ZVCM-1001M

Transformer Bushing Monitor

MADE BY AN AMERICAN COMPANY FOR OVER 25 YEARS

Transformer bushing failures are considered as one of the major causes of transformer outages. Historically, bushings were tested with off-line methods to measure the capacitance and dissipation/power factor.

The ZVCM-1001m is a permanently installed on-line bushing monitoring system. It continuously measures leakage currents from up to six bushings. With a double system, up to twelve bushings may be monitored. Power factor and capacitance values are calculated and various test method algorithms are applied. Free-standing CCVTs, circuit breaker bushings, and GIS-to-AIS transition bushings may all be monitored.

The bushing sensors replace the test tap grounding cover at the bushing base. The installation is semi-permanent and can be accessed for off-line power factor testing.

Measurements for all six bushings are taken simultaneously, not serially, preserving time alignment.

ZVCM bushing sensors are available for grounded or ungrounded capacitor taps. Redundant circuits within the sensor also limit the voltage at the output cable, protecting both the bushing and also personnel, if a cable is accidentally cut or damaged.

FM APPROVALS PROJECT NO: PR464633

Condition Monitoring Equipment | Transformer Monitoring | Bushing Defect

Class II Monitoring System per FM 6510

FM APPROVED

ZVCM-1001m On-Line Transformer Bushing Monitoring System (FM24FPUS0042X)

Power Supply and Input Voltage Range	85-264 Volts AC/DC
Operating Temperature Range	-55°C to +55°C
No of Channels	3 or 6
Leakage Current Measurement Range	0.5 to 140 mA
Leakage Current Accuracy	±1.5% of reading
Capacitance Measurement Range	100 to 3000 pF
Power Factor Measurement Range	0 to 15% PF
Phase Angle of Imbalance Current Range	0 to 360°
Output Port	RS-485, Ethernet, USB
Software	ZTZ Multi Tool, TraMoS
SCADA	MODBUS TCP or DNP over Ethernet

A standard installation with three high-side and three low-side bushings provides

- Sum-of-Three Current Test
- Adjacent Phase Reference Test
- Phase Comparison Test
- Patented High-to-Low Test

Additionally, with optional configuration with three PT voltage inputs and three bushing C1 inputs

- Reference Test (3 bushings and 3 CCVTs
- Reference Test (6 CCVTs and 6 bushings) requires double ZVCM system

Key Advantages

- Lifetime Warranty for all hardware and sensors
- Reliable Bushing Sensor designs refined over 40 years.

Sophisticated algorithms determine

- Relative capacitance in percentage to the start-up value
- Relative power factor %PF for each bushing
- Magnitude of imbalance currents for three-phase sets of bushings
- Phase angles of imbalance currents
- Alarm assertion for any parameter outside preferred limits

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