



#### Main applications

- Packaging machines
- Packing machines
- Labelers
- Food processing lines and machines
- Laboratory machines and ovens
- Electrical heaters for industrial heating

#### Main features

- Universal input configurable from the faceplate
- Accuracy better than 0,2% f.s. at nominal condition
- Control output: relay or logic with Heat or Cool function
- 1 alarm with configurable function
- Self-tuning, Auto-tuning, Soft-start, Man/Auto function
- Possibility to configure the unit by serial line

#### PROFILE

The series 450 temperature controller, measuring 48x48mm (1/16 DIN), offers simplicity of use and high quality of control.

The input from temperature sensors is "universal" and configurable with type J, K, R, S, T, B, E, N thermocouples and with 3-wire Rt100 resistance thermometers.

The user interface has a complete double display with green LEDs, 4 keys, and two red LEDs to signal active outputs.

The Lexan® membrane on the front panel guarantees an IP65 protection level for these products.

The controller outputs, freely configurable as control output and alarm output, are available in a 5A/250VAC relay version or in a logic signal version to drive solid state relays.

The input signal read speed (120msec) and the tested PID control algorithm with selftuning and autotuning parameter functions guarantee accurate and stable control even for rapid and discontinuous heating systems.

Series 450 models are factory-configured to satisfy most industrial heating applications (input for probe J, hot PID setting,

10 second cycle time) and can always be modified from keyboard and from PC with a few parameters grouped on intuitive menus.

A programming kit for PC is available, consisting of a cable and a user-friendly program for Windows with Wizard pages, oscilloscope for process analysis, saving of parameter recipes, and ability to reset factory parameters. A settable software protection code (password-protected) lets you limit access to internal parameters to various levels, up to total protection.

#### TECHNICAL DATA

##### INPUTS

Accuracy 0,2% f.s.  $\pm 1$ digit.  
Sampling time 120msec.

##### TC - Thermocouple

**J** (Fe-CuNi) 0...1000°C / 32...1832°F  
**K** (NiCr-Ni) 0...1300°C / 32...2372°F  
**R** (Pt13Rh-Pt) 0...1750°C / 32...3182°F  
**S** (Pt10Rh-Pt) 0...1750°C / 32...3182°F  
**T** (Cu-CuNi) -200...400°C / -328...752°F  
**B** (Pt30Rh-Pt6Rh) 44...1800°C / 111...3272°F  
**E** (NiCr-CuNi) -100...750°C / -148...1382°F  
**N** (NiCrSi-NiSi) 0...1300°C / 32...2372°F

##### RTD 3-wires

**Pt100** -200...600°C / -328...1112°F

##### OUTPUTS

Outputs fully configurable for control and single alarm function.

##### Relay

With rating: 5A/250 Va.c.,  $\cos\phi=1$   
(order code: R)

##### Logic

12V (6V min 20mA)  
(order code D)

### POWER SUPPLY

(Standard) 100...240 V a.c.  $\pm 10\%$   
(Optional) 11...27 V a.c./d.c.  $\pm 10\%$   
50/60Hz, max. 10VA

### AMBIENT CONDITION

**Working temperature range:** 0...50°C

**Storage temperature range:** -20...70°C

**Humidity:** 20...85%Ur non condensing

### CONTROL

On/Off, P, PD, PID either for heating or cooling, with parameters configurable from the faceplate.

Cooling setpoint relative to heating setpoint.

- Manual reset -999...999 digit
- Power reset -100,0...100,0%
- Cycle time 0...200sec
- Soft-start 0,0...500,0 min

For each action:

- Proportional band 0,0...999,9% f.s.
- Integral time 0,0...99,99 min
- Derivative time 0,0...99,99 min
- Max power limit 0,0...100,0%

### ALARMS

- 1 alarm with setpoint settable at absolute, deviation, symmetrical deviation value compared to setpoint with direct or inverse function.
- The alarm point may be set anywhere within the configured scale.
- LBA (Loop Break Alarm) function alarm
- Alarm Hysteresis configurable

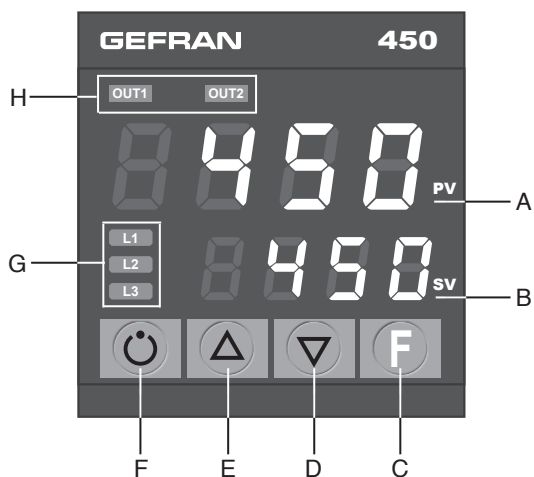
### WEIGHT

210g complete version

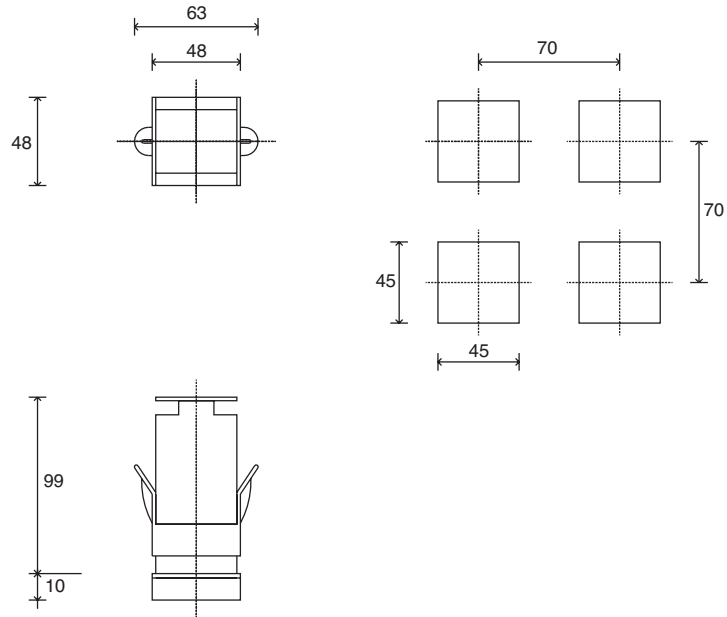
## FACEPLATE DESCRIPTION

- A** - Green coloured PV display, h 10mm
- B** - SV control setpoint display, 7 mm high green numbers
- C** - "Function" key
- D** - "Lower" key
- E** - "Raise" key
- F** - Auto / Man selection
- G** - Indication of active functions, red led
- H** - Indication of active outputs, red led

Faceplate protection IP65

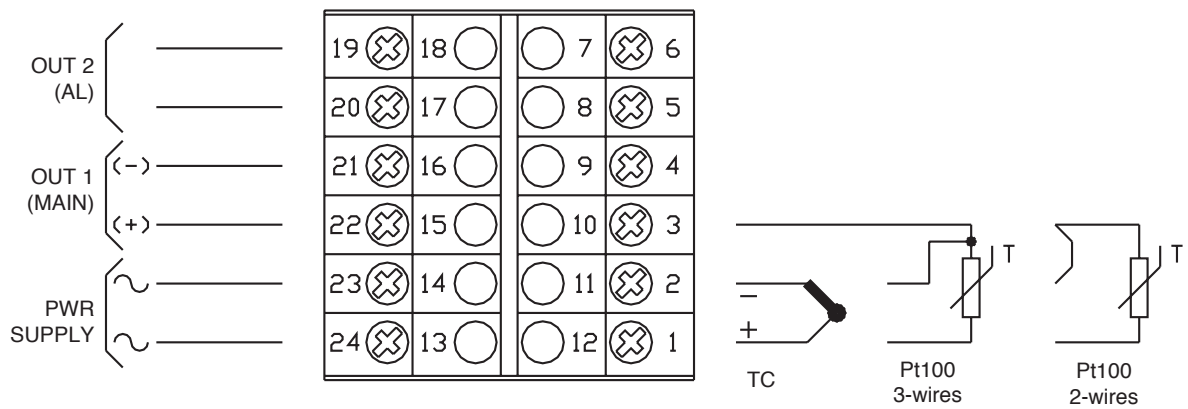


## DIMENSIONS AND CUT-OUT



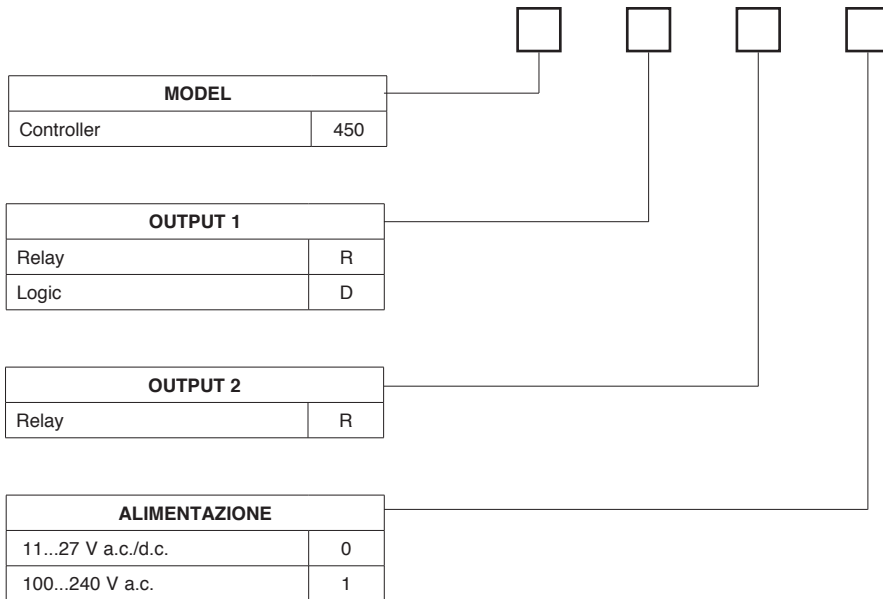
Dimensions: 48x48mm (1/16 DIN) depth 99mm

## CONNECTION DIAGRAM



 Apply user's manual warnings for a correct installation

## ORDER CODE



Model	Description	Code
450-D-R-1	1 Logic output, 1 Relay output, power supply 100...240VAC	F056773
450-R-R-1	2 Relay outputs, power supply 100...240VAC	F056774
450-D-R-0	1 Logic output, 1 Relay output, power supply 11...27VAC/DC	F056775
450-R-R-0	2 Relay outputs, power supply 11...27VAC/DC	F056776

Please, contact GEF 450 sales people for the codes availability.

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

<b>UL</b>	Conformity C/UL/US File no. E216851
<b>CE</b>	EMC: Compliance with Directive 2014/30/EU, with reference to the standard EN61326-1 LVD security: compliance with Directive 2014/35 / EU, with reference to EN 61010-1