

MNO

Application

Online monitoring for oil level in power transformers and reactors.

Main Features



Signal input in mA or resistive



3 setup levels for contacts actuation (high, low and trip levels)



Analog output for measured level



3 independent output relays (NAF)



Digital output RS485 Modbus RTU or DNP 3 protocols



Contact to fault indication (watchdog)



Power Supply 48 to 265 Vdc/Vac



Maximum and minimum levels memory storage

Quality

Built to comply with strict quality standards and the latest generation of electronic components (SMD). Its hardware was projected to endure several harsh working conditions. It can be mounted directly in the transformer/reactor cabinets in substations, offshore platforms and chemical industries.

It meets requirements levels of supportability and reliability according to the standards IEC, DIN, IEEE and ABNT.

Aluminium Enclosure

The aluminium enclosure has a high mechanical resistance and produces a Faraday cage which increases the immunity of the electronic circuit in cases of noise inductions and electric discharges at the equipment.

Easy to install and reduced size: 48 x 96 x 140 mm.

Display

Display with 4 digits of 13,8 mm height and LED with high luminosity.

Simple Configuration

Easy configuration through equipment keyboard or via laptop with support of UseEasy software, which emit graphs and reports as well.

Keys

Easy handling, with intuitive configuration menus. The perfect set to the user.

Sensors

To measure the oil level in transformers with expansion tank, it's recommended to use a magnetic indicator with resistive output. For some applications it's possible to use the pressure transmitter TPE (Electron).



Certificates

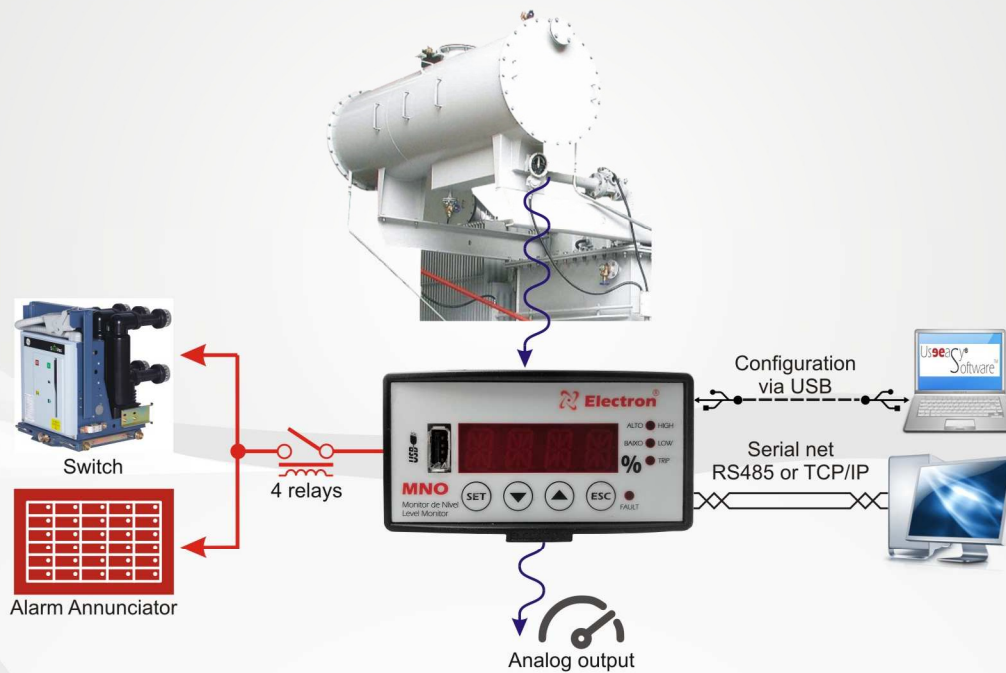
Proven Quality



Type tests realized



Certified Products!



Technical Data

| | |
|--------------------------------------|--|
| Power Supply | 48 – 265 Vdc/Vac 50/60 Hz |
| Power Consumption | < 15 W |
| Operation Temperature | -40 to +85 °C (-40 to +185 °F) |
| Storage Temperature | -50 to +60 °C (-58 to +140 °F) |
| Input for Level Measurement | Float (0 to 300 Ω or 4 to 20 mA) |
| Measurement Range | 0 to 100 % |
| Analog Outputs | 5 configurable outputs with range: 0..1 / 0..5 / 0..10 / 0..20 / 4..20 mA |
| Maximum Error for Input Measurements | 0.5% end of scale |
| Maximum Error for Analog Output | 0.5% end of scale |
| Output Contacts | 4 – Potential Free |
| Maximum Switching Power | 70 W / 250 VA |
| Maximum Switching Tension | 250 Vdc / Vac |
| Maximum Conduction Current | 6 A |
| Communication Protocol | RS485 – Modbus RTU and DNP 3.0 (L2) |
| Auto Baud Rate | 2.400 to 57.600 bps |
| Frontal Port USB | USB Serial – 2.0 |
| Enclosure DIN IEC 61554 | 48 x 96 x 140 mm – Aluminium |
| Fixation | Embedded in Panel Door |
| Protection Degree (NBR IEC 60529) | IP40 (Front side) ; IP30 (Back side) |

Type Tests

- Insulation Voltage (IEC 60255-5): 2kV / 60 Hz / 1 min (to ground);
- Voltage Impulse (IEC 60255-5): 1,2/50 μs / 5 kV / 3 neg e 3 pos / 5 s Interval;
- Electrostatic Discharge (IEC 60255-22-2): Air mode = 8 kV / Contact mode = 6 kV;
- Irradiated electromagnetic field immunity (IEC 61000-4-3): 80 A 1000 MHz / 10 V/m;
- Fast electrical transient immunity (IEC 60255-22-4): Power/Input/Output = 4 kV / Serial port 2 kV;
- Surge immunity (IEC 60255-22-5): Phase/Neutral 1 kV, 5 per polar (±) - phase-ground/neutral-ground 2 kV, 5 per polar (±);
- Conduced electromagnetic perturbations immunity (IEC 61000-4-6): 0,15 a 80 MHz / 10 V/m;
- Climatic test (IEC 60068-21-14): -40 °C → + 85 °C / 72 hours;
- Vibration resistance (IEC 60255-21-1): 3 axis / 10 - 150 Hz / 2G / 160 min/axis;
- Vibration response (IEC 60255-21-1): 3 axis / 0,075 mm @ 10 - 58 Hz / 1G @ 58 - 150 Hz / 8 min / axis