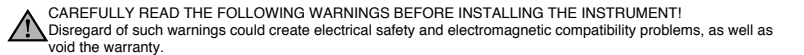


 This section contains the instructions needed for correct installation of GTF controllers on the machine/host system control panel and for correct connection of the power supply, inputs, outputs and interfaces.



• the controller DOES NOT have an On/Off switch: the user must install switch/isolator conforming to safety requisites (CE mark) to cut off the power supply up-line of the controller. The switch must be installed in the immediate vicinity of the controller in easy reach of the operator. A single switch can be used for multiple devices.

- * the earth connection must be made with a specific lead
- * if the product is used in applications with risk of harm to persons or damage to machines or materials, it **MUST** be equipped with auxiliary alarm devices.

It is advisable to provide the ability to check for tripped alarms during regular operation.

CE MARKING: EMC (electromagnetic compatibility) conformity in compliance with Directive 2014/30/EU and following modifications.

Series GTF controllers are mainly intended for industrial use, installed on panels or control panels of production process machines or systems.

For purposes of electromagnetic compatibility, the most restrictive generic standards have been adopted, as shown on the table.

LV (low voltage) conformity in compliance with Directive 2014/35/EU.

EMC conformity has been verified with the connections indicated on table 1 (see user's manual).

Instrument power supply

- The power supply for the electronic instrumentation on the panels must always come directly from a cut-off device with fuse for the instrument part.
 - Electronic instrumentation and electromechanical power devices such as relays, contactors, solenoids, etc., MUST ALWAYS be powered by separate lines.
- When the power supply line of electronic instruments is heavily disturbed by switching of thyristor power groups or by motors, you should use an isolation transformer only for the controllers, grounding its sheathing.
- It is important for the system to be well-grounded:
 - voltage between neutral and ground must not be $> 1\text{ V}$
 - Ohmic resistance must be $< 6\Omega$;
 - If the grid voltage is highly unstable, use a voltage stabilizer.
- In proximity of high-frequency generators or arc welders, use adequate grid filters.
- The power supply lines must be separate from instrument input and output lines.
 - Supply from Class II or from limited energy source.



Before connecting or disconnecting any connection, always check that the power and control cables are isolated from voltage.

Appropriate devices must be provided: fuses or automatic switches to protect power lines.

- The fuses present in the module function solely as a protection for the GTF semiconductors.
- Connected outside circuits must be doubly isolated.

- it's necessary to:
 - physically separate the input cables from those of the power supply, outputs, and power connections.
 - use braided and shielded cables, with sheathing grounded at a single point.

Use the extra-rapid fuse indicated in the catalogue according to the connection example equipped.

- Moreover, the applications with solid-state units require a safety automatic switch to section the load power line. To ensure maximum reliability, the device must be correctly installed in the panel in such a way as to obtain adequate heat exchange between the heat sink and the surrounding air under conditions of natural convection.

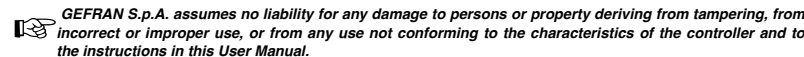
Fit the device vertically (maximum angle 10° to the vertical axis)







- Vertical distance between a device and the panel wall >100mm
- Horizontal distance between a device and the panel wall at last 20mm
- Vertical distance between a device and the next one at last 300mm.
- Horizontal distance between a device and the next one at last 20mm.

Check that the cable holder runners do not reduce these distances, in this case fit the cantilever units opposite the panel so that the air can flow vertically on the dissipator without any obstacles.

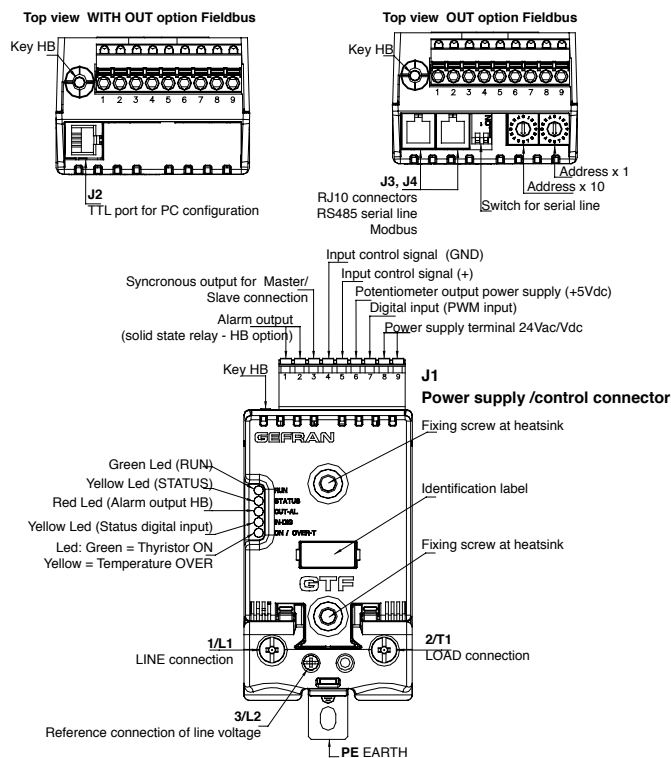
- Dissipation of device thermic power with effects on installation room temperature.
- Thermal power dissipation with limits on installation room temperature.
- Requires exchange with external air or an air conditioner to transfer dissipated power outside the panel
- maximum limits of voltage and derived power of transients on the line, for which the solid state power unit contains protective devices (based on the model).
- presence of dispersion current in GTF in non-conducting state (current of a few mA due to RC Snubber circuit to protect the thyristor).
- Suitable for use on a circuit capable of delivering not more than 100,000A RMS Symmetrical Amperes, 600 Volts maximum when protected by class J fuses rated xxxA. (Refer to the "SCCR fuse protection table this report for the details of the current size fuses for each model)
- Use fuses only.

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 shock, 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.



	Conformity TC RU C-IT, A132 B.00422
	Conformity C/CSA/US CoFC no. 70002856
	The device are manufactured according with the Community Directives 2011/65/EU (RoHS) 2014/30/EU (EMC), 2014/35/EU (LVD) in reference to product standard: EN 50581-2012 e EN 60947-4-3:2014
	Conformity C/UL/US File no. E243386 vol. 1 sez. 5
	Only for models 200A, 250A - 480V and 600V with or without fuse. Model 120A in combination fuse
	Only for 480-600V models This device conforms to TUV with reference to: EN 60947-4-3

CONNECTIONS INPUT/OUTPUT GTF 25-120A



Low view
WITHOUT option RS485 serial line

2/T1 "Load" connection
Protection fan
J5 Configuration TTL port

WITH option RS485 serial line

2/T1 "Load" Connection
Dip Switch serial line
J6, J7 RJ10 connector serial RS485 Modbus

Top View

n.c. 3/L2 (Ref. V_Line)
J8 Line voltage connector
Protection fan
1/L1 "Line" Connection

Bottom View

J8 Line voltage connector
1/L1 "Line" Connection
Screw front cover (Fuse inspection)
Outputs
Supply
Status leds
Digital input
Key HB
Address Rotary Switch (optional)
Control analog input connector
2/T1 "Load" Connection

J1

- HB OUT Switch (optional)
- OUT Master (7V)
- GND

J2

- 24 Vac/dc
- 24 Vac/dc
- Earth

J3

- n.c.
- n.c.
- +INDIG (P1M input)
- GND

J4

- OUT +5 V (Potentialometer)
- IN
- SHUNT - mA
- GND

Status leds

- RUN (Green)
- STATUS (Yellow)
- ALARMI HB (Red)
- DIAGNOSTIC (Yellow)
- ON Triacore (Green)
- OVER Temperature (Yellow)

POWER CONTROLLER



code 80324G - 06/2018 - ENG

Side 1 Installation and connection
Electrical connections

Side 2	Technical characteristics
	General characteristics
	Dimensions
	Template/Installation
	Derating curves

GEFRAN spa

via Sebina, 74 - 25050 Provaglio d'Iseo (BS)

Tel. 03098881 - fax 0309839063- Internet: <http://www.gefran.com>

RECOMMENDED WIRE GAUGES

GTF CURRENT LEVEL	TERMINAL	CABLE WIRE	WIRE TERMINAL	TIGHTENING TORQUE / TOOL
25A	1/L1, 2/T1, PE	4 mm ² 10 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
40A	1/L1, 2/T1, PE	10 mm ² 7 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
50A	1/L1, 2/T1, PE	10 mm ² 7 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
60A	1/L1, 2/T1, PE	16 mm ² 5 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
75A	1/L1, 2/T1, PE	25 mm ² 3 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
90A	1/L1, 2/T1, PE	35 mm ² 2 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
120A	1/L1, 2/T1, PE	50 mm ² 1/0 AWG	Wire terminal / Eye D. 6mm	2.5 Nm / Phillips screwdriver PH2 - PH3
-	3/L2 (Ref. Vline)	0.25 ... 2.5 mm ² 23...14 AWG	Wire terminal tip	0.5 ...0.6 Nm / Screwdriver blade 0.6 x 3.5 mm
150A	1/L1, 2/T1	70 mm ² 2/0 AWG	Wire stripped for 25 mm or with crimped pre-insulated terminal tube CEMBRE PKC70022	6 Nm / No. 6 hex head wrench
200A	1/L1, 2/T1	95 mm ² 4/0 AWG	Wire stripped for 25 mm or with crimped pre-insulated terminal tube CEMBRE PKC95025	6 Nm / No. 6 hex head wrench
250A	1/L1, 2/T1	120 mm ² 250 AWG	Wire stripped for 25 mm	6 Nm / No. 6 hex head wrench
-	3/L2 (Ref. Vline)	0.25 ...2.5 mm ² 23...14 AWG	Wire stripped for 8 mm or with tag terminal	0.5 ...0.6 Nm / Flat-head screwdriver tip 0.6 x 3.5 mm

Note:
Cables must be copper "Stranded Wire" or "Compact-Stranded Wire" type with maximum operating temperature 60/75°C

TECHNICAL CHARACTERISTICS

POWER (SOLID STATE)										
Category of use (Table 2 EN60947-4-3)	AC 51 resistive or low inductance loads - AC 55b Infrared lamps AC 56a: transformer primary in single-phase or open configuration only									
Trigger mode	PA - Load management by adjusting the firing angle (only configuration single-phase or delta open) ZC - Zero Crossing with constant cycle time (settable in range 1-200s) BF - Burst Firing with variable cycle time (GTT) optimized minimum. HSC - Half Single Cycle corresponds to Burst Firing that includes ON and OFF half-cycles. Useful for reducing flicker with short-wave IR loads (applied only to single-phase resistive or 3-phase 6-wire open delta loads)									
Feedback mode	V, V2 : Voltage feedback proportional to RMS voltage value on load (useful to compensate possible variations in line voltage)). I, I2 : Current feedback: bound to RMS current value on load to compensate variations in line voltage and/or variations in load impedance). P : Power feedback: proportional to real power value on load (useful to keep constant values of electrical power assigned regardless of load impedance or line voltage variations									
Max rated voltage	480Vac			600Vac			690Vac			
Work voltage range	90...530Vac			90...660Vac			90...760Vac			
Non-repetitive voltage	1200Vp			1600Vp			1600Vp			
Rated frequency	50/60Hz auto-determination									
Rated current AC51 -AC55b non inductive or slightly inductive loads, IR lamps (@ Tamb = 40°C)	MODEL GTF									
	25	40	50	60	75	90	120	150	200	250
	25A	40A	50A	60A	75A	90A	120A	150A	200A	250A
Rated current AC56A permitted trigger modes ZC, BF with DT (Delay Triggering), PA with softstart (@ Tamb =40 °C)	20A	32A	40A	50A	60A	75A	100A	125A	160A	200A
Non-repetitive e overcurrent (t=10msec)	400A	520A	520A	1150A	1150A	1500A	1500A	5000A	8000A	8000A
I _t for melting (t=1...10msec) A*s	450	1800	1800	6600	6600	11200	11200	125000	320000	320000
Critical Dv/dt with output deactivated	1000V/μs									
Nominal current for short circuit condition	5KA									
Held nominal voltage of to the impulse	4KV									
Diagnostics	Detection of short load circuit absence line voltage, HB alarm (partial breakage of load)									

GENERAL DATA

GENERAL DATA	
Power supply	GTF 25-120A: 24 Vac 50-60Hz / Vdc ± 25%, max 3VA GTF 150-250A: 24 Vac 50-60Hz / Vdc ± 25%, max 11VA
Power supply external fan	(only for GTF120A model) 24 Vdc ± 10%, max 200mA
Signals	5 leds: RUN: run state of CPU STATUS: operating state ALARM: state of alarm output DIGITAL INPUT: state of digital inputs ON / OVER-TEMP.: state control tirystor / Alarm for overheating
Load type and connection	Single phase load / Independent single-phase load in open delta 3-phase load / 3-phase load (star without neutral or closed triangle) with bi-fase control
Protection	IP20
Work/storage temperature	0...40°C (refer to dissipation curves) / -20 °C - +70 °C average temperature over a period of 24hour not exceeding 35° C(to EN 60947-4-3 § 7.1.1)
Relative humidity	20...85% RH non-condensing
Ambient conditions for use	indoor use, altitude up to 2000m
Installation	DIN bar EN50022 or panel with screws
Installation requirements	Installation category II, pollution level 2, double isolation (Only for >120A models) - Max temperature of air surrounding device 40°C ; for temperature >40°C refer at derating curves. - Device type: "UL Open Type"
Weight	
GTF 25, 40A	0,81 Kg
GTF 50, 60A	0,79 Kg
GTF 75, 90A	1,3 Kg
GTF 120A	1,5 Kg
GTF 150, 200, 250A	2,5 Kg Max

EMC filters are required in PA mode (Phase Angle, i.e., SSR trigger with phase angle modulation). The filter model and current level depend on the configuration and load used. The power filter **MUST** by connected as close as possible to the GTF. You can use a filter connected between the power line and GTF or an LC group connected between the GTF output and the load.

Models	EXTRARAPID FUSES				FUSEHOLDERS
	Size I ² t	Sign Format	Model Code	Power dissipation@ In	Adoption Acronym code
GTF 25	25A 390A².s	FUS-025 10x38	FWC25A10F 338474	6W	PFI-10X38 337134 R/C30A@690V
GTF 40... GTF 50...	50A 1600A².s	FUS-050 22x58	FWP50A22F 338127	9W	PFI-22X58 337223 R/C80A@600V
GTF 60...	63A 3080A².s	FUS-063 22x58	FWP63A22F 338191	11W	PFI-22X58 337223 R/C80A@600V
GTF 75...	80A 6600A².s	FUS-080 22x58	FWP80A22F 338199	14W	PFI-22X58 337223 R/C80A@600V
GTF 90...	125A 6950A².s	FUS-125N	660RF00AT125 338106	25W	PF-DIN 337092 R/C400A@1000V
GTF 120...	125A 6950A².s	FUS-125N	660RF00AT125 338106	25W	PF-DIN 337092 R/C400A@1000V
GTF 150...	200A 31500A².s	FUS-200S	DN000UB69V200 338930	19W	
GTF 200/250 480V/600V	450A 196000A².s	FUS-450S	DN00UB60V450L 338932	17W	
GTF 200/250 690V	400A 150000A².s	FUS-400S	DN00UB69V400L 338936	20W	

* SCCR RMS SYM 100KA / 600V UL508 SCCR FUSE PROTECTION TABLE	
GTF 200A 600V	Class J to up 400A
GTF 250A 600V	

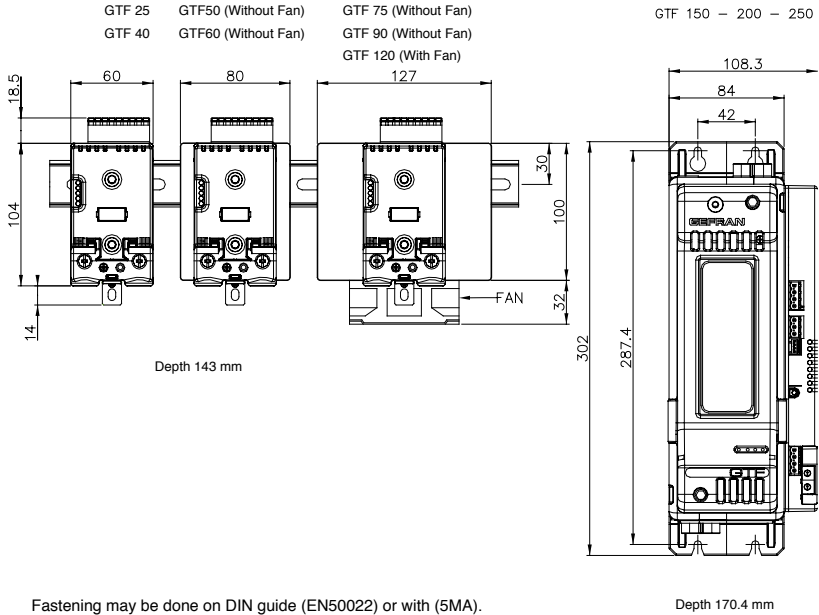
Graphic symbols

Indicates contents of sections, general instructions, notes, and other points to which the reader's attention needs to be called.

Indicates a particularly delicate situation that could affect the safety or correct operation of the controller, or an instruction that **MUST** be followed to prevent hazards.

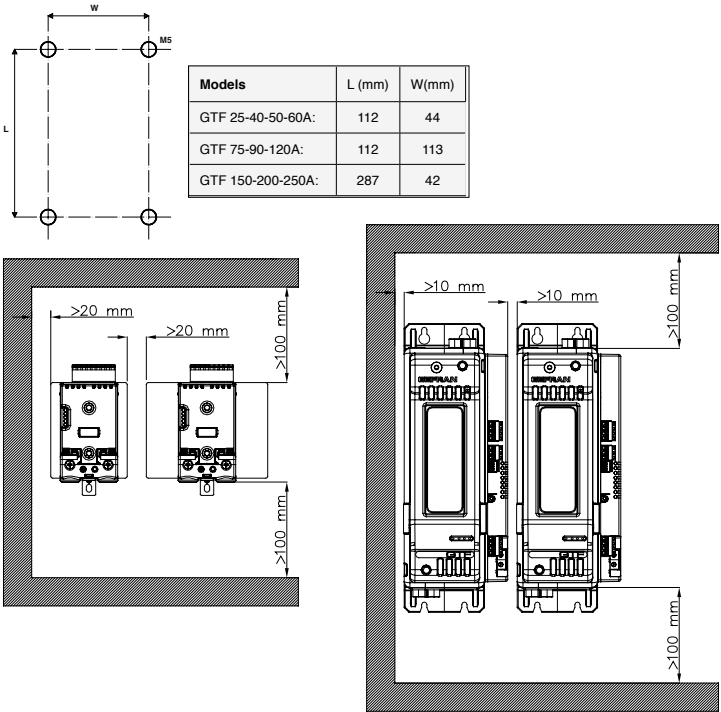
I Indicates a risk to the user's safety due to high voltage at the points indicated.

DIMENSIONS



Fastening may be done on DIN guide (EN50022) or with (5MA).
All dimensions are expressed in mm.

TEMPLATE / INSTALLATION



Attention: respect the minimum distances shown in figure to provide adequate air circulation.

DERATING CURVES

