

TPEG COMPETENCES
FOR WIND ENERGY



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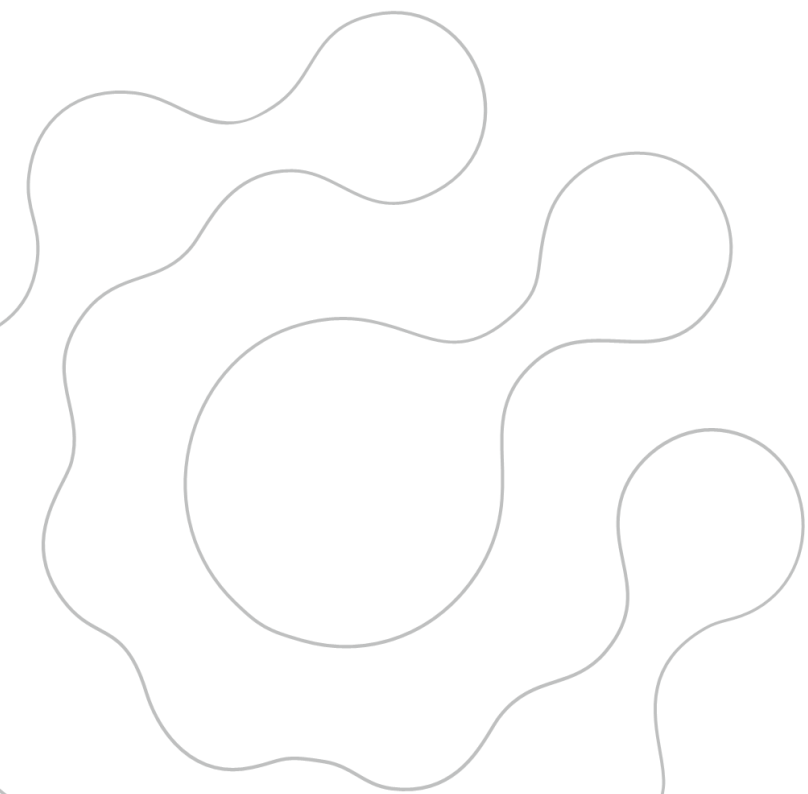


HOW IT WORKS

HOW DOES THE WINDENERGY WORK?

A wind turbine (WT) or wind energy converter (WEC) converts the kinetic energy of the wind into electrical energy and feeds it into a power grid. The dominant design is the three-bladed lift rotor with a horizontal axis and rotor upwind of a tall tower containing a generator.

A gearbox that increases the rotational speed can be located between the rotor and the generator. The common machine housing (also called a nacelle) is mounted on a tubular tower and, together with the rotor, is yawed into the wind direction by an electric motor.

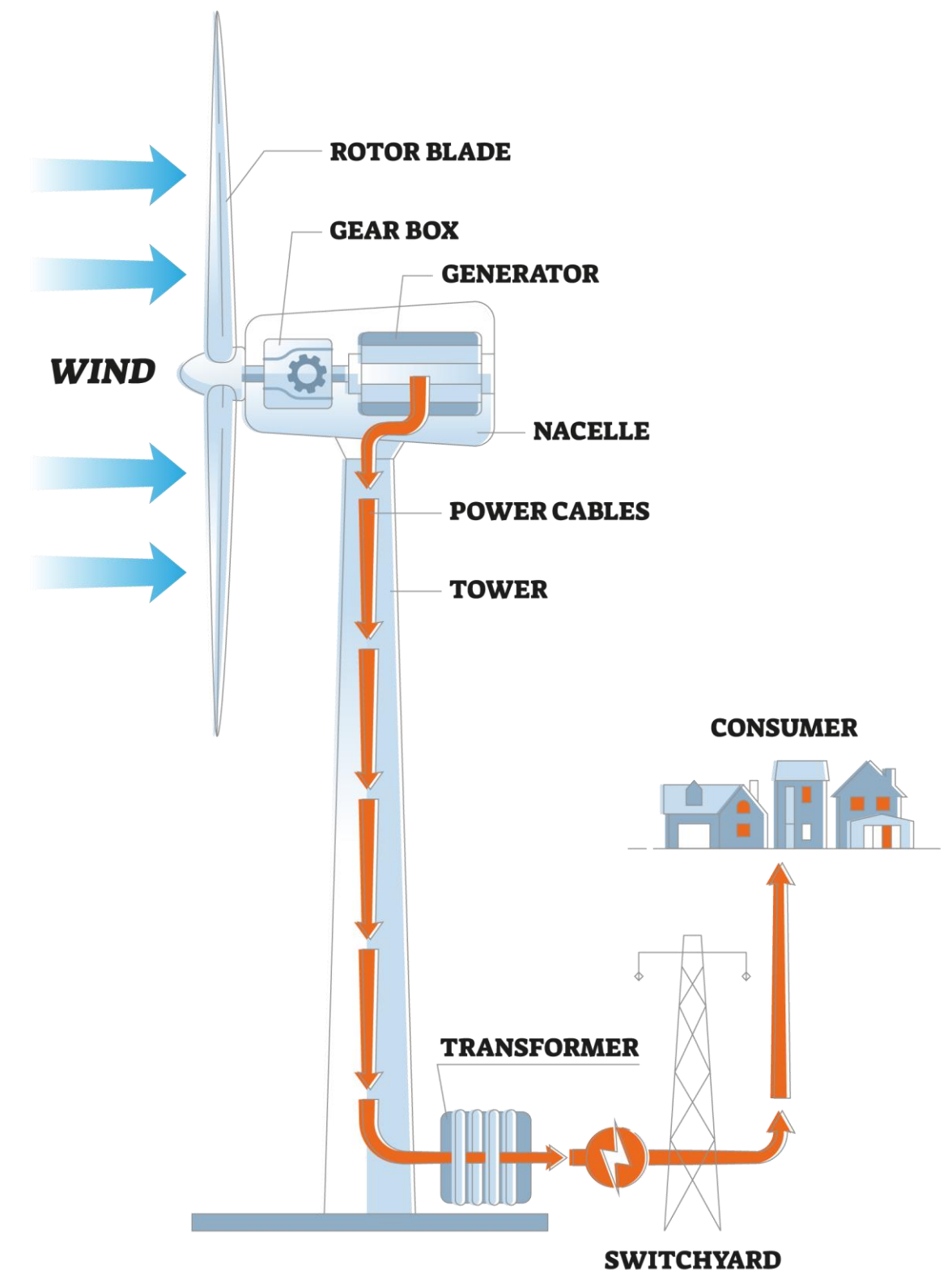


COMPONENTS OF WIND TURBINES

WHICH INDUCTIVE COMPONENTS ARE USED IN THIS PROCESS?

Inductive components for wind energy market:

- **Inductive sensors:** Monitor the rotational speed of the rotor shaft and determine the position of the rotor blades. These sensors provide critical information for controlling the turbine and ensuring its safe operation.
- **Inductive generators:** Convert the kinetic energy of the rotor into electrical energy. The efficiency and reliability of the generator are essential for maximizing the energy output of the wind turbine.
- **Transformers:** Convert the voltage from the generator to the grid voltage. This allows the electricity generated by the wind turbine to be safely and efficiently integrated into the power grid.
- **Inductors:** Smooth the current flow and reduce harmonics. This improves the power quality and protects the turbine from overvoltages. Inductors also help to compensate for the reactive power generated by the turbine.
- **Power electronics:** Control the generator and the grid connection of the wind turbine. This ensures that the turbine operates in accordance with grid regulations and optimizes energy production.



WHAT IS SPECIAL?

WHAT ARE THE SPECIAL REQUIREMENTS FOR THESE COMPONENTS?

Inductive components used in wind turbines must meet a number of special requirements, including:

- **Harshness and robustness:** Extreme temperatures from -40°C to +85°C; humidity and corrosion; vibrations and shocks; dirt and dust
- **Performance and reliability:** High efficiency; compact design; long service life; reliability under extreme conditions, voltage spikes, overvoltages and lightning strikes
- **Specific requirements depending on the component:**
 - **Inductive sensors:** High accuracy and resolution, fast signal transmission, EMC compatibility
 - **Inductive generators:** High power and speed capacity, good cooling, low-noise operation
 - **Transformers:** High insulation voltage, low loss factor, thermal stability
 - **Inductors:** High inductance, low power consumption, compact design
 - **Power electronics:** High switching frequency, high efficiency, robustness against thermal stress

As a manufacturer of inductive components for wind turbines, we must consider these special requirements in order to develop high-quality and reliable products.



WHAT WE CAN PROVIDE

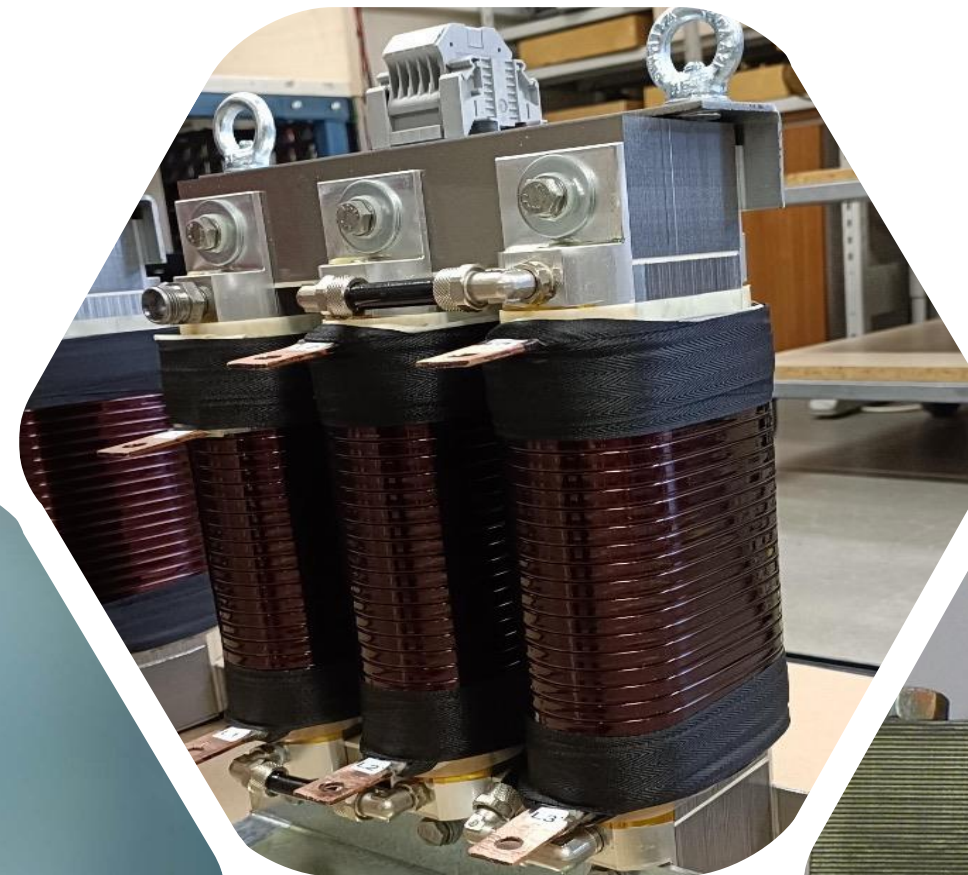
We have extensive expertise and many years of experience in the development and production of inductive components for wind turbine systems.



POWER TRANSFORMERS



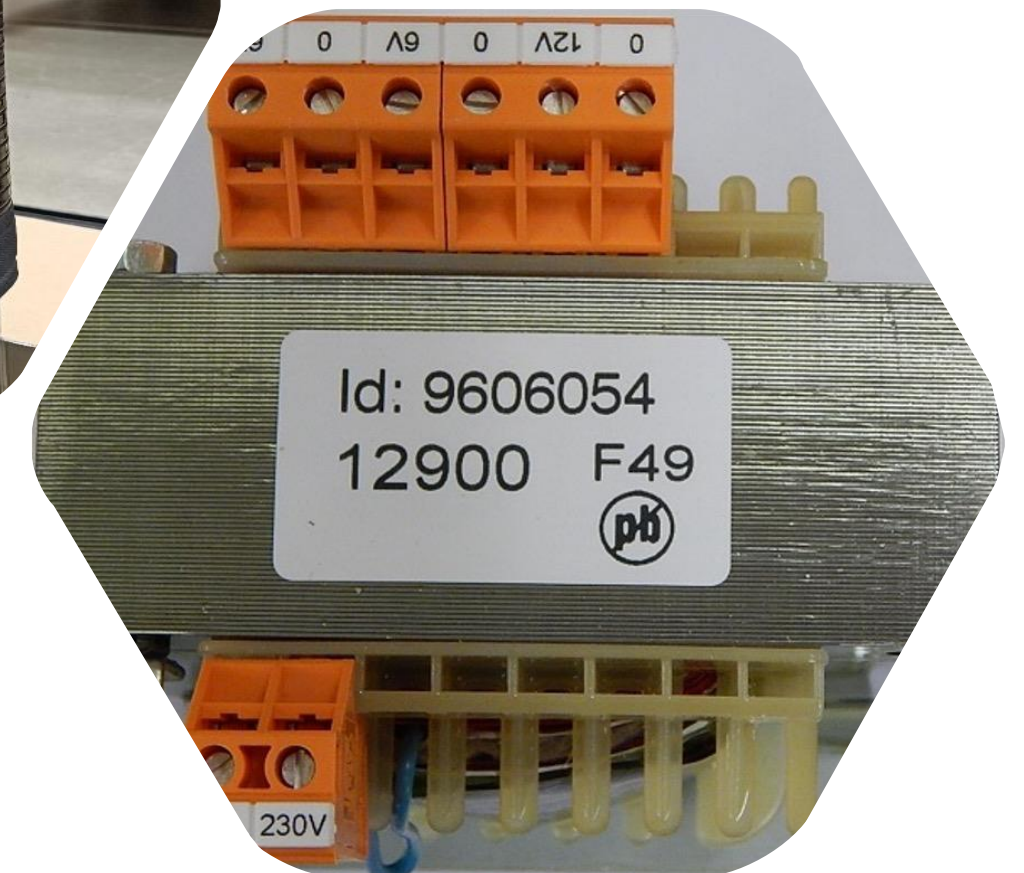
WATER COOLED CHOCKES



FILTERS



SAFETY TRANSFORMERS



POWER TRANSFORMERS

TP001469

Three Phase UK Transformer
Standard EN61558-2-4

PRODUCT PARAMETERS

- Rated output: 35 kVA
- Primary Voltage: 300 V, 70.3 A
- Secondary Voltage: 410 V, 50 A
- Frequency: 50-60Hz
- Vectorgroup: Dyn5
- Ambient temperature: t_a 40°C
- Insulation class: H
- Mode of operation: S1
- Safety class: prepared for safety class I
- Protection class: IP 00
- Weight: 158 kg



FILTERS

TP003602B

3-Phase Sine Filter Unit

Approvals: EN61558-1, EN61558-2-4

PRODUCT PARAMETERS

- Nominal apparent power S_n : 150kVA
- Insulation class F
- Cooling method: liquid cooling <10 l/min
- Flow temperature: max 50°C
- Total weight about: 50 kg
- Copper weight about: 10 kg
- Nominal Voltage: 500 Vrms
- Frequency: 50/60 Hz
- Nominal current: 3ph 173 Arms
- Inductance: 3x 0.39 mH $\pm 5\%$
- Ripple frequency and current: 10 kHz (PWM) and 10Arms
- Capacitors: 3x 40 μ F Δ
- Max. ambient temperature: 55°C
- Dielectric test: 2.8 kV : Windings – core



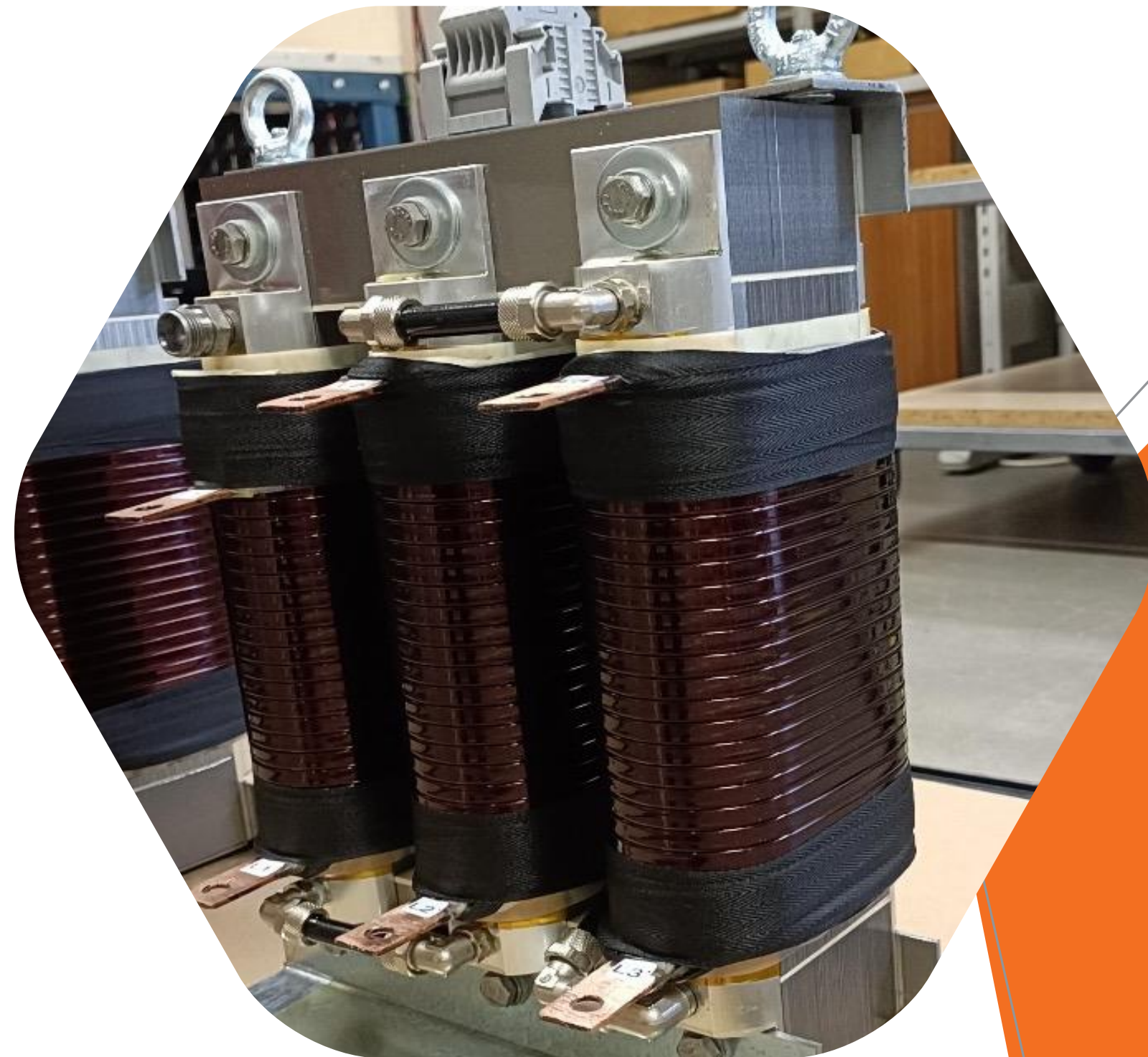
WATER COOLED CHOKE

TP003626C

2x3 Phase Water Cooled Choke

PRODUCT PARAMETERS

- Nominal current: 3ph 505A
- Inductance: 3x 0.130 mH
- Input Voltage: 420V
- Frequency: 50Hz
- Ambient Temperature: $t_a=65^{\circ}\text{C}$
- Insulation Class: F (155°C)
- Directly Water Cooled



SAFETY TRANSFORMERS

TP014565A

1-Phase Safety Transformer
Standard EN61558-2-6

PRODUCT PARAMETERS

- Input Voltage: 230V
- Secondary Voltage 1: 24V / 5.4A / 96VA
- Secondary Voltage 2+3: each 6V / 5.4A / 32,4VA
- Frequency: 50HZ
- Ambient Temperature: $t_a=40^{\circ}\text{C}$
- Insulation Class: B (130°C)





YOUR CUSTOM INDUCTIVE COMPONENT

THE BEST SOLUTION FOR YOUR APPLICATION

At TPEG, we understand the critical role that inductors play in modern technology. We are a leading designer, developer, and manufacturer of custom inductive components. Our team of experienced engineers boasts over 50 years of expertise in crafting high-performance inductors tailored to your exact needs.

- **Optimized performance:** Get the exact inductance value, current rating, and footprint you need for your application.
- **Reduced development time:** Our expertise eliminates the need for lengthy in-house design iterations.
- **Enhanced reliability:** Benefit from TPEG's commitment to quality and rigorous testing procedures.
- **Lightweight solutions:** We specialize in crafting lightweight inductors ideal for weight-sensitive applications.
- **Superior customer service:** Our dedicated team is here to support you throughout the entire development process.



THANK YOU MERCI | DANKE



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 TPEG SCHMELZER

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