

# INSULOGIX® B BUSHING MONITOR

## ENGINEERING EXPERTISE AND ONLINE MONITORING TO PROVIDE ACTIONABLE INFORMATION FOR YOUR HV & LV BUSHINGS

The InsuLogix® B is a cost-effective, software-oriented, continuous on-line monitoring system for monitoring power factor at operating voltage in high voltage capacitive bushings and/or HV current transformers. The device acquires, analyses, and trends data pertaining to AC Insulation Power Factor of Bushings and/or HV current transformers.

### BUSHING FAILURE MODES

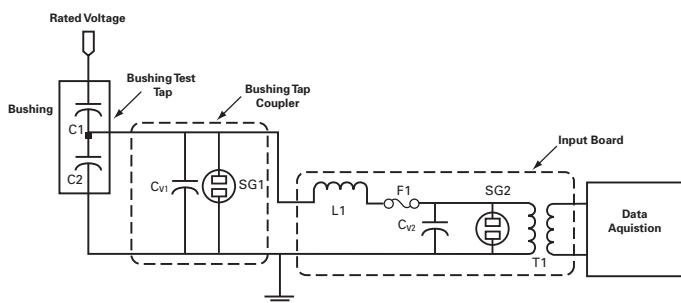
The most common type of bushing failure occurs in the internal capacitive layers. These failures occur slowly over time with one layer failing and burning through the insulation. The InsuLogix® B provides advanced warning of bushing failure through sensors that detect early changes in the voltage amplitude and phase angle.

### InsuLogix® B MONITORING TECHNIQUE

The InsuLogix® B monitors Power Factor/ $\tan \delta$  from the bushing C1 Test Tap using algorithms that simulate the Schering Bridge technique, a standard industry method of offline testing. This standard based method provides early warning of a problem bushing. Online tests are performed at rated voltage, under load, and in all weather conditions, as opposed to offline testing which is performed at 10 kV when weather conditions permit. This online test detects internal insulation failures or external issues such as surface contamination due to pollution. The condition of the bushing is displayed on a 0-100% scale indicating changes in the Power Factor/ $\tan \delta$ .

### BUSHING TAP SENSOR

The Bushing Tap Sensor forms a capacitive voltage divider between the operating voltage and the capacitance of the bushing. This sensor protects the test tap with quad redundant protection by using the voltage divider capacitors and two spark gaps. The sensor measures the condition of the bushing's insulation by using Phasor Values to compute Power Factor.



### UNIQUE ALGORITHMS

The system's trending algorithms provide early warning of changes to bushing insulation quality. The Condition Value of each bushing is calculated by trending the Power Factor/ $\tan \delta$  measurements in combination with comparative changes from the sampled set of bushings. The condition value is displayed in an intuitive Green, Yellow, or Red status indicating the level of risk for each monitored bushing. When compared to other methods of bushing monitoring, such as the current sum method, The InsuLogix® B's algorithms provide the most accurate and earliest indication of the condition of the bushing's insulation integrity under all weather and environmental conditions."

### ARCHITECTURE AND COMMUNICATIONS

- The system consists of a minimum set of three sensors permanently connected to a series of capacitive bushing taps, or lightning arresters.
- Up to 32 directly connected sensors, and up to 256 wireless sensors can be monitored in real time. Data can be downloaded on-site or remotely.
- The system can also interface to an existing EMS system via a LAN/WAN or dial-up connection to a IEC 61850 (UCA2.0TM ) network.

# WEIDMANN



#### COMMUNICATION OPTIONS INCLUDE:

- pcAnywhere™
- Windows RDP
- RJ45 Ethernet Interface
- Serial Interface (ASCII)
- LCD Touch Panel Display
- Hardwired or Wireless
- IEC 61850
- DNP3

The InsuLogix® B system can interface to signals from other InsuLogix® line WEIDMANN monitors, and 3rd party devices and IEDs such as: temperature sensors, DGA, or any 0-10 Vdc, 10 V peak, 4-20 mA, or 0-1 mA signal.

#### VALUE PROPOSITION

WEIDMANN can offer to its customers a comprehensive bushing evaluation and monitoring package, consisting of:

1. Bushing initial evaluation made by WEIDMANN experts.
  - o Bushing design, application, operating conditions and health status are reviewed and analyzed by WEIDMANN experts, who will generate a comprehensive engineering report and recommendations.
2. InsuLogix® B – continuous online bushing monitoring system.
3. Periodical evaluations made by WEIDMANN experts using field data recorded by InsuLogix® B.

#### BENEFITS

- Condition Based Maintenance
- Reduced Risk of Catastrophic Failure
- Scalable Smart Grid Solution
- Safety for Personnel & Assets
- Integration possible with other monitors from WEIDMANN InsuLogix® line
- Access to WEIDMANN experts for bushing engineering evaluations

#### TECHNICAL SPECIFICATIONS

<b>Input Power</b>	85—240 V AC 50/60 Hz or 85 - 240 V DC
<b>Signal Inputs</b>	
Bushing Monitoring Channels	30 AC Max (3 per AC Inputs Board)
Input Impedance	50 Ω (< 1 kHz)
Signal Input Mode	Differential
Maximum Full Voltage	60 V rms
Isolation Between Inputs	3000 V
Surge Withstand	ANSI/IEE C37.90.1—1989
Analog Input Channels	8 (with Optional Sensor Board)
<b>Signal Outputs</b>	
Isolated Alarm Contact	6 Contacts, Max DC 200 V, Max Current DC 1 Amp.
Digital to Analog Channels	2 (12 Bit Channels), ±5, 0-5 V or 0-10 V Range
<b>Enclosure</b>	
Dimensions	20" x 16" x 8" (49cm x 40.64cm x 20.32cm)
Weight	45lbs (20.4Kg)
<b>Power Supply</b>	
	Isolated Supply to Cabinet 110/220 V AC, 50/60 Hz, 40 W
<b>Environment</b>	
BTC & Interface Cabinet	-55° C to +65° C
Humidity	0-95 % non-condensing
Pollution	1°
<b>Interface</b>	
	Serial Port; 4 RS232/RS 485; 1 RJ45 Ethernet
<b>Optional Interface</b>	
	IEC 61850 ; DNP3 Wireless 2.4GHz, Spread Spectrum, Freq. Hopping Comms Touch Panel Display
<b>Sensor Cable</b>	
	Single STP to Overall Bundles
Rated	2 kV AC insulation Levels (Belden 1039A)
Min. Shield/Drain Gauge	>0.7 mm <sup>2</sup> (Single) ; >1.0 mm <sup>2</sup> (Overall)
Min. Core Gauge	>0.7 mm <sup>2</sup>

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#### WEIDMANN DIAGNOSTIC SOLUTIONS INC.

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