

DESCRIPTION

The MFM-100 Magnetic Flux Measuring System is designed to monitor the magnetic field and detect imbalances that contributes to machine vibration, overheating, and excessive stress on rotor and stator structures and components.

It is composed of the MFP-100 Probe installed on the stator wall and its remote MFC-100 Signal Conditioner. When combined with air gap, the probe is installed on the lamination stack in front of the air gap sensor.

The MFC-100 offers two types of outputs: absolute maximum flux density per pole which provides the maximum value for each rotor pole, and the raw flux density which traces the flux profile of each pole.

For effective diagnostics, MFM results are correlated with air gap measurements using the ZOOM® system which enables to determine whether the imbalance is caused by an electrical fault or induced by an uneven air gap.

MFM-100

MAGNETIC FLUX MEASURING SYSTEM

APPLICATIONS

- On-line magnetic flux measurements in most:
 - hydrogenerators
 - turbogenerators
 - synchronous condensers
 - large motors
- Installed as stand-alone or in combination with AGMS® for effective diagnostic of generator magnetic field

FEATURES

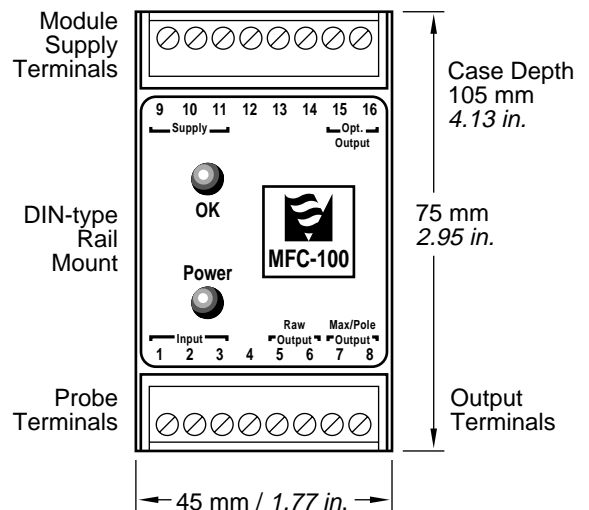
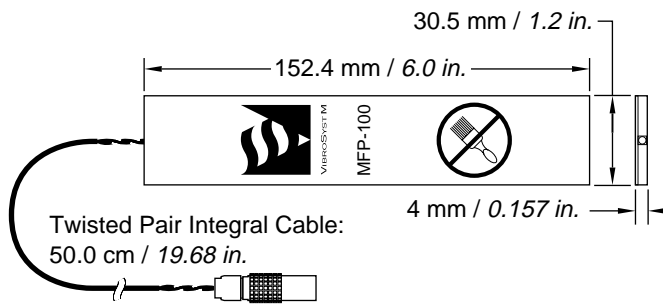
MFP-100 Probe

- Up to 1.5 Tesla at 50/60 Hz
- Immune to any deposits, vibration and temperature variation
- Safe for hydrogen-cooled environment
- Easy to install on stator wall without removing the rotor or poles

MFC-100 Signal Conditioner

- Conditioned output available:
 - absolute maximum flux density (4-20 mA) of each pole
 - raw flux density (± 5 V)
- Output available to ZOOM® or any other acquisition apparatus
- DIN rail-mount conditioner in a wall-mounted enclosure
- External power supply required

DIMENSIONS





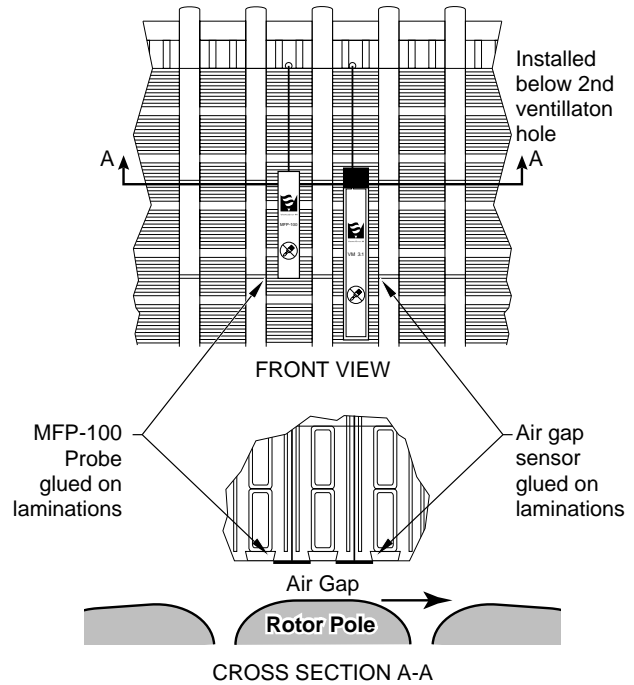
MFP-100 DESCRIPTION

The MFP-100 Probe dynamically senses the magnetic flux emanating from each rotor pole. It is a non-contact passive device highly immune to the harsh environment found in the generator air gap (deposits of carbon dust, dirt and oil, EMI-RFI, vibration) and is safe to operate in a hydrogen type environment.

The MFP-100 is glued onto the lamination stack of the stator. When combined with air gap, its position relative to the air gap sensor is defined by the machine rotational direction in generation mode (i.e. to the left if clockwise; to the right if counter clockwise) so that the poles cross the MFP-100 first. The MFP-100 probe is then installed on the stack in front (or one slot apart) of the air gap sensor.

A twinaxial extension cable connects the probe to the MFC-100 Signal Conditioner. Two lengths available: 10 m (32.8 ft) standard and 20 m (65.6 ft) optional.

MFP-100 INSTALLATION





MFC-100 DESCRIPTION

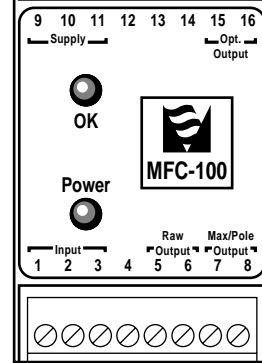
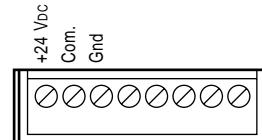
The MFC-100 Signal Conditioner conditions the probe signal and offers two outputs: raw flux density (± 5 V) and absolute flux density (4–20 mA). Raw flux density is the dynamic flux profile of the poles. Absolute flux density is the maximum flux value of each rotor pole with the negative values rectified. These outputs can be connected to the ZOOM system or any other acquisition apparatus.

Magnetic flux is closely related to the air gap characteristics of each rotor pole. Comparing flux with gap helps determine whether a field variation is mechanically induced by a gap variation or caused by an electrical fault. Correlation of synchronized measurements is done using the ZOOM system.

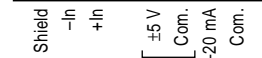
The MFC-100's comes in a DIN-type rail mount case and requires an external +24 VDC supply. It can be installed in any existing enclosure, or ordered with its own wall-mounted enclosure complete with power supply and terminal blocks. The standard 10 m twinaxial extension cable can be interchanged to a 20 m (65.6 ft) for connection to a remote enclosure installed outside the machine.

MFC-100 MODULE

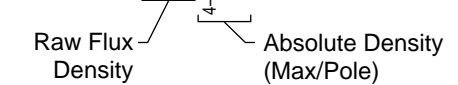
Module Supply Terminals



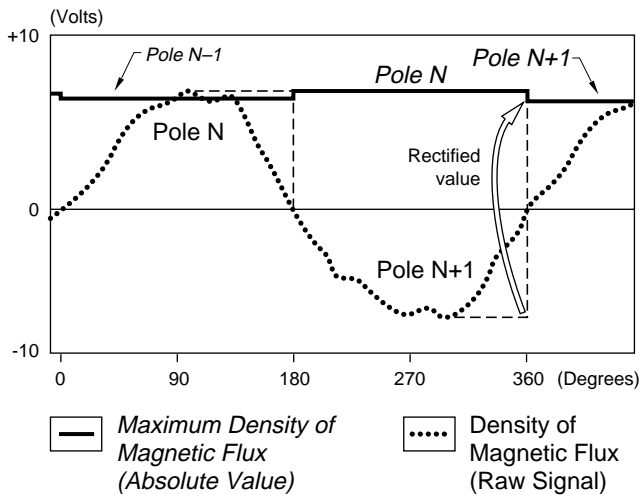
Probe Terminals



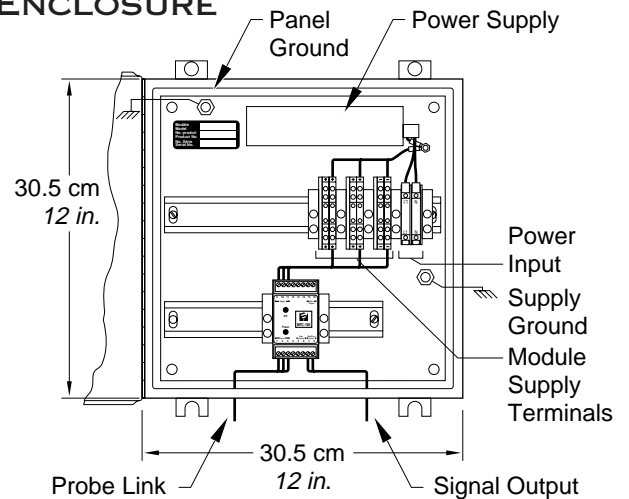
Output Terminals



OUTPUTS



ENCLOSURE





MFP-100 GENERAL SPECIFICATIONS

Input

- Magnetic Field Up to 1.5 Tesla at 50 to 60 Hz
- Interchangeability Better than 1% FSR

Cable

- Integral Twisted pair
 - Length 50 cm (19.7 in.)
 - Connector Female
- Extension Twinaxial shielded
 - Length 10 m standard (32.8 ft)
 - 20 m (65.6 ft) optional
 - Connector Male on sensor end
 - Skinned wires fitted with pins on conditioner end
- Temperature 0° to 200° C (32° to 392° F)

Environmental

- Operating temperature 0° to 125° C (32° to 257° F)

Dimension

- Height 152.4 mm (6.0 in.)
- Width 30.5 mm (1.2 in.)
- Thickness 4.0 mm (0.157 in.)

MFC-100 GENERAL SPECIFICATIONS

Signal Conditioning

- Input MFP-100
- Outputs
 - Raw flux density ± 5 V
 - Absolute flux density 4–20 mA, maximum per pole
- Connectors Screw terminals
- Accuracy $\pm 1\%$ FSR
- Linearity $\pm 0.5\%$ FSR
- Repeatability $\pm 0.05\%$ FSR
- Detection Thresholds min. 30 mTesla, max. 1.5 Tesla
- Temperature Drift <500 ppm/°C

Power Requirement

- Supply to module +24 V_{DC} $\pm 10\%$
- Power Consumption 2.4 W

Environmental

- Operating Temperature 0°–55° C (32°–131° F)
- Storage Temperature -25°–85° C (-13°–185° F)

Physical Characteristic

- Module DIN-type rail mount
Krilen case
- Height 75 mm (2.95 in.)
- Width 45 mm (1.77 in.)
- Depth 105 mm (4.13 in.)
- Weight 0.19 kg (0.4 lb)
- Enclosure (optional)
 - Type EEMAC/NEMA4 and 4X
 - Power Supply Included 85–265 V_{AC}, 47–440 Hz
110–330 V_{DC}
 - Height 305 mm (12 in.)
 - Width 305 mm (12 in.)
 - Depth 152.5 mm (6 in.)
 - Weight 10.8 kg (23.8 lb)

VibroSystM reserves the right to change specifications to improve products without notification.
MFM™ is a trademark, ZOOM® and AGMS® are registered trademarks of VibroSystM Inc.

Published: 95.07.31 **Revised:** 99.04.30

VIBROSYSTM

2727 East Jacques-Cartier Boulevard
Longueuil (Québec) Canada J4N 1L7
Phone: (450) 646-2157 • Fax: (450) 646-2164
In the U.S., call toll free 1-800-663-8379
E-mail: sales@vibrosystm.com