



Main Applications

- Tyre manufacturing plants
- Wire manufacturing plants
- Industrial heat-treatments
- Industrial cooling plants
- Painting plants
- Driers for ceramics, paper and textile product
- Ovens and furnaces

Main Features

- On-board microprocessor
- Numeric/digital control by serial line or by logic input
- Accurate measure of load voltage and currents (RMS)
- Completely configurable
- Auto-diagnostic
- Zero crossing switching of mains voltage
- Power contacts with anti-parallel double SCR
- R-C and MOV (varistor) protections
- Panel mounting, independent socket

PROFILE

Wattcor W401 line offers a wide range of solid state power controllers with "zero crossing" switching for resistive loads with 45A and 100A current ratings and 460Vac nominal voltage.

This product is designed to be used as intelligent peripherals in industrial heat-treatment processes using programmable logics or computers.

A switch enables to select the external -On/Off (standard)- or internal control mode, controlled by a microprocessor and configurable via serial link.

The RS485 MODBUS communication system allows the control of variables, such as power capacity control and cycle time, as well as the accurate monitoring of load voltage and current RMS values. Data strings are also available, concerning: instrument identification, diagnostic and hardware configuration.

The conduction is activated by the control signal at the first zero crossing of the load power voltage.

Switching off occurs by the first zero crossing of the load current after disabling the control signal.

The control of three-phase loads can be made by two or three W401 fired in parallel.

Each model is equipped with a logic (active low) input to disable the power controller and eventually break power supply off.

The auxiliary power supply output (+15Vdc) is available to activate autonomous control and inhibition logic inputs.

Wattcor W401 series are designed to operate nominal current and voltage values at 40°C ambient temperature. The internal extra-fast fuse option is available for both ratings.

Signal connections are made via "plug-in" connectors to enable easy wiring, while power connections are made through terminals integrated in the mounting socket, where the power controller itself is placed.

The instrument mounting is on panel by means of screws.

TECHNICAL DATA

General features

Nominal working voltage:

460Vac (max. range 200...460Vac $\pm 10\%$)

Nominal frequency: 50/60Hz

Current rating (at $T_A = 40^\circ\text{C}$)

45Arms, 100Arms

Repetitive overcurrent ($t=1\text{s}$): $\leq 300\text{A}$

Non repetitive overcurrent ($t=20\text{ms}$): $\leq 4800\text{A}$

I^2t for fusing ($t=1-10\text{ms}$): $< 113000\text{A}^2\text{s}$
critical dv/dt with output deactivated:
1000V/ μs

Dissipated Power:

1,2 W by loads Amps

Control logic input

(alternative to serial control)

- Max. dynamics: 0...30Vdc
- Enabling by voltage $> 8\text{Vdc}$
- Disabling by voltage $< 5\text{Vdc}$
- Impedance 10K Ω @ 30Vdc

Enabling logic input

- Max. dynamics: 0...30Vdc
- Enabling by voltage $> 8\text{Vdc}$
- Disabling by voltage $< 5\text{Vdc}$
- Impedance 10K Ω @ 30Vdc, typical

Auxiliary Power Supply Input

- Nominal voltage: 115/230Vac; -10...+15%
- Nominal frequency: 50...60Hz
- Consumption: 4VA
- Independent phase angle as to load voltage

Auxiliary Power Supply Output

- Nominal voltage: +15Vdc
- Protected against short-circuits

Serial Communication Link

- Connection: RS485, 2-wires
- Protocol: MO-DBUS
- Addressing: from 0 to 15, selectable from 4 microswitches (binary code)
- Baud-rate: 4800, 9600 Bauds, selectable from jumper

Main Variables Controlled via Serial Line

- Power capacity control (0...100%)
- Cycle time (3...300sec)
- Offset of voltage and current measures
- Stored and instantaneous RMS voltage

- Stored and instantaneous RMS voltage
- Unit address code
- Diagnostic data strings

Current and Voltage Measuring

- Galvanic-insulated measuring circuits through on-board TA and TV
- Vrms/Vdc double analogue converter
- A/D converter sampling time: 10mS
- Measure accuracy, by voltage and current from 20 to 100% of nominal value: $\pm 1\%$ by $T_{on} > 520\text{mS}$ conduction time

Mounting Comments

To achieve a high reliability it is very important to install the device properly, in order to ensure a suitable heat exchange between the heat sink and the surrounding air even without forced air circulation. The device must be installed vertically:

- Max. inclination as to the vertical axis: 10°
- Vertical distance between two instruments: $\geq 200\text{mm}$

- Horizontal distance between two instruments: $\geq 20\text{mm}$

Insulating

Input/output nominal insulation voltage: 3750Vac

Working Temperature

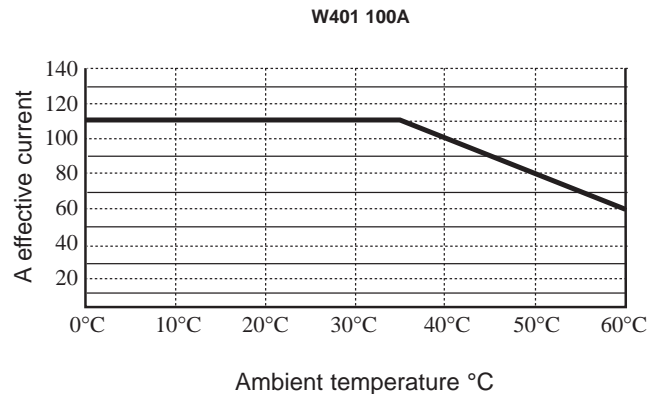
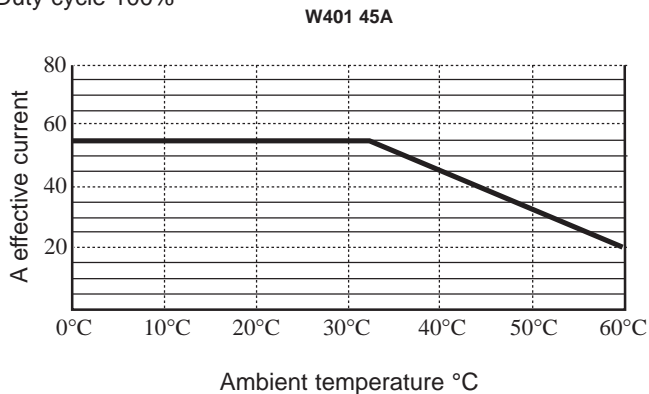
From 0 up to 60°C (see dissipation curves)

Leakage Current

$< 20\text{mA}$ by nominal voltage, due to RC filter and varistor

POWER DISSIPATION CURVES

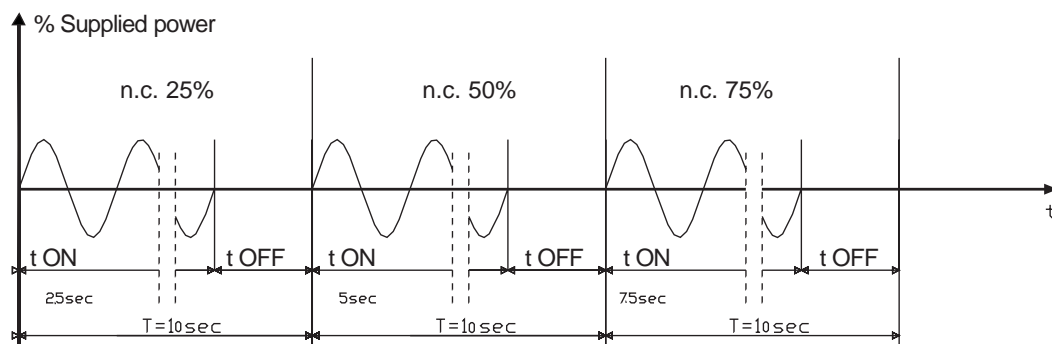
Duty cycle 100%



WORKING DIAGRAM

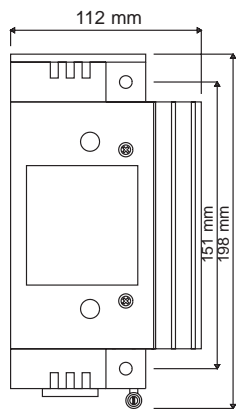
Zero crossing with control from serial line and "T" cycle time adjustable from 3 to 300 sec. ON/OFF time values ratio is a function of 0...100% numeric control (n.c.).

Working example per different power values with $T = 10\text{sec}$. Time period



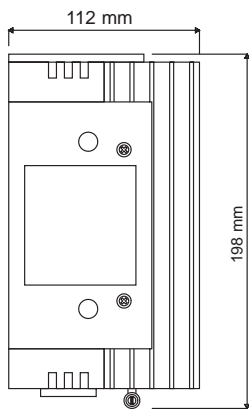
DIMENSIONS AND CUT-OUT

W401 45A



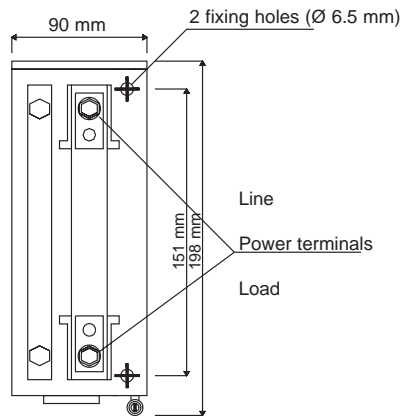
Depth = 215 mm
Weight = 3500g

W401 100A



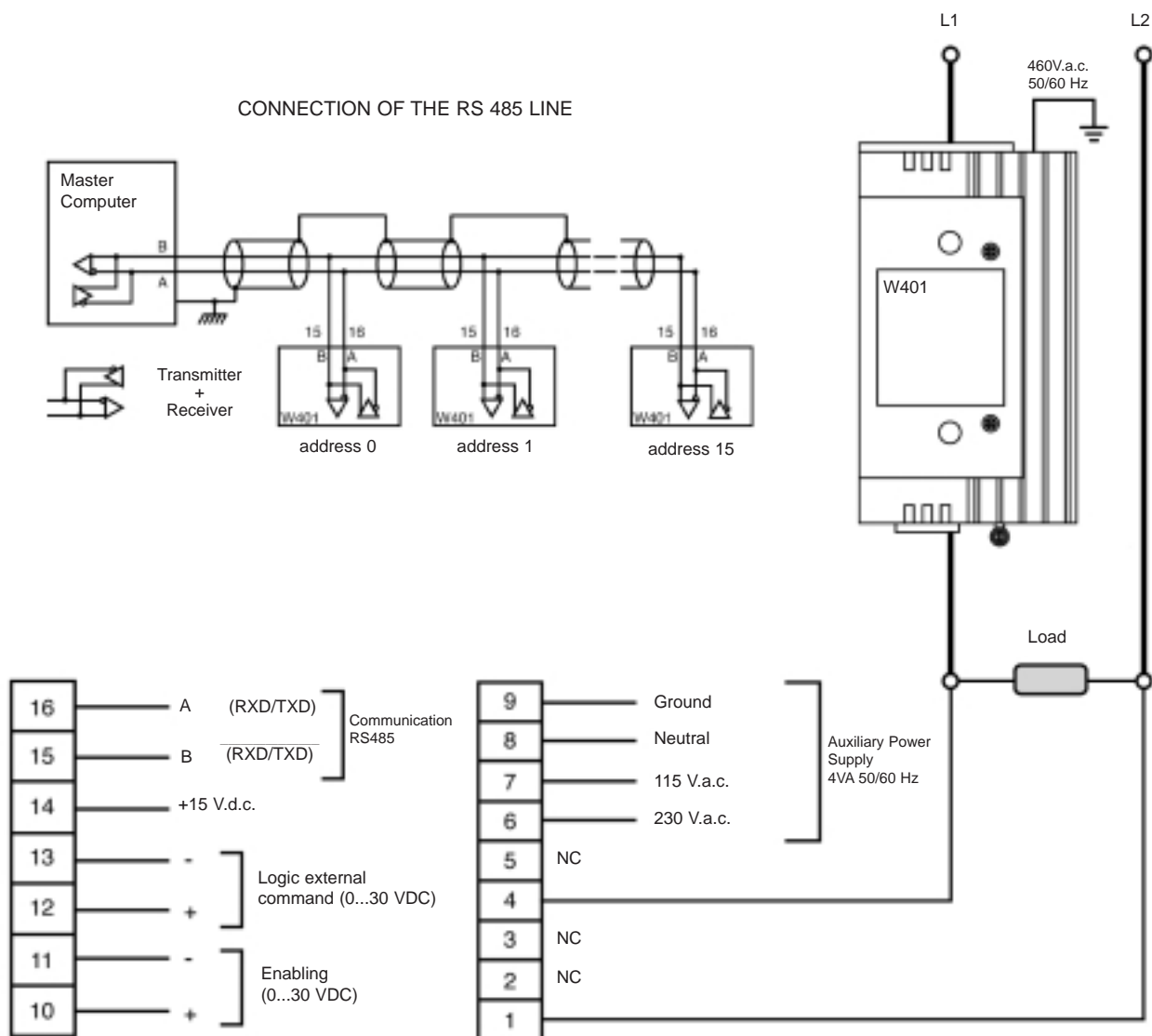
Depth = 215 mm
Weight = 3900g

Mounting socket
45/100A



CONTROL SIGNAL AND POWER CONNECTION

CONNECTION OF THE RS 485 LINE



SAFETY AND PROTECTION

- Grounded heatsink
- IP20 protection
- Thyristor high I²t
- Extra-fast on-board fuse (optional)
- RC filter and varistor on thyristors

Taglia	Fusibili	Sigla di Ordinazione
45A	63A	FUS-063N
100A	160A	FUS-160N

WIRING/TERMINALS

Power screw terminals (Ø6mm) are placed in the mounting socket of the instrument to be connected via an eyelet terminal wire.

Current ratings	Cable Section	Crimping Terminals	Torque
45A	16...25mm ²	16...25ø - Hole ø 6mm	5 - 6 Nm
100A	35mm ²	35ø - Hole ø 6mm	8 - 9 Nm

ORDER CODE

W401		460	0	2			.D
MODEL	W401						OPTION
							0 0 0 Extra-fast Fuse
NOMINAL CURRENT							5 0 0 None
45Aac	045						AUXILIARY POWER SUPPLY
100Aac	100						2 115/230Vac, 50...60Hz
NOMINAL VOLTAGE							
460Vac	460						

Please, contact GEFRAK 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



The instrument conforms to the european directives 89/336/CEE and 73/23/CEE, including updates.

GEFRAN

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cod. W401- 07/04