


 **BENDER** FP200

 ON

NGR Monitor

OK

NGR = 26

I NGR = 0

NGRM700

Neutral Grounding
Resistor Monitor

The better tool to monitor grounding resistors

Are you concerned with the reliability of your system grounding? The NGRM700 is a sophisticated device that allows continuous NGR monitoring to provide peace of mind that the power system grounding is intact.

The NGRM700 neutral grounding resistor monitor measures the resistance of the NGR for High Resistance Grounded Systems (HRG). Its monitoring capabilities include NGR current, voltage and continuity, phase-to-ground voltage. The ideal relay to protect the grounding system and to provide main or backup ground-fault detection. The relay can connect to a communications network and stores data onboard for local or remote viewing.

The NGRM700 allows the user to meet their local code requirements including the proposed 2018 CSA Section 10-302 - which requires detection of a ground fault on the conductor connecting the NGR to the source and of loss of continuity of the impedance grounding circuit for any impedance-grounded circuit used.





Early detection enhances operational safety and maintenance planning

Resistance-grounded systems use current transformer based ground-fault detection. An open grounding resistor renders these systems inoperable. Early detection of an NGR problem provides the ability to plan repair and indicates a previously unknown hazard.

The NGRM700 allows using already existing CTs and coupling devices for more easy retrofit on site.

Interfaces

- Multilingual user interface
- Web server with 1000 event data log; date and time stamped event recorder
- Modbus TCP
- LCD user interface

Features

- Monitoring of systems up to 25 kV
- Phase voltage and neutral voltage monitoring for fault indication
- AC and DC NGR current measurement
- Direct connection up to 690 V for phase-voltage monitoring
- Continuous NGR monitoring and CT monitoring
- Measurement of resistor value indication in Ω
- Harmonic analysis of NGR current and voltage



NGRM700

[3]



Overview



▼ Device settings



▼ Menu

Data meas. values

▼ Harmonics

Voltage

Current

Pulsar

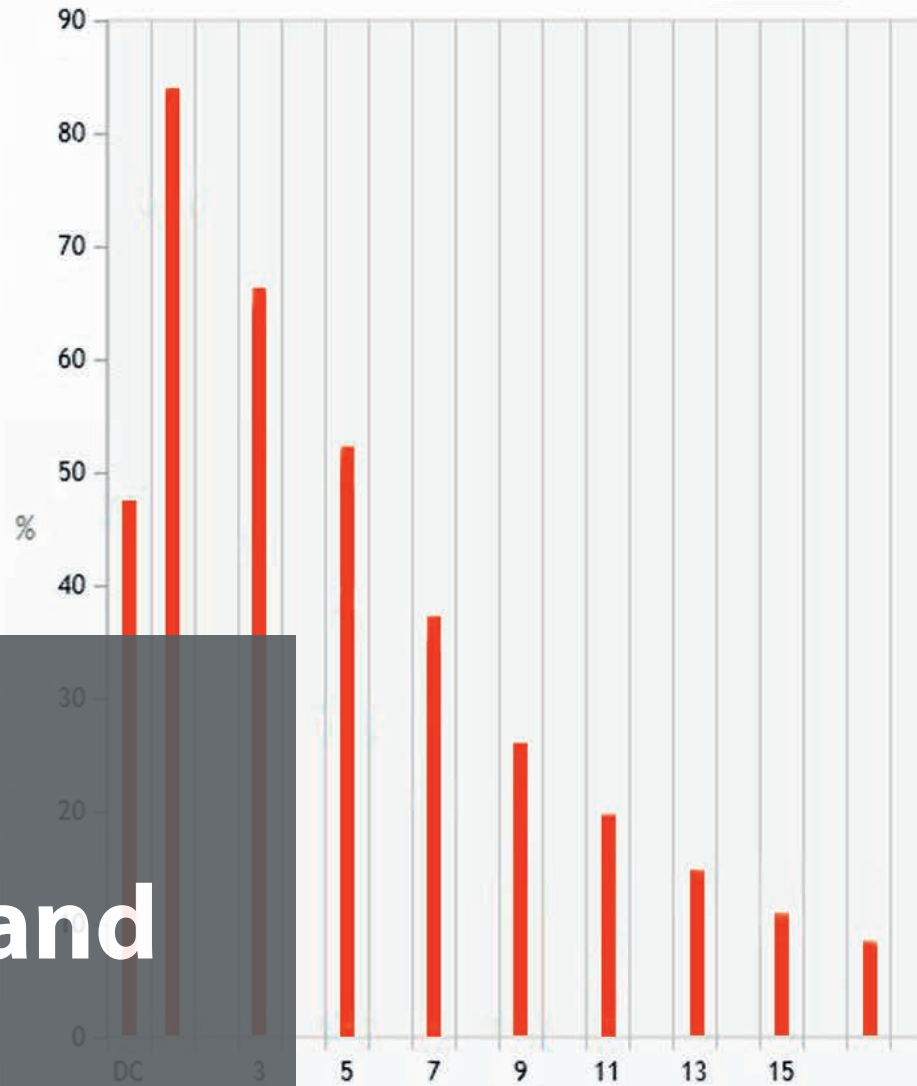
Display

▼ HVG settings

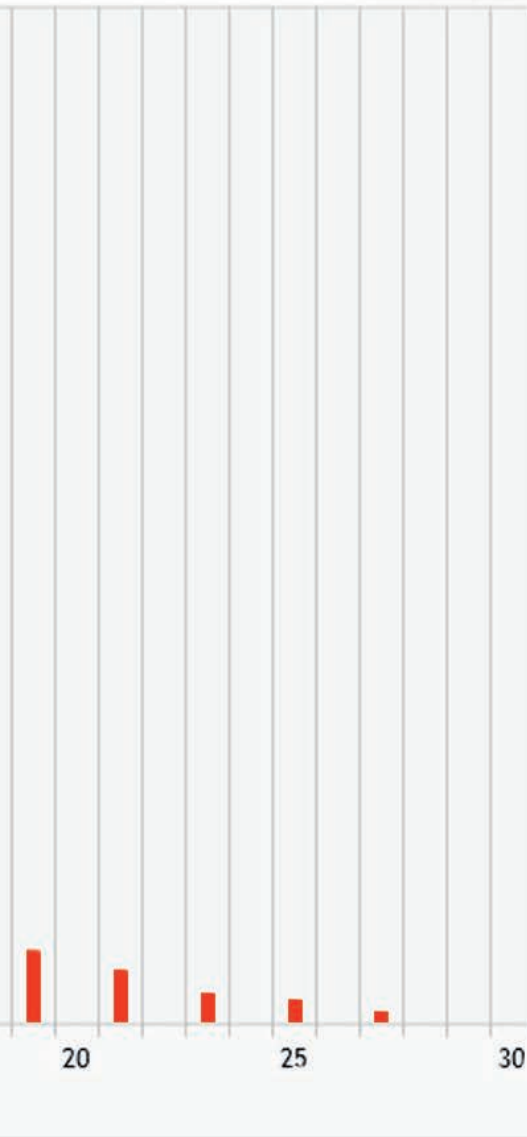
System G

Harmonics

I(harm)



Confidence in
**grounding and
analytical**
information on system
harmonics



Web server

All NGRM700 relays feature communications and allow viewing of information via an integrated web server. This enables information display and setting adjustment on a PC or a mobile device.

Interfaces

The integrated Ethernet interface supports data exchange within the Bender product portfolio (BCOM) and with third-party devices or software packages (Modbus TCP). Configurable analog outputs allow easy exchange of status information or measured values.

Harmonic Analysis of NGR Current and Voltage

- Monitor systems with variable-frequency drives, power conversion, etc.
- Bar-graph spectrum analysis on HMI display (I and V) and comms output
- Ground-fault response to RMS, fundamental, or selectable frequency range; AC and DC ground-fault detection

System Settings


The device can be adapted to the customer-specific application by setting all relevant parameters. The customer can choose between different trip options, i.e. on which signal the device should trip, either on RMS, Fundamental or Harmonic window. After setting all relevant parameters the device will perform a calibration on the installation to achieve the maximum accuracy.

```
HRG System 6.1
-----
1.Vsys(L-L): 400V
2.Frequency: 50Hz
3.I NGR nom: 1A
4.R NGR nom: 268Ω
```

```
Trip Signal 6.5.10
-----
○ RMS
○ Fundamental
○ Harmonics
```

```
Field Calibration 6.7
-----
Start field
calibration?
System will be
shut down!
Stop Start
```

 BENDER FP200

 ON

NGR

SERVICE

TRIPPED

NGR FAULT

GROUND FAULT

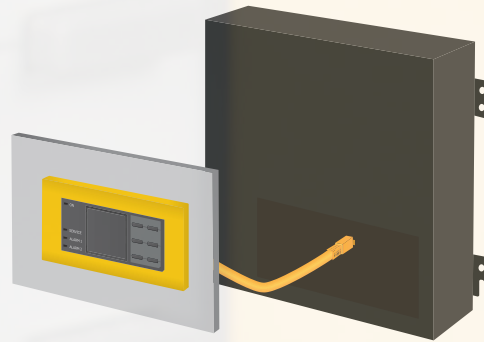
NGR
IN

Choose your
installation method



The **NGRM700** offers two HMI mounting options (FP200-NGRM):

- The FP200-NGRM HMI mounted in the NGRM700 chassis
- The display can be easily detached for mounting in a front panel



The display unit FP200-NGRM is mounted through a door using plastic tabs or the screw mounting hardware. It is connected via a provided RJ45 connection cable to the NGRM700. This installation variant makes it possible to install the display of the device in the control cabinet front without having to order any additional parts.

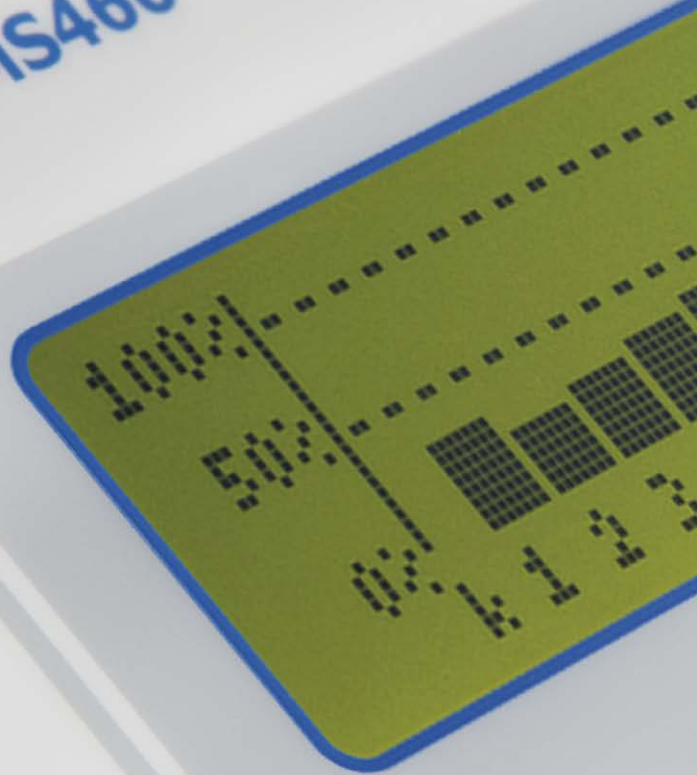
Fast and accurate
fault location
during operation

 **BENDER** RCMS460
LINETRAXX®

2
ALARM

1

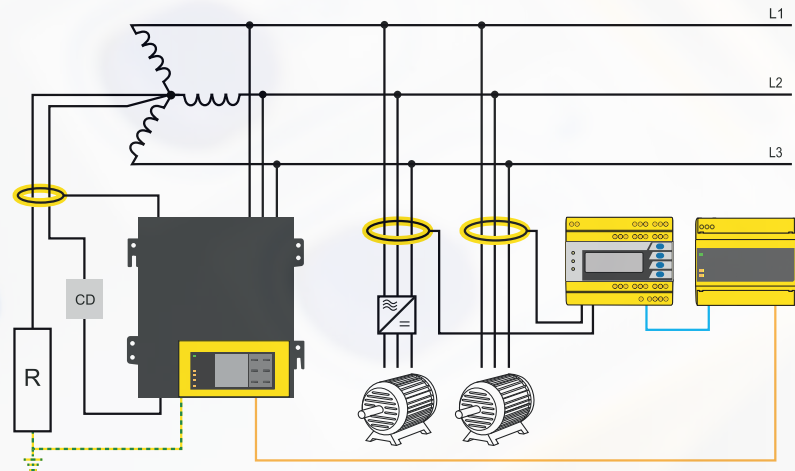
5mA...20A 42...2000Hz
776 V 42...460 Hz



Fast and easy ground-fault location

The NGRM indicates ground-fault occurrence and phase voltages. When a fault occurs it can be used to activate a pulsing ground-fault location system. Combining the NGRM700 with RCMS multi-channel ground-fault relays can provide a quick method of determining the location of the fault.

No matter what the system size add additional RCMS units to provide quick indication of the faulted feeder or loads and have indication of fault location before electricians are sent to repair.



RCMS460 versions provide indication of fault location via communications. RCMS490 versions provide local and remote indication of fault location. Additional single function or hand-held detectors can be used to further refine the search for the fault. The RCMS490 output may also be used to control a local breaker if tripping of the faulted load is preferred.



For even the **harshest** **environments**

Each electrical installation has its own requirements.

Increased climatic and mechanical requirements

The NGRM700 has conformally coated circuits and is suitable for extreme operating conditions from -40 to +70 °C.

Outdoor

The conformal coating protects the device from moisture, corrosion and contamination. The NGRM700 was designed to operate at an altitude where air does not have the same insulation and heat dissipation properties as it does at sea level. Offering unparalleled protection at any location.



Complete NGR packages can be supplied to meet your needs.

Supplier partners around the globe are available to provide system level solutions from the simplest ground-fault relay and NGR in an enclosure to the more sophisticated multi-feeder pulsing ground-fault location systems complete with around 2nd ground-fault protection.





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