

#### 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 strapped.

#### 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 available as an option for all 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:  $\leq 1\Omega$   
- N.C. version 30V-50mA conduction  
resistance:  $\leq 15\Omega$   
- 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:  $\leq 15\Omega$

#### **OUTPUTS**

##### **GRS 15**

Rated device current with appropriate  
heatsink: 15 A@40°C in continuous  
service  
Non-repetitive overcurrent  $t=20$  ms:  
620A  
 $I_{ft}$  for blowout:  $\leq 1800A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 25**

Rated device current with  
appropriate heatsink: 25 A@40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
620A  
 $I_{ft}$  for blowout:  $\leq 1800A2s$

dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 30**

Rated device current with  
appropriate heatsink: 30 A@40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
620A  
 $I_{ft}$  for blowout:  $\leq 1800A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 40**

Rated device current with appropriate  
heatsink: 40 A@40°C in continuous  
service  
Non-repetitive overcurrent  $t=20$  ms:  
620A  
 $I_{ft}$  for blowout:  $\leq 1800A2s$   
dV/dt critical with output deactivated:  
1000 V/ $\mu s$

##### **GRS 50**

Rated device current with appropriate  
heatsink: 50 A@ 40°C in continuous  
service  
Non-repetitive overcurrent  $t=20$  ms:  
1600A  
 $I_{ft}$  for blowout:  $\leq 12800A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 60**

Rated device current with appropriate  
heatsink: 60 A@ 40°C in continuous  
service  
Non-repetitive overcurrent  $t=20$  ms:  
1600A  
 $I_{ft}$  for blowout:  $\leq 12800A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 75**

Rated device current with appropriate  
heatsink: 75 A@ 40°C in continuous  
service  
Non-repetitive overcurrent  $t=20$  ms:  
1600A  
 $I_{ft}$  for blowout:  $\leq 12800A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 90**

Rated device current with appropriate  
heatsink: 90A@40°C in continuous  
service Non-repetitive overcurrent  $t=20$   
ms: 1500A  
 $I_{ft}$  for blowout:  $\leq 11250A2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

##### **GRS 120**

Rated device current with  
appropriate heatsink: 120A@  
40°C in continuous service  
Non-repetitive overcurrent  $t=20$  ms:

1500A

$I_{ft}$  for blowout:  $\leq 11250A2s$

dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **THERMAL PROTECTION**

(Optional, always present in GRS with  
current size  $\geq 50A$ ):

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:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,6^{\circ}C/W$

##### **GRS 25**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,6^{\circ}C/W$

##### **GRS 30**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,65^{\circ}C/W$

##### **GRS 40**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,6^{\circ}C/W$

##### **GRS 50**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,35^{\circ}C/W$

##### **GRS 60**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,35^{\circ}C/W$

##### **GRS 75**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,3^{\circ}C/W$

##### **GRS 90**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,3^{\circ}C/W$

##### **GRS 120**

Junction temp:  $\leq 125^{\circ}C$   
 $R_{th}$  junction/case:  $\leq 0,3^{\circ}C/W$

#### **CALCULATION OF THE POWER DISSIPATED BY THE SOLID STATE RELAY**

Single-phase static relay  
 $P_d = 1.4 \cdot I_{RMS} [W]$  (for GRS)  
 $I_{RMS}$  = single-phase load current

#### **CALCULATION OF THE HEATSINK'S THERMAL RESISTANCE**

$R_{th} = (90^{\circ}C - T_{amb. max}) / P_d$  with  $P_d$   
= 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)

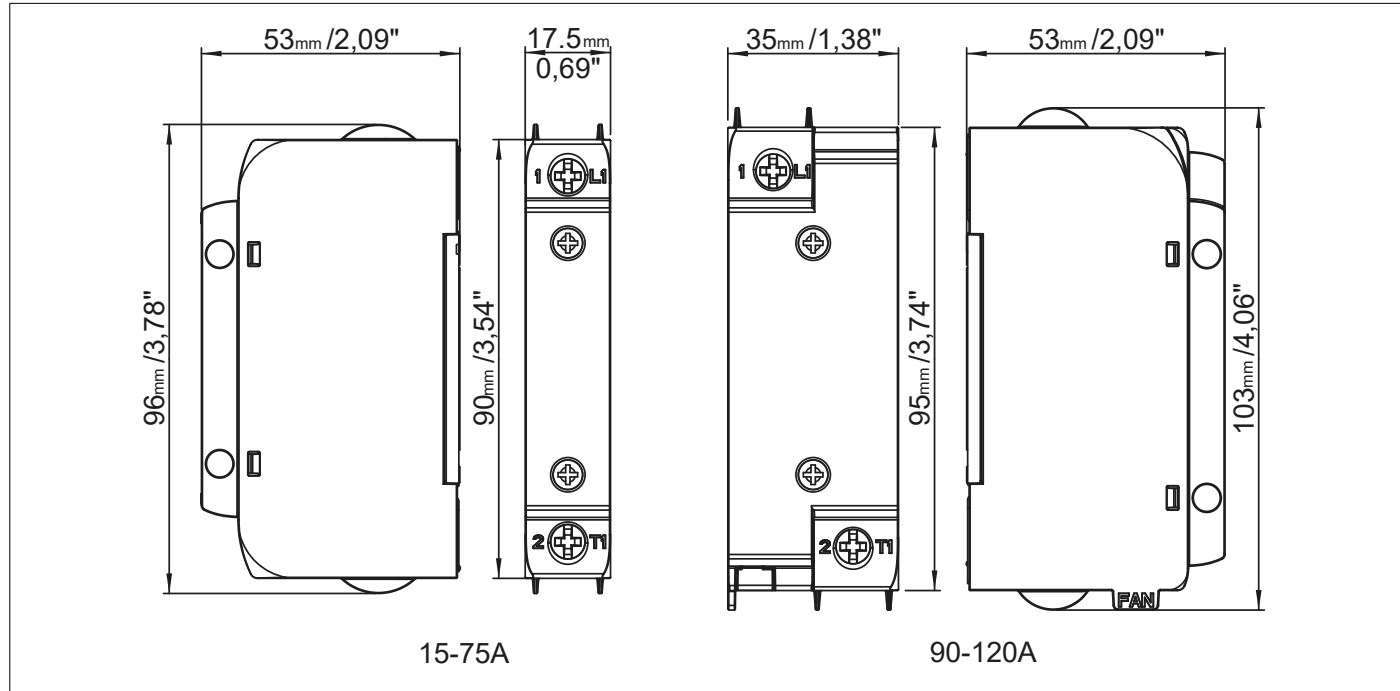
- Vertical distance between a device and the panel wall >100mm
- Horizontal distance between a device and the panel wall at least 20mm
- Vertical distance between one device and another at least 100mm.

• 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**

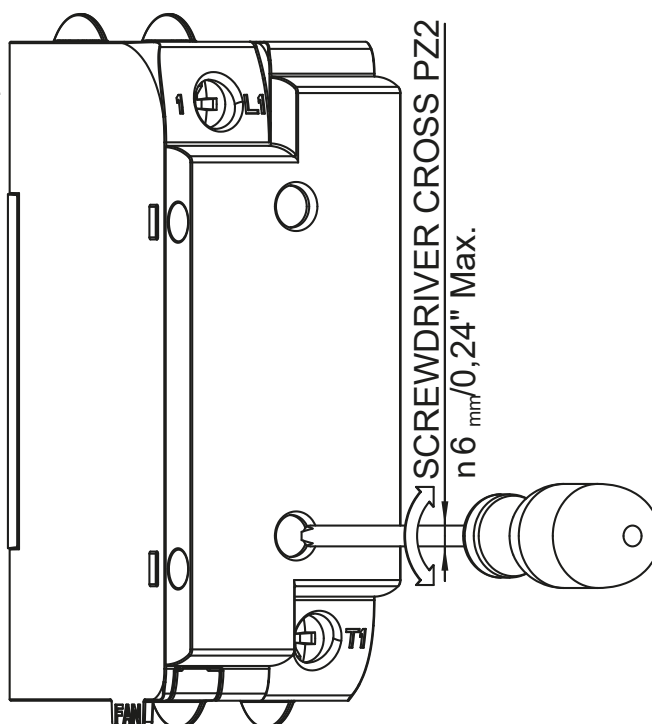
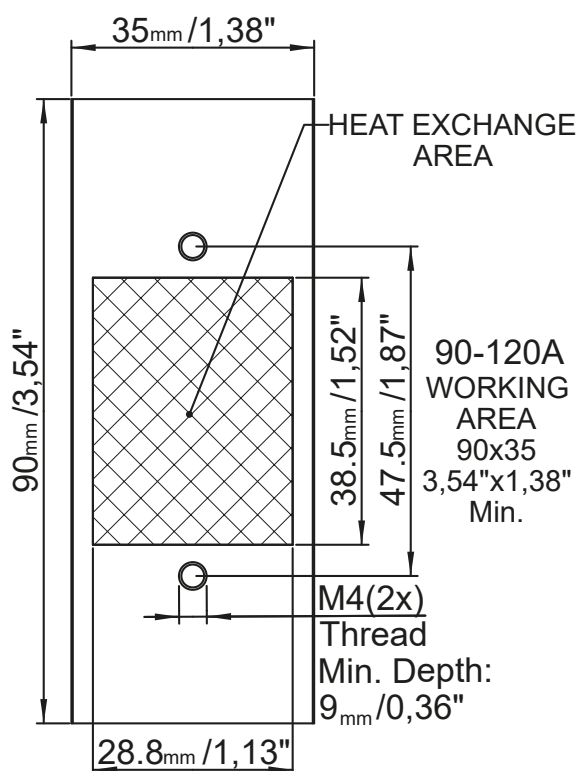
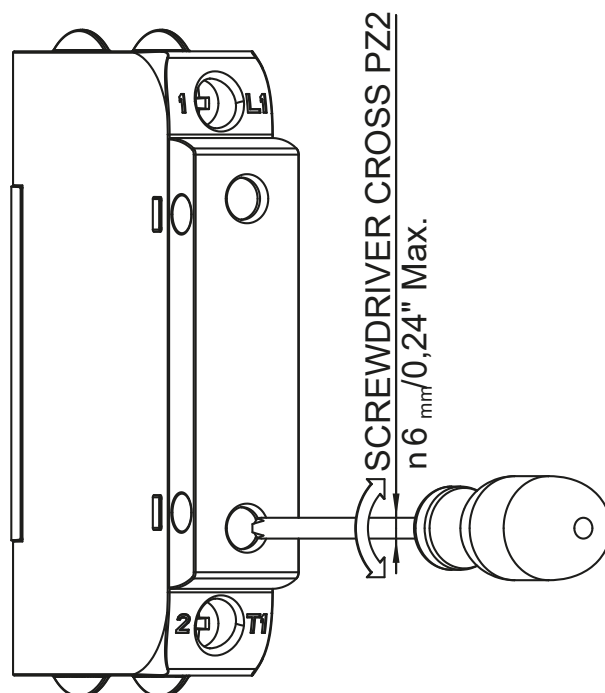
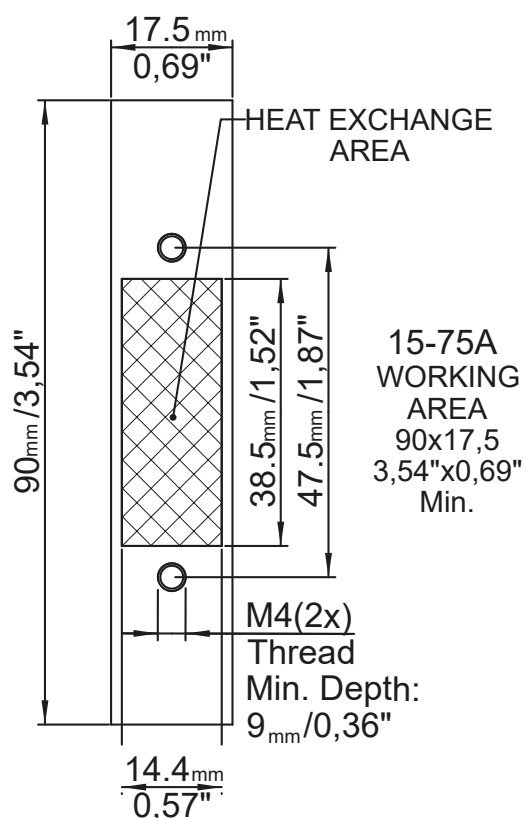
- Ambient temperature limits.
- Need for air exchange with the outside or an air conditioner to transfer the dissipated power to the outside of the panel.
- Installation limits (distances between devices to ensure dissipation under natural convection conditions)
- Maximum voltage limits and derivative 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**



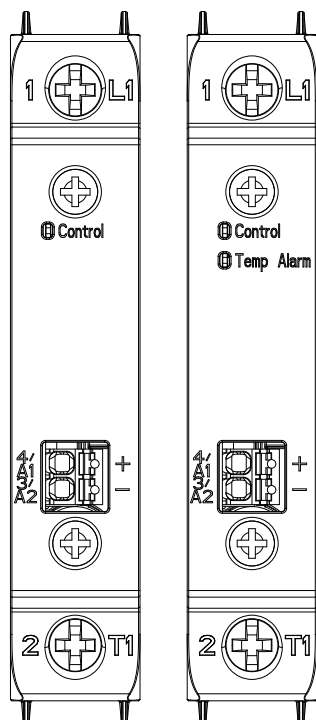
Model	15-75A	90-120A
Weight [g]	108	156

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

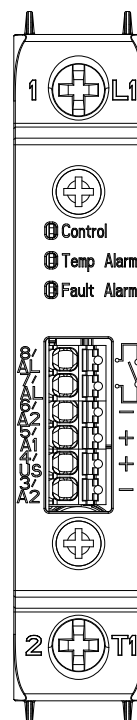


## DESCRIPTION OF CONNECTIONS

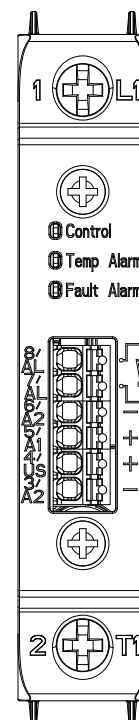
GRS...D-0



GRS...D-1



GRS...D-2



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

#### Power terminals (common to all versions) (Overvoltage Category III)

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

#### Signal connector version without options (GRS...D-0) (Overvoltage Category II o III)

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

#### Signal connector version with options "1 " and "2 " type (GRS...D-1/2) (Overvoltage Category II o III)

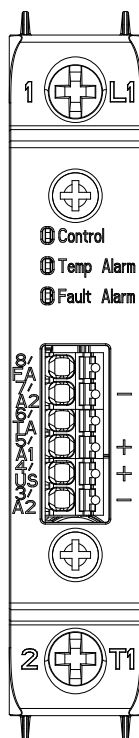
3/A2-	GND for power supply and control input ON/OFF	
4/Us	+ Vdc power supply	Power supply GRS (Range from 6 to 32 V DC, I <sub>max</sub> < 14 mA at 32V
5/A1+	+Vdc control input ON/OFF	Range: ON from 5 to 32Vdc, I <sub>max</sub> <0,5 mA a 32V OFF< 1,8V
6/A2-	GND Control input ON/OFF (common to terminal 3/A2-)	Additional connection to be used only as GND for the control signal
7/AL	Alarm output: - Interrupted load - Line voltage absent - Overtemperature	solid state conctat N.O. I <sub>max</sub> =150mA V <sub>max</sub> = 30 Vdc/25Vac Z <sub>close</sub> < 1 Ω Z <sub>open</sub> > 1 MΩ
8/AL		solid state conctat N.C. I <sub>max</sub> = 50mA V <sub>max</sub> = 30 Vdc/25Vac Z <sub>close</sub> < 15 Ω Z <sub>open</sub> > 1 MΩ

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

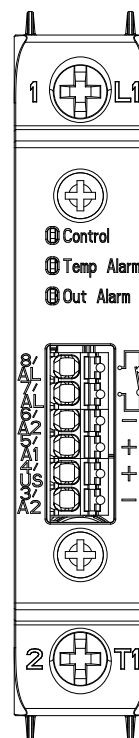
Note: For terminals and conductors to be used, see the table: "CLAMP AND CONDUCTOR CHARACTERISTICS TABLE" on page 14

## 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) (Overvoltage Category II o III)

Rif.	Description	Notes
3/A2-	GND for power supply and control input ON/OFF	
4/US	+ Vdc power supply	Power supply GRS (Range from 10 to 32 Vdc, I <sub>max</sub> < 14 mA a 32V)
5/A1+	+Vdc control input ON/OFF	Range: ON da 5 a 32Vdc, I <sub>max</sub> <0,5 mA a 32V OFF< 1,8V
6/TA	Overtemperature alarm output	PNP output normally not active (1) I <sub>max</sub> =150mA Vout: + V DC power supply -1V
7/FA	Alarm output: interrupted load or line voltage absent	PNP output normally not active (1) I <sub>max</sub> =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) (Overvoltage Category II o III)

3/A2-	GND for power supply and control input ON/OFF	
4/Us	+ Vdc power supply	Power supply GRS (Range from 6 to 32 V DC, I <sub>max</sub> < 14 mA at 32V)
5/A1+	+Vdc control input ON/OFF	Range: ON from 5 to 32Vdc, I <sub>max</sub> <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 <sub>max</sub> = 50mA V <sub>max</sub> = 30 Vdc/25Vac Z <sub>closed</sub> < 15 Ω Z <sub>open</sub> > 1 MΩ
8/AL		

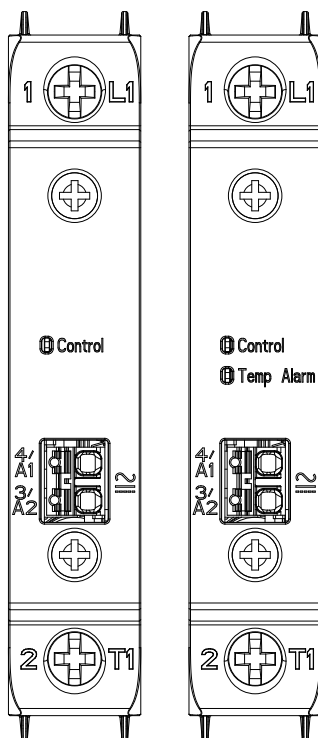
(1): The normally inactive PNP outputs can be connected to each other and obtain a single alarm output

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

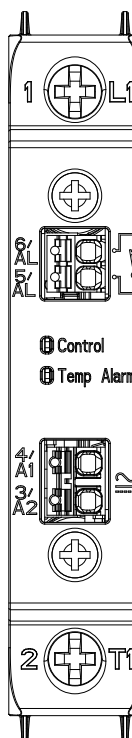
Note : For terminals and conductors to be used, see the table: "CLAMP AND CONDUCTOR CHARACTERISTICS TABLE" on page 14

## DESCRIPTION OF CONNECTIONS

GRS...A-0



GRS...A-5



### Description of terminal versions with type "A" input

#### "Power Terminals (common to all versions)" (Overvoltage category III)

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

#### "control connector" (Overvoltage Category II)

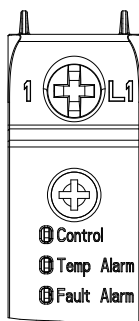
3/A2	Control input ON/OFF in AC	Vac/Vdc input (Range 20 to 260Vac/Vdc, I <sub>max</sub> < 8 mA) (Overvoltage Category II)
4/A1		

#### Alarm output connector version with type "5" option (GRS...A-5) (Overvoltage Category II o III)

5/AL	Overtemperature alarm output	Solid state N.C. contact I <sub>max</sub> = 150 mA V <sub>max</sub> = 30 Vdc/25Vac Z <sub>closed</sub> < 1 Ω Z <sub>open</sub> > 1 MΩ
6/AL		

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

Note : For terminals and conductors to be used, see the table: "CLAMP AND CONDUCTOR CHARACTERISTICS TABLE" on page 14

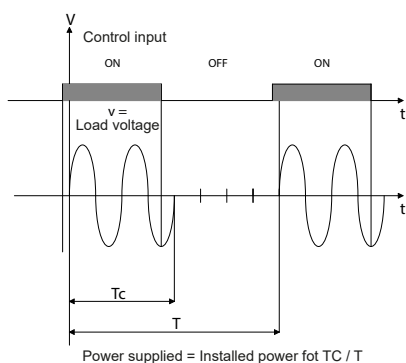


## LED STATUS DESCRIPTION

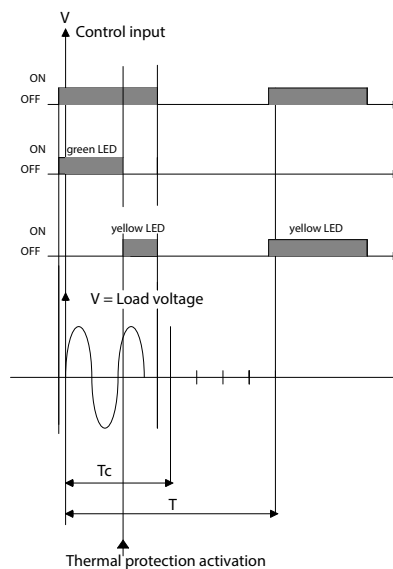
**Note:**  
ON LED is always present,  
Temp Alarm and Fault Alarm LEDs are optional

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

### Logic voltage output command

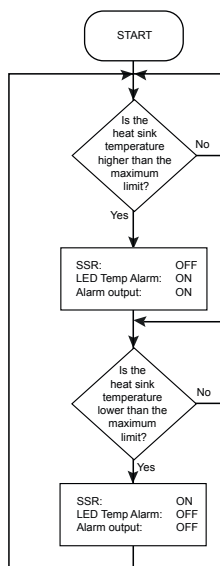


### GRS thermal protection

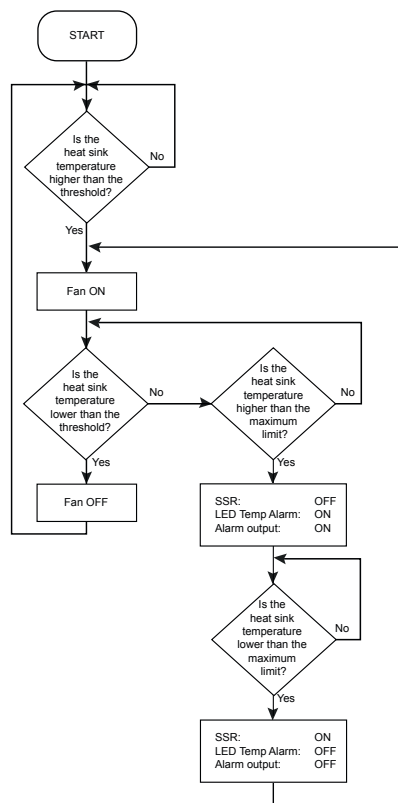


## THERMAL ALARM

### Models with thermal alarm

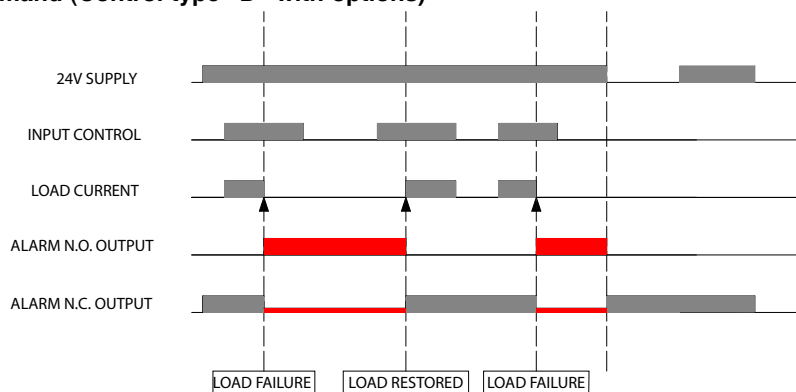


### Models with thermal alarm and FAN63 option



## ALARM LOAD INTERRUPTED

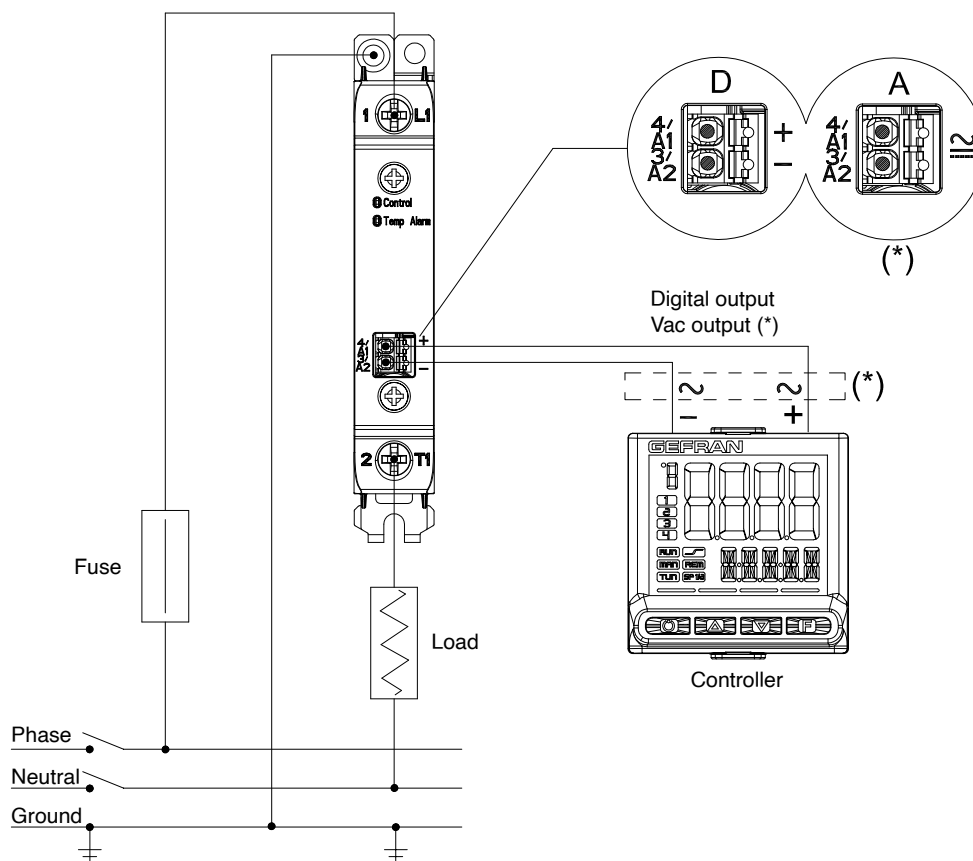
### GRS with V DC command (Control type "D" with options)



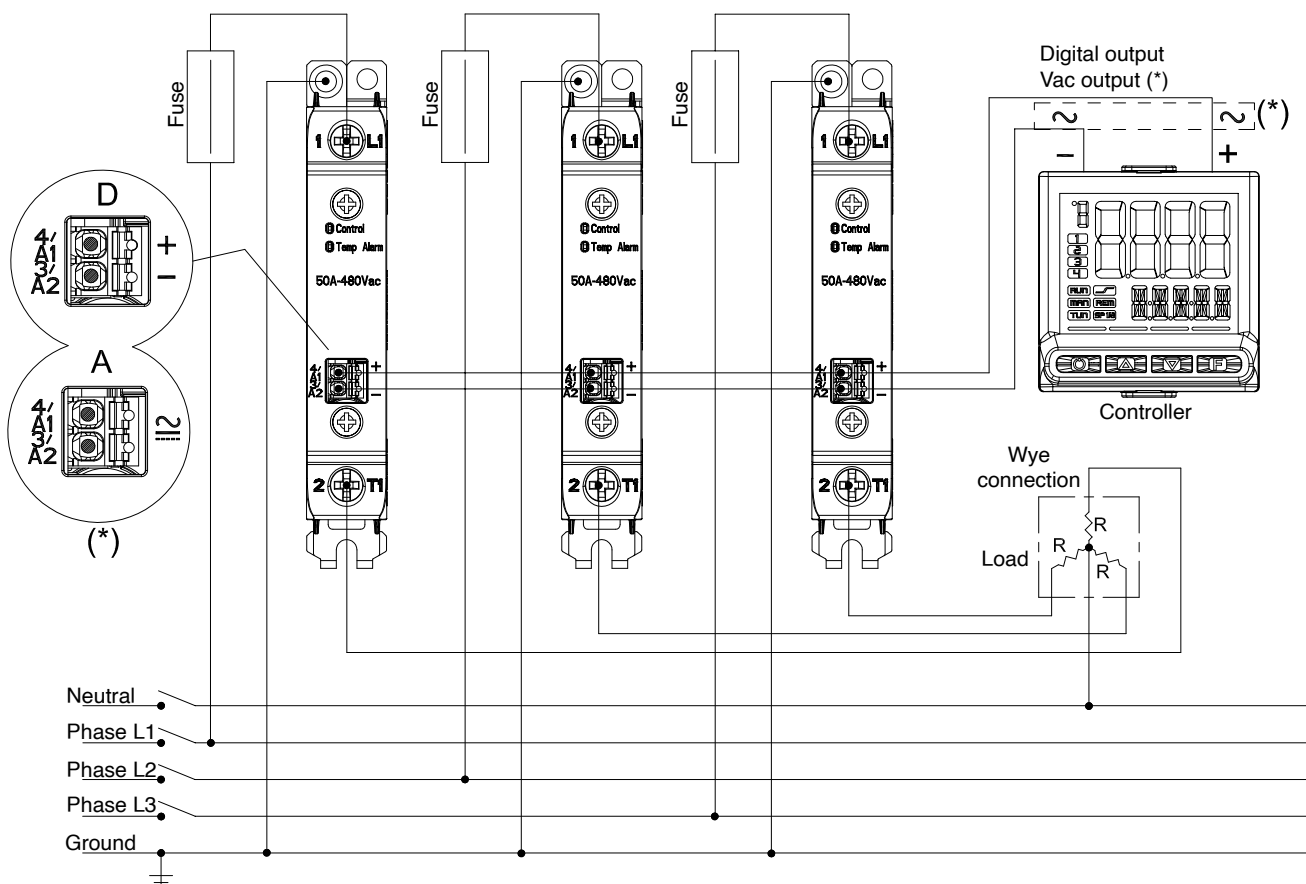


## CONNECTION EXAMPLES

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



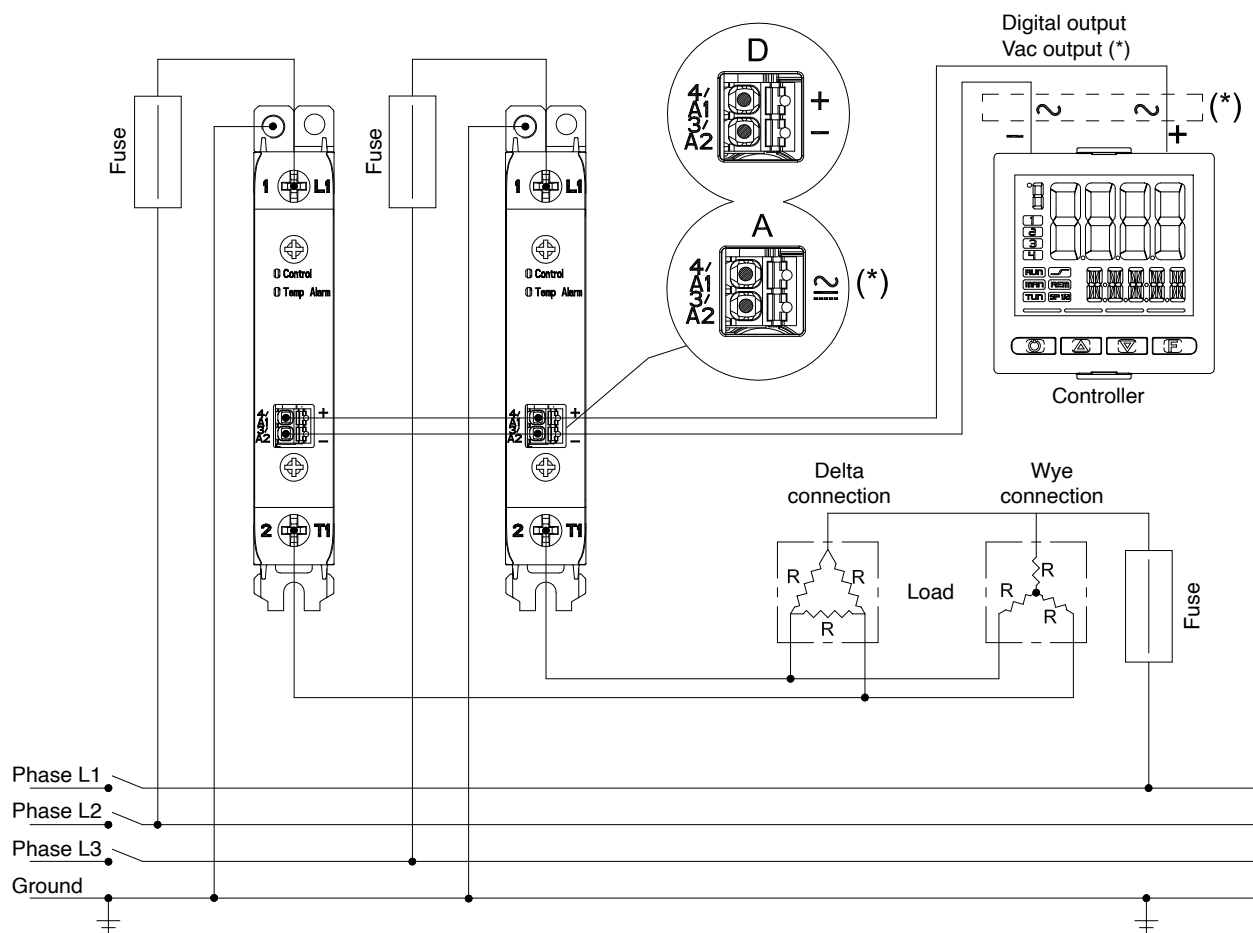
Three-phase Wye connection with neutral - GRS with V DC command input ("D" type input )



(\*) Or relè output with Vac tension  
(Use GRS with comand input vac type A)

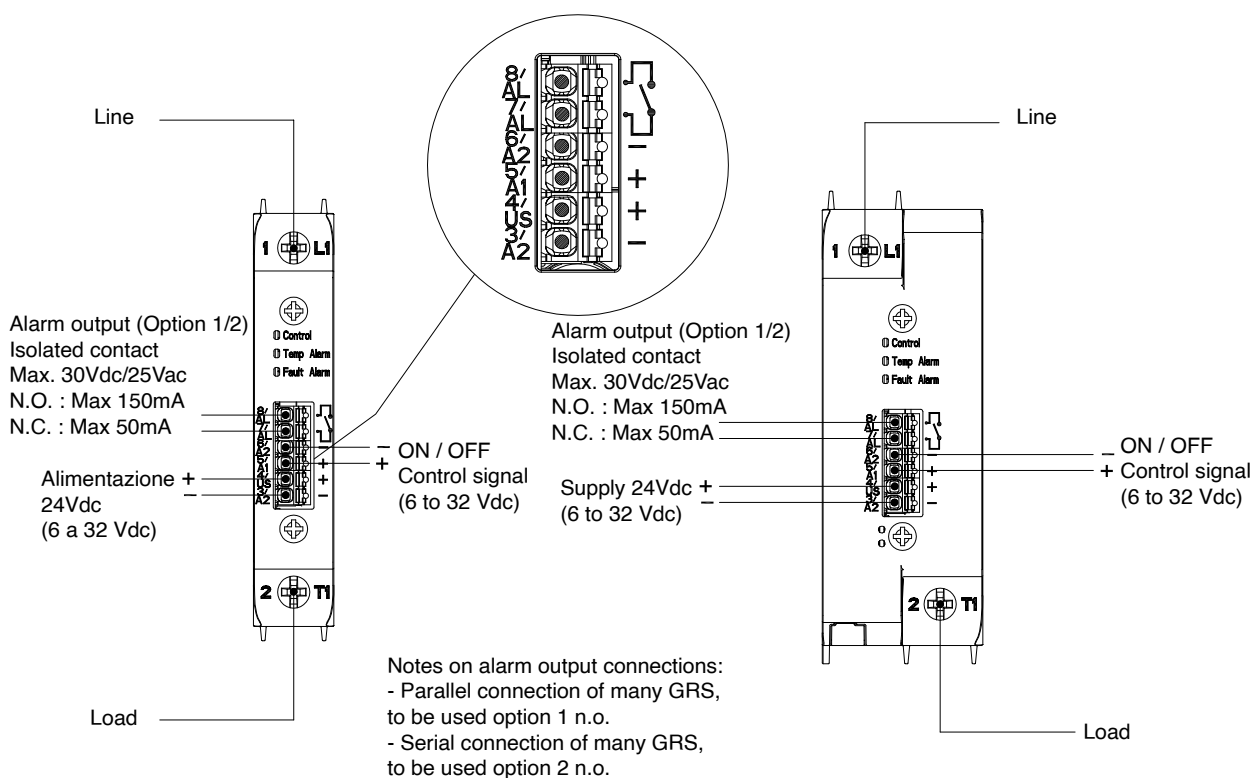
## CONNECTION EXAMPLES

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



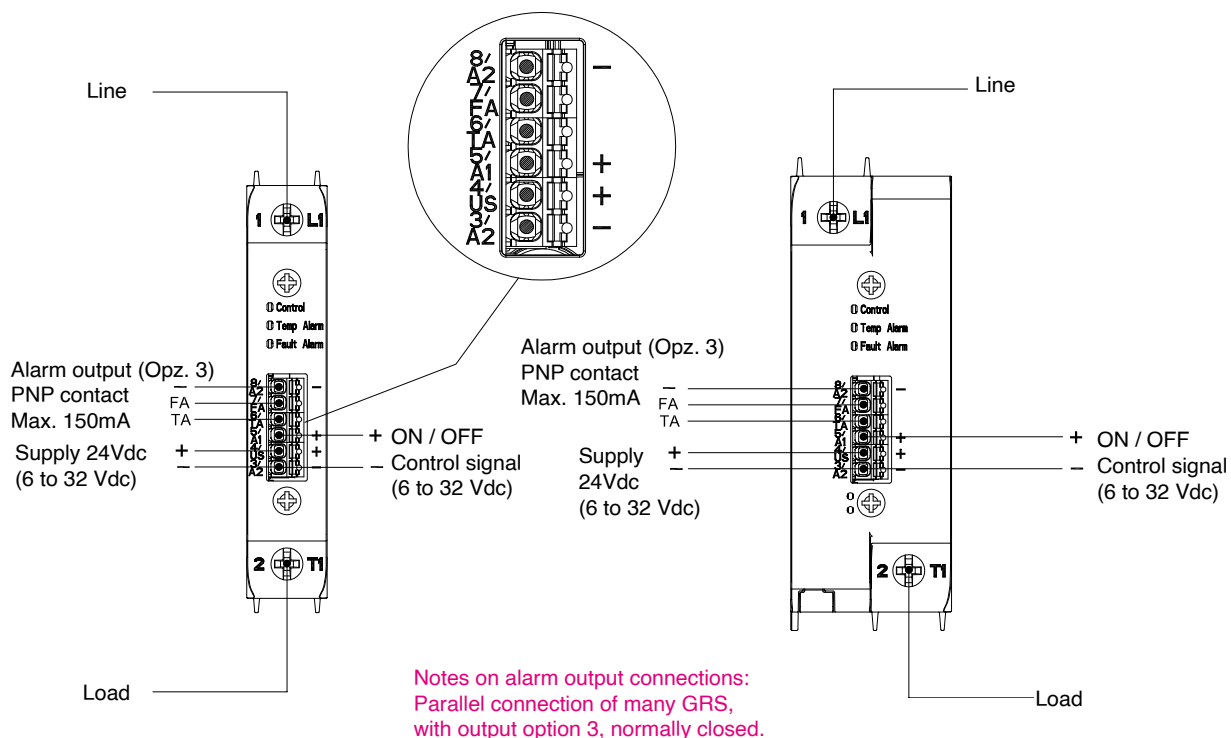
(\*) Or relay output with V AC output voltage  
(Use GRS with Vdc command input Type "A" input )

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

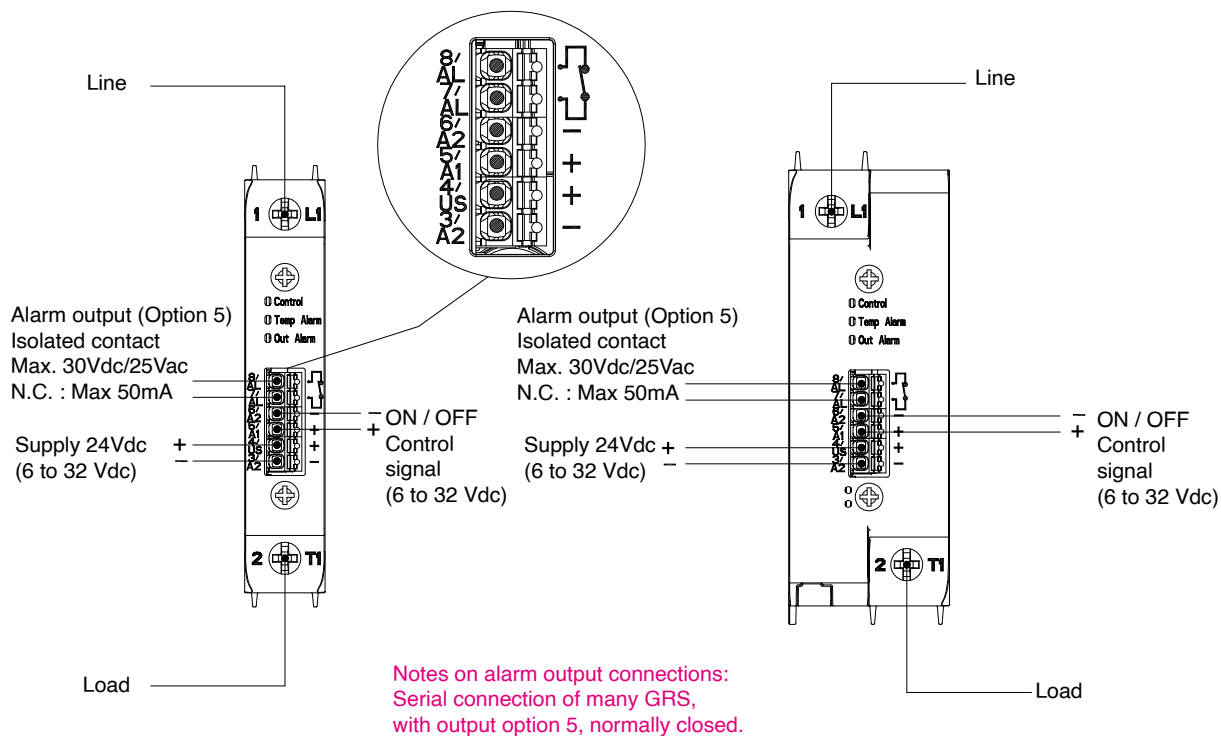


## CONNECTION EXAMPLES

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

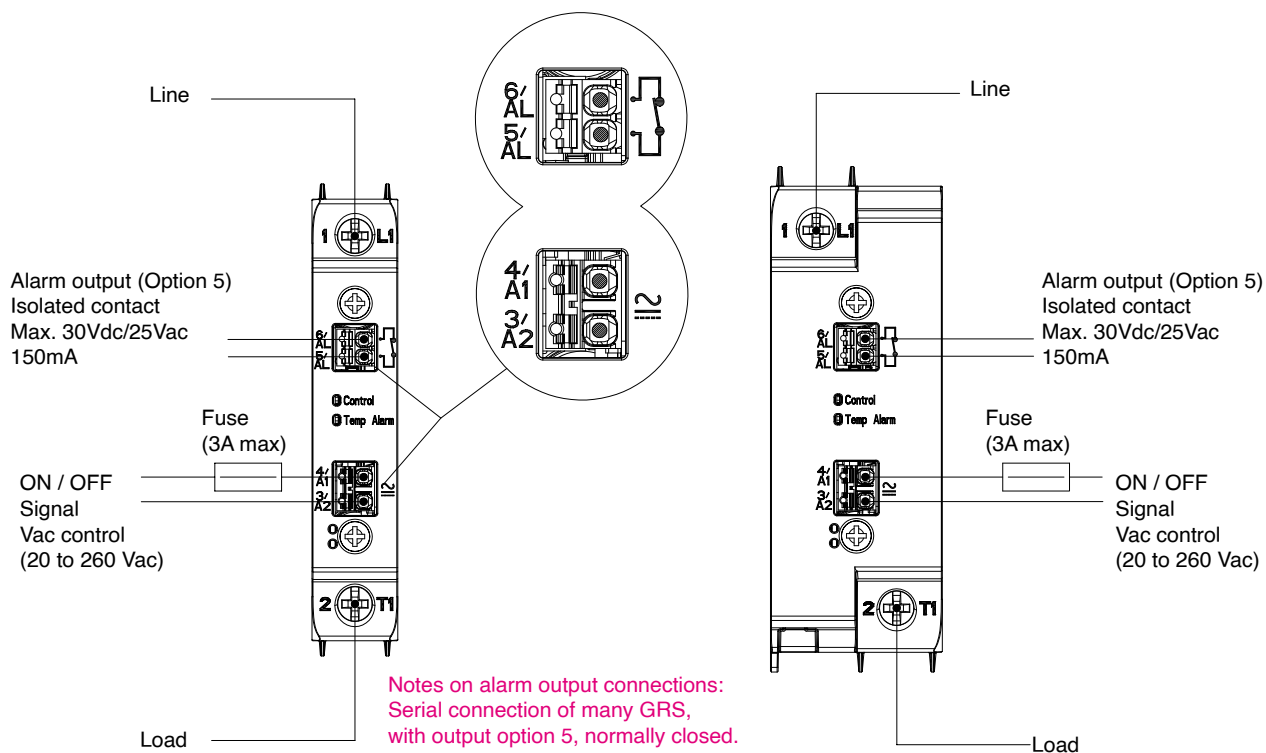


Connection example for GRS with V DC control with thermal alarm option (Option 5)



## CONNECTION EXAMPLES

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



## TABLE OF TERMINALS AND CONDUCTORS

CONTROL/SIGNAL TERMINALS			POWER TERMINALS		
Size	Type of connection	Conductor section / Stripping length	Contact area (WxD) screw type	Type of connection	Conductor section / Tightening torque / Stripping length
15A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 2.5 mm <sup>2</sup> / 2 x 1.5 mm <sup>2</sup> 1 x 14 AWG / 2 x 17 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
25A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 6 mm <sup>2</sup> / 2 x 4 mm <sup>2</sup> 1 x 10 AWG / 2 x 12 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
30A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 6 mm <sup>2</sup> / 2 x 4 mm <sup>2</sup> 1 x 10 AWG / 2 x 12 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
40A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 10 mm <sup>2</sup> / 2 x 6 mm <sup>2</sup> 1 x 8 AWG / 2 x 10 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
50A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 16 mm <sup>2</sup> / 2 x 10 mm <sup>2</sup> 1 x 6 AWG / 2 x 8 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
60A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 25 mm <sup>2</sup> / 2 x 16 mm <sup>2</sup> 1 x 4 AWG / 2 x 6 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
75A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 25 mm <sup>2</sup> / 2 x 16 mm <sup>2</sup> 1 x 3 AWG / 2 x 6 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	11 mm
90A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	10,5 mm x 10,7 mm M5	Rigid/flexible/ferrule conductor cross section	35 mm <sup>2</sup> 2 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	13 mm
120A	Rigid/flexible/cable lug conductor cross section	1 x 0.2-1.5 mm <sup>2</sup> / 2 x 0.1-0.75 mm <sup>2</sup> 1 x 24-16 AWG / 2 x 27-19 AWG	9,2 x 8 mm M5	Rigid/flexible/ferrule conductor cross section	1 x 50 mm <sup>2</sup> / 2 x 25 mm <sup>2</sup> 1 x 1/0 AWG / 2 x 3 AWG  2,5-3 Nm (22-26,6lb-in)
	Stripping length	8 mm		Stripping length	13 mm

NOTE: Use 60/75°C copper (CU), solid or multi-stranded conductors

NOTE: Use 75°C copper (CU), multi-stranded conductors

### Notes:

For Canadian end-use applications only, an R/C VZCA/7 (or CSA-approved) surge protector is required to be installed in the end-use as shown below:

- Maximum clamping voltage 800V, for the control input of Type "D" devices.
- Maximum clamping voltage 2500V, for control input of "A" type devices.
- Maximum clamping voltage 800V, for the auxiliary output of type "D" and "A" devices.

## SCCR COORDINATION FUSES

Model	"Short circuit current [Arms]"	"Max fuse size [A]"	"Bussmann Model Number"	"Max Voltage [VAC]"
GRS 15	100.000	40	DFJ-40	600
GRS 25	100.000	40	DFJ-40	600
GRS 30	100.000	40	DFJ-40	600
GRS 40	100.000	40	DFJ-40	600
GRS 50	100.000	80	DFJ-80	600
GRS 60	100.000	80	DFJ-80	600
GRS 75	100.000	80	DFJ-80	600
GRS 90	100.000	125	DFJ-125	600
GRS 120	100.000	125	DFJ-125	600

The fuses on the above table are representative of all the Bussmann DFJ fuses with lower current ratings

The devices protected with the fuses reported above, still be functional after the short circuit

Short circuit protection: The product variants listed in the table "SCCR COORDINATION FUSES" are "Suitable For Use On A Circuit Capable Of Delivering Not

More Than 100,000 A rms Symmetrical Amperes, 600 Volts Maximum when Protected by fuses.

Attention: the opening of the branch-circuit protective device may be an indication that a fault has been interrupted. To reduce the risk of fire or electric shocks,

current-carrying parts and other components of the device should be examined and replaced if damaged. If burnout of the device occurs, the complete device must be replaced or equivalent.

## 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
90A	363484	230 Vac 60mm x 60mm x 30mm for 90A models
120A	363011	230Vac 80mm x 80mm x 38 mm for 120A models
90A	363485	115Vac 60mm x 60mm x 30 mm for 90A models
120A	363003	115Vac 80mm x 80mm x 38 mm for 120A models
	363037	24 Vdc 60mm x 60mm x 25mm

GRS

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0

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0

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0

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: <b>EN 61000-6-2</b> (immunity in industrial environment) <b>EN 61000-6-4</b> (emission in industrial environment) - <b>EN 61010-1</b> (safety regulations).
	Conformity TC RU C-IT.A132.B.00422
	Conformity UL508 - File: E243386
	100 KA when protected by proper fuse