



GFR-31-R



GFR-31-I



GFR-31-IMb

System Overview and Functions

The GFR-31 product family consists of high-reliability automatic phase selection devices equipped with an integrated micro-controller. They ensure continuous power grid redundancy for single-phase loads in a three-phase (L1, L2, L3) environment.

The device monitors the phases in real time and, in the event of a fault (phase loss, critical voltage level), immediately selects the phase line with optimal parameters to continuously feed the output (OUT L).

General Technical Specifications

Parameter	Technical Value / Specification
Input Supply Network	3-phase (3x230V AC nominal, 50 Hz)
Total Operating Voltage Range	85 – 305 V AC (Phase-to-Neutral, P-N)
Voltage Measurement Type	True RMS (TRMS) measurement
Main Switched Output Capacity	1 × 230V AC / max. 16A ($\cos\phi = 1$)
Maximum Output Power	3.6 kW
Auxiliary Contact Rating (I / IMb)	Changeover relay output: 230V AC / max. 3A
Operating Ambient Temperature	-25°C ... +60°C
Mechanical Dimensions & Mounting	DIN EN 43880 standard rail mounting, 3-module width
Degree of Protection	IP20



GFR-31-R



GFR-31-I



GFR-31-IMb



Feature / Function	GFR-31-R (Residential)	GFR-31-I (Industrial)	GFR-31-IMb (Industrial + Modbus)
Part Number	740-6101-630	740-6101-631	740-6101-632
Display & Interface	3 status LEDs (L1, L2, L3)	1.3" OLED display + 4 buttons	1.3" OLED display + 4 buttons
Switching / Delay Time	Fixed 10 seconds	User-configurable (Min. 150 ms – Max. approx. 30 days)	User-configurable (Min. 150 ms – Max. approx. 30 days)
Voltage Limits	Fixed factory window: $\pm 10\%$ (± 23 V)	User-configurable (85 – 305 V AC)	User-configurable (85 – 305 V AC)
Output Drop Logic	Immediate disconnect if all available phase voltages are unsafe.	Immediate disconnect if all available phase voltages are unsafe.	Immediate disconnect if all available phase voltages are unsafe.
Communication	None	None	RS-485 Modbus RTU Interface
Auxiliary Contact (Status)	None	Changeover relay (COM/NC/NO)	Changeover relay (COM/NC/NO)
Connection Technology	Screw terminal blocks	Pluggable spring terminal blocks	Pluggable spring terminal blocks

Detailed Operational and Protection Logic

Residential Model (GFR-31-R)

- ▶ Voltage Tolerance: Fixed factory configuration, nominal voltage $\pm 10\%$ (± 23 V).
- ▶ Switching Delay: Fixed 10 seconds.
- ▶ Protective Disconnect: If all available incoming phase voltages (L1, L2, L3) fall outside the safe operating range, the device immediately disconnects the output for safety.

Industrial Models (GFR-31-I & GFR-31-IMb)

- ▶ Fully Configurable Voltage Limits: Users can freely adjust minimum, maximum, and critical lower/upper tripping voltage levels across the entire operating voltage range (85 – 305 V AC) via the menu system.
- ▶ User-defined Delays: Switching delays are fully flexible. The minimum response time is 150 ms, while the maximum configurable delay can be set up to approximately 30 days for specialized industrial processes.
- ▶ Protective Disconnect: If all available incoming phase voltages fall into the configured unsafe range, the output is disconnected immediately to protect connected equipment.

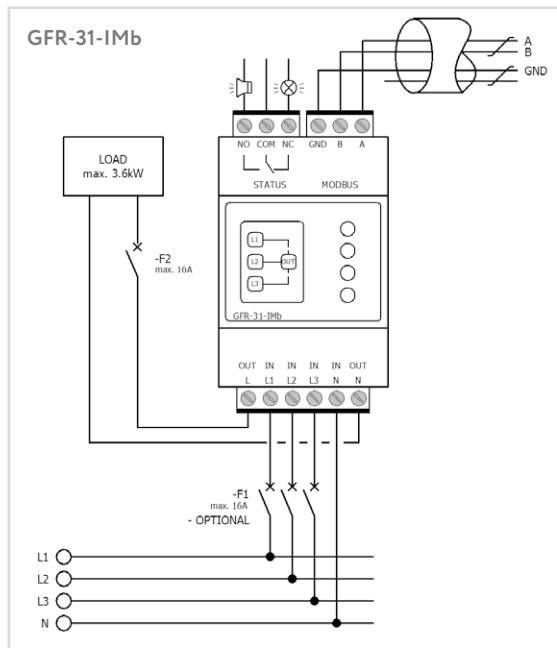
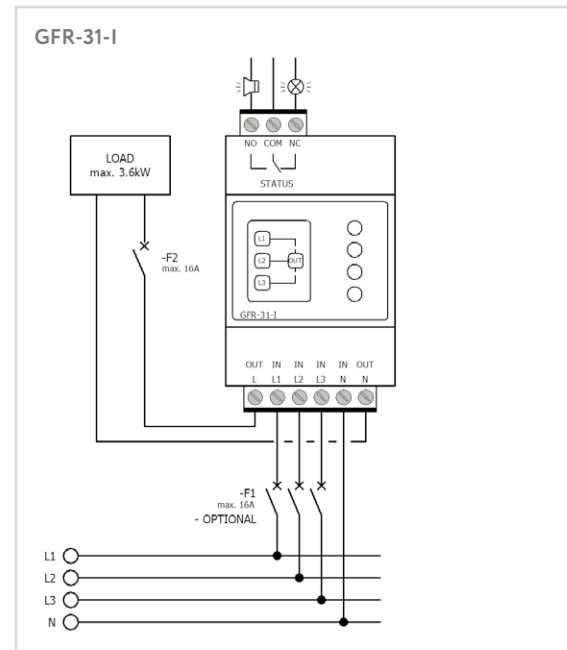
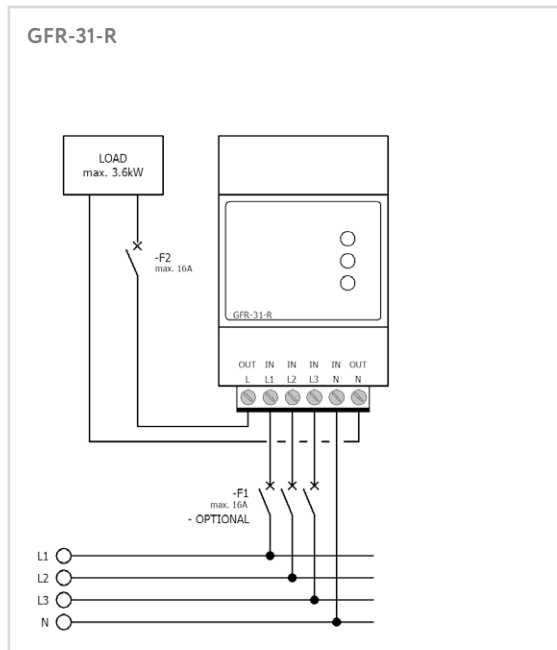
Modbus Communication (GFR-31-IMb Model Only)

Designed for integration into Building Management Systems (BMS) and SCADA networks:

- ▶ Baud Rate: Configurable between 1200 bps and 250000 bps.
- ▶ Transmission Format: 8 data bits, 1 or 2 stop bits, None / Even / Odd parity.



Installation and Electrical Wiring Guidelines



Safety Regulations & Safety Warning!

Installation and electrical connection of these devices must be performed strictly by qualified and licensed electricians! Prior to starting installation work, the entire distribution panel and incoming phase lines must be completely de-energized!

Applicable Standards and Compliance

The design and manufacturing of these devices comply with the following European and international standards:

- ▶ EN 50160: Voltage characteristics of electricity supplied by public electricity networks.
- ▶ EN 60947-6-1: Low-voltage switchgear and controlgear - Automatic transfer switching equipment (ATSE).
- ▶ EN 61000-6-2 / EN 61000-6-3: Electromagnetic compatibility (EMC).
- ▶ EN 60529: Degrees of protection provided by enclosures (IP20).