GTS-T 10 / 20; GTS 10 / 20 / 40 / 60 / 90 / 120A

POWER SOLID STATE RELAYS WITH LOGIC CONTROL

Main applications

- *Plastics extrusion lines and injection moulding machines*
- *Packaging machinery*
- *Polymerization plant for synthetic fibre production*
- *Rubber moulding machinery*
- *Driers for ceramics and components for the building industries*
- *Chemical and pharmaceutical industries*
- *Furnaces and industrial ovens*
- *Food processing plants*

Main features

- *Logic drive signal*
- *Zero-crossing switching.*
- *TRIAC and 2 SCR in antiparallel versions.*
- *LED on-state indicator*
- *Overtemperature indicator (optional)*
- *MOV (varistor)*
- *Panel mounting (standard); DIN rail mounting (optional)*

GENERAL

The insertion and disinsertion of an electrical load requires the use of a suitable switching device and protection that is safe and immune to interference.
Many industrial applications require the load to be activated with very short switching times in order to maintain accurate control.
The solution is to use solid-state relays.
Gefran offers a range of solid state relay units, GTS, with current ratings between 10A and 120A and nominal voltages of 230Vac, 400Vac and 480Vac.
According to the type of load, there are Triac versions, for purely resistive loads, and double SCR versions that can be used for partially inductive loads.
All models have been designed to guarantee continuous operation at the full current rating in an ambient temperature up to 40°C.
For less critical operations, it is possible to use the products at currents greater than their nominal rating (refer to the heat dissipation curves).
The units offer optional DIN rail mounting, overtemperature indication (for temperatures > 90-100°C), fuses and fuseholders.

TECHNICAL DATA

General features
Nominal voltage
- 230Vac (max. range 24...280Vac)
- 400Vac (max. range 24...440Vac)
- 480Vac (max. range 24...530Vac)

Nominal frequency: 50/60Hz
Non-repetitive voltage: 1000Vp
(500Vp for the models with nominal voltage 230)
Zero switching voltage:
< 20V
Energising response time: ≤ 1/2 cycle
Disenergising response time: ≤ 1/2 cycle
Voltage drop at nominal current: ≤ 1,6V
Power factor: ≥ 0,5@400Vrms
(1 for TRIAC models)

Inputs
Control voltage range: 6...32Vdc
Turn ON voltage: >5Vdc
Turn OFF voltage: <3Vdc
Max. assorbimento: 15mA@32V
Reverse voltage: ≤10Vdc

OUTPUTS

GTS - T 10 (TRIAC version)
Nominal current: 10 A@40°C
Non-repetitive overcurrent t=20 ms: 30A
I^2t for fusing: $72A^2s$
Critical dV/dt OFF-state:
500V/µs

GTS - T 20 (TRIAC version)
Nominal current: 20 A@40°C
Non-repetitive overcurrent t=20 ms: 50A
I^2t for fusing: $200A^2s$
Critical dV/dt OFF-state:
500V/µs

GTS 10 (SCR) version
Nominal current: 10 A@40°C
Non-repetitive overcurrent t=20 ms:
400A
I^2t for fusing: $800A^2s$
Critical dV/dt OFF-state:
1000V/µs

GTS 20 (SCR version)
Nominal current: 20 A@40°C
Non-repetitive overcurrent t=20 ms:
400A
I^2t for fusing: $800A^2s$
Critical dV/dt OFF-state:
1000V/µs

GTS 40 (SCR version)
Nominal current: 40 A@40°C
Non-repetitive overcurrent t=20 ms: 400A
I^2t for fusing: 800A^2s
Critical dV/dt OFF-state:
1000 V/µs

GTS 60 (SCR version)
Nominal current: 60 A@ 40°C
Non-repetitive overcurrent t=20 ms:1300A
I^2t for fusing: 8500A^2s
Critical dV/dt OFF-state:
1000 V/µs

GTS 90 (SCR version)
Nominal current: 90A@ 40°C
Non-repetitive overcurrent t=20 ms:1700A
I^2t for fusing: 15900A^2s
Critical dV/dt OFF-state:
1000 V/µs

GTS 120 (SCR version)
Nominal current: 120A@ 40°C
(Thermostat and
fans serie)
Non-repetitive overcurrent t=20 ms:1700A
I^2t for fusing: 15900A^2s
Critical dV/dt OFF-state:
1000V/µS

Insulation
Nominal insulation voltage input/output:
4000V

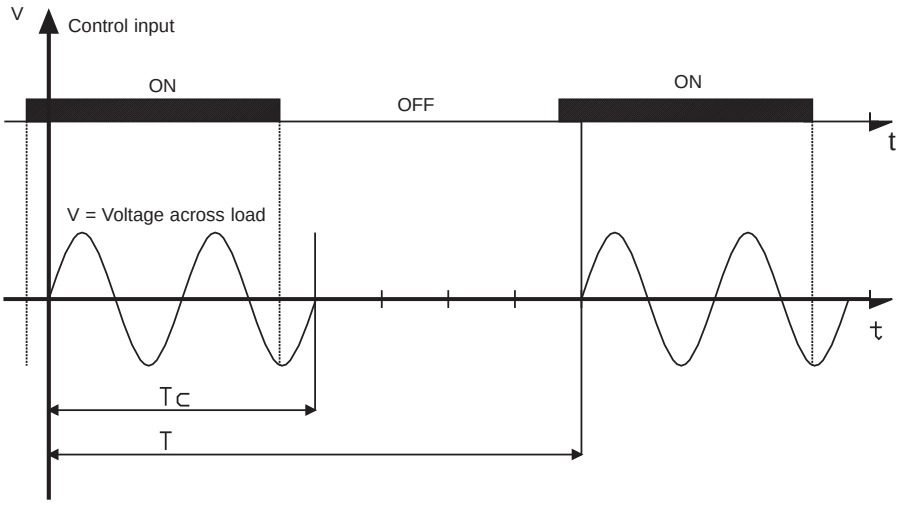
Ambient conditions
Operating temperature:
from 0 to 80°C (see “dissipation curves”).

Application notes
In order to obtain best reliability, it is important to install a heatsink correctly inside the panel, to reach an adequate thermal exchange between the device and the surrounding air in natural convection conditions.
Mount it vertically (max. 10° dinclination from the vertical axis)
• Vertical distance between two heatsinks >200mm
• Horizontal distance between two heatsinks >20mm

Main use limits
• Dissipation of thermic power on the relay with restraints on the ambient temperature of the installation.
• Equip the cabinet with an external air change or air-condition it, to put out dissipated power.
• Installation restraints (distances to be respected to grant dissipation with natural convection)
• Line transistor max. voltage and derivative limits, for which the solid state relay is equipped with inside safety devices.
• Leakage current (about 2mA) caused by thyristor, about 20mA for RC filter.

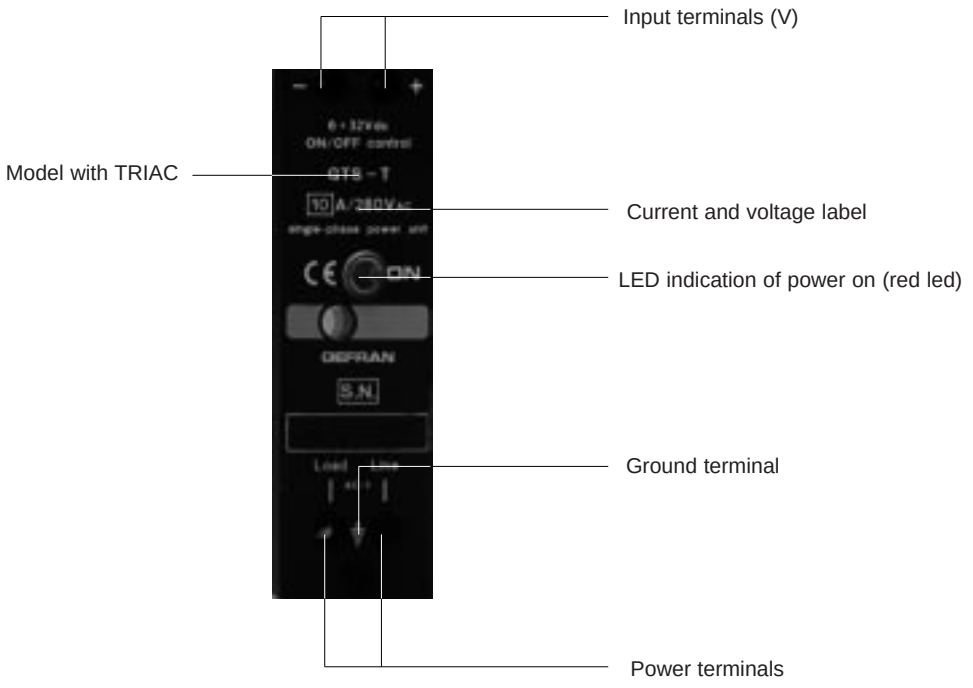
TIPOLOGY OF OPERATION

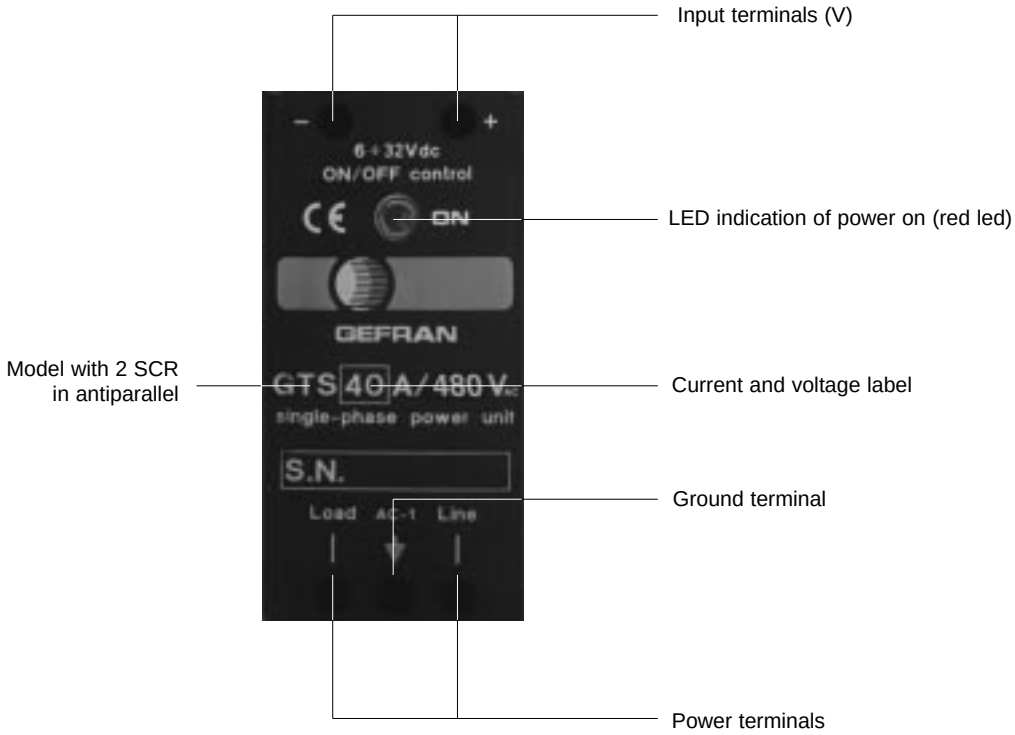
Logic input signal



Power out = Installed power TC / T

FACEPLATE DESCRIPTION



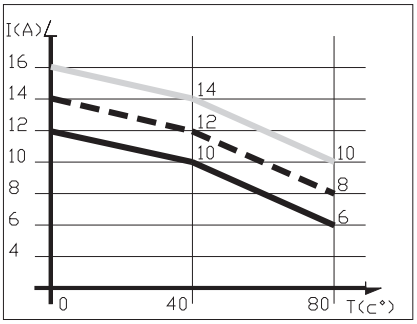


Grade of protection IP10

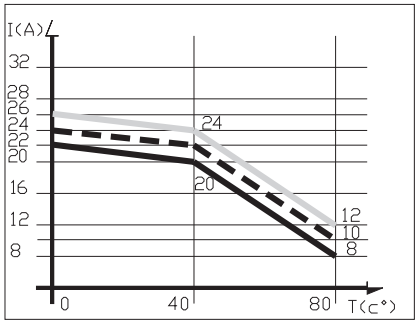
DISSIPATION CURVES

Curves showing the nominal current as a function of the temperature and of the “duty cicle” of the drive signal (duty cicle = (conduction time x 100)/ cycle time) of the control (control ouptut percentage requested by the system).

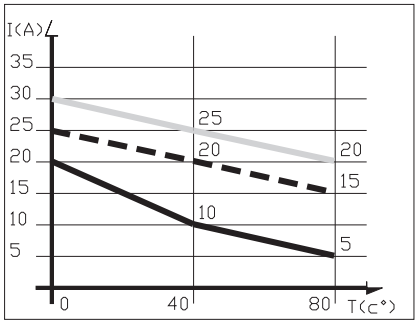
GTS-T 10



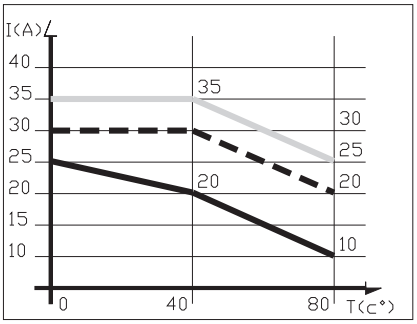
GTS-T 20



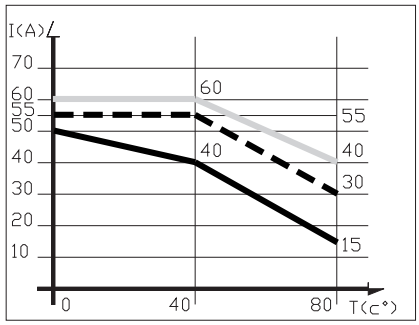
GTS 10



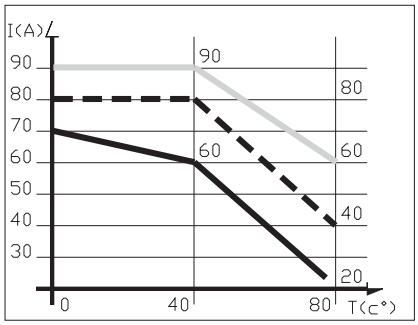
GTS 20



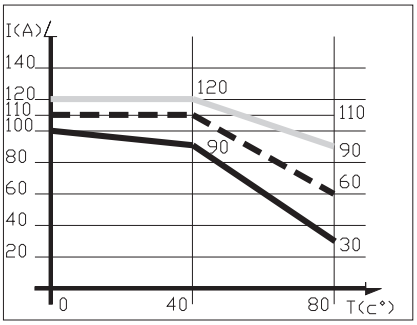
GTS 40



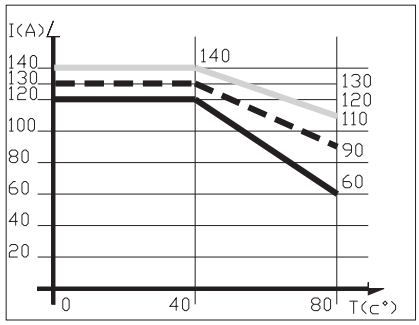
GTS 60



GTS 90



GTS 120



Legend:

= duty cicle 100%

= duty cicle ≤ 50%

= duty cicle ≤ 25%

THERMAL DUTY:

Pds = 1.6 x Irms (W)

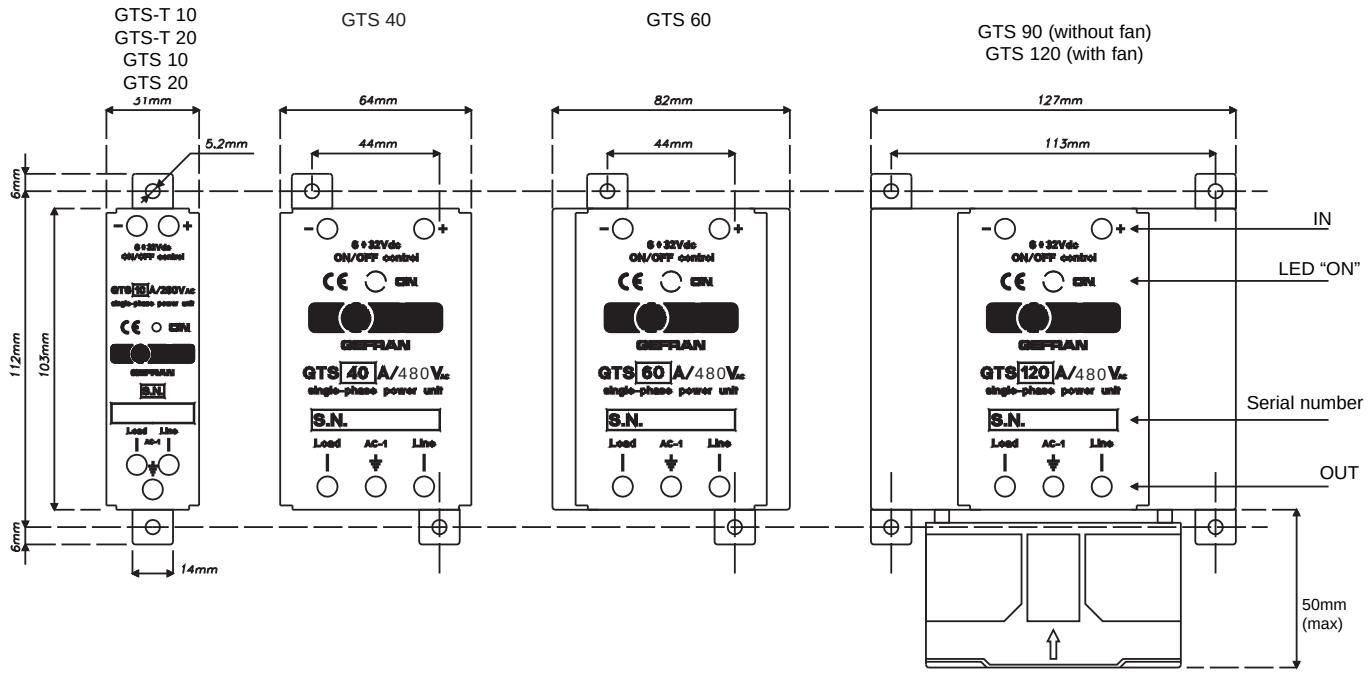
Irms = Nominal current of the single-phase load

N.B.: Graph refers to a device complete with working component fan (GTS 120).
The curves are referred to a cyle time less than or equal to 5 seconds

TABLE FOR TERMINAL CHOICE OF POWER TERMINAL BOARD

Size	Ø terminal eyelet	Suggested conductor section
10A	3mm	4mm²
20A	3mm	6mm²
40A	5mm	10mm²
60A	5mm	16mm²
90A	5mm	25mm²
120A	5mm	35mm²

DIMENSIONS AND CUT-OUT



depth = 64mm (*)
weight = 300g

depth = 112mm (*)
weight = 800g

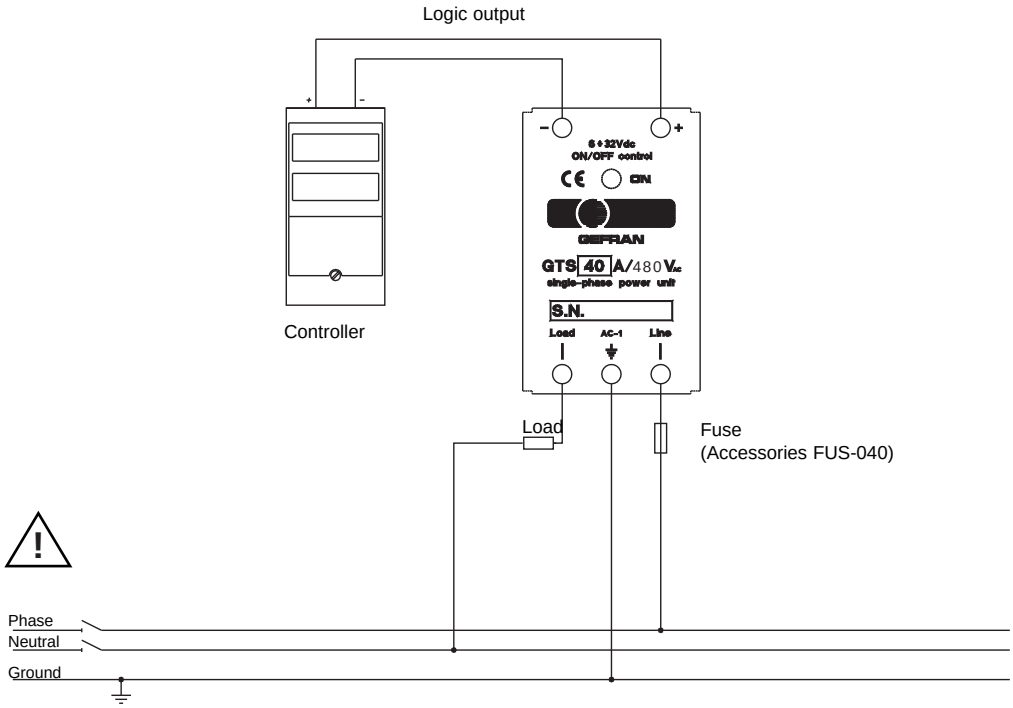
depth = 132mm (*)
weight = 1100g

depth = 132mm (*)
weight GTS 90 = 1300g
weight GTS 120 = 1800g

(*) with DIN rail mounting add. 15mm.

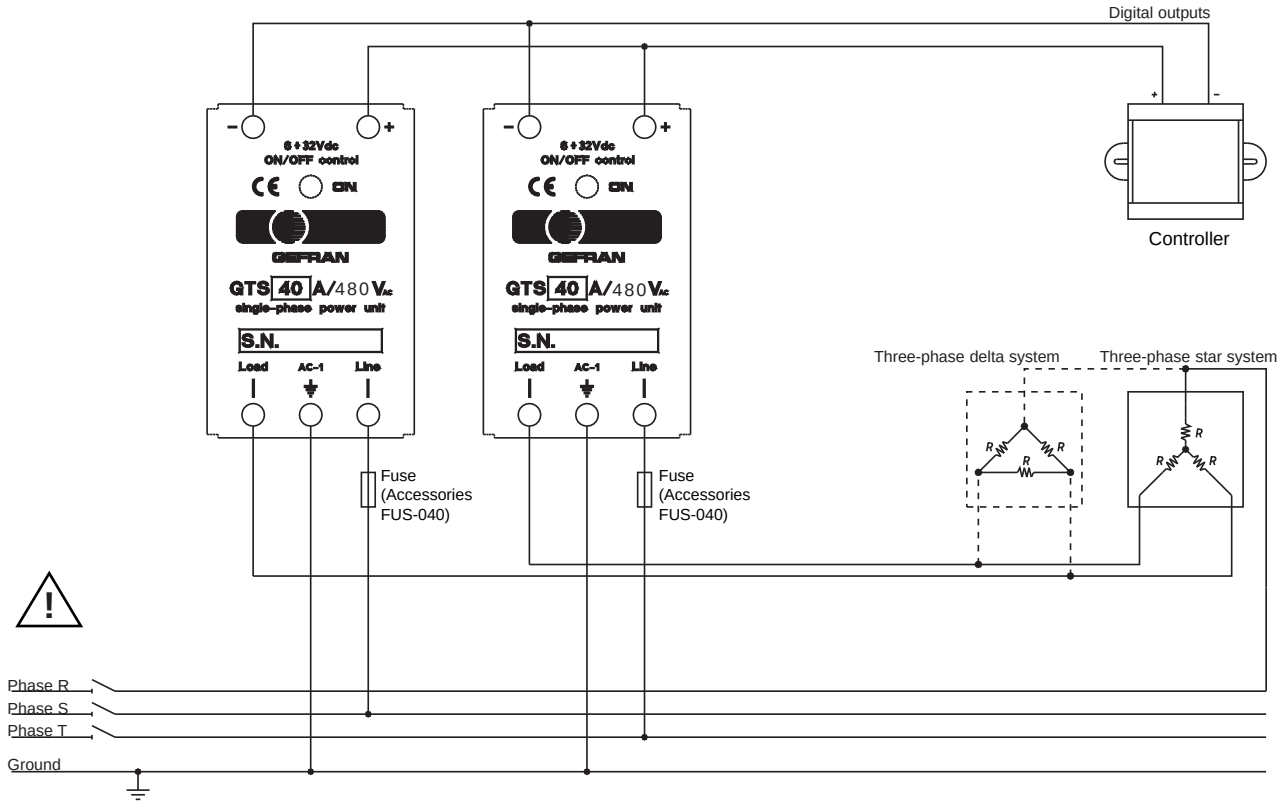
CONNECTION DIAGRAM

Single-phase connection for GTS-T, GTS

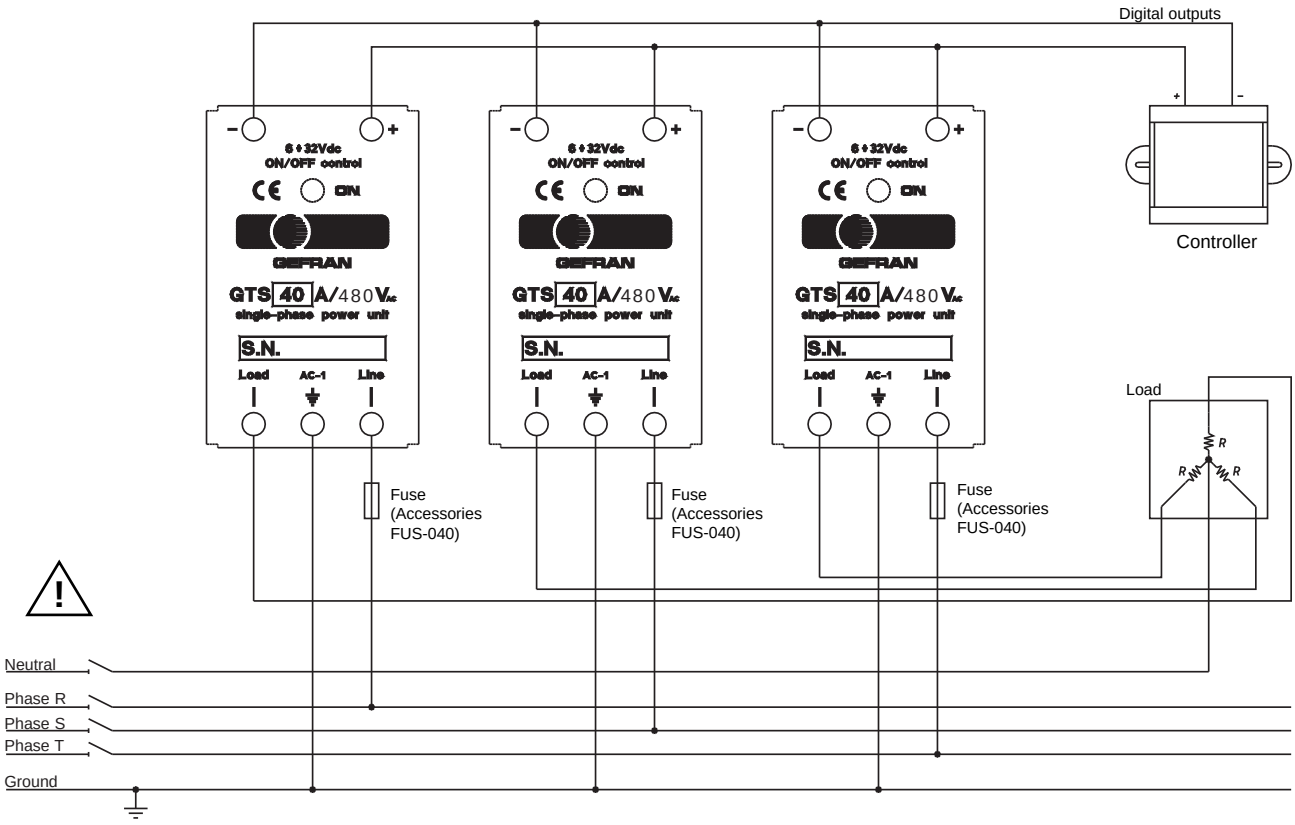


CONNECTION DIAGRAM

Star or delta three-phase without neutral, with control of two phases



Three-phase star connection with neutral



ACCESSORIES

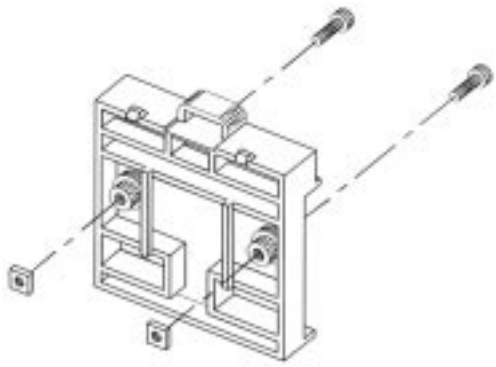
• Extrarapid fuses

Model GTS, GTS-T	*Order code (fuse)*
- GTS-T 10	FUS-010 (10x38mm)
- GTS-T 20	FUS-025 (14x51mm)
- GTS 10	FUS-012 (10x38mm)
- GTS 25	FUS-025 (14x51mm)
- GTS 40	FUS-040 (14x51mm)
- GTS 60	FUS-080 (22x58mm)
- GTS 90	FUS-100 (22x58mm)
- GTS 120	FUS-125N (100x51x30mm)

• Fuse holder

Order code (fuse holder)

- PF - 10x38	(for FUS-010, FUS-012, FUS-014)
- PF - 14x51	(for FUS-030 and FUS-040)
- PF - 22x58	(for FUS-080 and FUS-100)
- PF - DIN	(for FUS-125N)



• DIN rail mounting

Order code

- DIN-3 (for GTS 40, GTS 60, GTS 90, GTS 120)

• DIN rail mounting

Order code

- DIN-2 (for GTS-T 10, GTS-T 20, GTS 10, GTS 20)

• MOV (varistor)

Order code

- RV03 (for GTS-T)

• Overtemperature indication

Order code

- VIR-1 (for only models)

ORDER CODE

GTS-T [ ] / [ ]

Model	
Version withTRIAC	**GTS-T**

Nominal current	
10Aac	**10**
20Aac	**20**

Nominal voltage	
230Vac	**230**

GTS [ ] / [ ]

Model	
Version with double SCR	**GTS**

Nominal current	
10Aac	**10**
20Aac	**20**
40Aac	**40**
60Aac	**60**
90Aac	**90**
120Aac	**120**

Nominal voltage	
230Vac (*)	**230**
400Vac	**400**
480Vac	**480**

(*) only 10A and 20A models

•WARNINGS

WARNING: this symbol indicates danger.

Before installation, please read the following advices:
• follow the indications of the manual scrupulously when making the connections to the instrument.
• use a cable that is suitable for the ratings of voltage and current indicated in the technical specifications.
• if the instrument is used in applications where there is risk of injury to persons and damage to machines or materials, it is essential that it is used with an auxiliary alarm device.
It is advisable to verify frequently that the alarm device is functional even during the normal operation of the equipment.
• The instrument must NOT be used in environments where there could be the presence of dangerous atmospheres (inflammable or explosive).
• 100°C degrees can be reached by the heatsink when working continuously: contact with people or electrical cables are about ventilation and air-conditioning systems.
• before working on power devices, disconnect cabinet supply voltage.
•DO NOT open the cover if device is “ON”!
Installation:
• connect the device to the ground using the proper ground terminal.
• the power supply wiring must be kept separate from that of inputs and outputs of the instrument; always check that the supply voltage corresponds to that indicated on the instrument cover.
• keep away from dust, humidity, corrosive gases and heat sources.
• please follow installation distances advice (in order to allow generated heat dissipation).
Maintenance: periodically check the state of cooling fans and clean the ventilation filters.
Repairs must be carried out only by trained and specialised personnel. Remove the power to the instrument before accessing the internal parts.
DO NOT clean the case with solvent (trichlorethylene, petrol, etc.). The use of such solvents can have adverse effects on the mechanical reliability of the instrument. To clean the plastic case please use a clean cloth with ethilic alcohol or water
Service: GEFRAN has a service department. The guarantee excludes defects caused by usage that does not conform to the instructions.

GEFRAN spa reserves the right to make any kind of design or functional modification at any moment without prior notice

N.B.: This data sheet should be used as user manual

CE

In conformity to ECC 89/336/CEE and 73/23/CEE with reference to standards:
- EN 50082-2 (immunity in industrial enviroment)- **EN 50081-1** (emission in residential enviroment) - **EN 61010-1** (safety)

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