

STD
TRANSFORMER

power and distribution
transformers

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About Us

STD Transformator was established in 2009 at Adana, Turkey as manufacturer and service provider of Oil-immersed Power and Distribution Transformers combines a significant amount of transformer knowledge and expertise of some of the most respected and renowned Turkish producers and service companies of small, medium and large power transformers in one group.

Our Company produces various types of transformers of different power and voltage complying with international standards such as **IEC 60076 and ANSI, BSI, IEEE, NEMA, TS EN 60076, IS:2026** with its registered '**STD**' brand within the scope of **ISO 9001, ISO 14001, OHSAS 18001**.

Since it was established, our company aimed a controlled and steady growth and has a sustainable growth capacity offered by the vision of without compromising quality and customer satisfaction in all its services and products.

By virtue of product quality and innovation policy, **STD Transformator** becomes pioneer manufacturer of transformers in Turkey and exports 85% of its production to 17 countries.



Our **Mission**

Provide a wide range of electrical transformers within the perspective of understanding customer's requirements & applications and strive to fulfill their present and future expectations as regards Quality, Delivery and Services.

Our **Vision**

Achieving leadership in the international and domestic market and entering new markets through a commitment to quality to ensure satisfaction and expectations of our customers.

Our **Values**

Achieving customer satisfaction through commitment of all members of the company to do a job well done, being creative and innovative, getting better, and at less cost.



Product Group



Oil Immersed Medium Power Transformers



Oil Immersed Transformers With Conservator



Oil Immersed Hermetically Sealed Transformers



Cast-Resin Transformers



Oil Immersed Distribution Transformers



Special Transformers



Oil Immersed **Distribution Transformers**

STD Distribution Transformers are individually designed and manufactured to meet and exceed the highest industry standards and the exact specifications for the particular application involved. Special options and features are planned into the original design and built into the unit. **STD Distribution Transformers** are liquid-oil-immersed for the most efficient and reliable long-term operation in a wide variety of utility and industrial applications.

STD Distribution Transformers are liquid-oil-immersed with rated power in range from **25kVA up to 5,000kVA** both types, hermetically sealed and with conservator. **STD Distribution Transformers** individually designed and manufactured in accordance with local and international standards and fully adapted for mounting in complete transformer substations and steel-lattice poles. The windings can be made from **aluminium** or **copper** depending on customer requirements and needs within different series of losses according to **IEC 60076** and **EN 50464-1, ANSI, BSI, IEEE, NEMA, TS EN60076**.

Applications

- > Generation Step-up Units (GSU)
- > Transmission Substations
- > Distribution Substations
- > Industrial Plants
- > Oil & Gas
- > Cement
- > Chemicals & Petrochemicals
- > Rolling Mills
- > Mining
- > Desalination Plants

Main Characteristics

- > Power Rating : from **25kVA** up to **5000kVA**
- > Voltage Level : from **1,1kV** up to **36kV**
- > Frequency : **50** or **60Hz**
- > Vector Group : single phase or three phase transformers with possibility of star, zig-zag or delta connections in any of its windings.
- > Number Of Windings : possibility to manufacture transformers with primary + secondary, double secondary, or triple secondary and any other type according to requirements of customer.
- > Cooling : according to **UNE-EN/IEC 60076, ONAN, ONAF, KNAN, KNAF**



Oil Immersed **Medium Power Transformers**

STD Power Transformers are individually designed and manufactured to meet and exceed the highest industry standards and the exact specifications for the particular application involved. Special options and features are planned into the original design and built into the unit. **STD Power Transformers** are liquid-oil-immersed for the most efficient and reliable long-term operation in a wide variety of utility and industrial applications.

In addition to having extended our product line, we have also developed a technological, administrative and marketing infrastructure that is comparable with some of the finest manufacturers of similar products at worldwide.

STDTransformer is uniquely focused on becoming one of the most valued global providers of power & distribution products for utilities and industry.

Applications

- > Generation Step-up Units (GSU)
- > Transmission Substations
- > Distribution Substations
- > Industrial Plants
- > Oil & Gas
- > Cement
- > Chemicals & Petrochemicals
- > Rolling Mills
- > Mining
- > Desalination Plants

Main Characteristics

- > Power Rating : from **4MVA** up to **50MVA**
- > Voltage Level : from **3,3kV** up to **66kV**
- > Frequency : **50** or **60Hz**
- > Vector Group : single phase or three phase transformers with possibility of star and/or delta connections in any of its windings.
- > Number Of Windings : possibility to manufacture transformers with primary + secondary, double secondary, or triple secondary and any other type according to requirements of customer.
- > Cooling : according to **EN/IEC 60076, ONAN, ONAF, KNAN, KNAF, OFAF**
- > Tap Changer : **OLTC** or **OFFCIRCUIT**



Oil Immersed Transformers With Conservator

The free breathing transformers are equipped with an air cushion under the cover or a conservator to allow the oil to expand, at the temperature variations. As it is not hermetic, the oil is always in contact with the air. Moisture is kept at bay through the use of dehydrating salts contained in special filters (breather). The tank can be in finned or with radiators. This design applies to all powers, but especially from **4000kVA** and up. For higher powers and to avoid contact between the oil and air, a rubber separator (rubber bag) or a nitrogen cushion is used.

This type of transformer is equipped with an expansion tank or conservator mounted above the main tank. The expansion of the insulating liquid is compensated inside the conservator by the raising of the oil level. In the conservator the top of the oil is in contact with the air which must remain dry to avoid any oxidation. This is achieved by admitting the outside air in the conservator through a desiccating device containing silica-gel crystals.

Standard Features

- > HV bushings according to DIN 42531 or EN 50180
- > LV bushings according to DIN 42530 or EN 50386
- > Off-Circuit tap changer in 5 positions
- > Tank made of corrugated walls
- > Thermometer pocket
- > Contact thermometer (for transformers ≥ 630 kVA)
- > Buchholz Relay (upon request or ≥ 1000 kVA)
- > Lifting lugs
- > Rating plate
- > Earthing terminals
- > Hole with cap for filling with oil & Drain cock
- > Bi-Directional rollers - 90°



Oil Immersed **Hermtically Sealed Transformers**

The hermetically sealed oil transformers are normally manufactured with a sealed tank equipped with fins that allow the expansion at the temperature variations. The tightness of the tank is up to 0.5 Bar. This type of transformer is the most widely used in the world. In the hermetically sealed transformer, the oil does not come into contact with the air and its electrical properties are therefore not compromised, ensuring a long life span of the transformer. For powers exceeding 3150kVA, or in case of a transformer with radiators, the transformer can still be hermetically sealed by means of a nitrogen cushion.

For this type of transformers the expansion of the insulating liquid is compensated by the elastic deformation of the oil-cooling radiators attached to the tank. The protection against internal faults is ensured by means of a **DGPT device: Detection of Gas, Internal Over Pressure and Oil Over Temperature.**

Standard **Features**

- > HV bushings according to DIN 42531 or EN 50180
- > LV bushings according to DIN 42530 or EN 50386
- > Off-Circuit tap changer in 5 positions
- > Tank made of corrugated walls
- > Thermometer pocket
- > Contact thermometer (for transformers ≥ 630 kVA)
- > Safety valve
- > Lifting lugs
- > Rating plate
- > Earthing terminals
- > Filling plug & Drain cock
- > Bi-Directional rollers - 90°



Cast Resin Transformers

STD Cast Resin Transformers have at least one of the two windings embedded on an autoclave mould, at vacuum values close to zero with epoxy resin. The other winding can also be cast in H class.

STD Cast Resin Transformers have reached a high degree of reliability thanks to the technological advances in recent years. Our production **E2, C2, F1**, but also **E3 (IEC 60076-16)** and **C4 (GOST-R)**, can be used in the presence of a high humidity and pollution rate, low installation temperatures even down to **-60°C**, therefore eliminating the problems related to the risks of fire and emissions of toxic and harmful substances in case of fire.

As they are entirely built with insulating, flame retardant and self-extinguishing materials, they are completely free from all restrictions that should normally be applied to flammable equipment with a danger of spreading fire.



Applications

- > Generation Step-up Units (GSU)
- > Transmission Substations
- > Distribution Substations
- > Industrial Plants
- > Oil & Gas
- > Cement
- > Chemicals & Petrochemicals
- > Rolling Mills
- > Mining
- > Desalination Plants

Main Characteristics

- > Power Rating : from **50kVA** up to **2500kVA**
- > Voltage Level : from **1,1kV** up to **36kV**
- > Frequency : **50** or **60Hz**
- > Vector Group : single phase or three phase transformers with possibility of star or delta connections in any of its windings.
- > Number Of Windings : possibility to manufacture transformers with primary + secondary, double secondary and any other type according to requirements of customer.
- > Cooling : according to EN/IEC 60076, **AN, AF**

Special Transformers

For some applications, the transformer – whether hermetically sealed or conservator, with fins or radiators – has a customised tank design to allow the connection of other components present in the transformation cabin.

These instruments could be a MV or LV circuit breaker or switch. For some markets, the MV and LV terminals can be supplied laterally with the possibility of inspection of the transformer from above using a porthole or by removing the cover.



Single-Phase Transformers

A single-phase transformer is frequently used for power distribution and voltage reduction for residential and lighter commercial applications. Single phase transformers are most commonly used in non-urban areas, where it is not economical to have a three-phase transformer.

Grounding Transformers

A grounding (also known as earthing) transformer is a three-phase transformer connected to the power system to provide a missing neutral connection for earthing. Grounding transformer provides a relatively low-impedance path to ground, thereby maintaining the system neutral at or near ground potential.

Rectifier Transformers

A rectifier transformer is a specially designed transformer in order to feed 12, 18 or 24 pulse rectifier circuits. Rectifier transformers are used for industrial processes which require a significant direct current (dc) supply.

Amorphous Transformers

An amorphous metal transformer (AMT) is a type of energy efficient transformer found on electric grids. The magnetic core of this transformer is made with a ferromagnetic amorphous metal. The typical material (Metglas) is an alloy of iron with boron, silicon, and phosphorus in the form of thin (e.g. 25 μm) foils.

Production Process

STD Transformers are manufactured to provide a high quality and reliable transformer to the end user. We are using **Quality-Oriented Manufacturing (QMS)** platform, which defines design standards, equipment and processes used in its facilities. Use of this Common Technology enables us to guarantee customers a high quality and consistent product.

The transformer is a static inductive device that can step the voltage up and down to transfer electrical power efficiently. Winding types and methods that offer the least loss were selected using magnetic field analysis, and also used in the **STD Transformator** to ensure high levels of efficiency.

Moreover, by selecting the optimal insulating structure through the electric field analysis of insulation between turns, sections, windings and phases, the Transformer's electrical stability is achieved. **STD** fluent analysis technology has enabled the realization of an optimal cooling system, and 3 structure strength analysis has enabled a structural design that can withstand internal mechanical power short-circuits caused by system faults, seismic conditions according to external impacts, and the impact of transportation."

Our factory is equipped with the latest core processor machines, the latest winding machines, highcapacity vacuum heat drying equipment, state-of-the-art cleaning facilities, and has the best test room.



Production Process

Magnetic Core

The magnetic circuit is of column type with mitred joints. It is manufactured with first rate, grain oriented magnetic cold-rolled silicon steel lamination or amorphous steel. The mounted core is clamped down to reduce vibrations and minimize noise level. Further noise level and no-load losses decreasing are achieved by step lap core construction



Off-Circuit Tap Changer

The tapings of MV windings are connected to the off-circuit tap changer. The handle is located on the cover and should only be operated when the transformer is de-energized. The mechanism can also be pad-locked during normal operation.



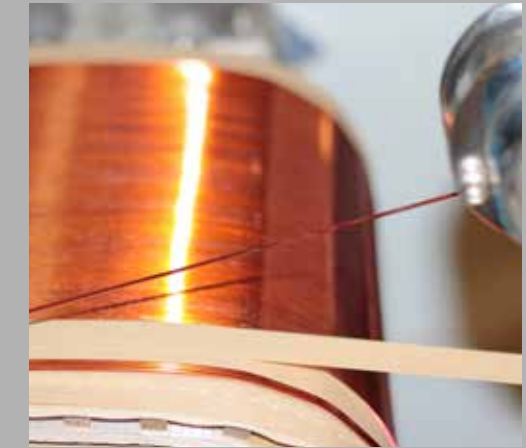
Tank and Cover

Tank walls are made of corrugated cooling surfaces. The welds are tested for oil tightness. The complete tank is tested and approved acc. to Cenelec HD 428.6 S1 standard.



LV & MV Windings

The windings are made of two components, conductor and the insulation materials. The conductors used are a high grade electrolytic copper or aluminum and are insulated with pure cellulose or double enamel. The MV windings are wound either with round, double enamel insulated or rectangular, paper insulated wire. The LV windings are wound with rectangular, paper insulated wire, enameled wire or foil.



Insulating Liquids

The mineral oil both inhibited and uninhibited types with its electrical and chemical characteristics is in compliance with IEC standards and PCB and PCT free. On special requests other insulation fluids, such as silicon, synthetic ester or natural ester are available



Painting and Surface Treatment

All metal parts are carefully sand-blasted and painted. Alternatively hot deep galvanized transformers can be supplied for use in heavy corrosion areas. Detailed painting procedures for different environmental conditions are available



Testing Process

All transformers are tested in our testroom according IEC 60076 standards. All transformers are delivered with maintenance manual, test report, technical drawing and all necessary certifications. **STD Transformer** has test room with very high level equipment. We are able to make all routine tests, without any exception. Our test room is equipped with a special converter 400 A up to 12000V with frequency ranging from 50 Hz up to 400 Hz. Furthermore there is an impulse test device, which guarantees impulse test range up to 400kV.



Routine Tests

- > Measurement Of Winding Resistance
- > Measurement Of Voltage Ratio And Check Of Phase Displacement
- > Measurement Of Short-Circuit Impedance and Load Loss
- > Measurement Of No-Load Loss and Current
- > Dielectric Routine Tests (IEC 60076-3)
- > Test On OLTC, Where Appropriate
- > Leak Testing With Pressure For Liquid-Immersed Transformers
- > Tightness Tests and Pressure Tests For Tanks For Gas-Filled Transformers
- > Check of Ratio and Polarity of Build-in Current Transformers
- > Check Core and Frame Insulation Transformers With Core Frame Insulation

Type Tests

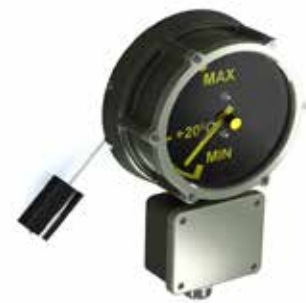
- > Temperature Rise Type Test (IEC 60076-2)
- > Dielectric Type Tests
- > Determination of Sound Level For Each Method Of Cooling
- > Measurement Of The Power Taken By Fan and Liquid Pump Motors
- > Measurement Of No-Load Loss and Current at 90% and 110% of Rated Voltage

Special Tests

- > Measurement of Zero-Sequence Impedances On Three-Phase Transformers
- > Measurement of D.C. Insulation Resistance Each Winding Winding to Earth and Between Windings
- > Determination of Weight with Transformer Arranged for Transport

Standard Accessories

- > Earthing Terminals
- > Low Voltage Bushings
- > Off Load Tap Changer
- > Safety Valve
- > Terminal Box
- > Filling Tap
- > Conservator (if not hermetic)
- > Buchholz Relay
- > Lifting Lugs
- > Thermometer pocket
- > Medium Voltage Windings
- > Bi-Directional Rollers
- > Magnetic Core
- > Oil discharge and extraction valve
- > Low Voltage Windings
- > Clamps
- > Oil level indicator (if not hermetic)
- > Medium Voltage Bushings
- > Silica Gel Breather (if not hermetic)
- > Tank with Corrugated Wall
- > Plug-in connectors (upon request)
- > Earthing point on tank
- > Name plate
- > Jacking Pods



Accessories Upon Request

- > DGPT2 or RIS or DMCR (if hermetic)
- > LV Extension Bars
- > Safety Valve with Contacts
- > Winding Temperature Indicator
- > Cable Box (MV / LV)
- > Oil Level Indicator with Contacts (if not hermetic)
- > PT100 sensors for oil temperature control (PTO)
- > Others (Contact Us)



Eco Desing Transformers

STD undertakes to respect the EcoDesign directive by manufacturing transformers that strictly comply with the technical specifications and requirements of standard EN 50588, with 'CE' marking and checked by a certified and calibrated laboratory test.

LOSSES LEVELS

Type	Power (kVA)	Current losses	From 01/07/2015
Poles	25, 50 and 100 kVA	C0 Dk	A0 Ck
	160 kVA	D0 Dk	C0 Ck + 32%
Cabin	50 and 100 kVA	C0 Dk	A0 Ck
	160 kVA	D0 Dk	
	250 to 630 kVA	E0 Ck	
	800 and 1000 kVA	D0 Dk	A0 Bk
	> 1000 kVA	D0 Dk	
Dry-type (≤ 3150 kVA)	≤ 630	C0 Bk	A0 Bk A0 Ak
	> 630	C0 Bk	

Average energy saving for the French installed base:
approximately - 20% of total losses for oil-immersed type transformers



Average energy saving for the French installed base:
approximately - 15% of total losses for dry-type transformers



Quality Assurance

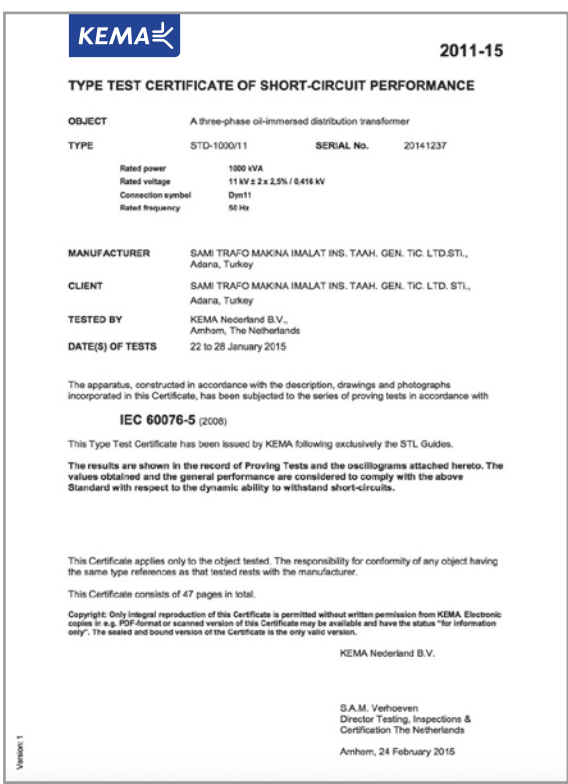
Our strength and confidence lies in the well proven designs, a helpful and friendly supplier base, trained and experienced personnel, latest design and manufacturing technology, modern machinery, and customer friendliness. The Quality Management Systems of the Organization meet the requirements of **ISO 9001, ISO 14001 and OHSAS 18001**.

Quality Management

STD Transformator runs a development library that carries out verifications in various sites of conditions. and comparison tests with other companies' products. This is achieving a growing customer satisfaction level through producing high-quality products. Such quality management has earned our company many certifications and awards, and has become the basis for a realization of products of a international standards.

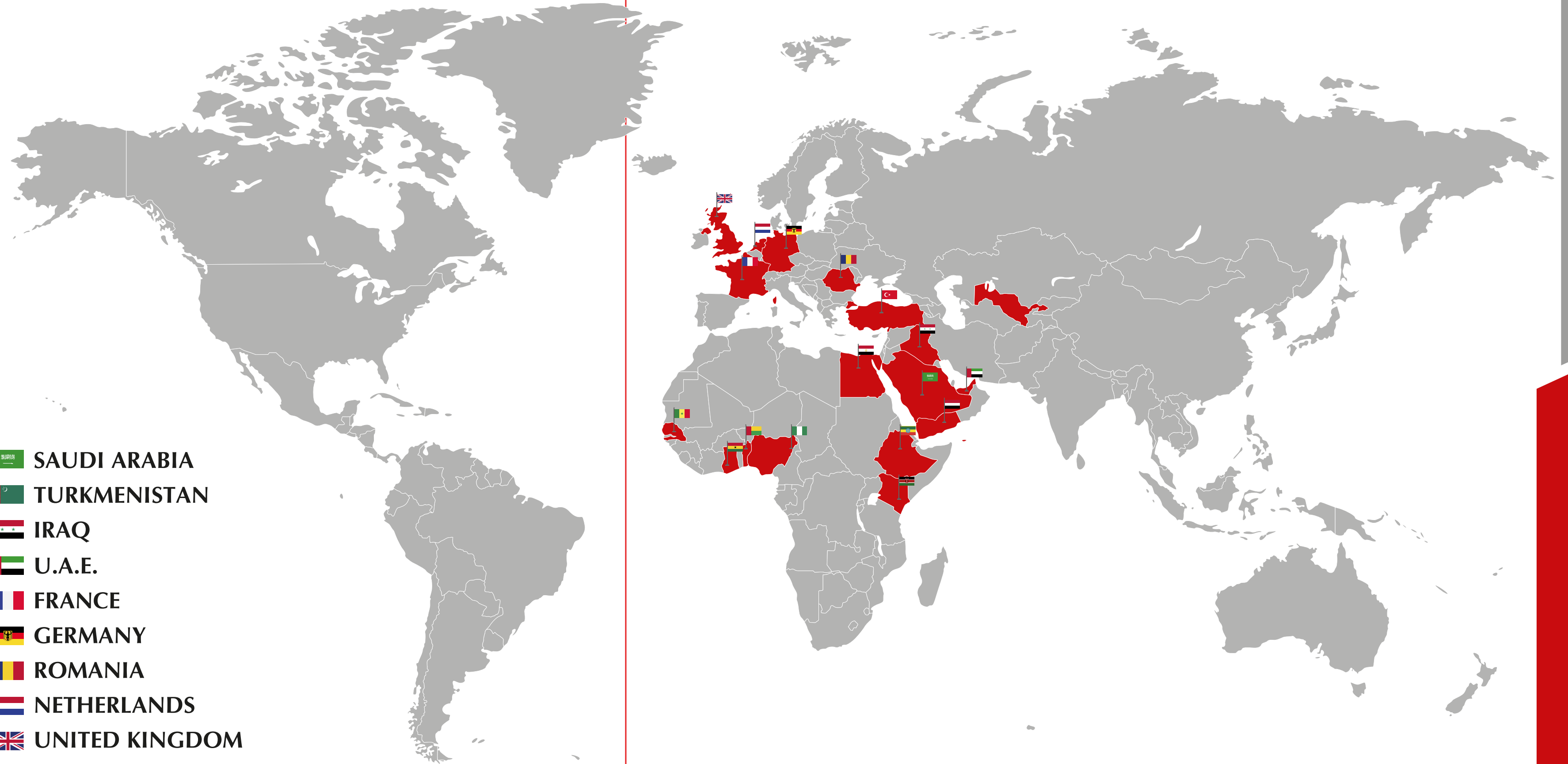
Customer Technology Training Service

STD offers the industry's first customer training program through the internal training institute. Factory automation and other Industrial electricity and electronic processes are taught through realistic practice apparatus. Technology advice and guidance are offered through this cutting-edge technological service.



Our References

STD Transformator is committed to providing true service quality to its customers and strives every day to deliver top-quality, reliable, lasting and innovative solutions. Our willingness to listen and our speed of response enable us to foster close ties with our customers.



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|  TURKEY |  SAUDI ARABIA |
|  NIGERIA |  TURKMENISTAN |
|  GHANA |  IRAQ |
|  ETHIOPIA |  U.A.E. |
|  SENEGAL |  FRANCE |
|  BENIN |  GERMANY |
|  KENYA |  ROMANIA |
|  EGYPT |  NETHERLANDS |
|  YEMEN |  UNITED KINGDOM |

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