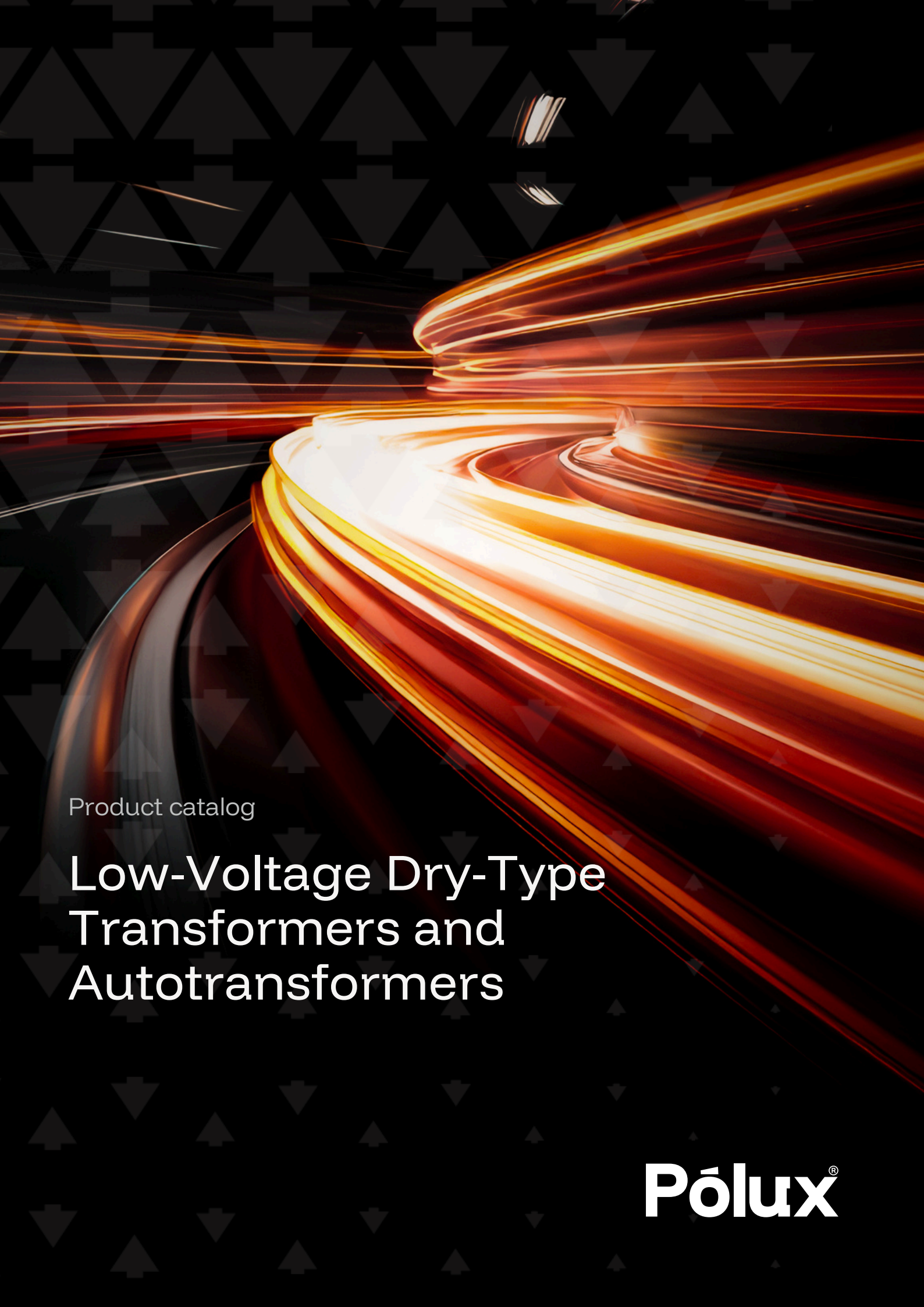




Product catalog

Low-Voltage Dry-Type Transformers and Autotransformers

Pólux[®]

Founded in 1986, Pólux is a Brazilian company headquartered in Jaraguá do Sul, Santa Catarina, specialized in the development and manufacture of magnetic solutions. Throughout our history, we have transformed knowledge into solutions that keep pace with the evolution of the industry and the needs of our customers, combining quality, safety, reliability, and sustainability.

Our energy drives transformation across various sectors of industry and infrastructure. Our solutions are used in electrical machinery, hospital equipment, elevators, electrical panels, power systems, home appliances, data centers, and industrial facilities. They are also used in applications across the naval and mining sectors, as well as in airports, oil rigs, residential buildings, shopping centers, and various other projects.

Our commitment to innovation and sustainable development guides our actions at every stage of our processes. We continuously invest in training our team, improving our technologies, and strengthening partnerships with customers and suppliers. As a result, we develop solutions aligned with market demands and adopt practice that reduce environmental impacts and restricts the use of substances harmful to human health and the environment.



Powering transformation

Purpose

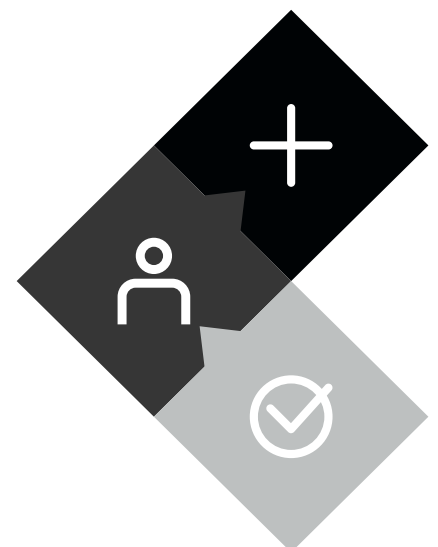
Transform actions into development, connecting society and organizations to the global future by utilizing the energy that keeps us moving.

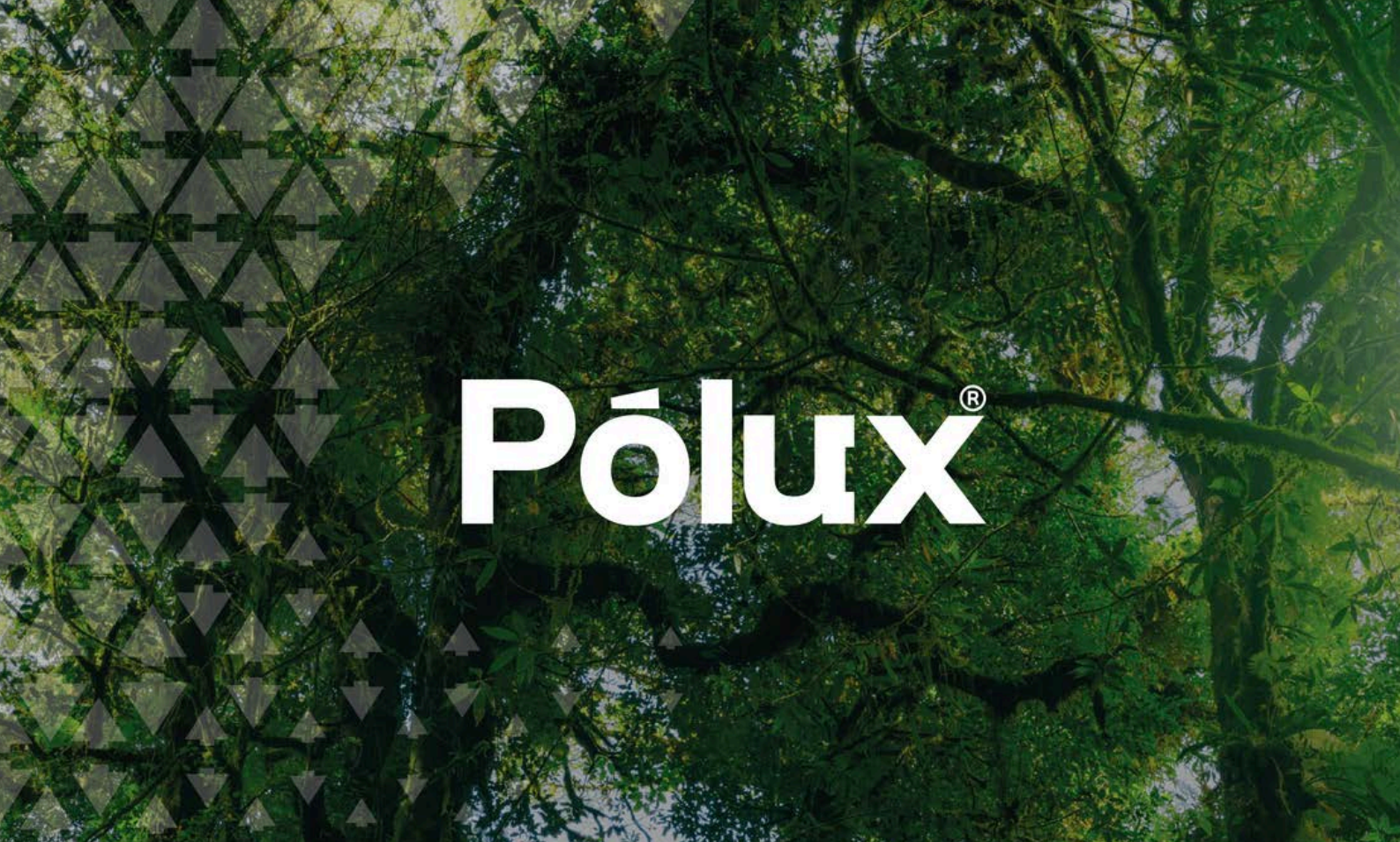
Culture

Our culture is rooted in a commitment to excellence and in relationships built on trust with our employees, customers, and suppliers.

Values

- Respect: value and inclusion of people, coupled with a commitment to sustainable development and social-environmental responsibility.
- Ethics and transparency: ethical conduct, compliance with applicable laws and regulations, and corporate governance.
- Innovation: continuously evolve in the pursuit of creative and efficient solutions.
- Excellence: a constant effort to achieve the highest technical and operational standards.
- Reliability: recognized quality in every solution delivered.





Pólux[®]

ESG Environmental, Social, and Governance

Pólux is an integral part of people's daily lives and is constantly striving for improvement in order to ensure the best possible balance between the economy, society, and the environment.

Sustainability is our strategic pillar, through which we aim to build economic, social, and environmental legacies, as well as reduce the impacts of our operations. Therefore, in addition to building strong and lasting ties with the local community, we also adhere to high ethical standards and practice highly transparent management, actively contributing to progress in the areas of the environment, biodiversity, and sustainable development.

Our dedication to sustainability has earned us ISO 14001 international certification. Its implementation demonstrates our commitment to protecting the environment through the management of environmental risks and the reduction of our environmental impact.



Main applications

- ENERGY
- SUGAR AND ETHANOL
- AGRIBUSINESS
- FOOD AND BEVERAGE
- CONSTRUCTION
- DATA CENTERS
- ELEVATORS
- SOLAR ENERGY
- HOSPITALS
- INDUSTRIES
- MINING
- ELECTRIC MOBILITY
- MARINE
- OIL & GAS
- PULP AND PAPER
- WATER AND WASTEWATER
- STEEL INDUSTRY
- CHEMICAL AND PETROCHEMICAL
- POWER GENERATION, TRANSMISSION AND DISTRIBUTION

Summary

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Three-Phase Isolation Transformers

Pólux three-phase isolation transformers are designed for power distribution, machine supply, and voltage adaptation in industrial and commercial applications. Their robust construction ensures safety, reliability, and continuous operation under a wide range of operating conditions.

Main Applications

- Low-voltage power distribution and voltage adaptation;
- Power supply for motors, machines, and industrial processes;
- Charging stations, electrical panels, and automation systems;
- Commercial, industrial, and building infrastructure;
- Continuous-duty production processes;
- Hospitals, tunnels, and mission-critical facilities;
- Mining, steel plants, and industrial utilities;
- Data centers and information technology infrastructure;
- Marine vessels, offshore platforms, and naval electrical systems;
- Hazardous areas requiring enhanced operational safety.



General Characteristics

Rated power:	up to 25,000 kVA;
Voltage class:	1.1 kV;
Cooling:	ANAN (natural air);
Frequency:	50 or 60 Hz;
Installation altitude:	up to 1,000 m;
Ambient temperature:	40 °C;
Finish:	vacuum pressure impregnation (VPI) varnish or resin coating;
Temperature class:	F (155 °C) or H (180 °C);
Winding material:	copper or aluminum;
IP rating:	IP00 to IP65;
Insulation:	galvanic between windings;
Other specifications:	upon request.

TECHNICAL STANDARDS

IEC 60076-11;
IEEE C57.12.01;
ABNT NBR 5356-11.



Optional features

- Thermal protection relay;
- Temperature sensors (PT-100 or thermostats);
- Forced-air cooling;
- Special painting plans for harsh and aggressive environments;
- Project-specific certifications and requirements (CE, UL, RETIE, ABS, DNV, Lloyd's and RINA);
- Bi-directional wheels;
- Off-circuit tap changer (OCTC);
- Protection devices (circuit breaker, fuse, surge arrester);
- Electrostatic shielding;
- Special terminals and connectors;
- Additional custom options available upon technical consultation.

Three-Phase Autotransformers

Pólux three-phase autotransformers provide an efficient and cost-effective solution for voltage adaptation in industrial systems. With reduced weight and dimensions compared to isolation transformers, they are ideal for applications where galvanic isolation is not required.

Main Applications

- Voltage adaptation between electrical networks;
- Power supply for industrial machines and equipment;
- Distribution centers and building infrastructure;
- High-power systems;
- Stepped starting for electric motors;
- Mining, steel plants, and industrial utilities;
- Continuous-duty production processes.



General Characteristics

Rated power:	up to 25,000 kVA
Voltage class:	1.1 kV;
Cooling:	ANAN (natural air);
Frequency:	50 or 60 Hz;
Installation altitude:	up to 1,000 m;
Ambient temperature:	40 °C;
Finish:	vacuum pressure impregnation (VPI);
Temperature class:	F (155 °C) or H (180 °C);
Winding material:	copper or aluminum;
IP rating:	IP00 to IP65;
Other specifications:	upon request.

TECHNICAL STANDARDS

IEC 60076-11.
IEEE C57.12.01;
ABNT NBR 5356-11.



Optional features

- Thermal protection relay;
- Temperature sensors (PT-100 or thermostats);
- Forced-air cooling;
- Special painting plans for harsh and aggressive environments;
- Project-specific certifications and requirements (CE, UL, RETIE, ABS, DNV, Lloyd's and RINA);
- Bi-directional wheels;
- Off-circuit tap changer (OCTC);
- Protection devices (circuit breaker, fuse, surge arrester);
- Special terminals and connectors;
- Additional custom options available upon technical consultation.

Pólux Data Center Line

Pólux transformers for data center applications are designed to meet the demanding requirements for availability, energy efficiency, and power quality in mission-critical facilities. Engineered for continuous operation under non-linear electronic loads such as PDUs, rectifiers, and servers, these transformers provide high resistance to the thermal effects caused by harmonic currents, low electrical losses, and reduced noise levels.

Their design incorporates features such as electrostatic shielding, digital monitoring, and optimized cooling systems, contributing to the reliability and performance of the data center electrical infrastructure.



General Characteristics

Rated power:	up to 25,000 kVA;
Voltage class:	1.1 kV;
Tap changer:	+2 x 2.5%; -4 x 2.5%;
Cooling:	ANAN (natural air);
Frequency:	50 Hz or 60 Hz.
Installation altitude:	up to 1,000 m;
Finish:	vacuum pressure impregnation (VPI) varnish or resin coating;
Temperature class:	F (155 °C) or H (180 °C), with limited temperature rise;
Winding material:	copper or aluminum;
Installation:	suitable for indoor use, protection classes IP00 to IP55;
Other specifications:	upon request.

TECHNICAL STANDARDS

IEC 60076-11;
IEEE C57.12.01;
ABNT NBR 5356-11.



Key Features

- Efficiency: designed for low no-load and load losses;
- Noise level: reduced for critical indoor environments (<65 dB on average);
- K factor: designed to withstand non-linear loads with high harmonic content (K13 to K20);
- Starting current: designed to operate with a low starting current (below 6xIn, or according to project requirements);
- Short-circuit withstand capability: high mechanical strength to withstand fault currents;
- Digital monitoring: temperature sensors (PT-100);
- Electrostatic shielding for reduced electromagnetic interference and enhanced operational safety;
- Project-specific certifications and requirements (CE, UL, RETIE).

Optional features

- Thermal protection relay;
- Forced-air cooling;
- Special painting plans for harsh and aggressive environments;
- Bi-directional wheels;
- Protection devices (circuit breaker, fuse, surge arrester);
- Special terminals and connectors;
- Additional custom options available upon technical consultation.

Water-Cooled Dry-Type Transformers

Pólux water-cooled dry-type transformers are designed for applications requiring high power density, reduced installation space, and maximum operational reliability. By utilizing an indirect air-to-water heat exchange system, this solution significantly reduces the transformer's size and weight compared to conventional dry-type transformers, making it especially suitable for installations with severe space constraints.

Main Applications

- Offshore oil and gas platforms;
- Marine vessels and naval applications;
- Marine power generation and distribution systems;
- Compact electrical rooms;
- Industrial plants with limited installation space;
- Retrofit projects where physical expansion is restricted;
- Applications requiring high installed power in confined areas.



General Characteristics

Rated power:	up to 25,000 kVA;
Voltage class:	1.1 kV;
Cooling:	AFAW (forced air cooling with air/water heat exchanger)
Frequency:	50 Hz or 60 Hz;
Installation altitude:	up to 1,000 m;
Ambient temperature:	45 °C;
Finish:	vacuum pressure impregnation (VPI) varnish or resin coating;
Temperature class:	B (130 °C) / F (155 °C) / H (180 °C);
Winding material:	copper or aluminum;
IP rating:	IP00 to IP65;
Insulation:	galvanic between windings;
Other specifications:	upon request.

TECHNICAL STANDARDS

IEC 60076-11;
IEEE C57.12.01;
ABNT NBR 5356-11.



Optional features

- K factor from K4 to K20 for non-linear loads and power electronics applications;
- Special painting plans for harsh and aggressive environments;
- Bi-directional wheels;
- Off-circuit tap changer (OCTC);
- Protection devices (circuit breaker, fuse, surge arrester);
- Special terminals and connectors;
- Additional custom options available upon technical consultation.

Pólux Renewable Energy Line

Pólux transformers for renewable energy applications are designed for photovoltaic systems, electric vehicle charging infrastructure, and energy storage systems. Engineered for seamless integration with power electronic equipment, they provide high efficiency, reliability, and continuous operation in demanding environments.

Main Applications

- Photovoltaic solar power plants;
- Distributed generation systems;
- Electric vehicle charging infrastructure, including charging stations;
- Solutions for light electric mobility, such as motorcycles, bicycles, and scooters;
- Energy storage systems (ESS);
- Power converters, rectifiers, and inverters.



General Characteristics

Single-phase or three-phase transformer;
Designed for integration with power electronics;
High energy efficiency;
Continuous operation in critical applications;
Low electrical losses;
Compact and robust construction;
K factor 4;
Custom voltage ratings and power capacities according to project requirements;
Compatible with photovoltaic systems and electric vehicle chargers;
IP rating according to the application (IP00 to IP65);
Special Features Upon Request.

TECHNICAL STANDARDS

IEC 60076-11;
IEEE C57.12.01;
ABNT NBR 5356-11.



Optional features

- Thermal protection relay;
- Temperature sensors (PT-100 or thermostats);
- Forced-air cooling;
- Special painting plans for harsh and aggressive environments;
- K factor from K4 to K20 for non-linear loads and power electronics applications;
- Project-specific certifications and requirements (CE, UL, RETIE, ABS, DNV, Lloyd's and RINA);
- Bi-directional wheels;
- Off-circuit tap changer (OCTC);
- Protection devices (circuit breaker, fuse, surge arrester);
- Electrostatic shielding;
- Special terminals and connectors;
- Additional custom options available upon technical consultation.

Single-Phase Transformers

Pólux single-phase isolation transformers are designed for voltage adaptation and galvanic isolation in low-voltage systems. Compact, reliable, and versatile, they are suitable for applications ranging from control circuits to the power supply of industrial equipment and other special applications.

Main Applications

- Control circuits and industrial automation;
- Electrical panels and auxiliary systems;
- Power supply for machines and equipment;
- Voltage adaptation and conversion;
- Hospital systems;
- Local low-voltage power distribution.



General Characteristics

Rated power:	up to 25,000 kVA;
Voltage class:	1.1 kV;
Cooling:	ANAN (natural air);
Frequency:	50 or 60 Hz;
Installation altitude:	up to 1,000 m;
Ambient temperature:	40 °C;
Finish:	vacuum pressure impregnation (VPI) varnish or resin coating;
Temperature class:	F (155 °C) or H (180 °C);
Winding material:	copper or aluminum;
IP rating:	IP00 to IP65;
Insulation:	galvanic between windings
Other specifications:	upon request.

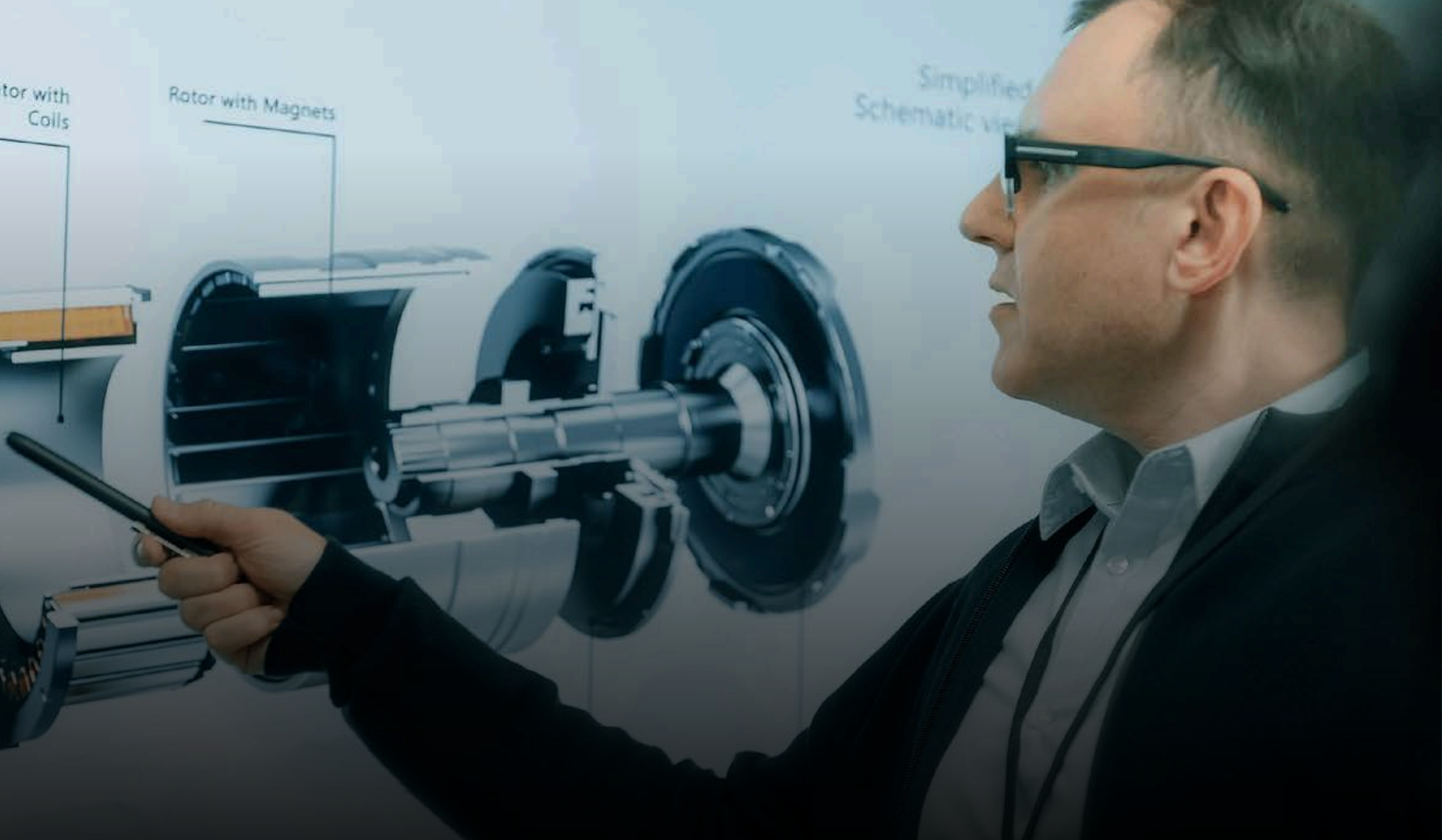
TECHNICAL STANDARDS

IEC 60076-11;
IEEE C57.12.01;
ABNT NBR 5356-11.



Optional features

- Thermal protection relay;
- Temperature sensors (PT-100 or thermostats);
- Special painting plans for harsh and aggressive environments;
- Bi-directional wheels;
- Protection devices (circuit breaker, fuse, surge arrester);
- Electrostatic shielding;
- Special terminals and connectors;
- Additional custom options available upon technical consultation.



DEVELOPMENT OF CUSTOM PROJECTS

Pólux features a highly specialized engineering team dedicated to developing customized solutions for a wide range of applications. Our strength lies in the flexibility to design dedicated projects, with every solution developed to meet each customer's specific requirements with the highest level of expertise and attention to detail.

At Pólux, we understand that every customer and every application is unique. That is why our engineering team carefully evaluates each project, exploring every possibility to deliver the most efficient and reliable solution.

Our manufacturing facility covers more than 10,000 m² and includes an in-house silicon steel processing center and metal fabrication shop, enabling us to develop products with customized dimensions and configurations. We also operate state-of-the-art testing laboratories that ensure full compliance with applicable international standards.

By choosing Pólux, you're not only ensuring a high-quality product, but also a solid partnership committed to your success! Our customer-focused approach and dedication to excellence ensure that every project is handled with the care, attention, and expertise it deserves.

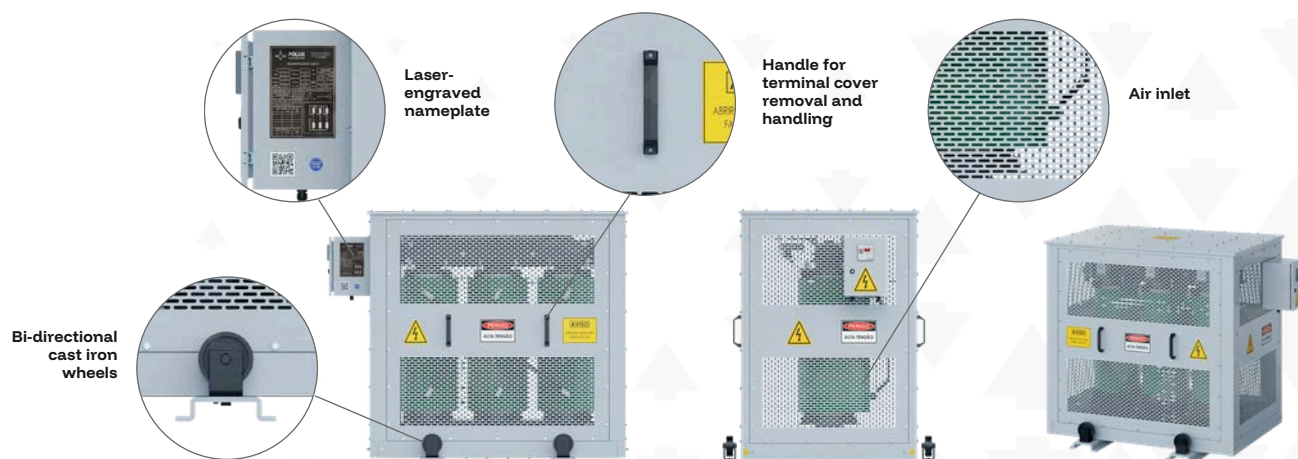
Contact us and let us contribute to the success of your next project!

DEGREE OF PROTECTION IN ACCORDANCE WITH IEC 60529

Pólux offers products with protection ratings ranging from IP00 to IP65. The most common ratings are:

IP00: designed without an enclosure. This protection rating is typically suitable for equipment installed inside electrical panels or in protected indoor locations where there is no public access and minimal dust exposure.

IP21: recommended for indoor installations where people may be present, with low dust levels and occasional exposure to water splashes.



IP54: suitable for outdoor installation in unsheltered environments with personnel and wildlife traffic, and full exposure to weather conditions.



Refer to the table below to determine the best IP rating for your application:

IP

X

1st CHARACTERISTIC NUMERAL:
protection against the ingress of solid foreign
objects and access to hazardous parts

	Indications regarding equipment protection	Indications regarding personal protection
0	Not protected	Not protected
1	Protected against solid foreign objects over 50 mm	Protected against access with the back of the hand
2	Protected against solid foreign objects over 12.5 mm	Protected against access with a finger
3	Protected against solid foreign objects over 2.5 mm	Protected against access with a tool
4	Protected against solid foreign objects over 1 mm	
5	Dust-protected (limited ingress permitted without harmful deposits)	Protected against access with a wire
6	Dust-tight	

X

2nd CHARACTERISTIC NUMERAL:
protection against the ingress of
water to hazardous parts

0	Not protected
1	Protected against vertically falling water drops
2	Protected against water drops falling at an angle up to 15° from the vertical
3	Protected against rain at an angle up to 60° from the vertical
4	Protected against water splashing from any direction
5	Protected against water jets (low pressure) from any direction
6	Protected against powerful water jets from any direction
7	Protected against the effects of temporary immersion (between 15 cm and 1 m)
8	Protected against the effects of continuous immersion under pressure

C

W

ADDITIONAL LETTER (OPTIONAL):
Protection provided against
access to hazardous parts

A	Protected against access with the back of the hand (used for IP0X enclosures)
B	Protected against access with a finger (used for IP0X and IP1X enclosures)
C	Protected against access with a tool (used for IP0X, IP1X and IP2X enclosures)
D	Protected against access with a wire (used for IP0X, IP1X, IP2X and IP3X enclosures)

To be used when:

- The actual protection against
access to hazardous parts is
higher than that indicated by the
first characteristic numeral;
- Only protection against access
to hazardous parts is indicated
(the first characteristic numeral
is replaced by "X").

SUPPLEMENTARY LETTER
(OPTIONAL):
Supplementary information

H	High-voltage equipment
M	Tested for protection against the harmful effects of water ingress while operating
S	Tested for protection against the harmful effects of water ingress while stationary
W	Intended for use under specified atmospheric conditions



TESTS AND STANDARDS

Experience Pólux's commitment to quality. Our fully equipped testing laboratory features state-of-the-art equipment, enabling us to meet the highest quality standards and comply with all applicable regulations and industry standards.

At Pólux, quality is more than a promise — it is a commitment. Every stage of our manufacturing process is carefully designed to ensure that each product delivers maximum performance and reliability.

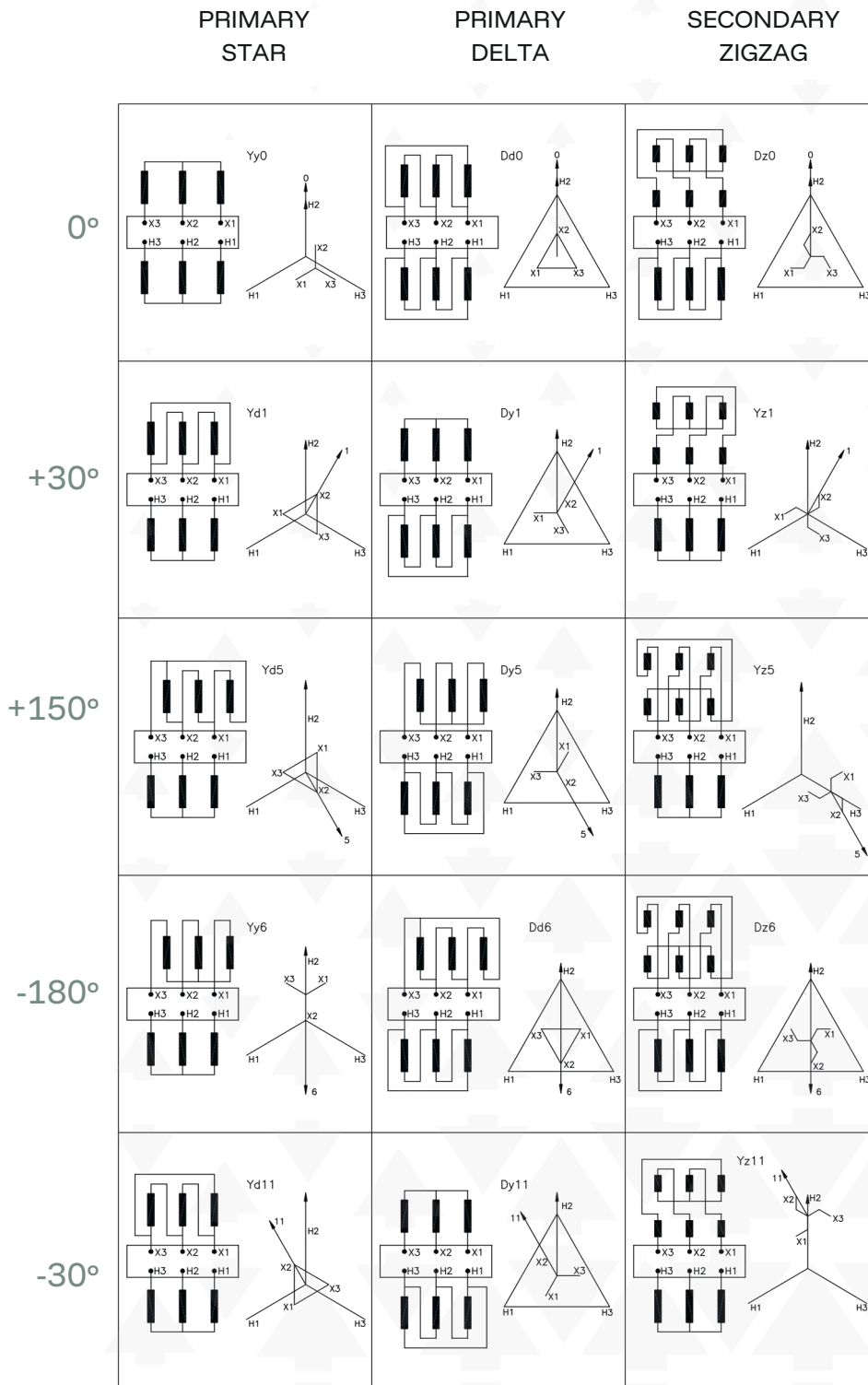
We perform all routine tests required by the applicable standards, ensuring that every product is thoroughly inspected and verified before delivery.

In addition to routine tests, we are fully equipped to perform type and special tests according to customer requirements. We understand that every project is unique, and testing requirements may vary. Our team is prepared to tailor the testing process to ensure full compliance with each project's specifications.

Our commitment to quality is reflected in every stage of production, from design and manufacturing to final testing and delivery. Choose Pólux to ensure excellence in every product you deliver to your customers!

THREE-PHASE TRANSFORMER CONNECTION GROUP

IN ACCORDANCE WITH IEC 60076-1



Typical Connections —
Examples of vector group
symbols, terminal markings,
and phasor diagrams for
three-phase transformers



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