

## Transformer service

# TXpert™ BM — real-time transformer bushing monitoring

Enabled by CoreTec 4, the TXpert Hub

Our newest solution for bushing monitoring combines our TXpert Hub data aggregator with TXpert Ready sensors to provide a turnkey solution for digital bushing monitoring.

You get a powerful insight into the condition of the bushing - a critical component in all electrical networks, as it brings current at high-voltage through a grounded barrier and an early warning of incipient faults to assure a transformer continuously delivers optimal performance.

### CoreTec 4 featuring bushing monitoring

Our CoreTec 4 has laid the foundation of our digital journey that allowed select transformer monitoring features and plug-and-play of select sensors. With the newest updates we are extending our monitoring functionality also to real time bushing monitoring.

### What you get?

With TXpert™ BM solution for bushing monitoring you get support for 1, 3 or 6 bushing configurations. The bushing monitoring acquisition hardware connects to the CoreTec 4 through the ethernet expansion port. Digital sensor implements real time monitoring through:

- Leakage current analysis
- Capacitance
- Dissipation factor ( $\tan\delta$ ,  $\Delta\tan\delta$ )

### How?

These parameters are then used by the algorithms in the CoreTec 4 version 2 firmware to give you an early warning of incipient faults developing in a bushing.

### Application

The TXpert™ BM is available for installation in both new transformer applications as well as retrofit. It is designed for an effective lifetime of 20 years.



01 Online condition monitoring with CoreTec™ 4, the TXpert Hub data aggregator, is a better way to manage your transformers.

### Why TXpert™ BM solution?

- Reliable and robust products
- Easy to install
- Based on an industry standard method
- Improved algorithms using pattern matching to identify bushing faults
- Integration into a single dashboard, the CoreTec 4
- Scalable system - from the smallest to a complete offering (Plug-and-play)
- A monitoring system, not a “control system”
- State of the art Cyber Security
- Avoidance of expensive unplanned outages
- Reduction in time-based inspection costs
- Reduction in human error; reduction of risk
- Health and safety benefits

## Why Hitachi Energy?

- Expertise in bushing technology & transformer monitoring
- Unique understanding of how to set the alarms to maximize the value of the system
- Expertise in data interpretation, possibility to interpret collected data through our own APM Edge software

- Rapid response time & local support guaranteed through the largest service organization throughout the complete lifetime of your transformer
- Unique one-stop-shop supplier with the broadest range of bushings, tap-changers, insulation, measurement & safety & monitoring devices, and Asset Performance Management.

### Functionalities

Measure	Bushing health readings and other parameters depending on device selection: - TXpert BM SC: Industry standard sum of currents algorithm - TXpert BM VR: Voltage reference method
Model	TXpert BM
Application	All bushing types (oil filled or dry) with tap connector; (some bushing models may require a custom tap adapter)

### Electrical specifications

Voltage input	Sensors: 12 VDC ; Evaluation unit: 24 VDC
Max current	max 2.0 A

### Mechanical specifications

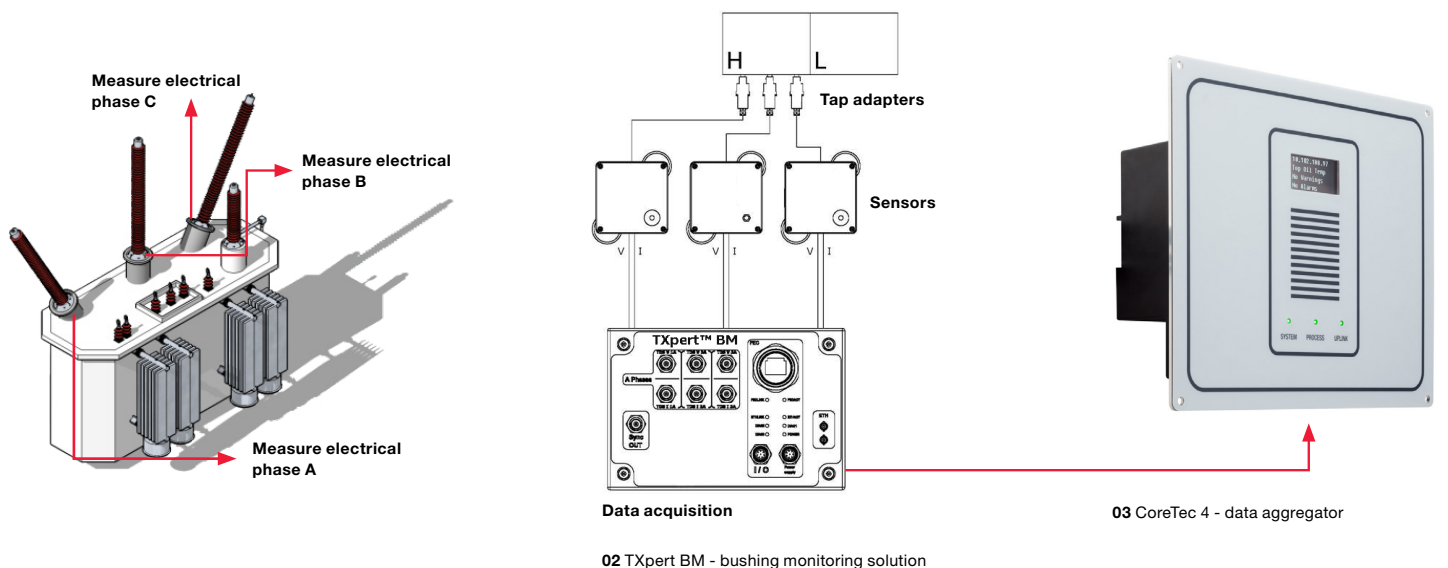
Number of bushings	3 – 6 – one evaluation unit, 3 bushing plus 3 reference VT signal
Measured parameters	Dissipation factor (tan d), Leakage current, capacitance
Bushing capacitance	Range: 1pF – 100nF with accuracy 1%
Dissipation factor (tanδ, Δtanδ)	10 <sup>-4</sup> to 1, ±0.00001
Resistance	10MΩ to 100TΩ, ±1%

### Communication specifications

Communication protocols	MODBUS, Connectivity through CoreTec 4: Modbus, DNP 3, IEC60870, IEC61850
CyberSecurity	Applicable only with CoreTec 4: EEE 1686, IEC 62443-4-1, IEC 62443-4-2

### Environmental specifications

Operating ambient temperature	-10°C to 60°C (-50 to +60C with optional cabinet heater)
Operating ambient humidity	5% to 95% RH non-condensing



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