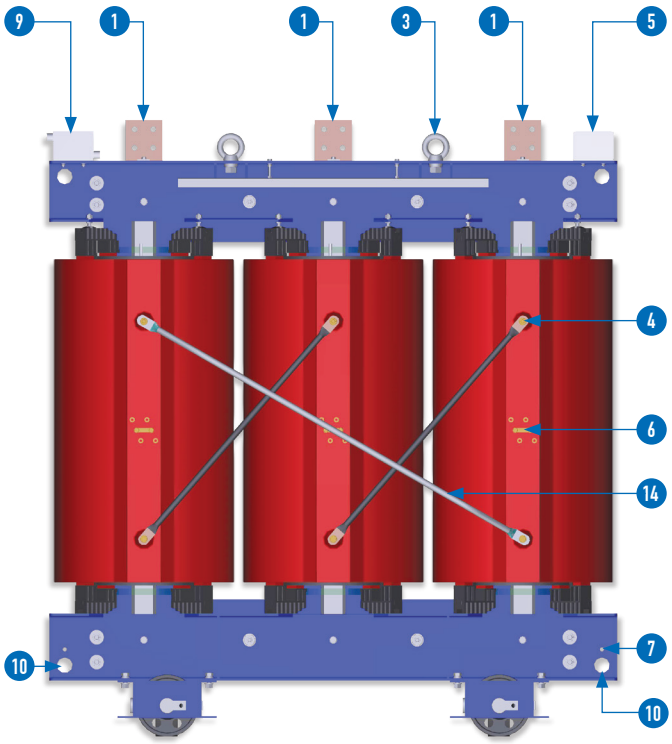


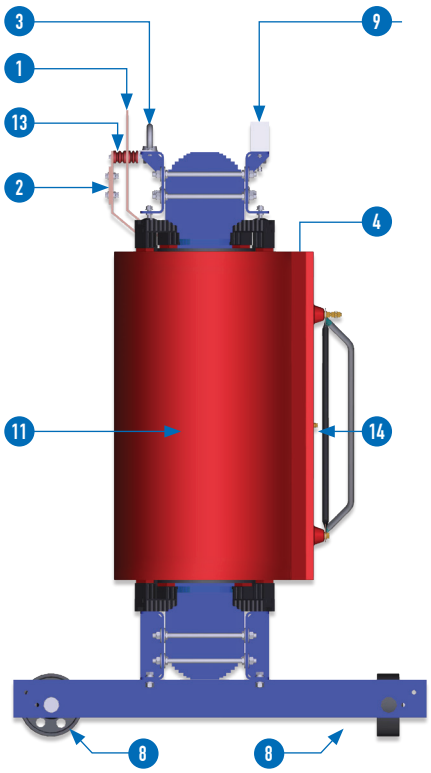
LV Winding

- LV windings are meticulously wound with precision using high-quality aluminum or copper foils. Each layer is carefully insulated with an inter-layer film, pre-impregnated with heat-activated epoxy resin.This advanced construction ensures not only durability but also exceptional thermal performance.
- Each LV winding is equipped with tin-plated aluminum or copper connection points. streamlining connections and enhancing overall efficiency.
- LV windings provide superior insulation against different climatic conditions and ensure longevity and reliability.
- Very good resistance to radial stress under short-circuit conditions.
- Temperature Optimization: Achieve optimal temperature distribution within the coil, enhancing overall efficiency and minimizing the risk of overheating.
- Our LV windings are designed to reduce additional losses, ensuring maximum energy efficiency and cost-effectiveness.

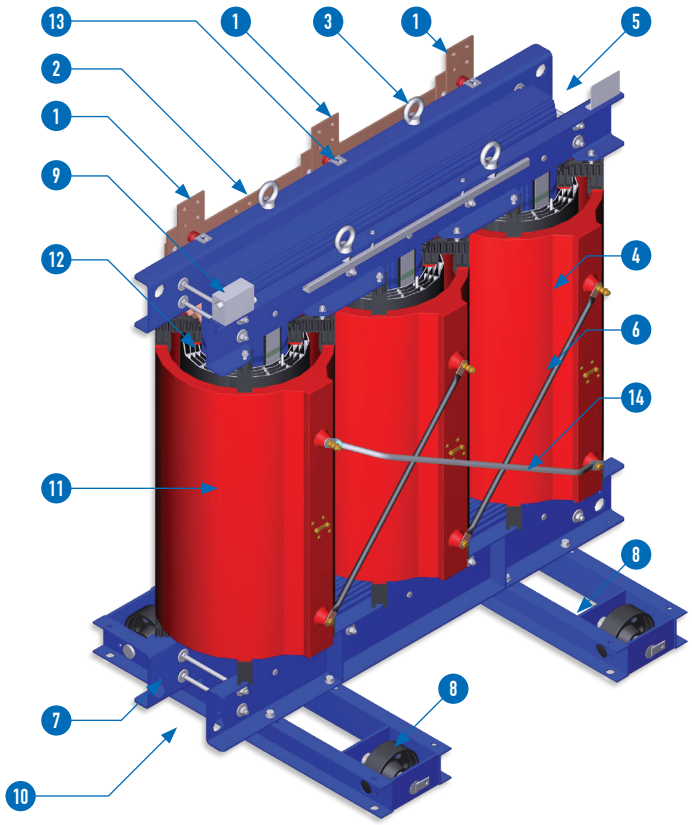


4 - Product Breakdown

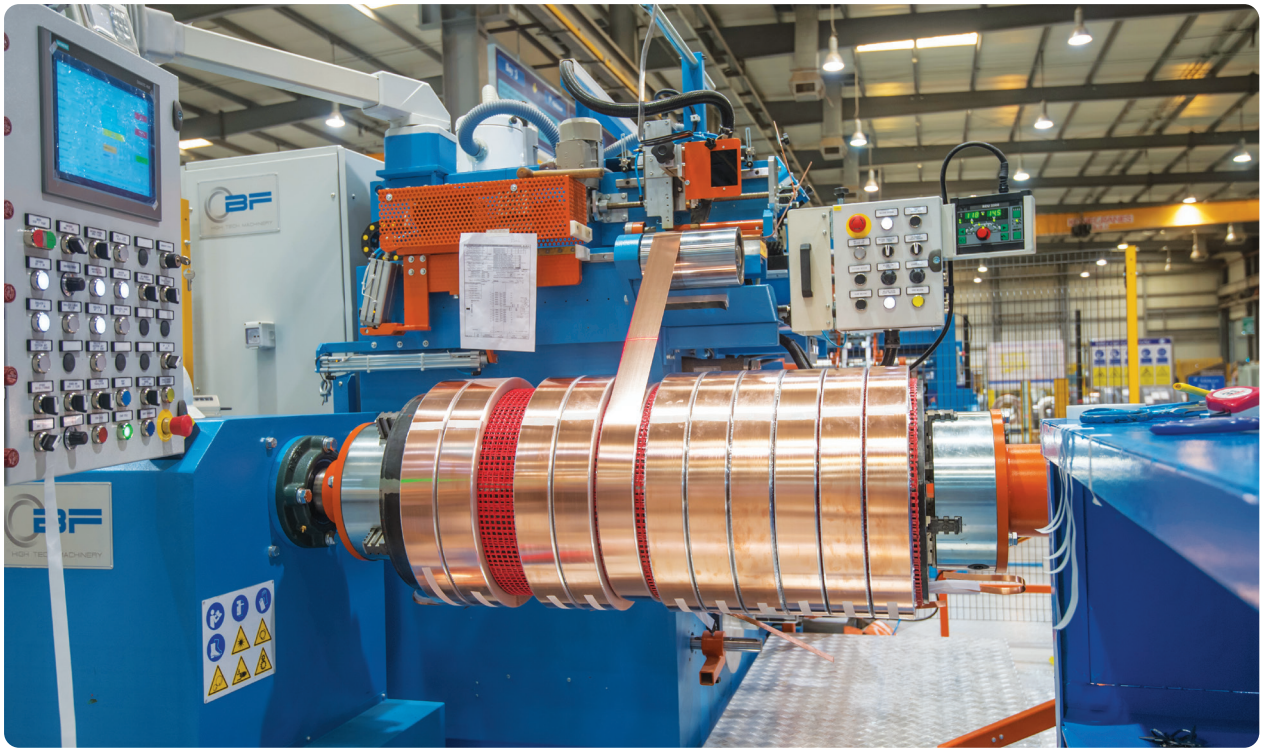




ID Number	DESCRIPTION
1	Low voltage terminals
2	Low voltage neutral terminal
3	Lifting eyebolt lugs
4	High voltage terminals
5	Rating plate
6	Off load de-energized tap changer
7	Earthling terminal
8	Dual direction scrolls wheels
9	PT100 connection terminal box
10	Pulling hole at bottom side
11	High voltage cast coil winding
12	Low voltage winding
13	Low voltage winding terminal supports
14	High voltage delta connection pipes



5 – Product Features



alfanar offers an optimized design for full range of Cast Resin Transformers made in KSA.

- ✓ Smart interface for LV and HV connection terminals.
- ✓ Magnetic core manufactured with high performance grain-oriented steel.
- ✓ Low voltage winding made by foil conductor (Al or Cu) full insulated with pre-impregnated insulation material (Pre-preg).
- ✓ High voltage winding made with a series of tape conductor (Al or Cu) sections vacuum cast processed by epoxy resin properly filled to obtain: extensive maintenance-free, moistureproof for any environment, pollution resistant, fire resistant and self-extinguishing.
- ✓ High voltage delta connection tubes with HV terminals at its terminations.
- ✓ Lifting eye lugs made by standard certified and approved components.
- ✓ Basement profiles equipped with by-directional convertible scrolling wheels.
- ✓ Pulling hole on basement profiles for easy movement to reach operation site.
- ✓ Clamping and belting hole on top core profiles ensure the easy and safe transport to the installation site on a truck deck.
- ✓ High voltage tapping selector for ±2x2,5% (other range available at request) easily operable at de-energized condition, located on HV terminal side to adapt the primary voltage to the network value AC connection point.
- ✓ Temperature monitoring sensors PT 100 (other alternative available upon request) located on each LV winding top side in strict contact with hot spot winding part.
- ✓ Steel parts are painted with a high temperature coating RAL 5012, (other colors and galvanized coating are available upon request), make them suitable for highly aggressive environments.
- ✓ Smart mechanical structure made with simple bolt assembled parts, for an easy interface with a long list of available accessories.

6 – Technical Information

6.1 alfanar Eco-design (Tier 2) Cast Resin Transformers Rated Voltage Up to 17.5kV (Copper foil)

Without enclosure (IP 00)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 Lx-DxH
400 kVA	675 W	4500 W	6	60 dB	2200 kg	1400 x 800 x 1700
630 kVA	990 W	7100 W	6	62 dB	2540 kg	1520 x 800 x 1740
800 kVA	1170 W	8000 W	6	64 dB	3040 kg	1520 x 970 x 1950
1000 kVA	1395 W	9000 W	6	64 dB	3320 kg	1560 x 970 x 1970
1250 kVA	1620 W	11000 W	6	65 dB	4120 kg	1680 x 970 x 2050
1600 kVA	1980 W	13000 W	6	66 dB	5040 kg	1760 x 1310 x 2250
2000 kVA	2340 W	16000 W	6	66 dB	6180 kg	1920 x 1310 x 2270
2500 kVA	2790 W	19000 W	6	68 dB	7620 kg	2100 x 1310 x 2390
3150 kVA	3420 W	22000 W	8	70 dB	8600 kg	2270 x 1310 x 2430

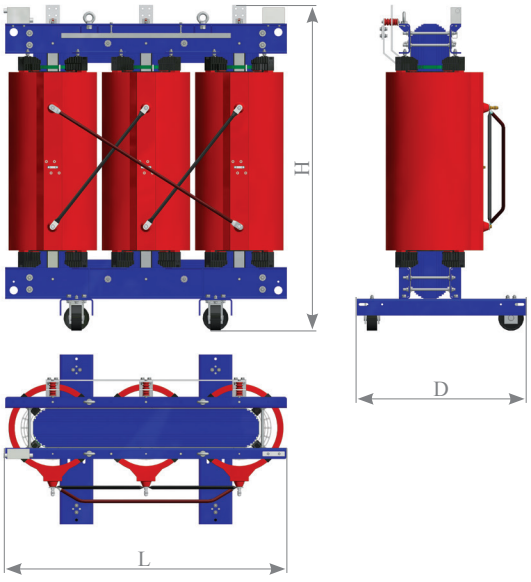
6.2 alfanar Eco-design(Tier 2) Cast Resin Transformers Rated Voltage Up to 17.5kV (Aluminium foil)

Without enclosure (IP 00)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
400 kVA	675 W	4500 W	6	60 dB	1740 kg	1520 x 800 x 1510
630 kVA	990 W	7100 W	6	62 dB	2100 kg	1520 x 800 x 1750
800 kVA	1170 W	8000 W	6	64 dB	2460 kg	1590 x 970 x 1870
1000 kVA	1395 W	9000 W	6	64 dB	3020 kg	1610 x 970 x 2170
1250 kVA	1620 W	11000 W	6	65 dB	3660 kg	1740 x 970 x 2270
1600 kVA	1980 W	13000 W	6	66 dB	4100 kg	1800 x 1310 x 2310
2000 kVA	2340 W	16000 W	6	66 dB	5940 kg	2070 x 1310 x 2390
2500 kVA	2790 W	19000 W	6	68 dB	6340 kg	2150 x 1310 x 2410
3150 kVA	3420 W	22000 W	8	70 dB	7640 kg	2390 x 1310 x 2500

All the above Cast Resin Transformers fulfill the following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8±2x2.5% / 0.4kV;
Insulation levels Primary / Secondary :	17.5 - 38 - 95 / 1.1 - 3kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90/ 100 KK
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

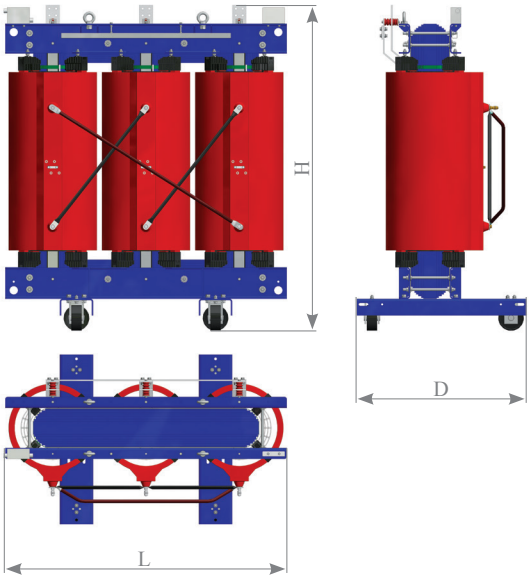
6.3 alfanar Eco-design(Tier 2) Cast Resin Transformers Rated Voltage Up to 36kV (Copper foil)

Without enclosure (IP 00)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
630 kVA	1139 W	7810 W	6	62 dB	4740 kg	1910 x 800 x 2210
800 kVA	1346 W	8800 W	6	64 dB	4020 kg	1800 x 970 x 2280
1000 kVA	1604 W	9900 W	6	64 dB	5560 kg	1980 x 970 x 2400
1250 kVA	1863 W	12100 W	6	65 dB	5640 kg	2030 x 970 x 2520
1600 kVA	2277 W	14300 W	6	66 dB	6300 kg	2120 x 1310 x 2400
2000 kVA	2691 W	17600 W	6	66 dB	7420 kg	2220 x 1310 x 2580
2500 kVA	3209 W	20900 W	6	68 dB	7920 kg	2240 x 1310 x 2660
3150 kVA	3933 W	24200 W	8	70 dB	10360 kg	2580 x 1310 x 2700

All the above Cast Resin Transformers fulfill the following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33±2x2.5% / 0.4kV;
Insulation levels Primary / Secondary :	36 - 70 - 170 / 1.1 - 3kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 / 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

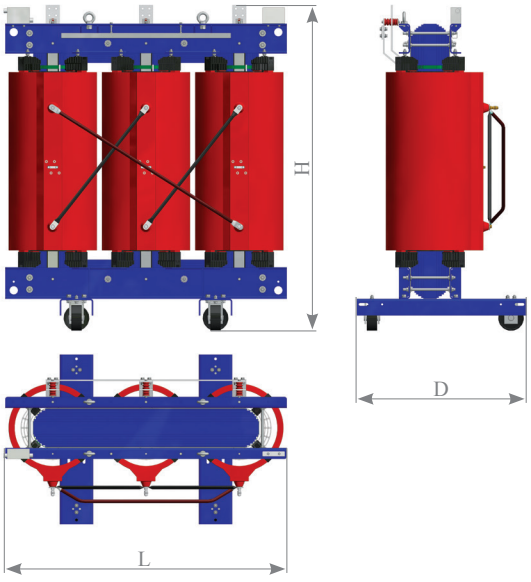
6.4 alfanar Eco-design(Tier 2) Cast Resin Transformers Rated Voltage Up to 36kV (Aluminium foil)

Without enclosure (IP 00)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
630 kVA	1139 W	7810 W	6	62 dB	3560 kg	1880 x 800 x 2390
800 kVA	1346 W	8800 W	6	64 dB	3580 kg	1860 x 970 x 2420
1000 kVA	1604 W	9900 W	6	64 dB	4840 kg	2100 x 970 x 2410
1250 kVA	1863 W	12100 W	6	65 dB	4680 kg	2030 x 970 x 2520
1600 kVA	2277 W	14300 W	6	66 dB	6720 kg	2220 x 1310 x 2640
2000 kVA	2691 W	17600 W	6	66 dB	7320 kg	2300 x 1310 x 2660
2500 kVA	3209 W	20900 W	6	68 dB	8940 kg	2450 x 1310 x 2840
3150 kVA	3933 W	24200 W	8	70 dB	9540 kg	2660 x 1310 x 2770
3150 kVA	3420 W	22000 W	8	70 dB	7640 kg	2390 x 1310 x 2500

All the above Cast Resin Transformers fulfill the following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33 ± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 / 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



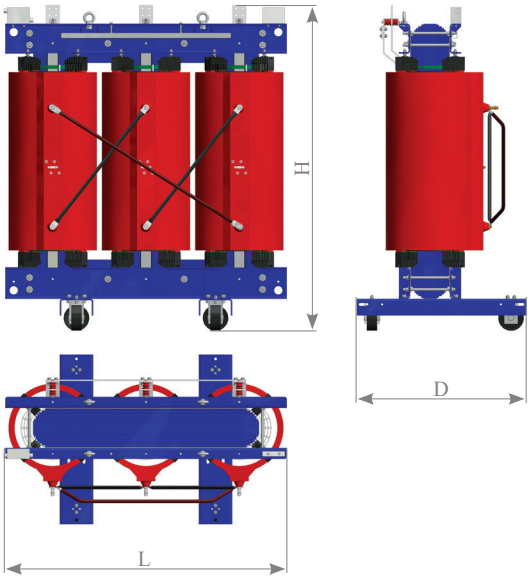
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.5 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 80K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1500 kg	1380 x 800 x 1460
400 kVA	1375 W	4500 W	6	60 dB	1660 kg	1460 x 800 x 1460
500 kVA	1600 W	5750 W	6	60 dB	1940 kg	1460 x 800 x 1650
630 kVA	1875 W	7100 W	6	62 dB	2420 kg	1520 x 800 x 1750
800 kVA	2300 W	8000 W	6	64 dB	2640 kg	1530 x 970 x 1780
1000 kVA	2625 W	9000 W	6	64 dB	3000 kg	1560 x 970 x 1950
1250 kVA	3200 W	11000 W	6	65 dB	3500 kg	1650 x 970 x 1990
1600 kVA	3550 W	13000 W	6	66 dB	4560 kg	1890 x 1310 x 2080
2000 kVA	4600 W	16000 W	6	66 dB	5500 kg	2010 x 1310 x 2180
2500 kVA	5750 W	19000 W	6	68 dB	6300 kg	2100 x 1310 x 2350
3150 kVA	6900 W	22000 W	8	70 dB	7840 kg	2210 x 1310 x 2420

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 80 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



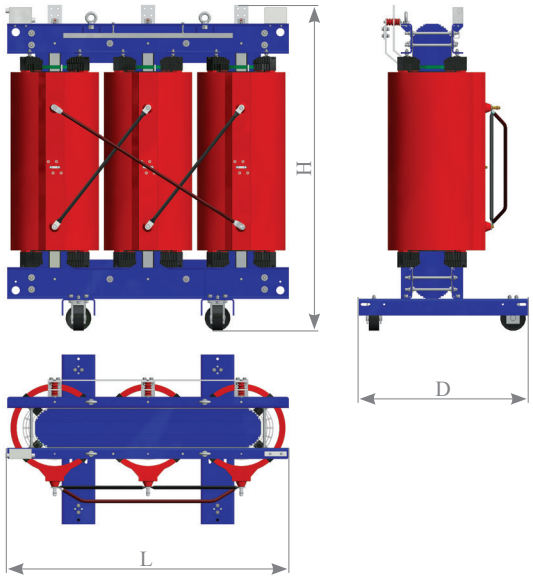
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.6 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 90K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1500 kg	1380 x 800 x 1460
400 kVA	1375 W	4500 W	6	60 dB	1560 kg	1400 x 800 x 1460
500 kVA	1600 W	5750 W	6	60 dB	1820 kg	1400 x 800 x 1680
630 kVA	1875 W	7100 W	6	62 dB	2180 kg	1455 x 800 x 1730
800 kVA	2300 W	8000 W	6	64 dB	2380 kg	1560 x 970 x 1790
1000 kVA	2625 W	9000 W	6	64 dB	3160 kg	1650 x 970 x 2000
1250 kVA	3200 W	11000 W	6	65 dB	3700 kg	1700 x 970 x 2050
1600 kVA	3550 W	13000 W	6	66 dB	4380 kg	1800 x 1310 x 2100
2000 kVA	4600 W	16000 W	6	66 dB	5460 kg	1950 x 1310 x 2250
2500 kVA	5750 W	19000 W	6	68 dB	6380 kg	2100 x 1310 x 2390
3150 kVA	6900 W	22000 W	8	70 dB	7880 kg	2220 x 1310 x 2400

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



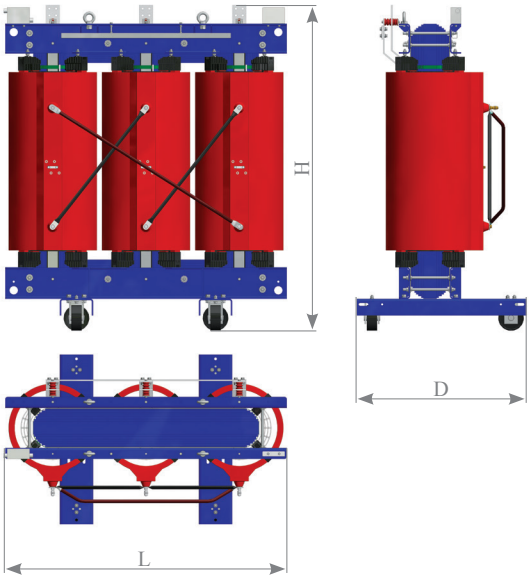
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.7 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 100K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1360 kg	1350 x 800 x 1360
400 kVA	1375 W	4500 W	6	60 dB	1440 kg	1380 x 800 x 1390
500 kVA	1600 W	5750 W	6	60 dB	1660 kg	1395 x 800 x 1650
630 kVA	1875 W	7100 W	6	62 dB	1960 kg	1400 x 800 x 1700
800 kVA	2300 W	8000 W	6	64 dB	2300 kg	1450 x 970 x 1780
1000 kVA	2625 W	9000 W	6	64 dB	2920 kg	1610 x 970 x 1870
1250 kVA	3200 W	11000 W	6	65 dB	3420 kg	1650 x 970 x 2000
1600 kVA	3550 W	13000 W	6	66 dB	4180 kg	1800 x 1310 x 2050
2000 kVA	4600 W	16000 W	6	66 dB	4880 kg	1900 x 1310 x 2200
2500 kVA	5750 W	19000 W	6	68 dB	5960 kg	1900 x 1310 x 2350
3150 kVA	6900 W	22000 W	8	70 dB	7720 kg	2150 x 1310 x 2400

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



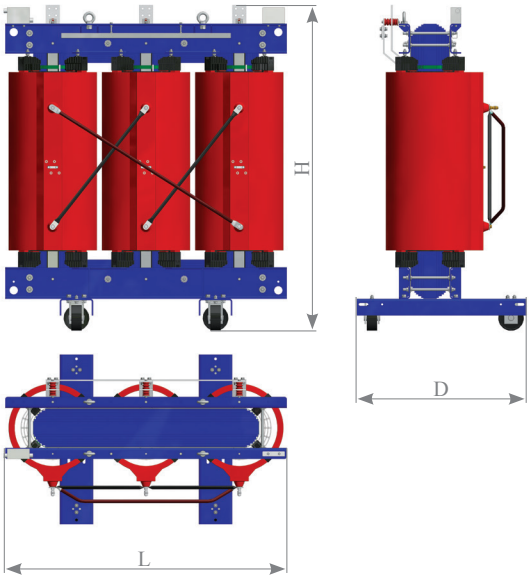
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.8 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 80K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1460 kg	1460 x 800 x 1460
400 kVA	1375 W	4500 W	6	60 dB	1580 kg	1520 x 800 x 1490
500 kVA	1600 W	5750 W	6	60 dB	1760 kg	1470 x 800 x 1690
630 kVA	1875 W	7100 W	6	62 dB	2040 kg	1560 x 800 x 1730
800 kVA	2300 W	8000 W	6	64 dB	2460 kg	1620 x 970 x 1870
1000 kVA	2625 W	9000 W	6	64 dB	2920 kg	1650 x 970 x 2200
1250 kVA	3200 W	11000 W	6	65 dB	3400 kg	1730 x 970 x 2230
1600 kVA	3550 W	13000 W	6	66 dB	3860 kg	1800 x 1310 x 2290
2000 kVA	4600 W	16000 W	6	66 dB	5300 kg	2070 x 1310 x 2400
2500 kVA	5750 W	19000 W	6	68 dB	6080 kg	2190 x 1310 x 2400
3150 kVA	6900 W	22000 W	8	70 dB	7600 kg	2490 x 1310 x 2500

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 80 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



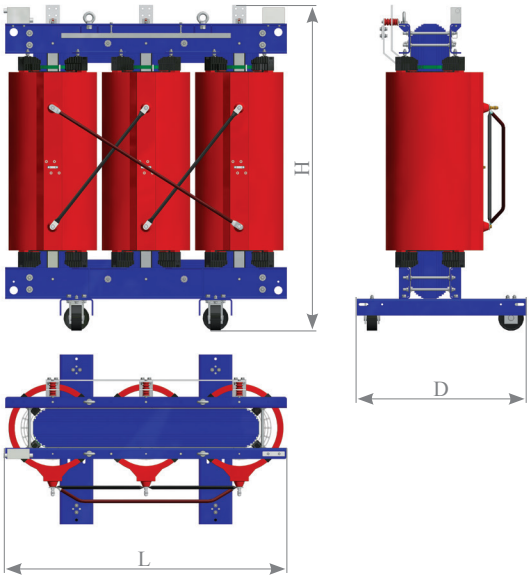
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.9 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 90K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1460 kg	1460 x 800 x 1460
400 kVA	1375 W	4500 W	6	60 dB	1580 kg	1520 x 800 x 1490
500 kVA	1600 W	5750 W	6	60 dB	1760 kg	1470 x 800 x 1690
630 kVA	1875 W	7100 W	6	62 dB	1960 kg	1500 x 800 x 1730
800 kVA	2300 W	8000 W	6	64 dB	2320 kg	1560 x 970 x 1870
1000 kVA	2625 W	9000 W	6	64 dB	2720 kg	1560 x 970 x 2170
1250 kVA	3200 W	11000 W	6	65 dB	3400 kg	1730 x 970 x 2250
1600 kVA	3550 W	13000 W	6	66 dB	3860 kg	1800 x 1310 x 2300
2000 kVA	4600 W	16000 W	6	66 dB	4680 kg	1950 x 1310 x 2440
2500 kVA	5750 W	19000 W	6	68 dB	5480 kg	2070 x 1310 x 2400
3150 kVA	6900 W	22000 W	8	70 dB	6740 kg	2340 x 1310 x 2460

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



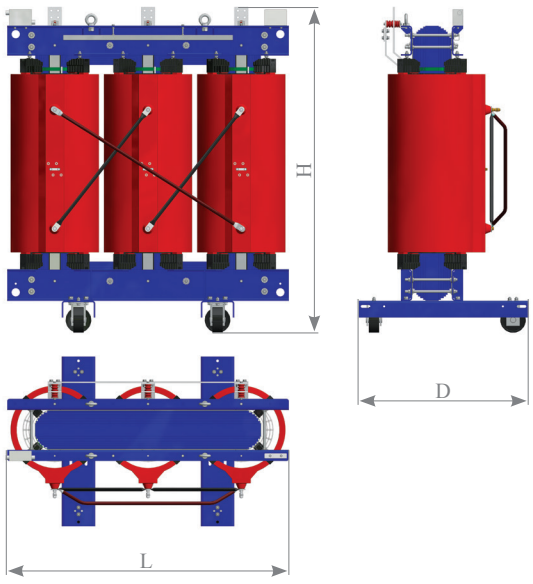
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.10 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 100K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
315 kVA	1250 W	4000 W	6	60 dB	1320 kg	1400 x 800 x 1460
400 kVA	1375 W	4500 W	6	60 dB	1420 kg	1450 x 800 x 1490
500 kVA	1600 W	5750 W	6	60 dB	1640 kg	1400 x 800 x 1760
630 kVA	1875 W	7100 W	6	62 dB	1800 kg	1450 x 800 x 1760
800 kVA	2300 W	8000 W	6	64 dB	2160 kg	1550 x 970 x 1870
1000 kVA	2625 W	9000 W	6	64 dB	2660 kg	1550 x 970 x 2200
1250 kVA	3200 W	11000 W	6	65 dB	3040 kg	1650 x 970 x 2270
1600 kVA	3550 W	13000 W	6	66 dB	3740 kg	1800 x 1310 x 2310
2000 kVA	4600 W	16000 W	6	66 dB	4520 kg	1900 x 1310 x 2400
2500 kVA	5750 W	19000 W	6	68 dB	5340 kg	2050 x 1310 x 2390
3150 kVA	6900 W	22000 W	8	70 dB	6680 kg	2340 x 1310 x 2460

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	13.8± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	17.5 - 38 - 95/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



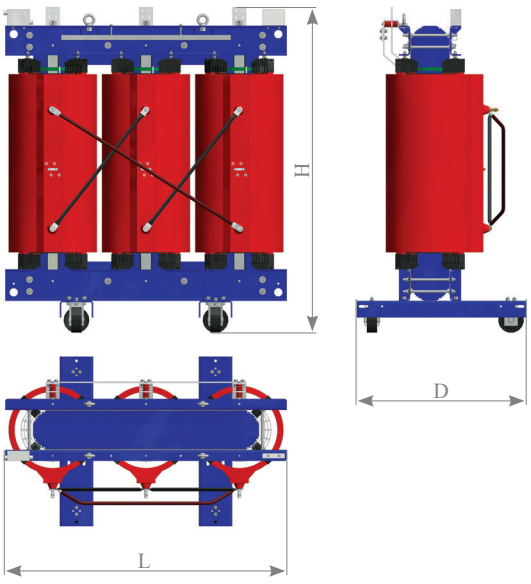
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.11 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 80K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2920 kg	1800 x 800 x 2140
630 kVA	2550 W	7000 W	6	62 dB	3140 kg	1800 x 800 x 2170
800 kVA	3100 W	8400 W	6	64 dB	3360 kg	1800 x 970 x 2250
1000 kVA	3650 W	10000 W	6	64 dB	3700 kg	1910 x 970 x 2250
1250 kVA	4200 W	12000 W	6	65 dB	4200 kg	2000 x 970 x 2250
1600 kVA	4900 W	14000 W	6	66 dB	5340 kg	2120 x 1310 x 2360
2000 kVA	5750 W	17000 W	6	66 dB	6360 kg	2190 x 1310 x 2560
2500 kVA	6700 W	20000 W	6	68 dB	7660kg	2340 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	9060 kg	2490 x 1310 x 2650

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 80 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



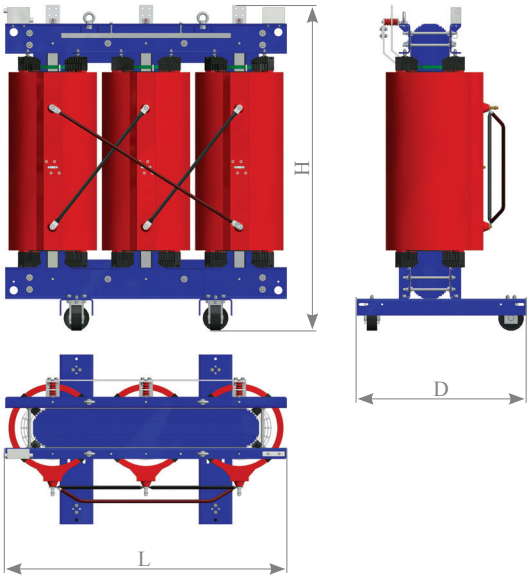
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.12 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 90K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2920 kg	1800 x 800 x 2140
630 kVA	2550 W	7000 W	6	62 dB	3140 kg	1800 x 800 x 2170
800 kVA	3100 W	8400 W	6	64 dB	3360 kg	1800 x 970 x 2250
1000 kVA	3650 W	10000 W	6	64 dB	3700 kg	1910 x 970 x 2250
1250 kVA	4200 W	12000 W	6	65 dB	4200 kg	2000 x 970 x 2250
1600 kVA	4900 W	14000 W	6	66 dB	5340 kg	2120 x 1310 x 2360
2000 kVA	5750 W	17000 W	6	66 dB	6360 kg	2190 x 1310 x 2560
2500 kVA	6700 W	20000 W	6	68 dB	7660kg	2340 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	9060 kg	2490 x 1310 x 2650

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



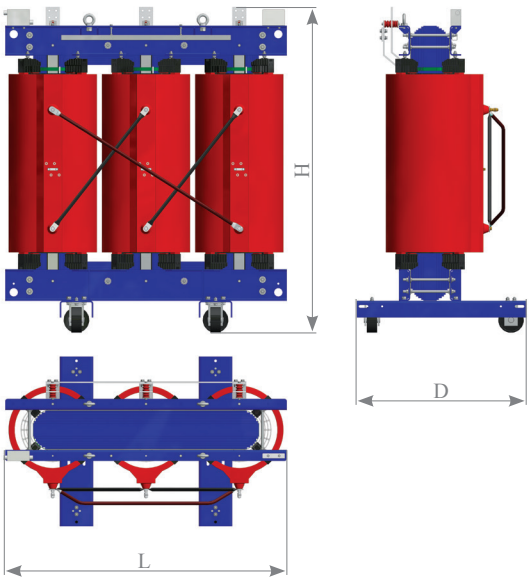
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications

6.13 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 100K Temp. Rise (Copper foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2920 kg	1800 x 800 x 2140
630 kVA	2550 W	7000 W	6	62 dB	3140 kg	1800 x 800 x 2170
800 kVA	3100 W	8400 W	6	64 dB	3360 kg	1800 x 970 x 2250
1000 kVA	3650 W	10000 W	6	64 dB	3700 kg	1910 x 970 x 2250
1250 kVA	4200 W	12000 W	6	65 dB	4200 kg	2000 x 970 x 2250
1600 kVA	4900 W	14000 W	6	66 dB	5340 kg	2120 x 1310 x 2360
2000 kVA	5750 W	17000 W	6	66 dB	6360 kg	2190 x 1310 x 2560
2500 kVA	6700 W	20000 W	6	68 dB	7660kg	2340 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	9060 kg	2490 x 1310 x 2650

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Copper foil



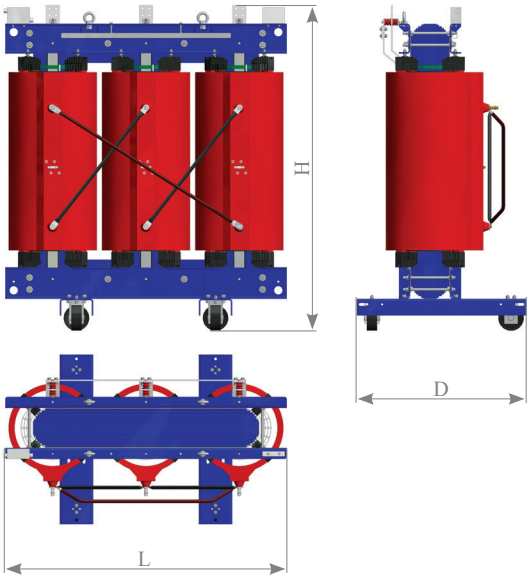
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.14 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 80K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2920 kg	1800 x 800 x 2140
630 kVA	2550 W	7000 W	6	62 dB	3140 kg	1800 x 800 x 2170
800 kVA	3100 W	8400 W	6	64 dB	3360 kg	1800 x 970 x 2250
1000 kVA	3650 W	10000 W	6	64 dB	3700 kg	1910 x 970 x 2250
1250 kVA	4200 W	12000 W	6	65 dB	4200 kg	2000 x 970 x 2250
1600 kVA	4900 W	14000 W	6	66 dB	5340 kg	2120 x 1310 x 2360
2000 kVA	5750 W	17000 W	6	66 dB	6360 kg	2190 x 1310 x 2560
2500 kVA	6700 W	20000 W	6	68 dB	7660kg	2340 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	9060 kg	2490 x 1310 x 2650

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



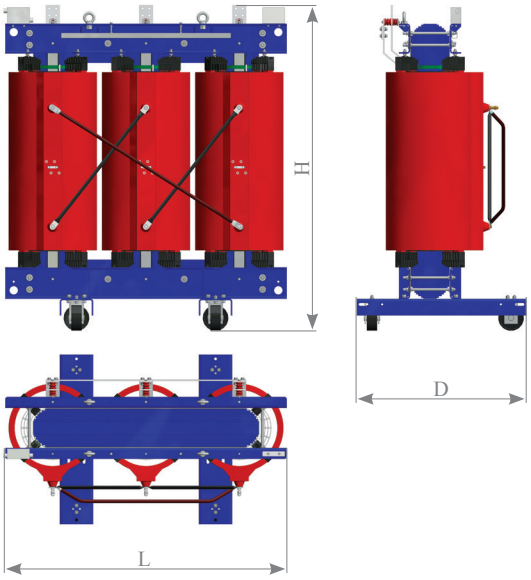
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications

6.15 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 90K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2640 kg	1830 x 800 x 2070
630 kVA	2550 W	7000 W	6	62 dB	2660 kg	1800 x 800 x 2070
800 kVA	3100 W	8400 W	6	64 dB	3100 kg	1920 x 970 x 2200
1000 kVA	3650 W	10000 W	6	64 dB	3760 kg	1970 x 970 x 2340
1250 kVA	4200 W	12000 W	6	65 dB	4020 kg	1980 x 970 x 2500
1600 kVA	4900 W	14000 W	6	66 dB	5140 kg	2150 x 1310 x 2550
2000 kVA	5750 W	17000 W	6	66 dB	5820 kg	2220 x 1310 x 2580
2500 kVA	6700 W	20000 W	6	68 dB	6440 kg	2280 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	8260 kg	2700 x 1310 x 2690

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 100 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



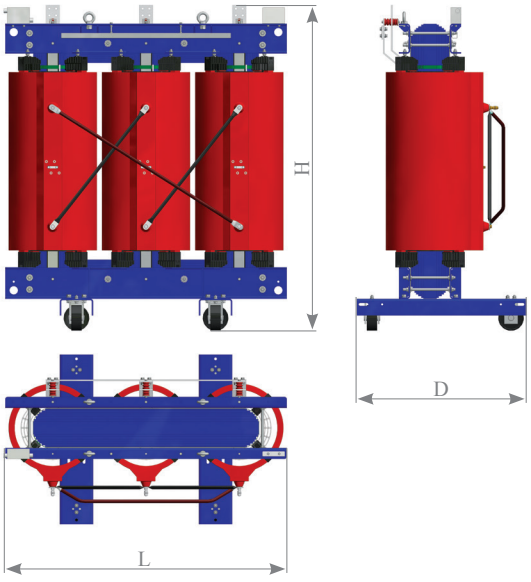
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.16 alfanar Cast Resin Transformers Rated Voltage Up to 36kV with 100K Temp. Rise (Aluminium foil)

Rating	Po (W)	Pk 120° (W)	k%	Lp(A)	Weight (kg)	Dim. IP 00 LxDxH
500 kVA	2300 W	6000 W	6	60 dB	2640 kg	1830 x 800 x 2070
630 kVA	2550 W	7000 W	6	62 dB	2660 kg	1800 x 800 x 2070
800 kVA	3100 W	8400 W	6	64 dB	3100 kg	1920 x 970 x 2200
1000 kVA	3650 W	10000 W	6	64 dB	3760 kg	1970 x 970 x 2340
1250 kVA	4200 W	12000 W	6	65 dB	4020 kg	1980 x 970 x 2500
1600 kVA	4900 W	14000 W	6	66 dB	5140 kg	2150 x 1310 x 2550
2000 kVA	5750 W	17000 W	6	66 dB	5820 kg	2220 x 1310 x 2580
2500 kVA	6700 W	20000 W	6	68 dB	6440 kg	2280 x 1310 x 2650
3150 kVA	7700 W	25000 W	8	70 dB	8260 kg	2700 x 1310 x 2690

All the above Cast Resin Transformers fulfilling following common technical data:

Distance measures in :	Millimetres
Voltage ratio :	33± 2x2.5%/0.4kV
Insulation levels Primary / Secondary :	36 - 70 - 170/1.1 - 3 kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F - 90 K
Vector group :	Dyn11
Frequency :	60 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



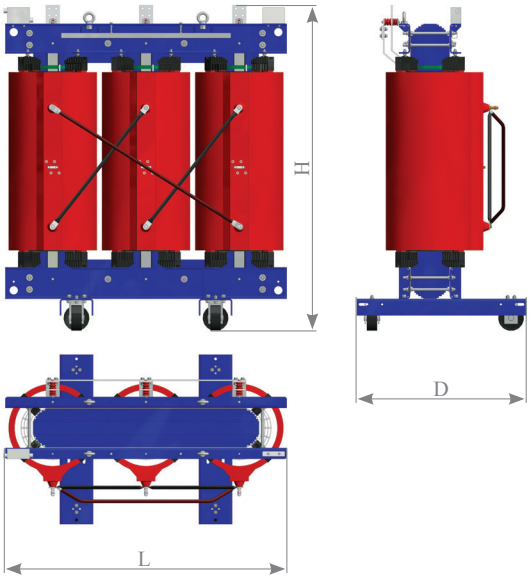
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.17 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 80/90/100K Temp. Rise with Enclosure (IP21/31)

Rating (kVA)	ENCLOSURE TYPE	Length L (mm)	Width W (mm)	Height H (mm)	Enclosure Weight(kg)
315	CRT-ENC-G01-A01	2050	1350	2000	270
400-500	CRT-ENC-G02-A01	2150	1450	2200	320
630-800	CRT-ENC-G03-A01	2300	1450	2300	350
1000-1250	CRT-ENC-G04-A01	2400	1450	2650	390
1500-2000	CRT-ENC-G05-A01	2550	1600	2850	440
2500	CRT-ENC-G06-A01	2800	1800	3000	500
3150	CRT-ENC-G07-A01	3000	1850	3000	600

All the above Cast Resin Transformers fulfill the following common technical data:

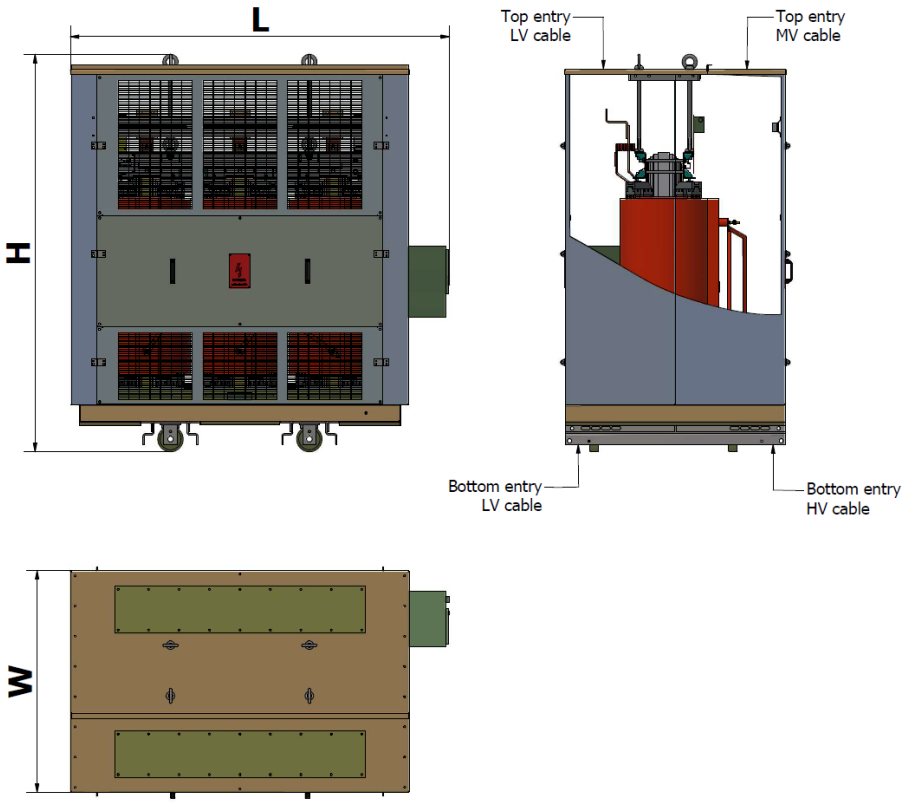
Distance measures in :	Millimetres
Voltage ratio :	13.8±2x2.5%/0.4kV
Insulation levels Primary / Secondary :	12 - 28 - 75 / 1,1 - 3kV
Partial discharge level :	< 10 pC
Insulation thermal class :	F / F - 100 / 100 K
Vector group :	Dyn11
Frequency :	50 Hz
Available environmental classes :	Up to E4
Available climatic classes :	Up to C4
Fire classification:	F1
Conductor material:	Aluminium foil



NOTE: Power ratings higher than 3150 kVA, and/or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.18 alfanar Cast Resin Transformers Rated Voltage 36kV with 80/90/100K Temp. Rise with Enclosure (IP21/31)

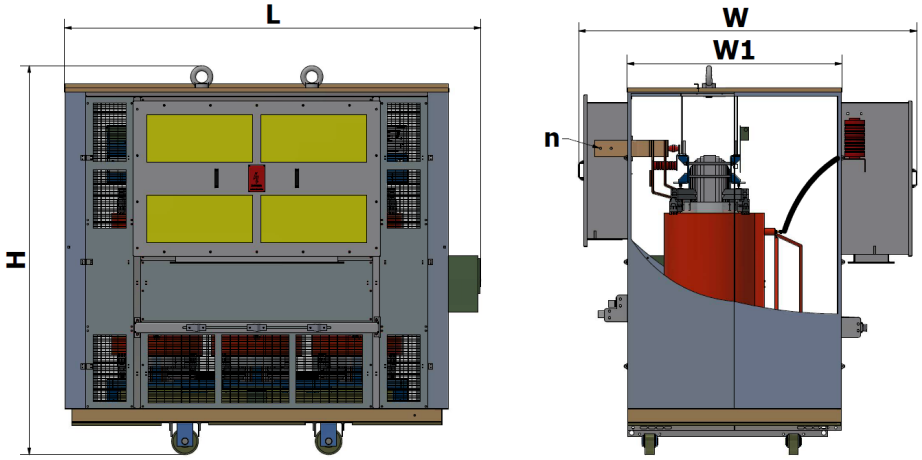
Rating (kVA)	ENCLOSURE TYPE	Length L (mm)	Width W (mm)	Height H (mm)	Enclosure Weight(kg)
500-630	CRT-ENC-L01-A01	2650	1550	2550	400
800-1000	CRT-ENC-L02-A01	2750	1650	2700	450
1250-1500	CRT-ENC-L03-A01	2850	1750	2900	500
1600-2000	CRT-ENC-L04-A01	3050	1850	3050	600
2500	CRT-ENC-L05-A01	3200	1900	3100	650
3150	CRT-ENC-L06-A01	3500	2050	3200	700



NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.19 alfanar Cast Resin Transformers Rated Voltage 17.5kV with 80/90/100K Temp. Rise with Enclosure (IP21/31) with cable boxes on both side

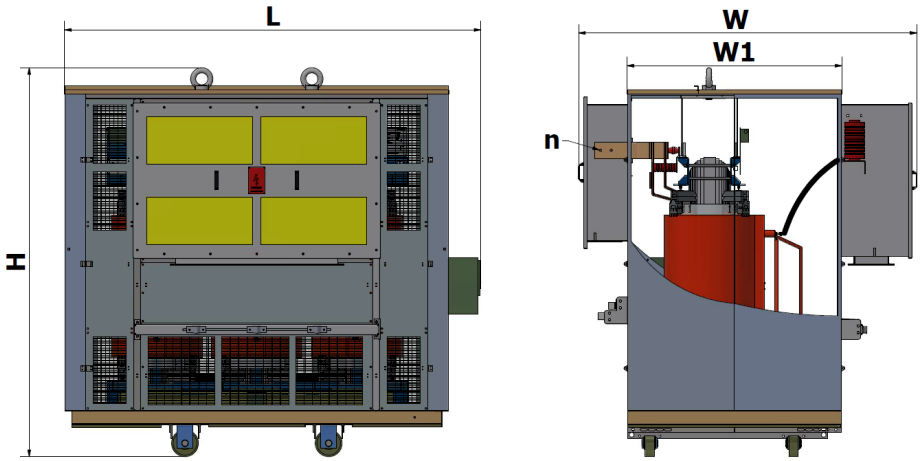
Rating (kVA)	ENCLOSURE TYPE	Length L (mm)	Width W (mm)	Height H (mm)	W1 (mm)	n (Number of LV BB holes)	Enclosure Weight(kg)
315	CRT-ENC-G01-B01	2050	1750	2000	1100	1	350
400-500	CRT-ENC-G02-B01	2150	1850	2200	1200	1	410
630-800	CRT-ENC-G03-B01	2300	1970	2300	1250	2	450
1000-1250	CRT-ENC-G04-B01	2400	2070	2650	1350	2	480
1500-2000	CRT-ENC-G05-B01	2550	2170	2850	1450	2	530
2500	CRT-ENC-G06-B01	2800	2270	3000	1450	3	600
3150	CRT-ENC-G07-B01	3000	2500	3000	1500	5	700



NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.20 alfanar Cast Resin Transformers Rated Voltage 36kV with 80/90/100K Temp. Rise with Enclosure (IP21/31) with cable boxes on both side

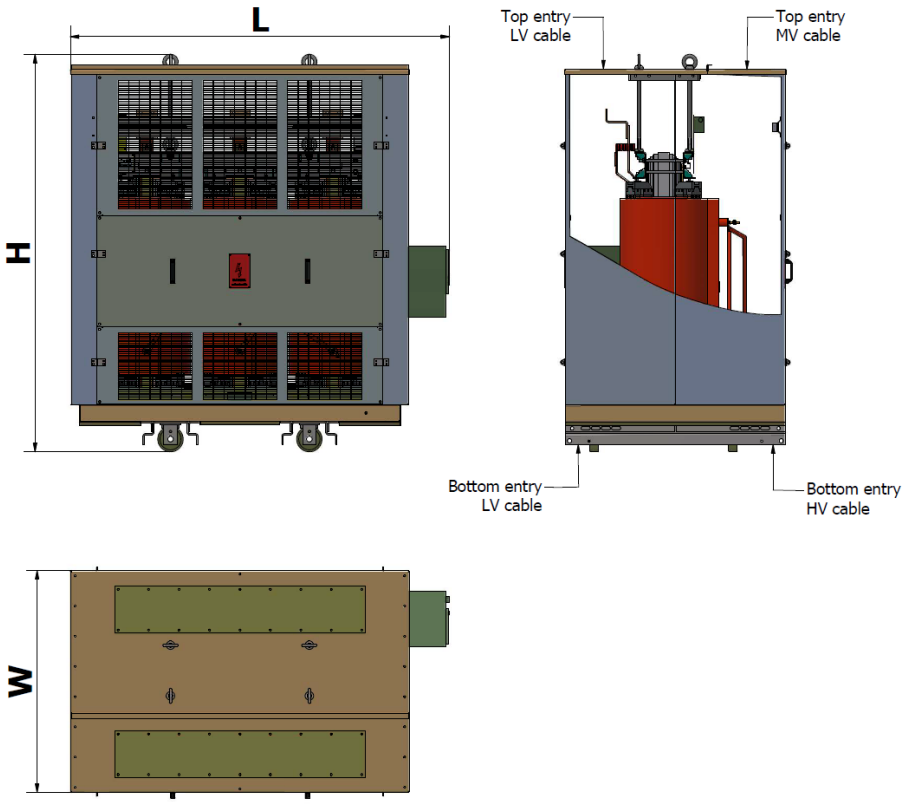
Rating (kVA)	ENCLOSURE TYPE	Length L (mm)	Width W (mm)	Height H (mm)	W1 (mm)	n (Number of LV BB holes)	Enclosure Weight(kg)
500-630	CRT-ENC-L01-B01	2650	2280	2550	1450	1	540
800-1000	CRT-ENC-L02-B01	2750	2400	2700	1500	2	600
1250-1500	CRT-ENC-L03-B01	3000	2460	2900	1600	2	650
1600-2000	CRT-ENC-L04-B01	3050	2510	3050	1650	2	720
2500	CRT-ENC-L05-B01	3200	2660	3100	1700	3	780
3150	CRT-ENC-L06-B01	3500	2940	3200	1800	5	900



NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

6.21 alfanar Cast Resin Transformers Rated Voltage Up to 17.5kV with 80/90/100K Temp. Rise with Enclosure (IP21/31)

Rating (kVA)	ENCLOSURE TYPE	Length L (mm)	Width W (mm)	Height H (mm)	Enclosure Weight(kg)
315	CRT-ENC-G01-A01	2050	1350	2000	270
400-500	CRT-ENC-G02-A01	2150	1450	2200	320
630-800	CRT-ENC-G03-A01	2300	1450	2300	350
1000-1250	CRT-ENC-G04-A01	2400	1450	2650	390
1500-2000	CRT-ENC-G05-A01	2550	1600	2850	440
2500	CRT-ENC-G06-A01	2800	1800	3000	500
3150	CRT-ENC-G07-A01	3000	1850	3000	600



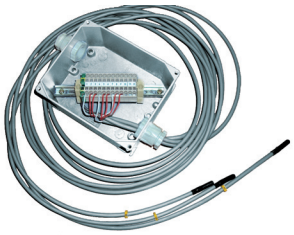
NOTE: Power ratings higher than 3150 kVA, and or different voltage ratio, or impedance value, as well as particular designs for specific dedicated applications are available upon request and submission of technical specifications.

7 - Accessories

For each one of the CRT sizes included in this catalogue, the following list of accessories are available:

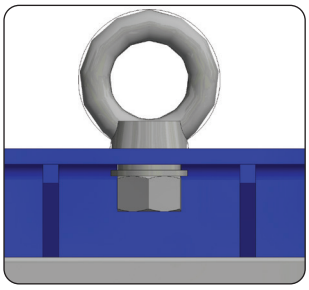
Standard accessories

Standard accessories included in all the Cast Resin Transformers:

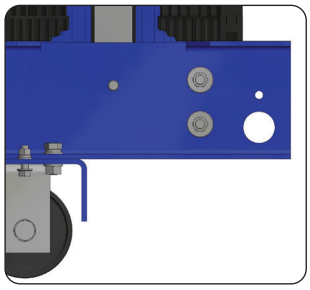


3 x PT100 connection box

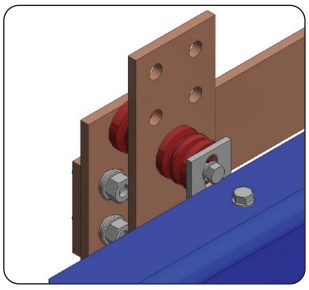
PT 100 linear resistance are used as sensors for monitoring and controlling temperature of the transformers. This system can perform temperature setting, highest temperature recording, signal for alarm and trip, and start the fan on and off automatically or manually.



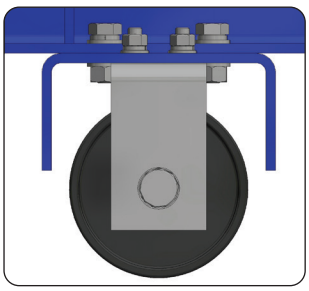
4 x Lifting Eyes



2 x Grounding Terminal

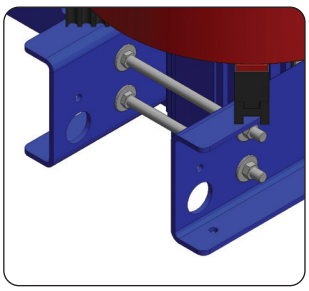


3+1 x LV Terminals

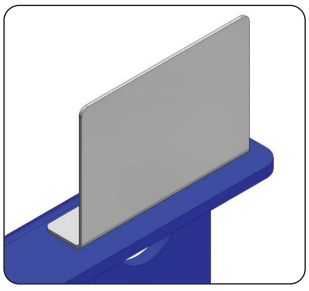


4 x Scrolling Wheels

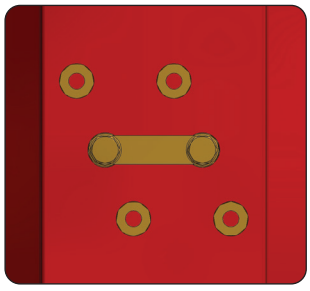
3 x HV Terminals



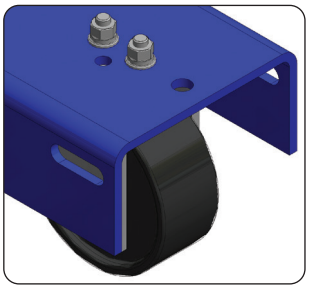
4 x Pulling Holes



1 x Rating Plate



3 x Off load HV Tapping Selector



4 x Truck Belting Holes

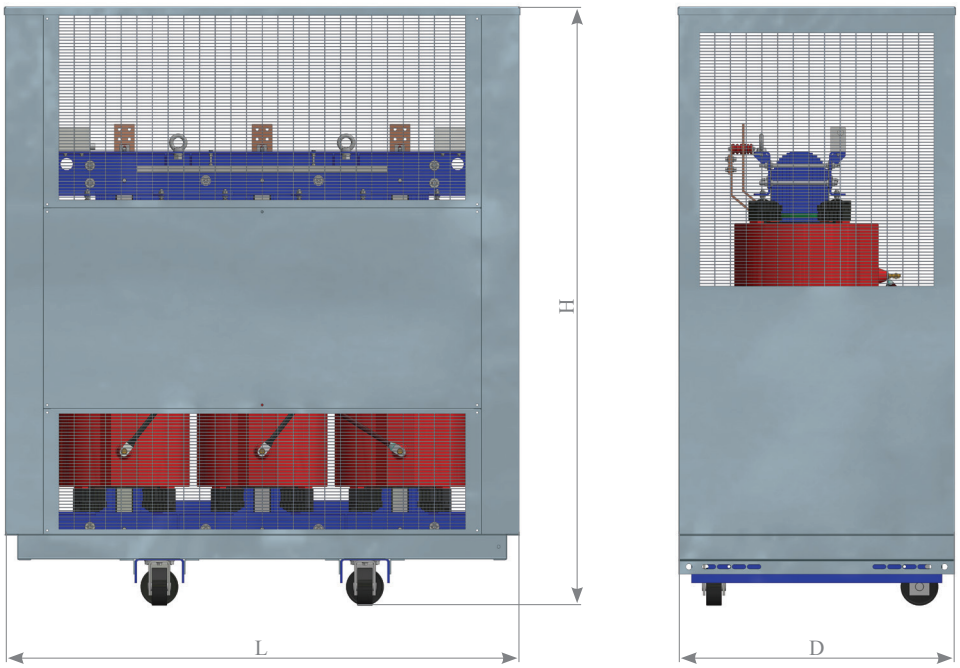
Additional accessories

Available accessories for all cast resin transformers models:

1. Enclosures

There are different sizes of protective enclosures that can cover all the CRT rating range, suitable for inside installation with the available protective degree IP 21, IP23, IP 31 and IP 33.
The enclosures guarantee enough natural ventilation for CRT natural cooling, and protect the CRT from direct sunlight in outdoor applications.

Enclosure Dimensions

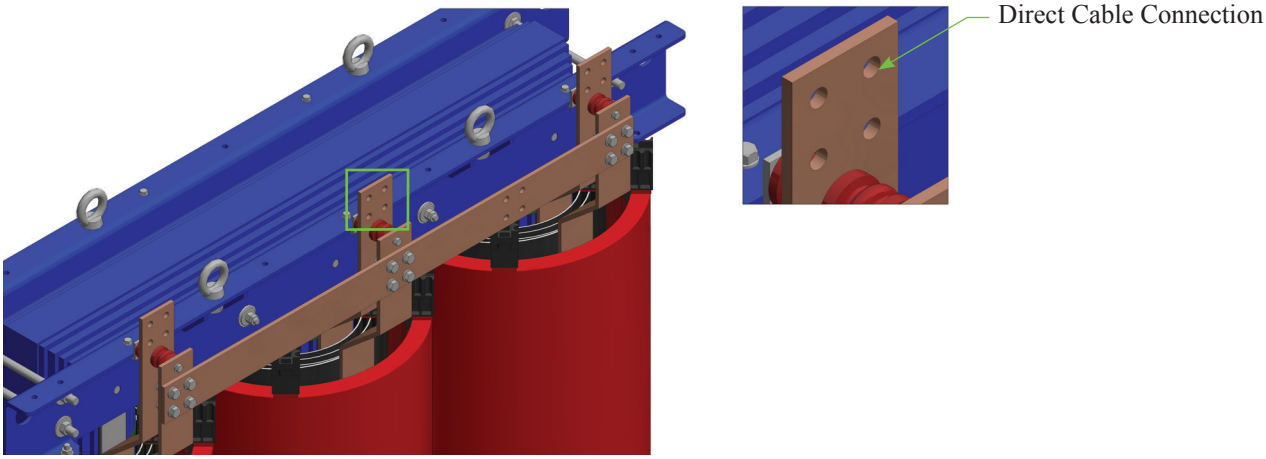


* Approximate dimensions

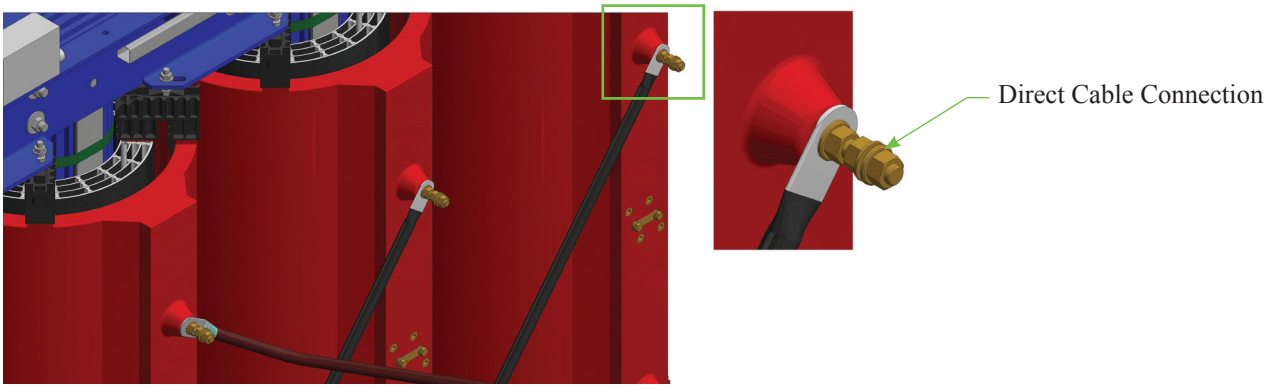
Note: Special enclosures for specific applications can be designed and equipped to customer's requirements, such as extraction fans, filters, special protection, etc…

2. HV & LV Connections

Standard Connection

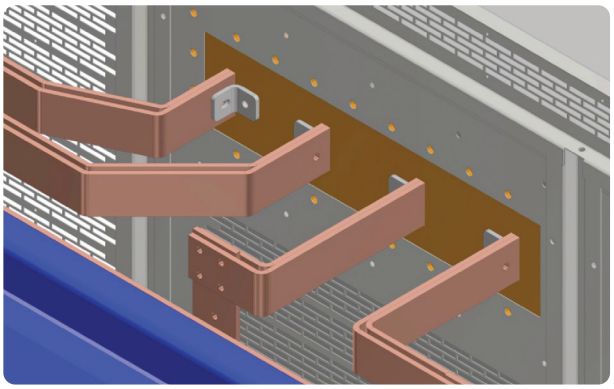


LV Connection

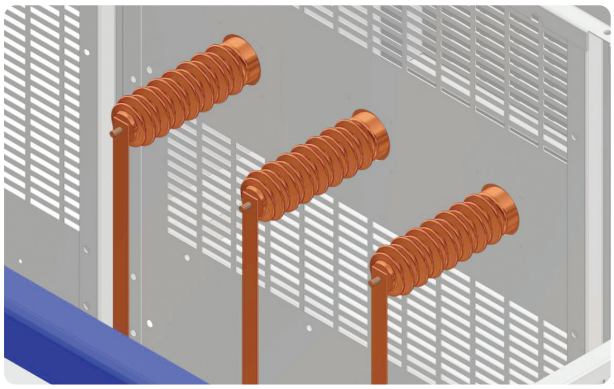


HV Connection

Special Connection



LV extension busbar



HV terminal bushing

Note: Cable box may be also used.

3. Temperature Protection and Control Relay

The scope of this relay is to measure the LV winding hot spot temperature through to the installed PT100 on each LV phase.

An option, if required or already installed, the relay will also measure the top yoke core temperature with separate alarm and trip set point for this fourth sensor.

The ventilation fans protection and control kit supplies, protects, and controls the forced air ventilation kit in combination with the temperature monitoring relay.

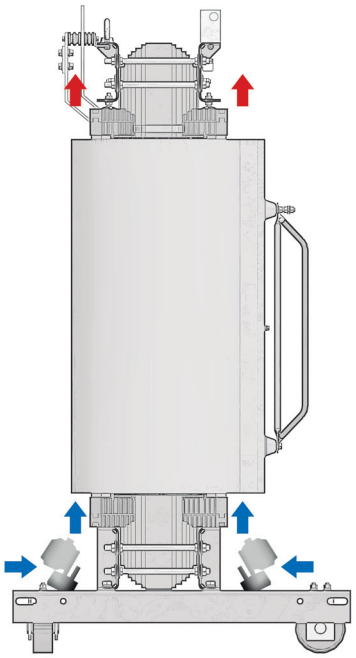
4. Ventilation Fans

The ventilation fans kit is comprised of two ventilation bars where each one has three radial ventilators with adjustable position and adjustable supporting stirrup able to be directly connected on the alfanar CRT predisposition. There is a different rate of fan kit available that is able to confer with the cast resin transformer with an overload capability of 25 to 40%, according to customer requirements.

CRT in AF shall be operated only for limited time and generally in case of emergency.

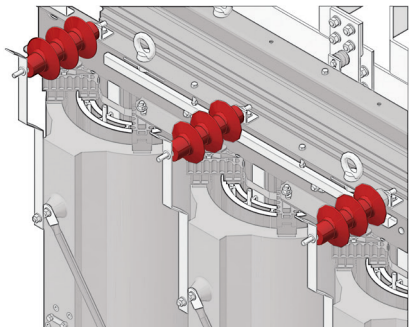
➢ CRT on load losses in AF increasing of:

- 156 % when operated at 125% overload
- 169 % when operated at 130% overload
- 200 % when operated at 140% overload



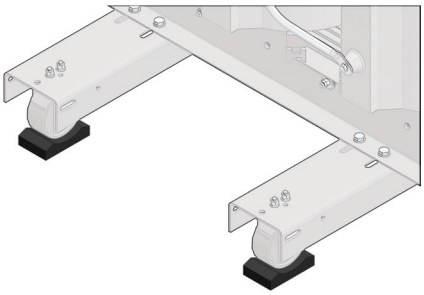
5. Surge Arrestors Kit

The surge arrestors kit is comprised of three surge arrestors selected according to the CRT insulation level to be directly connected on the alfanar CRT terminal predisposition.



6. Antivibration Pads Kit

The antivibration pads kit is comprised of four rubber dumpers selected according to the CRT size and located below to the alfanar CRT scroll wheels.



8 – Tests

alfanar CRT had been tested according to the latest IEC standards

Routine Tests

1 - **Measurement of winding resistance** according to IEC 60076-1
2 - **Measurement of voltage ratio and check of phase displacement** according to IEC 60076-1
3 - **Measurement of short circuit impedance and load losses** according to IEC 60076-1
4 - **Measurement of no load-loss and current** according to IEC 60076-1
5 - **Separate-source AC withstand test** according to IEC 60076-3
6 - **Induced AC withstand voltage test** according to IEC 60076-3
7 - **Partial discharges measurement** according to IEC 60076-11, IEC 60270 and Annex A of IEC
8 - **Measurement of insulation resistance** according to IEC 60076-1

Type Tests

1 - **Temperature rise test** according to IEC 60076-11, and IEC 60076-2
2 - **Lightning impulse test** according to IEC 60076-11, and IEC 60076-3

Special Tests

1 - **Measurement of sound level** according to IEC 60076-11, and IEC 60076-10
2 - **Short-circuit test** according to IEC 60076-11, and IEC 60076-5
3 - **Environmental test** according to IEC 60076-11, for E2, and IEC 60076- 16
4 - **Climatic test** according to IEC 60076-11
5 - **Fire behaviour test** according to IEC 60076-11
6 - **Measurement of zero-sequence impedance** according to IEC 60076-1

Notes

Notes

Notes

For catalogue soft copy scan QR code

MKT_115719_Dry transformer _April2024