2026

EXPRESS CATALOG

Peace of Mind with Electrical Protection

MICROENER

PEACE OF MIND ELECTRICAL PROTECTION

MICROENER offers a **complete** range of features and hardware options to meet your protection, automation, and control needs for high-voltage and extra-high-voltage electrical networks. Our **wide range of products** ensures you get the **best solution** for your application. We also offer **customized products** to meet the needs of the most demanding users, providing **flexibility**, **interoperability**, and **security**.

For over 25 years, **MICROENER** has been offering intelligent electronic relays for the protection and control of medium and high voltage electrical networks. **MICROENER's** product families are based on expertise gained from over 60 years of experience in the field of protection relays.

SMARTLINE and PROTECTA range relays

The relays in the A, N-DIN, M, MC, and ULTRA_M ranges are no longer available. As explained later in this document, they have all been replaced, without exception, by relays in the **SMARTLINE** and **PROTECTA** ranges.

The **multifunction** relays in the **SMARTLINE** range have been designed for use as primary or backup protection in public and industrial electrical networks. This range includes two families of protection relays: the **S16** and **S24** series. These devices form an optimized range of protection, monitoring, and control functions in a **disconnectable** enclosure, designed for flush, semi-flush, or DIN rail mounting.

The **multifunction** relays in the **PROTECTA** range are made up of modular elements. This design makes it possible to obtain a fully customized solution to meet user requirements. The relays in this range are available in 9½" or 19" racks. They are designed for all types of mounting (flush-mounted, cabinet-mounted, surface-mounted with front or rear connection, semi-flush-mounted).

All relays in the **PROTECTA** and **SMARTLINE** ranges are unique in that they are made up of the same electronic cards and **Software Function Blocks** (SFBs). These **SFBs** enable quick and easy assembly in production to obtain the desired protection relay functions. The corresponding electronic cards are combined and assembled according to the **SSFs** required for protection. This particular configuration of SSFs and electronic cards ensures high reliability for the firmware embedded in the protection devices and the electronics, as they are common to all devices and therefore widely distributed.

Depending on requirements, all relays in these two ranges can be equipped with a color touch screen. An integrated **web server** is standard equipment on the **PROTECTA** and **S24** ranges of protection devices.

The predefined factory configuration can be adapted to user specifications using the powerful **EuroCAP** tool.

The **Express Catalog** provides a summary of all the **equipment and services** we offer to electrical contractors. It gives a quick overview of the scope of our offering.

You will therefore find a brief description of all our protection relays, automation systems, control systems, and services. There is also a presentation of measurement, metering, signaling, alarm, and protection systems designed for low voltage applications.

Detailed and comprehensive documentation for each product family is available on our website: www.microener.com

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POWER PLANTS, SUBSTATIONS & INDUSTRIES

RELAYS FOR PUBLIC AND INDUSTRIAL DISTRIBUTION

The M and ULTRA M ranges

Although **no longer available, UMWH** and **UM30/A** relays are still authorized for use in delivery substations on distribution networks managed by ENEDIS.

The **UMWH** relay (C13-100) is used as general protection for public distribution networks with compensated or impedance neutral. It is subject to Temporary Authorization for Use (ATE) No. 22E201.

The **UM30/A** relay (C15-400) is used as decoupling protection. It is subject to Temporary Use Authorization (ATE) No. 23B021. The **S24/U** relay is set to replace it in the first few weeks of 2026.

The Smartline and Protecta ranges

The relays in these **two ranges** replace the relays in the M range, which are now discontinued. The **S24/F** and **DTIVA/F** relays replace the relays in the IM30/A series. The **S24/Fr** and **DTIVA/Fr** relays replace the DM30 and DM33 series relays. The **S24/U** and **DTIVA/U** relays replace the UM and UFD series relays. The **S16/F** relay replaces the N-DIN/F relay.

DTIVA, **S24**, and **S16** relays are configured to protect, control, and monitor the components that make up power distribution and industrial systems, regardless of their topology: radial, looped, or meshed. They are also fully effective on high-impedance networks. In this case, the earth fault current is relatively low. This is the case when distributed generation or loop structures are present. Under these conditions, the choice of relay should be geared towards equipment that requires additional voltage measurements and directional functions.

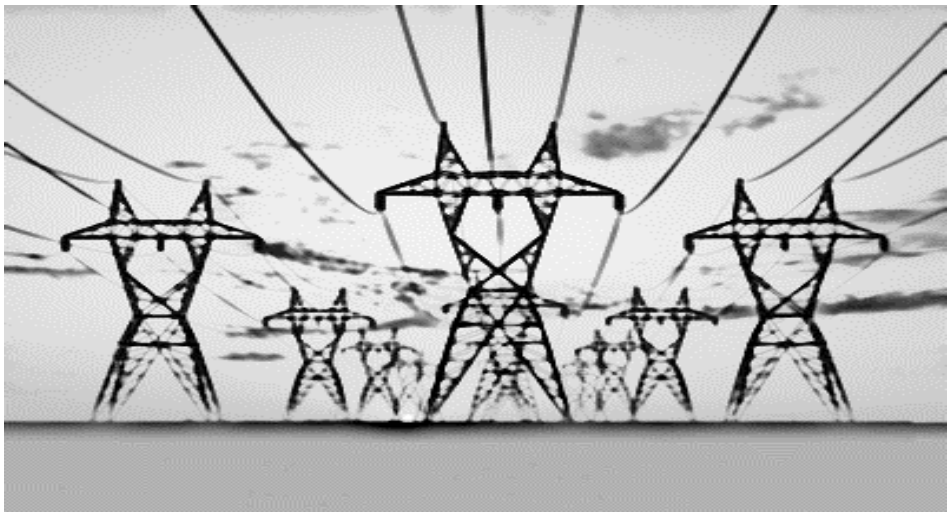
Cable differential protection is also available to protect strategic connections. The use of this type of protection also provides an additional level of selectivity.

Main functions and characteristics

- Basic three-phase-to-ground bidirectional amperometric unit
- Three-phase and zero-sequence directional element
- Basic three-phase earth voltmeter unit
- Specific element sensitive to the detection of high-impedance earth faults
- Element for fault handling with phase separation
- Automatic reclosing function
- "Qualimetry" function with monitoring of voltage variations, voltage imbalances, voltage and current harmonics up to the 19th order (THD and TDD)

Applications

- Protection of radial or looped networks
- Protection for wind farms and solar farms
- Primary or backup protection for transmission, distribution, industrial, and tertiary networks
- Protection against overvoltage, undervoltage, and voltage imbalances.
- Protection against frequency variations
- Basic protection for transformers or busbars
- Automatic reclosing



Overcurrent protection selection table

S16/DT	S16/F	S24/F	S24/FR
 Three-phase directional earth relay **50/51, 50N/51N, 67N**	 Three-phase earth relay **46, 49,50/51, 50N/51N**	 Three-phase bidirectional earth relay **46, 49 50/51, 50N/51N, 79**	 Directional three-phase earth relay **50/51, 67, 50N/51N, 67N, 79**
DTIVA/F	**DTIVA/D**	**DTIVA/FR**	
 Three-phase bidirectional earth relay **46, 49, 50/51, 50N/51N, 79**	 Three-phase directional earth relay **50/51, 50N/51N, 67N**	 Three-phase directional earth relay **27, 50/51, 50N/51N, 59, 59N, 67, 79, 81, df/dt (81R)**	

Color code		
Smartline S16 range	Smartline S24 range	Protecta range

Earth fault protection selection table

S16/F	S16/DT	S16/U	S24/HZ
			
Bidirectional zero-sequence current relay **50N/51N**	Directional zero-voltage current relay **67N**	Homopolar voltmeter relay **59N**	Restricted earth relay **87REF**

Table for selecting protection against voltage and frequency variations

S24/Fr	S24/U	DTIVA/U	DTIVA/Fr
			
Three-phase earth voltage relay **24, 27, 47, 59, 59N, 78VJ, 81, df/dt (81R)**	Three-phase earth voltmeter relay **27, 59, 59N, 60V, 81, df/dt (81R)**	Three-phase frequency relay **27, 59, 59N, 81, df/dt**	Three-phase earth relay **27, 47, 59, 59N, 81, df/dt**

S16/U

Three-phase earth voltmeter relay **27, 59, 59N, 78VJ, 81, df/dt (81R)**

RELAYS FOR RENEWABLE OR TRADITIONAL POWER PLANTS

For self-producers feeding into the distribution network in parallel, our relays are used for a wide variety of applications, such as protecting **the decoupling** of power plants from the grid and **limiting the inrush currents** of power transformers in order to limit voltage drops at the delivery point.

The M range

The **UM30/A** relay provides decoupling protection in accordance with note PRO-RES_10E published by ENEDIS. It is covered by Temporary Use Authorization (ATE) No. 23B021 for functional use as decoupling protection of types H1, H2, H3SEI, H4, H5, B1, and F1. The pre-wired enclosure is the solution chosen by the vast majority of our customers.

This, along with the mini-rack presentation, facilitates the integration and use of decoupling protection in electrical diagrams.

Main functions and features

- Wind farms
- Micro power plants
- Solar or photovoltaic power plants
- Wood, biogas, and biomass power plants
- Diesel, gas, and fuel oil power plants
- Combined cycle power plants
- Cogeneration plants

The Protecta range

When transformers are powered up, there is always a risk of transient overcurrents. The main consequence of this transient phenomenon is a voltage drop at the transformer connection point. The magnitude of this voltage drop will depend on the value of the overcurrent, the source impedance at the moment of power-up, the residual voltage of the transformer at the same moment, and the moment of contact between the poles of the transformer's power supply circuit breaker.

TRIM/POW relays are equipped with two three-phase voltmeter units and an ammeter unit (optional) which measure, via reducers, the voltage and current present at the primary and secondary terminals of an EHV or HV transformer. Using this equipment, it limits the inrush current, and therefore the voltage drop at the delivery point, when the transformer at the delivery substation (PDL) or transformer substation (PTR) is switched on.

The Smartline S24 range

The **S24/U** relay, which is currently undergoing Authorization for Use (ATE), is set to replace the UM30/A relay in the coming weeks.

Main functions and features

- Limitation of the switching current of transformers and reactors
- Minimization of voltage drop at the supply point

Protection selection table for self-producers

UM30/A	GTE cabinets	GTE cabinets with reclosing
		
ENEDIS-approved decoupling protection **27, 59, 81, 59Vo, 68, 86**	Decoupling box compliant with NOI_RES_10E (GTE2666) and C15-400 **27, 59, 81, 59Vo, 68, 86**	Decoupling box compliant with NOI_RES_10E (GTE2666) and C15-400 **27, 59, 81, 59Vo, 68, 86**
TRIM/POW	**S24/U**	
		
Power transformer inrush current limiter **POW, SSC**	Decoupling protection **B1, H1, H2, H3.1, H4, H5, F1** **Qualification in progress**	

RELAYS FOR SYNCHRONOUS MACHINES

The Analog range

As mentioned in the previous pages, the A Range relays designed to protect synchronous machines **are no longer available**. All their features have been integrated into our digital solutions except for the "rotating diode fault" function, which is no longer available at all.

The Smartline and Protecta ranges

Main functions of analog relays integrated into digital relays

- 100% stator ground fault function
- Rotor ground fault function
- Restricted ground function
- Temperature measurement using RTD probes
- Analog inputs and outputs possible

The **PROTECTA** and **SMARTLINE** ranges offer generator protection tailored to each application

Protecting a generator is a complex task, as many special conditions must be taken into account during operation. Our protection relays cover all the functions of generator protection, block generators, and auxiliaries.

With their basic and optional features, the devices in the **PROTECTA** range are suitable for small, medium (50-100 MVA), and large (>100 MVA) generators.

Basic functions include standard protection against overcurrent, voltage variations, frequency variations, as well as protection against controlled voltage overcurrent, loss of excitation, and power feedback.

Optional protection against rotor ground faults, 100% stator ground faults, and internal machine faults is available.

The **S24/G** relay from the **SMARTLINE** range replaces the obsolete MG30, MG30/I, IM30/G, and IM3/GV solutions. The **S24/DG** relay is the perfect replacement for the MD32/G relay.

Also in this range, the **S24/Fr** relay effectively protects small power generation sources that do not require the differential function (mainly photovoltaic applications).

Main functions and features

- Differential protection;
- Protection against motor running;
- Protection against unintentional/accidental energization (incorrect connection);
- Thermal protection against overcurrent and current imbalances;
- Protection against loss of excitation
- Protection against voltage-dependent overcurrents (equivalent to a minimum impedance);
- 100% protection against stator ground faults (based on the 3rd harmonic of voltage)
- Protection against rotor ground faults (isolated or not);
- Protection against interturn faults (based on voltage for single-winding generators and on current for double-winding generators)

Protection selection table for synchronous machines

S24/G	S24/DG	DGEN/2	DGEN/2T
 Generator protection **27, 32, 37, 40, 46, 47, 49 50/51/67, 64S/67N, 51V, 59, 59N, 60, 68, 78VJ, 81, df/dt (81R)**	 Alternator differential protection **51, 64S, 87G**	 Generator protection **24, 27, 40, 46, 47, 50/51, 50N/51N/64S, 51V, 58, 59N, 60, 78, 81, 81R, 87G, 87N**	 Generator protection **24, 27, 40, 46, 47, 50/51, 50N/51N/64S, 51V, 58, 59N, 60, 78, 81, 81R, 87GT, 87N**
DGEN/2TS	**DGEN/3T**	**DGEN/3TS**	**CTT8**
 Generator protection **24, 25, 27, 40, 46, 47, 50/51, 50N/51N/64S, 51V, 58, 59N, 60, 78, 81, 81R, 87GT, 87N**	 Generator protection **24, 27, 40, 46, 47, 50/51, 50N/51N/64S, 51V, 58, 59N, 60, 78, 81, 81R, 87GTA, 87N**	 Generator protection **24, 25, 27, 40, 46, 47, 50/51, 50N/51N/64S, 51V, 58, 59N, 60, 78, 81, 81R, 87GTA, 87N**	 Temperature relay 8 PT100 probes **26**
ASZKG			
 Synchronous coupler **13, 15, 18, 25, 27, 27R, 55, 59, 81, 90**			

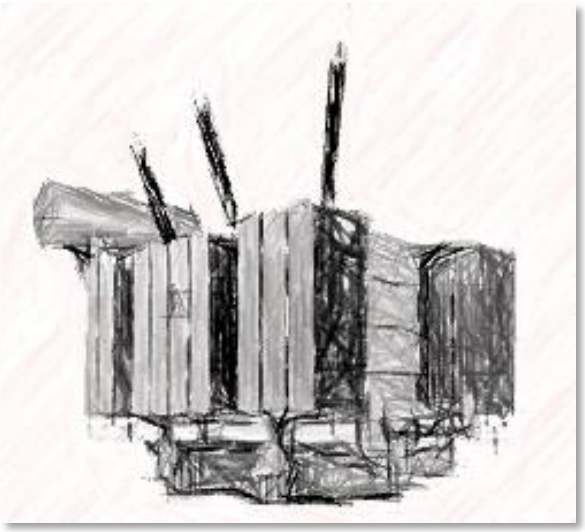
RELAYS FOR THE PROTECTION, CONTROL, AND REGULATION OF TRANSFORMERS AND REACTORS

The Analog and ULTRA M ranges

As mentioned in the previous pages, the A and ULTRA_M range relays designed for transformer protection **are no longer available**. All their features have been integrated into our digital solutions.

The Smartline and Protecta ranges

The **S24/T** relay in the **SMARTLINE** range is a differential protection device for power transformers. It replaces the MD32/T relay. The **DTRV/T3** relays in the **PROTECTA** range for three-winding transformers replace the MD33/T relay. Finally, the MTR33 voltage regulators are replaced by the **DTRV/TR**.



These specialized devices are designed to be the primary protection and control relays for **two- and three-winding** power transformers, including **autotransformers** and special **railway** transformers. The relays offer a variety of versatile protection functions in addition to the main transformer differential function, such as protection against phase overcurrents, ground faults, and current imbalances, thermal overload protection, restricted ground fault protection, etc. They can also be used as backup protection relays for downstream equipment (e.g., power lines, cables).

The voltage regulator function can be integrated into the protection in a dedicated device.

Main functions and features

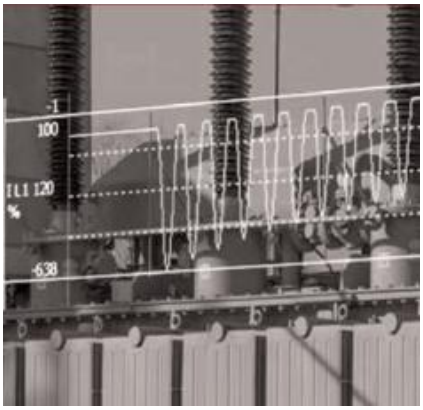
Differential protection for three-phase transformers:

- Automatic compensation for phase shift and transformer transformation ratio;
- Limitation of harmonics 2 and 5 related to transformer inrush current and detection of over-excitation (overvoltage);
- Residual current elimination function if there is a grounded neutral transformer in the protected area on the secondary side of the transformer;
- Sensitive and restricted protection against ground faults;

Several voltage-based protection functions are available

- Voltage regulation with automatic tap changer controller (integrated in the protection relay or voltage regulator): For up to 4 transformers in parallel, depending on the type of transformer.
- Minimum circulating current or master-slave principles; for a maximum of 4 transformers in parallel, depending on the type of transformer.
- Binary input coding type: binary, BCD, Gray;

- Optional external units:
    - Tap changer transceiver: 28 inputs / 5 outputs (TRCS);
    - Remote I/O unit (RIO);
    - Optional transducer I/O (RTD/mA);
    - Optional impedance-based protection.



Without our **TRIM/POW** relay, energizing transformers always carries a risk of transient overcurrents. In a transformer, the remanent flux and saturation characteristics of the iron core can further increase transient currents. The resulting overcurrents place high stresses on the insulation and mechanical structures of the equipment, accelerating their aging. In addition, these transients can induce faults and unintended operation of protective devices in the electrical system.

The most effective way to deal with these problems is to eliminate the root cause: finding the optimal moment to energize the system. The purpose of the **TRIM/POW** relay with its **controlled switching** function (SSC) is to find this moment and delay the circuit breaker closing command accordingly. **The point-of-wave switching** (POW) function is intended, among other things, for managing the power-up of transformers and reactors.

Main functions and characteristics

- Limitation of the inrush current of transformers and reactors
- Minimization of voltage drop at the supply point
- Optimizes the service life of power transformers
- Optimizes the selectivity of installation protections
- Point of Wave (POW) switching function can be integrated into transformer protection

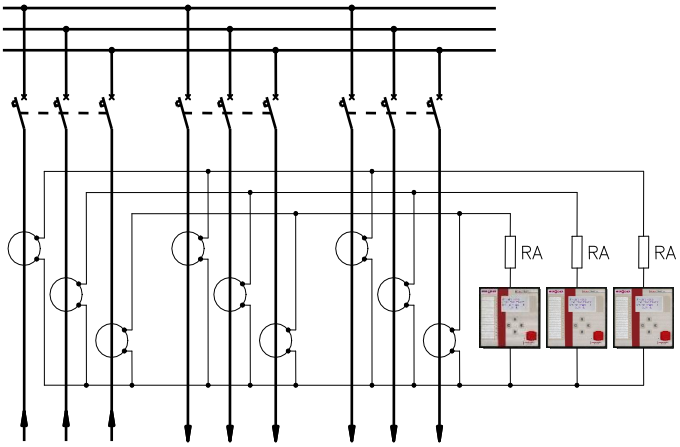
Selection table for transformer protection and reactors

S24/T	TRIM/POW	DRL	DTRV/TZ
			
Transformer protection relay **50/51, 50N/51N, 68, 46, 49, 87T, 50BF**	Power transformer or reactor inrush current limiter **POW, SSC**	Compensation coil management system (Pertersen coil) **90**	Three-phase earth relay for power transformer protection **51, 51N/67N, 21, 46, 87N, 59, 27, 59N, 24, 60**
DTRV/T2	**DTRV/T2V**	**DTRV/T2R**	**DTRV/T3**
			
Differential relay for protecting transformers with two windings **50/51, 50N/51N, 46, 49, 87T, 87N, 60, 50BF**	Complete relay for protecting transformers with two windings: **50/51, 50N/51N, 46, 49, 87T, 87N, 59, 27, 59N, 47, 81, 81R, 24, 60, 50BF**	Complete relay and voltage regulator for protecting 2-winding transformers: **50/51, 50N/51N, 46, 49, 87T, 87N, 59, 27, 59N, 47, 81, 81R, 24, 60, 50BF, 90**	Differential relay for protecting 2-winding transformers **50/51, 50N/51N, 46, 49, 87T, 87N, 60, 50BF**
DTRV/T3V	**DTRV/T3R**	**DTRV/TR**	**CTT4**
			
Complete relay for protecting 3-winding transformers **50/51, 50N/51N, 46, 49, 87T, 87N, 59, 27, 59N, 47, 81, 81R, 24, 60, 50BF**	Complete relay and voltage regulator for protecting 3-winding transformers: **50/51, 50N/51N, 46, 49, 87T, 87N, 59, 27, 59N, 47, 81, 81R, 24, 60, 50BF, 90**	Voltage regulator for protecting two-winding transformers **46, 59, 27, 60, 90, AVR**	Temperature relay 4 PT100 probes **26**
S16/F			
			
Three-phase earth relay **46, 49,50/51, 50N/51N**			

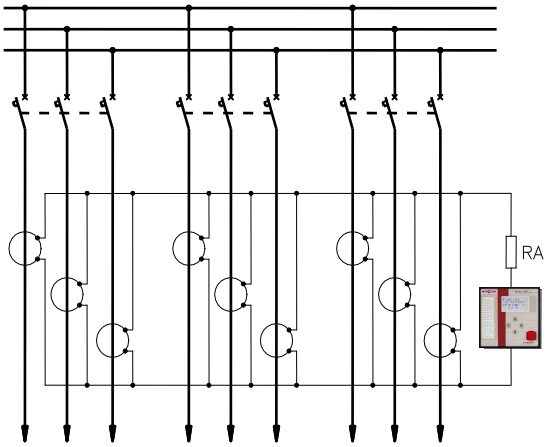
DIFFERENTIAL PROTECTION FOR BUSBARS

The Smartline range

The number of relays used, the busbar configuration, and the auxiliary equipment required depend on the complexity and requirements of the installation. The **SMARTLINE** range offers a simple busbar protection solution with the high-impedance relay: **S24/HZ**.



Three-phase differential protection for busbars



Restricted earth protection for busbars

Main functions and features

- High impedance busbar differential protection
- Protection against earth faults (single-pole)

The Protecta range

The **PROTECTA** range offers two types of busbar differential protection, **OGYD** and **DGYD**, which differ mainly in their structure. They replace the M-LIB3 busbar differential protection.

Decentralized version (OGYD):

The **OGYD** protection from the **PROTECTA** range is specially designed to be the main unit in a decentralized busbar protection system. It has low impedance to protect busbar networks with up to 30 bays.

In this version, other individual unit protection devices (distance protection, overcurrent protection, etc., or possibly dedicated substation computers) are used in the busbar protection scheme as bay units.

Their location in the substation depends on the structure of the primary system bays. These devices measure currents and have access to all busbar protection information.

This information is transmitted via fiber optics to the central unit. Calculations and decisions are made by the central unit, and dedicated trigger commands are sent back to the devices, also via fiber optic links.

Centralized version (DGYD):

The **DGYD** protection from the **PROTECTA** range provides fast and stable centralized protection for busbars in high-voltage substations. It also has low impedance and is mainly used in transmission substations.

If the number of baysconnected to the busbar is a maximum of 6. Tasks related to the busbar differential protection function are performed within a single device.

If there are more than 6 bays, the tasks are distributed among three independent devices. Each of them is responsible for the differential protection of one phase (L1, L2, or L3) of the busbar. This version can also be considered a centralized version.

Main functions and features

- Dynamic replication of the busbar, depending on the status of the disconnectors;
- High stability in the event of external faults, even in the event of CT saturation;
- Short tripping time;
- Selectivity in the event of an internal fault: only the bays connected to the faulty busbar are disconnected. All others remain in operation.
- Easy expansion as the busbar evolves
- Easy adaptation to any type of substation topology
- Simple busbar
- Busbars with transfer bars
- Ring busbar
- Busbar with 1 ½ circuit breakers
- Coupling bars
- Split busbar set with one or two current transformers
- Busbar transfer
- Individual calculations and numerical decisions for each phase;
- Stabilized differential current characteristics;
- Enhanced safety and stability with special software functions:
- Voltage drop condition;
- Condition on the "check zone" to increase protection stability;
- Saturated waveform compensation;
- Integrated "circuit breaker failure" protection using status information processed by the busbar protection to isolate only the section of the busbar where the circuit breaker is faulty.

Busbar protection selection table

S24/HZ	OGYD	DGYD
		
High impedance busbar differential protection **87N**	Decentralized busbar differential protection **87B, 50BF**	Centralized busbar differential protection **87B, 50BF**

LINE AND CABLE PROTECTION

The Smartline and Protecta ranges

The **SMARTLINE** range of protection relays, **S24/L** and **S24/LD**, are ideal for protecting long distribution lines and high-voltage cables. They are used as backup protection for the **PROTECTA** range of distance protection devices.

The **S24/LD** relay replaces the now obsolete MFP/5 differential protection.

Main functions and characteristics

- Minimum impedance protection
- Cable/line differential protection
- Detection of high-impedance earth faults
- Sensitive earth directional function for transient fault detection

The **DTVAs** in the **PROTECTA** range are designed to protect and monitor connections between substations in transmission networks, where the latter are generally operated with a directly earthed neutral. In these networks, single-phase earth faults cause a high fault current, similar to that of polyphase faults; therefore, both types of faults require fast protection functions.

Main functions and features

Five-zone independent distance protection with polygon or MHO characteristic:

- Load encroachment characteristics;
- Analog input processing applied to the zero-sequence current of the parallel line;
- Complex earth fault compensation factor applied for correct measurement of single-phase earth fault impedance;
- Power variation detection function to block the distance protection function in case of stable variations, or generate a trip command in case of loss of synchronism;
- Numerous transfer trip schemes available (PUTT, POTT, DUTT, directional comparison or blocking, etc.)
- Weak infeed processing logic.

Phase-selective line differential protection:

- The adaptive characteristics of the restraint device ensure stability against detection of current transformer saturation;
- Optional redundant communication for two-ended topology;
- Processing of three-ended topologies.
- Optional capacitive load compensation
- The main application is the protection of overhead transmission lines and underground cables (including series-compensated lines);
- Wide range of supported communication schemes: dedicated fiber optic channel, pilot wire, communication networks using G703.1 (64 kbit/s);

- Transformer included or not included in the protected area;
- Single-phase/three-phase tripping and support for stations with two circuit breakers or such as one-and-a-half circuit breaker schemes or stations with a ring architecture;
- Transmission of up to 12 logic signals.

Automatic reclosing up to four cycles:

- Individually adjustable timeouts for each reclosing sequence, separately for single-phase faults and multi-phase faults.

Applications

- Use on overhead lines or cables (including series compensation)
- Single-phase/three-phase tripping and support for double circuit breakers such as ring or one-and-a-half circuit breaker topologies.
- Backup protection for transformers, lines, generators, motors, and busbars
- Automation and control of electrical equipment with synchro control/synchrocheck switching capability;
- Optional decentralized bus differential protection module.

Measurement and recording

- High-capacity event recording with 1 ms time stamping (more than 10,000 events can be stored);
- Integrated disturbance recorder for up to 32 analog signal channels and 64 digital signal channels (sampling rate: 20 or 40 samples/cycle);
- Integrated fault locator;
- Measurement of currents, simple voltages, zero-sequence and reverse voltages, power, energy (import/export), harmonics (current and voltage), symmetrical components (current and voltage), etc.

Control and supervision functions

- Control of electrical equipment with user-defined locking;
- Current transformer supervision;
- Voltage transformer supervision;
- Monitoring of circuit breaker status;
- Integrated trip circuit supervision (TCS).

Furthermore, switching lines and cables on and off is a real problem on transmission lines and cables. The **TRIM/POW** relay is dedicated to these operations (see also the *Digital Control* section later in this catalog).

Line and cable protection selection table

S24/L	S24/LD	DTIVA/L	DTIVA/Di
			
Line protection relay **21, 50/51/67, 50N/51N/67N, 68, 46, 49, 27, 59, 59N, 47, 81, 81R, 25, 79, 50BF**	Line differential relay **87L, 50/51, 50N/51N, 68, 46, 49, 79, 50BF**	High voltage line protection **50/51/67, 50N/51N/67N, 21, 27, 59, 59N, 47, 81, df/dt, 68, 46, 49, 79, 60, 50BF, 32**	High voltage line differential protection: **50/51/67, 50N/51N/67N, 87L, 27, 59, 59N, 47, 81, df/dt, 68, 46, 49, 79, 60, 50BF, 32**

DTVA/L	DTVA/DL	TRIM/POW
		
HTB line protection (distance) **50/51/67, 50N/51N/67N, 21, 78, 27, 59, 59N, 47, 81, df/dt, 25, 68, 46, 49, 79, 60, 50BF, 32**	HTB line differential protection: **50/51/67, 50N/51N/67N, 21, 87L, 78, 27, 59, 59N, 47, 81, df/dt, 25, 68, 46, 49, 79, 60, 50BF, 32**	Synchronized power-up **POW/SCC**

PROTECTION RELAYS FOR MOTORS

The Smartline and Protecta ranges

The solutions offered with the **PROTECTA** and **SMARTLINE** ranges are advantageous replacements for N-DIN/MA relay **motor** protection and the MM30 series of the N-DIN and M ranges.

These new protection devices perform a number of special motor protection and monitoring functions. This improves their operation, whether they are powered by electronic starters or not.

Main functions and features

- Motor start monitoring and control
- Locked rotor protection
- Protection against load loss or idling (pump sloshing)
- Protection against voltage variations to prevent instability and loss of motor torque during start-up
- Protection against frequency variations
- Monitoring of the thermal condition of the motor via its thermal image and/or temperature sensors.
- Differential machine protection.
- Synchronous motor protection

Motor protection selection table

S24/F	DTIVA/M	DTIVA/MD
 Three-phase motor protection - bidirectional grounding **50/51, 50N/51N, 68, 46, 49, 37, 48, 66, 50BF**	 Complete three-phase earth relay for asynchronous motors **50/51, 50N/51N, 27, 59, 59N, 47, 27D, 68, 46, 49, 48, 37, 66, 60, 50BF**	 Complete three-phase earth relay for synchronous motors **50/51, 50N/51N, 87G, 27, 59, 59N, 47, 27D, 81, 68, 46, 49, 48, 37, 66, 60, 50BF**
CTT8	**S16/MDT**	**S16/M**
 Temperature relay 8 PT100 probes **26**	 Three-phase motor protection earth - Directional earth **37, 46, 49, 50/51, 48, 59N, 64, 66, 67N**	 Three-phase motor protection - bidirectional earth protection **37, 46, 49, 50/51, 48, 64, 66**

RELAYS FOR CAPACITORS

The Smartline and Protecta ranges

With the **PROTECTA** and **SMARTLINE** ranges, we offer solutions that replace the IM30/C relay from the M range for protecting **capacitor** banks.

The **DTIVA/C** relay is specifically designed for the protection and control of power capacitor banks. In addition to standard current-based protection, this relay has protection functions specially designed to protect capacitor banks. The device is capable of managing and protecting different battery configurations, such as single or double isolated star connection, delta connection, and "H" configuration.

The voltage measurement provided by this relay enables effective protection against overvoltages occurring on the phases or relative to ground.

Another economical solution for protecting capacitor banks is implemented with the **S24/F** relay. This relay provides dedicated functions (in the form of options) for protecting and monitoring the capacitor bank, in addition to its basic functions.

These relays can be combined with the **TRIM/POW** relay to manage the switching off and on of capacitor banks (see also the *Digital Control* section in this catalog).

Main functions and features

- Management of various capacitor bank configurations
- Protection against capacitor imbalances (bridge (H), double star, or delta connection)
- Definition of the compensation characteristic inherent in capacitor bank imbalance to prevent misuse and increase sensitivity
- Protection diagram applicable with or without internal or external fuses on the battery
- Simple protection principle with the S24 series
- Optional voltage measurement is possible for protection and measurement

Capacitor protection selection table

DTIVA/C	TRIM/POW	DTIVA/P
		
Relays for capacitor banks **51, 51N, 60**	Current limiter for capacitor banks **POW/SCC**	Three-phase power earth relay **51, 51N, 27, 59, 59N, 81, 60, 50BF, 32**

SYNCHRONOUS COUPLER & SOURCE SWITCHING

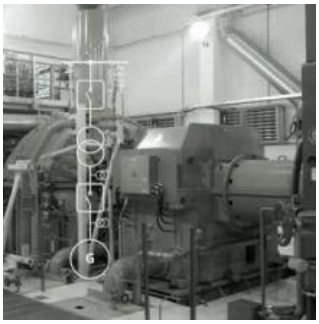
The Smartline and Protecta ranges

The **S24/U** relay from the **SMARLINE** range, equipped with the **synchrocheck** function, replaces the SCM21 relays

Main functions and features

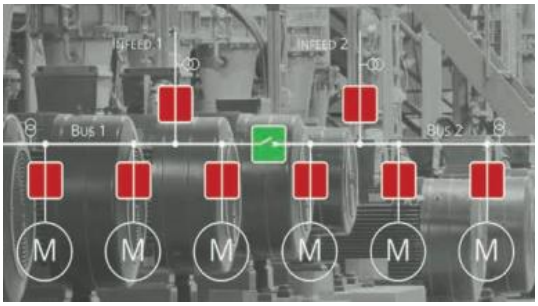
- Allows switching from a normal source to a backup source
- Ensures transfers according to a Make Before Break or Break Before Make
- Cost-effective solution for connecting generators to the grid if an external system generates voltage and frequency information to the machine's controllers.
- Real-time monitoring of voltage, frequency, and phase shift on both sides of the power circuit breaker
- Source transfer initiated manually or automatically

The **ASZKG** relay from the **PROTECTA** range provides an **automatic synchronous coupler** function **for generators** to connect them to the grid or to a dead busbar. It completely replaces the synchronous coupler from the M range: SPM21



Main functions and features

- Synchronization and coupling of any synchronous machine
- Output information to voltage and speed regulators
- Automatically selectable coupling device (CB or busbars)
- User-configurable coupling/shutdown conditions



The **HSBT** relay performs the fast source transfer function. Like the SCX systems it replaces, this relay ensures source transfers in accordance with ANSI C50-41.

It minimizes the switching time between a normal source and its backup source while high-power, high-inertia motors are still connected to the busbar. It allows for the on-the-fly resumption of asynchronous motor power supply in accordance with the standard.

Main functions and features

- Provides reliable, uninterrupted power supply to a set of asynchronous motors
- Suitable for applications operated with a single busbar, double busbar, or more complex configurations
- Guarantees short and fast transfer times (in accordance with ANSI C50-41)
- Guarantees minimal process interruption time
- Real-time monitoring of voltage, frequency, and phase shift on both sides of the power circuit breaker
- Manually or automatically initiated source transfer

The **METRA** relay is a **busbar power transfer** system. It provides a high level of power availability by switching and organizing the power supply to the busbar of a high-voltage substation.

This system was developed to automatically switch the power supply of high-voltage substations in the event of a failure of one of the network components. The transfer is initiated by a series of events triggered by logic inputs and the position of the substation's switching devices.

Main functions and features

- Automatic transfer in the event of an internal fault or loss of power to primary equipment
- Secure control and switching between power supplies
- Manually initiated transfer

Synchrocheck and synchrocoupler selection table

S24/U	HSBT	ASZKG	METRA
 Synchrocheck **27, 59, 59N, 81, df/dt (81R), 25**	 Fast source transfer **25, 27, 27R, 59, 81**	 Synchrocoupler **13, 15, 18, 25, 27, 27R, 55, 59, 81, 90**	 Synchrocheck **25, 27, 27R, 59, 81**

RAILWAY INFRASTRUCTURE

RELAYS FOR RAILWAY INFRASTRUCTURE

Applications for conventional trains and high-speed trains

In addition to applications for distribution networks, the **PROTECTA** range offers a protection solution specifically designed for AC-powered catenary systems.

The **DRFP** catenary protection relay is designed to monitor single-phase AC traction power supply systems (16 2/3 Hz; 50 Hz).

Main functions and characteristics

- Non-directional basic protection against overcurrents;
- Distance protection supplemented by remote protection and fault detection;
- Integrated fault locator;
- Constant-time protection against overvoltage and undervoltage;
- Automatic reclosing

Applications: Subways and Tramways

The **TFPR** relay is a multifunction digital protection device combining measurement, control, and protection for DC traction power supply management.

It is suitable for all traction systems such as trams, trolleybuses, subways, and power supply substations for railway infrastructure. It complies with the most stringent international standards. It is equipped with a graphic touch screen and a very user-friendly HMI.

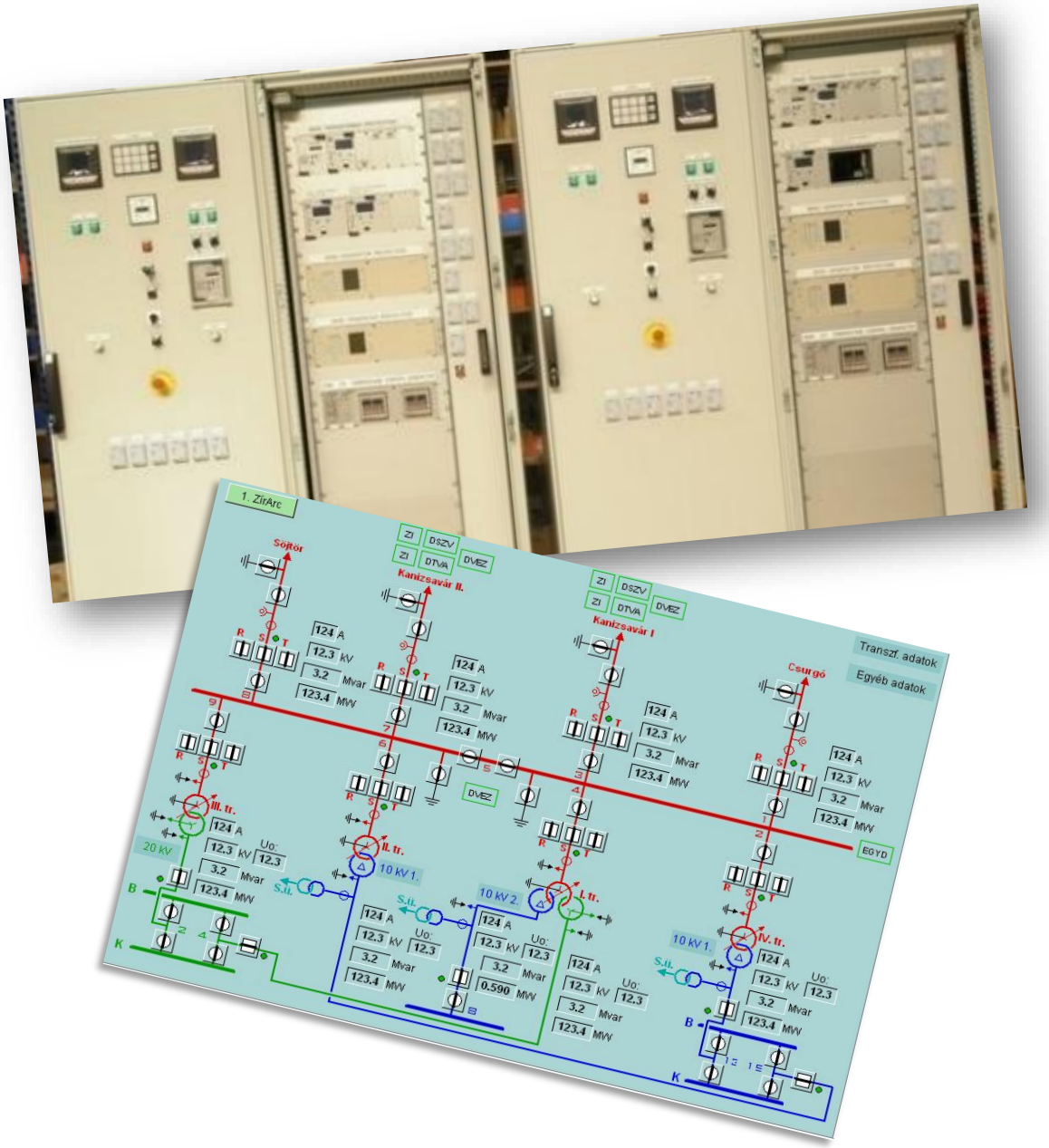
Main functions and features

- Measuring transducer connected by fiber optics to the measuring units;
- Remote fault detection;
- Line test function;
- Numerous opto-isolated logic inputs;
- Ethernet port for IMH or Modbus TCP/IP;
- IEC 61-850 port (optional);

Railway protection selection table

TFPR	DRFP
 Remote fault detector **DDL, di/dt, Di, 45, 76, 49**	 High-voltage catenary protection **21, 27, 49, 50/51, 59, 79, 85**

CABINETS & SYSTEMS



DIGITAL CONTROL

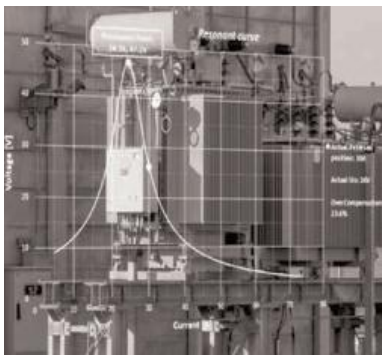
The Protecta range

DVEZ systems are used when substation computers are required to perform automation functions in transmission and distribution substations.

They enable complete control of all types of switching equipment, including interlocking functions and other automation systems necessary for the operation of installations.

Main functions and features.

- Comprehensive measurement solution (U I F P Q, S, power factor, energy, etc.)
- Electrical equipment interlocking
- Support for 3-position disconnectors
- Includes "circuit breaker failure" function
- "Qualimetry" function with monitoring of voltage variations, voltage imbalances, voltage and current harmonics up to the 19th order (THD and TDD)
- Automatic reclosing function for HTA and HTB networks
- Load shedding operations
- Up to 128 logic inputs and 96 output relays
- Analog inputs (4-20mA or 0-10V) for connection to transducers
- PT100 temperature sensor inputs
- Synchrocheck function (optional)
- Remote signaling and remote control (optional)
- Voltage regulation function (AVR)/Tap changer (optional)



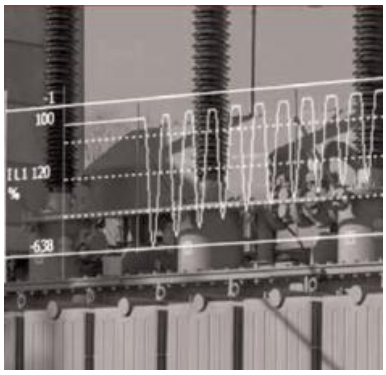
The **DRL** system enables complex, automatic control of Petersen coils.

It thus eliminates electric arcs associated with compensated neutral systems. It can be used on networks subject to ferroresonance, automatically adjusting to the value of the compensation coil.

Main functions and features

- Automatic control of arc suppression on compensated neutral networks
- Use of current injection for measurement
- Measurement of zero-sequence voltage to detect the presence of ground faults in the network
- Possibility of controlling several coils in parallel on the same network with communication between DRLs

The **TRIM/POW** provides switch-controlled functionality (SSC) to control the switching on and off of lines and cables, capacitor banks, transformers, and shunt reactors.



Switching off at a random time can cause overvoltages and flashovers due to the power cut or because the distance between the circuit breaker terminals is too small. The most effective way to deal with these problems is to eliminate the root cause: finding the optimal moment for closing and opening. The goal of Point of Wave Switching (POW) is to find this moment and delay the circuit breaker's closing and opening commands accordingly.

Main functions and features

- Uses the principle of wave point switching (POW)
- Works with all types of circuit breakers (single-pole or three-pole).
- Taking into account the nature of the neutral system of the installation in the power-on/power-off algorithms.

SIRACUS reconfiguration device

The Automatic Isolation and Re-energization System for a network with an open break in a satellite station: **SIRACUS**

SIRACUS is an automatic reconfiguration system for an electrical loop operated in open-circuit mode. **Five** solutions are available to meet your **budget** and **operational** requirements.

Main functions and features

- **SIRACUS1**: Designed to work with any type of protection relay and fault indicator (even those from our competitors).
- **SIRACUS2**: Designed to be installed on networks equipped with both circuit breakers and switches fitted with our protection relays and fault indicators.
- **SIRACUS2+**: Same as SIRACUS2, with the addition of extended operating and analysis features.
- **SIRACUS3 and 3+**: Spread your budget over time with the third-generation decentralized solution.

MYOSOTIS supervision system

The **MYOSOTIS** software enables the supervision and control of a factory electrical network equipped with protection and automation relays supplied by **MICROENER**, whether or not combined with equipment from other manufacturers. The entire system communicates using ModBus RTU, Modbus TCP/IP, and IEC 61-850 protocols.

Main functions and features

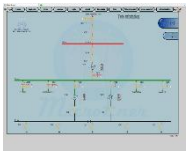
- Implementation of digital control systems
- Renovation or replacement of existing supervision systems,
- Management and supervision of the electrical network from a control station,
- Monitoring of the load profile over time.

Unit cabinets

MICROENER develops and manufactures its own unit cabinets

Control and automation device selection panel

TRIM/POW	DRL	DVEZ	SIRACUS
 Controlled Switching System (SSC/POW) for capacitor banks, shunt reactors, and transformers	 Electric arc suppression controller	 Calculator and substation controller for network management and supervision. Protocols: MODBUS RTU, MODBUS TCP/IP, DNP3, IEC 61-850	 High-voltage loop reconfiguration device

MYOSOTIS	Cabinets
 Network supervision and control system in a Linux environment. Protocols: MODBUS, IEC61-870, IEC61-850	 Cabinet for units, lines, transformers, busbars, reactors, alternators, synchronous machines

MEASUREMENT AND SIGNALING , AND LOW-VOLTAGE RELAYS

INDICATORS AND MEASURING STATIONS

EMM-µD3VA

VOLTMETER / AMPEREMETER
MODULAR VERSION - 3 MODULES

- True RMS voltage and current measurement
- Storage of minimum, maximum, and average values (maximum demand)
- Connection via external CT
- Measurement of average voltage by programming the voltage transformer (VT) ratio
- 2 digital outputs

EMM-µ3VA

VOLTMETER / AMPEREMETER
FLUSH-MOUNTED VERSION - DIN 72x72 mm

- True RMS voltage and current measurement
- Storage of minimum, maximum, and average values (maximum demand)
- Connection via external CT
- Measurement of average voltage by programming the voltage transformer (VT) ratio
- 2 digital outputs

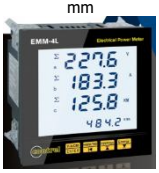
EMM-R3VA

VOLTMETER / AMPEREMETER
FLUSH-MOUNTED VERSION - DIN 96x96 mm

- True RMS voltage and current measurement
- Storage of minimum, maximum, and average values (maximum demand)
- Connection via external CT
- Measurement of average voltage by programming the voltage transformer (VT) ratio
- 2 digital outputs

EMM-4L

DIGITAL LCD MULTIMETER
FLUSH-MOUNTED VERSION - DIN 96x96 mm



- Pulse output
- Backlit LCD screen
- Tool-free panel mounting
- True RMS measurement
- Three-phase digital multimeter
- Standard 96x96 mm flush-mount housing
- Integrated RS485 interface (Modbus RTU)
- Wide selection of electrical measurements, including voltage and current harmonic distortion

EMM-4h

LED MULTIMETER
FLUSH-MOUNT VERSION - DIN 96x96 mm

- 4 LED displays for optimal readability
- Effective (true) value measurements
- 45 measurements
- Active, reactive, and apparent energy meters
- Minimum and maximum values
- Maximum demand
- Digital outputs
- RS485, Ethernet, Profibus DP and LON interfaces for remote control

EMM-µ4h

LED MULTIMETER
FLUSH-MOUNTED VERSION - DIN 72x72 mm

- Compact size: 72 x 72 mm
- 4 LED displays for optimal readability
- Effective (true) value measurements
- 45 measurements
- Active, reactive, and apparent energy meters
- Minimum and maximum values
- Maximum demand
- RS485 communication interface

EMM-R4h

LED MULTIMETER
FLUSH-MOUNTED VERSION - DIN 96x96 mm

- Shallow depth
- 4 LED displays for optimal readability
- Effective (true) value measurements
- 45 measurements
- Active, reactive, and apparent energy meters
- Minimum and maximum values
- Maximum demand
- RS485 communication interface

EMM-4dc

LED MULTIMETER
FLUSH-MOUNTED VERSION - DIN 96x96 mm

- 4 LED displays for optimal readability
- DC measurement
- Total and partial active energy measurement
- Average and maximum values
- Maximum demand
- PT100 temperature input
- Digital outputs
- RS485, Ethernet, and Profibus DP interfaces for remote control

EMM-D4h

LED MULTIMETER
MODULAR VERSION - 6 MODULES

- 4 LED displays for optimal readability
- Effective (true) value measurements
- 45 measurements
- Active, reactive, and apparent energy meters
- Minimum and maximum values
- Maximum demand
- Digital output
- RS485, Ethernet, Profibus DP, and LON interfaces for remote control

EMM-µD3h

LED MULTIMETER
MODULAR VERSION - 3 MODULES

- Compact size
- 3 LED displays for optimal readability
- Effective (true) value measurements
- 45 measurements
- Active, reactive, and apparent energy meters
- Minimum and maximum values
- Maximum demand
- RS485 communication interface

EMS 96

TFT NETWORK ANALYZER
FLUSH-MOUNTED VERSION - DIN 96x96 mm

- High precision
- Digital power analyzer
- True RMS measurements
- Color TFT display, 320x240 pixels
- Reading of over 500 electrical parameters
- Voltage and current harmonic analysis up to the 21st order
- Event storage and management
- Advanced programmable I/O functions
- RS485, Ethernet, and Profibus DP interfaces for remote control

EMA D9

LCD NETWORK ANALYZER
MODULAR VERSION - 9 MODULES

- Digital power analyzer
- Graphic LCD display, 2 x 20 characters
- True RMS measurements
- Voltage and current harmonic analysis
- Event storage and management
- Advanced programmable I/O functions
- RS485 communication interface

EMA 11

LCD NETWORK ANALYZER
FLUSH-MOUNT VERSION - DIN 144x144 mm

- Digital power analyzer
- Color LCD screen, 128x128 pixels
- True RMS measurements
- Voltage and current harmonic analysis up to the 31st order
- Event storage and management
- Advanced programmable I/O functions
- RS485, Ethernet, and Profibus DP interfaces for remote control

EMA 14

LED NETWORK ANALYZER
FLUSH-MOUNT VERSION - DIN 144x144 mm

- Digital power analyzer
- 14-segment LED display
- True RMS measurements
- Voltage and current harmonic analysis up to the 31st order
- Event storage and management
- Advanced programmable I/O functions
- RS485, Ethernet, and Profibus DP interfaces for remote control

EMA 90

LCD NETWORK ANALYZER
FLUSH-MOUNT VERSION - DIN 96x96 mm

- Digital power analyzer
- Color LCD screen, 128x128 pixels
- True RMS measurements
- Voltage and current harmonic analysis up to the 31st order
- Event storage and management
- Advanced programmable I/O functions
- RS485, Ethernet, and Profibus DP interfaces for remote control

TRANSDUCERS – ENERGY METERS

EML 16	EMC 3b	EMC D3b
DATA CONCENTRATOR MODULAR VERSION - 6 MODULES  The EML 16 data concentrator offers a pulse collection function and an interface with supervision systems. The EML 16 can be used as a tool for counting the consumption of energy, water, gas, heat meters, etc. It supports RS485 communication and TCP/IP communication.	**THREE-PHASE ENERGY METER** FLUSH-MOUNTED VERSION - DIN 96x96 mm  • Three-phase with or without neutral • Connection via CT/5A or CT/1A • Active energy measurement and accuracy: class 1 • 2 static outputs • 1 digital input • RS485 communication interface	**THREE-PHASE ENERGY METER** MODULAR VERSION - 6 MODULES  • Three-phase with or without neutral • Connection via CT/5A or CT/1A • Active energy measurement and accuracy: class 1 • 2 static outputs • 1 digital input • RS485 communication interface
DVH | DDH | MDVH | MDDH	**WH 6165**	**EMT-4s**
MID-APPROVED THREE-PHASE ENERGY METERS MODULAR VERSION - 6 MODULES  • MID certified • Three-phase with or without neutral • Direct connection or via current transformers • Active energy according to EN 50470-3 class C • LCD screen • Pulse LEDs for active energy consumption • Static output for pulses • RS485 communication interface	**MID-APPROVED SINGLE-PHASE ENERGY METER** MODULAR VERSION - 2 MODULES  • Single-phase • MID certified • Direct connection • Active energy according to EN 50470-3 class C • LCD • Pulse LED for active energy consumption • Static output for pulses	**MEASURING TRANSDUCER** MODULAR VERSION - 6 MODULES  • Power transducer • Version for inside panel • True RMS measurements • High accuracy • Voltage and current harmonic analysis • Advanced programmable I/O functions • RS485 communication interface

ALARM SEQUENCES – SIGNAL LIGHTS

COMPALARM A

ALARM SEQUENCE

RACK VERSION

- Alarm card
- Relay card
- Timing card
- Card holder
- Power supply and flashing card
- Transformers and DC/DC converters
- SQ-type signal cells (with LEDs on request)

COMPALARM AP

ALARM GLASSES - FLUSH-MOUNTED VERSION

- Audible alarm output
- Cumulative alarm output
- 1 extension
- 12 contact inputs
- 4 button inputs (test, audible alarm stop, confirmation, and reset)
- Opto-isolated inputs
- Normally open/closed input contacts
- Low power consumption
- No lamp maintenance required
- Automatic reset power supply fuse
- 4 preselectable sequences: ISA A, ISA M, ISA F1A, and ISA F1

COMPALARM CM

MECHANICAL ALARM GLASSES

FLUSH-MOUNTED VERSION - DIN 96x96 mm

- Up to 6 input channels
- Mechanical signals
- 3 buttons (confirmation, reset, and test)
- 2 output relays

COMPALARM E

DIGITAL ALARM SEQUENCE

FLUSH-MOUNTED VERSION - DIN 96x96 mm

- Event log
- Common repeat relays
- Programmable outputs
- Unit for systems of all sizes
- Color LCD graphic display
- All channels can be programmed from the front panel

COMPALARM C2C

ALARM INDICATOR

FLUSH-MOUNT VERSION - DIN 96x96 mm

- 2 output relays
- Remote keys
- 12 alarm display LEDs
- 3 buttons (confirmation, reset, and test)
- NO or NC alarm input configuration
- ISA alarm sequences: F1M, F3A, F1A, M, R8, M5, and A
- Internal audible device

COMPALARM D2

ALARM INDICATOR WITH VARIABLE MESSAGES

FLUSH-MOUNT VERSION - DIN 96x96 mm

- 16 input channels
- 2 outputs
- Each input channel fully programmable
- User-friendly configuration software
- Real-time clock
- Internal sound device
- RS485 interface (Modbus RTU)
- Ethernet interface (Modbus TCP)

COMPALARM D2m

VARIABLE MESSAGE ALARM INDICATOR

MODULAR VERSION - 6 MODULES

- 16 input channels
- Up to 8 outputs
- Each input channel fully programmable
- User-friendly configuration software
- Output relays
- Real-time clock
- Internal audible alarm
- RS485 interface (Modbus RTU)
- Ethernet interface (Modbus TCP)

COMPALARM GW

GSM-GPRS MODEM - 4 MODULES

- Up to 12 digital inputs
- 2 digital outputs
- SIM card slot
- Backup battery
- GSM connection for sending and receiving text messages
- Programmable SMS texts
- SMS command to activate a relay output
- List of 50 users authorized to send and receive messages
- Network status details

COMPALARM C0/sq

ILLUMINATED INDICATOR FOR FRONT PANEL INSTALLATION

FLUSH-MOUNT VERSION - DIN 48x48 mm

- Number of LEDs: 3 or 4
- Voltage inputs: 24 V AC/DC, 48 V AC DC, 115 V AC, 115 V DC, and 230 V AC
- LED colors: red, yellow, green, blue, white, and orange

COMPALARM C2/sq

INDICATOR LIGHT FOR FRONT PANEL INSTALLATION

FLUSH-MOUNT VERSION - DIN 96x96 mm

- Number of LEDs: 12
- Voltage inputs: 24 V AC/DC, 48 V AC DC, 115 V AC, 115 V DC, and 230 V AC
- LED colors: red, yellow, green, blue, white, and orange
- Test lamps
- Remote test lamp button

COMPALARM C3

ILLUMINATED INDICATOR FOR FRONT PANEL INSTALLATION

FLUSH-MOUNTED VERSION - DIN 72x144 mm

- Number of LEDs: 12
- Voltage inputs: 24 V AC/DC, 48 V AC DC, 115 V AC, 115 V DC and 230 V AC
- LED colors: red, yellow, green, blue, white, and orange
- Remote test lamp button

GROUND FAULT RELAY (DIFFERENTIAL)

ELR-7

FLUSH-MOUNTED VERSION DIN 48x48 mm

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Adjustable IΔN threshold and trip delay
- Configurable integrated safety feature
- Test and reset buttons on the front panel
- Automatic or manual reset

ELR-4 | ELR-4m

DIN 48x96 mm flush-mount version

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset
- Indicator light (type ELR-4m)

ELR-91 | ELR-92

DIN 72x72 mm flush-mount version

- Type A earth leakage relay
- 1 operating threshold
- 2 operating thresholds (type ELR-92)
- External toroidal transformer
- Configurable integrated safety feature (type ELR-92)
- Adjustable IΔN threshold and trip delay
- Pre-alarm LED indicator (type ELR-92)

ELR-1E

DIN 96x96 mm flush-mount version

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset

ELR-2 | ELR-2M

DIN 96 x 96 mm flush-mount version

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Configurable integrated safety feature
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset
- Indicator light (type ELR-2M)

ELR-8V | ELR-8tcs | ELR-8mVtcs

DIN 96 x 96 mm flush-mount version

- Type A earth leakage relay
- 2 operating thresholds
- External toroidal transformer
- Configurable integrated safety feature
- Fault current measurement
- Digital display
- Indicator light
- Adjustable IΔN threshold and trip delay
- Emission trip circuit operation test (TCS)

ELR-1D

MODULAR VERSION 1 MODULE

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset

ELR-3B

TYPE B EARTH LEAKAGE RELAY -
MODULAR VERSION 3 MODULES

- AC, DC, or mixed current measurements, type B (IEC 60755)
- External toroidal transformer
- Parameter programming
- Trigger current (displayed in red when triggered)
- Instantaneous leakage current
- 2 independent programmable outputs (alarm and pre-alarm)

ELR-02

MODULAR VERSION 2 MODULES

- Type A earth leakage relay
- True RMS value
- 1 operating threshold
- External toroidal transformer
- IΔN threshold and adjustable trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset
- LCD screen
- RS485 serial interface (Modbus RTU)

ELR-3C

MODULAR VERSION WITH 3 MODULES

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- IΔN threshold and adjustable trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset

ELR-3F

MODULAR VERSION 3 MODULES

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- Selectable trip threshold (IΔN): fixed 0.3 A or 0.5 A
- Selectable trip delay: fixed 0.02 s or 0.5 s
- Test and reset buttons on the front panel
- Automatic or manual reset

ELR-3E

MODULAR VERSION 3 MODULES

- Type A earth leakage relay
- 1 operating threshold
- External toroidal transformer
- IΔN threshold and adjustable trip delay
- Test and reset buttons on the front panel
- Manual reset

ELR-61 | ELR-m61 | ELR-62 | ELR-m62

MODULAR VERSION 6 MODULES

- Type A earth leakage relay
- 2 operating thresholds
- External toroidal transformer
- IΔN threshold and adjustable trip delay
- Test and reset buttons on the front panel
- Configurable automatic or manual reset
- Pre-alarm LED indicator (type ELR-62)
- Indicator light (type ELR-62)

ELRC-B

MODULAR VERSION WITH 6 MODULES

- Type A earth leakage relay
- 1 operating threshold
- Integrated toroidal transformer
- Configurable integrated safety feature
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Automatic or manual reset
- Pre-alarm LED indicator (type ELR-62)
- Indicator light (type ELR-62)

ELRC-BL | ELRD-L | ELRD-L2m

PUBLIC LIGHTING
MODULAR VERSION 6 MODULES

- Type A earth leakage relay
- 2 operating thresholds
- External toroidal transformer
- IΔN threshold and adjustable trip delay
- Test and reset buttons on the front panel
- Configurable automatic or manual reset
- Pre-alarm LED indicator (type ELR-62)
- Indicator light (type ELR-62)

ELRC-1

COMPACT INTERNAL PANEL VERSION

- Type A earth leakage relay
- 1 operating threshold
- Integrated toroidal transformer
- Adjustable IΔN threshold and trip delay
- Test and reset buttons on the front panel
- Diameter from 35 to 110 mm

GROUND FAULT RELAY (CPI)

RI-F48 | RI-R48 | RI-R48N

PERMANENT INSULATION MONITOR FOR 24-48 V AC/DC NETWORKS

MODULAR VERSION - 3 MODULES

- Insulation monitoring for all 24-48 V AC/DC computer networks
- Manual reset after tripping
- Low insulation LED indicator
- Damaged terminal LED indicator
- Test button
- Setting the trigger threshold

RI-R11 | RI-R11D

NETWORK INSULATION TEST UP TO 230 V DC

MODULAR VERSION - 6 MODULES

- Monitoring of the insulation of computer networks up to 230 V DC
- LEDs for triggering and alarm signaling
- Insulation level
- Damaged terminal indicator LED
- Trigger and alarm threshold adjustment
- Test and reset buttons

RI-R15

NETWORK INSULATION CONTROL UP TO 1000 V DC

MODULAR VERSION - 6 MODULES

- Monitoring of computer network insulation up to 1000 V DC
- Wide range of trigger threshold settings
- Secure relay for continuous monitoring even in the event of a power failure
- Remote testing and resetting possible with a button
- Visual indication of network status and polarity faults

RI-F22 | RI-R22 | RI-R38

NETWORK INSULATION TEST UP TO 440 V AC

MODULAR VERSION - 3 MODULES

- Insulation monitoring up to 440 V AC
- Reset button (only for RI-R22 and RI-R38)
- Device operation indicator
- Low insulation LED indicator
- Test button
- Trigger threshold adjustment (only for RI-R22 and RI-R38)

RI-R44-485 | RI-R44-V-485

NETWORK INSULATION TEST UP TO 440 V AC

MODULAR VERSION - 2 MODULES

- LCD
- Manual reset
- Low insulation LED indicator
- Insulation monitoring for systems up to 440 V AC
- Test button
- Trigger threshold adjustment
- Output relay
- RS485 serial interface (Modbus RTU)

RI-R60

ELECTRICAL NETWORK INSULATION MONITORING UP TO 1000 V AC

MODULAR VERSION - 6 MODULES

- Insulation monitoring up to 1000 V AC
- Dual monitoring threshold for more effective fault prevention
- Dual secure relay for effective system control and continuous monitoring even in the event of a power failure
- Instant display of insulation level
- Remote testing and reset possible with a button
- Visual indication of network status

RI-SM | RI-SM-485

OFF-VOLTAGE NETWORK ISOLATION CONTROL

MODULAR VERSION - 2 OR 3 MODULES

- Device operation indicator
- Test button
- Low insulation LED indicator
- Safety setting
- Trigger threshold adjustment
- Output relay
- RS485 serial interface (Modbus RTU)

HRI-R40

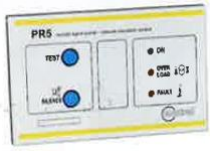
MEDICAL INSULATION MONITORING DEVICE

MODULAR VERSION - 6 MODULES

Quality: the recognized standard for hospital insulation monitoring
Specialization: designed specifically for hospitals
Complete system: all electrical and thermal parameters monitored by a single device
Flexibility: adjustable intervention thresholds based on all monitored parameters
Robustness: high resistance to network interference
Integration: can communicate with supervision systems using the Modbus-RTU protocol via the RS485 serial port
Flexibility: ability to send alarms to 4 medical stations manned by medical personnel, thanks to remote signaling panels
Reliability: secure monitoring in all conditions thanks to the coded signal

PR-5

REMOTE SIGNALING PANEL - FLUSH-MOUNTED VERSION



- Compact size
- Installation in a flush-mounted box with 3 universal E503-type modules
- Reliability: rapid identification of faults
- Simultaneous disconnection of multiple signal panels
- Visual and audible signaling

HRI-R24

MEDICAL INSULATION MONITORING DEVICE FOR SURGICAL LIGHTS - MODULAR VERSION - 3 MODULES

- Tests the ground insulation of 24 V AC/DC power supply circuits for surgical lights
- **Flexibility:** programmable alarm threshold
- **Compact size:** occupies only 3 modules
- **Convenience:** extremely easy to install and use
- **Integration:** ideal complement to HRI-R40

RMS-24

MULTI-ROOM MONITORING DEVICE

FLUSH-MOUNT VERSION - DIN 96x96 mm

- Color TFT graphic display
- Keeps the electrical parameters of different medical rooms under control
- Output relay
- Alarm page: displays a summary of alarms in real time on the screen
- Log function
- Configurable device language
- RS485 serial interface (Modbus RTU)
- Ethernet interface (MODBUS TCP)

SUPERVISION AND CONTROL RELAYS

TCS A5

RELAY FOR SUPERVISION OF TRIP CIRCUITS
MODULAR VERSION - 6 MODULES

- Normally closed buttons and contacts used with a low voltage power supply to improve safety and avoid functional problems with long lines
- Active control with signal interruption or short-circuiting of line buttons
- Possibility of using multiple buttons (including 5 with full control) or more buttons that control the TCS-A5
- Outputs for control switch, output signaling alarm, and emergency output
- Control of the output line to the opening coil with continuity control

TCS R6

MULTI-TRIGGER DEVICE TO CONTROL THE CONTINUITY AND EFFICIENCY OF UP TO 5 CIRCUITS WITH THE POSSIBILITY OF CONTROLLING ADDITIONAL DEVICES
MODULAR VERSION - 6 MODULES

- Not affected by power cuts (no batteries required)
- Number of buttons or contacts selectable
- Button selection function or alarm activation in the event of line and/or coil line failure
- Isolated and stabilized power supply, insensitive to micro-cuts
- Auxiliary voltage presence check

TCS 1 | 2

RELAY FOR SUPERVISION OF TRIP CIRCUITS
MCCB CIRCUITS - MODULAR VERSION - 3 MODULES

- TCS for control and protection of trip units
  This protection is used to monitor the operation of the trip circuit when it is connected via the current transmission coil
- Voltage control circuit:
  13,÷ ,30 V AC/DC or 24,÷ ,60 V AC/DC (TCS 1)
  50÷ 260 V AC/DC or 250÷ 440 V AC/DC (TCS 2)
- 2 changeover outputs

TCS 3 | 4

RELAY FOR SUPERVISION OF TRIP CIRCUITS
MCCB CIRCUITS - FLUSH-MOUNTED VERSION - DIN 96x96 mm

- TCS for control and protection of trip units. This protection is used to monitor the operation of the trip circuit when connected via the current-emitting coil
- Voltage control circuit:
  13,÷ ,30 V AC/DC or 24,÷ ,60 V AC/DC (TCS 3)
  50÷ 260 V AC/DC or 250÷ 440 V AC/DC (TCS 4)
- 2 changeover outputs

RSR-72

AUTOMATIC MOTOR RESTART RELAY (RELESTAGE) -
FLUSH-MOUNT VERSION - DIN 72x72 mm

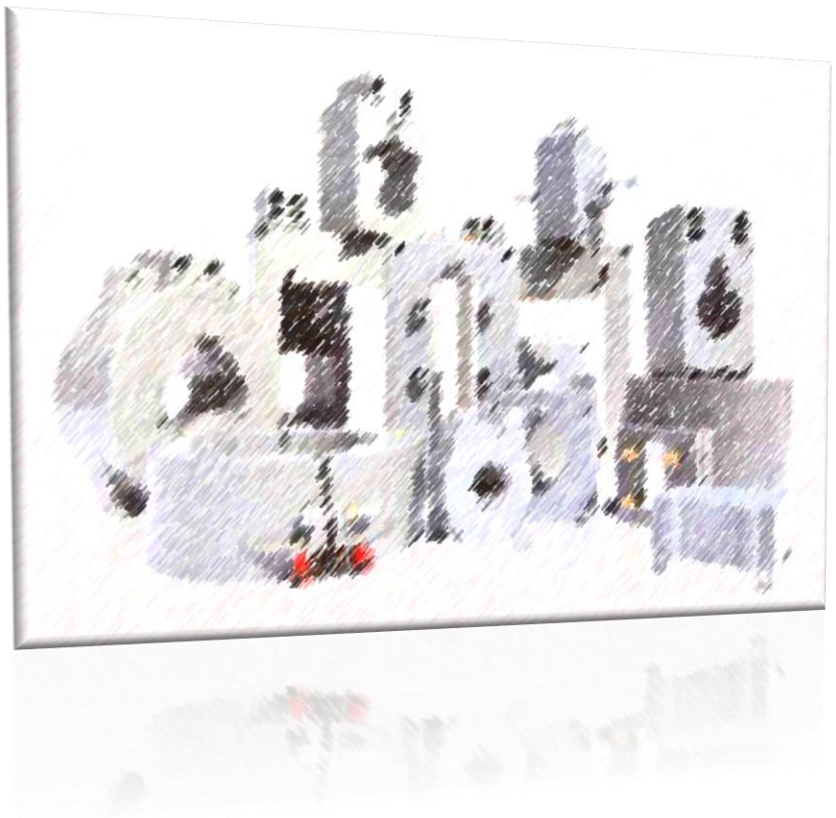
- Power supply and voltage control circuit
- Contactor control and memory activation circuit with optocoupler separation
- Motor stop control circuit via PA (stop) button and fast memory stop with optocoupler separation
- The final relay closure circuit and control circuit are microprocessor-controlled

ELM-4

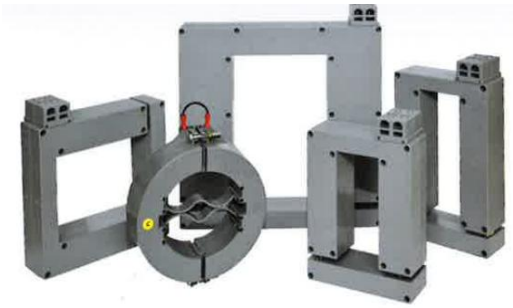
NUMERICAL CURRENT AND/OR DIFFERENTIAL CURRENT INDICATOR -
FLUSH-MOUNT VERSION - DIN 96x96 mm

- 4 LED displays offering optimal readability
- True RMS measurements
- Up to 4 current inputs
- Measurement of differential or residual currents
- Digital outputs
- RS485 communication interface

MEASUREMENT REDUCERS & ACCESSORIES



CURRENT AND VOLTAGE TRANSFORMERS

TCB series	TCM series
MEASURING, PROTECTION AND DUAL RATIO TRANSFORMERS	MEASURING AND PROTECTION TRANSFORMERS
	
TC Series	**TCC | TCCN Series**
CURRENT TRANSFORMERS WITH ANALOG OUTPUT	MEASURING AND PROTECTION TRANSFORMERS
	
TCB-A Series	**TO-CT1**
OPEN CURRENT TRANSFORMERS	HOMOPOLAR TORUS
	
ROGOWSKI TORS	**TVB Series**
	VOLTAGE TRANSFORMERS
	

ACCESSORIES & PROGRAMMING SOFTWARE

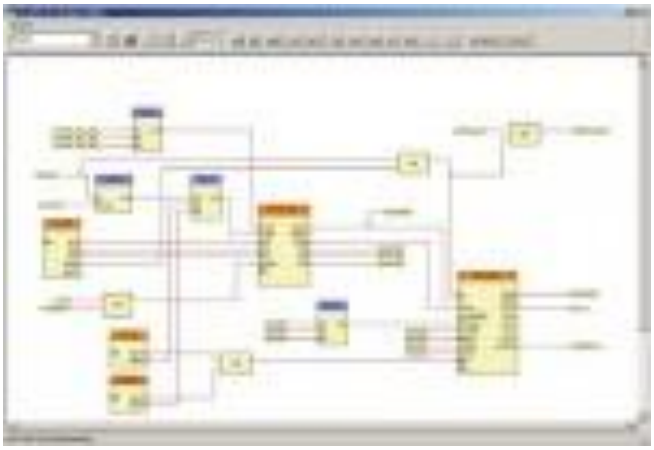
Previous digital ranges (N-DIN, M, MC, ULTRA-M, G-Base)

The **MSCom2** software allows configuration of protection relays in the N-DIN, M, MC, Ultra-M, and G-Base ranges. It runs in a Windows environment.

Main functions and features

- Offline definition or editing of setting parameters
- Viewing, comparing, and saving protection settings
- Viewing factory-preconfigured logic

The Protecta and Smartline S24 ranges



The **EUROCAP** software is a tool for configuring and controlling the PROTECTA and S24 range of protection relays. It is used in a Windows environment, in addition to the web server integrated into the protection relays.

Main functions and features

- Definition and configuration of relay hardware
- Visualization of existing hardware
- Modification of the hardware of certain modules
- Definition of analog and digital inputs and outputs
- Integration of a logic editor
- Creation and management of logic pages
- Visualization of factory-preconfigured logic
- Offline definition or editing of settings
- Viewing, comparing, and saving protection settings
- Importing protection settings into the graphical editor
- Import/export parameters in Excel format
- Generation and saving of parameters in Rio format for laboratory testing of distance protection
- Configuring communication
- Automatically generates protection operating files containing defined connections, online measurements, recordings, disturbance graphs, light signaling assignments, combinatorial logic pages, and communication parameters collected by the protection, as well as control and monitoring parameters
- Definition of the animated synoptic on the protection touch screen

The Smartline S16 range

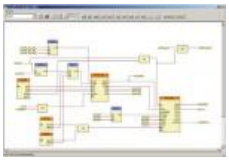
The **S16 Tool** software is designed for configuring protection relays in the Smartline S16 range. It runs on Windows.

This software provides a remote interface for S16 range relays via a USB connection. When connected, the protection device is automatically recognized, allowing direct access to settings via a dedicated interface. This software must be downloaded to the operator's PC prior to use.

Main functions and features

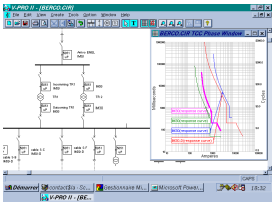
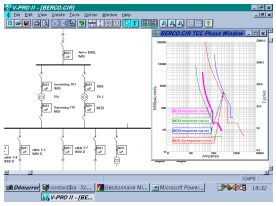
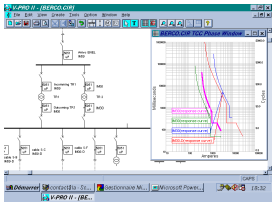
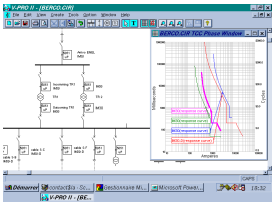
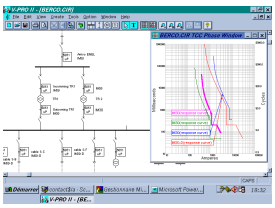
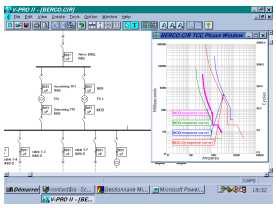
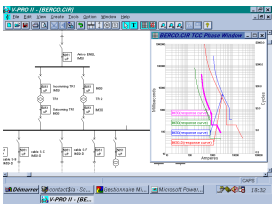
- Offline definition or editing of settings
- Viewing, comparing, and saving protection settings
- Viewing of factory-preconfigured logic

Table of configuration software options

EMI-1P USB	EUROCAP	S16 Tool
 • USB/RS485 serial converter, galvanically isolated at 25 kV • FTDI USB chip • Uses a Windows-certified driver with automatic download • Secure connection to Modbus devices on RS485 serial port	 Programming and configuration software for PROTECTA and Smartline S24 range relays	 Programming and configuration software for Smartline S16 range relays

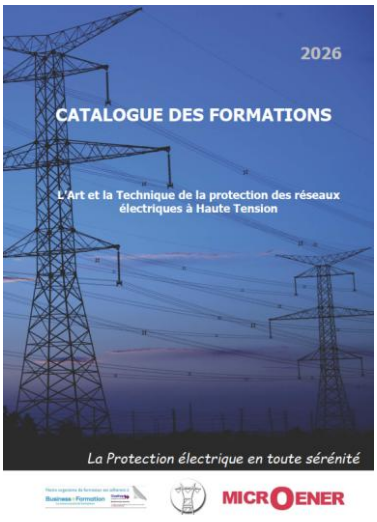
SERVICES, TRAINING, AND INFORMATION

ENGINEERING & COMMISSIONING

Selectivity Study	Definition of the protection plan	Validation or definition of measurement reducers (TC/TP)	Dynamic stability
			
Cable sizing	**Load flow**	**Impact of motors**	**On-site interventions**
			 Commissioning, Expertise, Protection relay testing campaign

TECHNICAL TRAINING – APPLICATIONS

REQUEST OUR 2026 TRAINING CATALOG



DISCONTINUED RELAYS

SEE THE CORRESPONDING SECTION ON OUR WEBSITE

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