

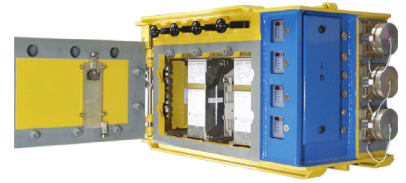


## Why endis?

- **Compact switchgear**
- **TransSwitch**
- **Modular Technology**
- **Disconnecting device for every plug-in module**
- **Integrated control and monitoring electronics**
- **Easy parameterisation**
- **Plug-in connections**
- **Systematic control**

## Compact switchgear

endis switchgear have no terminal compartments. Plug-in modules replace switches, contactors, and discrete monitoring technology. There are no conventional disconnecting switches. Every plug-in unit is part of the disconnecting device. The power bus with plug contacts for the plug-in modules replaces conventional wiring. This saves space. All switchgear have standardised slots (Types 1, 3, 6, and 10), into which a plug-in module suited for the slot type can be inserted.



KE 1004 compact station

## TransSwitch



TEK transformer/switchgear combination for medium voltage

We have gone a step further, however. We have combined the transformer and switchgear into a single unit. In the case of transformers of the TEK type, terminal boxes or switchgear can be switched onto the primary and/or secondary voltage side.

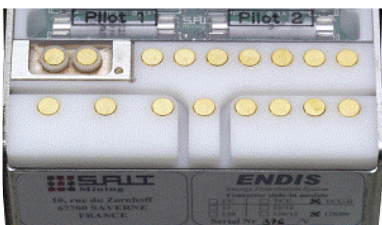
TransSwitch (**transformer and switchgear unit**) is even more compact. It consists of a flameproof enclosure for the transformer and switchgear and is inconsiderably larger than a transformer alone, whilst still being a complete power station with insulation monitoring and lighting and contactor outputs.



TransSwitch for low voltage

## Modular Technology

Modular technology? That isn't anything special.



Contacts for monitoring circuits

But endis is. Our modular technology differs considerably from the standard. There is no connection between the plug-in module and the switchgear for power and control lines, which have to be connected manually. The plug-in module must only be pushed into the switchgear and switched on using the disconnecting device. In the process, all connections are established automatically. Nothing else is necessary.

An appropriate plug-in module is available for every application, whether as a power contactor for a large drive, a double contactor for low to medium power drives (even as a double reversing contactor), insulation monitor with lighting outputs, or a power switch for medium voltage.

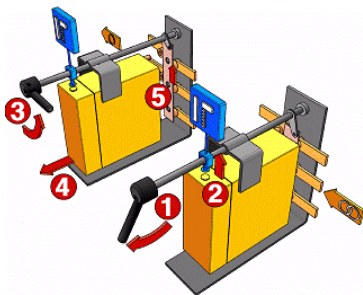


Plug-in module

## Disconnecting device for every plug-in module

Only one disconnecting switch for several plug-in modules? Or even only one for the entire switchgear? That was not enough. In the endis system, every plug-in module has a disconnecting device.

A plug-in module is disconnected from the power bus as follows:



Functional principle of the disconnecting device

- Lift the lever of the disconnecting device.
- The monitoring circuits are disconnected and the plug-in module is shut down.
- Turn the lever of the disconnecting device to the left.
- Remove the plug-in module from the power bus.
- The feed contacts are covered to prevent contact. In case of medium voltage, the shunting contacts are also earthed.

## Integrated control and monitoring electronics

No individual monitoring components have to be set by hand.

A protective module, an electronic unit that assumes all control and monitoring functions of the plug-in module, has been integrated into the plug-in module:

- Insulation monitor
- Short circuit and overload protection
- Locking device against accidental earthing with functional test
- Phase monitor (failure and unbalance)
- Temperature monitor
- Pilot circuit (overload/PE monitor)
- Control system of the vacuum switching tubes
- Short circuit release test

## Easy parameterisation

The protective module in the plug-in module communicates with the display module in the switchgear via a serial data bus. There, the most important information from the plug-in module are displayed, and all parameters are set and saved as a protection against a voltage loss. The flameproof enclosure of the switchgear does not have to be opened for this purpose. After a change of the plug-in module, the values stored in the display module are automatically transferred to the protective module in the plug-in module and stored there. A re-entry of the parameters is not necessary.

## Plug-in connections



PC Plug system on switchgear

In the case of the endis switchgear for low voltage, there is no excessive work for the laying and insertion of lines and for connecting them to terminals in tight terminal compartments. All external connections are created using plug-in connectors. This saves time in the installation.

The PC (Power Connector) plug system covers the spectrum of mains voltages up to 1.1 kV and nominal currents 400 A. All three designs with nominal voltage 250 V for lighting systems and 1.1 kV for small and large

drives have flameproof enclosure „d“ type of protection when assembled.

The assembly of both 1.1 kV designs is very easy and can also be performed underground. Due to the solid, completely screwed construction, the plugs can be reused.

Switchgear for medium voltage 3.3 kV are also available with plug-in connectors, of course.



Plug system designs

## Systematic control

The plug-in modules in the switchgear can be controlled in parallel via contacts, but also serially using field bus adapters through our BETACONTROL, MINCOS, MINING MASTER, PROMOS, and PROMOS PLUS system families.