



MARINE & OIL AND GAS **SOLUTIONS**

 TRAFOTEK



TRAFOTEK has been providing all the major shipyards of the world with transformer and filter solutions since 1983. Hundreds of vessels, from luxury cruise liners to offshore rigs and platforms, rely on Trafotek solutions for high-quality energy out at sea.

AT THIS MOMENT there are over 900 vessels sailing the world's oceans that are equipped with our transformers. These vessels need to be completely self-sufficient regarding the production and distribution of energy. They rely on energy produced onboard for everything from forward propulsion to the lights in the cabins. Energy solutions in isolation from the general grid must be reliable, durable, safe and economical even in the most demanding of conditions.

With the continuing growth of the offshore industry, rigs and platforms are being placed in increasingly challenging and remote locations. This will continue to place high demand on products. They not only have to be reliable as service and spare parts deliveries become more difficult and time-consuming, but they must be built to endure in increasingly harsh environments. In today's business environment all these challenges must be met while ensuring that the delivered solutions are also environmentally sound.



OVER
900

vessels around the world
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Trafotek transformers.

FACT.

TRAFOTEK dry-type transformers are designed to meet customer requirements in demanding applications. We are specially focused on manufacturing transformers for different types of frequency converters and special applications. Our transformer product range spans from low voltage VPI transformers up to medium voltage cast resin transformers.

PERFORMANCE AND RELIABILITY ON THE HIGH SEAS

COMPACT AND LIGHTWEIGHT SOLUTIONS are important in the marine industry. Space is always a limited luxury on-board ships, which means that the less space that is taken up by transformers, the better. Keeping the weight of our products down, thus decreasing the permanent load that the vessel has to carry, is also an important factor in the marine industry.

DURABILITY AND RELIABILITY are key factors out at sea. Trafotek transformers are designed and manufactured to withstand high level of vibrations and shocks. The transformer housing is specifically designed for marine use and a wide range of transformers accessories can be selected according to the customer's needs.

GOOD CUSTOMER SERVICE can only be achieved by having a thorough understanding of the customer's needs. Efficient and detailed documentation means that we are able to serve our customers faster. And even more importantly, an understanding of the customer's business means that we are always able to deliver the right solutions the first time around.

ZAKI CHAABOUNI, SALES DIRECTOR, POWER TRANSFORMERS »

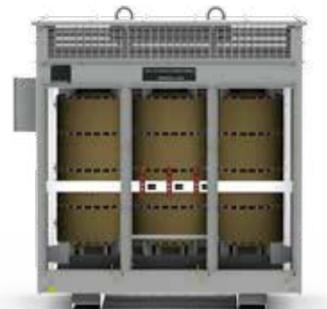




Oil still remains the biggest source of energy. With many existing oil fields rapidly passing their peak, production is shifting towards unexploited oil reserves such as deep-water oil fields, which present their own unique challenges stemming from hard-to-reach locations and harsh environments.

TRAFOTEK OFFERS products specifically designed to endure in these demanding oil & gas environments. Typical solutions include distribution, isolation and drive transformers. Our long-term cooperation with major system integrators and drive manufactures gives us the best possible technical vantage point.

AS A REFERENCE, Trafotek has delivered full 24-pulse 5-winding transformer for electric propulsion system for an offshore support vessel. By using a full 24-pulse transformer almost 20% space and weight can be saved and losses are over 35% lower compared to traditional Q24 pulse transformer solutions.





85%

of heat loss can be transferred into the liquid in our reliable AFWF-cooled products.

FACT.

TRAFOTEK produces a comprehensive range of transformer, filter and reactor solutions for demanding marine and offshore applications. Variations of all products can be flexibly designed and manufactured to your specifications.

OUR TRANSFORMERS are always scaled and optimized solutions and designed with sophisticated design tools by using FEM to secure safe use and long life time. A wide range of auxiliary components can be selected for integration into our transformers. Components such as pre-magnetizing systems, starter units for fan motors or extra windings for auxiliary power.

We also take environmental aspects into careful consideration when designing and manufacturing our products. We use environmentally friendly materials in manufacturing and we have invested into the development and rationalization of our production to minimize environmental stress. All Trafotek transformers and filters can be provided with a Green Passport.

» **TRANSFORMERS**

The power range of our dry-type transformers goes from 100 kVA to 20 MVA. Cooling can be AN, AF or AFWF. We also offer transformer housings especially designed for marine environments and a wide range of related accessories.

Third party certification for marine and offshore applications: LR, RINA, GL, DNV, BV, ABS, RMRS, CCS, PRS, KR, NK

TRANSFORMERS FOR DRIVE APPLICATIONS // DISTRIBUTION // ISOLATION // MOTOR START UP



» **REACTORS**

The current of reactors manufactured by us is in the range from 10 A up to 6000 A. Cooling alternatives include liquid and free or forced air circulation. Reactors can be manufactured by using copper or aluminium winding.

LINE REACTORS // SPECIAL REACTORS

» **FILTERS**

Trafotek's know-how in the field of filters is based on long experience. Our filters are generally used in conjunction with power converters or inverters. They help achieve a higher overall quality of energy with no spikes or deviations. Our products are durable, reliable and always scaled to perfectly fit your process.

LCL FILTERS // dU/dt FILTERS // SINE FILTERS

TRAFOTEK'S AFWF-COOLED TRANSFORMERS are efficient and reliable. The cooling system enables the effective and compact transfer of heat losses from electrical premises into the circulating liquid. By using AFWF cooling up to 30% of transformer weight can be saved.

MARINE REFERENCES

» WENCHONG SHIPYARD, CHINA

Trafotek 3-winding transformers minimize the harmonic distortion on the bow thrusters of the dredger vessel built for CHEC Dredging.

» FISKERSTAND VERFT, NORWAY

Car Ferry Muhumaa uses Trafotek's full 24 pulse 2500 kVA transformers. By using a full 24 pulse transformer almost 20% space and weight could be saved and losses are over 35% lower compared to traditional quasi 24 pulse transformer solutions.

» STX YARDS, FINLAND

The Oasis of the Seas marks an unprecedented step forward in the development of cruise vessels and opens totally new prospects for cruise business. In the Oasis of the Seas there are over 20 Trafotek distribution transformers.

» FINCANTIERI ANCONA SHIPYARD, ITALY

Le Boréal is an exceptional mega-yacht with a unique style. Mega-yacht was designed and built for the most demanding customers. Le Boréal is equipped with total propulsion power of 4,8 MW supplied with Trafotek main propulsion transformer power of 2x2560 kVA.

» SAMSUNG HEAVY INDUSTRIES, KOREA

The first in a series of four liquefied natural gas (LNG) carriers is using Trafotek's 3 winding transformer for the supply of the medium voltage drive. The transformer is equipped with Trafotek integrated pre-magnetizing system to secure the soft start of the transformer.

OFFSHORE REFERENCES

» SAIPEM CASTORONE

290 m pipelaying fully DP vessel is one of the biggest pipelaying vessels ever build. Castorone is equipped with 2x8000 kW propulsion power motors supplied with 4 units of 5000 kVA Trafotek propulsion transformers.

» RAMFORM EXPLORER

Launched in 1995, upgraded to GeoStreamer 2010. Ramform Explorer is a seismographic research ship and is capable of detecting all kinds of underground fields, such as oil fields by using 3D techniques. Ramform Explorer was the first ever vessel to tow eight streamers. In the upgrade the old AN-cooled propulsion transformers were replaced by Trafotek's AFWF-cooled transformers.

» F&G JU 2000E

The F&G JU 2000E is a self-elevating drilling unit with rated water depth of 400 feet and rated drilling depth of 35 000 feet. The F&G JU 2000E is also a harsh environment design rig capable of operating in the North Sea. Trafotek has supplied 1250 kVA 5-winding transformers for jacking systems for total of 10 Jack-up's during year 2011.

» MAERSK PEREGRINO

Maersk Peregrino is unique in its complexity. The vessel is 58 metres wide and 345 metres in length. This is about the size of three standard football fields. The topside modules include crude oil separation, water treatment, chemical injection, metering, power generation and electrical station. Trafotek has supplied topside distribution transformers. This vessel is an excellent reference of Trafotek knowhow in oil & gas sector.

» STX YARDS, NORWAY AND BRAZIL

OSCV 06L is one of the world's most advanced subsea construction vessels in its class, and features Trafotek's advanced propulsion and distribution transformers, total transformer power up to 40 MVA.

BETTER ENERGY



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