



# BM-2

## BUSHING MONITOR

### CATALOG

[treetech.com.br](http://treetech.com.br)

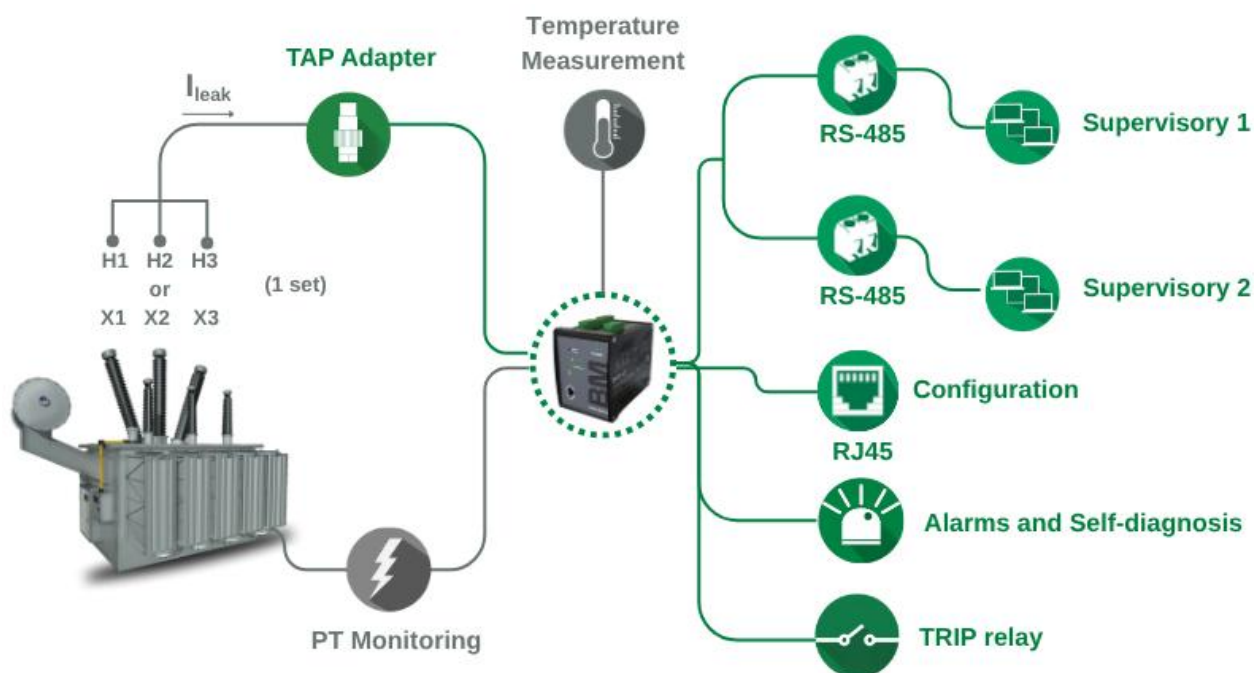
## BM: Technological, compact, and reliable. The Bushing Monitor that combines simplicity and precision!



Did you know that a failure in insulation bushings can cause serious damage and millions of dollars in losses to high-voltage equipment? These components are fundamental to ensuring the safe operation of power transformers, reactors, and other high and extra-high voltage assets. When the insulation fails, the entire system is at risk; therefore, monitoring the integrity of the bushings is an essential measure to avoid surprises and maintain operational reliability.

With this in mind, Treotech developed the BM, ideal for detecting changes that compromise bushing insulation in their early stages. With compact dimensions, reliable algorithms, and high data processing capacity, our equipment delivers efficient, precise, and high-quality monitoring, as well as contributing to maintenance planning. BM, fits in the dashboard and in your pocket!

## SYSTEM TOPOLOGY



## FEATURES AND FUNCTIONS

### **IED**

- ✓ This IED (Intelligent Electronic Device) features a modern and compact design, specifically planned for transformer applications, whether in substations, industrial or commercial installations.

### **MODULAR SYSTEM**

- ✓ Configurable for monitoring up to 3 bushings (1 set).

### **PT MONITORING**

- ✓ RMS measurement of the PT and recording in memory to enhance event analysis.

### **ALARMS AND SELF-DIAGNOSIS**

- ✓ Issuing alarms in case of abnormalities.
- ✓ Self-diagnosis for detecting internal faults.

### **COMMUNICATION PROTOCOL**

- ✓ 2 RS-485 serial communication ports for integration with supervisory or remote monitoring systems. Open communication protocols Modbus® RTU or DNP3.

### **INTERNAL CLOCK**

- ✓ Adjustment maintained for a maximum of 3 days in case of power failure, without the use of batteries; maintenance-free equipment.

### **MASS MEMORY (Default)**

- ✓ Non-volatile memory for storing measurements and alarm events.

### **RESET BUTTON**

- ✓ The BM-2 has a button that, when pressed, allows the user to access the default communication parameters.

### **TRIP relay**

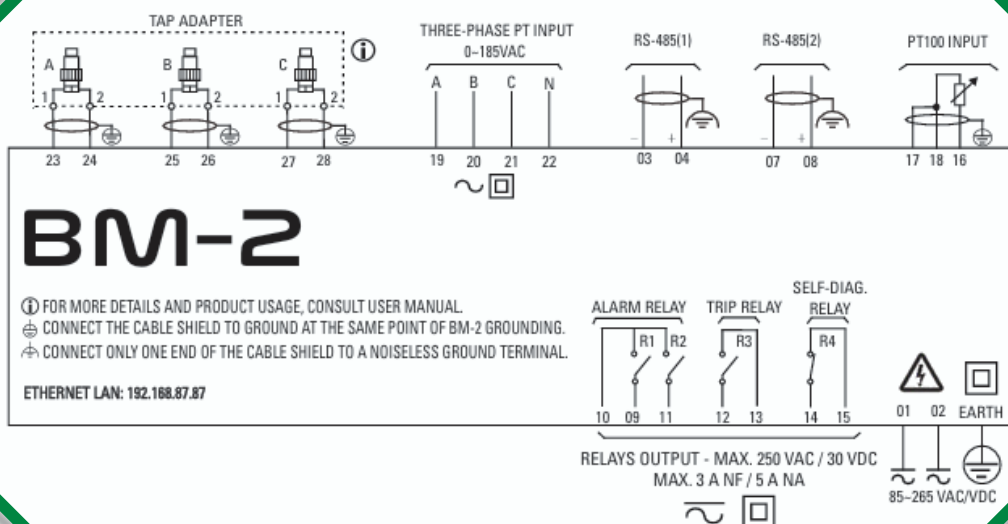
- ✓ Relay equipped with TRIP function triggered by alarms due to currents.

## TECHNICAL DATA

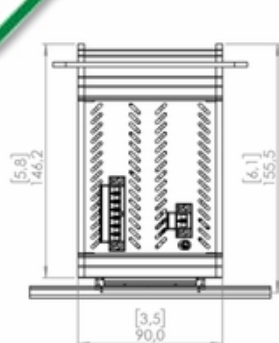
| HARDWARE                           |                                                                                                                 |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Supply voltage                     | 85...250 Vac/Vdc                                                                                                |
| Frequency                          | 50/60 Hz                                                                                                        |
| Maximum consumption                | <12 W                                                                                                           |
| Operating temperature              | -40...85 °C                                                                                                     |
| Degree of protection               | IP20                                                                                                            |
| Mounting                           | Panel<br>DIN Rail                                                                                               |
| INPUTS                             |                                                                                                                 |
| Current inputs (1 set)             | 0...100 mA                                                                                                      |
| Three-phase voltage inputs (1 set) | 0...185 Vac                                                                                                     |
| 1 RTD                              | PT100 $\Omega$ at 0°C with 3 wires, range -55...200°C                                                           |
| OUTPUTS                            |                                                                                                                 |
| 2x Alarms                          | Normally Open (NO) relays<br>Dielectric strength: 4000Vrms<br>5 A at 125 VAC<br>5 A at 250 VAC<br>5 A at 30 VDC |
| 1x Self-diagnosis                  | Normally Closed (NC) relay<br>Dielectric strength: 4000Vac<br>3 A at 125 VAC<br>3 A at 250 VAC<br>3 A at 30 VDC |
| 1x Trip relay                      | Normally Open (NO) relays<br>Dielectric strength: 4000Vrms<br>5 A at 125 VAC<br>5 A at 250 VAC<br>5 A at 30 VDC |
| COMMUNICATION INTERFACE            |                                                                                                                 |
| Communication protocols            | DNP3<br>Modbus® RTU                                                                                             |
| Communication ports                | 2 RS-485                                                                                                        |
| Configuration port                 | 1 RJ45                                                                                                          |
| DIMENSIONS AND WEIGHT              | DESCRIPTION                                                                                                     |
| Dimensions                         | 146.8 mm x 131.1 mm x 90 mm                                                                                     |
| Weight                             | Approx. 1000g                                                                                                   |

## ELECTROMAGNETIC TESTS

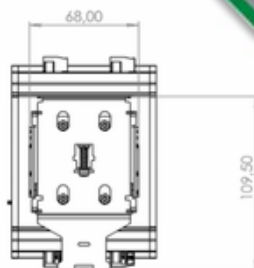
| TESTS                                                                                      |
|--------------------------------------------------------------------------------------------|
| Immunity to conducted emission (IEC-61000-4-6)                                             |
| Immunity to voltage variations, short interruptions, and voltage dips (CEI-IEC-61000-4-11) |
| Immunity to fast electrical transients (IEC-61000-4-4)                                     |
| Immunity to electrostatic discharge – ESD (IEC-61000-4-2)                                  |
| Immunity to 60Hz magnetic field (IEC-61000-4-8)                                            |
| Immunity to surges (IEC-61000-5-4)                                                         |
| Immunity to irradiated emissions (IEC 61000-4-3)                                           |
| Radiated emission (CISPR 11)                                                               |
| Conducted emission (CISPR 11)                                                              |
| Power failure (IEC 61000-4-11)                                                             |
| Cold withstand (IEC 60068-2-1)                                                             |
| Dry heat withstand (IEC 60068-2-2)                                                         |
| Humid heat withstand (IEC 60068-2-78)                                                      |
| Thermal cycle (IEC 60068-2-14)                                                             |
| Response to vibration (IEC 60255-21-1)                                                     |
| Durability to vibration (IEC 60255-21-1)                                                   |



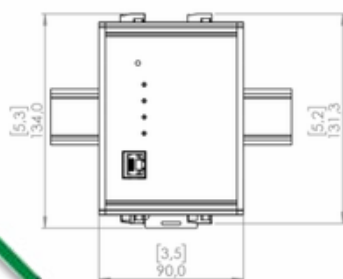
## ELECTRICAL DIAGRAM



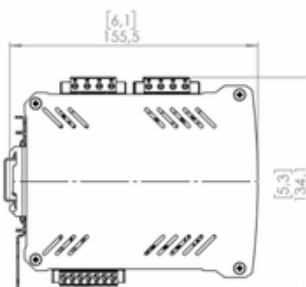
TOP VIEW



REAR VIEW



FRONT VIEW

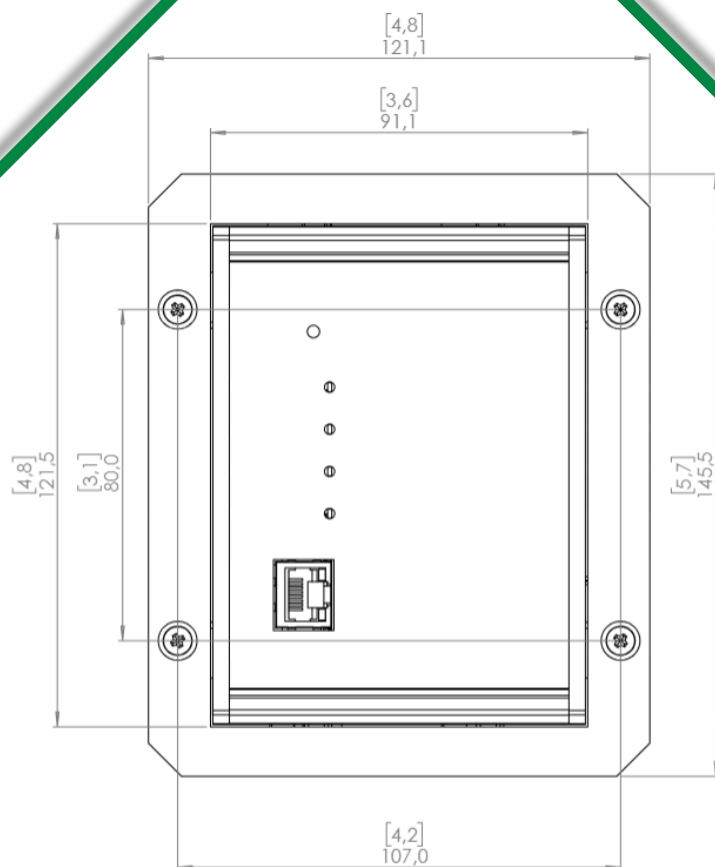


SIDE VIEW

**DIMENSIONS  
(DIN)**

**FRONT**





Panel mounting cutout for the IED  
should be 91.1 x 121.5 mm

**DIMENSIONS  
(PANEL)**

## ESSENTIAL ACCESSORIES



## TAP ADAPTER

Tap adapters are essential accessories for the operation of the BM; their mechanical construction varies according to the model and manufacturer of the bushing. Treotech offers ready-made adapters for most bushings on the market, and other models are readily developed whenever necessary. For more information, request our catalog.

## RECOMMENDED ACCESSORIES



## SIGMA ECM® MONITORING SOFTWARE

In addition to online temperature monitoring of your assets, our monitoring system and specialized team allow you to track the condition of your assets beyond simply reading data.

Monitoring is done through analysis of information collected by the IEDs installed in your assets.

## PT100 SENSORS

For ambient temperature measurements, it is recommended to select the type of Pt100 sensor according to the installation location. For indoor environments, sensors designed for protected locations should be used, ensuring stable and accurate measurements. For outdoor environments, it is recommended to use Pt100 sensors with robust construction and protection against weather exposure, ensuring reliability and durability. Both models can be purchased from Treotech.

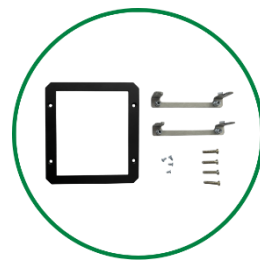


## WEATHER SHELTER

If ambient temperature measurement is required in exposed locations, it is recommended to use a weather shelter to protect the Pt100 sensor from direct exposure, minimizing measurement errors caused by inclement weather.

## PANEL MOUNTING KIT

To install the equipment in a panel, the use of the mounting kit is required. This set ensures proper fixation and mechanical alignment, and consists of a front bezel, screws, and mounting clips.



## SPECIFICATIONS FOR ORDERS

In the product purchase order, it is necessary to specify:

- ✓ Product name;
- ✓ Quantity;
- ✓ Accessories.



**Note:** If panel mounting is required for the application, ensure you request the Panel Mounting Kit. For further details and included components, refer to the Recommended Accessories section above.

**Treotech®**

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See the list of our distributors at:

[www.treotech.com.br/contato/representantes/](http://www.treotech.com.br/contato/representantes/)