# FACB

## DC Isolation Monitor with Automatic Reset and Real-Time Display


✓ Detects **symmetrical and asymmetrical** insulation faults of the (+) and (-) conductors with respect to ground

✓ **2 independent potential-free** output contacts, with programmable actuation levels and time delays: pre-alarm and alarm

✓ **Pre-alarm:** actuation level of 1 - 8 MΩ and actuation delay of 10-30 seconds

✓ **Alarm**: actuation level of 100 kΩ - 8 MΩ and actuation delay of 10-30 seconds

✓ Alarm with **automatic reset** configurable between 1-60 minutes

✓ **Real-time display** of the installation's insulation level. Measurement range: 1 kΩ - 10 MΩ

✓ For IT systems of **$180V_{DC}$ - $1500V_{DC}$** depending on the model

✓ **Modbus** Communications

## Applications

Monitoring for possible ground faults in IT DC systems isolated from ground:

- Electrical installations isolated from earth
- Photovoltaic installations
- Electric car chargers
- Battery systems
- Systems with power conversion for components with rectifiers and inverters

## Function Features

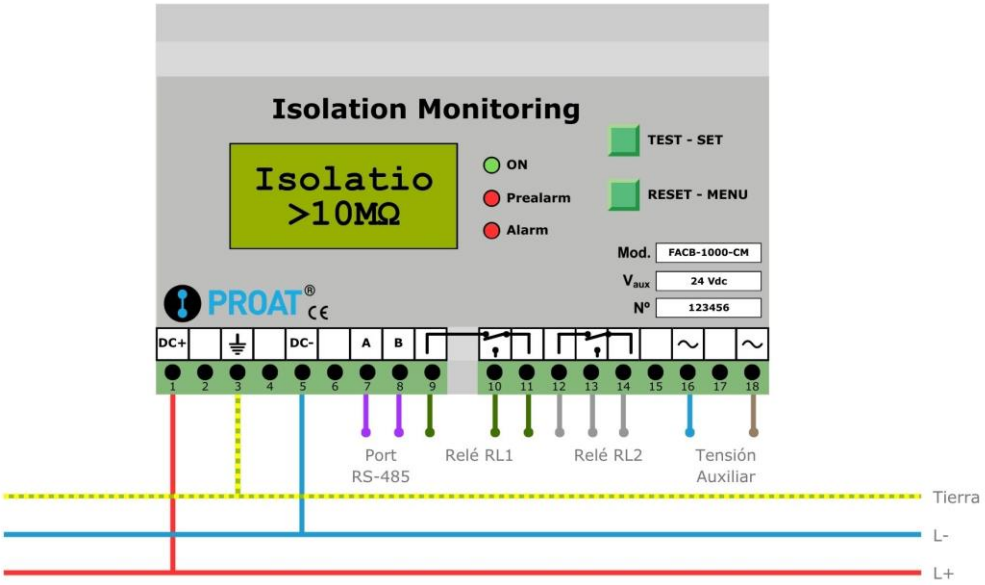
- 2 output relays with independent potential-free changeover contacts, with programmable actuation levels and timings: Pre-alarm and Alarm
- Programming adjustment values using the SET-MENU buttons on the front of the device:
  - Pre-alarm action level
  - Alarm action level
  - Pre-alarm timing
  - Alarm Timing
  - Automatic Reset Time
  - Alarm Memory – Yes/No
  - ID Modbus
  - Language: Spanish/English
- Real-time display of ground resistance measurement
- Front Display 2x8 characters
- **TEST** button to simulate ground fault (+) and (-)
- **RESET** button to restart the equipment and clear the fault
- LEDs to signal Pre-alarm and Alarm faults
- Electrically isolated RS-485 interface with Modbus-RTU protocol depending on the model:
  - Instant isolation measure
  - Relay Status
  - View ModBus map

## Models

| Model | Nominal Voltage $U_N$ | Operating Range | Alarm level | Power Voltage | DIN size | Communications |
|---|---|---|---|---|---|---|
| **FACB-600-CM** | 600 $V_{DC}$ | 180-600 $V_{DC}$ | 100 kΩ - 1 MΩ | 86-264$V_{AC}$ \| 96-370$V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-600-CM-24** | 600 $V_{DC}$ | 180-600 $V_{DC}$ | 100 kΩ - 1 MΩ | 24 $V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-800-CM** | 800 $V_{DC}$ | 240-800 $V_{DC}$ | 100 kΩ - 1 MΩ | 86-264$V_{AC}$ \| 96-370$V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-800-CM-24** | 800 $V_{DC}$ | 240-800 $V_{DC}$ | 100 kΩ - 1 MΩ | 24 $V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-1000-CM** | 1000 $V_{DC}$ | 300-1000 $V_{DC}$ | 100 kΩ - 1 MΩ | 86-264$V_{AC}$ \| 96-370$V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-1000-CM-24** | 1000 $V_{DC}$ | 300-1000 $V_{DC}$ | 100 kΩ - 1 MΩ | 24 $V_{DC}$ | 6M - 106mm | ModBus-RTU |
| **FACB-1500-CM** | 1500 $V_{DC}$ | 450-1500 $V_{DC}$ | 100 kΩ - 1 MΩ | 86-264$V_{AC}$ \| 96-370$V_{DC}$ | 9M - 160mm | ModBus-RTU |
| **FACB-1500-CM-24** | 1500 $V_{DC}$ | 450-1500 $V_{DC}$ | 100 kΩ - 1 MΩ | 24 $V_{DC}$ | 9M - 160mm | ModBus-RTU |

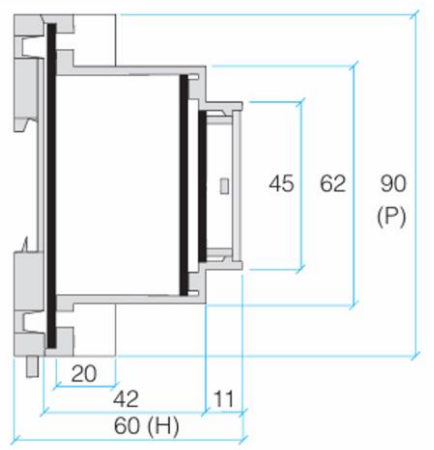
* Other models can be manufactured upon request.

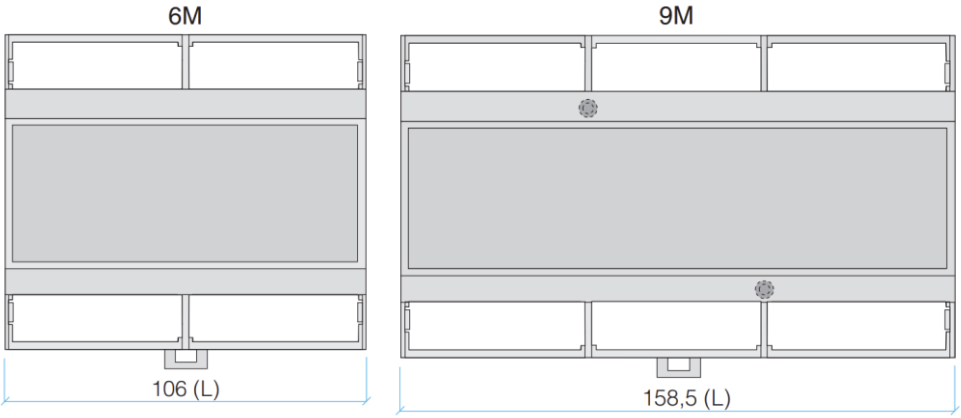
## Wiring



## Constructive Features

- DIN rail mounting
- Front plate terminals
- Class VO self-extinguishing plastic enclosure



## Technical Data

| MODELO | FACB |
|---|---|
| **Voltage Range** | |
| Voltage Range $U_N$ | **0,3*$U_N$ - $U_N$** |
| Auxiliary Voltage $V_{AUX}$ | 86 – 264 $V_{AC}$<br>96 – 307 $V_{DC}$<br>24 $V_{DC}$ |
| Consumption at rest | ≤1W |
| Maximum consumption | ≤12W |
| **Response Values** | |
| Pre-Alarm Level | **1 - 8 MΩ** |
| Alarm Level | **100 kΩ - 1 MΩ** |
| Measurement Range | 1 kΩ - 10 MΩ |
| Measurement error | ±10 % |
| Pre-alarm timing | 10-30 s |
| Alarm Timing | 10-30 s |
| Auto-Reset time | 1-60 min |
| **Factory settings** | |
| Pre-Alarm Level | 1 MΩ |
| Alarm Level | 150 kΩ |
| Pre-alarm timing | 10 seg. |
| Alarm Timing | 5 seg. |
| Auto-Reset time | 1 min. |
| ID Modbus | 1 |
| Alarm Memory | Si |
| **Measuring Circuit** | |
| Max voltage $U_N$ | $U_N$ + 10% |
| Internal resistance R+ | 2,1 MΩ |
| Internal resistance R- | 2,1 MΩ |
| Ground impedance | >750 KΩ |
| Max parasitic capacitance | <5uF |
| Type of faults detected | Symmetrical and Asymmetrical |
| **Front View** | |
| ON | Green led |
| Pre-Alarm | Red led |
| Alarm | Red led |
| Test button | Si |
| Reset button | Si |
| Screen | LCD 2x8 charac. |
| Display | Isolation level |
| **Dielectric Test** | |
| $V_{DC}$ Input – $V_{AUX}$ | 3k $V_{RMS}$ – 1min |
| $V_{DC}$ Input - Output Contacts | 3k $V_{RMS}$ – 1min |
| $V_{AUX}$ – Output Contacts | 3k $V_{RMS}$ – 1min |

| | |
|---|---|
| **Switching Elements** | |
| Number of switching elements | 2 |
| Type of outputs | Switched contact |
| Voltage outputs | Voltage free |
| Max AC Load | 250$V_{AC}$ 2A |
| Max DC Load | 300$V_{DC}$ 0,1A |
| Switching time RL | < 10 ms |
| Number of cycles | 20,000,000 |
| **General Data** | |
| Operation mode | Continually |
| Mounting | DIN rail |
| Connection | Screw M2,5 |
| Screw torque | ≤0,4 Nm |
| Protection grade | IP20 |
| Flammability class | UL94V-0 |
| Weight | 350 gr |
| Operating temperature | -5ºC...+60ºC |
| Storage temperature | -20ºC...+80ºC |
| Relative humidity (without condensation) | <95% |
| Setting values method | Front opening |
| **Standards** | |
| Electrical safety requirements | UNE-EN 61010-1 |
| Electrical safety requirements | UNE-EN 61010-2-0081 |
| Electromagnetic compatibility (EMC) | UNE-EN 61000-6-1 |
| Electromagnetic compatibility (EMC) | UNE-EN 61000-6-3/A1 |
| European Directive | 2006/95/CE |
| European Directive | 2004/108/CE |
| Standard | IEC-61557-8 |
| **Communications** | |
| Interface | RS-485 |
| Protocol | ModBus-RTU |
| Port parameters | 9600,8,0,1 |
| ID ModBus | 1-248 |
| Available Features | 3,4 |
| Operation | Slave |
| Cable length (m) | <1200 |
| Connection | Terminals A/B |