

Main applications

- Extrusion, injection, blow moulding, thermoforming of plastics
- Vulcanization of rubber
- Synthetic fibre production and polymerisation
- Packing and packaging
- Dryers for ceramics and building elements
- Industrial electric ovens
- Food processing plants
- Chemical and pharmaceutical industry



Main features

- Ultra-compact dimensions from 15A to 120A
- Switching at zero voltage changeover
- Input command from DC/AC logic signal with push-in connectors; signalling leds
- Cage clamps for power cables
- Load voltage 480V, 600V AC
- Thermal alarm option with led and alarm output
- Interrupted load option with led and alarm output
- Internal overvoltage protection

PROFILE

Correct management of electrical heating elements for industrial heating applications requires robust, safe, interference-free, fast and diagnostically capable static contactors.

The range of static contactors GRS meets all these requirements, with current ratings from 15 to 120 Amperes and voltages up to 600 V AC, with extremely compact size in every single current level.

It's necessary use the relay with a proper heat sink (see section accessory). Accessories like heat sink, fuses and fans are available.

GRS COMMAND SIGNAL CONNECTION

The GRS series can be controlled by DC and AC logical signals managed through push-in connectors for a faster and easier connection, even without tools.

The ON / OFF status of the static device is always displayed by a green LED on the front panel, for an immediate view of its operation.

POWER CONNECTIONS

Both the line voltage terminal available on the upper part of the device and the load terminal on the lower part are of the "cage" type, which offers the best and safest seal even for cables of different cross-sections, whether mounted with a cable lug or simply stripped.

DIAGNOSTICS AND ALARMS

It is increasingly vital for operators and maintainers to recognize possible anomalies in the system immediately and solve them quickly in order to ensure the efficiency and profitability of machinery and plants. The GRS series offers a series of diagnostic information associated with a physical alarm output with voltage-free or PNP-type isolated contact.

The thermal alarm is triggered if heat dissipation exceeds a critical threshold, signalling it with a yellow led on the front panel, interrupting the power supply and triggering the alarm output (NO or NC). This function is always present for current levels from 50 A up to 120 A, and is available as an option for other current levels.

The absence of current on the load (for models with DC control) is indicated by a red led on the front panel and by the activation of the alarm output, as well as by the absence of line voltage. Alarm output status is memorized: in the presence of a 24 V DC auxiliary power supply, the alarm will be memorized even in the event of an OFF command.

The alarm is reset when normal operating conditions are restored, or when the 24 V DC auxiliary power supply is switched off and on again.

TECHNICAL DATA

Main FEATURES

Category of use: AC51

Rated working voltage

- 480Vac (max. range 24...530Vac)

- 600Vac (max range 24 ... 660Vac)

Rated frequency: 50/60Hz

Non-repetitive voltage:

- 1200Vp for model with rated voltage 480Vac

- 1400Vp for model with rated voltage 600Vac

Switching voltage for zero: < 20V

Activation time: = 1/2 cycle

Deactivation time: = 1/2 cycle

Potential drop at rated current:

= < 1,2Vrms
Power factor = 1

CONTROL INPUT

- DC INPUT (Type "D"):
Max. input: < 9mA @32V
Max. reverse voltage: 36Vdc
Control voltage: 6...32Vdc
Activation voltage: > 5,1Vdc
Deactivation voltage: < 3Vdc

- AC INPUT (Type "A"):
Control voltage: 20...260 Vac/Vdc
INSTALL FUSE (3A MAX) ON THE CONTROL INPUT CIRCUIT
Activation voltage: > 15Vac/Vdc
Deactivation voltage: < 6Vac/Vdc
Current draw: ≤ 8 mAac/dc @ 260 Vac/Vdc

ALARM OUTPUT OPTION

(TYPE "D" INPUT VERSION)

A load or line failure or an overtemperature alarm commands:

- Options 1/2/5: one voltage-free contact (solid state N.C or N.O.), max. properties:
- N.O. version 30V-150mA conduction resistance: ≤ 1Ω
- N.C. version 30V-50mA conduction resistance: ≤ 15Ω
- Option 3: two normally inactive (parallelable) PNP digital outputs, one for load failure and the other for overtemperature (properties: I_{max} = 150mA V_{out} = + V DC power supply -1V).

Maximum interrupted load alarm trip delay < 400ms
Maximum cable length between GRS-H and load for correct load fault diagnostics < 25m

ALARM OUTPUT OPTION

(TYPE "A" INPUT VERSION)

The over-temperature alarm commands a voltage-free contact (solid state N.C.), max. properties:
30V-50mA conduction resistance: ≤ 15 Ω

OUTPUTS

GRS 15

Rated device current with appropriate heatsink: 15 A@40°C in continuous service
Non-repetitive overcurrent t=20 ms: 620A
I_t for blowout: ≤ 1800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 25

Rated device current with appropriate heatsink: 25 A@40°C in continuous service
Non-repetitive overcurrent t=20 ms:

620A
I_t for blowout: ≤ 1800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 30

Rated device current with appropriate heatsink: 30 A@40°C in continuous service
Non-repetitive overcurrent t=20 ms: 620A
I_t for blowout: ≤ 1800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 40

Rated device current with appropriate heatsink: 40 A@40°C in continuous service
Non-repetitive overcurrent t=20 ms: 620A
I_t for blowout: ≤ 1800A2s
dV/dt critical with output deactivated: 1000 V/μs

GRS 50

Rated device current with appropriate heatsink: 50 A@ 40°C in continuous service
Non-repetitive overcurrent t=20 ms: 1600A
I_t for blowout: ≤ 12800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 60

Rated device current with appropriate heatsink: 60 A@ 40°C in continuous service
Non-repetitive overcurrent t=20 ms: 1600A
I_t for blowout: ≤ 12800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 75

Rated device current with appropriate heatsink: 75 A@ 40°C in continuous service
Non-repetitive overcurrent t=20 ms: 1600A
I_t for blowout: ≤ 12800A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 90

Rated device current with appropriate heatsink: 90A@40°C in continuous service
Non-repetitive overcurrent t=20 ms: 1500A
I_t for blowout: ≤ 11250A2s
dV/dt critical with output deactivated: 1000V/μs

GRS 120

Rated device current with appropriate heatsink: 120A@

40°C in continuous service
Non-repetitive overcurrent t=20 ms: 1500A
I_t for blowout: ≤ 11250A2s
dV/dt critical with output deactivated: 1000V/μs

THERMAL PROTECTION

(Optional, always present in GRS with current size ≥ 50A):

The temperature of the SCR module is constantly monitored inside the device. When the maximum temperature threshold of the internal SCR is exceeded, current conduction to the load is interrupted and the yellow thermal protection LED comes on to signal the condition.

THERMAL CHARACTERISTICS

GRS 15

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,6 °C/W

GRS 25

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,6 °C/W

GRS 30

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,65 °C/W

GRS 40

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,6 °C/W

GRS 50

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,35 °C/W

GRS 60

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,35 °C/W

GRS 75

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,3 °C/W

GRS 90

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,3 °C/W

GRS 120

Junction temp: ≤ 125°C
R_{th} junction/case: ≤ 0,3 °C/W

CALCULATION OF THE POWER DISSIPATED BY THE SOLID STATE RELAY

Single-phase static relay
Pd = 1.4 * I_{RMS} [W] (for GRS)
I_{RMS} = single-phase load current

CALCULATION OF THE HEATSINK'S THERMAL RESISTANCE

R_{th} = (90°C - T.amb. max) / Pd with Pd = power dissipation
Max amb. T.= maximum air temperature

in the electrical cabinet.
Use a heatsink with lower than calculated heat resistance (Rth).

Isolation

Rated isolation voltage input/output:
4000VACrms 1min

Ambient conditions

- **Working temperature:**
from 0 to 80°C
- **Max. relative humidity:**
90% non-condensing at 40°C
- **Max. installation altitude:**
6600ft above sea level
- **Pollution level :** 2
- **Storage temperature:**
-20..+85°C

Installation notes

Use the extra-rapid fuse shown in the catalogue according to the connection example supplied.
Applications with static units must also include a safety circuit breaker for disconnecting the power line from the load.
Protect the SSR from over-temperature using an appropriate heatsink (accessory). The heatsink must be appropriately scaled for the ambient temperature and load current (refer to technical documentation).
-Mounting procedure on the heatsink:

The module-heatsink contact surface must have a maximum flatness error of 0.05mm and a maximum roughness of 0.02mm. The anchorage holes on the heatsink must be threaded and countersunk. Caution: Spread 1 gram of heat-conducting silicone paste (DOW CORNING 340 HeatSink is recommended) on the dissipative metal surface of the module. The surfaces must be clean, and there must be no impurities in the heat-conducting paste.
Tighten the two fixing screws alternately until a torque of 0.60 Nm / 5.3 lb.in for M4 screws and 0.75 Nm / 6.6 lb.in for M5 screws is reached. Wait 30 minutes so that the excess paste can drain away. Tighten the two fixing screws alternately until a torque of 1.2 Nm / 10.6 lb.in for M4 screws and 1.5 Nm / 13.3 lb.in for M5 screws is reached. It is recommended that you check the soundness of the execution by disassembling a sample module to check that there are no air bubbles under the copper plate.
Mount the device vertically (maximum 10° inclination from the vertical axis)

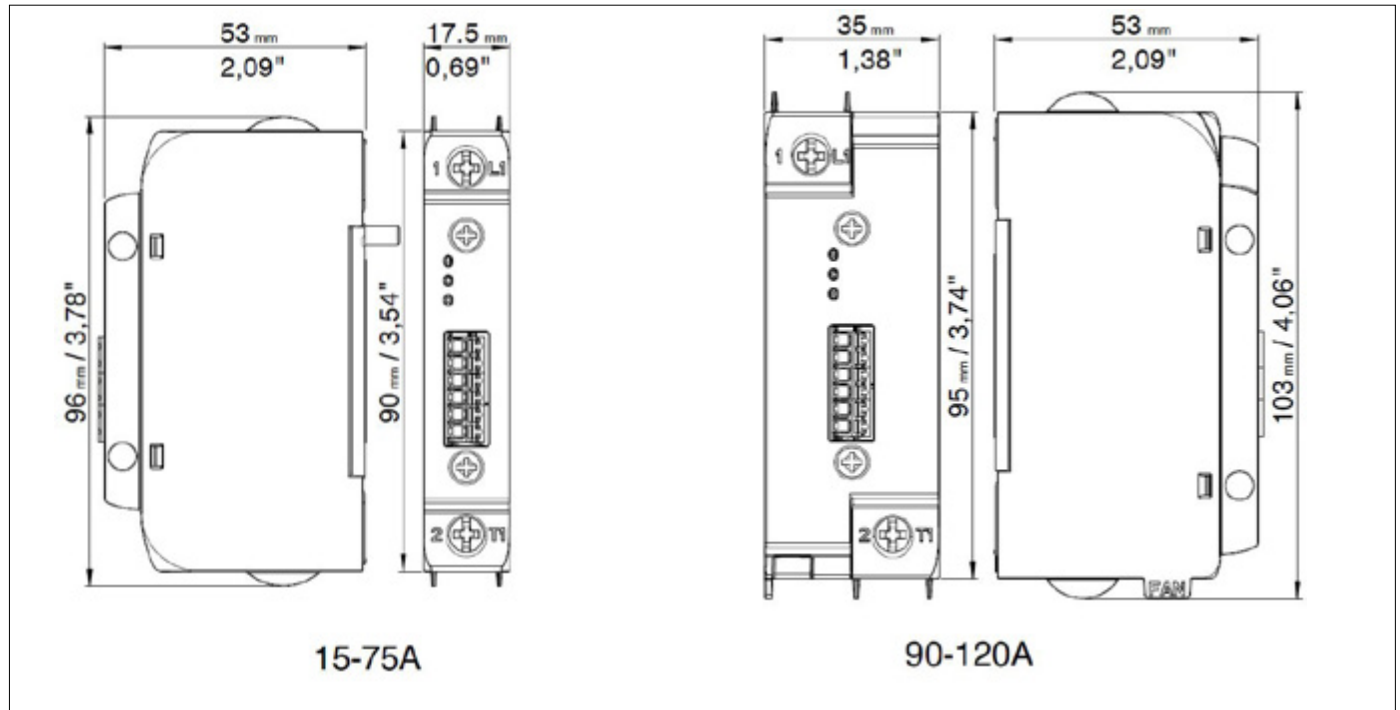
- Vertical distance between a device and the panel wall >100mm
- Horizontal distance between a device and the panel wall at least 20mm

- Vertical distance between one device and another at least 300mm.
- Horizontal distance between one device and another at least 20mm. Make sure that the cable ducts do not reduce these distances; in this case, mount the units overhanging the panel, so that the air can flow vertically on the heat sink without hindrance.

Limits of use

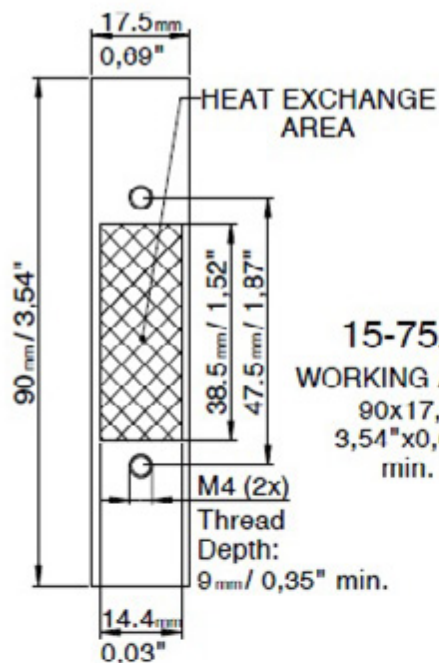
- Ambient temperature limits.
- Need for air exchange with the outside or an air conditioner to transfer the dissipated power to the outside of the panel.
- Installation limits (distances between devices to ensure dissipation under natural convection conditions)
- Maximum voltage limits and derivative of the transients present on the line, for which the static unit provides internal protection devices (depending on the models).
- Presence of leakage current < 3mA (max. value with nominal voltage and junction temperature of 125°C).

DIMENSIONS AND MOUNTING MEASUREMENTS

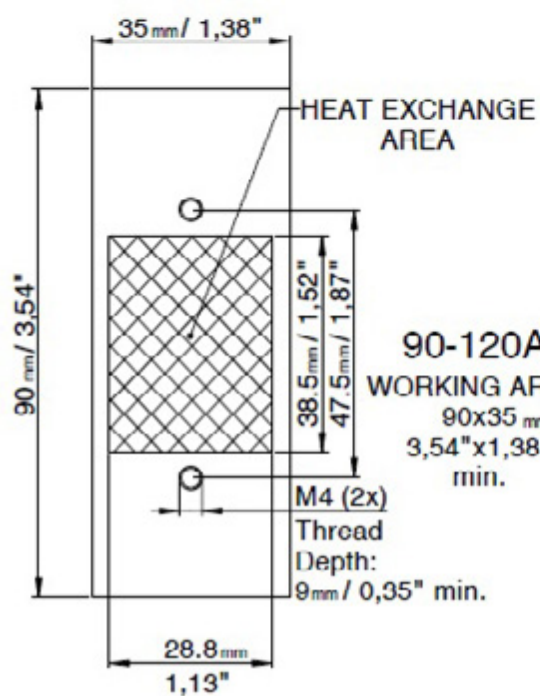
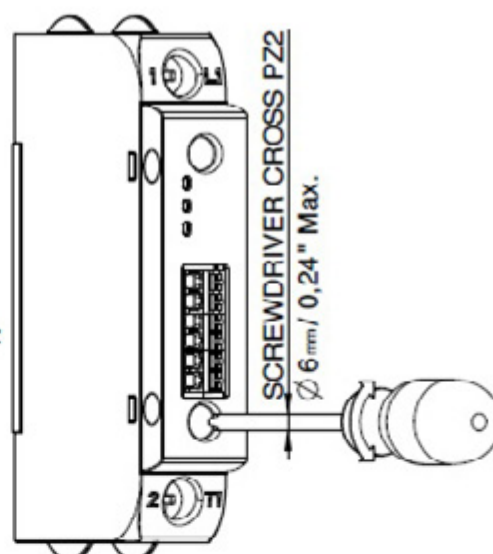


Model	15-75A	90-120A
Weight [g]	108	156

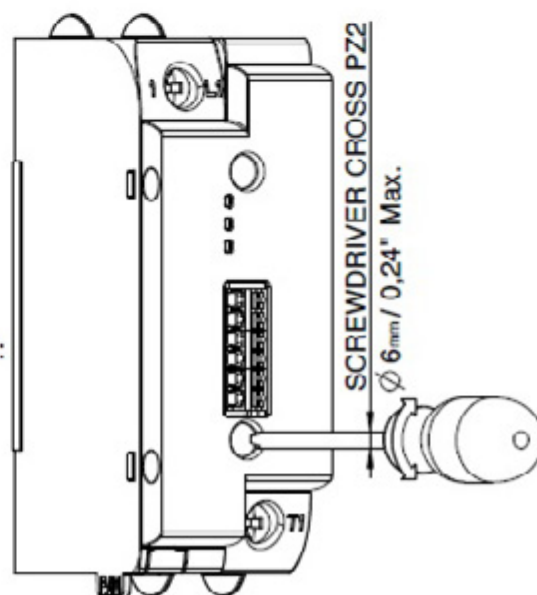
Notes:
The dimensions are representative of all models of the series (command "D" type, "A" type and with options)



15-75A
WORKING AREA:
 90x17,5 mm
 3,54"x0,69"
 min.

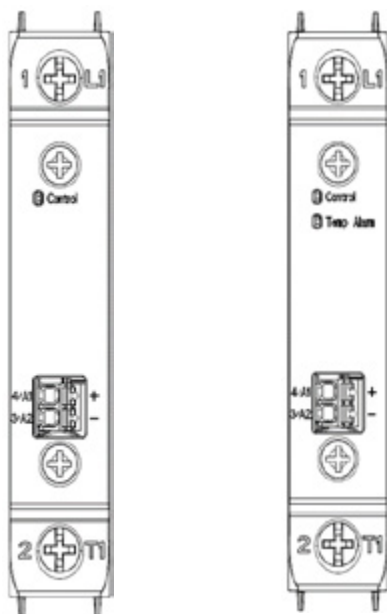


90-120A
WORKING AREA:
 90x35 mm
 3,54"x1,38"
 min.

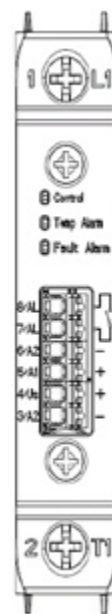


DESCRIPTION OF CONNECTIONS

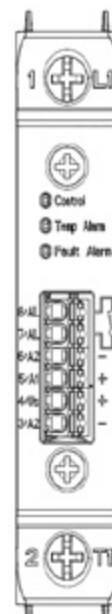
GRS...D-0



GRS...D-1



GRS...D-2



Description of terminal/connector versions with type "D" input

Power terminals (common to all versions)

Rif.	Description	Notes
1/L1	Line Connection	
2/T1	Load Connection	

Signal connector version without options (GRS...D-0)

3/A2-	GND Control input ON/OFF	Control input ground
4/A1+	+Vdc control input ON/OFF	Range from 6 to 32 Vdc, I _{max} < 9 mA a 32V

Signal connector version with options "1" and "2" type (GRS...D-1/2)

3/A2-	GND for power supply and control input ON/OFF	Control input ground
4/Us	+ Vdc power supply	Power supply for optional functions (Range from 6 to 32 V DC, I _{max} < 14 mA at 32V)
5/A1+	+Vdc control input ON/OFF	Range: ON from 5 to 32Vdc, I _{max} < 0,5 mA a 32V OFF < 1,8V
6/A2-	GND Control input ON/OFF (common to terminal 3/A2-)	Additional connection to be used only as GND for the control signal
6/A2-	GND Control input ON/OFF (common to terminal 3/A2-)	Additional connection to be used only as GND for the control signal
7/AL	Alarm output: - Interrupted load - Line voltage absent - Overtemperature	Version with option 1
8/AL		Version with option 2

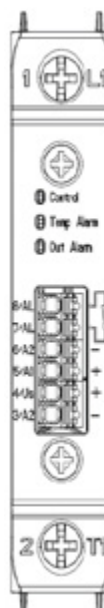
Note: The connections are also representative of 90-120A models

DESCRIPTION OF CONNECTIONS

GRS...D-3



GRS...D-5



Description of terminal/connector versions with type "D" input

Signal connector version with option type "3" (GRS...D-3)

Rif.	Description	Notes
3/A2-	GND for power supply and control input ON/OFF	
4/US	+ Vdc power supply	Power supply for optional functions (Range from 10 to 32 Vdc, I _{max} < 14 mA a 32V)
5/A1+	+Vdc control input ON/OFF	Range: ON da 5 a 32Vdc, I _{max} <0,5 mA a 32V OFF < 1,8V
6/TA	Overtemperature alarm output	PNP output normally not active (1) I _{max} =150mA Vout: + V DC power supply -1V
7/FA	Alarm output: interrupted load or line voltage absent	PNP output normally not active (1) I _{max} =150mA Vout: + V DC power supply -1V
8/A2-	GND Control input ON/OFF (common to terminal 3/A2-)	Additional connection to be used only as GND for the control signal

Alarm output connector version with type "5" option (GRS...A-5)

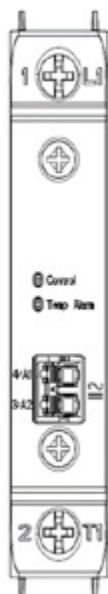
3/A2-	GND for power supply and control input ON/OFF	
4/Us	+ Vdc power supply	Power supply for optional functions (Range from 6 to 32 V DC, I _{max} < 14 mA at 32V)
5/A1+	+Vdc control input ON/OFF	Range: ON from 5 to 32Vdc, I _{max} <0,5 mA a 32V OFF < 1,8V
6/A2-	GND Control input ON/OFF (common to terminal 3/A2-)	Additional connection to be used only as GND for the control signal
7/AL	Overtemperature alarm output	Solid state N.C. contact I _{max} = 50mA V _{max} = 30 Vdc/25Vac Z _{closed} < 15 Ω Z _{open} > 1 MΩ
8/AL		

(1): The normally inactive PNP outputs can be connected to each other and obtain a single alarm output

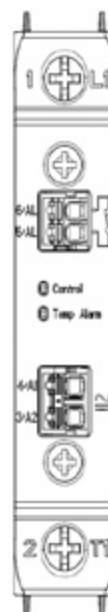
Note: The connections are also representative of 90-120A models

DESCRIPTION OF CONNECTIONS

GRS...A-0



GRS...A-5



Description of terminal versions with type "A" input

Description of terminal versions with type “A”input		
Rif.	Description	Notes
1/L1	Line Connection	
2/T1	Load Connection	
3/A2	Control input ON/OFF in AC	Vac/Vdc input (Range 20 to 260Vac/Vdc, I _{max} < 8 mA)
4/A1		
Alarm output connector version with type “5” option (GRS...A-5)		
5/AL	Overtemperature alarm output	Solid state N.C. contact I _{max} = 150 mA V _{max} = 30 Vdc/25Vac Z _{closed} < 1 Ω Z _{open} > 1 MΩ)
6AL		

Note: The connections are also representative of 90-120A models



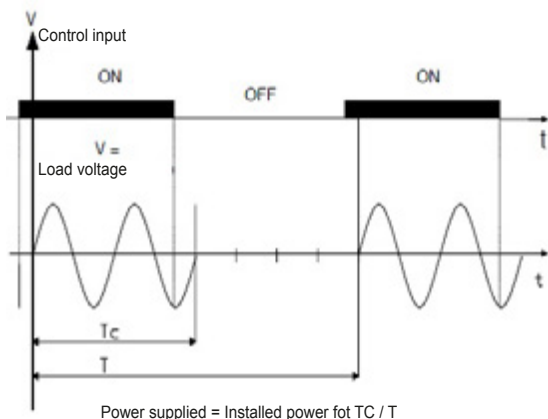
LED STATUS DESCRIPTION

Note:
ON LED is always present,
Temp Alarm and Fault Alarm LEDs are optional

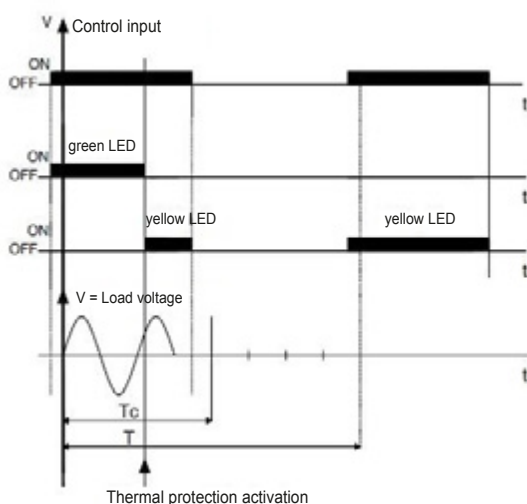
STATUS	LED Control (Green)	LED Temp Alarm (Yellow)	LED Fault Alarm/Out Alarm (Red)
SCR OFF, no alarm	OFF	OFF	OFF
SCR ON, no alarm	ON	OFF	OFF
SCR ON, Alarm output active	ON	OFF	ON
Control signal active, SCR forced off for overtemperature protection	OFF	ON	OFF
Control signal active, SCR forced off for overtemperature protection, Alarm output active	OFF	ON	ON
SCR off, Alarm output active for interrupted load (alarm is stored, Status only possible with GRS with Type D input and options 1/2/3)	OFF	OFF	ON

TYPE OF OPERATION

Logic voltage output command

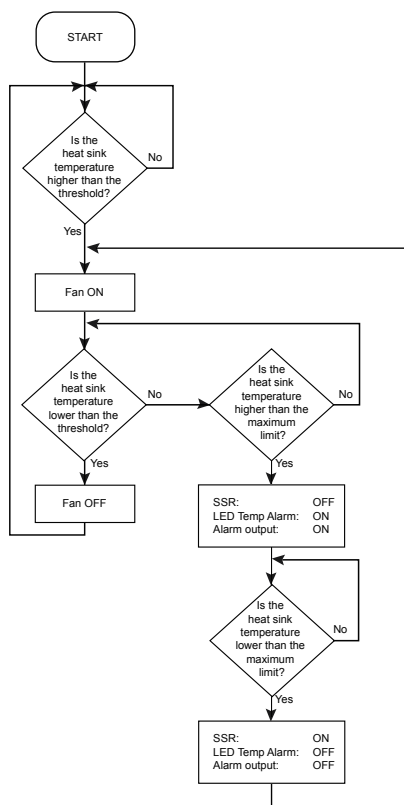


GRS thermal protection

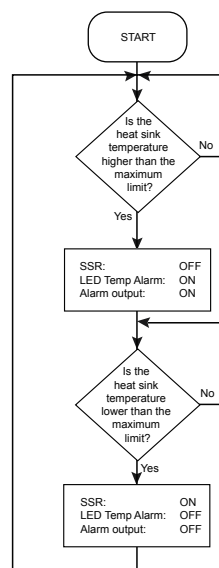


THERMAL ALARM

Models with thermal alarm

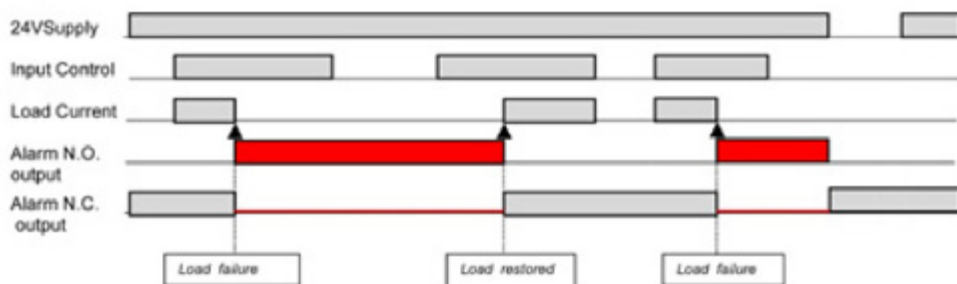


Models with thermal alarm and FAN63 option



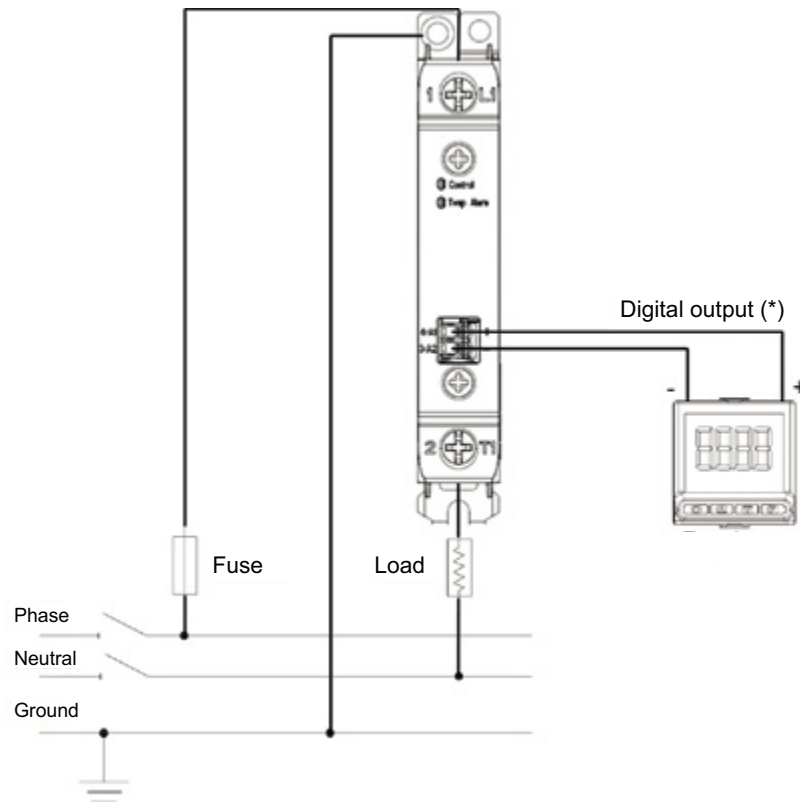
ALARM LOAD INTERRUPTED

GRS with V DC command (Control type "D" with options)

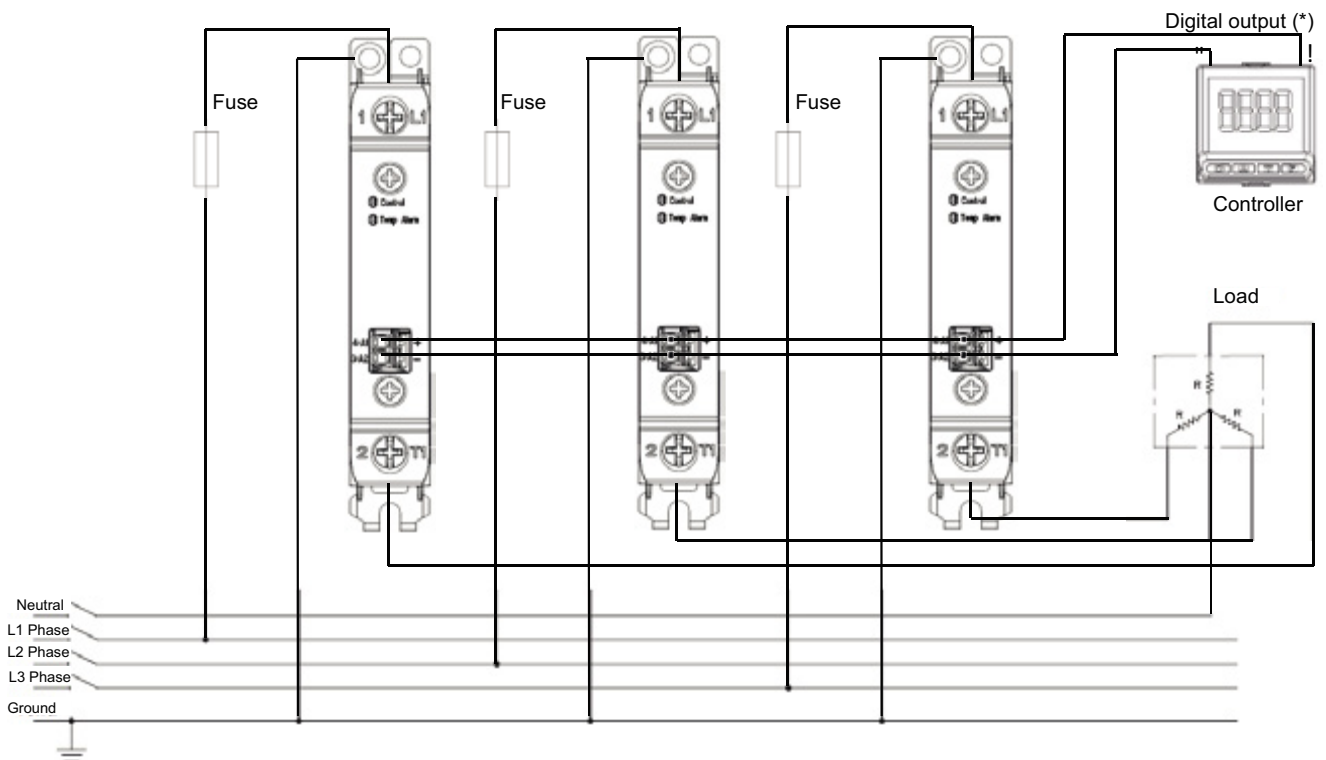


CONNECTION EXAMPLES

Single-phase connection - GRS with Vdc command input (Type "D" input)



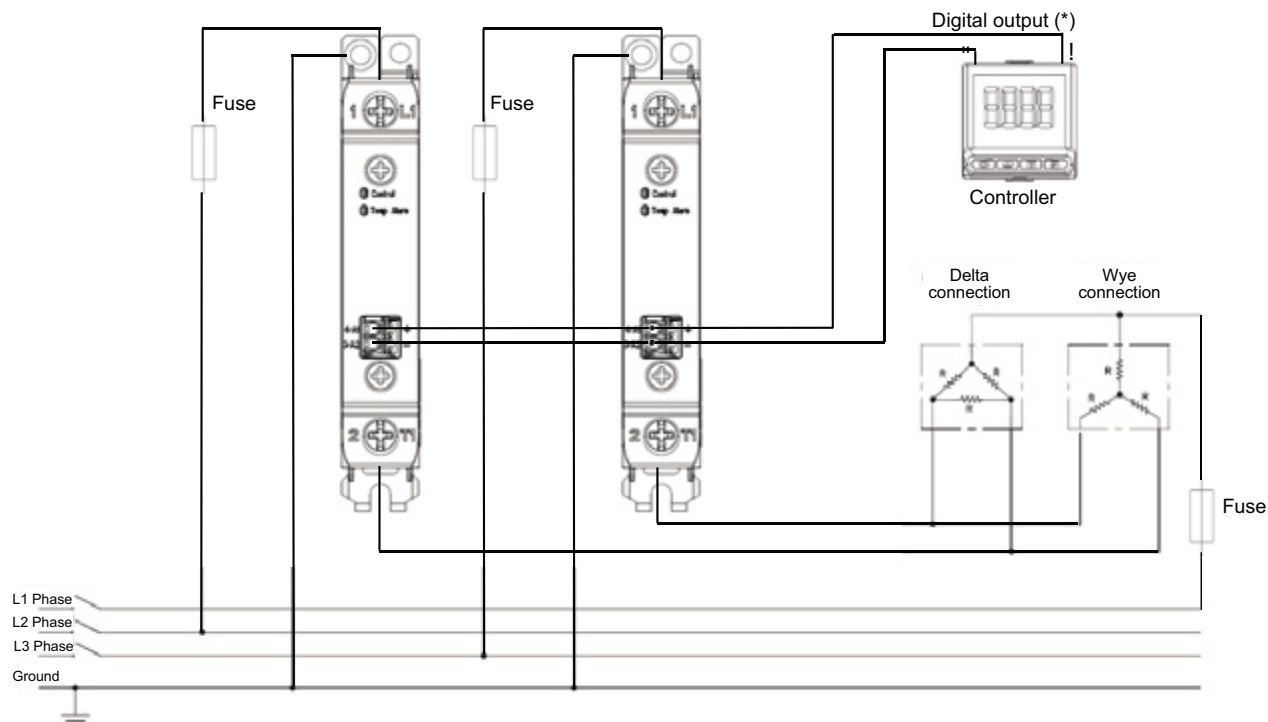
Three-phase Wye connection with neutral - GRS with V DC command input ("D" type input)



(*) Or relay output with V AC output voltage
(Use GRS with Vdc command input Type "A" input)

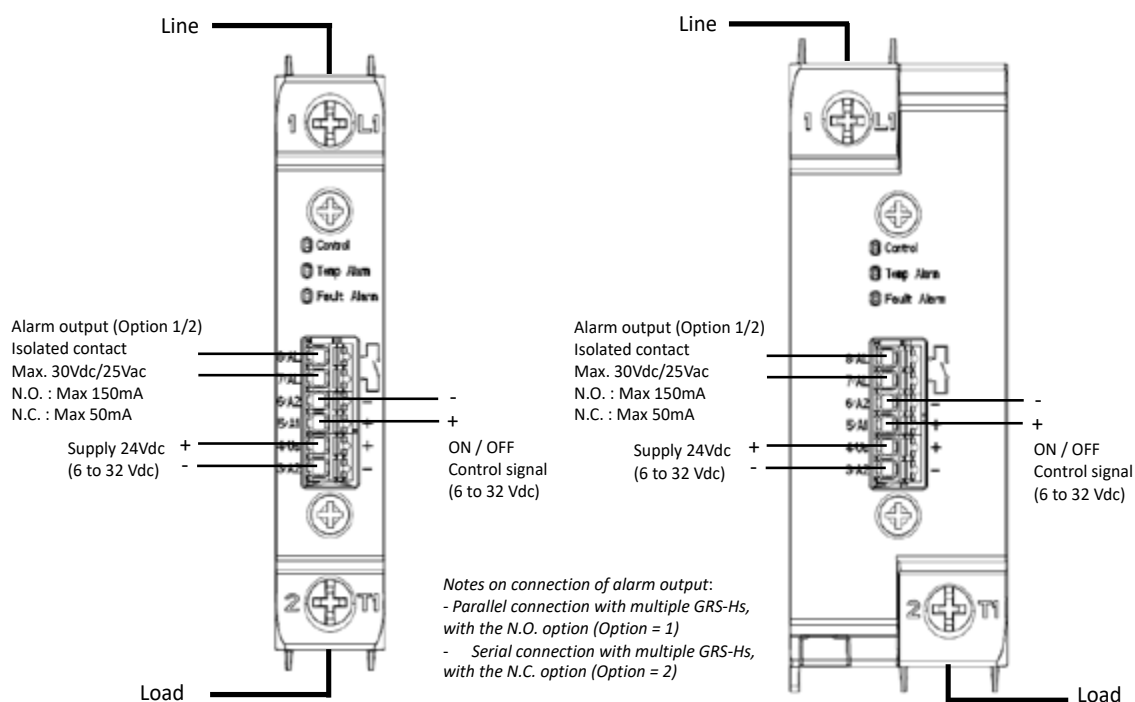
CONNECTION EXAMPLES

Three-phase Triangle or Star connection without neutral on two phases - GRS with Vdc command input (Type "D" input)



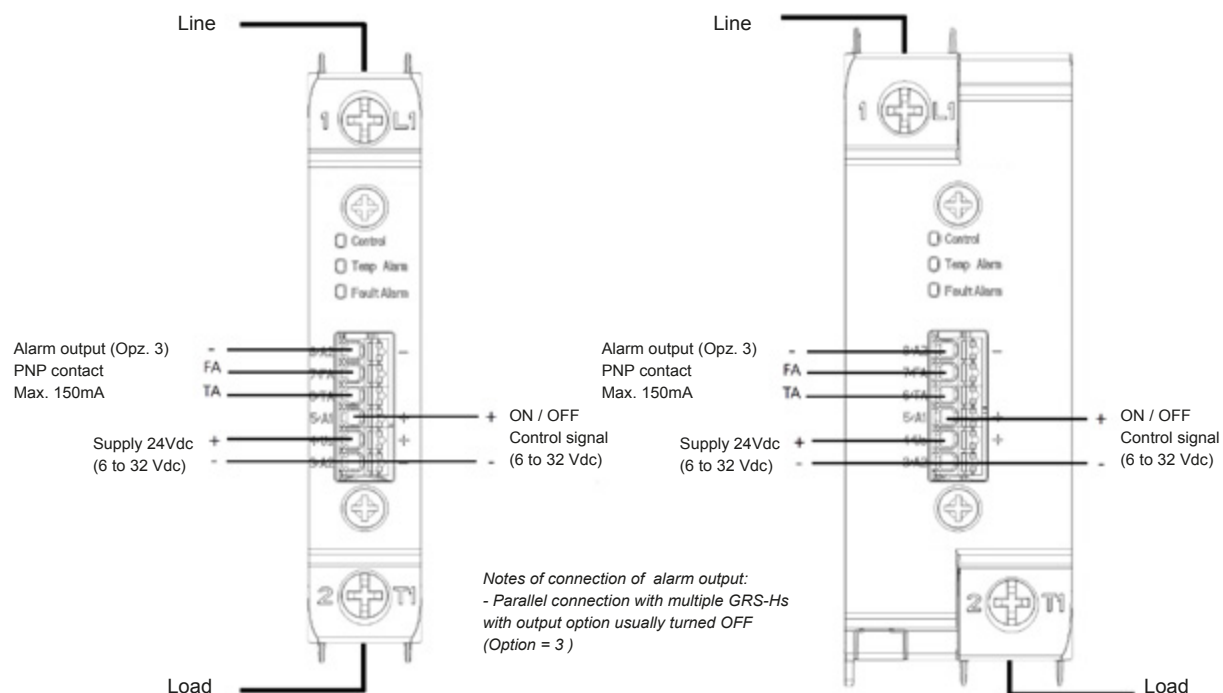
(*) Or relay output with V AC output voltage
(Use GRS with Vdc command input Type "A" input)

Connection example for GRS with V DC command with isolated contact alarm output option (Options 1 and 2)

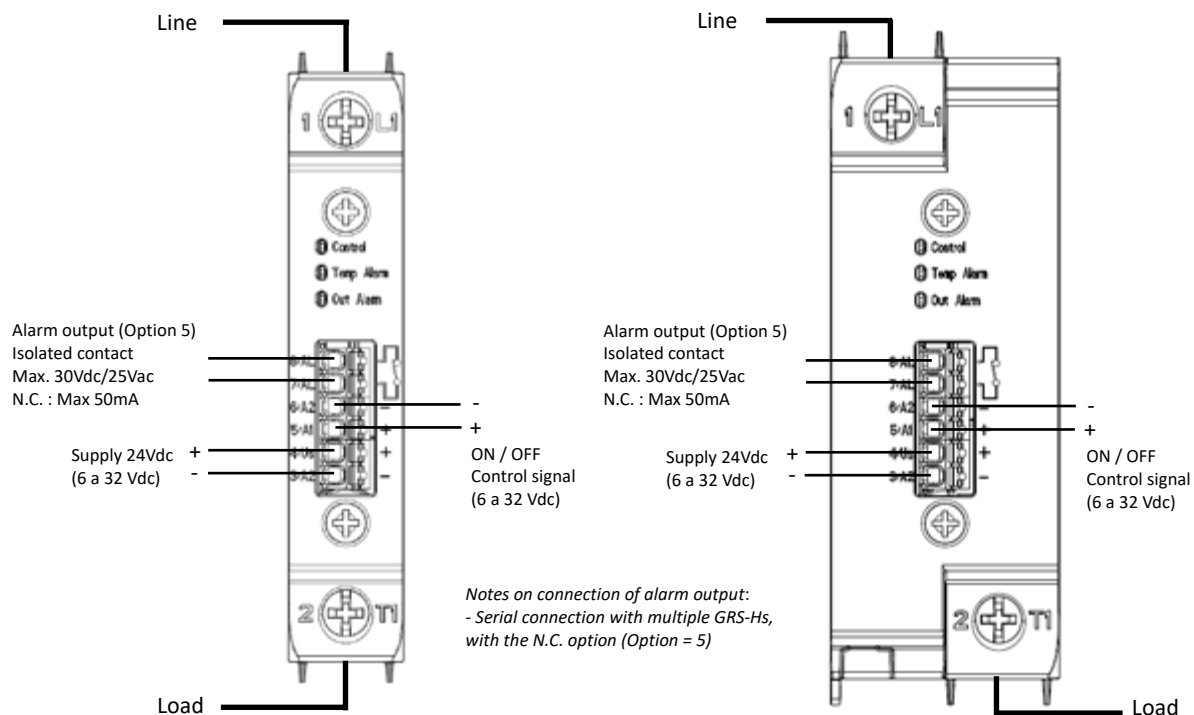


CONNECTION EXAMPLES

Connection example for GRS with V DC command with PNP alarm output option (Option 3)

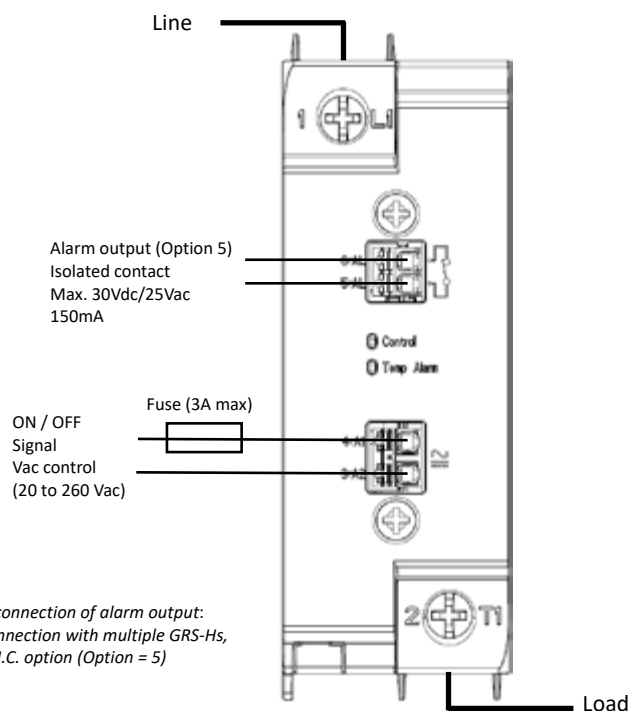
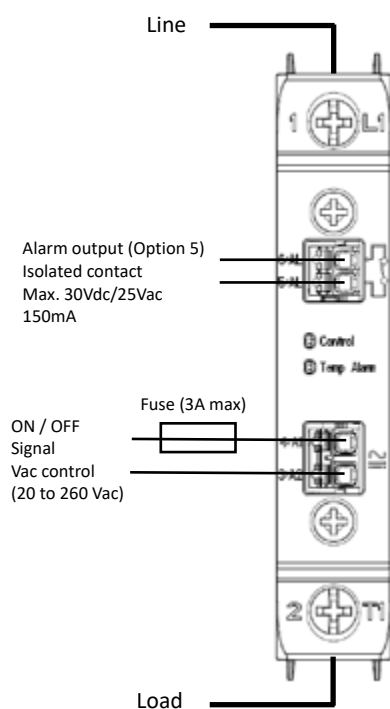


Connection example for GRS with V DC control with thermal alarm option (Option 5)



CONNECTION EXAMPLES

Connection example for GRS with V AC control with thermal alarm option (Option 5)



Notes on connection of alarm output:
- Serial connection with multiple GRS-Hs,
with the N.C. option (Option = 5)

TABLE OF TERMINALS AND CONDUCTORS

CONTROL TERMINAL		
Size	Type of connection	Conductor section / Stripping length
15A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
25A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
30A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
40A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
50A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
60A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
75A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
90A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm
120A	Rigid/flexible/cable lug conductor cross section	0,2 - 1,5 mm ² 24 - 16 AWG
	Stripping length	8 mm

POWER TERMINAL		
Contact area (WxD) screw type	Type of connection	Maximum conductor section / Tightening torque / Stripping length
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	25 mm ² 3 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	11 mm
10,5 mm x 10,7 mm M5	Rigid/flexible/ferrule conductor cross section	50 mm ² 1/0 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	13 mm
9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	50 mm ² 1/0 AWG 2,5-3 Nm (22-26,6lb-in)
	Stripping length	13 mm

(WxD) = Width x depth

EXTRARAPID FUSES

Model	Fuse manufacturer	Fuse Model size
GRS 15, GRS 15/48, GRS 15/60	Bussmann Div Cooper (UK) Ltd	FWC16A10F 10x38
GRS 25, GRS 25/48, GRS 25/60	Bussmann Div Cooper (UK) Ltd	FWC25A10F 10x38
GRS 30, GRS 30/48, GRS 30/60	Bussmann Div Cooper (UK) Ltd	FWP40A14F 14x51
GRS 40, GRS 40/48, GRS 40/60	Bussmann Div Cooper (UK) Ltd	FWP40A14F 14x51
GRS 50, GRS 50/48, GRS 50/60	Bussmann Div Cooper (UK) Ltd	FWP63A22F 22x58
GRS 60, GRS 60/48, GRS 60/60, GRS 75, GRS 75/48, GRS 75/60	Bussmann Div Cooper (UK) Ltd	FWP80A22F 22x58
GRS 90, GRS 90/48, GRS 90/60	Bussmann Div Cooper (UK) Ltd	FWP100A22F 22x58
GRS 120, GRS 120/48, GRS 120/60	Bussmann International Inc. USA	170M1418 000-TN/80

HEATSINKS

Model	Heatsink dimension [mm]	Heatsink rth [°C/W]
GRS 15/25	90x50x17,5	3,52
GRS 30	90x85x17,5	2,48
GRS 40/50	90x85x35	1,45
GRS 60/75/90/120	90x113x70	0,867

FANS (for 90A/120A models only)

Model	Code	Type
FAN60	363484	230 Vac 60mm x 60mm x 30mm for 90A models
	363011	230Vac 80mm x 80mm x 38 mm for 120A models
FAN61	363485	115Vac 60mm x 60mm x 30 mm for 90A models
	363003	115Vac 80mm x 80mm x 38 mm for 120A models
FAN62	363037	24 Vdc 60mm x 60mm x 25mm

ORDER CODE

GRS		-		-		-		-		-	0	-	0	-	0
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Rated current	
15Aac	15
25Aac	25
30Aac	30
40Aac	40
50Aac	50
60Aac	60
75Aac	75
90Aac	90
120Aac	120

Rated voltage	V
480Vac	48
600Vac	60

Input type	
6 ... 32 Vdc	D
20 ... 260 Vac / Vdc	A

Future developments	
0	None

Control terminal	
0	Push In

OPTIONS	
0	None
1	Thermal alarm and load interrupted Insulated contact (NO) (1)
2	Thermal alarm and load interrupted Insulated contact (NC) (1)
3	Thermal alarm and load interrupted Digital output PNP (NO) (1)
5	Thermal alarm Insulated contact (NC)

Notes:
(1) Not available for Type A input versions

WARNINGS



WARNING: this symbol indicates danger.

Read the following warnings before installing, connecting or using the device:

- follow instructions precisely when connecting the device.
- always use cables that are suitable for the voltage and current levels indicated in the technical specifications.
- In applications with risk of damage to persons, machines or materials, you **MUST** install auxiliary alarm devices. It is advisable to verify frequently that the alarm device is functional even during the normal operation of the equipment.
- **DO NOT** operate the device in rooms with dangerous (flammable or explosive) atmosphere.
- During continuous operation, the heat sink can reach up to 100°C, and stays at a high temperature even after the device is turned off due to thermal inertia; therefore, **DO NOT** touch it and avoid contact with electrical wires.
- do not work on the power part without first disconnecting electrical power to the panel.
- do not remove the cover when the device is powered!

Installation:

- correctly ground the device using the specific terminal.
- power supply lines must be separated from device input and output lines; always check that the supply voltage matches the voltage indicated on the device label.
- avoid dust, humidity, corrosive gases and heat sources.
- respect the installation distances between one device and another (to allow for dissipation of generated heat).
- to keep air in movement, we advise you to install a fan near the GRS group in the electrical panel containing the GRSs.

Maintenance: at regular intervals, check operation of the cooling fans and clean all air ventilation filters.

- repairs must be done out only by trained and specialized personnel. Cut power to the device before accessing internal parts.
- do not clean the box with solvents derived from hydrocarbons (trichloroethylene, gasoline, etc.). Using such solvents will compromise the device's mechanical reliability. Use a clean cloth moistened with ethyl alcohol or water to clean external parts in plastic.

Service: GEFTRAN has a service department. The warranty excludes defects caused by any use not conforming to these instructions.

GEFRAN spa reserves the right to make aesthetic or functional changes at any time and without notice.



This device conforms to European Union Directive 2014/30/EU and 2014/35/EU as amended with reference to generic standards: **EN 61000-6-2** (immunity in industrial environment) **EN 61000-6-4** (emission in industrial environment) - **EN 61010-1** (safety regulations).