



#### Main applications

- Plastic extrusion lines and injection presses
- Packing and packaging machines
- Polymerization and production plants for synthetic fibers
- Rubber vulcanization plants
- Driers for ceramics and construction elements
- Chemical and pharmaceutical industry
- Industrial electric furnaces
- Food processing plants

#### Main features

- Input control from logic signal
- Switching at voltage zero crossing
- Versions with TRIAC and with double SCR in antiparallel.
- LED power on indicator
- MOV protections (varistor)
- Fastening to DIN bar (standard); fastening to panel (optional)

#### GENERAL

Turning an electric load on or off requires the use of a suitable interrupt and protection device that is safe and immune to disturbances. In addition, for optimum process control in many industrial applications, it is indispensable to drive the load with very short switching times: the best solution is the use of solid state relays.

Gefran proposes the GTS range of power solid state relays with voltage zero crossing, currents from 10A to 120A, and rated voltages of 230Vac and 480Vac.

Versions with TRIAC and with double SCR are available.

All models are designed to guarantee operation at rated currents, with continuous driving of power at 40°C working temperature.

**For less critical operating conditions, you can use the products beyond rated currents (using the dissipation curves as reference).**

Various accessories are available, such as the attachment for panel fastening, fuses and fuse holders.

#### TECHNICAL DATA

##### General features

Category of use: AC1  
 Rated working voltage  
 - 230Vac (max. range 24...280Vac)  
 - 480Vac (max. range 24...530Vac)  
 Rated frequency: 50/60Hz  
 Non-repetitive voltage:  
 • 500Vp for model with rated voltage 230Vac  
 • 1200Vp for model with rated voltage 480Vac  
 Switching voltage for zero: < 20V  
 Activation time: = 1/2 cycle  
 Deactivation time: = 1/2 cycle  
 Potential drop at rated current: = < 1.4Vrms  
 Power factor = 1

##### Control inputs

Max. input: < 10mA @32V  
 Max. reverse voltage: 36Vdc

##### GTS –T10/T20/T25 (TRIAC version)

Control voltage: 5...32Vdc  
 Activation voltage: > 4.2Vdc  
 Deactivation voltage: < 2Vdc

##### GTS 15 ... 120A (versione SCR)

Control voltage: 6...32Vdc  
 Activation voltage: > 5.1Vdc  
 Deactivation voltage: < 3Vdc

#### OUTPUTS

##### GTS –T10 (TRIAC version)

Rated current: 10 A@40°C in continuous service  
 Non-repetitive overcurrent t= 20 ms: 30A  
 I<sup>2</sup>t for blowout: 72A<sup>2</sup>s  
 dV/dt critical with output deactivated: 500V/μs

##### GTS –T20 (TRIAC version)

Rated current: 20 A@40°C in continuous service  
 Non-repetitive overcurrent t=20 ms: 50A  
 I<sup>2</sup>t for blowout: 315A<sup>2</sup>s  
 dV/dt critical with output deactivated: 500V/μs

##### GTS –T25 (TRIAC version)

Rated current: 25 A@40°C in continuous service  
 Non-repetitive overcurrent t=20 ms: 50A  
 I<sup>2</sup>t for blowout: 315A<sup>2</sup>s  
 dV/dt critical with output deactivated: 500V/μs

##### GTS 15 (SCR version)

Rated current: 15 A@40°C in continuous service  
 Non-repetitive overcurrent t=20 ms: 400A

$I^2t$  for blowout:  $\leq 450A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 25 (SCR version)**

Rated current: 25 A@40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
400A

$I^2t$  for blowout:  $\leq 645A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 40 (SCR version)**

Rated current: 40 A@40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
600A

$I^2t$  for blowout:  $\leq 1010A^2s$   
dV/dt critical with output deactivated:  
1000 V/ $\mu s$

#### **GTS 50 (SCR version)**

Rated current: 50 A@ 40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
1150A

$I^2t$  for blowout:  $\leq 6600A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 60 (SCR version)**

Rated current: 60 A@ 40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
1150A

$I^2t$  for blowout:  $\leq 6600A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 75 (SCR version)**

Rated current: 75 A@ 40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
1300A

$I^2t$  for blowout:  $\leq 8000A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 90 (SCR version)**

Rated current: 90A@ 40°C in  
continuous service  
Non-repetitive overcurrent  $t=20$  ms:  
1500A

$I^2t$  for blowout:  $\leq 11200A^2s$   
dV/dt critical with output deactivated:  
1000V/ $\mu s$

#### **GTS 120 (SCR version)**

Rated current: 120A@ 40°C in  
continuous service (complete with fan  
and standard thermostat)  
Non-repetitive overcurrent  $t=20$  ms:  
1500A

$I^2t$  for blowout:  $\leq 11200A^2s$

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

#### **Isolation**

Rated isolation voltage  
input/output:  
2500VAC rms TRIAC version  
4000VAC rms SCR version

#### **Ambient conditions**

• **Working temperature:**  
da 0 a 80°C (according to  
dissipation curves)

• **Max. relative humidity:**  
50% at 40°C

• **Max. installation altitude:**  
2000m asl

• **Pollution level :** 3

• **Storage temperature:** -20..+85°C

#### **Installation notes**

Use the high-speed fuse specified  
in the catalog according to the  
connection example given.

- Applications with solid state power  
units must also include an automatic  
safety switch to cut out the load  
power line.

For maximum reliability, it is essential  
to install the device correctly in the  
panel in order to have adequate heat  
exchange between the sink and the  
surrounding air by natural  
convection.

Install the device vertically (max. 10°  
inclination to vertical axis)

- Vertical distance between a device  
and panel wall >100mm
- Horizontal distance between a  
device and 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.

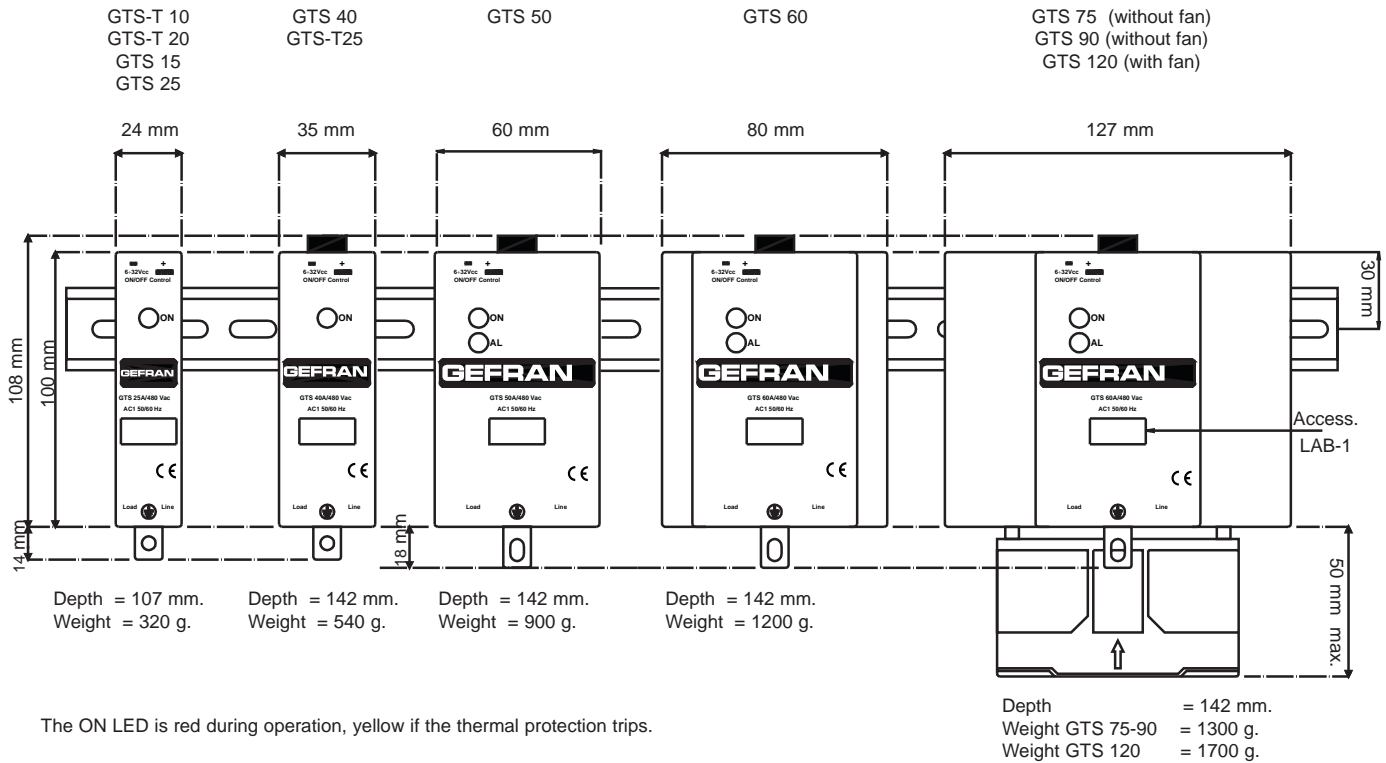
Make sure that the cable channels  
do not reduce such distances; if so,  
install the groups cantilevered to the  
panel so that air can flow  
vertically on the heat sink  
without obstructions.

#### **Limits of use**

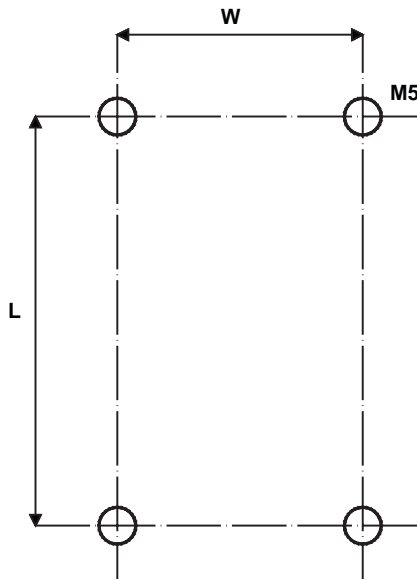
- dissipation of thermal power of  
device with restrictions on  
temperature of installation site.

- requires exchange with outside air  
or an air conditioner to transfer  
dissipated power outside the panel.
- installation restrictions (distances  
between devices to guarantee  
dissipation by natural convection)
- max. voltage limits and derivative  
of transients in line, for which the  
solid state unit has internal protection  
devices (depending on model).
- presence of dispersion current  
< 3mA for SCR version GTSs and  
< 4mA 4mA for Triac version GTSs.  
(max. value with rated voltage  
and junction temperature of 125°C).

## DESCRIPTION OF FACEPLATE / DIMENSIONS AND MOUNTING MEASUREMENTS



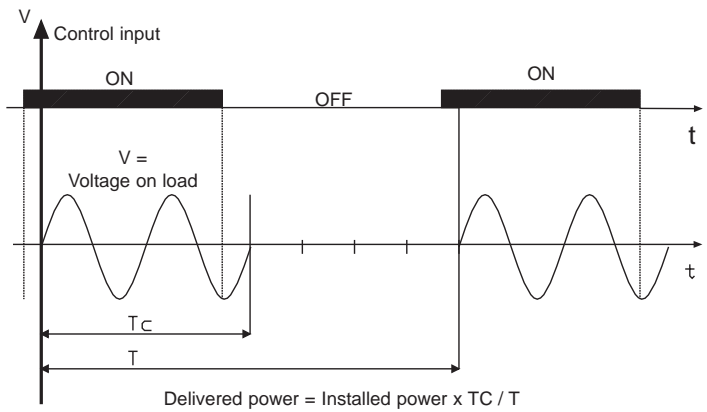
## TEMPLATE DIMENSIONS



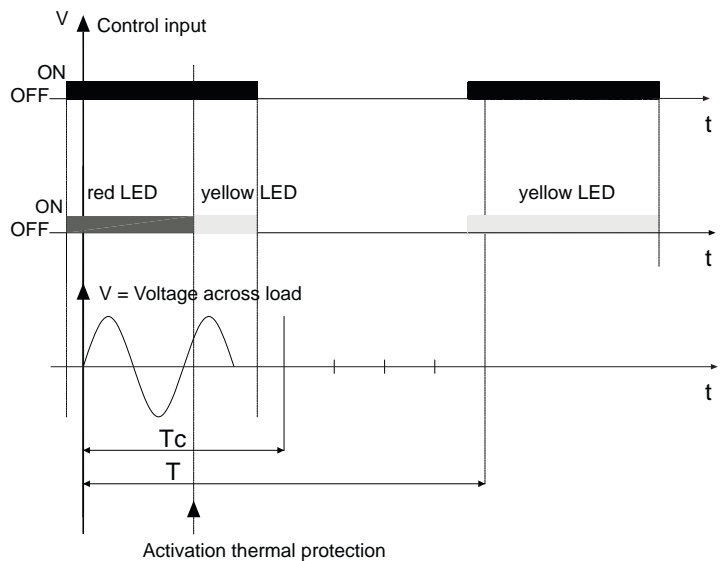
	L(mm)	W(mm)
GTS 15-25 GTS-T 10-20	112	0
GTS 40 GTS-T 25	112	25
GTS 50-60	112	44
GTS 75-90-120	112	113

## TYPE OF OPERATION

### Control from logic output in voltage

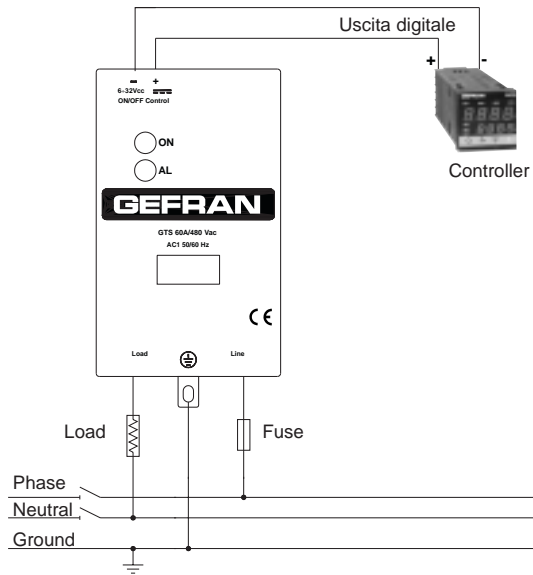


### GTS thermal protection

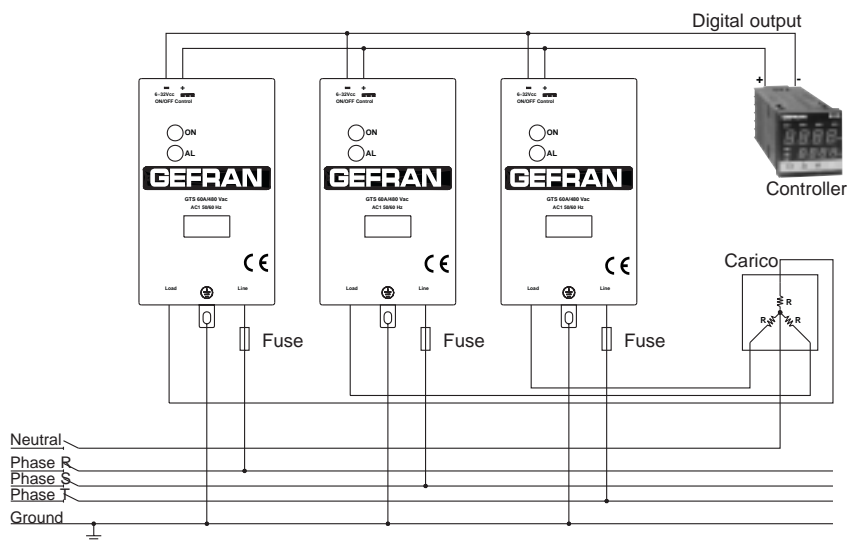


## CONNECTION EXAMPLES

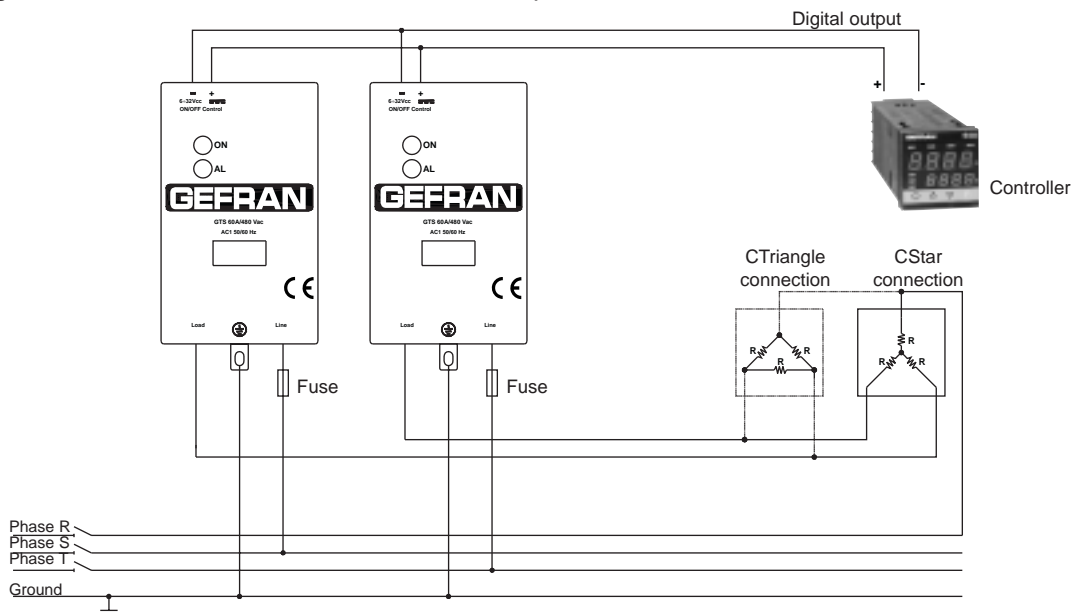
### Single-phase connection



### Three-phase Star connection with neutral



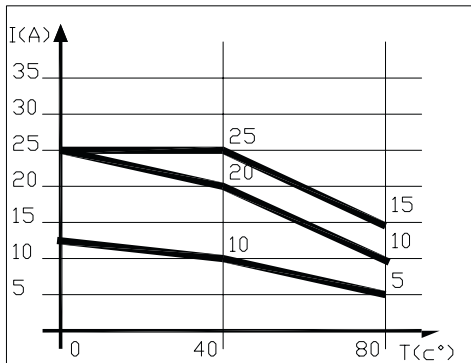
### Three-phase Triangle or Star connection without neutral on two phases



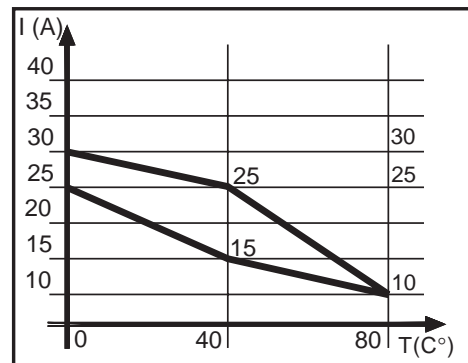
## DISSIPATION CURVES

Curves of rated current according to room temperature.

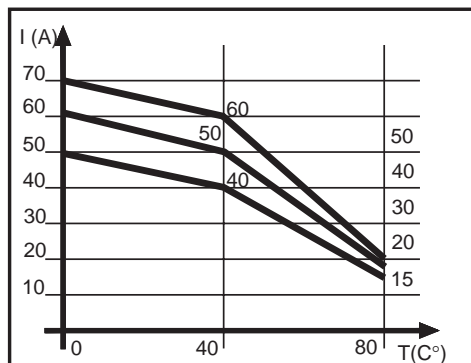
### GTS-T



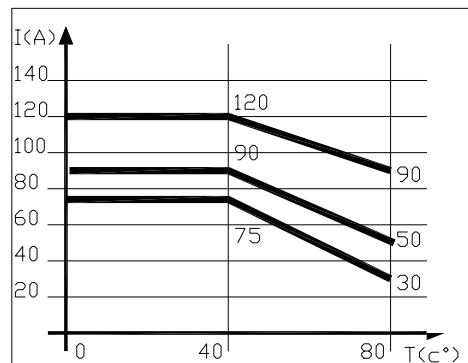
### GTS 15 - 25



### GTS 40 - 50 - 60



### GTS 75 - 90 - 120



N.B.: Curves for the GTS 120 refer to the device complete with standard running.

## TABLE OF TERMINALS AND CONDUCTORS

Size	CONTROL TERMINAL			POWER TERMINAL			GROUND TERMINAL •	
	Contact area (WxD) screw type	Type of pre-isolated terminal	Max section. ** conductor tightening torque	Contact area (WxD) screw type	Type of pre-isolated terminal	Max section. ** conductor tightening torque	Contact area (WxD) screw type	Max section. ** conductor tightening torque
10/15/20A	6,4x9 M3	Eye/fork/ Faston type conn*	6mm <sup>2</sup> 0.6Nm Max	6,4x9 M3	Eye/fork/ conn tipo Faston*	6mm <sup>2</sup> 0.4-0.6 Nm	9x12 M5	6mm <sup>2</sup> 1.3-1.8 Nm
25A (GTS)	6,4x9 M3	Eye/fork/ Faston type conn*	6mm <sup>2</sup> 0.6Nm Max	6,4x9 M3	Eye/fork	6mm <sup>2</sup> 0.4-0.6 Nm	9x12 M5	6mm <sup>2</sup> 1.3-1.8 Nm
40A	6,3x9 M3	Eye/fork/ tip	2.5mm <sup>2</sup> 0.6Nm Max	12x12 M5	Eye/fork	16mm <sup>2</sup> 1.5-2.2 Nm	11,5x12 M5	16mm <sup>2</sup> 1.5-2.2 Nm
25A(GTS-T)	6,3x9 M3	Eye/fork/ tip	2.5mm <sup>2</sup> 0.6Nm Max	16x18 M6	Eye/fork	50mm <sup>2</sup> 3.5-6 Nm	14x16 M5	50mm <sup>2</sup> 1.8-2.5Nm
50/60A	6,3x9 M3	Eye/fork/ tip	2.5mm <sup>2</sup> 0.6Nm Max	16x18 M6	Eye/fork	50mm <sup>2</sup> 3.5-6 Nm	14x16 M5	50mm <sup>2</sup> 1.8-2.5 Nm
75-90A	6,3x9 M3	Eye/fork/ tip	2.5mm <sup>2</sup> 0.6Nm Max	16x18 M6	Eye/fork	50mm <sup>2</sup> 3.5-6 Nm	14x16 M5	50mm <sup>2</sup> 1.8-2.5 Nm
120A	6,3x9 M3	Eye/fork/ tip	2.5mm <sup>2</sup> 0.6Nm Max	16x18 M6	Eye/fork	50mm <sup>2</sup> 3.5-6 Nm	14x16 M5	50mm <sup>2</sup> 1.8-2.5 Nm

(\*) Female faston (for insertion, remove the M3 screw by making the nut re-enter the seat in the holder)

(\*\*)The max. sections specified refer to unipolar copper wires isolated in PVC..

- Note: For the ground terminal, you have to use an eye wire terminal.  
(WxD) = Width x depth

## ACCESSORIES

A wide range of accessories is available (including fuses and fuse holders, heat sinks, ID plates and thermostats).

To choose accessories, see the section "Solid state relays - Accessories."

## ORDER CODE

<b>Model</b>	
Version with TRIAC	<b>GTS-T</b>

<b>Rated current</b>	
10Aac	<b>10</b>
20Aac	<b>20</b>
25Aac	<b>25</b>

<b>Rated voltage</b>	
230Vac	<b>230</b>

<b>Model</b>	
Version with double SCR	<b>GTS</b>

<b>Rated current</b>	
15Aac	<b>15</b>
25Aac	<b>25</b>
40Aac	<b>40</b>
50Aac	<b>50</b>
60Aac	<b>60</b>
75Aac	<b>75</b>
90Aac	<b>90</b>
120Aac	<b>120</b>

<b>Rated voltage</b>	
230Vac	<b>230</b>
480Vac	<b>480</b>

<b>Fan (for mod.120A only)</b>	
fan 80x80x40 230V 14W	<b>VEN-90</b>
fan 80x80x40 115V 14W	<b>VEN-91</b>
fan 80x80x25 24Vdc 4W *	<b>VEN-92</b>

\* Accessory for GEFLEX mod. GFX-\*\*\* 120/480 only

Please contact GEFTRAN personnel for information on availability of codes.

## •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 GTS group in the electrical panel containing the GTSs.
- respect the indicated dissipation curves

**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:** GEFRAN 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.

	Conformity <b>C/CSA/US</b> certificate nr. LR188658-1345925 (upon request)
	This device conforms to European Union Directive 89/336/CEE and 73/23/CEE as amended with reference to generic standards: <b>CEI-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).