

EVOLUTION

NORTHERN TRANSFORMER



EVOLUTION, the transformer's primary control and monitoring system, combines all features into a single cabinet. **EVOLUTION** can also incorporate other client technologies in the primary cabinet.

Advantages

- Open Architecture - Compatible with sensors of any manufacturer, retrofittable.
- Enables automation and digitization solutions of the ISM® platform.
 - Asset Intelligence: EVOLUTION® monitors collected data and generates analyses and recommendations for action with the help of intelligent algorithms.
 - Fulfills national and international standards in data exchange and cyber security.
- Availability of different cabinet sizes and different drive solutions depending on the specific customers' needs.
 - Cabinet made of aluminum sheet (protection class IP66). Also available in double-walled design with passive cooling for optimized temperature management while minimizing the CO2 footprint.
 - Removes the need for a separate cabinet and simplifies wiring.

EVOLUTION BASIC CONFIGURATION

Standard motor drive functions

- **EVOLUTION** Cabinet 1200
- Motor drive functionality (ED 6,5Nm)
- Climate zone EXPERT (-40°C...+55°C)
- Corrosion protection class (C4H)
- OLTC Motor Voltage - 3AC



Digital Functions

- HMI operator interfaces
- Substation visualization
- Transformer monitoring BASIC
- Temperature measurement BASIC
- OLTC Monitoring BASIC
- SensorBUS®

➔ Enablement for future upgrades



OPTIONAL PACKAGES

Ready

- SCADA
- AVR BASIC

ReadyPlus

- SCADA
- AVR BASIC
- **Cooling Monitoring BASIC (ONAF)**
- **Cooling Control PRO (ONAF)**

Pro

- SCADA
- AVR BASIC
- Cooling Monitoring BASIC (ONAF)
- Cooling Control PRO (ONAF)
- Temperature measurement **PRO**
- **MSense® DGA 3**
- **MSense® FO 8 channels***
- **Upgrade cabinet size 1500**

ProSuite

- SCADA
- AVR BASIC
- Cooling Monitoring **PRO**
- Cooling Control PRO
- Temperature measurement PRO
- **MSense® DGA 9**
- **MSense® FO 8 channels***
- **Bushing Monitoring BASIC (Capacitance C1)**
- **OLTC Monitoring PRO MSense®VAM**
- **Transformer Personal Logic Editor**
- **Upgrade cabinet size 1800**

**Needs to be known in advance*

Ready



SCADA: Connection to SCADA systems via protocol (IEC60870-5-101, -103, -104, IEC IEC61850 Ed. 1 and Ed 2., MMS, GOOSE, Modbus TCP, RTU, ASCII, DNP3.0 and IOT: MQTT).



AVR BASIC: Enables regulation of the OLTC based on the preferred voltage levels. EVOLUTION® ensures an easy installation with less wiring effort within the substation. SCADA commands access and control to the automatic voltage regulation.



ReadyPlus



Cooling Monitoring: The state and time of operating fan groups as well as starts per cooling stage is continuously monitored and gives a wide range of information about the cooling system.

Cooling Control: A smart algorithm uses the OTI sensor measured temperature and expands the system to a maximum temperature and cooling temperature-dependent switching point control with hysteresis and delay time. **Configured modes: Load-dependent, periodic, alternating.**



Pro



Temperature measurement PRO: Additional information such as paper moisture or bubbling temperature and dynamic transformer overload capability are given. In combination with direct fiber optic temperature measurement, you can detect changes in your transformer equipment at an early stage thus optimizing operational safety and operating costs.



MSENSE® DGA 3: Simple monitoring of dissolved gases and moisture in oil. Detection of increasing gas content and trend analysis of hydrogen and carbon monoxide.



Fiber optical (FO) measurement: FO measurement records the temperature at several points simultaneously obtaining a direct overview of the temperature distribution of your active part.



Upgrade of cabinet size from 1200 to 1500 model: For additional useable space.



ProSuite



OLTC Monitoring PRO MSense® VAM: Preventive and continuous vibroacoustic monitoring of the OLTC detects anomalies during every tap-changer operation.



MSENSE® DGA 9: Dissolved gas analyzation of 8 gases and moisture. Rogers, Duval, and Dörnenburg analysis methods are integrated for support.



Bushing Monitoring: Monitoring of the bushings during operation and identification of errors. Available for oil-impregnated paper bushings (OIP) and resin-impregnated paper bushings (RIP) for voltage levels $U_m = 66...420$ kV. Protects your power transformer from one of the most frequently appearing faults.



Cooling Monitoring: Directly measured temperatures via the installed fiber optic system are used in the integrated cooling control & monitoring application. Calculation of thermal resistance and cooling efficiency based on upper oil temperature, ambient temperature, and load current. The graphical visualization with local storage or transmission for remote interpretation.



Transformer Personal Logic Editor (TPLE): Many signals and measured values on this premium package benefit from customized programs which are possible with TPLE. Easy to program logical links via the web-based visualization link the inputs and outputs available on the device using function modules.



Upgrade of cabinet size from 1800 model: For additional useable space.



Future Ready!

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