

A man with a beard is working on a server rack. He is using a multimeter to test the electrical connections. The server rack is blue and has many cables connected to it. The man is looking intently at the device he is testing.

Earth leakage protection and monitoring in Power Distribution

VigiPacT Residual Current Devices

se.com/vigipact

Life Is On

Schneider
Electric

A nighttime cityscape featuring several prominent skyscrapers. The buildings are illuminated with various lights, and the sky is dark. The text "1. Introducing VigiPacT" is overlaid in the center of the image.

1. Introducing VigiPacT

Simplifying navigation across our entire digital offers

Vigirex range is becoming VigiPacT.

We are making it easier for you to navigate across the wide range of our world-class digital offerings so you can select with confidence the offers that are right for you and your needs.

Building on the strengths of the PacT Series, Vigirex name will be progressively changed into VigiPacT to evolve a complete range of protection and monitoring devices.

Old Names	New Names
Compact	Com PacT
Masterpact	Master PacT
Vigirex	Vigi PacT
Micrologic	MicroLogic
Transferpact	Transfer PacT
Fupact	Fu PacT

VigiPacT and the PacT series

Future-proof your installation with Schneider Electric’s low and medium voltage PacT Series.

Built on legendary Schneider Electric innovation, the PacT Series comprises world-class circuit breakers, switches, residual current devices, and fuses, for all standard and specific applications.

Experience robust performance with this comprehensive range of EcoStruxure-ready electrical panels, designed for all applications from 16 to 6300 A in low-voltage and up to 40.5 kV in medium-voltage.

VigiPacT residual current relays, with associated toroids measure the earth leakage current in your electrical installation to provide protection and earth leakage monitoring.

Enjoy a simpler and easy experience with our EcoStruxure platform

To enable brand consistency, relevance, and impact, we are reinforcing our EcoStruxure architecture and digital customer lifecycle tools to ensure a seamless experience from the CAPEX to OPEX phases of each project, bridging our entire ecosystem of partners, services providers, and end users.

EcoStruxure is our IoT-enabled system architecture, providing an open, and interoperable platform.

EcoStruxure delivers enhanced values around safety, reliability, efficiency, sustainability, and connectivity for our customers.

Leveraging advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity technologies to deliver innovation at every level.

Connected Products include, Edge Control, Apps, Analytics & Services and our IoT technology levels.

Unleashing digital intelligence trans-generationally

Schneider Electric’s full suite of LV switchboards and breakers (from individual units to cloud-connected smart panels and app-based interfaces) bring breakthrough innovation to power distribution.

With “plug and play” modules that feature built-in connectivity, both backward compatible and forward thinking to enable powerful digitization for multiple generations of our switchboard and breaker products.

Connectivity revolutionizes the experience of all who work with these connected breakers, liberating people from on-site checks to receive remote, real-time updates once the data is integrated into monitoring systems.

Connectivity will keep evolving and enhancing the experience for anyone working with our breakers of the future.

For the electrical distribution industry, these breakers and switchboards of the future will set the foundation for an All Digital, All Electric world.

With Schneider Electric MCCBs in 30-40% of buildings around the globe, 1.5M units installed per year, and 10 years of standing as the leading breaker, ComPacT and its series of modular accessories are already enabling connected capabilities across generations of breakers.

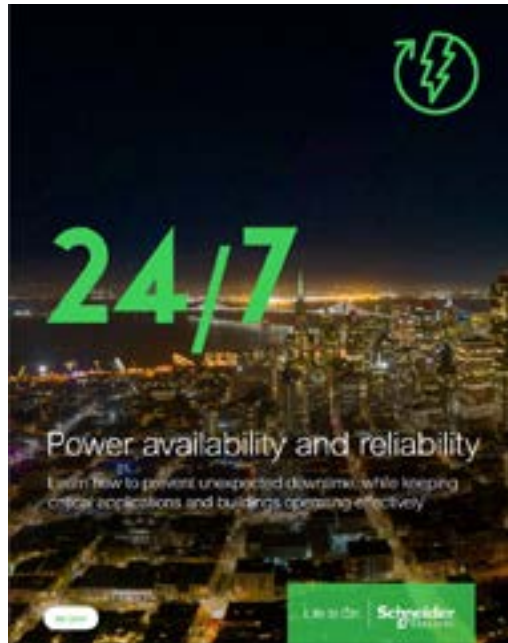
We are changing the game for power distribution while elevating all expectations, experience, and capabilities for our breakers now and well into the future.

Life

Schneider Electric simplifies the complexity of electrical installations for channel partners, and in accordance, propose some value-added content around 3 mains topics:



Fire prevention



Power availability

2. Applications and markets

A construction worker wearing a white hard hat and an orange high-visibility jacket is shown in profile, looking down at a laptop computer. The scene is set at night, with blurred city lights in the background. The overall lighting is dim, with the worker's face and jacket highlighted by a soft light source. The text '2. Applications and markets' is overlaid in white on the left side of the image.

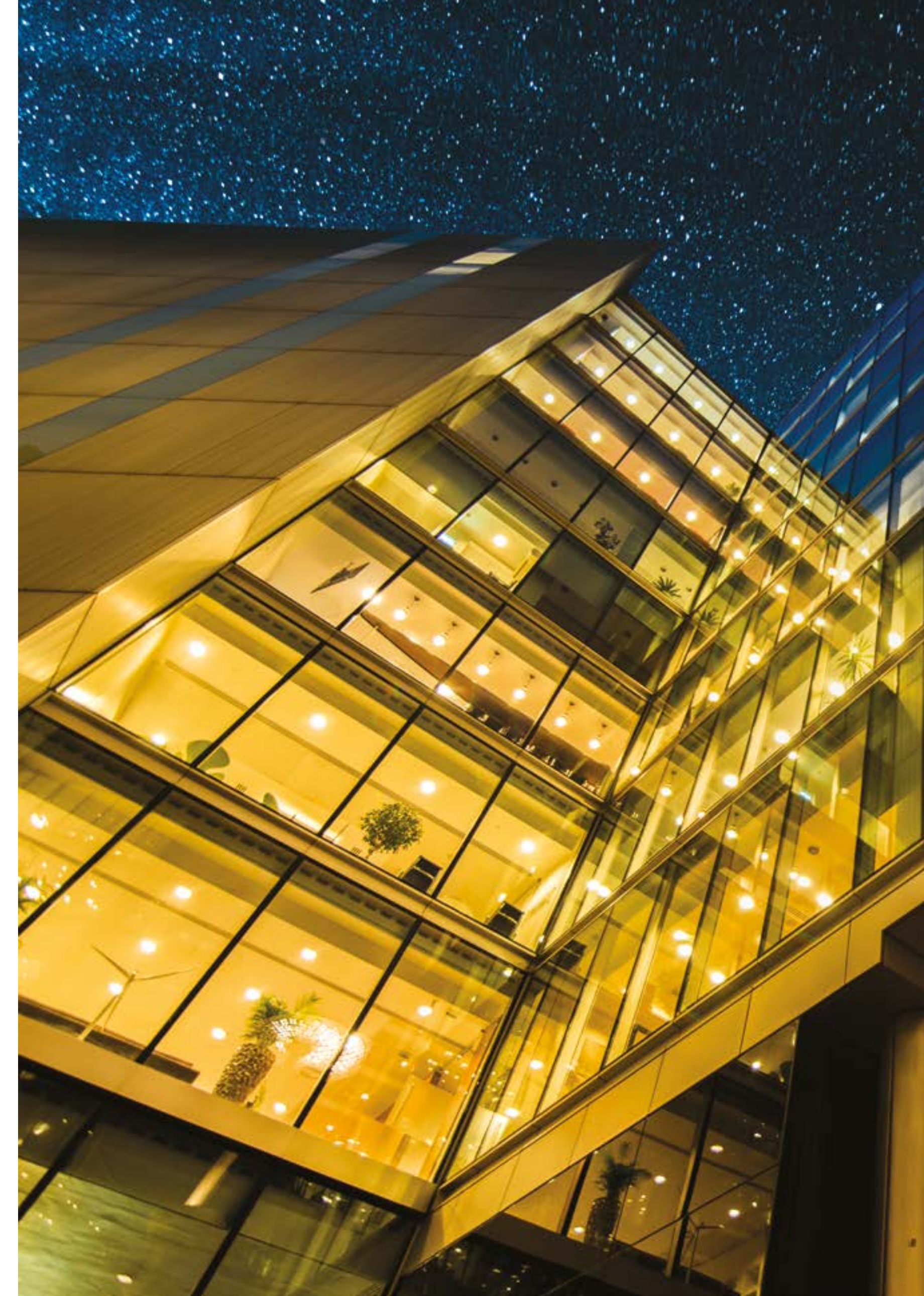
Designed for all types of distribution systems and all voltages

We supply for an extensive range of auxiliary supply voltages offering a variety of possibilities

- Wide range of compatible sensors up to 3200 A
- Broad selection of settings and operating possibilities

Markets

- Energy and infrastructure, buildings, industry and data center installations
- Small, middle size, commercial and industrial, large and critical buildings
- Airports, sea ports, railways, tunnels
- Data centers, hospitals (operation theater), oil and gas, pharmaceutical, food and beverage
- WWW (water and wastewater) MMM (mining mineral and metal)
- Machinery



A low-angle photograph of a construction site at dusk. In the foreground, a worker wearing a white hard hat, safety glasses, and a high-visibility orange and yellow vest is seen from the side, holding a control lever. In the background, a yellow crane basket is suspended in the air, with another worker visible inside. The scene is filled with complex metal structures, pipes, and scaffolding against a dark blue sky with a bright sun flare in the upper left corner.

3. Offering reliable life and propriety protection

Offering reliable life and propriety protection

The overrun of leakage current thresholds may represent a threat to life and property if it is not immediately located.

The way to protect differs following the earthing system

There are 4 types of Residual Current Devices (RCD) defined by the IEC standards,

- AC is used for alternating sinusoidal residual current to protect equipment which is resistive, capacitive or inductive without any electronic components
- A is used for alternating sinusoidal residual current and for residual pulsating direct current up to 6 mA
- F is used for frequency-controlled appliances and equipment
- B is used for single and three-phase equipment



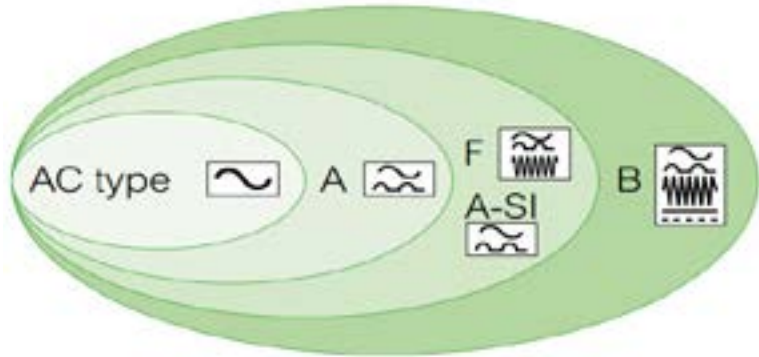
This Electrical Installation Wiki is a collaborative platform, brought to you by Schneider Electric: our experts are continuously improving its content, collaboration is also open to all.

People risk following IEC 60364-4-41 standard

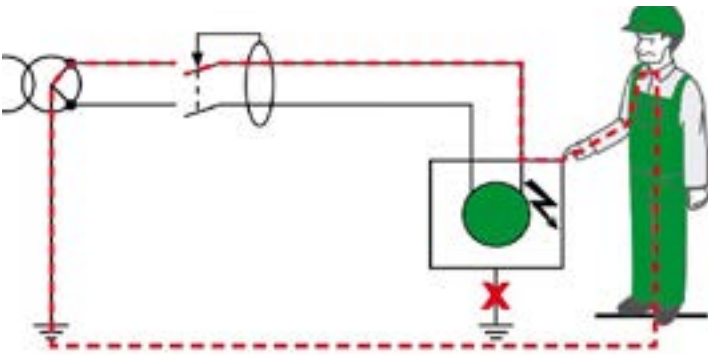
Clause 411: Protection in case of fault by automatic disconnection of the supply (Indirect contact)

TT	Residual Current Devices (RCD) act as the main protection in case of fault
TN-S	RCD when Overcurrent is not sensitive enough (long cable, weak supply ...)
TN-C	RCD can not be used
IT	RCD can be required for second fault (as for TT or TN depending on the way earthing has been done)

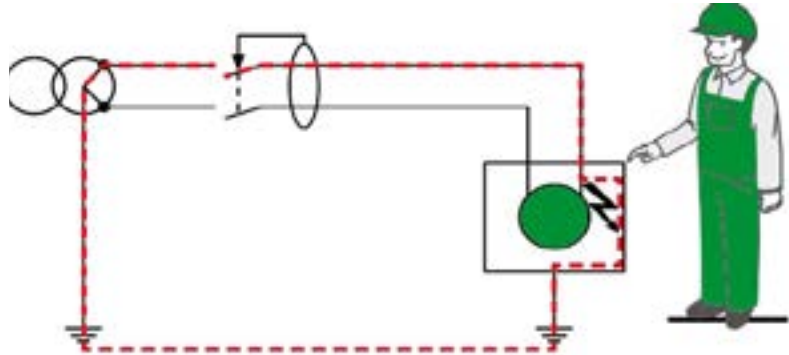
	TT	TNS	IT
VigiPacT A Type*	X	X	X
VigiPacT B Type	X	X	
Vigilohm (Insulation Monitoring)			X



Direct Contact



Indirect Contact



“The use of RCDs with a rated residual operating current not exceeding 30 mA, is recognized in a.c. systems as additional protection in the event of failure of the provision for basic protection and/or the provision for fault protection or carelessness by users.”
Assuming we may need a quotation for this if it isn't SE words in ”.

VigiPacT offer values and differentiation

Offering safe and efficient protection against overrun leakage

Through permanent monitoring of this overrun, the VigiPacT range makes protection efficient.

- **Operation in less than 40ms**
Schneider Electric promises the safe clearing of faults, combined with any of its circuit breakers rated up to 3200 A.
- **Overvoltage category IV**
The reinforced insulation (overvoltage category IV, i.e. the most severe category) makes direct connection possible at the head of the installation or on the upstream busbars without any additional galvanic isolation.
- **Continuous self-monitoring**
VigiPacT relays continuously monitor the power supply, relay/toroid link, and internal electronics. Failure of the detection circuit is signaled and can be used to trip the circuit breaker. The LEDs on the front panel can also be used 24/7 to check operation.
- **Settings protected by a lead-sealable cover or password**
Access to settings can be protected by a cover with a lead seal. The test and reset buttons remain accessible on the front panel of the relay. For RHU and RMH relays, settings are protected by a keyboard password.
- **Efficiency of all protection chain components for complete safety**
VigiPacT residual current devices (RCDs) offer appropriate settings to provide effective protection of life and property. The characteristics of the relay/toroid combination ensure consistently reliable measurements.



Earth fault protection:

How to design efficient earth fault protection with Residual Current Devices (RCD)



Vigilohm:

Insulation Monitoring for Ungrounded Networks

Ensure power availability

With VigiPacT, unnecessary downtime is eliminated through:

- Diagnosis of installation faults
- Minimized outages
- Reduced tripping tolerance
- Frequency filtering and true RMS measurement
- Test and reset.

The entire VigiPacT range offers 3 ways to protect your installation based on Schneider Electric breakers. Further on, we propose numerous setting possibilities that can be used to create many discrimination levels, from the incomer to the final output circuits.



A complete range of protection and monitoring devices

There are three ways to add earth-leakage protection in Power Distribution:

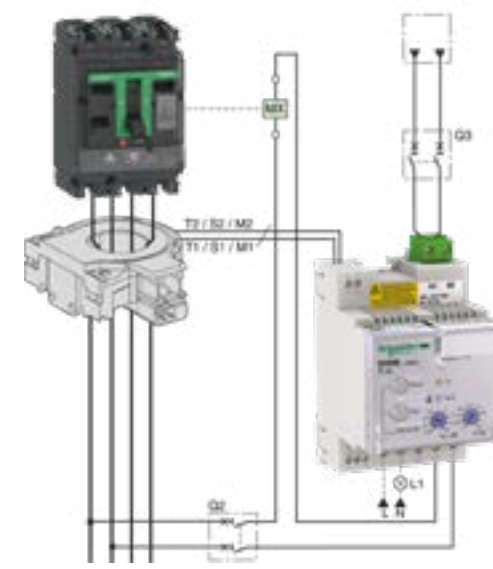
- Circuit Breaker with Embedded Earth-Leakage Protection
- Add-on Block to the Circuit Breaker
- Relay combined with toroid sensors



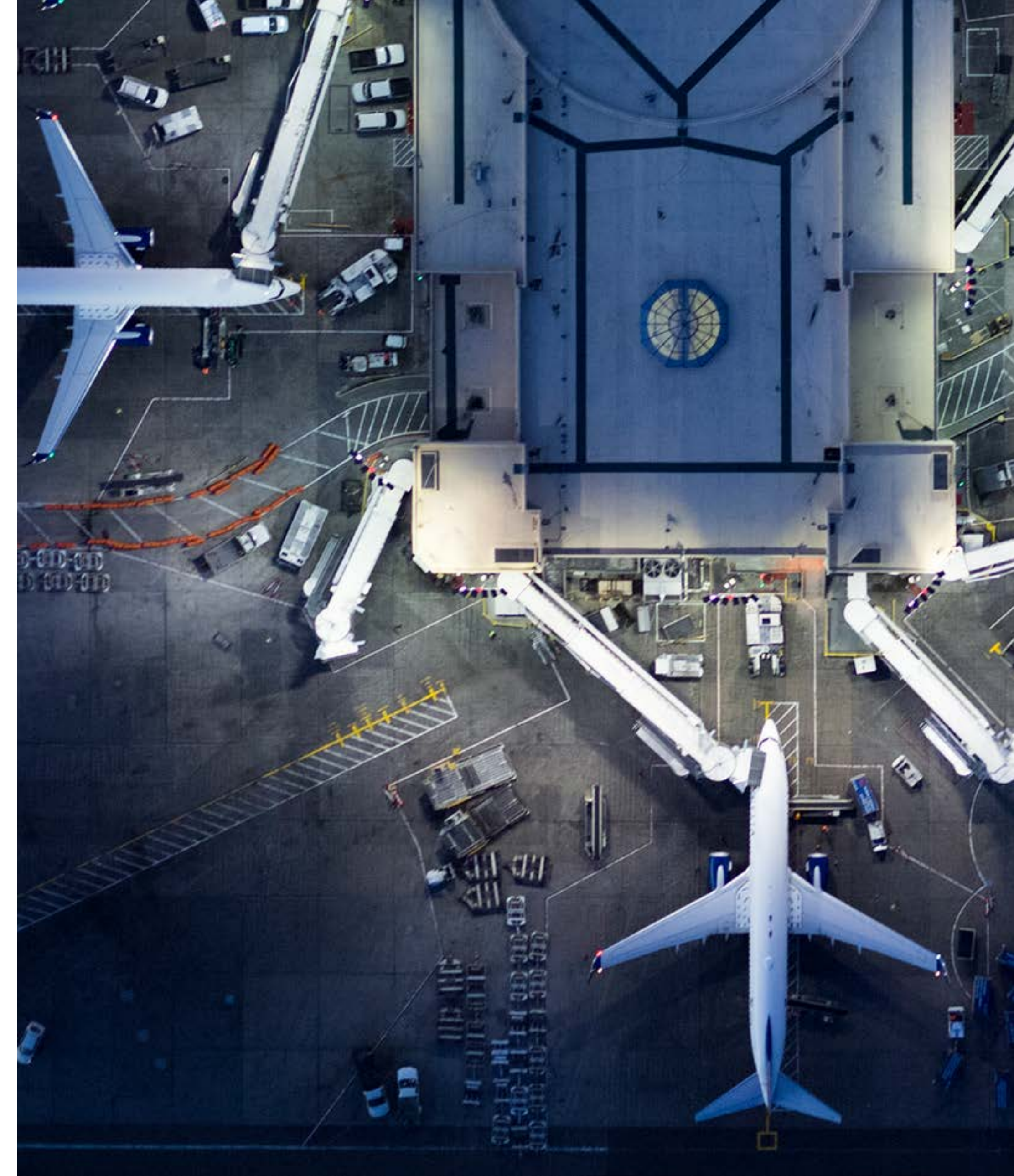
ComPacT NSX and ComPacT NSXm
with embedded earth leakage protection



ComPacT NSX and
Vig iPacT add-on block



ComPacT NSX with Vig iPacT
external relay and toroid

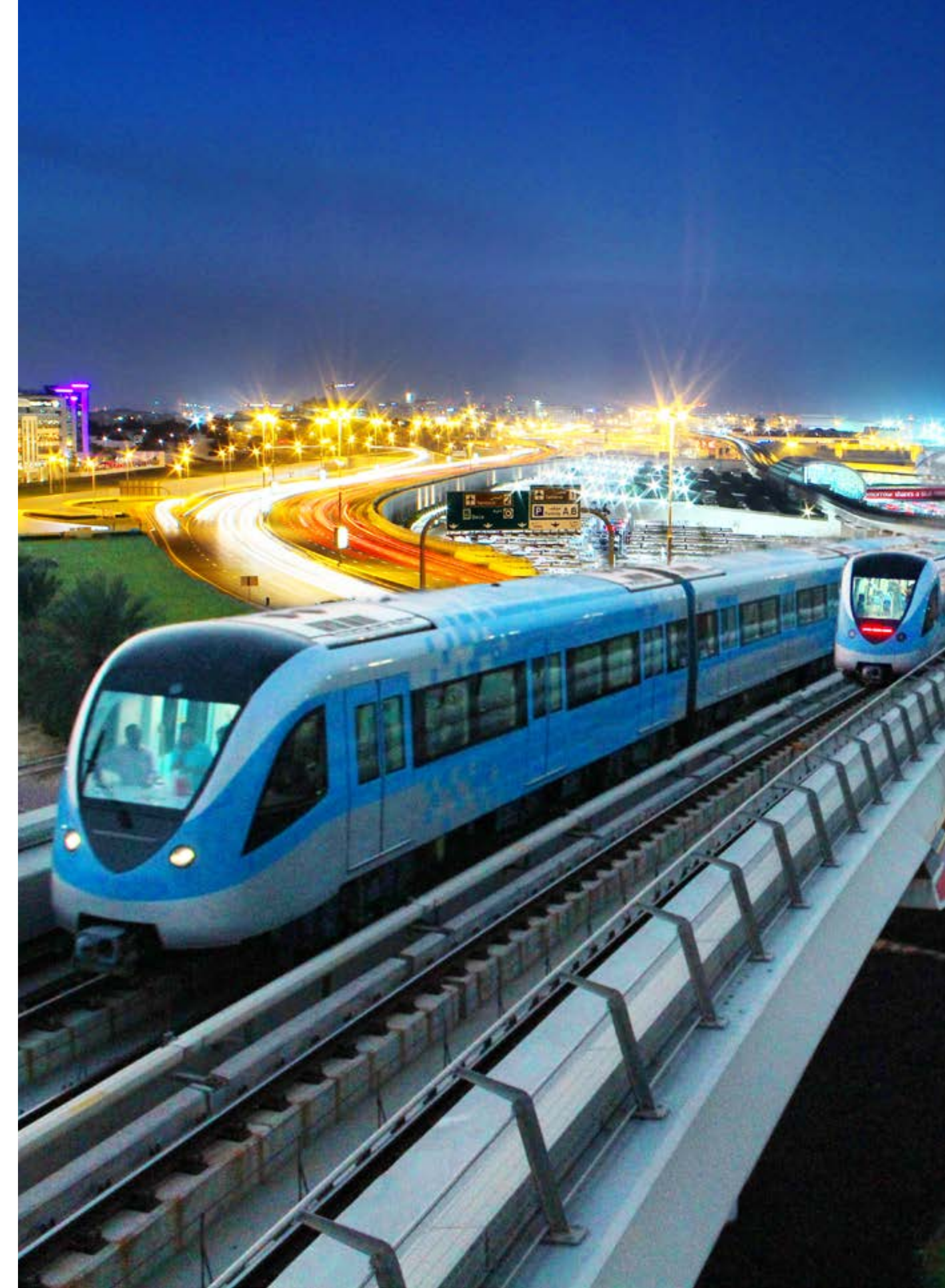


Circuit Breaker with Embedded Earth-Leakage Protection

Thanks to MicroLogic trip units there is the possibility to have the earth leakage protection embedded in the circuit breaker from 16 A up to 6300 A. For ComPacT NSX range and the ratings up to 630 A is possible to have either protection or monitoring function as for earth leakage, covering the different needs in different applications

Compatible with

- MasterPacT MTZ from 630 A to 6300 A with MicroLogic 7.0X integrating earth leakage protection (LSIV) with digital upgrade capabilities thanks to Digital Modules
- ComPacT NS from 630 A to 3200 A with MicroLogic 7.0 A or 7.0 P integrating earth leakage protection (LSIV) with embedded Ammeter or Power meter
- ComPacT NSX from 16 A to 630 A with MicroLogic 4.x (LSolR) / 4.x AL (LSol + Earth Leakage Alarm) or 7.x E (LSIR + Energy Metering) / 7.x E AL (LSI + Earth Leakage Alarm + Energy Metering) integrating earth leakage protection or monitoring with energy metering to be included as capability
- ComPacT NSX from 16 A to 160 A with MicroLogic 4.1 (LSolR) integrating earth leakage protection, reducing significantly LV system footprint and capable to be combined in the same DIN rail with final distribution devices



Add-on Block to the Circuit Breaker

Earth-leakage protection is achieved by installing a VigiPacT add-on directly on to the circuit breaker terminals. It immediately actuates the trip unit (magnetic, thermal-magnetic or MicroLogic).

Remote indications

The VigiPacT add-on can be equipped with an auxiliary contact (SDV) to remotely signal tripping that is caused by an earth fault.

Use of 4-pole VigiPacT add-on with a 3-pole ComPacT NSX

In a 3-phase installation with an uninterrupted neutral, fixing an accessory makes it possible to use a 4-pole VigiPacT add-on with connection of the neutral cable.

Compatibility with ComPacT NSX



Plug-in devices

The VigiPacT add-on can be installed on a plug-in base.

Power supply

The VigiPacT add-ons are self-powered internally by the distribution-system voltage, and therefore do not require any external source. They continue to function even when supplied by only two phases.



ComPacT NSX and NSXm:



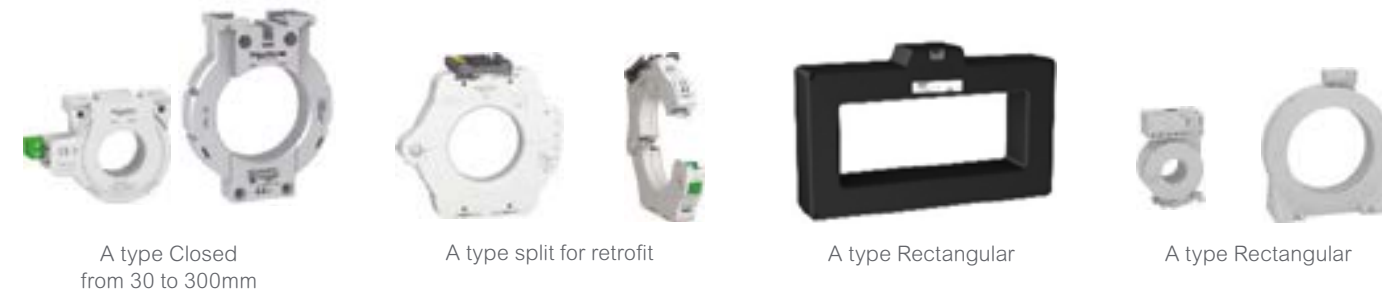
Relay combined with toroid sensors

Developed to be suitable for all installation systems, this solution provides real simplicity of choice and assembly.

Easy to choose

A three-step process

1 Detection
with associated toroid



2 Alarm
with the VigiPacT relay

Protection Relays, Monitoring Relays & centralized Monitoring Relays



3 Protection
with the circuit breaker



VigiPacT:

Residual-Current
Protection Relays



Easy to install

Formats for all installation systems

- Schneider Electric Molded Circuit Breaker format devices in the VigiPact range can be mounted on a DIN
- rail (RH10,RH21, RH68, RH86, RH99, RH197 and RHB) or on a universal mounting plate using mounting
- lugs (RH10, RH21 RH68, RH86 and RH99). The 72 x 72 mm front-panel mount devices (RH10, RH21, RH68,
- RH86, RH99, RH197, RMH, RHUs and RHU) are mounted on panels, doors or front plates using clips.

Installation System		Suitable format	
Main LV switchboard		• Front-Panel mount	
Power distribution system	Instrument Zone	• Front-Panel mount	
	Modular-device zone		• DIN rail
Motor Control Centre (MCC)			• DIN rail
Automatic control panel or machine panel			• with mounting lugs
Final Distribution enclosures			



Front panel mount device

- Panel Device
- Adjustable tripping threshold from 30 mA to 30 A
- Adjustable pre-alarm of the tripping threshold value
- New HMI with keyboard unit display LED
- Modbus communications

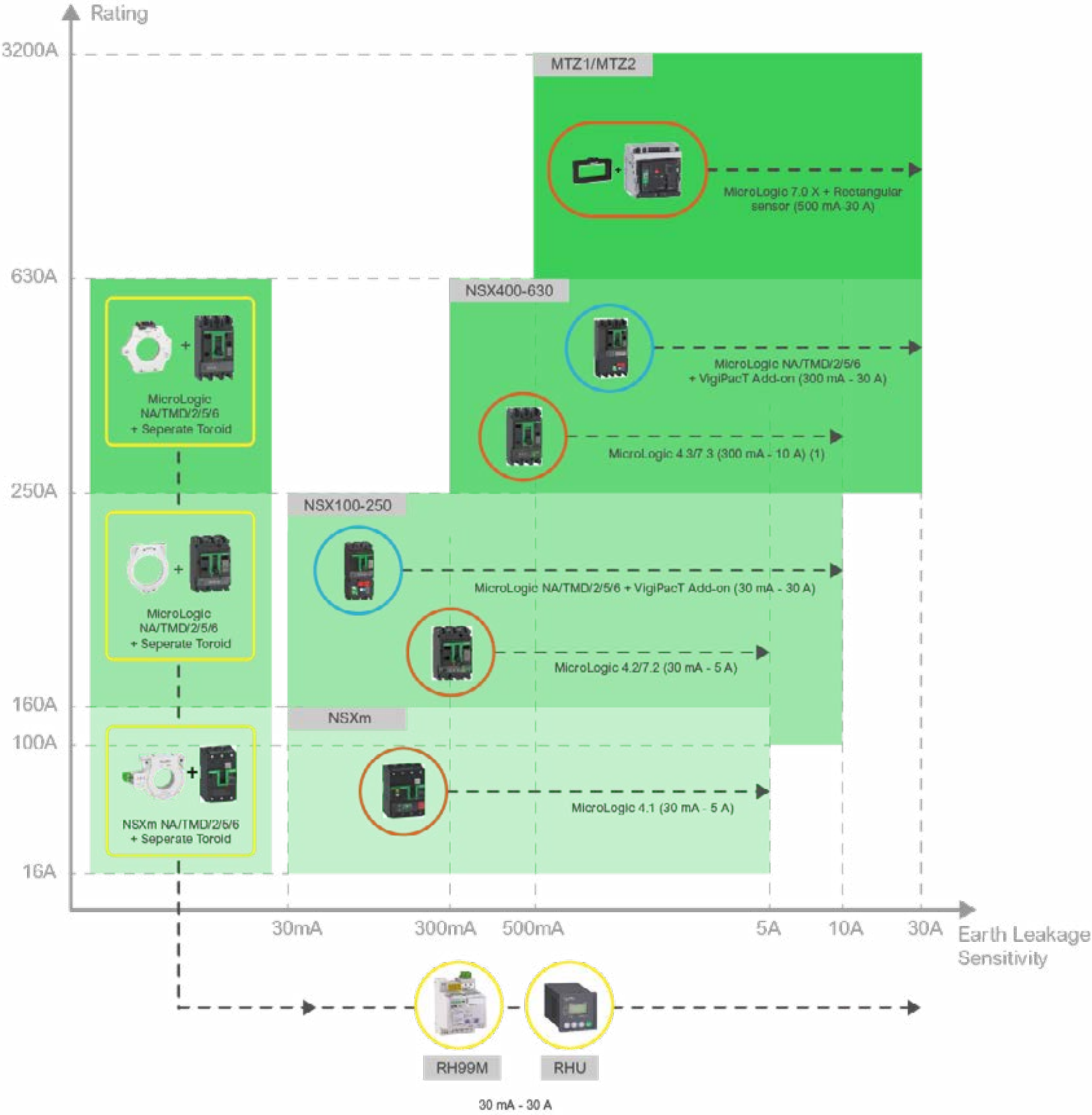


DIN rail mount device

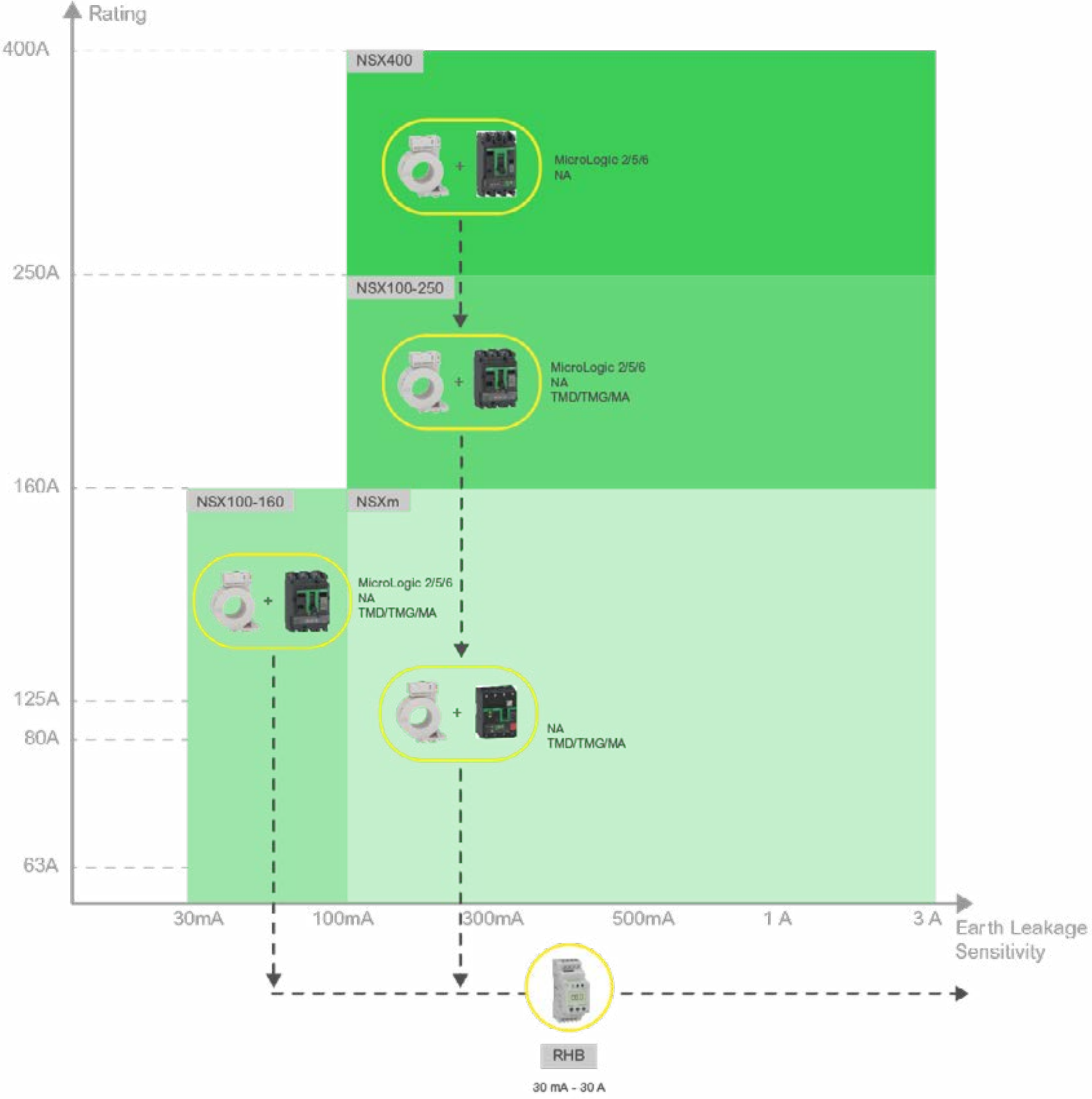
- With mounting lugs to a mounting plate
- Plug in connectors allow easy disconnection for switchboard acceptance dielectric tests.

Selecting the appropriate RCD for applications that require type AC and A protection


- Circuit Breaker with Embedded Earth-Leakage Protection
- Add-on Block to the Circuit Breaker
- Relay combined with toroid sensors



Selecting the appropriate RCD for applications that require type B



● Relay combined with toroid sensors

A photograph of an industrial facility, possibly a refinery or chemical plant, with several tall distillation columns and complex piping. In the foreground, a man wearing a white hard hat and a high-visibility yellow safety vest is seen from the side, talking on a red mobile phone. The scene is set against a hazy, overcast sky. The text "5. Compliance with all the promises of a leading brand" is overlaid in white on the right side of the image.

5. Compliance with all the promises of a leading brand

Offering all the promises of a leading brand

Certification

The VigiPacT residual current relays comply with all the major standards worldwide, in particular, those dealing with:

- Earth leakage protection: IEC 60755 and IEC 60947-2 annex M (sequences MI/MII/MIII/MIV) for the protection of life and property,
- Installation: IEC 60364,
- Electromagnetic compatibility (EMC): IEC 61000,
- Insulation coordination: IEC 60664.

And North American standards:

- Ground fault protection: UL 1053 and CSA 22.2 No. 144 (protection of equipment and property).

Certified quality: ISO 9001: 2000

Our efforts are based on a Quality Management System, designed to enhance the effectiveness of our processes, the goal being to ensure continuous improvement in compliance with standard ISO 9001: 2000.

Our quality objectives are built into our products right from the design phase.

We are committed to implementing the five key points of our quality policy:

- Measurement of customer satisfaction
- A solidly built product
- Control of the manufacturing process
- Management of development projects
- Commitment of all those involved

CE marking

The CE marking created by the European legislation, is designed to provide assurance that the product is not dangerous, non-polluting, and immune to electromagnetic disturbances (EMC directive)

Environmentally friendly products

Schneider Electric is committed to an environmental approach, manufacturing products in line with the requirements of European Directive RoHS (Restriction of Hazardous Substances) in non-polluting ISO 14001-certified manufacturing units.

Achieve Green Building certification

In compliance with ISO 14025 PEP Ecopassport program, Schneider Electric publishes a comprehensive Life Cycle Analysis of our product, providing the environmental data you need to achieve Green Building certifications

Experience the difference today at se.com.



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Learn more about Schneider Electric at:

se.com/vigipact

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