GEFRAN

W401 (45-100A)

POWER CONTROLLERS

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 ±10%)
Nominal frequency: 50/60Hz

Current rating (at TA = 40°C)

45Arms, 100Arms
Repetitive overcurrent (t=1s): ≤ 300A
Non repetitive overcurrent (t=20ms): ≤ 4800A
I^2t for fusing (t=1-10ms): < 113000A^2s
critical dv/dt with output disactivated: 1000V/µs

Dissipated Power:
1,2 W by loads Amps

Control logic input
(alternative to serial control)
- Max. dinamics: 0...30Vdc
- Enabling by voltage > 8Vdc
- Disabling by voltage < 5Vdc
- Impedance 10KΩ @ 30Vdc

Enabling logic input
- Max. dynamics: 0...30Vdc
- Enabling by voltage > 8Vdc
- Disabling by voltage < 5Vdc
- Impedance 10KΩ @ 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 aganist 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 instananeous RMS voltage
- Stored and instananeous 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: ±1% by Ton > 520mS 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 whitout forced air circulation. The device must be installed vertically:
- Max. inclination as to the vertical axis: 10°
- Vertical distance between two instruments: ≥ 200mm
- Horizontal distance between two instruments: ≥ 20mm

Insulating
Input/output nominal insulation voltage: 3750Vac

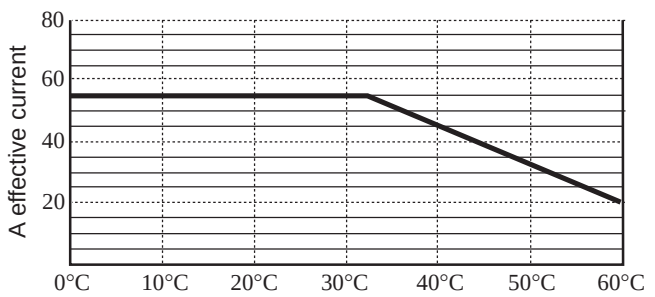
Working Temperature
From 0 up to 60°C (see dissipation curves)

Leakage Current
< 20mA by nominal voltage, due to RC filter and varistor

POWER DISSIPATION CURVES

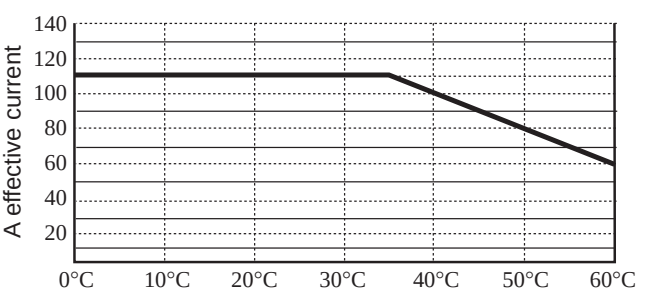
Duty cycle 100%

W401 45A



Ambient temperature °C

W401 100A

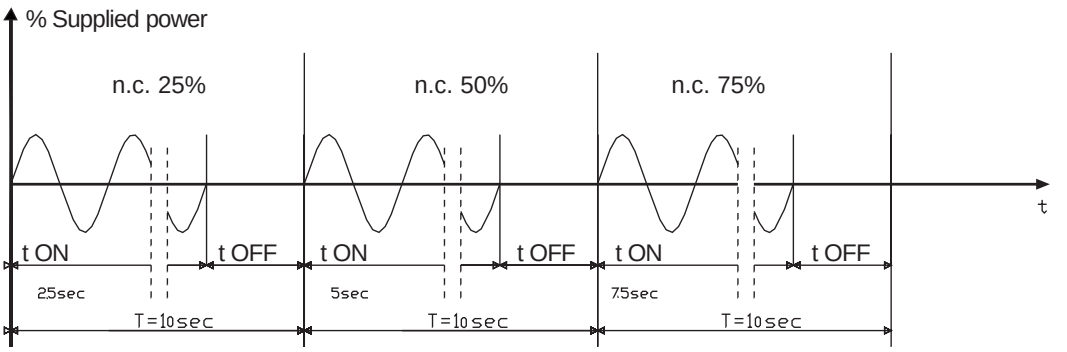


Ambient temperature °C

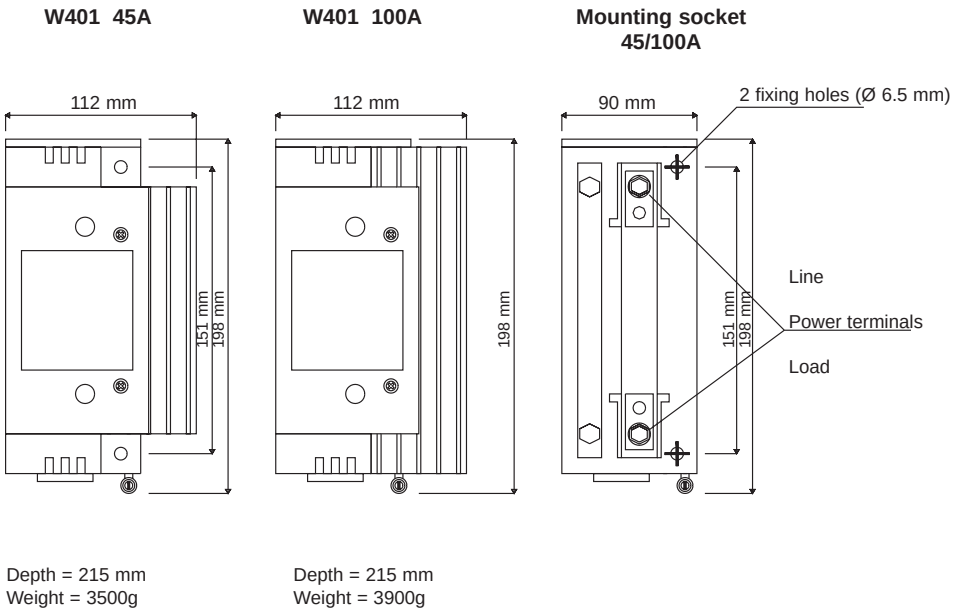
WORKING DIAGRAM

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 = 10sec. Time period



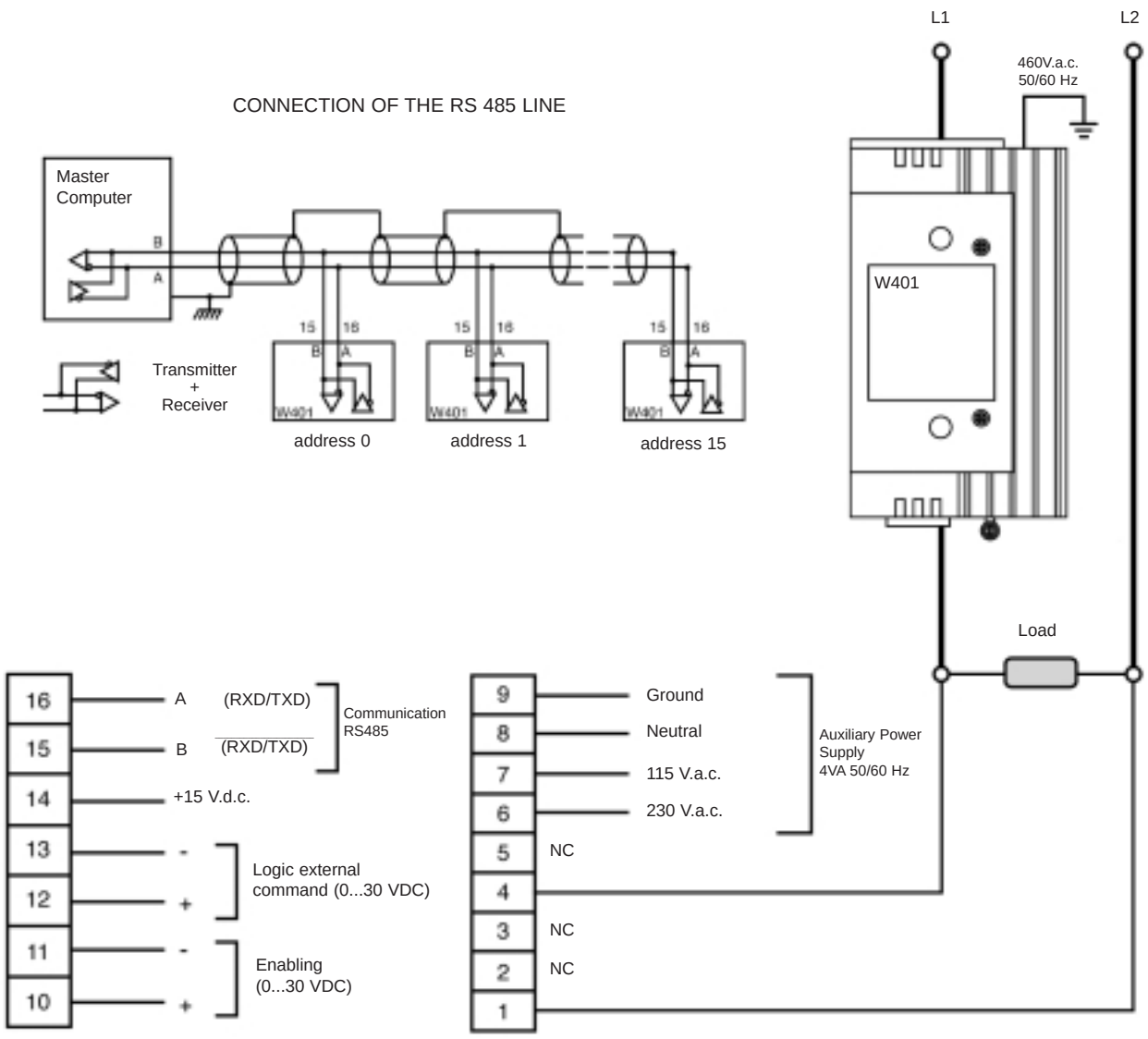
DIMENSIONS AND CUT-OUT



Depth = 215 mm
Weight = 3500g

Depth = 215 mm
Weight = 3900g

CONTROL SIGNAL AND POWER CONNECTION



SAFETY AND PROTECTION

- Grounded heatsink
- IP20 protection
- Thyristor high I^2t
- 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

NOMINAL CURRENT	
45Aac	045
100Aac	100

NOMINAL VOLTAGE	
460Vac	460

OPTION	
0 0 0	Extra-fast Fuse
5 0 0	None

AUXILIARY POWER SUPPLY	
2	115/230Vac, 50...60Hz

Please, contact GEFRAN 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).

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