



# Trihal connected, for enhanced safety and performance

Best-in-class dry-type distribution transformers for medium voltage applications with scalable connectivity

[se.com/trihal](https://se.com/trihal)



Life Is On

**Schneider**  
Electric



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An innovative solution for customers in the following sectors:



Buildings



Data  
Centers



Automotive



Mining,  
Minerals, &  
Metals



Nuclear



Wind



Food &  
Beverage



Oil &  
Gas





# Meet the connected Trihal transformer

The connected  
Trihal



New  
Features



EcoStruxure  
Power



Benefits of working  
with Trihal connected





# Introducing the New Electric World

The consumption of electricity will double within the next 20 years, helping people and businesses to thrive in a growing world of decarbonized electricity.

The New Electric World improves our overall electrical distribution systems through the integration digital technologies, is more decentralized and powered by distributed renewable energy sources and storage systems.

As a result, the distribution and consumption of electricity is changing significantly.

This poses a challenge for electrical networks and grid operators, however this also presents a great opportunity. Businesses and industries can use the New Electric World and its digital technologies to improve cost, reliability and safety of their everyday operations.

## CO<sub>2</sub>

emissions need to be halved by 2040

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## 85%

of CO<sub>2</sub> emissions are related to energy

Source: IEA 2013

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## 2x

electricity demand in the next 20 years

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New  
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# Setting a new standard for cast resin transformers

Our latest Trihal transformer leads the pack when it comes to enhanced safety and reliable performance with a long service life. The first transformer certified to the latest revision of international standard IEC 60076-11:2018, Trihal's high performance allows your business to benefit from best-in-class performance in F1, C4 and E4 certifications.

With over 35 years proven experience, Trihal transformers are designed to serve customers around the world, from mid-sized buildings to large industries such as textile, food & beverage, and transportation.

Now with new digital and IoT capabilities, Trihal connected enables you to meet new challenges in operation and maintenance of your electrical network, helping you avoid unplanned downtime, enhance safety and save time.

- **Identify electrical losses**
- **Improve safety of operations**
- **Prevent unplanned downtime**



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# Certified high performance for enhanced safety and reliability

Trihal offers the highest level of compliance to IEC 60076-11:2018. High performance comes as standard with fire safety and partial discharge helping to provide increased power continuity, even in the most harsh of environments, including seismic certification to AG3K1 standards.

## F1 fire certification

- Self-extinguishing capability
- Suitable for installations in fire-hazard areas
- Limited formation of fumes, no toxic emissions or opaque smoke

## C4 climate certification

- Resistance to thermal shock
- Highest performance under severe ambient conditions
- Superior behavior on load changes

## E4 environmental certification

- Highly resistant to frequent condensation, heavy pollution or a combination of both
- Withstand humidity greater than 95%
- Extended service life, even in harsh environments

## Partial discharge rating of $\leq 5$ pC

- Proven quality design with best-in-class reliability
- Reduced risk of an electrical breakdown
- Slower equipment deterioration





# Our proven design helps you become smart

Since its launch over 35 years ago, we have manufactured 150,000+ Trihal transformers, which means that each year 5,000+ units leave our factories.



Trihal manufacturing started in **1982** in France

Since **2003** Trihal has been manufactured in China

Starting in **2015**, customized Trihal transformers have been produced in Saudi Arabia

Since **2018** Trihal leverages digital technologies around the world

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New Features



EcoStruxure Power



Benefits of working with Trihal connected





# Make your business future-ready with a digital transformation

With new IoT-based features, Trihal connected is the perfect choice for intelligent distribution systems. Equipped with smart sensors, and 24/7 connectivity, real-time data supports effective decision making.

- **Enhanced safety** of both people and equipment
- **Greater reliability** with predictive maintenance helping reduce downtime
- **Simplified asset management** through digital features
- **Compliance with environmental** regulations

20%

improvement\* in asset utilization

30%

reduction\* in maintenance costs

25%

reduction\* in unplanned downtime

\*Figures based on previous customer performance. Not a guarantee of performance in every case.

The connected Trihal



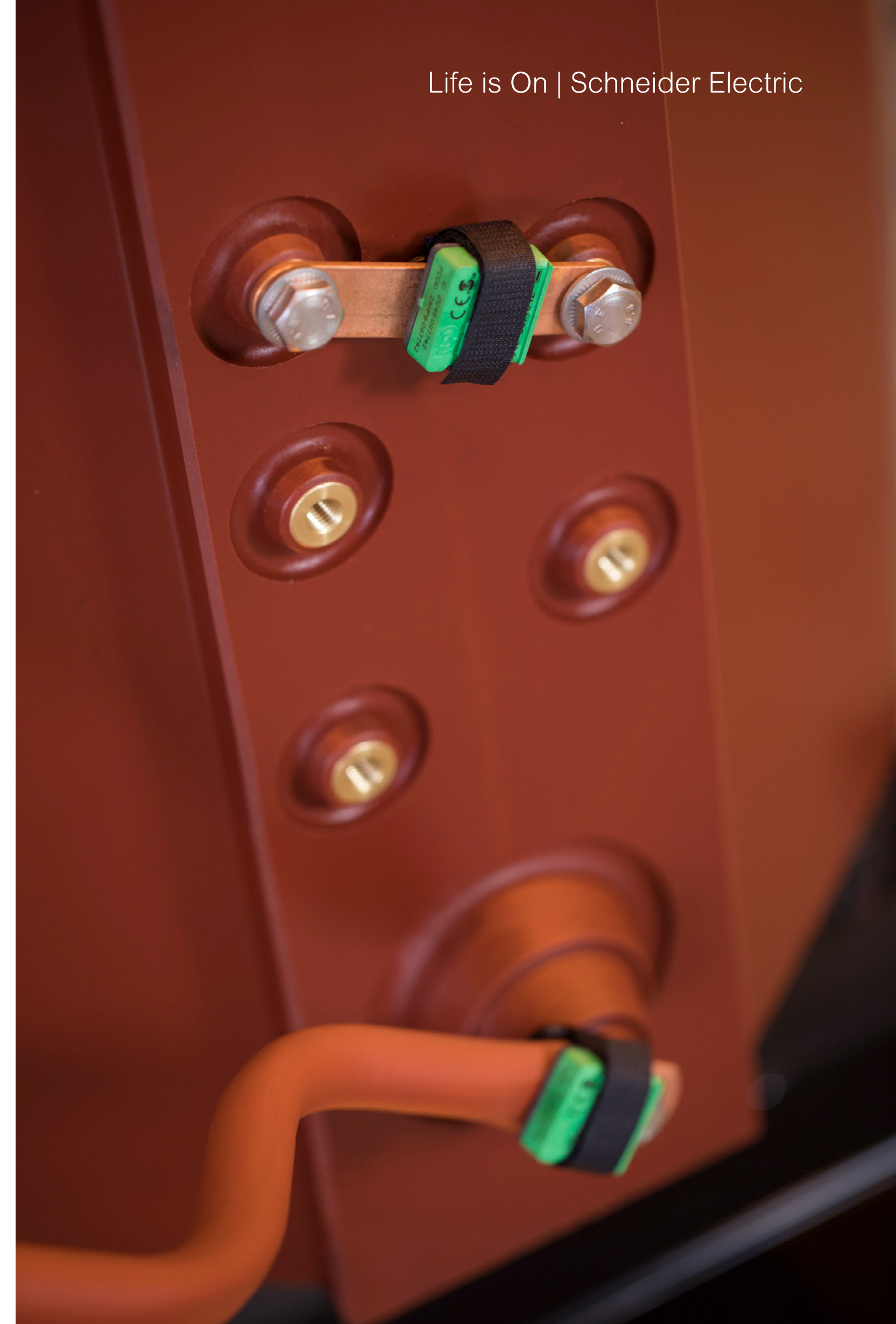
New Features



EcoStruxure Power



Benefits of working with Trihal connected





# New features for enhanced safety and performance

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# Discover your Trihal with scalable connectivity

The main causes of a transformer outage are electrical disturbances or environmental conditions. By adding IoT sensors and condition-monitoring tools to the transformer, facility managers' control and maintenance capabilities are greatly improved.

Our connected transformer is equipped with a new generation of wireless smart sensors to ensure simple, reliable, and safe communication of data.

Trihal adapts by scalable solutions to better fit your needs on three levels of connectivity:

## Enabled

- Take the first step into the world of EcoStruxure

## Enabled Plus

- Widen your connection with Edge Control

## Combo

- Maximized benefits integrated with MV switchgear



The connected Trihal



New Features



EcoStruxure Power



Benefits of working with Trihal connected





# Trihal connected Enabled

Local thermal monitoring for reduced downtime and cost

Directly monitor the quality of your power connections with simple color-coded alarms. Utilize on-demand connectivity up to 10m from your transformer, with our [Easergy Thermal Connect app](#). With real-time thermal monitoring, detect issues early, like loose connections, and take preventive action to avoid unplanned downtime.

Monitoring of MV and LV transformer connections and tapping links provide up to the minute insight into the transformer's health, supported by alarms and warnings in case of an event. Performance data can be used and shared to create better long-term maintenance plans.

Just plug in our Zigbee dongle to your smartphone, and flash the NFC tag to set up your app to start scanning!

[Download the app now!](#)



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# Trihal connected Enabled Plus

Take maximum benefit with 24/7 condition monitoring

Trihal transformers can be enhanced with a range of optional, factory-fitted monitoring sensors to continuously track the health of your assets. Condition monitoring that is 24/7 connected helps detect issues early and prevent downtime, helping reduce OPEX costs.

## Environmental monitoring

- Detect excessive humidity and poor environmental conditions that lead to fast aging

## Thermal monitoring

- Identify thermal hot-spots and take preventative action against faulty connections

## Substation Monitoring Device

- Collect and store data from smart sensors on up to 16 transformers
- Provide meaningful information to local monitoring HMI or smart alarms via SMS
- Flexible integration in local SCADA or our cloud-based services platform



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# Trihal connected Combo

Integrated condition monitoring of your complete MV substation

Benefit from the same 24/7 condition monitoring as our Enabled Plus option, thanks to our Substation Monitoring Device (SMD).

Monitor your complete MV substation, transformer and switchgear, with one unique system, one single interface, and only one SCADA integration.

Using the Enabled Plus architecture with a combination of any Schneider Electric medium voltage switchgear and Trihal transformers, you can monitor all MV equipment connection points and environmental conditions.

Easily detect hot-spots on all major connection points such as cables, busbars or tapping links and also excessive humidity conditions.

Condition monitoring of both the switchgear and transformer combo provides an optimized and simple solution to help you detect early signs of equipment downtime and aging.



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New  
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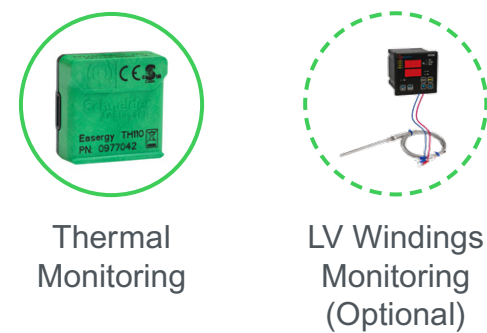
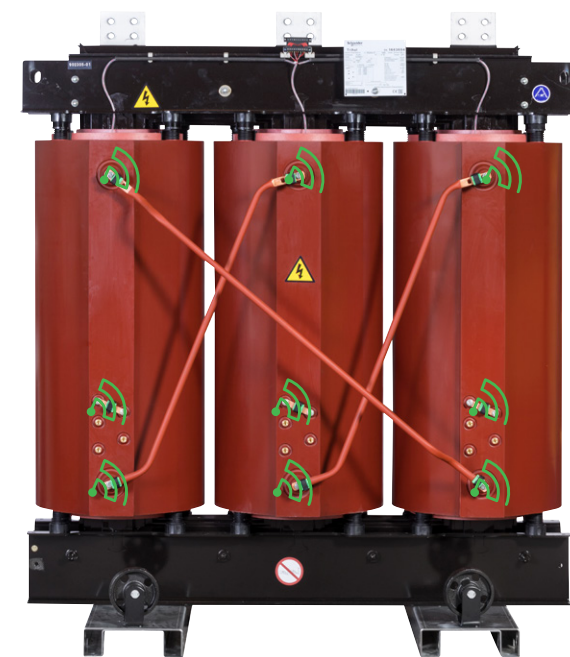
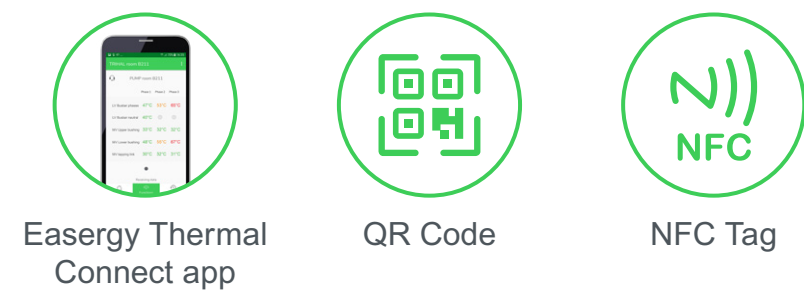


# Scalable to your needs

## Enabled

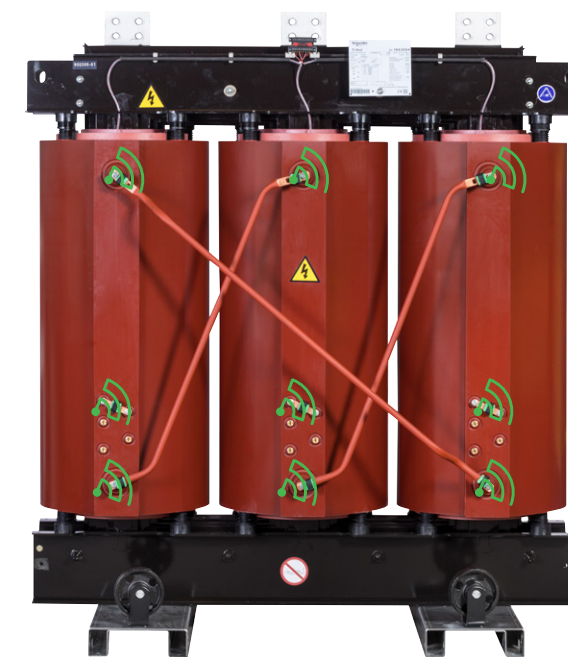
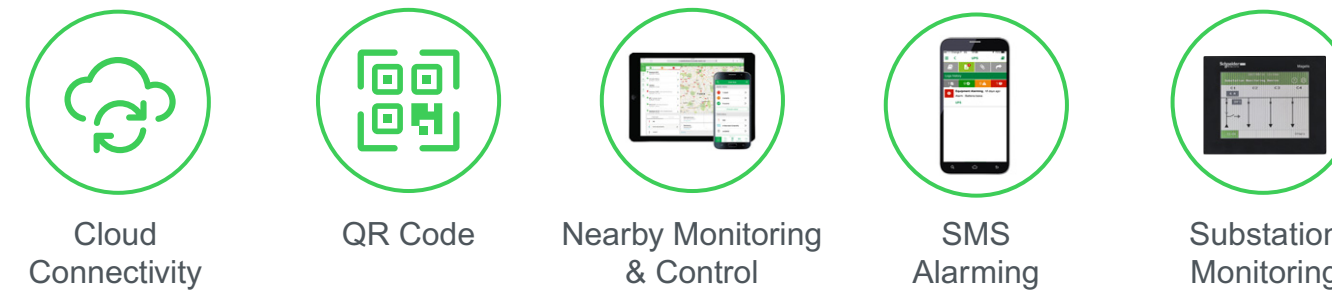
Local, on demand connectivity enables:

- Nearby thermal monitoring on your smartphone up to 10m from your transformer
- Fast access to documentation via QR code



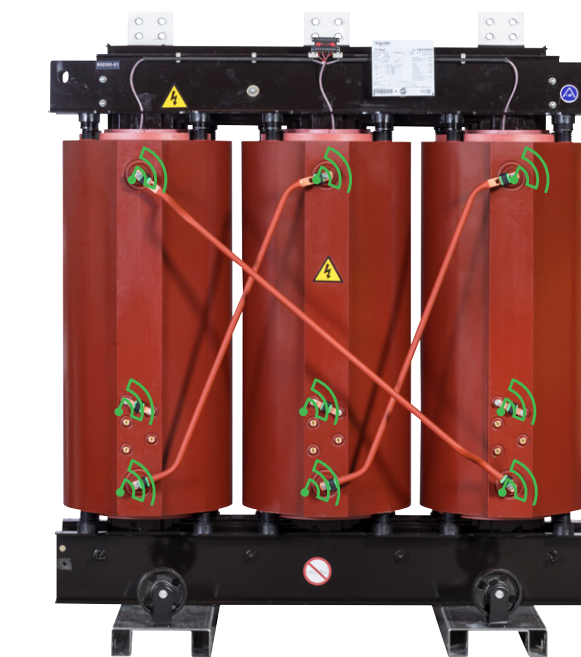
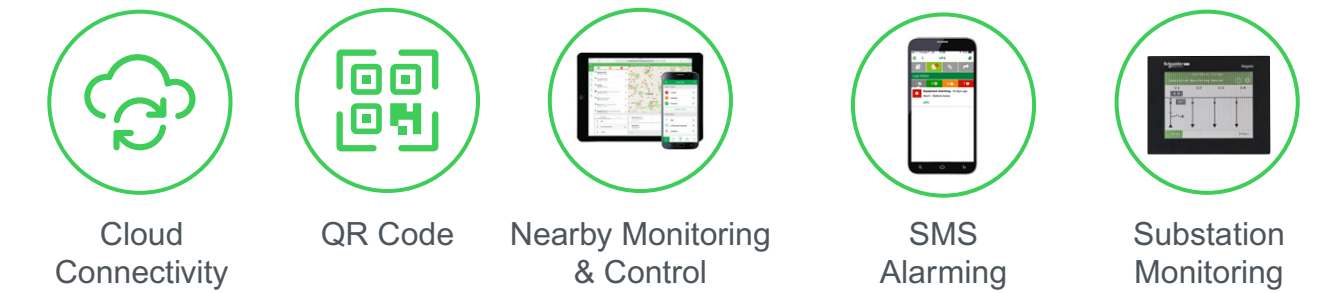
## Enabled Plus

24/7 connected condition monitoring of your transformer with local, remote and cloud based connectivity for advanced services and smart alarms.



## Combo

Combine Trihal connected with our latest connected MV switchgear to provide 24/7 complete substation health assessment, anywhere, anytime.



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New Features

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Benefits of working with Trihal connected







# Boost your business with EcoStruxure Power

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# Discover the benefits of EcoStruxure

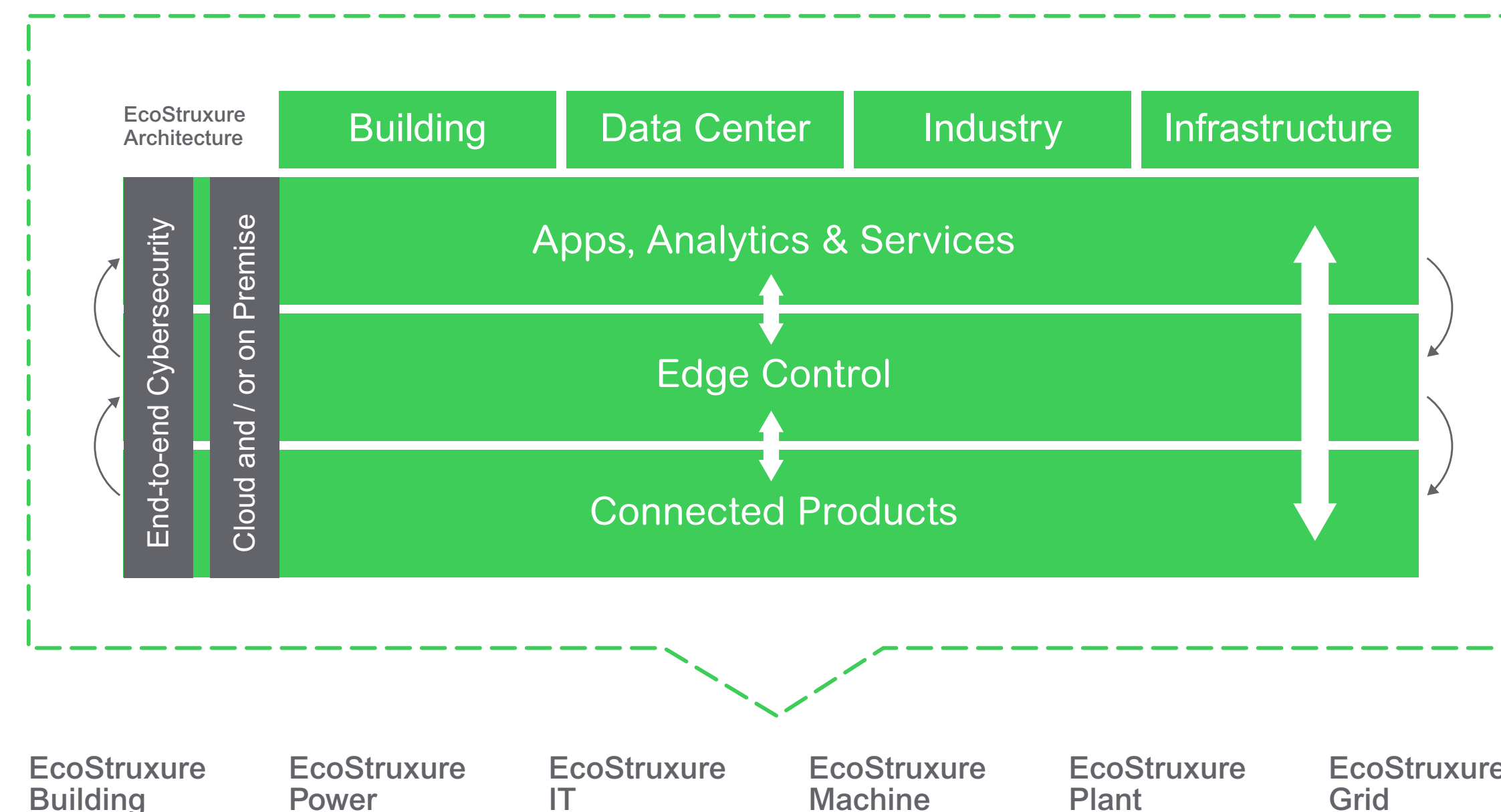
EcoStruxure Power is part of Schneider Electric’s open, interoperable IoT-enabled system architecture and platform.

It delivers enhanced value around safety, reliability, efficiency, sustainability, and connectivity for our customers.

EcoStruxure Power leverages advancements in IoT, mobility, sensing, cloud, analytics, and cybersecurity to deliver innovation at every level with solutions across three critical layers:

- Apps, Analytics & Services
- Edge Control
- Connected Products

This unified approach provides more value than a traditional network of isolated devices and is covered by end-to-end cybersecurity.



[Learn more](#)

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New Features



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# Benefits of working with Trihal connected

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# Technical specifications

| Specification                  | Value  |
|--------------------------------|--|
| Rated power                    | up to 15 MVA   |
| Rated LV (MV) insulation level | 1.1–7.2 kV   |
| Frequency                      | 50–60 Hz   |
| Rated HV insulation level      | Up to 36 kV (IEC)  |
| Insulation class               | F (155 C)  |
| Vector group                   | Star/Delta   |
| Manufacturing standards        | IEC 60076 -11 2018, EN 50588, EN 50629                               |
| Efficiency (losses level)      | Eco-Design (On request)  |
| Class tests                    | C4, E4, F1, ≤ 5 pC   |
| HV/LV coils                    | HV encapsulated in cast resin/ LV impregnated (cast/cast on request) |
| Cooling system                 | Standard: AN (natural air).<br>Option AF (air forced)                |

Specific demands available upon request



For full specifications and technical information, click here to view the Trihal catalogue.

[Discover Trihal Connected Catalog](#)



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New Features



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# Three levels of scalable benefits

- ✓ Included
- ✓ Optional
- Not Available



|   | Enabled | Enabled Plus | Combo |
|---|---------|--------------|-------|
| Thermal monitoring – On demand                | ✓       | ✓            | ✓     |
| Thermal monitoring – 24/7 connected           | —       | ✓            | ✓     |
| Environmental monitoring – 24/7 connected     | —       | ✓            | ✓     |
| LV winding monitoring                         | ✓       | ✓            | ✓     |
| Monitoring – On SCADA                         | —       | ✓            | ✓     |
| Monitoring – On the Cloud                     | —       | ✓            | ✓     |
| Monitoring – Complete MV substation           | —       | —            | ✓     |
| SMS or Smart alarming                         | —       | ✓            | ✓     |
| Web dashboard                                 | —       | ✓            | ✓     |
| Expert support from our Connected Service Hub | —       | ✓            | ✓     |

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New Features



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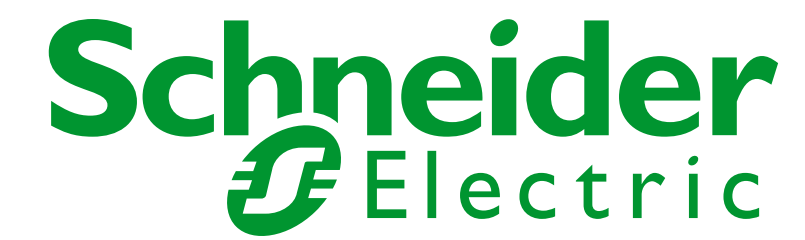


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For more information visit:

[se.com/trihal](https://se.com/trihal)



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