

GRM-H Series Compact Power Controllers

GRM-H Series Overview



Part No. GRM-H-25-48-AN-0-1

The Gefran GRM-H series provides ultra-compact single-phase power controllers with current ratings from 10A to 75A and load voltages up to 480 VAC in an extremely compact DIN rail or panel-mount package. These solid-state controllers feature advanced current limiting and continuous load monitoring with special algorithms that prevent startup current surges (which can reach up to 15 times rated current on cold loads like infrared lamps or silicon carbide heating elements) and maintain stable energy delivery by compensating for voltage fluctuations, temperature variations, and heating element aging. Control options include analog input (0–5V, 0–10V, 0–20 mA, 4–20 mA, potentiometer, PWM) or Modbus RTU digital communication, with feedback algorithms in V, I, V^2 , I^2 , P, and Z to ensure consistent power delivery. Multiple firing modes are available including ZC (Zero-crossing), phase angle control, ON/OFF, optimized/fixed cycle time, half-single-cycle, and configurable softstart ramps for demanding applications. The thermal design guarantees continuous rated current delivery at 40 °C (104 °F) ambient temperature through high-efficiency heatsinks. Configuration is accomplished via smartphone app using NFC technology or PC software (GF_eXpress) via USB cable or using RS-485 on supported models with three configurable alarm outputs (two PNP, one dry contact) for comprehensive load diagnostics including partial/total heater break, line faults, and over-temperature detection. The specified models include 10A, 25A, 50A, and 75A ratings at 480V with analog control, both standard and Modbus RTU (MR models) versions, plus NFC dongle and USB programming cable accessories.

Features



Part No. GRM-H-25-48-AN-MR-1

- Current Ratings & Voltage: 10A, 25A, 50A, 75A models rated for 480 VAC (60–530 VAC working range), all in ultra-compact dimensions (137.8mm × 116.5mm × varying widths)
- Analog Control Input: Configurable analog command input supporting 0–10V, 0–5V, 0–20 mA, 4–20 mA, potentiometer (1 kΩ – 47 kΩ with +5V supply), and PWM (1–100 Hz); input accuracy ±1% F.S. ±1 scale point at 25 °C (77 °F)
- Power Supply: 12–30 VDC (I_{max} 20 mA @ 24 VDC) for standard models; 18–30 VDC (I_{max} 35 mA @ 24 VDC) for MR (Modbus RTU) models; cage clamp terminals for power connections
- Control Modes: Zero-crossing (ZC), Burst Firing with optimized cycle time (BF), Fixed Cycle Time (FCT, 1–200 sec), Half-Single-Cycle (HSC), Phase Angle (PA) with configurable softstart ramps; delay triggering 0–90° for inductive loads
- Advanced Load Protection: Continuous current monitoring with current limiting algorithms, feedback control in V, I, V^2 , I^2 , P, Z for stable energy delivery compensating line voltage fluctuations and load aging, startup inrush current management
- Diagnostics & Alarms: Three alarm outputs - two PNP outputs (normally off, configurable), one dry contact N.O. (max 30 VDC 150 mA); configurable alarms for partial/total heater break (HB), line fault, thermal protection, SCR short circuit
- Configuration Options: NFC smartphone app (Android/iOS) with NFC dongle (GRM-H-NFC accessory), or PC software via USB-TTL cable (GRM-H-USB-CBL accessory); supports parameter duplication and sharing
- Environmental & Mounting: Operating temperature 0–80 °C (32–176 °F) with derating curves, IP20 protection rating, DIN EN50022 rail or panel screw mounting, minimum 20mm horizontal spacing between units, vertical orientation required (max 10° inclination)



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GRM-H Series Compact Power Controllers Selection								
Model	Rated Current	Communication	Network	Power Voltage	Power Current	Weight (lb)	Drawing Link	Price
GRM-H-10-48-AN-0-1	10A	None	Standalone	12–30 VDC	20 mA	1.03	PDF	\$295.00
GRM-H-25-48-AN-0-1	25A					1.03	PDF	\$305.00
GRM-H-50-48-AN-0-1	50A					1.04	PDF	\$345.00
GRM-H-75-48-AN-0-1	75A					1.67	PDF	\$385.00
GRM-H-10-48-AN-MR-1	10A	Modbus RTU	Up to 31 units	18–30 VDC	35 mA	1.06	PDF	\$390.00
GRM-H-25-48-AN-MR-1	25A					1.07	PDF	\$395.00
GRM-H-50-48-AN-MR-1	50A					1.07	PDF	\$445.00
GRM-H-75-48-AN-MR-1	75A					1.69	PDF	\$475.00

GRM-H Series Compact Power Controllers General Specifications	
Electrical	
Rated Voltage	480 VAC
Voltage Drop @ Rated Current	≤1.2V RMS
Leakage Current	<3 mA max
Surge Protection	1,200 Vp
Short Circuit Rating	5 kA
Minimum Load Current	150 mA
Critical dV/dt	1,000 V/μs
Line Frequency	50/60 Hz (auto-detect)
Control Input	
Control Type	Analog input
Input Options	0–5V, 0–10V, 0–20 mA, 4–20 mA, Potentiometer (1–47 kΩ), PWM (1–100 Hz)
Input Accuracy	±1% F.S. ±1 scale point @ 25 °C [77 °F]
Sampling Time	10 ms
Control Modes	
Firing Modes	ZC (Zero-crossing), BF (Burst Firing), FCT (Fixed Cycle Time 1-200s), HSC (Half-Single-Cycle), PA (Phase Angle)
Feedback Options	Voltage (V, V ²), Current (I, I ²), Power (P), Impedance (Z)
Current Limiting	Yes - monitors and limits inrush current
Softstart Ramps	Configurable for all firing modes
Diagnostics	
Status LED	Multi-color RGB (Green/Red/Blue)
Alarm Outputs	2 outputs: PNP (Us - 0.7V, 15 mA) + Dry contact N.O. (30 VDC / 150 mA)
HB Alarm (Heater Break)	Partial/total detection, up to 8 parallel loads
Thermal Protection	Auto shutdown on over-temperature
SCR Fault Detection	Open/short circuit detection
Line Fault Detection	No-line voltage detection
Current/Voltage Monitoring	Real-time, ±2% F.S. @ 25 °C [77 °F]

GRM-H Series Compact Power Controllers

GRM-H Series Compact Power Controllers General Specifications Continued

<i>Environmental</i>	
Operating Temperature	0 to 80 °C [32 to 176 °F] - see derating curves in manufacturer's information
Max Ambient @ Full Current	40 °C [104 °F]
Storage Temperature	-20 to +85 °C [-4 to +185 °F]
Humidity	90% non-condensing
Protection Rating	IP20
<i>Installation</i>	
Mounting	35mm DIN rail or panel screw mount
Orientation Required	Vertical (max 10° from vertical)
Min Horizontal Spacing	20mm between units
Min Vertical Spacing	50mm between units
Terminal Type	Cage clamp (tool-free or screwdriver)
Tightening Torque	2.5–3.0 N·m (22–26.6 lb-in)
Power Terminal Stripping	13mm
Signal Terminal Stripping	8mm
<i>Configuration</i>	
NFC Support	Yes
NFC App	Gefran NFC - free (Android/iOS)
USB Configuration	Via GRM-H-USB-CBL + GF_eXpress software or via RS485 on supported models

GRM-H Series Compact Power Controllers Resources

<i>Manufacturer Datasheet</i>	<i>Manufacturer Quick Start Guide</i>	<i>Manufacturer Configuration and Programming Manual</i>
PDF	PDF	PDF

For additional specifications and details see Manufacturer's information.

Power Terminal Wire Sizing by Current Rating

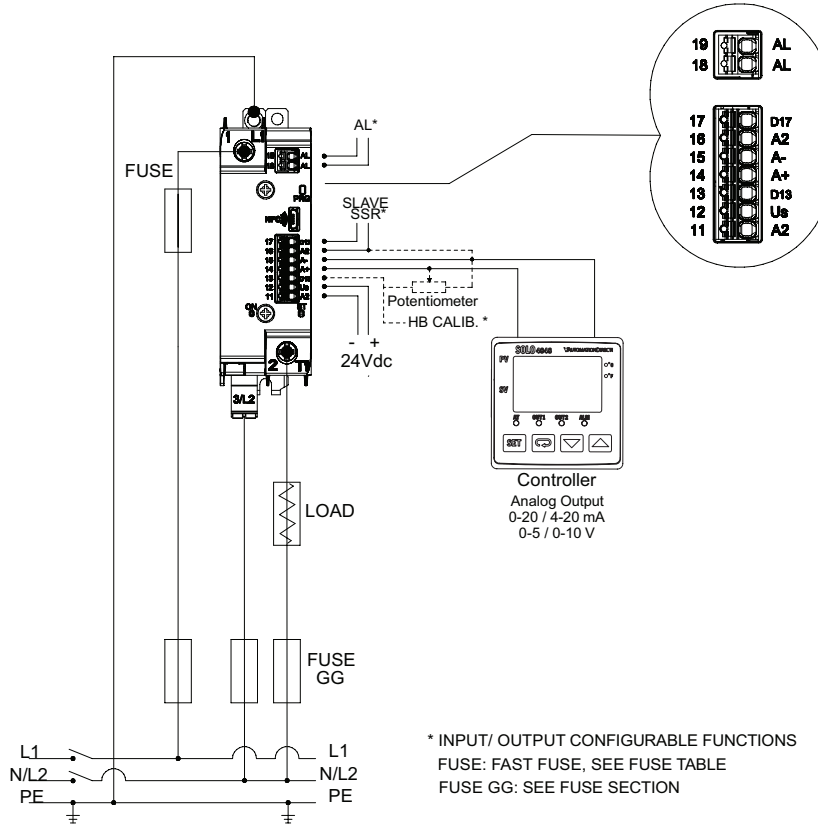
<i>Current Rating</i>	<i>1 Conductor (mm²)</i>	<i>1 Conductor (AWG)</i>	<i>2 Conductors (mm²)</i>	<i>2 Conductors (AWG)</i>
10A	2.5	14	1.5	17
25A	2.5	14	1.5	17
50A	10	8	6	10
75A	25	4	16	6

Notes:

- Tightening Torque: 2.5–3.0 N·m (22–26.6 lb-in)
- Stripping Length: 13mm
- Conductor Type: 60/75°C (140/167°F) copper (CU)
- Terminal: Cage clamp (accepts rigid, flexible, or ferrule)

GRM-H Series Compact Power Controllers

Analog Wiring

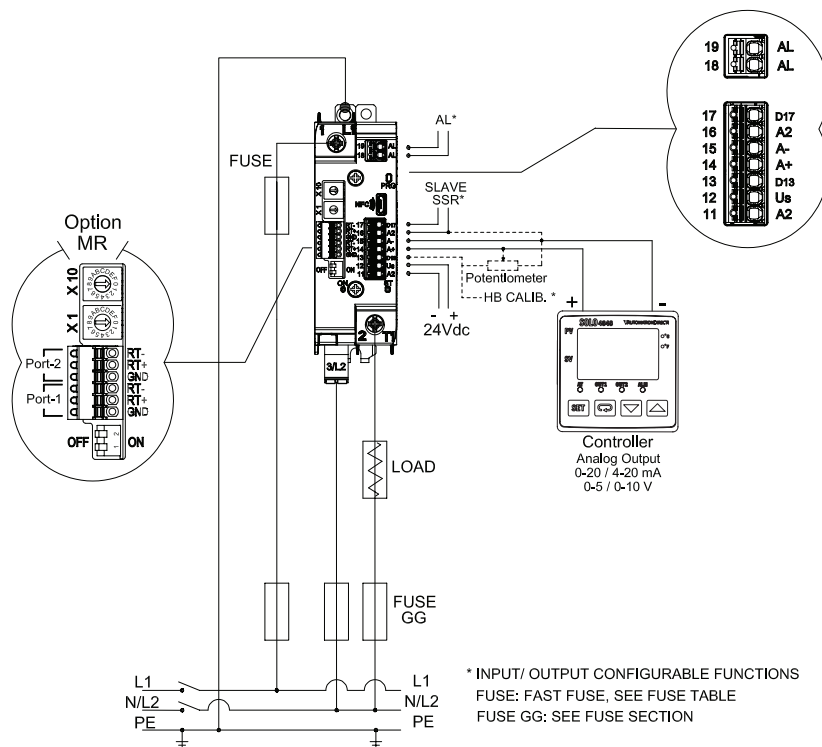


CONNECTION FOR SINGLE PHASE LOAD

Power terminals		
Rif.	Description	Note
1/L1	Line Connection	
2/T1	Load Connection	
3/L2	Line voltage reference connection	
Power supply and signal connector (analog input)		
11/A2-	GND (-) with 24Vdc power supply	
12/Us	Signal (+) with 24Vdc power supply	GRM-H power supply: Range 12 - 30 Vdc, I _{max} 20mA @ 24Vdc
13/D13	Potentiometer power supply output (+ 5Vdc) / Auxiliary digital input 1 / PWM control input	Potentiometer output voltage: 5V DC, I _{out} max = 10mA Digital input: 5-30V max 3 mA PWM control input: 5-30V max 3 mA, Frequency range: (1, ..., 100 Hz), Resolution max 1% (0.1ms)
14/A+	Analogue differential command input	
15/A-		
16/A2-	GND alarm output	Same as 11/A2- connection
17/D17	Master-Slave output / Alarm output / Digital input auxiliary 2	Master-Slave output: Output voltage: Us - 0.7Vdc, I _{out} max = 15mA Alarm output: PNP output normally not active (Configurable as normally active) (Us*1,14) - 0.7Vdc (ver. AA), I _{out} max =15mA Digital input: 5-30V, max 3mA
18/AL	Alarm output	Dry contact N.O. Maximum current: 150mA Maximum voltage = 30 Vdc Closed contact impedance <1 Ω Open contact impedance > 1 MΩ
19/AL		

GRM-H Series Compact Power Controllers

Analog with Modbus Wiring



CONNECTION FOR SINGLE PHASE LOAD

Power terminals		
Ref.	Description	Notes
1/L1	Line Connection	
2/T1	Load Connection	
3/L2	Line voltage reference connection	
Power supply and AN version signal connector (Analog Input)		
11/A2-	GND (-) with 24Vdc power supply	
12/Us	Signal (+) 24Vdc power supply	GRM-H power supply with MR option: Range 18 -30 Vdc, I _{max} 35mA @ 24Vdc
13/D13	Potentiometer power supply output (+ 5Vdc) / Auxiliary digital input 1 / PWM control input	Potentiometer output voltage: 5V DC, I _{out} max = 10mA Digital input: 5-30V max 3 mA PWM control input: 5-30V max 3 mA, Frequency range: (1, ..., 100 Hz), Resolution max 1% (0.1ms)
14/A+	Analogue differential command input	
15/A-		
16/A2-	GND alarm output	Same as 11/A2 connection
17/D17	Master-Slave output / Alarm output / Digital input auxiliary 2	Master-Slave output: Output voltage: Us - 0.7Vdc, I _{out} max = 15mA Alarm output: PNP output normally not active (Configurable as normally active) Output voltage: Us – 0.7V DC , I _{out} max =15mA Digital input: 5-30V, max 3mA
18/AL	Alarm output	Dry contact N.O. Maximum current: 150mA Maximum voltage = 30 Vdc Closed contact impedance <1 Ω Open contact impedance> 1 MΩ
19/AL		
RS-485 fieldbus signal connector (only with MR option)		
RT-	Tx/Rx- (Data transmission B-)	Port-1 and Port-2 interconnected for multislave chain connections * GND signal connection between slaves is recommended
RT+	Tx/Rx+ (Data transmission A+)	
GND *	Serial line GND reference signal	
Rotary switch Modbus node address configuration (only with MR option)		
X10	Tens	Node address between 01 to 99
X1	Unit	
RS485 termination line configuration (only with MR option)		
OFF	Serial line termination not active	It is recommended to enable the termination for the last device connected to the serial line. ATTENTION: Both switch must be configured in the same position
ON	Serial line termination active	

GRM-H Series Compact Power Controller Accessories



Part No. **GRM-H-USB-CBL**



Part No. **GRM-H-NFC**

The Gefran NFC Dongle enables contactless configuration and diagnostics of GRM-H power controllers via smartphone app using Near Field Communication technology. The dongle plugs into the micro-USB port on the GRM-H front panel and acts as an NFC antenna (not device memory), allowing wireless data exchange when a smartphone with the free Gefran NFC app (Android/iOS) is placed within a few millimeters of the dongle. Configuration can be performed with the GRM-H powered or unpowered, as the smartphone supplies power to the internal memory during NFC connection, and the device automatically validates transmitted data before loading new recipes to prevent corruption. The USB-TTL programming cable provides an alternative configuration method via PC using GF_eXpress software, featuring USB to micro-USB connectors with 1.8-meter (5.9 ft) cable length and TTL serial communication (non-isolated).

Features

- NFC Dongle with lanyard; removable or can remain inserted after configuration
- NFC Functionality: Enables wireless read/write of configuration recipes, model information, and diagnostic data (energy meters, current peaks, over-temperature events); supports recipe duplication and sharing across multiple devices; works with free Gefran NFC app (Android/iOS)
- USB Programming Cable: 1.8-meter (5.9ft) cable with USB to micro-USB connectors for PC configuration via GF_eXpress software; TTL serial 3V non-isolated communication; powers the GRM-H during programming; used for initial setup and advanced configuration
- Configuration Capability: Both NFC and USB methods support powered or unpowered device configuration; NFC uses smartphone power to access internal memory; automatic data validation ensures recipe integrity before loading; invalid transmissions are rejected to protect device operation



Manual



Scan or click the above QR code to be taken to the GRM-H Series Configuration and Programming Manual

GRM-H Series Compact Power Controller Accessories			
Model	Description	Weight (lb)	Price
<u>GRM-H-USB-CBL</u>	Gefran configuration cable, USB to micro-USB, 5.9ft/1.8m cable length. For use with Gefran GRM-H series power controllers.	0.13	\$197.00
<u>GRM-H-NFC</u>	Gefran NFC dongle, microB-USB. For use with Gefran GRM-H series power controllers.	0.06	\$17.50
<u>GF-EXPRESS-SW</u>	Gefran Windows configuration and monitoring software, free download only. For use with Gefran GRM-H series power controllers. Requires GRM-H-USB-CBL configuration cable or USB-485M USB to RS-485 communication adapter.	N/A	Free Download