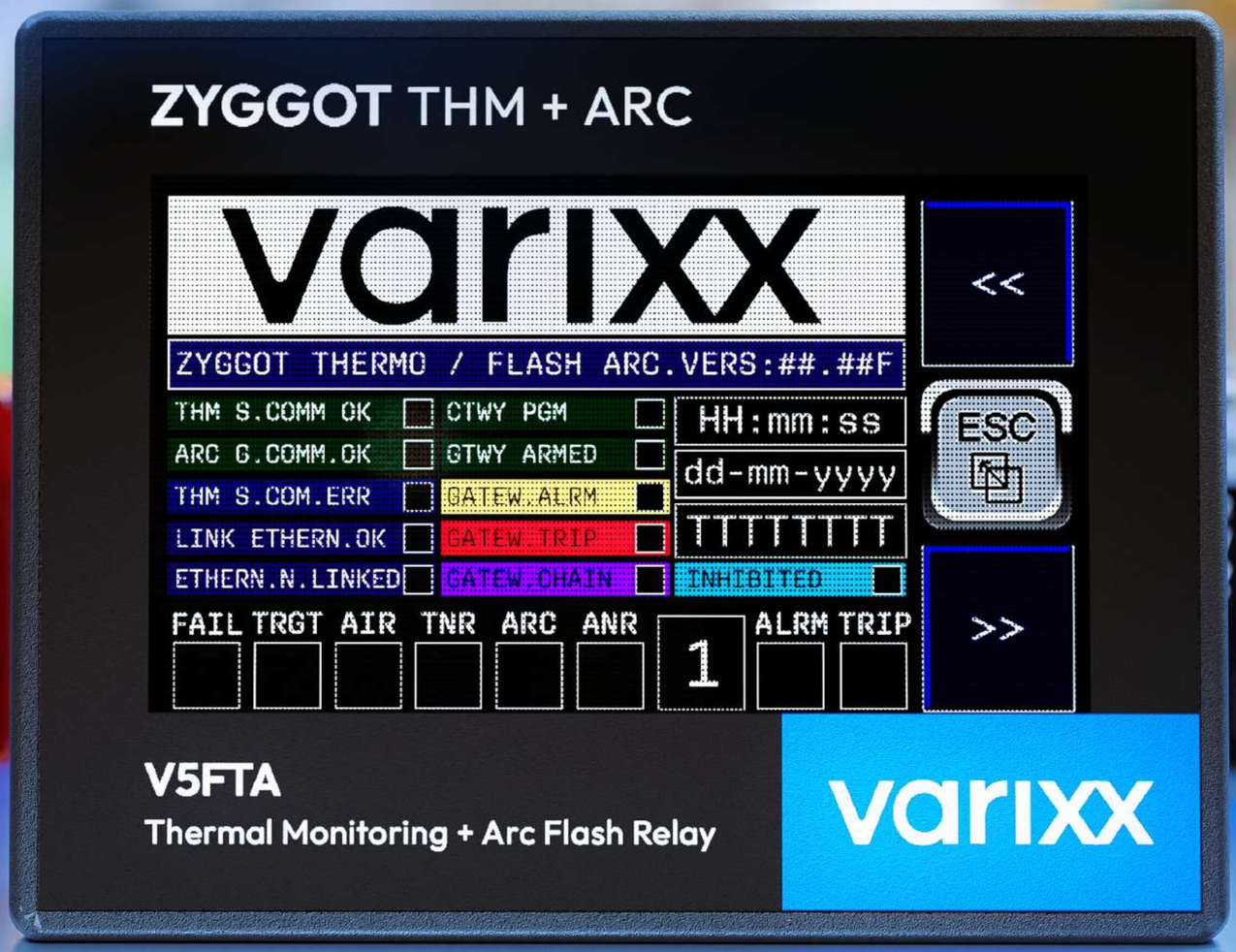
ZYGGOT® THM+ARC

Integrated Arc Protection System and
Continuous Online Thermography



ZYGGOT® THM+ARC

Integration and Innovation

ZYGGOT THM+ARC is an innovative protection and measurement solution developed to meet the growing demands for reliability and safety in low and medium power electrical systems. Integrating the continuous online thermography system, ZYGGOT Temperature, and the arc detection system, ZYGGOT Arc.
ZYGGOT THM+ARC combines the best of thermography and arc detection technologies in a single relay, offering robust monitoring, safety and protection.

Available in Mono and Multi Gateway versions, the system adapts to a variety of applications and needs, facilitating integration with existing industrial architectures and providing a quick and effective response to potential anomalies. This solution reflects Varixx's commitment to providing long-life, high-quality products capable of optimizing risk management and ensuring the protection of critical assets.

Main Advantages

General Characteristics

- **Color Touch Screen:** Modern and user-friendly interface.
- **Ethernet communication:** Compatible with various protocols for greater versatility.
- **Advanced Integration:** Networks of common temperature and arc sensors, combining arc protection and continuous thermography.

Protection Resources

- **UV Arc Protection:** Patented technology (Patent No. PI 0903809-4), the most advanced in the world.
- **Incident Energy Reduction:** Reduces incident energy by up to 150 times compared to systems that use light and current for detection.
- **No Current Measurement Required:** Arc confirmation without the need to measure current.

Advanced Features

- **Multi Gateways and Mono versions:** High selectivity for arc tripping. Low-cost tripping gateway available for cubicles or associated circuit breakers.
- **Real-time graphical record (Plot):** Continuous visualization of operational data.
- **Fault and event history:** Storage of information for future analysis.

Continuous Monitoring

- **Continuous measurements:**
  Temperature of 100 targets.
  Temperature of 100 sensor bodies (surrounding air).
  Voltage of 100 temperature sensors and 100 arc sensors.
- **Temperature reading:** Includes target and surrounding air temperature.

Communication and Protocols

- Equipped with Modbus RTU and Ethernet interfaces, the system guarantees quick and easy integration with customers' automation architectures, providing remote access to data and allowing flexible configurations.
- **Modbus RTU and Other Protocols:** Compatibility for integration with different systems.
- **Versatility in Communication:** Solutions that meet different integration needs with DCS systems.

Integration with DCS:

- It facilitates connection to the customer's digital distributed control system (DCS), centralizing monitoring and simplifying equipment maintenance and management.

Optimized Design and Interface

Space Saving

- The design of the **ZYGGOT THM+ARC** is designed to take up less space in the panel door, consolidating temperature monitoring and arc protection in one compact unit.

Fault History and Status

- It keeps a complete history of faults and operating status, facilitating performance analysis and identifying patterns for future interventions.

Advanced Interface with over 200 screens

- A comprehensive set of screens, comprising more than 200 interfaces, provides complete access to all Zyggot relay and system functionalities, allowing intuitive and detailed navigation for configuration, monitoring and real-time performance analysis.

Alarm Configuration and Graphical Logging

- It offers configurable alarm levels, accompanied by a continuous graphic record, allowing trend analysis and quick responses to detected irregularities.

ZYGGOT THM+ARC

Arc Selectivity with Multi-Gateways

The multi-gateway version of the **ZYGGOT THM+Arc** enables highly precise arc selectivity, which is essential for independently disarming circuit-breakers in a controlled manner. Each panel compartment can be equipped with a dedicated, cost-effective gateway, while a single central relay manages the entire system. This configuration allows only the circuit breakers in the affected compartments to be tripped, reducing the impact on interdependent systems and ensuring greater operational continuity.

The UV arc detection sensors **(ZGA1R)** can be connected to up to 40 gateways, with a limit of 100 sensors each per system in the Multi-Gateway version. This modular architecture not only increases scalability, but also guarantees lower cost per compartment, without compromising system reliability.

Thermography sensors (THM) are directly connected to the **ZYGGOT** relay via the **V5CON** interface, providing continuous temperature monitoring of critical busbars and connections. This feature enables early detection of hotspots or thermal faults that could develop into catastrophic failures.

On the other hand, the UV arc sensors use the gateways to communicate fault signals to the relay, enabling arc detection responses. This integration provides holistic, real-time protection, covering everything from preventive thermal monitoring to emergency action against arcing.

Technical Benefits

- **High precision in selective protection:**

The circuit breakers are only triggered where necessary, isolating faults without interrupting the rest of the system.

- **Scalability and modularity:**

The capacity of up to 40 connected gateways allows adaptation to panels of different sizes and complexities.

- **Advanced security:**

Rapid response and arc detection significantly reduce the risk of damage to equipment and operators.

- **Integration with DCS systems**

Communication via Modbus and Ethernet facilitates connection to distributed control systems, ensuring greater flexibility and automation in asset management.

Typical applications

- Renewable energy infrastructures and data center electrical systems.
- Motor control centers (MCC) in industrial plants.
- High and medium voltage substations.
- Power distribution systems in critical industries.

Technical Specifications and Capabilities

Voltage reading and capacity of up to 200 sensors

The system allows you to monitor the supply voltage for up to 200 sensors, combining temperature measurements and arc detection for wide monitoring coverage. It supports up to 100 arc sensors per gateway, providing robust detection, especially useful in high-power systems.

Arc Detection

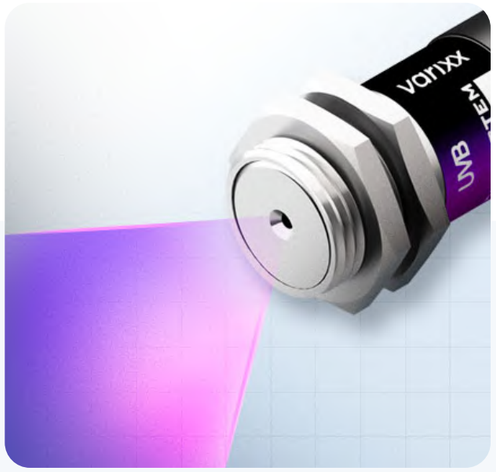
It includes differential arc detection, eliminating the need to measure current to identify the presence of an electric arc. Detection takes place via ultraviolet (UV) radiation, identifying the arc during the pre-arc phase (before the visible light event).

Continuous Monitoring and Temperature Detection

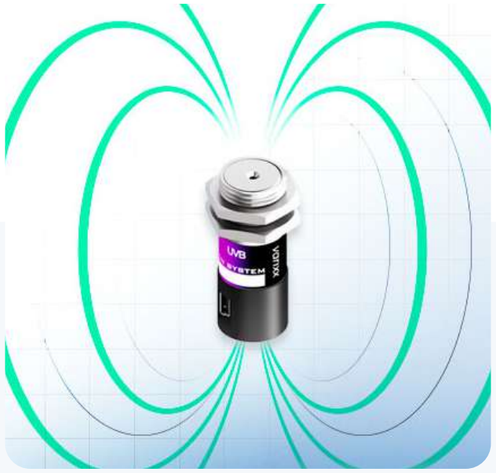
It takes continuous temperature readings for up to 100 targets per relay, as well as monitoring the body and surrounding air, detecting overheating in adjacent areas. Detection of thermal variations is integrated into the relay, with configurable alarms and limits for preventive action.

Reduction of Incident Energy

It reduces incident energy by up to 150 times compared to traditional systems, promoting safer and more efficient mitigation.



- Detection via ultraviolet (UV) radiation



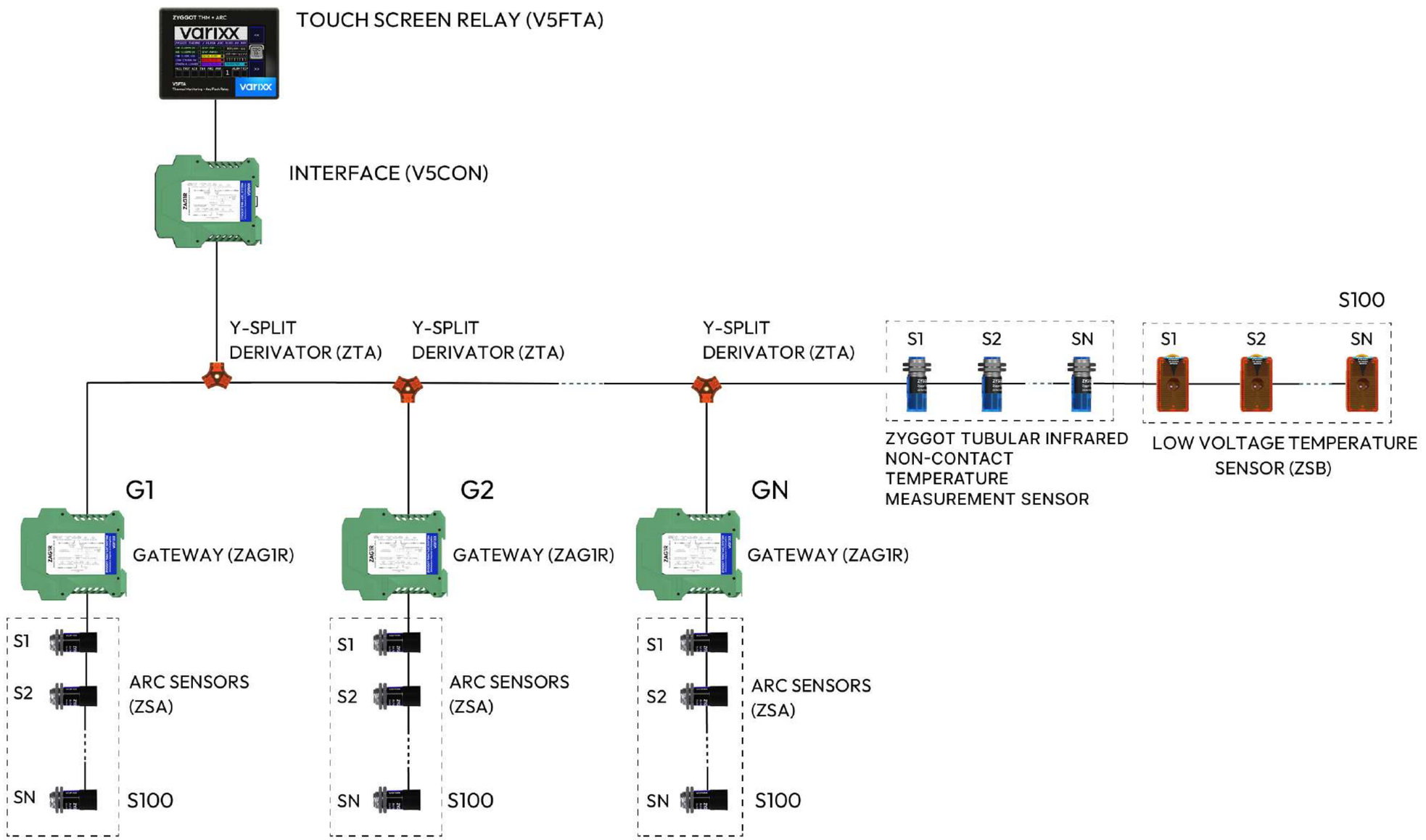
- Accuracy and reliability under electromagnetic interference

- Wide detection area (90°)

Topology operation

Each sensor is equipped with an LED that flashes on command from the relay, making it easy to diagnose and check the address. Differentiated alarm and trip levels for the temperatures of the target and the sensor body (surrounding air) allow the protection system to be optimized. Each relay is capable of monitoring up to 100 THM sensors.

The relay automatically identifies sensors that are not responding and monitors the supply voltage level to each one. This makes it possible to detect problems in the network, such as wiring beyond the permitted length.



ZYGGOT V5FTA and V5CON Relay Connection

The **V5CON** interface is designed to make it easy to connect the **ZYGGOT V5FTA** relay to the sensor network and power supply. It also incorporates the sensor network termination resistor at the end of the relay and two **RS232C** to **RS485** converters, optimized for long-distance communication. It must be installed on a quick-fix rail from the base, in the same cubicle as the **ZYGGOT relay.**

RELAY V5FTA THM+ARC

Power Supply: 24 Vdc	Input:
Capacity: Up to 100 sensors	4 analog
Target temperature: 0 to 300ºC	4 digital (12 to 24 Vdc)
Communication: Modbus RTU	Outputs: 2 Alarm and Trip outputs
Devicenet (optional)	(N.A)
Ethernet TCP-IP (optional)	2 Programmable outputs (N.A)
	1 Output for connection to sensors

V5CON

Power supply: 24 Vdc	Input: 4 analog
Capacity: Up to 100 sensors	4 digital (12 to 24 Vdc)
Target Temperature: 0 to 300ºC	Outputs:
Communication: Modbus RTU	2 Alarm and Trip outputs (N.A)
Devicenet (opcional)	2 Programmable outputs (N.A)
Ethernet TCP-IP (Optional)	1 Output for connection to sensors

System Characteristics

Sensors

Temperature Sensors:
Up to 100 non-contact temperature sensors, with communication via RS485 network and mini USB connections.

Arc Sensors:
Up to 100 arc sensors by UV detection on a CAN network.

Intelligence and Power:
Intelligent sensors powered by the network itself.

Measurement angle:
7° for temperature sensors (tubular sensor) and 90° for arc sensors.

Location LED:
Each sensor has a flashing LED that can be triggered by the relay to make it easier to locate and identify it on the network.

Interface and Communication

Relay with Display:
Relay with graphic color touch screen display and support for communication Modbus and Ethernet communication.

Fault History:
Fault history storage with “Time Stamp” for accurate records.

Applicability

Suitable for low and medium voltage.

Monitoring and Protection

Temperature:
Continuous temperature readings for over-temperature protection of up to 100 point targets or areas, plus up to 100 ambient/air temperature readings.

Arc Flash:
Arc Flash protection with up to 40 Gateways, each with up to 100 sensors per UV detection.

Inputs and outputs:
4 analog inputs for monitoring variables and
4 programmable digital outputs.

Operating modes:
Operation in “Fail Safe” mode for greater safety.

Additional monitoring:
Monitoring of external faults and sensor status.

Ethernet protocols

TCP/IP (Modbus Slave): Modbus over Ethernet.

Ethernet/IP: ODVA CIP over Ethernet.

FTP: File Transfer Protocol.

ASCII over TCP/IP: ASCII data over Ethernet.

NTP Protocol: Network Time Protocol.

HTTP (Web Server): Hypertext Transfer Protocol for a web server.

ZYGGOT Arc Integrated Sensors

Arc Flash Protection System

ZYGGOT Arc sensors do not need to read current and provide protection by detecting the ultraviolet radiation produced in any arc before visible light (which is associated with the air expansion phase and overheating).

UVA Sensor

For applications in sheltered environments up to 3kV.

UVB Sensor

For applications in unsheltered environments or above 3kV.

Sensor specification

- Power supply: 24 Vdc via standard cable
- Opening angle: 90º
- LED monitoring: Location and faults
- Detection range: UVA radiation (240 to 340 nm)
- Applicability: Panels and sheltered environments

Sensor specification

- Power supply: 24 Vdc via standard cable
- Opening angle: 90º
- LED monitoring: Location and faults
- Detection range: UVB radiation (220 to 320 nm)
- Applicability: Panels, open environments or weather monitoring of equipment

ZYGGOT Integrated Temperature Sensors

• Online Continuous Thermographic Monitoring

Designed for low and medium voltage panels. Each sensor measures two temperature levels: that of the monitored point and that of the surrounding air, allowing fault detection in places not usually measured with indirect heating.

Tubular Sensor

It continuously monitors the temperature in low and medium voltage electrical panels and other critical connections, measuring the temperature of the specific point and the surrounding air.

BT Sensor

Designed for low-voltage electrical panels that require many sensors in small spaces, with many critical points and connections for thermography.

Sensor Specification

- Power supply: 24 Vdc
- Measuring angle: 7º
- Target temperature: 0 to 300ºC
- Ambient temperature: 0 to 75 ºC
- Communication: Modbus RTU
- Emissivity: Adjustable (0.95 standard)
- Accuracy: +/- 2.5% F.S

Sensor Specification

- Power supply: 24 Vdc
- Measuring angle: 60º
- Target temperature: 0 to 120ºC
- Ambient temperature: 0 to 75 ºC
- Communication: Modbus RTU
- Emissivity: Adjustable (0.95 standard)
- Accuracy: +/- 2.5% F.S

Importance of Independent Systems

ZYGGOT® Temperature

Ideal for customers looking exclusively for continuous thermographic monitoring in real time, accurately meeting the needs of diagnosing and preventing thermal faults in electrical assets. Its non-contact online thermography technology guarantees reliable and safe operation without the need for additional resources.

ZYGGOT® Arc

It stands out as a robust solution for arc detection, protecting panels and equipment against the risks associated with arc faults. It is particularly suitable for installations where the priority is immediate protection against short circuits and arcs, without the need for thermal monitoring.

While **ZYGGOT THM+ARC** represents a technological breakthrough by integrating the **ZYGGOT** Temperature and **ZYGGOT** Arc systems into a compact and versatile solution, it is important to note that the stand-alone versions of these systems remain highly effective options with great added value for various applications.

Both systems allow for a modular and flexible approach, fitting perfectly into projects that don't require the full integration offered by **ZYGGOT THM+ARC.** This versatility ensures that customers can choose customized solutions, whether to simplify implementation, optimize costs or meet specific safety and monitoring requirements. Thus, **ZYGGOT Temperature** and **ZYGGOT Arc** remain reliable, safe and high-quality options in line with Varixx's values, complementing the company's portfolio with specific solutions that meet varied market demands.

varixx USA

VISIT OUR WEBSITE AND FIND OUT MORE ABOUT OUR SOLUTIONS.

Varixx has been developing high-tech products since 1976. Its know-how in power electronics has always enabled it to offer a wide range of products that have become known for their innovation, long service life and quality. The holder of numerous technological patents, Varixx strives to introduce functional and intelligent concepts to the domestic market and throughout the world.

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