ICE Solutions

Catalogue 2025 - 2026 Our energy at your service



OUR TRADEMARKS





Dear readers, clients,

We have designed this catalogue for you! Browse through it and discover how ICE can become your trusted partner in transforming your ideas into successful projects while ensuring the reliability and sustainability of your electrical networks.

Over 75 years of expertise at your service

For more than seven decades, we have been leveraging our expertise to address the complex challenges of electrical network protection, automation, and regulation. ICE offers tailor-made solutions combining high-performance products with dedicated services such as network studies, on-site interventions, and training.



Innovating to better meet your expectations

For us, innovation is at the heart of our commitment. Through constant investment in Research & Development, we anticipate market trends to offer you cutting-edge solutions in our areas of expertise: protection, automation, and network management.

A commitment to a sustainable future

Aware of environmental challenges, we are committed to complying with international standards (ISO 14001, ISO 9001, ISO 19443) and corporate social responsibility principles (EcoVadis). We ensure that our products and services meet current ecological and social requirements.

A global presence, local support

With our headquarters in France and a network of sister companies and international partners, we stand by your side at every stage of your projects. From needs analysis to installation and commissioning, we support you to ensure the success of your projects.



At ICE, our energy is dedicated to your success.

Emmanuel THIZON C00



99 Our energy at your service



Solution For over 75 years, ICE SAS has been supporting the energy, ecological, and digital transition to the power grid of tomorrow.

The technical complexities of electrical networks require every company to rely on experts to ensure the success of network evolution projects.

In this regard, we are a centre of expertise in electrical network behaviour and a designer of industrial solutions for the protection, control, and reliability of your installations.

With our expertise, attentiveness to needs, and adaptability, we are capable of handling all or parts of your projects: Analysis, Studies, Prototypes, Equipment, Turnkey Projects, Assistance, Training, and After-Sales Service.

We operate in five sectors, offering customised, competitive, and sustainable solutions for each.



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THEY TRUST US

NOTES



ABOUT US

+75 years

of expertise

+130

ICE SAS is a French company specialising in electrical network behaviour and the design of industrial solutions for their protection and control.

More than 600,000 protection relays have been installed worldwide under the ICE, CEE, and Technirel brands.

A leader in the nuclear, transmission, and railway markets in France, ICE SAS is renowned for the reliability of its solutions, deployed in critical environments.





RESEARCH & DEVELOPMENT

Our Research & Development (R&D) department is a central pillar in our mission to provide advanced and reliable solutions for the protection, control, and reliability of electrical installations.

We build on proven technologies and recognised industry standards. Our R&D department stands out for its ability to develop, refine, and customise these technologies to offer tailor-made solutions adapted to your needs. By investing in proactive technological monitoring, we ensure that we integrate the latest advancements while guaranteeing the stability and reliability of our products.

Our R&D team works closely with our clients and other company entities to design products that meet current expectations and anticipate the future needs of your electrical network.

With a focus on customisation and efficiency, ICE SAS remains your trusted partner in implementing intelligent, secure, and sustainable projects. Our ability to quickly adapt our solutions makes us a key player in the success of evolution and modernisation projects for your electrical infrastructure.



Multidisciplinary expertise

Adaptation & customisation

Reliability & sustainability

Innovation

Client collaboration

Support & guidance









In-depth knowledge of industrial networks

Bespoke protection plans

End-to-end support

Continuous optimisation

The engineering department of ICE SAS is dedicated to the study and protection of industrial electrical installations. Our specialised engineers conduct in-depth analyses of your infrastructure's electrical behaviour to provide robust solutions tailored to the operational and safety constraints of your environments.

Using advanced modelling (SKM, Etap...) and simulation tools, we assess how your systems respond to load variations, disturbances, or stress conditions, helping to prevent any malfunctions.

We develop bespoke protection plans that take into account the specific characteristics of your installations, ensuring the security of your critical equipment and processes.

Our approach includes risk management: we identify the vulnerabilities of your installations and propose appropriate measures, such as protection against electrical arcs.

ICE SAS also provides technical support for continuous monitoring and optimisation of your installations. We ensure that deployed solutions evolve according to your needs, including cybersecurity considerations and compliance with standards such as IEC 61850.

Our solutions, aligned with the latest technological and regulatory developments, are designed to meet the specific needs of each of your sites.





MANUFACTURING

For many years, we have been designing and manufacturing cabinets and equipment (protection relays, controllers, IEDs...) with over 6,000 cabinets produced in France, adhering to the strict standards of our clients. Our expertise lies in a fully customised design process, led by our Engineering Office, which develops components, bills of materials, and production methods tailored to each order.

With a flexible production capacity, ICE SAS handles over 8,000 manufacturing orders per year, catering to both bespoke and serial production. Assembly and wiring take place in our 6,000 m² factory.

We also produce automated wiring kits and other subassemblies for our solutions. More than 200 cabinets and 1,500 racks are manufactured annually. Every piece of equipment undergoes rigorous inspections before delivery, including electrical and mechanical testing.

Certified to ISO 9001, ICE SAS has implemented a document management system to ensure process traceability and compliance, particularly for products intended for the nuclear sector (ISO 19443), such as protection relays supplied to EDF.



Manufactured in France Engineering & Methods Office Production monitoring Assembly & wiring workshop Production capacity Quality control

Document management





ICE SAS COMMITMENT

S S

ICE SAS is committed to sustainable development by minimising the environmental impact of its activities and improving the environmental performance of its suppliers and subcontractors.

ISO 9001

This international standard sets requirements for a quality management system, ensuring our products and services consistently meet customer expectations. By adopting ISO 9001, ICE SAS demonstrates its commitment to quality and continuous improvement.

ISO 19443

Globally recognised for quality management and safety in the nuclear sector, this standard provides a framework for establishing, implementing, maintaining, and continuously improving our processes. It ensures that our nuclear products are aligned with industry best practices, guaranteeing reliability and safety.



ISO 14 001

ENVIRONMENT

BRONZE | Top 35%

ecovadis

Sustainability Rating

NOV 2024

 \mathbf{Q} ualianor

QUALIANOR

NUCLEAR SAFETY

Certification

ISO 19443

Certification

ISO 9001

OUALITY

The ISO 14001 standard defines requirements for an environmental management system. By complying with this standard, ICE SAS commits to sustainability and environmental responsibility while fostering a culture of continuous improvement in its operations.

EcoVadis

EcoVadis is a globally trusted provider of business sustainability ratings that enables companies like ICE SAS to assess and monitor their sustainable practices and those of their suppliers. By evaluating environmental, social, and ethical criteria, EcoVadis provides reliable methodologies and insights, enabling ICE SAS to make responsible procurement decisions and promote sustainability in its daily operations.



OUR PARTNERSHIPS & NETWORKS

Our collaborations with key industry players reflect our commitment to innovation, process modernisation, and skills development.

Together, we strive to enhance the ecological and technological performance of all our products.





GIMELEC

GIMELEC, a French professional association, plays a vital role in innovation and digital transformation in the electrical sector. Representing leading industry companies, ICE SAS sits on its board of directors and works to promote electrical and digital technologies in support of the energy transition and industrial efficiency.



CIGRE

ICE SAS is actively involved in CIGRE, a global organisation dedicated to highvoltage electrical systems, contributing to innovation, strengthening its expertise, and collaborating on best practices and emerging technologies. CIGRE enables ICE SAS to participate in network protection research and exchange knowledge with other experts, ensuring compliance with technological and regulatory advancements while supporting the transition to safer and more sustainable electrical grids.



GIFEN

The French Nuclear Energy Industry Association (GIFEN - Groupement des Industries Françaises de l'Énergie Nucléaire) supports the development and promotion of the French nuclear industry both domestically and internationally. As a GIFEN member, ICE SAS benefits from the organisation's support and initiatives.



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French Fab

French Fab is a national initiative designed to strengthen French industry by fostering innovation, competitiveness, and business growth. It promotes industrial excellence on a global scale, offering ICE SAS access to a dynamic ecosystem rich in expertise.



CENTRE OF EXPERTISE

Our high-voltage network expertise centre supports you in analysing and transforming your HV/MV electrical networks.

With our technical expertise and advanced modelling tools, we ensure performance optimisation and enhanced infrastructure security.

Our centre of expertise, dedicated to the reliable and sustainable management of your high-voltage networks, offers various types of studies:

- short-circuit current study
- selectivity
- loadflow study
- arc flash study
- harmonics study
- dynamic stability study
- HV delivery point study



SHORT-CIRCUIT CURRENT STUDIES

Context

Electrical networks are exposed to the risk of short circuits occurring at any point. Shortcircuit current studies aim to ensure that the effects of such faults on your installations remain within the maximum permissible limits.

Requirement

It is essential to calculate short-circuit current values at every point in the network and in all possible configurations. This allows for the appropriate sizing of distribution equipment (cables, transformers, switchgear, etc.) and the correct setting of protective devices.

Service approach

ICE SAS performs short-circuit current calculations through numerical simulations by modelling the entire network and accounting for various influencing parameters: short-circuit power of the supply, normal/emergency modes, load rates, motor start-up, power supply configurations, autonomous generators, etc.

These calculations comply with applicable standards and regulations, including IEC 60909, IEC 61363, NFC 13200, UTE C13-205, ANSI C37 013.

Results

ICE SAS provides a report listing all calculated short-circuit current characteristics.

These results are used for equipment sizing, verification of structural integrity, and protection settings.





SELECTIVITY STUDIES

Context

In an industrial electrical network, protecting assets and people requires a protection plan based on the definition and configuration of protective equipment in accordance with selectivity principles.

Each protective device should activate for its assigned faults while avoiding unnecessary tripping for other faults.

Requirement

Changes within an HV or LV network, as well as variations in the electrical connection point (short-circuit power), can render initial protection settings obsolete, compromising their ability to clear short circuits effectively.

Service approach

ICE SAS begins by calculating fault currents at all network points to determine the minimum and maximum current values that protective devices must eliminate.

The next step involves analysing the existing protection plan or developing a new one by defining which protections should act in case of a fault and according to which criteria.

Finally, current/time curves are generated to verify selectivity.

Results

Following the analysis, ICE SAS may:

- validate the current protection plan without modifications
- validate the existing plan while recommending new setting (setting reports)
 - recommended a new protection plan with a revised strategy for the site.





Context

Existing electrical networks may undergo modifications that impact the flow of active and reactive power, as well as voltage levels at various points in the network.

Reactive power compensation is crucial, as it is often subject to billing by the network operator.

Requirement

It is necessary to verify whether power flows and voltage levels remain within acceptable values under all network operating conditions.

This helps in the correct sizing of distribution equipment (cables, transformers, etc.) and reactive power compensation solutions.

Service approach

ICE SAS conducts loadflow studies through numerical simulations, modelling the entire network and considering different operating modes (winter/summer, backup, maintenance, etc.).

All electrical parameters of the network are then calculated and analysed by our engineering team.

Results

Our report includes:

- verification of power flow and voltage compliance
- proper sizing of distribution equipement (cables, transformers, ect.), complementing the short-circuit study
- assessment of the need for reactive power compensation solutions
- analysis of data consistency and recommendations for network modifications in case of non-compliance





ARC FLASH STUDIES

Context

An electrical arc results from a fault current travelling through the air between conductors of different phases, the neutral, or the earth.

It can release a massive amount of radiant energy, causing severe damage to equipment and posing serious risks to personnel.

Requirement

An arc flash study calculates the incident energy during a fault to determine the minimum protective measures required for personnel working near the affected area.

This study also ensures compliance with arc flash standards (IEEE 1584, NFPA 70E).

Service approach

ICE SAS conducts the study and provides recommendations for choosing appropriate protective measures. Personnel must wear appropriate personal protective equipment (PPE) with sufficient arc rating, as determined by our study.

Results

With this study, you can:

- select PPE suitable for the incident energy levels
- generate warning labels indicating arc flash hazard levels
- implement recommended solutions to reduce incident energy levels



HARMONICS STUDIES

Context

The increasing presence of power electronics (inverters, converters, variable speed drives, etc.) and IT loads (data centres) contributes to significant harmonic currents in modern distribution networks.

At the same time, ensuring voltage quality is a key objective, subject to specifications and standardisation.

Requirement

Harmonic currents can cause severe over voltages at specific network points, leading to equipment damage.

Service approach

ICE SAS performs harmonic studies, including:

- numerical simulations and modelling of the entire network
- evaluation of harmonic currents generated by loads based on their characteristics
- harmonic propagation calculations using simulation tools
- frequency impedance analysis at various network points to identify resonance risks

Results

ICE SAS provides:

- a study detailing harmonic current amplitudes in each branch and total harmonic distortion levels at different network points
- harmonic filtering solutions to improve network quality



DYNAMIC STABILITY STUDIES

Context

Electrical networks may experience sudden changes in operating conditions due to:

- coupling or loss of a generation unit
- load variations
- motor start-up or re-acceleration
- islanding or load shedding
- short circuits or voltage sags

Requirement

The transition between initial and final operating conditions, known as the transient phase, may cause disturbances or degrade network performance. These include:

- exceeding network-standard frequency and/or voltage limits
- risk of static and dynamic instability (generator loss of synchronism)
- poorly damped oscillations in control systems
- resonance issues

Service approach

ICE SAS conducts dynamic and transient stability studies, considering transient equipment behaviours (machines, regulators, etc.) and simulating the network using dynamic modelling software.

Results

Our studies analyse transient phases, quantify disturbances, assess stability margins, and propose corrective solutions.

We also evaluate control strategies such as load shedding, power balancing between generators, and network reconfiguration.



HV DELIVERY POINT STUDIES

Context

To ensure grid stability, network operators (Enedis, RTE, municipal utilities) enforce specific standards, including NF C 13-100/200/300, UTE C15-400, and operator directives.

Requirement

Obtaining approval from the network operator is mandatory for connecting an industrial site to the grid. Guidance is often required to complete all necessary formalities.

Service approach

ICE SAS carries out:

- studies to meet the network operator's requirements
- required calculations, simulations, and compliance assessments

Results

ICE SAS provides a study report in the required format, ensuring your connection meets the operator's standards and regulations.





TOOLS & LICENCES



POWER^{*}TOOLS[®] SOFTWARE

ICE SAS uses POWER^{*}TOOLS[®], developed by SKM Systems Analysis Inc., for comprehensive electrical system analysis.

ICE SAS is the official distributor of POWER*TOOLS® licences in France.





PROJECT CENTRE

DISTRIBUTED CONTROL SYSTEM (DCS)

ICE SAS provides industrial sites with control and monitoring solutions for medium and high voltage electrical networks. Our offer includes the PS8000, a SCADA (Supervisory Control and Data Acquisition) system based on Zenon, combined with our range of protection relays, connected via a digital network for robust and cybersecured communications.

With extensive experience in public transmission and distribution networks, ICE SAS delivers optimised solutions tailored to meet the specific requirements of each client.

Our teams support you throughout the lifecycle of your system and assist in maintaining its operational and security conditions (MCO/MCS).



DCS

CONFIGURATION AND DEPLOYMENT

Our project centre and engineering service support you in the implementation and monitoring of your digital control and monitoring system (DCS) for HV and MV networks:

- defining your DCS requirements,
- assistance in specification and design, including protection needs or network architecture,
- consideration of field constraints (legacy equipment, older technologies) to minimise expenses,
- support in implementing IEC 61850 standards and DCS system cybersecurity (OT Cybersecurity IEC 62443).

Deployment is carried out by our own teams or by a team of your choice through controlled processes such as Factory Acceptance Tests (FAT) and Site Acceptance Tests (SAT).

Our training centre ensures full autonomy on numerous topics, including IEC 61850 standards, cybersecurity for your equipment (IEC 62443), and independent digital device updates.



Simplified configuration

Comprehensive, interoperable and secure

Flexible, versatile and integrated

Zenon engine by COPA DATA







IP NETWORK AND SECURITY

A crucial aspect of a digital control and monitoring system is its network architecture.

DCS

Our project centre assists in the complete definition of this architecture, whether it is fully IEC 61850-compliant or a hybrid model integrating multiple field protocols.

Our team helps define functional data flows, which, once identified, are segregated through the implementation of various VLANs (Virtual Networks), ensuring system performance and significantly improving cybersecurity.

System maintenance

Beyond system development and deployment, our teams support DCS maintenance with a range of services:

- strategic stock management (fast service recovery),
- updating and upgrading digital equipment,
- supporting teams in modifying electrical installations,
- annual installation checks (relay testing through on-site injections, cybersecurity audits, DCS updates, etc.),
- hotline and after-sales service.





MV SOLUTIONS

Leveraging the combined expertise of ICE SAS and our partners, we offer a range of medium voltage switchgear. This offering is an excellent complement to our DCS solutions.

This solution combines advanced technology with proven reliability, ensuring optimal management of electrical systems.

ICE SAS provides:

- MV switchgear and protection relays,
- installation supervision,
- commissioning and maintenance (protection relays and MV circuit breakers).







The C9-AIR switchgear solution uses air-insulated switchgear (AIS), compliant with the European IEC 62271-1 standard.

ICE SAS offers three types of switchgear to accommodate a wider range of applications and budget:

- C9-AIR-MCI Series
- C9-AIR-MCCompact Series
- C9-AIR-DP Series





MV SOLUTIONS

MV SWITCHGEAR UP TO 24 KV









Learn more

C9-AIR-MCI

Its architecture consists of a series of standard and modular Metal-Clad cells (internally partitioned by an earthed shielding) compliant with LSC-2B level of IEC 62271-200.

The main components are withdrawable (circuit breaker, voltage transformers, protection relays). The C9-AIR-MCI is designed for primary distribution networks up to 4,000 A nominal, with a short-circuit current of up to 50 kA / 1s. It can also be adapted for secondary networks as required.

Technical data

- ICC: up to 50 kA / 1s
- Rated voltage: 12 to 24 kV
- Nominal current: up to 4,000 A
- Type: Metal-Clad LSC-2B
- Compartmentalisation: PM (metallic partition between compartments)
- Internal arc classification (IAC): A-FLR
- External IP: IP 4X
- Internal IP: IP 2X
- Withdrawable circuit breakers
- Variants: DE (two-tier), DSB (double busbar system)
- Dimensions:

height: 2,410 mm width: 600 / 750 / 1,000 mm depth: 1,640 / 1,800 / 2,300 mm

Standards and certifications

IEC 62271-1 IEC 62271-200 IEC 62271-100 IEC 62271-102

Applications

Industry: oil, chemicals, metallurgy, automotive, mining, cement plants...

Infrastructure: data centres, airports, ports, hospitals, renewable energy.



MV SOLUTIONS

MV SWITCHGEAR UP TO 24 KV









Learn more

C9-AIR-MCCompact

Standard Metal-Enclosed switchgear with a fixed (noncompartmentalised) architecture, compliant with LSC-2B safety level of IEC 62271-200. Designed for secondary distribution networks up to 2,500 A nominal current, with a short-circuit current of up to 25 kA / 1s.

Technical data

- ICC: up to 31.5 kA
- Rated voltage: 12 to 24 kV
- Nominal current: up to 1,250 A
- Type: Metal-Clad LSC-2B
- Compartmentalisation: PM (metallic partition between compartments)
- External IP: IP 4X
- Internal IP: IP 2X
- Internal arc classification (IAC): A-FLR
- Withdrawable circuit breakers
- Dimensions: height: 2,410 mm width: 600 / 750 / 1,000 mm depth: 1,505 mm

Standards and Certifications

IEC 62271-1 IEC 62271-200 IEC 62271-100 IEC 62271-102

Applications

Industry: oil, chemicals, metallurgy, automotive, mining, cement plants...

Infrastructure: data centres, airports, ports, hospitals, renewable energy.



MV SOLUTIONS MV SWITCHGEAR 36 KV







Learn more

C9-AIR-DP

Modular switch gear with single or double busbar, air insulation, up to 36 kV / 4,000 A.

It consists of a series of standard and modular Metal-Clad cells (internally partitioned by an earthed shielding) compliant with LSC-2B level of IEC 62271-200.

The main components are withdrawable (circuit breaker, voltage transformers, protection relays). The C9-AIR-DP is designed for primary distribution networks with a rated current of up to 4,000 A and a short-circuit current limited to 50 kA / 1s. It can also be offered for secondary distribution networks depending on specific requirements.

Technical data

- Nominal voltage: 12 kV / 17.5 kV / 24 kV / 36 kV / 40.5 kV*
- Nominal busbar current: up to 4,000 A
- Frequency: 50 Hz / 60 Hz
- Short-circuit current: up to 50 kA / 3s
- Shock withstand voltage: up to 170 kV
- Internal arc classification (IAC): A-FLR
- Service continuity class: LSC2B-PM
- Dimensions: height: 2,250 mm width: 1,000 mm depth: 2,000 mm

Standards and certifications

IEC 62271-1 IEC 62271-200 IEC 62271-100 IEC 62271-102

Applications

Photovoltaic park, wind farm

*available on request, with containerization option.





ICE Solutions Catalogue – Project centre
AMOA

ICE SAS supports you throughout your project.

Project management assistance is an essential service to ensure the success and smooth progress of projects.

At ICE SAS, we are committed to providing expert support at every stage of the process. As a project management assistant, our role is to act on your behalf to ensure that your interests are protected and that your objectives are achieved within the allocated timeframes and budgets.



ΑΜΟΑ

PROJECT MANAGEMENT ASSISTANCE







MOE

Specialising in the management of complex projects, we support our clients at every stage, from design to execution, ensuring optimal coordination of teams and resources. Thanks to our technical expertise and tailored approach, we guarantee quality, adherence to deadlines, and budget compliance.

Our goal: to transform your ideas into concrete achievements while providing you with total peace of mind. Discover how we can help you succeed in your projects



PROJECT MANAGEMENT

MOE



MAINTENANCE

The performance and reliability of your electrical installations depend on rigorous and tailored maintenance. At ICE SAS, we leverage our expertise to ensure the safety and longevity of your infrastructure. Whether preventive, adaptive, or corrective, our approach is based on a trusted partnership with our clients, combining technical know-how and responsiveness.

We implement procedures recommended by the original manufacturer, enriched by the cumulative experience of our technical service and site supervisors.

Discover our comprehensive maintenance services to ensure the proper functioning of your electrical equipment and optimise its lifecycle.





HIGH VOLTAGE SWITCHGEAR MAINTENANCE

Switchgear maintenance

- Level 1 to 4 maintenance operations: manufacturer level
- Enclosure inspection
- Busbar compartment inspection (de-energised)
- Control compartment inspection
- Cable compartment inspection
- Circuit breaker compartment inspection
- Circuit breaker inspection

Protection relay maintenance

- Functional testing of protection relays (ALL BRANDS)
- Assistance in optimal use of products and systems
- Troubleshooting and rapid intervention on all types of protection
- Post-intervention follow-up
- Maintaining operational and security conditions

System maintenance

- Dedicated strategic stock management (short service restoration time)
- Support for your teams during modifications to your electrical installations
- Annual installation inspection, relay testing via on-site injections, cybersecurity audit
- Update and upgrade of your digital equipment
- Network infrastructure update
- Hotline and after-sales service

On-site interventions

- Periodic inspection of your installation
- Verification of protection settings
- Proper functioning verification (VABF)
- Reporting and correction of identified anomalies



Security condition maintenance (SCM)

- Firmware updates for your system
- Cybersecurity measures for your installation (network planning, traffic segregation)
- Assistance to your technical teams in log analysis in the event of a cyber attack
- Implementation of a cyber and operational recovery plan

Remote assistance and maintenance contract monitoring

- After-sales service & hotline
- Detailed explanations through our operation guides
- Centralisation of your requests via your dedicated commercial contact



PROTECTION RELAYS

CEE 7000 SERIES

1666

Our CEE 7000 Series of analogue relays, benefiting from over 40 years of expertise, is an integral part of our Long Term Support (LTS) programme.

ITG 7166

As the leading range in the nuclear sector, it currently equips numerous customer sites requiring the advantages of analogue technology while ensuring the quality guarantee of support and follow-up provided by ICE SAS.



CEE 7000 SERIES 🛛 🗖

7000 RELAYS CODIFICATION



X Supervision

Note: some combinations are not feasible. Please do not hesitate to contact us.



MOUNTING AND FIXINGS - R1 CASE

R1 case - Connection



Panel-mounted rear connectors



Surface-mounted rear connectors



Surface-mounted front connectors

R1 case - Dimensions



Panel-mounted rear connectors



Surface-mounted rear connectors



Surface-mounted front connectors

R1 case – Drilling and cut-outs



Surface-mounted front connectors



Surface-mounted rear connectors



Panel-mounted rear connectors





MOUNTING AND FIXINGS - R2 CASE

R2 case - Connection



Panel-mounted rear connectors



Surface-mounted rear connectors



 connectors

 (\bigcirc) (\bigcirc)

 (\bigcirc) (\bigcirc)

Surface-mounted front

Surface-mounted front connectors

R2 case - Dimensions



Panel-mounted rear connectors



Surface-mounted rear connectors

R2 case – Drilling and cut-outs



Surface-mounted front connectors



Surface-mounted rear connectors



Panel-mounted rear connectors



MOUNTING AND FIXINGS - R3 CASE

R3 case - Connection







Surface-mounted rear connectors



Surface-mounted front connectors

R3 case - Dimensions



Panel-mounted rear connectors



Surface-mounted rear connectors



Surface-mounted front connectors

R3 case – Drilling and cut-outs



Surface-mounted front connectors



Surface-mounted rear connectors



Panel-mounted rear connectors





MOUNTING AND FIXINGS - R4 CASE

R4 case - Connection



Panel-mounted rear connectors



Surface-mounted rear connectors



Surface-mounted front connectors

R4 case - Dimensions



Panel-mounted rear connectors



Surface-mounted rear connectors

85



207

Surface-mounted front connectors

0 4.5

R4 case – Drilling and cut-outs



Panel-mounted rear connectors



85

Surface-mounted rear connectors



Surface-mounted front connectors



CEE 7000 SERIES SPRODUCT LIST

ITG7000

Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	NP800R equivalent
ITG7013	50	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPI800R
ITG7105	51	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITG7111	51N	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	RI	NPI800R
ITG7113	51	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPI800R
ITG7114	51 51H3	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITGS7114	51 51H3	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITG7116	50 51	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7118	37	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPI800R
ITG7123	51	1 A or 5 A (2 phases)	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITG7166	50 51	1 A or 5 A (3 phases)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7196	50 50N 51 51N	1 A or 5 A (3 phases + N)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPI800R
ITG7205	51 51N (inverse)	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITG7216	50 51 (inverse)	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7266	50 51 (inverse)	1 A or 5 A (3 phases)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7296	50 50N 51 51N (inverse)	1 A or 5 A (3 phases + N)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPI800R
ITG7305	51 51N (very inverse)	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPI800R
ITG7316	50 51 (very inverse)	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7366	50 51 (very inverse)	1 A or 5 (3 phases)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7396	50 50N 51 51N (very inverse)	1 A or 5 A (3 phases + N)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPI800R
ITG7416	50 51 (extrm. inverse)	1 A or 5 A	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7466	50 51 (extrm. inverse)	1 A or 5 A (3 phases)	2ln 80ln	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPI800R
ITG7496	50 50N 51 51N (extrm. inverse)	1 A or 5 A (3 phases + N)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPI800R

Type: Current

Auxiliary power supply: AC or DC

CEE 7000 SERIES 📮



IMM7900

Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	NP800R equivalent
IMM7960	46 50 51N 51LR 37	1 A or 5 A	15In 80In	50 Hz or 60 Hz	1 CB / 1 DO	R2	NPM800R
IMM7990	37 46 49 50 51N 51LR 66 O d	1 A or 5 A	15In 80In	50 Hz or 60 Hz	1 CB / 1 DO / 49(*)	R3	NPM800R

Type: Current

Auxiliary power supply: AC or DC

(*): dedicated DO

ITV7x66

Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	CEE case
ITV7166	50 51 27 (max restricted in V)	1 A or 5 A 110 V or 400 V	21n 801n 1.3Un 2Un	50 Hz or 60 Hz (±10%)	R3
ITV7266	50 51 27 (max very inverse restricted in V)	1 A or 5 A 110 V or 400 V	21n 801n 1.3Un 2Un	50 Hz or 60 Hz (±10%)	R3
ITV7366	50 51 27 (max extremely inverse restricted in V)	1 A or 5 A 110 V or 400 V	21n 801n 1.3Un 2Un	50 Hz or 60 Hz (±10%)	R3

DI/DO: 2 paired DO Type: Current/Voltage Auxiliary power supply: AC or DC

TTB7000

	Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	Aux. supp.
fI)	TTB7011	59	24/48/110/125/220 ∨ (+20%)	120%Un 2Un	-	1 paired DO	RI	-
fI)	TTB7013	27	24/48/110/125/220 ∨ (-20%)	120%Un 2Un	-	1 paired DO	RI	-
	TTB7025	27 59	20 mV to 300 V	from ±60 V to ±400 V	Internal filtering 1 or 2 Hz	2 paired DO	R2	AC or DC
	TTB7026	27	20 mV to 300 V	from ±60 V to ±400 V	Internal filtering 1 or 2 Hz	2 paired DO	R2	AC or DC
	TTB7027	59	20 mV to 300 V	from ±60 V to ±400 V	Internal filtering 1 or 2 Hz	2 paired DO	R2	AC or DC

Application: DC Voltage



CEE 7000 SERIES 📮

PRODUCT LIST

TTG7000 - TTG7100

	Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	NP800R equivalent
Æ.	TTG7011	59	57.7 V to 380 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPU800R
f1	TTG7012	27	57.7 V to 380 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	RI	NPU800R
ſĮ.	TTGd7012	27	57.7 V to 380 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPU800R
FI)	TTG7013	27	57.7 V to 380 V (18 Hz - 65 Hz)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPU800R
	TTG7023	27	57.7 V to 380 V (2 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7025	27	57.7 V to 380 V (2 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	2 paired DO	R2	NPU800R
	TTG7032	27	57.7 V to 380 V (3 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7033	27	57.7 V to 380 V (3 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7034	59N	57.7 V (3 phases)	230 Vac (permanent)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPUH800R
ſŪ.	TTG7111	59 (ind. delay)	57.7 V to 380 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	RI	NPU800R
Æ.	TTG7112	27 (ind. delay)	57.7 V to 380 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPU800R
	TTG7113	27 (ind. delay)	57.7 V to 380 V (18 Hz - 65 Hz)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	NPU800R
	TTG7114	59N (ind. delay)	57.7 V (3 phases)	230 Vac (permanent)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7123	27 (ind. delay)	57.7 V to 380 V (2 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTGd7123	27 (ind. delay)	57.7 V to 380 V (2 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7132	27 (ind. delay)	57.7 V to 380 V (3 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7133	27 (ind. delay)	57.7 V to 380 V (3 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7134	59N (ind. delay)	57.7 V (3 phases)	230 Vac (permanent)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	NPU800R
	TTG7166	27 59 (ind. delay)	57.7 V to 230 V (3 phases)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	4 paired DO	R3	NPU800R

Type: Voltage

Auxiliary power supply: AC or DC

CEE 7000 SERIES

PRODUCT LIST

TTE7000

Model	ANSI Codes	Туре	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	Aux. supp.
TTE7015	64	DC Voltage	600 V	800 V @50 Hz	50 Hz or 60 Hz (±10%)	1 paired DO	R2	AC
TTE7017	64	DC Voltage	600 V	600 V Peak-to-peak	-	1 paired DO	R2	DC

TTT7100

	Model	ANSI Codes	Туре	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	Aux. supp.
FQ.	ΤΤΤ7ΙΙΙ	2 (pre-trip)	-	-	-	_	1 paired DO	R1	AC or DC
	TTT7112	2 (trip hold)	-	-	-	-	1 paired DO	RI	AC or DC

WTGA7100

	Model	ANSI Codes	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	NP800R equivalent
ſſ	WTGA7131	32 32N	1 A or 5 A 100 V or 110 V	21n 801n 1.3Un 2Un	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPW800R
ſŪ	WTGA7132	32 32N	1 A or 5 A 100 V or 110 V	21n 801n 1.3Un 2Un	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPW800R
	WTGA7133	32 32N	1 A or 5 A 100 V or 110 V	2In 80In 1.3Un 2Un	50 Hz or 60 Hz (±10%)	2 paired DO	R3	NPW800R

Type: Current/Voltage

Auxiliary power supply: AC or DC



CEE 7000 SERIES 🗳

PRODUCT LIST

Other 7000 Series relays

	Model	ANSI Codes	Туре	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	Aux. sup.	NP800R equivalent
ſĮ)	DTM7033	87M	Current	1 A or 5 A	2ln 80ln	40 to 70 Hz	1 paired DO	R3	AC or DC	-
 	DTT7031	87T	Current	1 A or 5 A	2ln 80ln	45 to 65 Hz	1 paired DO	R4	DC	-
	GTM7111	25	Current Voltage	1A or 5A 110V or 230V	2ln 80ln 2Un	50 Hz or 60 Hz	1 paired DO	R2	AC or DC	-
	HDG7020	81	Voltage	100 110 120 220 240 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (-7 Hz/+5.7 Hz)	2 paired DO	R2	AC or DC	NPU800R
	HDGE7020	81	Voltage	100 110 120 220 240 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (-7 Hz/+5.7 Hz)	2 paired DO	R2	AC or DC	NPU800R
FŪ	ITI7521	46	Current	1 A or 5 A (3 phases + N)	2ln 80ln		2 paired DO	R3	AC or DC	-
	PTG7111	32	Current Voltage	1 A or 5 A 110 V or 400 V	2ln 80ln 1.3Un 2Un	50 Hz or 60 Hz (±10%)	1 paired DO	R2	AC or DC	-
	RAD7004	86	-	5 A or 500 V	-	-	4	R1	-	-
	RADE7010	86	-	5 A or 500 V	-	-	10	R2	-	-
	STS7041	25	Voltage	110 V - 220 V	1.5 Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R3	DC	NPSC800R
	YTM7111	40	Current Voltage	1 A or 5 A 100 V or 110 V	3ln 80ln 1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	2 paired DO	R2	DC	-



CEE 7000 SERIES

GENERAL CURRENT PROTECTION







Learn more





Static phase and/or homopolar overcurrent protection

Overcurrent relay for phase-to-phase or phase-to-earth faults.

ANSI Codes

50	Instantaneous overcurrent
50N	Instantaneous earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent

Case: R2

Available products: ITG7105 / ITG7116 / ITG7166 / ITG7196

NP800R equivalent: NPI800R

K3 qualified product: ITG7166

ITG70XX - ITG71XX

Instantaneous or definite time maximum/minimum current protection

Overcurrent and undercurrent relay providing instantaneous or definite time protection against phase or earth faults, with one or two threshold levels.

ANSI Codes

50	Instantaneous overcurrent
50N	Instantaneous earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
37	Undercurrent or underpower monitor
	•

Case: R2

Available products: ITG7013 / ITG7113 / ITG7114 / ITGS7114 / ITG7118 / ITG7123

NP800R equivalent: NPI800R



Learn more



CEE 7000 SERIES

GENERAL CURRENT PROTECTION







Learn more

ITG7200 - ITG7300 - ITG7400

Inverse overcurrent protection with inverse, very inverse, extremely inverse time

Protection relays against phase and/or earth faults with inverse, very inverse, and extremely inverse time characteristics, with or without high-set instantaneous units.

ANSI Codes

50	Instantaneous overcurrent
50N	Instantaneous earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent

Case: R2

Available products: ITG7216 / ITG7266 / ITG7296 / ITG7305 / ITG7316 / ITG7366 / ITG7396 / ITG7416 / ITG7466 / ITG7496

NP800R equivalent: NPI800R



CEE 7000 SERIES E POWER PROTECTION







Learn more



WTGA7131 - WTGA7132 - WTGA7133

Static power protection

Unbalanced power in three-phase, three-wire networks, measured using the two-wattmeter method.

ANSI Code

32P Maximum of active power

Case: R3

NP800R equivalent: NPW800R

K3 qualified product: WTGA7131 / WTGA7132

PTG7111

Static protection

Protection of diesel driven alternators against motoring conditions. These same ranges also make it suitable for protecting synchronous motors against operation as generators. For these situations, it operates as a reverse power relay.

ANSI Code

32 Overpower

Case: R3

NP800R equivalent: NPW800R



Learn more



CEE 7000 SERIES

VOLTMETRIC PROTECTION







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TTG7000 - TTG7100

Static protection of phase or homopolar current

Overvoltage and/or undervoltage protection on phase or residual voltage (overvoltage), with instantaneous or definite time delay.

ANSI Codes

27	Undervoltage
27P	Positive sequence undervoltage
59	Overvoltage
59N	Maximum of zero sequence voltage
60	Voltage balance

Cases: R1 - R2 - R3

Available Products: TTG7011 / TTG7012 / TTG7012 / TTG7013 / TTG7023 / TTG7025 / TTG7032 / TTG7033 / TTG7034 / TTG7111 / TTG7112 / TTGd7112 / TTG7113 / TTG7134 / TTG7133 / TTG7134 / TTG7166

NP800R equivalent: NPU800R

K3 qualified product: TTG7011 / TTG7012 / TTGd7012 / TTG7013 /TTG7111 / TTG7112

HDG7020 - HDGE7020

Voltage/frequency protection

Two-level frequency relays, either maximum or minimum frequency.

ANSI Code

81 Over and/or under frequency

Case: R2

NP800R equivalent: NPU800R

K3 qualified product: HDGE7020

CEE 7000 SERIES MOTOR PROTECTION







Learn more





Motor protection with a wide current range

Electrical protection for medium and low voltage high power motors without alarm output.

ANSI Codes

- 37 Undercurrent or underpower monitor
- 46 Reversal, loss of phase or unbalance phase
- 49 Thermal overload
- 50 Instantaneous overcurrent
- 51N Earth fault overcurrent
- 51LR Locked rotor
- 66 Restart inhibit / frequent starts
- Od Thermal start authorisation

Case: R2

NP800R equivalent: NPM800R

IMM7990

Motor protection with a wide current range

Electrical protection for medium and low voltage high power motors with alarm output.

ANSI Codes

37	Undercurrent or underpower monitor
46	Reversal, loss of phase or unbalance phase
50	Instantaneous overcurrent
51N	Earth fault overcurrent
51LR	Locked rotor

Case: R3

NP800R equivalent: NPM800R



Learn more



CEE 7000 SERIES

GENERATOR PROTECTION





TTE7015 - TTE7017

Rotor earth fault protection

They detect any insulation fault affecting the rotor circuit of a synchronous machine as soon as it appears.

The TTE7015 operates on the principle of direct current injection, while the TTE7017 uses very low-frequency current injection at low voltage and current levels.

ANSI Code

64F Rotor earth fault

Case: R2



Learn more



STS7041

Check synchronising relay

Synchronism check relay between two sources, used to allow the transmission of a closing signal to a breaker which ties together two independent sources.

ANSI Code

25 Synchro-check

Case: R3



Learn more



CEE 7000 SERIES SCIENTION







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GTM7111

Synchronous motor out-of-step protection relay

Protects synchronous motors against out-of-step (or loss of synchronism) conditions which may result from sudden overloads, a drop in network voltage, or a drop in excitation (or field) current.

ANSI Code

25 Synchro-check

Case: R2



Alternator loss of field protection relay

Admittance relay, specifically designed for the detection, by using the electrical quantities available in its stator circuit, of the loss of field of an alternator connected to a network.

ANSI Code

40 Field failure

Case: R2

NP800R equivalent: NPG800R



Learn more



CEE 7000 SERIES SCIENTION



ITI7521

Alternative negative sequence protection relay

Reverse overcurrent protection for alternators.

ANSI Code46Negative phase sequence overcurrent

Case: R3

NP800R equivalent: NPG800R



Learn more



ITV7x66

Voltage restrained overcurrent relays

Relays essentially designed to provide selective protection of generators in the event of overloads and heavy internal or external faults.

ANSI Codes

- 27 Undervoltage50 Instantaneous overcurrent
- 51 Overcurrent

Case: R3

Available Products: ITV7166 / ITV7266 / ITV7366



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CEE 7000 SERIES 🛛 📼

DIFFERENTIAL PROTECTION







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DTM7033

Ensures longitudinal differential protection, with restraint, for rotating machines on three-phase electrical networks at 50 Hz or 60 Hz.

ANSI Code

87M Machine differential relay

Case: R3

K3 qualified product



Transformer differential protection relay

Biased three phase differential relay designed to protect high voltage transformers against internal faults.

ANSI Code

87T Transformer differential relay

Case: R4



Learn more



CEE 7000 SERIES E AUXILIARY RELAYS







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TTT7111 - TTT7112

Time delay relays in modular case Time delay relays with different functions.

ANSI Code 2 Time-delay starting or closing relay Case: R1

K3 qualified product: TTT7111

RAD7004 - RADE7010

Trip relays with mechanical lock-out series

Trip relays without self-reset action.

- RAD7004 provides in a small volume 4 independent hand-reset contacts.
- RADE7010 has 10 contacts which may be hand-reset or electrically-reset

ANSI Code

86 Latching of the output contacts

Cases: R1 - R2



Learn more



NP800P

NP800F

NP800R Series are dedicated to the retrofit and digitisation of industrial installations protected by our CEE 7000 Series.

TRN

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Several hundred relays can be retrofitted at a lower cost, thanks to the mechanical compatibility of the sockets and R cases between our NP800R and CEE 7000 Series.



CODIFICATION



N Digital (processor-based)

Application

- I Current
- U Voltage
- ID Directional current
- IH Residual current
- M Motor
- SC Synchronism
- UH Residual voltage
- W Power



Extension

output

Addition of binary input and

CEE 7000 SERIES RETROFIT

NP800R Series are dedicated to the renovation of installations protected by our CEE 7000 Series relays.

The mechanical compatibility reduces panel modification costs while minimising downtime of your installations.

Our NP800R Series are available in R2, R3, or R4 cases depending on the model, allowing you to digitise your control/ monitoring system in a cost-effective and rapid manner.

The board diagrams are retained, along with the ringcores already installed. You control the risks associated with modernisation. Retrofit of your system can be done at your own pace and according to your budget.





MOUNTING AND FIXINGS

Panel-mounted

222 m











Surface-mounted





Pretection & Centrol



PRODUCT LIST

NP800 Series

Model	ANSI Codes	Туре	Rating	Withstand (Cont. / 1s)	DI / DO	CEE case
NPG800R	21 24 27 32P 32RP 37P 32Q 37Q 40 46 49 51 51V 59N 59 64 81O 81U 86 74TC 50 50V	Current Voltage	1 A or 5 A 30V to 110 V	3ln 80ln 240 V 275 V (1min)	8 DI / 7 DO	R3
NPG800RE	21 24 27 32P 32RP 37P 32Q 37Q 40 46 49 51 51V 59N 59 64 81O 81U 86 74TC 50BF	Current Voltage	1 A or 5 A 30V to 110 V	3ln 80ln 240 V 275 V (1min)	4 DI + 4 DI (79) / 7 DO	R3
NPI800R	51 50N 51N 49T 46 46BC 86 74TC 50BF 50 50NBF	Current	1 A or 5 A	3In 80In	4 DI / 3 DO	R2
NPID800R	50 50N 51 51N 67 67N 49T 46 46BC 86 74TC 50BF 50NBF	Current Voltage	1 A or 5 A 30V to 110 V	3In 80In 240 V 275 V (1min)	8 DI / 7 DO	R3
NPIDR800R	50 50N 51 51N 67 67N 49T 46 46BC 86 74TC 50BF 79 50NBF	Current Voltage	1 A or 5 A 30V to 110 V	3ln 80ln 240 V 275 V (1min)	4 DI + 4 DI (79) / 7 DO	R3
NPIH800R	50N 51N 86 74TC 50NBF	Current	1 A or 5 A	3In 80In	4 DI / 3 DO	R2
NPIHD800R	50N 51N 67N 86 74TC 50NBF	Current Voltage	1 A or 5 A 30V to 110 V	3In 80In 240 V 275 V (1min)	4 DI / 3 DO	R2
NPM800R	5 49 48 51LR 50 66 46 51N 37I 86 74TC 50BF 50NBF 51LR	Current	1 A or 5 A	3ln 80ln	4 DI / 3 DO	R2
NPM800RE	5 49 48 51LR 50 66 46 51N 37I 86 74TC 50BF 50NBF 51LR	Current	1 A or 5 A	31n 801n	8 DI / 7 DO	R3
NPSC800R	25	Voltage	55 V to 120V	240 V 275 V (1min)	4 DI / 3 DO	R2
NPSC800RE	25	Voltage	55 V to 120V	240 V 275 V (1min)	8 DI / 7 DO	R3
NPU800R	27 27P 47 59 59N 81O 81U 86 74TC	Voltage	33 V to 120V	240 V 275 V (1min)	4 DI / 3 DO	R2
NPU800RE	27 27P 47 59 59N 81O 81U 86 74TC	Voltage	33 V to 120V	240 V 275 V (1min)	8 DI / 7 DO	R3
NPUH800R	59N 86 74TC	Voltage	33 V to 120V	240 V 275 V (1min)	4 DI / 3 DO	R2
NPW800R	32P 37P 32Q 37Q 59 27 810 81U 59N 55 74TC 86	Current Voltage	1 A or 5 A 33V to 110 V	3In 80In 240 V 275 V (1min)	8 DI / 7 DO	R3

Auxiliary power supply: 19 to 70 Vdc / 85 to 255

Vac (50 / 60 Hz)

C

Frequency (±10%): 50 Hz or 60 Hz

1 dedicated DO Watchdog (WD) across the entire range

CURRENT PROTECTION







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NPI800R

Phase and residual current protection

Designed for the protection of networks against phase-to-phase and phase-to-earth faults.

ANSI Codes

46	Reversal, loss of phase or unbalance phase
46BC	Broken conductor detection
49T	Thermal overload for transformer
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R2

7000 CEE equivalents: ITG7xx5 / ITG7xx6 / ITG7000 / ITG7100 / ITT7610 / RMS700 / RMS7900 / RMST7900

NPID800R

Phase and earth fault overcurrent protection with directional criteria

Designed for the protection of your upstream or downstream network sections, enhancing selectivity and adaptability of the protection scheme.

ANSI Codes

46	Reversal, loss of phase or unbalance phase
46BC	Broken conductor detection
49	Thermal overload
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
67	Phase directional overcurrent
67N	Earth directional overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R3

7000 CEE equivalents: RMS7900 / RMST7900



CURRENT PROTECTION







Learn more

NPIDR800R

Phase and earth fault overcurrent protection with directional criteria and auto-recloser

Relays designed for the protection of your upstream or downstream network sections, enhancing the selectivity and adaptability of the protection scheme, and incorporating an auto-reclosing function.

ANSI Codes

46	Reversal, loss of phase or unbalance phase
46BC	Broken conductor detection
49	Thermal overload
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
67	Phase directional overcurrent
67N	Earth directional overcurrent
74TC	Trip circuit supervision of the breaker
79	Autorecloser
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R3

7000 CEE equivalents: RMS7900 / RMST7900



CURRENT PROTECTION





NPIH800R

Residual current protection

Provides detection of residual (zero-sequence) currents in mediumand high-voltage electrical networks.

ANSI Codes

50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51N	Earth fault overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R2

7000 CEE equivalent: RMS711



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NPIHD800R

Directional earth fault protection

Detects zero-sequence (earth fault) currents in medium and high voltage electrical networks and can operate based on directional criteria.

ANSI Codes

50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51N	Earth fault overcurrent
67N	Earth directional overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R2

7000 CEE equivalent: RMS711


NP800R SERIES - RETROFIT POWER PROTECTION







Learn more

NPW800R

Power protection

Performs the measurement of the apparent (S), active (P) and reactive (Q) power of 3 or 4 wire electrical networks. The monitoring of the energy flow direction is completed by the management of power factor, tangent ϕ and by the supervision of network voltage and frequency.

ANSI Codes

- 27 Undervoltage
- 32P Maximum of active power
- 32Q Maximum of reactive power
- 37P Loss of load (pump unpriming) / Underpower
- 37Q Underpower reactive relay
- 55 Management of the network power factor59 Overvoltage
- 59N Maximum of zero sequence voltage
- 74TC Trip circuit supervision of the breaker
- 810 Over frequency
- 810 Under frequency
- 86 Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R3

7000 CEE equivalent: WTG7000

NP800R SERIES - RETROFIT

VOLTAGE PROTECTION







Learn more





Learn more

NPU800R - NPU800RE

Phase voltage, frequency and/or residual voltage protection

Monitors phase voltage and/or frequency in electrical networks. These multifunction relays detect faults between phases or between phase and earth, as well as direct, reverse, and residual voltages (depending on wiring). They also ensure proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

59

- 27 Undervoltage
- 27P Positive sequence undervoltage
- 47 Maximum of negative sequence voltage
 - Overvoltage
- 59N Maximum of zero sequence voltage
- 74TC Trip circuit supervision of the breaker
- 810 Over frequency
- 81U Under frequency
- 86 Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Cases: R2 - R3

7000 CEE equivalents: TTG7000 / TTG7100 / TTGd7x12 / TMS700 / TMS7000 / HDG7020

NPUH800R

Earth fault voltage protection

Monitors the zero-sequence voltage of three-phase networks with isolated or high impedance earthed neutral. It monitors phase to phase and phase to earth faults and ensures the proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

59N	Maximum of zero sequence voltage
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Case: R2

7000 CEE equivalents: TMS714 / TTG7XX4



NP800R SERIES - RETROFIT MOTOR PROTECTION







Learn more

NPM800R - NPM800RE

Motor protection

Provide protection for medium-voltage motors and high-power lowvoltage motors. These multifunction relays analyse the currents drawn by the motor during the starting, re-acceleration, and normal operating phases. They also supervise the proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

5	Thermal start authorisation
371	Minimum of load (unpriming) / undercurrent
46	Reversal, loss of phase or unbalance phase
48	Too long start
49	Thermal overload
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50NBF	Breaker failure with earth fault overcurrent
51LR	Locked rotor
51N	Earth fault overcurrent
66	Restart inhibit / frequent starts
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

Cases: R2 - R3

7000 CEE equivalents: IMM7900 / ITM700



NP800R SERIES - RETROFIT

GENERATOR PROTECTION







Learn more

NPG800R - NPG800RE

Generator protection

They provide protection for synchronors generators connected to three-phase networks. They protect machine-generator sets ranging from a few hundred kVA to several tens of MVA.

ANSI Codes

21

24

27

51

- Distance relay
- Overfluxing
- Undervoltage
- 32P Maximum of active power
- Maximum of reactive power 320
- 32R Reverse active power
- Loss of load (pump unpriming) / Underpower 37P
- Underpower reactive relay 370 40
 - Field failure
- 46 Reversal, loss of phase or unbalance phase
- 49 Thermal overload
- 50 Instantaneous overcurrent
- Instantaneous overcurrent with voltage control 50V
 - Overcurrent
- 51V Maximum overcurrent with voltage control
- 59 Overvoltage
- Maximum of zero sequence voltage 59N
- 64 Sensitive earth fault
- Trip circuit supervision of the breaker 74TC
- Over frequency 810
- 81U Under frequency
- Latching of the output contacts 86

Communication: Modbus (RS845 or Ethernet)

Cases: R2 - R3

7000 CEE equivalents: GMS7001 / GMSH7001 / GMSV7001



NP800R SERIES - RETROFIT

SYNCHRONISM CONTROL





NPSC800R - NPSC800RE

Source Synchronism Protection

Performs check of synchronism between two power supplies. They are usually used to authorise the closing order of a paralleling circuit breaker.

It can also control, via a dedicated output relay, the reconnection of two bus sections fed by the same supply.

ANSI Code

25 Synchro-check

Communication: Modbus (RS845 or Ethernet)

Cases: R2 - R3

7000 CEE equivalent: STS7041



Learn more



The NP800 Series has been designed for fast commissioning and easy operation.

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Providing the essential protection and control functions, along with Ethernet or RS485 serial bus communication, our NP800 Series offer a clear understanding of your installation and continuous control over your operations, thanks to its user-friendly interface.

Complementary services, such as protection scheme studies or training delivered by our expert protection engineers, are also available to complete our offer.



CODIFICATION

Type P Protection

Range800Simplified protection range

Technology N Digital (processor-based)

- Application
 - I Current U Voltage
- ID Directional current
- IH Residual current
- IHD Directional residual current

N P M 8 0

- M Motor
- SC Synchronism
- UH Residual voltage
- W Power



MOUNTINGS AND FIXINGS

Panel-mounted



Surface-mounted







0 0 0 0 0 0 0 0 GICE GICe 4 x Ø 7 NP800 NP800 Φ Φ O WD 0 L1 0 L2 0 L3 0 L4 101.5 177 K 3 Closing plate 204P38175 Closing plate 204P38175 Closing plate 204P38175 φ Φ CE CE 0 0 ø 0 ø 0 ø Ø 466 483



PRODUCT LIST

NP800 Series

Model	ANSI Codes	Туре	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO
NPG800	21 24 27 32P 32RP 37P 32Q 37Q 40 46 49 50 50V 51 51V 59N 59 64 81O 81U 86 74TC 50BF	Current Voltage	1 A or 5 A 30V to 120 V	3ln 100ln 240 V 275 V (1min)	50 Hz / 60 Hz (±10%)	8 DI / 7 DO
NPI800	46 46BC 49T 50 50N 51 51N 86 74TC 50BF 50NBF	Current	1 A or 5 A	31n 1001n	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPID800	46 46BC 49T 50 50N 51 51N 67 67N 86 74TC 50BF 50NBF	Current Voltage	1 A or 5 A 30V to 120 V	3ln 100ln 240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPIH800	50N 51N 86 74TC 50NBF	Current	1 A or 5 A	In0 40In0	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPIHD800	50N 51N 67N 86 74TC 50NBF	Current Voltage	1 A or 5 A 30V to 120 V	3ln 100ln 240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPM800	5 49 48 51LR 50 66 46 51N 37I 86 74TC 50BF	Current	1 A or 5 A	31n 1001n	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPSC800-1	25	Voltage	55 V to 120V	240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	4 DI / 3 DO
NPSC800-2	25	Voltage	55 V to 120V	240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPU800	27 27P 47 59 59N 81O 81U 86 74TC	Voltage	33 V to 120V	240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPUH800	59N 86 74TC	Voltage	33 V to 120V	240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO
NPW800	32P 37P 32Q 37Q 59 27 81O 81U 59N 55 86	Current Voltage	1 A or 5 A 33V to 110 V	3ln 100ln 240 V 275 V (1min)	50 Hz or 60 Hz (±10%)	8 DI / 7 DO

Auxiliary power supply: 19 to 70 Vdc / 85 to 255 Vac (50 / 60 Hz)

Communication: Ethernet RS485

Double RS485

1 dedicated DO Watchdog (WD) across the entire range



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CURRENT & EARTH FAULT PROTECTION





Learn more



NPI800

Overcurrent protection

Provides phase and earth overcurrent protection for medium and high voltage electrical networks. It monitors phase to phase and phase to earth faults, negative sequence currents, reverse currents, the thermal state of the protected device, and ensures proper operation of the circuit breaker and its tripping circuit.

ANSI Codes

46	Reversal, loss of phase or unbalance phase
46BC	Broken conductor detection
49T	Thermal overload for transformer
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

NPIH800

Residual overcurrent protection

Provides earth fault overcurrent protection for medium and high voltage electrical networks.

It monitors phase to earth faults and ensures the proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51N	Earth fault overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)







DIRECTIONAL OVERCURRENT PROTECTION





Learn more





Learn more



Directional overcurrent protection

Provides phase and earth overcurrent protection for medium and high voltage electrical networks against all types of short circuits. This multifunction relay with directional criteria monitors upstream or downstream network sections, enhancing the selectivity and adaptability of your protection scheme.

ANSI Codes

46	Reversal, loss of phase or unbalance phase
46BC	Broken conductor detection
49T	Thermal overload for transformer
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51	Overcurrent
51N	Earth fault overcurrent
67	Phase directional overcurrent
67N	Earth directional overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

NPIHD800

Directional residual overcurrent protection

Provides earth fault overcurrent protection for medium and high voltage electrical networks.

ANSI Codes

50N	Instantaneous earth fault overcurrent
50NBF	Breaker failure with earth fault overcurrent
51N	Earth fault overcurrent
67N	Earth directional overcurrent
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)



POWER PROTECTION





Learn more

NPW800

Wattmetric protection

Performs the measurement of the apparent (S), active (P) and reactive (Q) power of 3 or 4 wire electrical networks. The monitoring of the energy flow direction is completed by the management of power factor, tangent ϕ and by the supervision of network voltage and frequency.

ANSI Codes

- ΣP Maximum of integrated power activates
- ΣQ Maximum of integrated power revives
- 27 Undervoltage
- 32P Maximum of active power
- 32Q Maximum of reactive power
- 37P Loss of load (pump unpriming) / Underpower
- 370 Underpower reactive relay
- 55 Management of the network power factor
- 59 Overvoltage
- 59N Maximum of zero sequence voltage
- 74TC Trip circuit supervision of the breaker
- 810 Over frequency
- 81U Under frequency
- 86 Latching of the output contacts
- BF Breaker failure
- Q/P Management of the network φ

Communication: Modbus (RS845 or Ethernet)



VOLTMETRIC PROTECTION





Learn more



NPU800

Phase voltage, frequency and/or residual voltage protection

Monitors phase voltage and/or frequency in electrical networks. It detects faults between phases or between phase and earth, as well as direct, reverse, and residual voltages (depending on wiring). It also ensures proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

27	Undervoltage
27P	Positive sequence under voltage
47	Maximum of negative sequence voltage
59	Overvoltage
59N	Maximum of zero sequence voltage
74TC	Trip circuit supervision of the breaker
810	Over frequency
81U	Under frequency
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)

NPUH800

Homopolar overvoltage protection

Monitors the zero-sequence voltage of three-phase networks with isolated or high impedance earthed neutral. It monitors phase to phase and phase to earth faults and ensures the proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

59N	Maximum of zero sequence voltage
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)





MOTOR PROTECTION







Learn more

NPM800

Dedicated motor protection

Provides protection for medium-voltage motors and high-power lowvoltage motors. This multifunction relay analyses the currents drawn by the motor during the starting, re-acceleration, and normal operating phases. It also supervises the proper functioning of the circuit breaker and its tripping circuit.

ANSI Codes

5	Thermal start authorisation
49	Thermal overload
48	Too long start
51LR	Locked rotor
46	Reversal, loss of phase or unbalance phase
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
51N	Earth fault overcurrent
371	Underpower or undercurrent
66	Restart inhibit / frequent starts
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)



GENERATOR PROTECTION







Learn more

NPG800

Dedicated generator protection

Protects generators connected to three phase networks. Its numerous protection functions and measurement capabilities make it suitable for machine-generator sets ranging from a few hundred kVA to several tens of MVA.

ANSI Codes

- 21 Distance relay
- 24 Overfluxing
- 27 Undervoltage
- 32P Maximum of active power
- 32Q Maximum of reactive power
- 32R Reverse active power
- 37P Loss of load (pump unpriming) / Underpower
- 37Q Underpower reactive relay
- 40 Field failure
- 46 Reversal, loss of phase or unbalance phase
- 49 Thermal overload
- 50 Instantaneous overcurrent
- 50BF Breaker failure with overcurrent
- 50V Instantaneous overcurrent with voltage control
- 51 Overcurrent
- 51V Maximum overcurrent with voltage control59 Overvoltage
- 59N Maximum of zero sequence voltage
- 64 Sensitive earth fault
- 74TC Trip circuit supervision of the breaker
- 810 Over frequency at 2 seuils
- 81U Under frequency at 2 seuils
- 86 Latching of the output contacts

Communication: Modbus (RS845 or Ethernet)



SYNCHRONISM CONTROL





NPSC800-1

Source Synchronism Protection

Performs check of synchronism between two power supplies. It is usually used to authorise the closing order of a paralleling circuit breaker.

ANSI Code

25 Synchro-check

Communication: Modbus (RS845 or Ethernet)



Learn more

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NPSC800-2

Line-busbar coupling

Allows voltage transfer between the line and busbars. It can also control, via a dedicated output relay, the reconnection of two bus sections fed by the same supply.

ANSI Codes

25	Synchro-check
DLDB	Dead Line – Dead Bus
DLLB	Dead Line – Live Bus
LLDB	Live Line – Dead Bus

Communication: Modbus (RS845 or Ethernet)





The optimal management of electrical power systems is based in particular on the reliability, availability and communication skills of protection, measurement and automation devices.

The NP900 Series covers all the functionalities required for the protection of industrial electrical networks.

It includes numerous features such as:

- customisable and intuitive HMI
- multiple options: I/O cards, RTD, Arc Flash
- TRMS disturbance records up to 31st harmonic
- communication protocols including IEC 61850-8-1 MMS and GOOSE, and Modbus
- built-in programmable automation functions
- SMART9 software suite (licence-free) for the entire range



CODIFICATION







MOUNTING AND FIXINGS

Sizes



Panel cut-out



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PRODUCT LIST

NP900 Series

Model	ANSI Codes	Туре	Rating	Current withstand (Cont. / 1s)	Frequency	Options
NPF910	50 51 50N 51N 50H 51H 68H 49F 87N 50BF 52BF 74TC 79 68 86 99 46 46R 46L	Current	0.2-10A	30A 500A	6Hz-75Hz	Up to 4 optional cards I/O cards, ArcFlash, Temperature sensor
NPF915	21FL 25 27 27P 32 32R 37 46 46R 46L 47 49F 50 50N 50H 50BF 51 51N 51H 51V 52BF 59 59N 59P 60 67 67N 67NT 68 68H 74TC 78 79 79N 81U 81O 81R 86 87N 99	Current Voltage	0.2-10A 0.2-400V	30A 500A	6Hz-75Hz	Up to 3 optional cards I/O cards, ArcFlash, Temperature sensor
NPM910	50 51 50N 51N 50H 51H 68H 87N 48 14 66 37 51M 50BF 52BF 74TC 49M 86 99 46 46R 46L 51LR	Current	0.2-10A	30A 500A	6Hz-75Hz	Up to 4 optional cards I/O cards, ArcFlash, Temperature sensor
NPM915	14 27 27P 32 32R 37 46 46R 46L 47 48 49M 50 50N 50H 50BF 51 51N 51H 51M 51LR 52BF 55 59 59N 59NP 60 66 67 67N 67NT 68H 74TC 81O 81U 81R 86 87N 99	Current Voltage	0.2-10A 0.2-400V	30A 500A	6Hz-75Hz	Up to 3 optional cards I/O cards, ArcFlash, Temperature sensor
NPG915	21 24 25 27 27P 32 32R 37 40 46 46R 46L 47 49M 50 50N 50H 50BF 51 51N 51H 51V 52BF 55 59 59N 59NP 60 64S 67 67N 68H 74TC 78 81O 81U 81R 86 99	Current Voltage	0.2-10A 0.2-400V	30A 500A	6Hz-75Hz	Up to 3 optional cards I/O cards, ArcFlash, Temperature sensor
NPT916	46 46R 46L 49T 50 50H 50BF 50N 51 51H 51N 68 68H 74TC 86 87T 87M 87G 87N 99 52BF	Current	0.2-10A	30A 500A	6Hz-75Hz	Up to 2 optional cards I/O cards, ArcFlash, Temperature sensor
NPTA915	49T 50 50N 50H 50BF 51 51N 51H 67 67N 68H 46 46R 46L 87N 59 27 59P 59N 27P 47 24 90 52BF 60 74TC 21 25 81O 81U 81R 21FL 78 99	Current Voltage	0.2-10A 0.2-400V	30A 500A	6Hz-75Hz	Up to 3 optional cards I/O cards, ArcFlash, Temperature sensor
NPV911	25 27 27P 59 59N 47 50BF 52BF 59NP 60 74TC 78 81O 81U 81R 86 99	Voltage	0.2-400V	-	6Hz-75Hz	Up to 5 optional cards I/O cards, ArcFlash, Temperature sensor

DI/DO: 3 DI + 5 DO + 1 WD

Auxiliary power supply: 18 to 72 Vdc / 80 to 265 Vac Communication: Ethernet | RS232 HSR | PRP



FEEDER PROTECTION



NPF910 - NPF915

Feeder dedicated protection

Designed to protect and monitor three-phase electrical networks against all types of short-circuits, between phases and between phase and earth. Optional cards (I/O, communication...) are available for more comprehensive monitoring and control applications.

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The NPF910 & NPF915 communicate using various protocols, including the IEC 61850 substation communication standard.

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	lones	
/	COUCS	

49F	Thermal overload for cable
50	Instantaneous overcurrent
50BF	Breaker failure with overcurrent
51	Overcurrent
50N	Instantaneous earth fault overcurrent
51N	Earth fault overcurrent
50H	Harmonic overcurrent instantaneous
	protection
51H	Harmonic overcurrent timer protection
67	Phase directional overcurrent
52BF	Breaker failure protection with position
	rise
74TC	Trip circuit supervision of the breaker
79	Autorecloser
68	Cold-load pick-up block
46/46R/46L	Current unbalance / broken conductor
	protection
86	Latching of the output contacts
99	Programmable functions
	-

Communication: Modbus, IEC 61850

NPF915 only

32R	Reverse active power
37	Undercurrent or underpower monitor
32	Directional power
21FL	Fault locator
60	Fuse failure
25	Synchro-check
67NT	Intermittent earth fault protection
51V	Maximum overcurrent with voltage
	control
79N	Zero sequence recloser
68H	Broken conductor protection
87N	Cable-end differential protection
67N	Earth directional overcurrent
59	Overvoltage
27	Undervoltage
59P	Positive sequence overvoltage protection
27P	Positive sequence undervoltage
47	Maximum of negative sequence voltage
59N	Maximum of zero sequence voltage
810	Over frequency
81U	Under frequency
81R	Rate of change frequency
78	Vector jump / surge



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MOTOR PROTECTION



NPM910 - NPM915

Motor protection

Protect and monitor your medium-voltage motors with low or medium power ratings. Optional cards (I/O, communication...) are available for more comprehensive monitoring and control applications. In addition, up to 16 RTD signals can be connected for thermal alarming and tripping.

The NPM910 & NPF915 communicate using various protocols, including the IEC 61850 substation communication standard.

ANSI Codes

50	Instantaneous overcurrent
51	Overcurrent
50N	Earth tank protection
51N	Instantaneous earth fault overcurrent
50H	Harmonic overcurrent instantaneous
	protection
51H	Harmonic overcurrent timer protection
68H	Broken conductor protection
87N	Cable-end differential protection
37	Undercurrent or underpower monitor
49M	Machine thermal overload protection
48	Too long start
14	Under speed
66	Restart inhibit / frequent starts
51M	Load jam monitor
50BF	Breaker failure with overcurrent
52BF	Breaker failure protection with position
	rise
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts
99	Programmable functions
46/46R/46L	Current unbalance / broken conductor
	protection
51LR	Locked rotor

Communication: Modbus, IEC 61850

NPM915 only

55	Management of the network power
	factor
60	Fuse failure
67NT	Intermittent earth fault protection
47/27P/59NP	Positive sequence under/overvoltage
	protection
67	Phase directional overcurrent
67N	Earth directional overcurrent
59	Overvoltage
59N	Maximum of zero sequence voltage
27	Undervoltage
810	Over frequency
81U	Under frequency
32	Directional power
32R	Reverse active power



Protection & Control

Learn more



GENERATOR PROTECTION



NPG915

Generator protection

Suitable for the protection and monitoring of your generators. It can be combined with NPT916 to protect larger machines requiring differential protection and greater protection redundancy.

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The NPG915 communicates using various protocols, including the IEC 61850 substation communication standard.

ANSI Codes

50	Instantaneous overcurrent	49M	Machine thermal overload protection
51	Overcurrent	21	Minimum of impedance
50N	Instantaneous earth fault overcurrent	51V	Maximum overcurrent with voltage
51N	Earth fault overcurrent		control
50H	Harmonic overcurrent instantaneous	40	Field failure
	protection	24	Overfluxing
51H	Harmonic overcurrent timer protection	64S	100% stator earth-fault protection
68H	Broken conductor protection	50BF	Breaker failure with overcurrent
67	Phase directional overcurrent	52BF	Breaker failure protection with position
67N	Earth directional overcurrent		rise
59	Overvoltage	60	Fuse failure
59N	Maximum of zero sequence voltage	74TC	Trip circuit supervision of the breaker
27	Undervoltage	25	Synchro-check
810	Over frequency	86	Latching of the output contacts
81U	Under frequency	99	Programmable functions
81R	Rate of change frequency	46/46R/46L	Current unbalance / broken conductor
78	Vector jump / surge		protection
32R	Reverse active power	47/27P/59NP	Positive sequence under/overvoltage
37	Undercurrent or underpower monitor		protection sequence voltage
32	Directional power	55	Management of the network power
			factor

Communication: Modbus, IEC 61850



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Learn more

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TRANSFORMER PROTECTION



NPT916

Differential protection

Transformer protection including an easy-to-implement differential protection function. It provides both low and high side overcurrent, earth-fault, negative sequence and two independent restricted earthfault instances. It can be applied for generator and motor differential protection as well.

The NPT916 communicates using various protocols, including the IEC 61850 substation communication standard.

ANSI Codes

50	Instantaneous overcurrent
51	Overcurrent
50N	Instantaneous earth fault overcurrent
51N	Earth fault overcurrent
50H	Harmonic overcurrent instantaneous
	protection
51H	Harmonic overcurrent timer protection
68H	Broken conductor protection
87N	Cable-end differential protection
87T	Transformer differential relay
49T	Thermal overload for transformer
50BF	Breaker failure with overcurrent

52BF	Breaker failure protection with position
	rise
74TC	Trip circuit supervision of the breaker
86	Latching of the output contacts
99	Programmable functions
46/46R/46L	Current unbalance / broken conductor
	protection
87M	Machine differential relay
87G	Generator differential relay
68	Cold-load pick-up block

Communication: Modbus, IEC 61850





TRANSFORMER PROTECTION



NPTA915

Voltage regulating

NPTA915 is a voltage regulating IED. It comes with current and voltage based protection functions as well making it suitable for combined transformer voltage regulation and back-up protection. Transformer monitoring module included as a standard feature provides for statistical information for preventive maintenance purposes.

The NPTA915 communicates using various protocols, including the IEC 61850 substation communication standard.

ANSI Codes

50	Instantaneous overcurrent	59N	М
51	Overcurrent	810	0
50N	Instantaneous earth fault overcurrent	81U	Uı
51N	Earth fault overcurrent	81R	Ra
50H	Harmonic overcurrent instantaneous	78	Ve
	protection	49T	Th
51H	Harmonic overcurrent timer protection	21	Μ
68H	Broken conductor protection	24	0
46/46R/46L	Current unbalance / broken conductor	50BF	Bi
	protection	52BF	Bi
87N	Cable-end differential protection		ris
67	Phase directional overcurrent	99	Pr
67N	Earth directional overcurrent	21FL	Fa
59	Overvoltage	60	Fu
27	Undervoltage	74TC	Tr
47/27P/59NP	Positive sequence under/overvoltage protection	25	S۷

N90	Maximum of zero sequence voltage
310	Over frequency
31U	Under frequency
31R	Rate of change frequency
78	Vector jump / surge
19T	Thermal overload for transformer
21	Minimum of impedance
24	Overfluxing
50BF	Breaker failure with overcurrent
52BF	Breaker failure protection with position
	rise
99	Programmable functions
21FL	Fault locator
50	Fuse failure
74TC	Trip circuit supervision of the breaker
25	Synchro-check

Communication: Modbus, IEC 61850



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Learn more

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VOLTAGE PROTECTION







Learn more

NPV911

Busbar protection

Voltage and frequency protection, combined with programmable logic functions, make the NPV911 the ideal solution for load shedding and automatic transfer applications. Optional cards (I/O, communication...) are available.

The NPV911 communicates using various protocols, including the IEC 61850 substation communication standard.

ANSI Codes

59	Overvoltage
27	Undervoltage
59N	Maximum of zero sequence voltage
810	Over frequency
81U	Under frequency
81R	Rate of change frequency
78	Vector jump / surge
60	Fuse failure
74TC	Trip circuit supervision of the breaker
25	Synchro-check
86	Latching of the output contacts
99	Programmable functions
47/27P/59NP	Positive sequence under/overvoltage protection
50BF	Breaker failure with overcurrent
52BF	Breaker failure protection with position rise

Communication: Modbus, IEC 61850





The optimal management of electrical power systems is based on the reliability, availability and communication skills of protection, measurement and automation devices.

The NP950 Series devices offer a modular protection and control solutions for applications requiring a large I/O capacity. Up to 11 optional I/O or communication cards are available for extensive monitoring and control applications.

The NP950 Series communicates using various protocols including the IEC 61850 substation standard.

Its key features are as follows:

- 3.2 kHz sampling rate
- fully modular design
- IEC 61850 2nd Edition
- large colourful configurable display
- up to 11 additional module cards (depending on products)
- arc flash compatible

R 9 2 20 8 8

• IEC 60255, RoHS and REACH compliance



CODIFICATION



ICE SAS Solutions Catalogue – Protection relays



MOUNTING AND FIXINGS







PRODUCT LIST

NP950 Series

Model	ANSI Codes	Rating	Current withstand (Cont. / 1s)	DI / DO	Options
NPF955	50/51 50N/51N 67 67N 67NT 46/46R/46L 50H/51H/68H 50BF 52BF 87N 59 27 59N 47/27P/59NP 81O 81U 81R 32 32R 49F 49T 21 40 24 99 50ARC 50NARC 51V 90 79 79N 78 60 21FL 32N 32O 32U 21U RTD TST CTS CBW THD	0.1-10A 0.2-480V	30A 500A	3 DI / 5 DO + 1 WD	Up to 11 optional cards I/O cards, ArcFlash, Temperature sensor
NPM955	50/51 50N/51N 67 67N 32N 46/46R/46L 50H/51H/68H 50BF 52BF 87N 59 27 59N 47/27P/59NP 81O 81U 81R 32 RTD 49M 48 14 66 37 51M 55 99 50ARC 50NARC 60 MST CTS CBW THD	0.1-10A 0.2-480V	30A 500A	3 DI / 5 DO + 1 WD	Up to 11 optional cards I/O cards, ArcFlash, Temperature sensor
NPG957	50/51 50N/51N 67 67N 32N 46/46R/46L 50H/51H/68H 50BF 52BF 87N 51V 59 27 59N 47/27P/59NP 81O 81U 81R 32 24 21U 21 RTD 49M 87T 87M 87G 55 64S 99 50ARC 50NARC 78 CTS 60 CBW THD 40	0.1-10A 0.2-480V	30A 500A	3 DI / 5 DO + 1 WD	Up to 9 optional cards I/O cards, ArcFlash, Temperature sensor
NPT957	50/51 50N/51N 67 67N 32N 46/46R/46L 50H/51H/68H 50BF 52BF 59 27 59N 47/27P/59NP 81O 81U 81R 32 24 RTD 49T 87T 87M 87G 99 50ARC 50NARC 78 90 CTS CBW THD 21FL 60 SOTF TRF	0.1-10A 0.2-480V	30A 500A	3 DI / 5 DO + 1 WD	Up to 9 optional cards I/O cards, ArcFlash, Temperature sensor

Туре:	Current / Voltage
Frequency:	6Hz-75Hz
Auxiliary power supply:	18 to 72 Vdc / 80 to 265
	Vac (50 / 60Hz)
Communication:	Ethernet RS232 HSR PRP



FEEDER PROTECTION





NPF955

Feeder dedicated protection

The NPF955 feeder protection device offers a modular feeder protection and control solution for applications that require a large I/O capacity.

You can add up to total 11 optional modules (I/O and other type of modules) into the device for extensive monitoring and control applications.

The NPF955 feeder protection device communicates using various protocols, including the IEC 61850 substation standard.

ANSI Codes

50/51	Three phase overcurrent protection	21	Distance rela
50N/51N	Earth tank protection	40	Field failure
67	Phase directional overcurrent	24	Overfluxing
67N	Earth directional overcurrent	99	Programmab
67NT	Intermittent earth fault protection	50ARC	Arc protectio
46/46R/46L	Current unbalance / broken conductor	50NARC	Arc protectio
	protection	51V	Maximum ov
50H/51H/68H	Harmonic overcurrent protection / inrush		control
	blocking	90	Voltage regu
50BF	Breaker failure with overcurrent	79	Autorecloser
52BF	Breaker failure protection with position	79N	Zero sequent
	rise	78	Vector jump
87N	Cable-end differential protection	60	Voltage bala
59	Overvoltage	21FL	Fault locator
27	Undervoltage	32N	Directional e
59N	Maximum of zero sequence voltage	320	Overpower
47/27P/59NP	Positive sequence under/overvoltage	32U	Underpower
	protection	21U	Underimpen
810	Over frequency	RTD	Resistance te
81U	Under frequency	TST	Transformer
81R	Rate of change frequency	CTS	Current trans
32	Directional power	CBW	Circuit break
32R	Reverse active power	THD	Current and v
49F	Thermal overload for cable		distortion
49T	Thermal overload for transformer	C	

21	Distance relay
40	Field failure
24	Overfluxing
99	Programmable functions
50ARC	Arc protection
50NARC	Arc protection
51V	Maximum overcurrent with voltage
	control
90	Voltage regulator
79	Autorecloser
79N	Zero sequence recloser
78	Vector jump / surge
60	Voltage balance
21FL	Fault locator
32N	Directional earth fault
320	Overpower
32U	Underpower
21U	Underimpendance
RTD	Resistance temperature detectors
TST	Transformer status monitoring
CTS	Current transformer supervision
CBW	Circuit breaker wear monitoring
THD	Current and voltage total harmonic
	dictortion

Communication: Modbus, IEC 61850





MOTOR PROTECTION



NPM955

Motor protection

The NPM955 motor protection device offers a modular protection and control solution for larger and more important motors that require a large I/O capacity.

You can add up to total 11 optional modules (I/O and other type of modules) into the device for extensive monitoring and control applications.

You can also connect up to 16 RTD signals for thermal alarms and trips. The NPM955 communicates using various protocols, including the IEC 61850 substation standard.

ANSI Codes

50/51	Three phase overcurrent protection	49F	Thermal overload for cable
50N/51N	Earth tank protection	49T	Thermal overload for transformer
67	Phase directional overcurrent	21	Distance relay
67N	Earth directional overcurrent	40	Field failure
67NT	Intermittent earth fault protection	24	Overfluxing
46/46R/46L	Current unbalance / broken conductor	99	Programmable functions
	protection	50ARC	Arc protection
50H/51H/68H	Harmonic overcurrent protection / inrush	50NARC	Arc protection
	blocking	51V	Maximum overcurrent with voltag
50BF	Breaker failure with overcurrent		control
52BF	Breaker failure protection with position	90	Voltage regulator
	rise	79	Autorecloser
87N	Cable-end differential protection	79N	Zero sequence recloser
59	Overvoltage	78	Vector jump / surge
27	Undervoltage	60	Voltage balance
59N	Maximum of zero sequence voltage	21FL	Fault locator
47/27P/59NP	Positive sequence under/overvoltage	32N	Directional earth fault
	protection	320	Overpower
810	Over frequency	32U	Underpower
81U	Under frequency	21U	Underimpendance
81R	Rate of change frequency	RTD	Resistance temperature detectors
32	Directional power	TST	Transformer status monitoring
32R	Reverse active power	CTS	Current transformer supervision
		CBW	Circuit breaker wear monitoring

oring THD Current and voltage total harmonic distortion

Communication: Modbus, IEC 61850



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Learn more



voltage

GENERATOR PROTECTION





NPG957

Generator protection

The NPG957 generator protection device is well-suited for large machines that require complete generator protection and differential protection.

The device has an integrated automatic voltage regulator function. You can add up to total 9 optional modules (I/O and other type of modules) into the device for extensive monitoring and control applications.

You can also connect up to 16 RTD signals for thermal alarms and trips. The NPG957 communicates using various protocols, including the IEC 61850 substation standard.

ANSI Codes

50/51	Three phase overcurrent protection
50N/51N	Earth tank protection
67	Phase directional overcurrent
67N	Earth directional overcurrent
32N	Directional earth fault
46/46R/46L	Current unbalance / broken conductor
	protection
50H/51H/68H	Harmonic overcurrent protection / inrush
	blocking
50BF	Breaker failure with overcurrent
52BF	Breaker failure protection with position rise
87N	Cable-end differential protection
51V	Maximum overcurrent with voltage control
59	Overvoltage
27	Undervoltage
59N	Maximum of zero sequence voltage
47/27P/59NP	Positive sequence under/overvoltage
	protection

- 810 Over frequency
- 81U Under frequency
- 81R Rate of change frequency
- 32 Directional power
- 24 Overfluxing
- 210 Underimpendance
- 21 Distance relay
- RTD Resistance temperature detectors
- 49M Machine thermal overload protection
- 87T Transformer differential relay
- 87M Machine differential relay
- 87G Generator differential relay
- 55 Management of the network power factor
- 64S 100% stator earth-fault protection
- 99 Programmable functions
- 50ARC Arc protection
- 50NARC Arc protection
- 78 Vector jump / surge
- CTS Current transformer supervision
- 60 Fuse failure
- CBW Circuit breaker wear monitoring
- THD Current and voltage total harmonic distortion
- 40 Field failure

Communication: Modbus, IEC 61850





TRANSFORMER PROTECTION



NPT957

Transformer protection and voltage regulator

The NPT957 is a transformer protection device with a differential protection function and an integrated automatic voltage regulator function.

The relay also provides complete current-based and voltage-based protection functions as well as full measurements.

You can add up to total 9 optional modules (I/O and other type of modules) into the device for extensive monitoring and control applications. The NPT957 communicates using various protocols, including the IEC 61850 substation standard.

ANSI Codes

50/51	Three phase overcurrent protection	24	Overfluxing
50N/51N	Earth tank protection	RTD	Resistance temperature detectors
67	Phase directional overcurrent	49T	Thermal overload for transformer
67N	Earth directional overcurrent	87T	Transformer differential relay
32N	Directional earth fault	87M	Machine differential relay
46/46R/46L	Current unbalance / broken conductor	87G	Generator differential relay
	protection	99	Programmable functions
50H/51H/68H	Harmonic overcurrent protection / inrush	50ARC	Arc protection
	blocking	50NARC	Arc protection
50BF	Breaker failure with overcurrent	78	Vector jump / surge
52BF	Breaker failure protection with position	90	Voltage regulator
	rise	CTS	Current transformer supervision
59	Overvoltage	CBW	Circuit breaker wear monitoring
27	Undervoltage	THD	Current and voltage total harmonic
59N	Maximum of zero sequence voltage		distortion
47/27P/59NP	Positive sequence under/overvoltage	21FL	Fault locator
	protection	60	Voltage transformer supervision
810	Over frequency	SOTF	Switch-on-to-fault
81U	Under frequency	TRF	Transformer status monitoring
81R	Rate of change frequency		
32	Directional power	Communication: Modbus, IEC 61850	



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AP900 SERIES ARC FLASH

The AP900 Series has been designed to enhance the safety and reliability of electrical distribution networks, particularly within low and medium voltage switchboards.

These modern devices, combining simplicity, flexibility, and functionality, detect the light emitted by an arc fault and promptly trigger the circuit breaker to cut the power supply, thereby minimising potential damage.

They meet the increasing demands of switchgear applications and are suitable for all types of industrial electrical networks.

Our AP900 Series integrates seamlessly with our NP900 protection relays, ensuring a consistent and high-performance installation.





CODIFICATION



P Point-to-point


MOUNTING AND FIXINGS

AP901(S) - AP902



Sensors AS01 - AS02





MOUNTING AND FIXINGS

AP910F - AP910P









Sensors AS01 - AS02



PRODUCT LIST

AP900 Series

Model	Current card	Light sensors	Fibre sensors	Fast outputs (<5ms)	Trip relay (7ms)	Binary outputs (24 Vdc)	Binary inputs (24 Vdc)	Event recording	LED indicators
AP901		12	1 (option)		4*	1	2	\checkmark	12
AP901S		12			3*	3	6	\checkmark	17
AP902			3		4*	1	2	\checkmark	11
AP910F	\checkmark		3	2	4*	1	2	\checkmark	19
AP910P	~	12	1 (option)	2	4*	1	2	\checkmark	20

* An electronically latched trip relay, normally closed, is available as an option.

Auxiliary power supply: 18 to 72 Vdc / 92 to 265 Vac (50 / 60Hz)

5

Mounting: Panel/Rack

Watchdog output: 1

Sensors AS0x

Compatible AP900 mounting	AS01 light point sensor unit (8,000 lux)	AS02 light and pressure point sensor unit (8,000 lux - 0.2 bar above ambient pressure)	AS06 plastic fibre optic loop sensor	AS07 glass fibre optic loop sensor
AP901	\checkmark	\checkmark	🗸 (option)	🗸 (option)
AP901S	\checkmark	\checkmark		
AP902			\checkmark	\checkmark
AP910F			\checkmark	\checkmark
AP910P	\checkmark	\checkmark	🗸 (option)	🗸 (option)



ARC FAULT DETECTORS





Learn more

AP901 - AP9015 - AP902

Standalone Arc Flash protection

The AP901, AP901S, and AP902 arc fault detectors are standalone local protection devices. They can be paired with sensors monitoring a specific point or with a fibre optic sensor for 360° area detection.

AP901

Able to manage light sensors, and combined light and pressure sensors, alongside 360° fibre optic sensors.

AP901S

Dedicated to light and pressure sensors, with an increased number of LEDs and DIs.

AP902

Dedicated to 360° fibre optic sensors.

AP901, AP901S, and AP902 operate either autonomously or in a master/slave configuration with an AP910.

Sensors AS01 / AS02

Ultra-fast triggering, under 7 ms. Triggering by light and/or pressure.

Sensors AS06 / AS07

360° fault monitoring Fibre length up to 50m





ARC FAULT DETECTORS





Learn more

AP910F - AP910P

Arc Flash protection with fault current monitoring

AP910x arc flash detectors combine the detection of light or pressure changes caused by an arc flash event with real-time monitoring of current values flowing through the busbar, thereby enhancing the safety of your installation.

They are typically used as the master unit in a network of AP901 / AP902 sensors.

AP910F

Arc flash protection with 360° fibre optic light sensor AS06 / AS07.

AP910P

Arc flash protection with light sensor AS01 / AS02 and current measurement.

Sensors AS01 / AS02

Ultra-fast triggering, under 7 ms Triggering by light and/or pressure

Sensors AS06 / AS07

360° fault monitoring Fibre length up to 50m







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Our 9000 Series of protection relays has been specially designed to cover all your needs as a railway infrastructure manager, whether for conventional lines or high-speed rail (HSR).

Our expertise, built over more than 40 years in railway infrastructure protection, will help you enhance the reliability of your network and shape its future.



MOUNTING AND FIXINGS

PDZI9000





PGT9000







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PRODUCT LIST

9000 Series - AC Protection

Model	ANSI Codes	Туре	Rating	Current withstand (Cont. / 1s)	Frequency	DI / DO
PDZI9000	21 21SUM 27 50BF 50/51 51DPR 59 59H 67 74TC 79 87L 86 21FL/50FL/87FL	Current Voltage	1 A or 5 A 100 V or 110 V	3 ln 80 ln 1.5 Un 1.9 Un (5s)	50 Hz or 60 Hz (±3%)	18 DI / 28 DO + 2 CB
PGT9000	21 27 50BF 50/51 59 86 50N/51N RT	Current Voltage	1 A or 5 A 100 V or 110 V	3 ln 80 ln 1.5 Un 1.9 Un (5s)	50 Hz or 60 Hz (±3%)	18 DI / 28 DO + 2 CB

Auxiliary power supply: 48 Vdc to 125 Vdc (±15%)





AC CATENARY PROTECTION







Learn more

PDZI9000

Catenary protection - 25 kV or 2x25 kV

Protects 25 kV or 2x25 kV AC catenary systems at 50 or 60 Hz.

Embedding various protection functions, including a distance function [21] combined with a large event recording capacity, our PDZI9000 facilitates the operation of your AC railway electrical network.

Thanks to its hybrid acquisition via CTs or IEC 61850-9-2 «Sampled Values», it is now possible to protect catenaries operated in parallel connected to the same transformer by means of a patented summed current management.

Operating functions such as fault location [21FL] - [50FL] - [87FL], an embedded web server and a touch screen HMI complete its range of functions.

ANSI Codes

21	Minimum of impedance
50/51	Three phase overcurrent protection
50BF	Breaker failure with overcurrent
67	Phase directional overcurrent
27	Undervoltage
59	Overvoltage
79	Autorecloser
51DPR	Power swing detection
21SUM	Underimpendance summing
87L	De-icing
59H	Harmonic overvoltage
86	Circuit breaker monitoring
21FL/50FL/87FL	Fault locator
74TC	Trip circuit supervision

Communication: Modbus, IEC 61850



AC TRACTION GROUP PROTECTION







Learn more

PGT9000

Traction group protection

Protects fixed electric traction installations supplying 25 kV or 2x25 kV AC catenary systems at 50 or 60 Hz.

Our PGT9000 has a large event recording capacity facilitating the operation of your railway electrical network.

Its embedded web server and its touch screen HMI, allow you to calmly approach the future of your railway infrastructures.

ANSI Codes

50/51	Three phase overcurrent protection
50BF	Breaker failure with overcurrent
27	Undervoltage
59	Overvoltage
21	Minimum of impedance
86	Circuit breaker monitoring
50N/51N	Earth tank protection
RT	Voltage reverse

Communication: Modbus, IEC 61850





Our 9000 Series, specifically developed for the protection of railway networks with DC supplies of up to 3 kV, is based on over 40 years of expertise.

This new range will help you shape your future thanks to its advanced features and the use of the IEC 61850 edition 2 communication protocol.



MOUNTING AND FIXINGS

DDL9000





DFF9000





O ICC

PRODUCT LIST

9000 Series - DC Protection

Model	ANSI Codes	Туре	Rating	Current withstand (Cont. / 1s)	DI / DO
DDL9000	27DC 49DC 59DC 76BF 76 86 87L PAU SC di/dt di/dtSUM	Current Voltage	Primary current: 1 kA to 10 kA Primary voltage: 500 V to 4 kV	according to sensor	18 DI / 12 DO + 2 CB
DFF9000	27H 51H 59H	Current Voltage	Primary current: 1 kA to 10 kA Primary voltage: 500 V to 4 kV	according to sensor	9 DI / 8 DO + 1 CB

Auxiliary power supply: 48 Vdc to 125 Vdc (±15%)





DC CATENARY PROTECTION







Learn more

DDL9000

Catenary voltage protection up to 3 kV

Protects your catenaries or the power supply rails for direct current electric traction.

Our DDL9000 protection relay facilitates the operation of your railway electrical networks thanks to its protection functions such as [di/dt] and its patented parallel line management version, or its high capacity for recording faults and events.

Its embedded web server and its touch screen HMI, allow you to calmly approach the future of your railway infrastructures.

ANSI Codes

27DC	DC undervoltage
59DC	DC overvoltage
76BF	Breaker failure
76	DC overcurrent
49DC	Cable thermal overload
87L	De-icing
di/dt SUM	Rate of change of summed current
86	Circuit breaker monitoring
PAU	Presence and lack of catenary voltage
SC	Sensors monitoring
di/dt	Rate of change of current

Communication: Modbus, IEC 61850

Note: our DDL9000 relay operates in conjunction with a direct current sensor, which depends on the voltage level of your network.

It must be defined in collaboration with our engineering department.



FUNDAMENTAL FREQUENCY DETECTOR







Learn more

DFF9000

Fundamental frequency detector 50 Hz or 60 Hz

Protects your fixed electrical traction installations on a DC network, by monitoring the quality of the currents and voltages supplied.

Our DFF9000 detector monitors the presence of AC current and voltage on your DC network thanks to its overcurrent or harmonic voltage functions.

Its highly accurate processing from 5 Hz, its scalable platform, its embedded web server and its touch screen HMI, allow you to calmly approach the future of your railway infrastructures.

ANSI Codes

51H	Harmonic overcurrent timer protection
59H	Harmonic overvoltage
27H	Harmonic undervoltage

Communication: Modbus, IEC 61850

Note: our DFF9000 relay operates in conjunction with a direct current sensor, which depends on the voltage level of your network.

It must be defined in collaboration with our engineering department.





CONTROL AND MONITORING

ICE SAS's range of auxiliary relays is designed to meet all the constraints and requirements commonly found in electromechanical automation systems. Extremely robust and highly reliable, our relays lie at the heart of numerous systems that demand high endurance and long service life. Their proven designs have demonstrated their performance and reliability in the field over many years.

ICE SAS has continuously enhanced this range over time to meet the demanding requirements of control/monitoring and installation protection systems.

This range includes three product families:

- instantaneous monostable relays: ACH and AF
- bistable relays: ABF and ABG
- time delay relays: CEF and CEH



AT LA

PRODUCT LIST

Range of auxiliary relays

				Bre	aking Cap	acity					
		DC			DC			AC			
Product	Res	sistive cire	cuit	L/R	circuit = 40	0 ms	Cos φ = 0.4			Enclosure	
	24 V	125 V	220 V	24 V	125 V	220 V	24 V	125 V	220 V		
Instantaneous	monostab	le relays									
ACH88	10 A	1A	0.6 A	10 A	0.8 A	0.4 A	10 A	10 A	10 A	Н	
AF3300	10 A	1A	0.6 A	10 A	0.8 A	0.4 A	10 A	10 A	6 A	F	
AF440	10 A	1A	0.6 A	10 A	0.8 A	0.4 A	10 A	10 A	10 A	F	
AF4400C	10 A	10 A	4 A	10 A	6 A	2 A	10 A	10 A	10 A	F	
Magnetically la	atched bist	able relag	ys								
ABF330	10 A	1A	0.6 A	10 A	0.8 A	0.4 A	10 A	7 A	7 A	F	
ABF330S2	10 A	1A	0.6 A	10 A	0.8 A	0.4 A	10 A	7 A	7 A	F	
Mechanically I	atched bist	table rela	vs								
ABG13	5 A	0.8 A	0.4 A	3.5 A	0.6 A	0.3 A	6 A	6 A	5 A	G	
Time-delayed	on pick-up	or drop-c	out								
CEF4	4 A	0.5 A	0.2 A	4 A	0.3 A	0.1 A	4 A	4 A	4 A	F	
CEF4MU	4 A	0.5 A	0.2 A	4 A	0.3 A	0.1 A	4 A	4 A	4 A	F	
CEF50	4 A	0.5 A	0.2 A	4 A	0.3 A	0.1 A	4 A	4 A	4 A	F	
CEF50MU	4 A	0.5 A	0.2 A	4 A	0.3 A	0.1 A	4 A	4 A	4 A	F	
CEF50MU2	4 A	0.5 A	0.2 A	4 A	0.3 A	0.1 A	4 A	4 A	4 A	F	
CEH70	4 A	0.2 A	0.1 A	8 A	0.4 A	0.2 A	80 A	16 A	9 A	Н	
CEH70MU2	1A	0.2 A	0.1 A	8 A	0.4 A	0.2 A	80 A	16 A	9 A	н	

INSTANTANEOUS MONOSTABLE RELAYS





Learn more

ACH88 (formerly RAG)

Instantaneous monostable relays designed to meet a wide range of field applications.

The ACH88 offers a broad auxiliary power supply range and features 8 changeover contacts.

Enclosure & socket - type H

Type H enclosure, with a front-facing dimension of 110 x 110, is dustproof and consists of a moulded baseplate and of a transparent cover secured by two captive knurled-head nuts. Connection is by means of external protected loose-proof screw terminals, each receiving two 20/10 wires.

It is designed for mounting on a rail or panel, either as a fixed surface installation or as a plug-in unit. Rear connection is also available via 5 x 0.8 mm tabs, allowing connection by clip-on connectors (2 per terminal) or by soldering.

This enclosure can be plugged into a compatible socket.

Type H sockets are equipped either with front or rear terminals or, exclusively in the rear-terminals version, with 5 x 0.8 clip-on or solder tags.

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION

ACH88





INSTANTANEOUS MONOSTABLE RELAYS



Learn more

AF3x - AF4x

Instantaneous monostable relays designed to meet a wide range of field requirements.

AF relays are used in numerous critical applications.

Enclosure & socket - type F

Type F enclosure, with a front-facing dimension of 45 x 45, is dustproof and consists of a moulded baseplate and of a transparent cover secured by means of two captive screws and equipped with an extraction handle.

It is designed for mounting:

- as a fixed surface-mounted unit with rear terminals using clip-on connectors or solder tags,
- as a plug-in surface-mounted unit on a socket.

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION



AF3300





BISTABLE RELAYS





Learn more

ABF330

The ABF330 bistable relays are designed with two coils mounted in opposition. The contact holding is magnetic. Return to the initial position is achieved by energising the opposite coil.

They consist of 1 group of 3 changeover contacts and are built around our type F enclosures.

Enclosure & socket - type F

Type F enclosure, with a front-facing dimension of 45 x 45, is dustproof and consists of a moulded baseplate and of a transparent cover secured by means of two captive screws and equipped with an extraction handle.

It is designed for mounting::

- as a fixed surface-mounted unit with rear terminals using clip-on connectors or solder tags,
- as a plug-in surface-mounted unit on a socket.

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION

ABF330



BISTABLE RELAYS





ABG13

The ABG13 bistable relays are designed with two coils mounted in opposition. The contact holding is mechanical. Return to the initial position is achieved by energising the opposite coil.

They consist of 2 groups of 3 changeover contacts and are built around our type G enclosures.

Enclosure & socket - type G

Type G enclosure, with a front-facing dimension of 66 x 110 mm, is dustproof and consists of a moulded baseplate and of a transparent cover secured by two captive knurled-head screws.

It is designed for mounting:

- as a fixed surface-mounted unit with rear connections using clipon connectors or solder tags,
- as a plug-in surface-mounted unit on a socket.



RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION



Protection & Central

TIME-DELAY RELAYS ON PICK-UP OR DROP-OUT





CEF4 - CEF50

The CEF relays offer numerous advantages:

- various timing options (order emission or suppression),
- adjustment via 4 timing ranges (from 0.1 second to 4 hours),
- effective isolation between the supply circuit, contacts and earth,
- immunity to HF disturbances,

CEFx family codification

• contact type configurable upon command (NO, NC, changeover, etc.).



Enclosure & socket - type F

Type F enclosure, with a front-facing dimension of 45 x 45, is dustproof and consists of a moulded baseplate and of a transparent cover secured by means of two captive screws and equipped with an extraction handle.

It is designed for mounting:

- as a fixed surface-mounted unit with rear terminals using clip-on connectors or solder tags,
- as a plug-in surface-mounted unit on a socket.

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION

CEF4 (2222) 14 (12) 13 (12) (13) 14) (11) 10 B2 -10 B2 -(7 A1 6 (5) 6 3 டிரி ⊘ Œ control comma control comma permanent polarity

CEF4MU (2122)

CEF4

Learn more



Learn more



TIME-DELAY RELAYS ON PICK-UP OR DROP-OUT

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION



CEF50 (2222)

CEF50 (0044)



CEF50MU (2122)



CEF50MU2 (0022)



IMPORTANT NOTE:

When powered by alternating current, the control contact must supply only the CEF4MU relay, excluding any other load.



Delayed closing upon command emission. Instant opening upon command suppression.



Instant closing upon command emission. Delayed opening upon command suppression.



TIME-DELAY RELAYS ON PICK-UP OR DROP-OUT



CEH70

The CEH70 relays offer the following advantages:

- precision and reliability,
- · visualisation of relay states through front-facing indicators,
- compact size,
- immunity to HF disturbances,
- effective isolation between the supply circuit, contacts, and earth.



Learn more

CEH70 family codificatio	า
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Contact notation for CEH70 families					
Instantaneous	Delayed				
Work or Rest	Work or Rest				
Х	Y				
Example XY	= 32				

= 3 instantaneous + 2 delayed

(Work or Rest configurable per jumper)

Enclosure & socket - type H

Type H enclosure, with a front-facing dimension of 110x110, is dustproof and consists of a moulded baseplate and of a transparent cover secured by two captive knurled-head nuts. Connection is by means of external protected loose-proof screw terminals, each receiving two 20/10 wires.

It is designed for mounting on a rail or panel, either as a fixed surface installation or as a plug-in unit. Rear connection is also available via 5 x 0.8 mm tabs, allowing connection by clip-on connectors (2 per terminal) or by soldering.

This enclosure can be plugged into a compatible socket.

Type H sockets are equipped either with front or rear terminals or, exclusively in the rear-terminals version, with 5x0.8 clip-on or solder tags.



TIME-DELAY RELAYS ON PICK-UP OR DROP-OUT

RELAYS VIEWED FROM FRONT – DE-ENERGISED POSITION

CEH70

CEH70MU2









ENERGY & AUTOMATION RANGE

Our range of measurement control units and RTU (Remote Terminal Unit) controllers is designed to meet the needs of industrial and energy infrastructures.

Our range enables precise monitoring of your facilities, ensuring reliable data acquisition and automation of critical processes. Thanks to their robustness and compatibility with various communication protocols, our units and RTUs integrate easily into your existing systems, providing intelligent and secure control.



ENERGY & AUTOMATION RANGE

PRODUCT LIST

MEASUREMENT CONTROL UNIT

Model	НМІ	Туре	Rating	Withstand (Cont. / 1s)	Frequency	Options
NPP915	4-inch screen	Current Voltage	0.2-10A 0.2-400V	30A 500A	6 Hz-75 Hz	Up to 3 optional cars I/O cards, ArcFlash, temperature sensor
					DI/DO:	3 DI + 5 DO + 1 WD
				Auxiliary	y power supply:	18 to 72 Vdc / 80 to 265 Vac (50 / 60 Hz)
				Co	ommunication:	Ethernet RS232
						HSR PRP

RTU CONTROLLERS

Model	ANSI Codes	НМІ	Options	
NPS914	86	4-inch screen	Up to 6 optional cards I/O cards, ArcFlash, temperature sensor	
NPS954	86 99	7-inch screen	Up to 14 optional cards I/O cards, ArcFlash, temperature sensor	
		DI/DO: 3 DI + 5 DO + 1 WD		
		Auxiliary power supply:	18 to 72 Vdc / 80 to 265 Vac (50 / 60 Hz)	
		Communication:	Ethernet RS232	
			HSR PRP	



ENERGY & AUTOMATION RANGE

MEASUREMENT CONTROL UNIT





Learn more

NPP915

Measurement Control Unit

Housed in the same mechanical casing as our NP900 series, the NPP915 offers a unique combination of high accuracy power and energy measurement of class 0.2S with dynamic measurement range up to 250A secondary current. Freely configurable data logging, programmable logic and disturbance recorder features allows for variety of power quality monitoring applications.

→

The NPP915 communicates using various protocols, including IEC 61850 substation communication standard.

Communication: Modbus, IEC 61850



ENERGY & AUTOMATION RANGE

RTU CONTROLLERS



Learn more

NPS914

Alarm and indication

The NPS914 alarm and indication can be applied for substation general I/O extension, control and alarm annunciation. Optional cards (I/O, communication...) can be inserted depending on application requirements. Easy to use and powerful logic programming expands further the application range to more demanding control, alarm and indication needs. Large freely programmable HMI display provides quick visualization of the object, alarm and event status.

The NPS914 communicates using various protocols, including IEC 61850 substation communication standard.

ANSI Codes

86 Latching of the output contacts99 Programmable functions

Communication: Modbus, IEC 61850



Learn more

NPS954

Alarm and indication

Housed in the same mechanical casing as our NP950 Series, the NPS954 offers the most comprehensive automation and signalling solution in our range, designed for applications requiring a high I/O capacity. You can add up to a total of 14 optional modules (I/O and other type of modules) into the device, depending on the requirements of your application.

The NPS954 communicates using various protocols, including IEC 61850 substation communication standard.

ANSI Codes

86	Latching of the output contacts
99	Programmable functions

Communication: Modbus, IEC 61850





REGULATION

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TRANSFORMER VOLTAGE REGULATION RANGE

Our range of voltage regulators for HV/MV transformers is designed to optimise the stability and performance of your high-voltage electrical networks.

It ensures precise and reliable voltage control, maintaining high-quality power supply even under fluctuating load conditions.

Tailored for high and very high voltage transformers, our regulators offer intelligent energy management alongside enhanced protection for your transformers.

With our cutting-edge technologies, you can improve the efficiency of your infrastructure while reducing operating costs.



TRANSFORMER VOLTAGE REGULATION RANGE

PRODUCT LIST

NPTx9xx

Model	ANSI Codes	НМІ	Parallel operation of multiple transfo	Compounding	g DI/DO	Options
NPTA915	90	4-inch screen	Yes by logic	No	3 DI + 5 DO + WD	Up to 3 optional cards
NPT957B	90	7-inch screen	Yes by logic	No	3 DI + 5 DO + WD	Up to 9 optional cards
					Auxiliary power supply:	18 to 72 Vdc / 80 to 265 Vac (50 / 60 Hz)
					Communication:	Ethernet RS232 HSR PRP

TARTN20D

Model	ANSI Code	Parallel operation of multiple ransfo	Compounding	DI / DO	Auxiliary supply
TARTN20D	90	Yes reactive power flow	Yes	25 DI + 17 DO + WD	48 or 125 Vdc



TRANSFORMER VOLTAGE REGULATION RANGE

VOLTAGE REGULATORS









Learn more

NPTA915

Advanced voltage regulator

Based on the measurement of currents and voltages flowing through the transformer, the NPTA915 combines voltage regulation with backup protection.

The overload statistics and fault count provided by the NPTA915 inform you of the need for preventive maintenance on your transformer.

Housed in the same mechanical enclosure as our NP900 Series, the NPTA915 communicates via various protocols, including the IEC 61850 communication standard.

ANSI Code

90 Voltage regulator

Communication: Modbus, IEC 61850



NPT957B

Expert voltage regulator

By measuring the currents and voltages flowing through the transformer, the NPT957B enables the combination of Automatic Voltage Regulation (AVR) with transformer protection, allowing regulation across multiple transformers.

The overload statistics and fault count provided by the NPT957B inform you of the need for preventive maintenance on your transformer.

Housed in the same mechanical enclosure as our NP950 Series, the NPT957B communicates using various protocols, including the IEC 61850 communication standard.

ANSI Code

90 Voltage regulator

Communication: Modbus, IEC 61850


TRANSFORMER VOLTAGE REGULATION RANGE

REGULATION PLC









Learn more

TARTN20D

Voltage regulating control relay

The Voltage Regulating Control Relay «TARTN20D» provides regulation of the supply medium-voltage (MV) provided by a transformer HV / MV or by two parallel transformers.

The TARTN20D monitors the voltage and current of HV network and initiates to the transformer tap changer mechanism the different commands to raise or lower voltage.

It can operate according to two modes:

- · direct regulation by measuring output voltage of the transformer,
- by reactive compounding regulation

The direct regulation operates by comparison between transformer output voltage and the setting voltage Vc (apart near a α).

The reactive compounding takes account the complex load impedance of the network: Z = R + jX, in order to calculate a compensated output voltage.

ANSI Code

90 Voltage regulator



TECHNIREL

Our range of control solutions for rotating machinery is designed to optimise the performance and reliability of your rotating equipment.

Our controllers ensure precise control of speed and torque, guaranteeing dynamic and stable management of machines such as turbines, generators, and motors.

Our control solutions enhance energy efficiency, extend the lifespan of your installations, and ensure uninterrupted operation.



PRODUCT LIST



NPRG8x0

Model	ANSI Codes	+/- f control	+/-U control	DI / DO
NPRG810	25	No	No	4 DI + 4 DO +WD
NPRG860	25 90	Yes	No	8 DI + 14 DO +WD
NPRG870	25 90	Yes	Yes	8 DI + 14 DO +WD

Auxiliary power supply: 19 to 70 Vdc / 85 to 255 Vac (50 / 60 Hz) Communication: Modbus RS232 or RS485

RG7xx	TECHNIREL		
Model	Functions	Application	Auxiliary supply
RG750	Regulation of excitation current through the rotor Regulation of voltage at stator terminals Power factor (cos ∳) regulation Limitation of rotor and stator currents Limitation of absorbed reactive power (Q) Synchronous alternators	Synchronous generators	DC 48-110-127 Vdc
RG730MS-Q	Regulation of excitation current through the rotor Regulation of voltage at stator terminals Power factor ($\cos \phi$) regulation Limitation of rotor and stator currents	Synchronous motors	DC 24 Vdc

Communication: Modbus RS232

SYNCHRONISM CONTROL





NPRG810

Digital synchronisation control for generator

NPRG810-1G provides synchronisation control between a generator and an electrical grid. More generally, it is used to authorise the transmission of a closing command to a coupling circuit breaker.

NPRG810-4G provides sequential synchronisation control between four generators and an electrical grid.

Both devices also feature a dead busbar paralleling function.

ANSI Code

25 Synchro-check

Communication: Modbus RS232 or RS845



Learn more

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NPRG860 - NPRG870

Automatic synchronizer for generator

NPRG860 & NPRG870 perform synchronization and paralleling of generators with electrical network. More generally, they are used for the synchronisation and coupling of alternators to an existing voltage source.

NPRG860 features a speed adjustment function. NPRG870 adds a voltage adjustment function. These two devices also include CB time compensation allowing paralleling without phase shift.

Codes ANSI

25	Synchro-check
90	Voltage regulator

Communication: Modbus RS232 or RS845



Learn more



REGULATOR





TECHNIREL



Learn more

RG750

Digital controller for synchronous machines

The digital Automatic Voltage Regulator (AVR) RG750 was specially designed to control the excitation of large synchronous machines (alternators & motors).

It allows the machines that are equipped with to ensure dynamic stability of electrical networks.

Functions

Regulation of excitation current through the rotor Regulation of voltage at stator terminals Power factor ($\cos \phi$) regulation Limitation of rotor and stator currents Limitation of absorbed reactive power (Q)

Communication: Modbus RS232

Relay from our Technirel trademark



TECHNIREL



Learn more

RG730MS-Q

Digital controller for synchronous motors

The RG730MS-Q is designed for the regulation of synchronous motors, with control of "Rotor Current (I Rotor) and Power Factor (Cos Phi)", or, when activated via an external contact, control of «Reactive Power».

Functions

Regulation of excitation current through the rotor Regulation of voltage at stator terminals Power factor ($\cos \phi$) regulation Limitation of rotor and stator currents Limitation of absorbed reactive power (Q)

Communication: Modbus RS232

Relay from our Technirel trademark



ROTATING MACHINERY CONTROL





K-EX700

Excitation kit

Simple solution designed to fulfil the needs of revamping excitation circuits of brushless machines

Basically, one kit includes:

- one Automatic Voltage Regulator RG750,
- one excitation frame protected by a steel cover

The necessary components that require the excitation and the field flashing circuits are designed according to the machine's excitation characteristics.

TECHNIREL



Learn more

A row of terminal blocks allows the wiring between the different modules from the excitation frame to the excitation field circuit and RG750 AVR.

The excitation kit K-EX700 is supplied tested and ready for use including the specific wiring diagram.

Excitation frame from our Technirel trademark



P\$8000 😡	PBC - Poste SkV
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SCADA SUPERVISION



SCADA - SUPERVISION

SUPERVISORY SOFTWARE







Learn more

PS8000

Complete system from field to operator levels

- Complete set of hardware and software complying with all electrical requirements
- Multilingual, user-friendly and easy to use

Advanced functionalities for energy management

- Full dynamic representation and colouring of the network
- Complete interface with relays and data acquisition devices
- Automation functions via an integrated PLC
- Optional high speed load shedding

Advanced solution based on Ethernet

- Reliability and performance
- Industrial, evolving, adaptable solution
- Fast and secure
- Support of more than 300 protocols including IEC 60870-5 and IEC 61850

Continuity of services ensured by redundancy

- On all levels of layers of the PS8000
- From simple configuration (two servers) to more complex applications (cluster of servers in loop)









SCADA - SUPERVISION

SYNOPTICS AND OPERATION LOG

Real-time update of synoptics, measures and energies

Real-time overview of the state of the electrical network:

- status or value of any aperiodic information from all sub-stations
- measures and energies
- display of relay parameters
- secure command of switches



Event log

PS8000 📷	Journal de bo	rd Filtrer p	rofils
	[*]-[*]-[T,Rel:0d,1h,0m,0s]	Filtro	
-	Heure d'appartion	Tonla	Nom variable
Vue globale	23/01/2020 16:52:33	Modification valeur spontanée: (100.100.254.254)	IP_switch
17	23/01/2020 16:52:33	Modification valeur spontanée: (100.100.3.1)	IP_impr
P Poste PBC	23/01/2020 16:52:33	Modification valeur spontanée: (1)	cal_ground
Proto 225 kV	23/01/2020 16:52:33	Modification valeur spontanée: (0)	false
	23/01/2020 16:52:33	Modification valeur spontanée: (1)	cal_arrivee_2_225kV
🖉 Poste UI	23/01/2020 16:52:33	Modification valeur spontanée: (1)	cal_arrivee_1_225kV
	23/01/2020 16:52:33	Modification valeur spontanée: (1)	true
Poste PCC	23/01/2020 16:52:33	Modification valeur spontanée: (100.100.254.254)	IP_switch
<i>n</i>	23/01/2020 16:52:33	Modification valeur spontanele: (100.100.3.1)	IP_impr
Poste AA	23/01/2020 16:52:33	Modification valeur spontanée: (1)	cal_ground
7 Produ AD	23/01/2020 16:52:33	Modification valeur spontanée: (0)	false
V roseno	23/01/2020 16:52:33	Modification valeur spontanele: (1)	cal_arrivee_2_225kV
7 Poste IF	23/01/2020 16:52:34	Modification valeur spontanée: (1)	cal_arrivee_1_225kV
	23/01/2020 16:52:34	Modification valeur spontanée: (1)	true
Poste PAD	23/01/2020 16:52:34	Modification valeur spontanée: (100.100.254.254)	IP_switch
17. C	23/01/2020 16:52:34	Modification valeur spontanele: (100.100.3.1)	IP_impr
	23/01/2020 16:52:34	Modification valeur spontanée: (1)	cal_ground
	23/01/2020 16:52:34	Modification valeur spontanée: (0)	false
	23/01/2020 16:52:34	Modification valeur spontanele: (1)	cal_arrivee_2_225kV
The second second second second	23/01/2020 16:52:34	Modification valeur spontanée: (1)	cal_arrivee_1_225kV
Joamail de bont	23/01/2020 16:52:34	Modification valeur spontanée: (1)	true

The event log records all events with a precision of 1 ms:

- appearance/disappearance of events/alarms
- follow up of operator actions (discharge, sending of command and orders, etc.)
- messages and errors reports
- specific editions (records, results of sorting, parameters, measures, etc.).

Alarm and event management

- User configurable list of alarms
- The appearance of an alarm triggers an alert sound and generates an entry in the event log
- An overall list of alarms, acknowledged or not, is available







SCADA - SUPERVISION SYNOPTICS AND OPERATION LOG

Alarms geolocation

Grouping alarms by:

- types,
- domains,
- groups,
- emergency levels.

Visualisation of faults on links.





Local PLC embedded



- Powerful graphic editor (SFC, FBD, LD)
- Text editor (ST, IL)
- Fully compatible with IEC 61131-3







MARKET-SPECIFIC SOLUTIONS





QUALIANOR

NUCLEAR SAFET

Certification

NUCLEAR SOLUTION

ICE SAS is offering solutions for most of nuclear applications such as feeders, generator or motor protection.

Our CEE 7000 Series has proven its robustness during more than 50 years and are still included in our LTS program.

Manufacturers are still counting on us for the next nuclear power plant generation.

We provide tailor-made solutions, like qualified retrofitting based on our CEE 7000 Series, at reduced cost and short time delivery.

Our nuclear offer includes:

- nuclear qualified static protection relays since 1973 under our trademark CEE
- nuclear on-site installation and commissioning
- studies and technical assistance for the protection of electrical networks
- a worldwide presence through our sister companies and our network of agents.







- Protection of auxiliaries and support systems
- CEE 7000 Series qualified protection relays for nuclear activities related to safety
 - LTS program



Qualified teams (UTO 85-114 HN1, HN2, HN3) for on-site operations and control



OUR OFFER AT A GLANCE



- Supplies (spare parts)
- Technical support
- Engineering
- Training
- Installation
- Maintenance and control
- After-sales

- More than 12,000 relays installed worldwide
- Made in France
- Qualifications: EDF, ANAV, Engie Electrabel, CNNC, CGNPC, ...





K3-QUALIFIED PROTECTION RELAYS



CEE 7000 Series – K3 qualified

Model	ANSI Codes	туре	Rating	Withstand (Cont. / 1s)	Frequency	DI / DO	CEE case	Auxiliary supply
DTM7033	87	Current	1 A or 5 A	21n 801n	40 to 70 Hz	1 paired DO	R3	AC or DC
HDGE7020	81	Voltage	100/110/120/220/240 V	1.3Un 2Un (10s)	50 Hz or 60 Hz (-7hz/+5.7Hz)	2 paired DO	R2	AC or DC
ITG7166	50 51	Current	1 A or 5 A (3 phases)	21n 801n	50 Hz or 60 Hz (±10%)	2 paired DO	R2	AC or DC
TTB7011	59	DC Voltage	24/48/110/125/220 ∨ (+20%)	120%Un 2Un	-	1 paired DO	R1	-
TTB7013	27	DC Voltage	24/48/110/125/220 ∨ (-20%)	120%Un 2Un	-	1 paired DO	R1	-
TTG7011	59	Voltage	57.7 V to 380V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	AC or DC
TTG7012	27	Voltage	57.7 V to 380V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	AC or DC
TTG7013	27	Voltage	57.7 V to 380V (18Hz - 65 Hz)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	AC or DC
TTG7111	59 (Ind. delay)	Voltage	57.7 V to 380V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	AC or DC
TTG7112	27 (Ind. delay)	Voltage	57.7 V to 380V	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R1	AC or DC
TTGd7012	27	Voltage	100 V (1 phase + Aux)	1.3Un 2Un (10s)	50 Hz or 60 Hz (±10%)	1 paired DO	R2	AC or DC
ΤΤΤ7ΙΙΙ	2 (before trip.)	-	-	-	-	1 paired DO	R1	AC or DC
WTGA7131	32 32N	Current Voltage	1 A or 5 A 100 V or 110 V	2ln 80ln 1.3Un 2Un	50 Hz or 60 Hz (±10%)	2 paired DO	R3	AC or DC
WTGA7132	32 32N	Current Voltage	1 A or 5 A 100 V or 110 V	2ln 80ln 1.3Un 2Un	50 Hz or 60 Hz (±10%)	2 paired DO	R3	AC or DC



R3 Case



R2 Case





TTBE7010 / TTBE7020 / TTGE7020







Our dedicated teams are qualified upon the NT UTO 85-114 with level HN1 (operator), HN2 (Team Manager) and HN3 (Verification and control) for nuclear plants.

We have our own state-of-the-art R&D department. Our teams of engineers work closely with our network of suppliers and laboratories specialising in nuclear activities.

We handle simple to complex projects like nuclear qualified retrofitting or on-site and off-site tests and analysis.



DESIGN & MANUFACTURING TECHNICAL SUPPORT

Nuclear-dedicated products are designed by our R&D department based in Alfoutville, in the Paris region, and the manufacturing of our relays, along with their cabinet assembly, is carried out at our factory in Brie-Comte-Robert. All processes are fully documented in accordance with our ISO 19443 guality system.



TRAINING

ICE SAS offers dedicated modular training courses across all its product ranges, allowing us to tailor the content to your specific needs and to the various stakeholders involved: procurement, technical management, field technicians, or any other personnel essential to the successful delivery of your project.



INSTALLATION MAINTENANCE & CONTROL

Our teams, trained to work on nuclear sites, support you throughout the entire lifecycle of your installation. From commissioning to decommissioning, we provide support to ensure the operational readiness (OR) and the safety readiness (SR) of your facilities, thanks to a team of specialised technicians trained specifically in the nuclear sector.



AFTER-SALES

Our after-sales service is at your disposal for any technical or commercial enquiries. We handle repairs, obsolescence management, and the replacement of components within your facilities, in full compliance with established standards and procedures. Our commitment to product support spans several decades, thanks to our Long-Term Support (LTS) programme for nuclear-dedicated products.



TRANSMISSION SOLUTION

ICE SAS is a long-standing partner and supplier to RTE (Réseau de Transport de l'Électricité), supporting the company through the technological developments of its electrical transmission network and the various successive technical stages. We consistently offer increasingly innovative, high-performance, and tailored protection and automation solutions, ensuring a high level of quality and safety.

The operation of the French electricity transmission network is managed by RTE (Electricity Transmission Network), from generation plants to Enedis distribution substations.

ICE SAS remains attentive to network operators and takes all their requirements into account, from design and commissioning to long-term maintenance of the products.



TRANSMISSION SOLUTION





Bringing together all the functional modules required to protect electrotechnical infrastructure, our system is structured around a self-healing backbone network using fibre optics, based on HSR/PRP protocols. The system is distributed across various types of cabinets to meet all functional requirements.

Functional cabinets

Each functional module is housed in its own dedicated cabinet. The design of these enclosures allows for the integration of all protection functions, as well as related variants or options, whether through our own processors or third-party protection devices.





TRANSMISSION SOLUTION





Our commitment to high quality standards (ISO 9001) and sustainable solutions (ISO 14001 – EcoVadis) ensures that our products and services not only meet expectations but exceed them.

With our dedicated offer for transmission networks, we provide solutions that are perfectly tailored to your specific needs, helping you face the future with confidence.



PRE-STUDIES

Our engineering department, with its expertise in the French Transmission & Distribution markets, supports you throughout your projects. Its role in the design of control systems, centred around the IEC 61850 standard, allows you to prepare for the future with confidence. Our knowledge of older technical levels facilitates the modernisation and version upgrades of your installations.



DESIGN AND MANUFACTURING TECHNICAL SUPPORT

Our teams manage the design and manufacturing of control-command assemblies, from the creation of schematics and HMI diagrams to the cabinet assembly in our Brie-Comte-Robert factory. The entire project is documented in accordance with our quality process, ensuring traceability and control of its environmental impact throughout the system's lifecycle.



TRAINING

For each system or piece of equipment integrated into your substations, we offer tailored training, modular in nature, enabling us to adjust the content based on your needs and the different stakeholders: purchasing, technical management, intervention technicians, operators, or any other relevant party you may deem necessary.



INSTALLATION MAINTENANCE & CONTROL

Once your teams are ready for the system handover, we will plan its installation on-site together. Our teams accompany you throughout the life of your installation, assisting you with operational maintenance (MCO) and safety maintenance (MCS), through software updates and periodic checks of its components (protection relays, PC hosting the supervisor, network switches).



AFTER-SALES

Our after-sales service is available for any technical or commercial inquiries. We handle the repair or replacement of various system components throughout its lifespan. We also offer dedicated services such as obsolescence management and the creation of a safety stock.



DISTRIBUTION SOLUTION

ICE SAS designs and installs high-performance solutions for the supervision and protection of electrical distribution infrastructures, particularly for Enedis, the main electricity distributor in France. With multi-technical expertise and over 70 years of experience, we offer robust control-command systems that ensure secure management and optimal operation of your installations.

Digital protection relays and controllers are key components of our technology. They are manufactured in Brie-Comte-Robert, in the Paris region.

ICE SAS has contributed to nearly 400 substations, 300 of which are fully digital, with over 400 HTB/HTA transformers protected, and 4,700 HTA cells deployed.



DISTRIBUTION SOLUTION





ICE SAS is a long-standing partner and supplier of EDF (the main electricity producer and supplier in France), having consistently supported them through the technological evolutions of their electrical network, as well as the various successive technical milestones. We have always offered increasingly innovative, high-performance, and tailored protection and automation solutions, ensuring a high level of quality and safety.



The operation of the French electrical distribution network (20 kV) is currently managed by Enedis, from the transformation substations to the consumers.

Our protection and control-command equipment mainly equips the source substations, which are the interface between the transmission network and the distribution network.

From the equipment for HTB (high-voltage) sections to HTA (medium-voltage) cells, ICE SAS remains attentive to the needs of operators and takes into account all requirements, from design to commissioning and long-term maintenance of the products.

We ensure the longevity and scalability of the equipment in operation, particularly for Enedis, by offering a comprehensive range of protection and automation solutions for older electronic and digital technology milestones.



DISTRIBUTION SOLUTION

OUR OFFER AT A GLANCE





ICE SAS OFFERS A TURNKEY SOLUTION

A privileged contact with AMEPS and BRIPS

Our engineering teams are available to assist agents with any technical or commercial requests.

A solution for every substation topology

In partnership with project managers, our R&D team, and our technical-sales engineers, we define the best technical solution.

A single point of contact

We ensure follow-up throughout the entire process, from order placement to the commissioning of the systems.

We are able to establish a substation configuration, then test all equipment in our factory before shipping it to site:

- creation, control of B2-B5, and parameter loading
- testing (communication, RF, BA/DT...) and system validation
- preparation of test reports.











PRE-STUDIES

Our engineering department, with over 75 years of expertise across all technological milestones, supports you in defining your needs. It also ensures the ongoing followup of your installations, particularly during modernisations and version upgrades, guaranteeing full compatibility between system versions.



DESIGN AND MANUFACTURING TECHNICAL SUPPORT

Once the project scope is clearly defined and validated with your teams, we take responsibility for the design and manufacturing of the control-command assemblies, ranging from the creation of schematics and HMI diagrams to cabinet assembly in our Brie-Comte-Robert factory. The entire project is documented in accordance with our quality process to facilitate technical support throughout the system's lifecycle.



TRAINING

For each system or equipment integrated into your substations, we offer tailored modular training, allowing us to adapt the content based on your needs and the various stakeholders involved: purchasing, technical management, intervention technicians, or any other relevant participants in the project.



INSTALLATION MAINTENANCE & CONTROL

Once your teams are ready for the system handover, we plan its deployment on-site together. Our teams support you throughout the life of your installation, ensuring operational maintenance and safety maintenance (MCS), particularly through software updates and periodic checks of its various components (protection relays, PC hosting the supervisor, network switches).



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AFTER-SALES

Our after-sales service is available for any technical or commercial inquiries. We handle the repair or replacement of various components of your system throughout its lifespan. We also offer dedicated services such as obsolescence management and the creation of a safety stock.





RAILWAY SOLUTION

For more than 40 years, the priorities of our engineering teams have always been to advise and listen to our customers, by providing a secure, robust, innovative and sustainable railway solution

Among our flagship products, the 9000 Series relays are specially designed to railway power infrastructure protection. Moreover, numerous complementary services enhance our 9000 series, empowering you to anticipate, define, and successfully achieve all your projects.

Through training, diagnosis of your current installation, product manufacturing, and on-site intervention, ICE SAS continually supports Railway Infrastructure Operators.





- High-quality standards for all products and services (ISO 9001)
 Sustainable solutions for a better world (ISO 14001 EcoVadis)
 Dedicated to railway market
- Perfectly fitting your needs

DC CURRENT

- DDL9000 DC catenary protection relays, up to 3 kV
- DFF9000 AC leaking on DC network
- Fully digital (embedded web server, IEC 61850-8-1 MMS, Modbus)



RAILWAY SOLUTION





AC CURRENT

- PDZI9000 Catenary protection relays for 25kV AC and 2x25kV AC for traditional and high-speed trains
- PGT9000 Transformer group protection
- Fully digital (embedded web server, IEC 61850-8-1 MMS, Modbus)
- Patented technologies for parallel railway protection

THEY TRUST US

- SNCF Réseau
- Eurotunnel
- KORAIL
- STIB
- ONCF

...

AURIZON





RAILWAY SOLUTION

AC PROTECTION RELAYS





PDZI9000 - Catenary protection - 25 kV or 2x25 kV Protects the catenaries on 25 kV or 2x25 kV networks, 50/60 Hz

PGT9000- Traction Group Protection

Protects fixed electric traction installations responsible for the power supply on 25 kV or 2x25 kV networks, 50/60 Hz



LDN2 - Location of catenary faults

DPR800 - Pumping effect detector



AP900 Series Arc Flash protection relays



NPDT620 - NPDT630

Differential transformer digital protection with two or three windings and, depending on the version, with restricted earth



RAILWAY SOLUTION

DC PROTECTION RELAYS





DDL9000 - DC Catenary protection - Catenary voltage up to 3 kV

Protects the fixed electric traction installations responsible for supplying catenaries with direct current up to 3 kV.

DFF9000 - DC Fundamental Frequency detector Monitors the presence of the AC fundamental frequency (50/60 Hz).









Our commitment to high quality standards (ISO 9001) and sustainable solutions (ISO 14001 – EcoVadis) ensures that our products and services not only meet but exceed expectations. With a focus on the railway market, we offer solutions that are perfectly tailored to your specific needs.



STUDIES ENGINEERING

For over 40 years, our engineering service has been supporting infrastructure managers in defining their needs. Our design engineers oversee the monitoring of your installations, especially during their modernisation, ensuring full compatibility between system versions.

To meet your specific requirements, we also offer the creation or integration of customised products according to your specifications.



TRAINING

For each system or equipment integrated into the electrical network substations under your management, we offer dedicated drawer-based training, allowing us to tailor the content according to your needs and the various stakeholders: purchasing, technical management, intervention technicians, or any other participants you deem necessary for your projects.



INSTALLATIONS ON-SITE INTERVENTIONS

Our teams support you throughout the entire lifecycle of your installations. From commissioning to decommissioning, we intervene to ensure the operational readiness (MCO) and safety condition (MCS) of your control-command system, thanks to a team of specialised technicians.



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AFTER-SALES

Our after-sales service is available for any questions you may have. We provide repair or replacement of the various components of your system throughout its lifespan. We also offer dedicated services such as obsolescence management and propose the establishment of a dedicated spare parts stock.



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STELLANTIS



EURO



AURIZON







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