

Case study

Digitalisation of grids: CSOR, the current sensor for earth cables

Integration of old cables in smart
grid environments | EWR GmbH





Old earth cables in digital networks - EWR GmbH upgrades medium-voltage cables with innovative solution from Horstmann

Challenge

EWR GmbH is facing the challenging task of modernising its medium-voltage substations. Like many grid operators, it still uses old oil filled cables to connect its medium-voltage substations. Although these work perfectly, they have been difficult to integrate into smart grid environments. The previous difficulty in adapting these cables to modern standards requires an innovative solution. The focus is not only on ensuring smooth operation, but also on the safety of the electricity grid in and around the town Remscheid.

EWR GmbH sees this challenge as an opportunity to strengthen its technological leadership position while also making a contribution to the sustainable development of the energy infrastructure in the region. With a clear focus on efficiency, cost reduction and safety, EWR GmbH is driving forward the transformation of its medium-voltage substations in order to meet the increasing demands of a digitalised world.

Solution

The Horstmann solution enables old oil filled cables to be retrofitted and integrated into a digital network. As a first step, specially developed CSOR-type current sensors are attached to the insulated, unshielded medium-voltage cables. These enable attachment to the individual conductors above the oil filled cable termination. The second step is then to connect the current sensors to a Sigma F+E 3 L short-circuit indicator. This transmits detected short-circuit incidents directly to the control room and from there by e-mail to the network managers. Transmission takes place via a LoRaWAN radio network, which transports small amounts of data very well and securely over long distances. A particularly practical feature is that the LoRaWAN transmission module is already integrated into the Sigma F+E 3 L short-circuit indicators.

With the development of special holders for insulated unscreened medium voltage cables, Horstmann has paved the way for the simple and economical digitalisation of medium-voltage grids with old cables. The two-part holder enables subsequent and centred installation around the individual conductor up to 45 mm. The entire installation only takes around 30 minutes per cable and is therefore considerably faster and more cost-effective than all previous solutions.

CSOR current sensor

With the new CSOR sensor holder, the current sensor can be installed on insulated, unshielded medium-voltage cables, called earth cables. The current sensor is suitable for connection to the entire Sigma and ComPass series.



The type-tested design consisting of sensor and holder allows partial discharge-free operation for nominal voltages up to 11 kV.



The retrofit solution with a two-part holder for insulated oil filled cables up to 11 kV enables quick and easy installation for conductors up to 45 mm.

55%

of all medium-voltage cables at
EWR are oil filled cables

Product features

- ▶ Type-tested retrofit option – Safe application
- ▶ Simple installation without conversion work – Cost savings
- ▶ Fast installation – Time saving
- ▶ For cables up to Ø 45 mm – Flexible application options for all standard earth insulated unscreened medium voltage cables
- ▶ Suitable for all ComPass and Sigma devices – Universally usable
- ▶ Article number: V49-6024-010-042

Customer benefits

The new solution from Horstmann enables simple installation of holders and the integration of current sensors on insulated unscreened medium voltage cables. Short-circuit detection is carried out quickly and reliably using the Sigma F+E 3 L device combination and the LoRaWAN network. The future-proof nature of the solution is underlined by the potential of the LoRaWAN network for grid digitalisation.

Horstmann's new solution for connecting old oil filled cables to the LoRaWAN network has now made a major digitalisation step economically feasible for us.

Dirk Reinholz
Electricity Operation Manager



About EWR

EWR GmbH, with around 260 employees, is the energy and water supply company of the Stadtwerke Remscheid group of companies. Every day, we supply the approximately 112,000 inhabitants of the city of Remscheid with electricity, gas, water and heat around the clock. Technical energy services round off our range of services.

About Dipl.-Ing. H. Horstmann GmbH

Dipl.-Ing. H. Horstmann GmbH is a medium-sized company with its headquarters in Heiligenhaus near Düsseldorf. The company was founded in 1946 by Heinrich Horstmann and has been successfully run as a family business ever since. Many years of experience and constantly striving to innovate and invest have made Horstmann a leading manufacturer of medium-voltage technology:

- ▶ Short-circuit and earth fault indicators
- ▶ Voltage detectors and test systems
- ▶ Earthing devices and accessories

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