

#### Main applications

- Industrial heat-treatment and metallurgy furnaces
- Industrial cooling plants
- Painting plants
- Driers for ceramics, paper and textile products
- Industrial heaters
- Ovens and furnaces
- Sterilizers
- Furnaces for glass

#### Main features

- Conduction inhibition input
- Overcurrent protection (DE option)
- Detection of partial load failure (RPC option)
- SCR diagnosis circuit and complete load failure (DTC option)
- Analogue signal Input control in mA and potentiometer
- Synchronization slave digital output
- Adjustable modulation cycle duration
- Zero crossing switching of mains voltage
- High capacity anti-parallel SCR double thyristor
- LED status indicators
- MOV protections (varistor)
- DIN rail or panel mounting (depending on version)

#### PROFILE

Wattcor W212 line offers a wide range of solid state power controllers with "zero crossing" switching for resistive loads with current ratings up to 600A and 660Vac nominal voltages.

The models of the W212 series accept logic commands in volts, milliamperes and from a potentiometer.

Directly on the W212 it is possible to set, using a trimmer, the cycle time which is used for the power modulation in relation to the input analogue signal.

The control of the triphase loads can be made with a W212 used as master and one or more W211 used as slaves.

Each model is equipped with a logic input to disable the solid state relay/power controller and eventually break off power supply.

Different options are available for the more critical applications, such as the "load control" (RPC option) which detects and indicates partial load failure interruption/cut-off, with a LED on the faceplate, and a relay alarm output.

The DTC option allows the control of a possible SCR short-circuit or the complete current failure in the load.

A further safety option is represented by

the "electronic cut-off" circuit, (DE option), a device protecting the power element against a momentary excess current higher than a selected value, corresponding to approx. 13 times the nominal current of the solid state power controller.

The alarm condition disables the power supply, activates an alarm relay (in common with RPC option) and allows the instrument resetting through a front button.

The WATTCOR W212 series are designed to guarantee nominal current and voltage values at 50°C ambient temperature, with a working temperature range from -5°C up to 60°C.

250A and 600A units are supplied with internal fuse and digital output for the fuse status. Signal connections are made via "plug-in" connectors to enable easy wiring.

The instrument can be DIN rail or panel mounted (from 250 up to 600A current ratings, panel mounting only).

#### TECHICAL DATA

##### General features

Nominal working voltage  
660Vac (max. range 20...725Vac)  
Nominal frequency: 50/60Hz

##### Current ratings (50°C)

	Repetitive overcurrent (t=1s)	Non repetitive overcurrent (t=20ms)
25Arms	≤ 74A	≤ 600A
40Arms	≤ 100A	≤ 1500A
75Arms	≤ 180A	≤ 1700A
100Arms	≤ 300A	≤ 4800A
150Arms	≤ 300A	≤ 4800A
250Arms	≤ 450A	≤ 7800A
400Arms	≤ 2000A	≤ 15000A
600Arms	≤ 2000A	≤ 15000A

	Pt for fusing (t=1-10ms)	Critical dv/dt with output disactivated
25Arms	≤ 1800A <sup>2</sup> s	1000V/μs
40Arms	≤ 11200A <sup>2</sup> s	1000V/μs
75Arms	≤ 14450A <sup>2</sup> s	1000V/μs
100Arms	≤ 86200A <sup>2</sup> s	1000V/μs
150Arms	≤ 86200A <sup>2</sup> s	1000V/μs
250Arms	≤ 200000A <sup>2</sup> s	1000V/μs
400Arms	≤ 1125000A <sup>2</sup> s	500V/μs
600Arms	≤ 1125000A <sup>2</sup> s	500V/μs

**Dissipated Power:**

1.2 W per Amp of load

**Control Input**

- Analogue input configurable in voltage or current
- Voltage range: 0-5V (potentiometer 10KW); 0-10V
- Current range: 0-20mA ; 4-20mA
- Typical impedance: 23KW@0-5V, 50KW@0-10V, 250W@0-20 / 4-20mA
- Cycle time adjustment: from 0.5 to 10 seconds, by way of front accessible "CY" trimmer

**Inhibition Input**

- Max. voltage range: 0...30Vdc
- Impedance: 15KW
- Active inhibition: ≥ 5Vdc

**Slave Output**

- Digital synchronization output to match the Wattcor W212 (Master) to one or more Wattcor W211 (Slave)
- Logic output voltage: 0/5Vdc
- Permitted output current: 50mA max (No. 10 W211 Max)

**Auxiliary Power Supply**

- 115 or 230Vac 50...60Hz - 5VA with phase independent of the voltage on the

load

- Fan power supply (for ratings ≥ 150A)
- 115 or 230Vac 50/60Hz - 35VA

**Partial Load Failure Option (RPC)**

- Detects a decrease in the load current (in regard to a pre-selected value), distinguishing one caused by a mains voltage decrease. It is necessary to specify the voltage applied to the load (115 or 230 or 440Vac ± 10%)
- Current limit point selectable from 30% up to 100% of nominal current (to be set via a front trimmer).
- Min. working time to let the alarm start: 400ms
- Alarm output: relay with NO 5A-250Vac working contact (shared by the DE option).

**SCR (DTC) Control and Complete Load Failure Option**

Detects current crossing in the load when there is no control signal (SCR short-circuit).  
 Detects load current failure when a control signal is active (complete load or SCR failure/interruption, fuse break, load voltage failure).  
 The alarm mode, with memory or not, is

selectable via an internal switch.

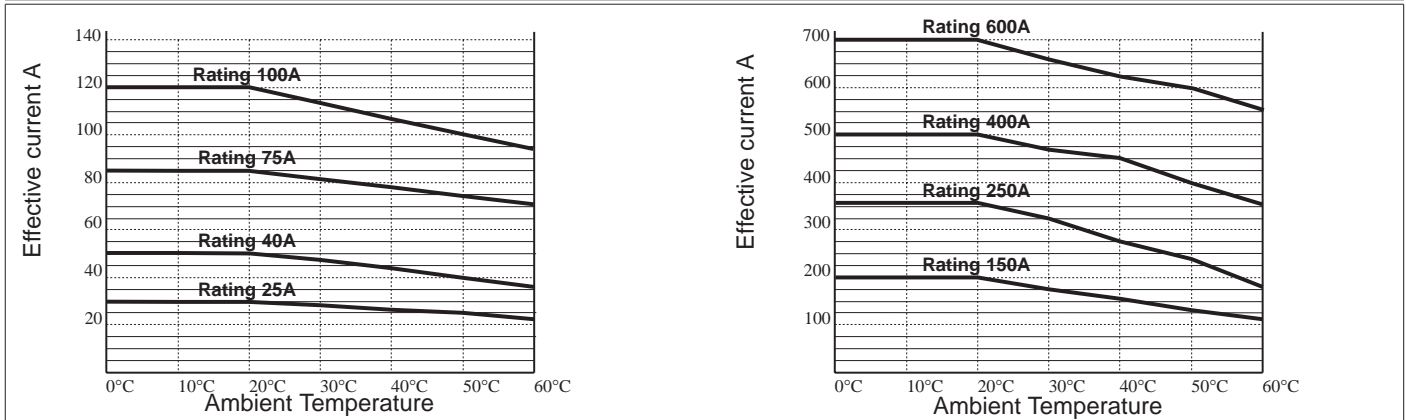
**Overcurrent Protection Option (DE)**

- Switching off with memory of the SCR if current exceeds the nominal value by 13 times
- Option available for ratings from 25 up to 150A
- Max. response time: 10ms@50Hz; 8.33ms@60Hz
- Alarm output: 5A-250V NO contact relay (shared by RPC option)
- Reset of standard working through a front-face key
- This option does not replace extra-fast fuses, which should be used in any installation.

**Installation Comments**

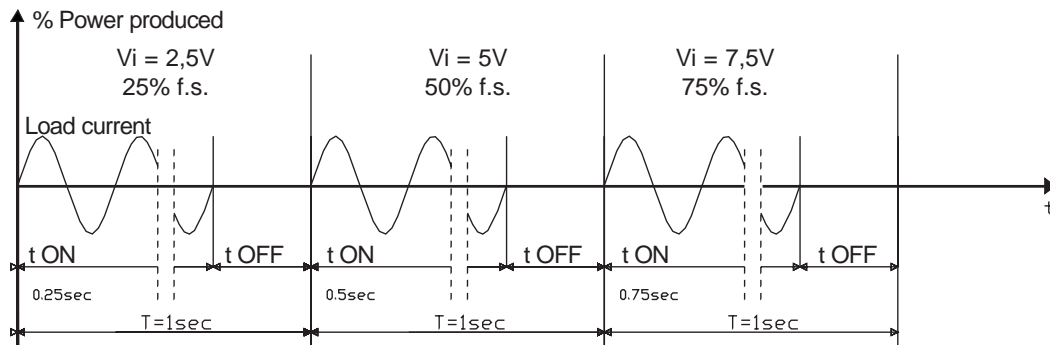
- It is necessary to install the instrument correctly inside the panel to ensure best reliability:
- Max. inclination as to the vertical axis: 10°
  - Vertical distance between two instruments: > 200mm
  - Horizontal distance between two instruments: > 20mm

**POWER DISSIPATION CURVES**



**TYPE OF FUNCTIONING**

Zero crossing with cycle time T fixed (adjustable from 0.5 to 10 sec.). The ON/OFF times ratio is a function of the analogue control signal Vi. An example of functioning for different values of the input analogue signal Vi; bottom scale 0-10V with period T=1 sec.



**MOUNTING**

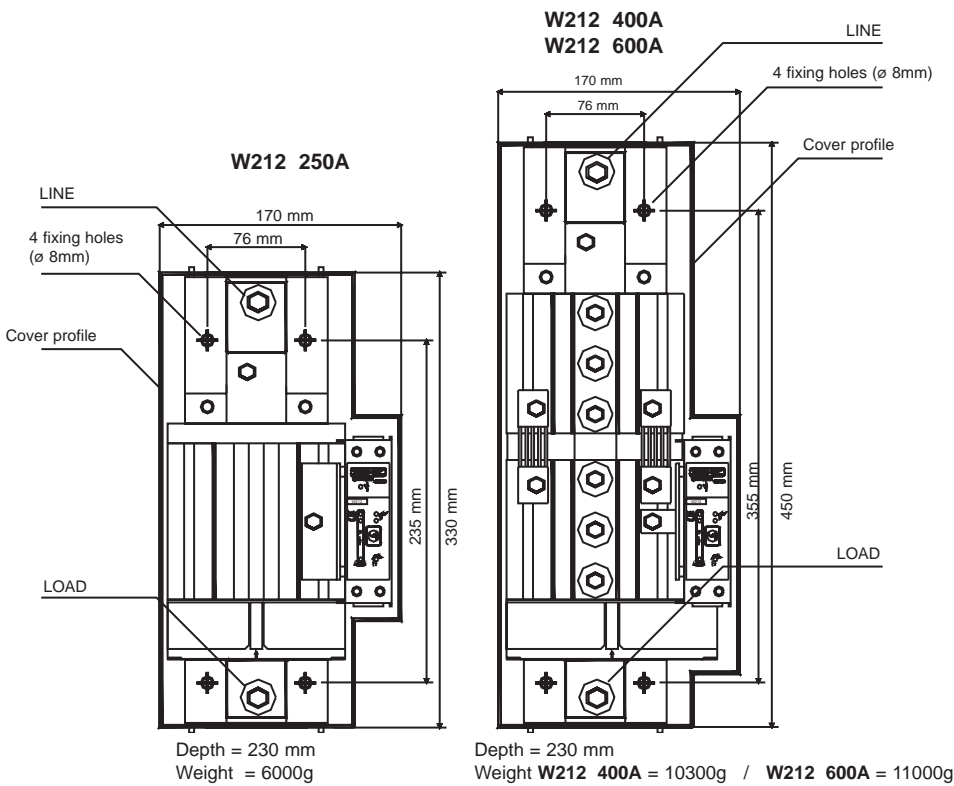
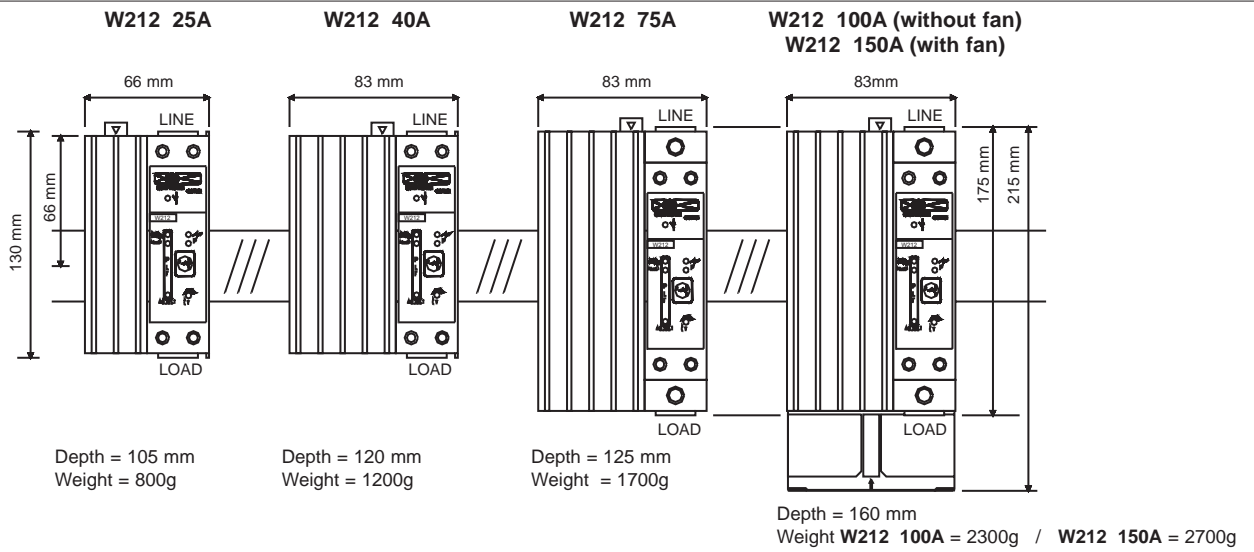
**Ratings from 25 up to 150A:**

- DIN rapid rail mounting
- Panel mounting kit for ratings 75-150A (option 1886001)

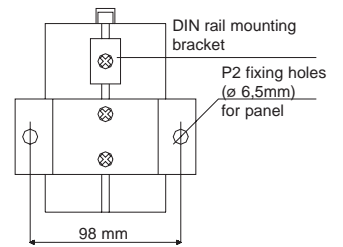
**Ratings from 250 to 600A:**

- Panel mounting only

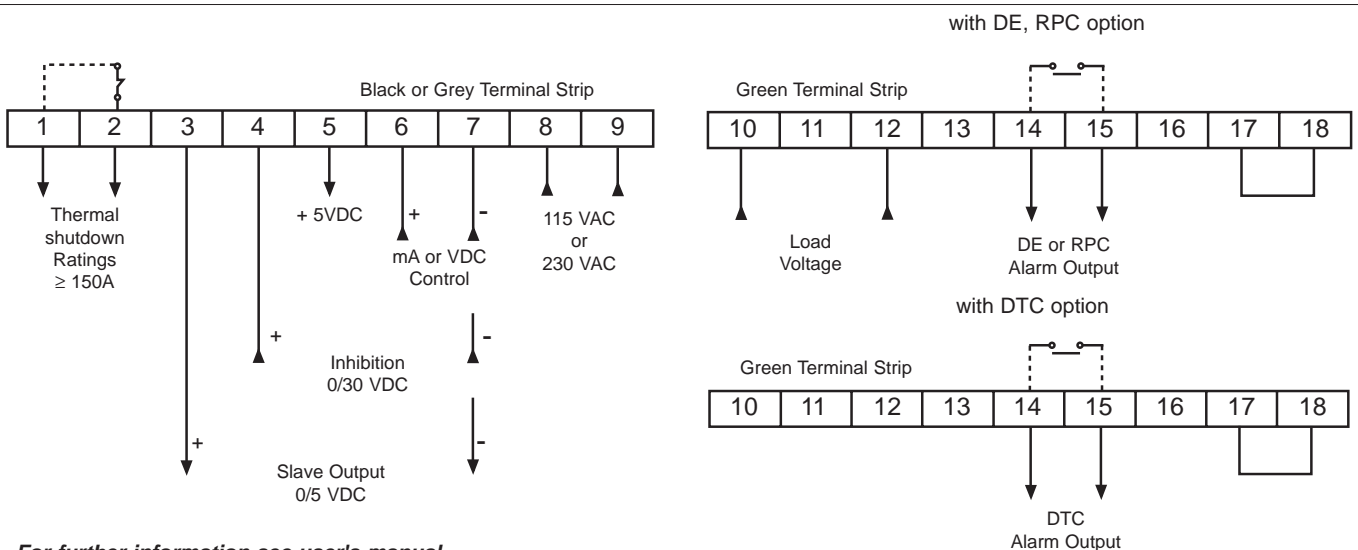
## DIMENSIONS AND MOUNTING



### Panel Mounting Kit



## CONTROL SIGNAL CONNECTION



For further information see user's manual

## SAFETY AND PROTECTION

- Ground heatsink (except for models from 400 up to 600A)
- Input/output insulation voltage 3750 Vac
- IP20 protection level
- UL94V0 self-extinguishing plastic case
- Thermostat for models with rating  $\geq 150A$
- Thyristor high  $I^2 t$
- Extra fast fuses

Rating	Fuses	Fuse carrier	Rating	Fuses	Fuse switch
25A	FUS-050	PF 22x58	250A	FUS-450N	SW-FUS
40A	FUS-063	PF 22x58	400A	FUS-630N	SW-FUS
75A	FUS-100	PF 22x58	600A	FUS-900N	SW-FUS
100A	FUS-250	PF 27x60			
150A	FUS-250	PF 27x60			

## WIRING/TERMINALS

### Power Terminals

- Ratings from 25A to 150A: cage terminals for stripped cable without cable terminals
- Ratings from 250A to 600A: cables with terminal cable terminals or copper bar

Current ratings	Usable cable section [mm <sup>2</sup> ]	Tightening torque (Nm)
25-40A	1,5 a 16	1,2 a 1,4
75-100-150	20 a 70	6 a 7
250-400-600	cables with terminal cable or copper bar	12 a 13

## ORDER CODE

MODEL	
W212	

NOMINAL CURRENT	
25Aac	25
40Aac	40
75Aac	75
100Aac	100
150Aac	150
250Aac	250
400Aac	400
600Aac	600

NOMINAL VOLTAGE	
660Vac (range 20...725Vac) (if the RPC option is used, the working range is 350...440 Vac)	660
660Vac (range 20...725Vac) (for RPC option with range 260...350Vac)	661
660Vac (range 20...725Vac) (for RPC option with range 180...260Vac)	662
660Vac (range 20...725Vac) (for RPC option with range 90...180Vac)	663

FUSE FAILURE MICROSWITCH ( $\geq 250A$ )	
0	None ( $\leq 250A$ )
1	Microswitch ( $\geq 250A$ )

AUXILIARY POWER SUPPLY	
1	115Vac 50...60Hz
2	230Vac 50...60Hz

OPTIONS	
0	None
3	RPC
5	DTC

INPUT	
*	0-5 Vdc and potentiometer
2	0-10 Vdc
*	0-20 mAdc
*	4-20 mAdc

Note: RPC option not available for working range  $>440V_{ac}$

(\*) Selectable by Dip-Switches

Please, contact GEFTRAN 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



This device conforms to European Union Directive 2004/108/CE and 2006/95/CE as amended with reference to generic standards: EN 61000-6-2 (immunity in industrial environment) EN 61000-6-4 (emission in industrial environment) - EN 61010-1 (safety regulations).

# GEFRAN

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