INSTRUCTION MANUAL FOR THE INSTALLATION, USE AND MAINTENANCE OF THE REGULATOR

GENIUS POWER COMBI

(TRANSLATION OF THE ORIGINAL INSTRUCTION MANUAL IN ITALIAN)

PRELIMINARY VERSION

WARRANTY

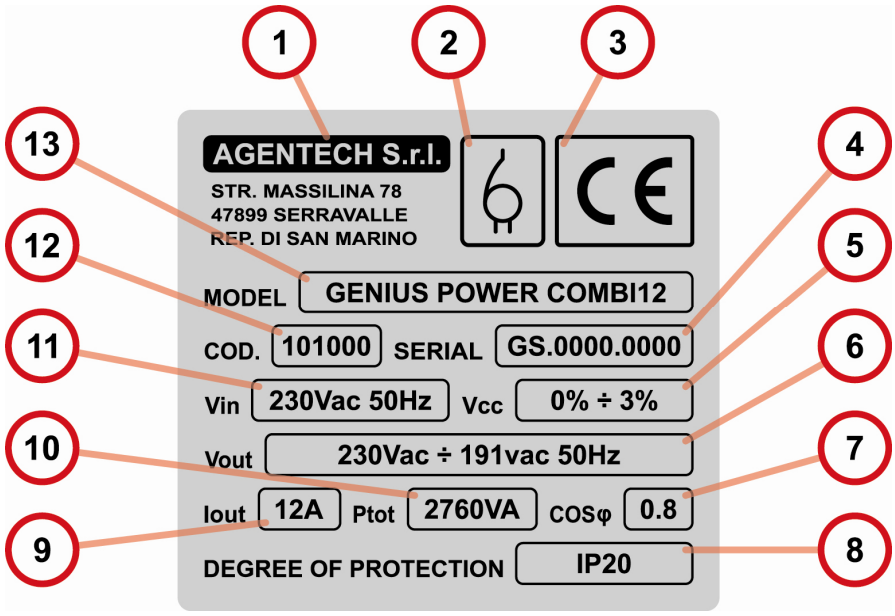
- The device is guaranteed 24 months from date of purchase against defects in workmanship or its materials.
- Failures due to inexperience or inappropriate use of the regulator are excluded from warranty.
- No warranty at any time if the device has been tampered or opened by unauthorized personnel
- Warranty does not cover the replacement of the device
- Transport costs are borne by the owner of the device
- Always reference the serial number and model of your device when contacting the technical assistance service

RANGE OF PRODUCTS

CODE	MODEL	I_{OUT}	P_{TOT}
101615	GENIUS POWER **COMBI 6**	6A	1.4KVA
101616	GENIUS POWER **COMBI 10**	10A	2.3KVA
101617	GENIUS POWER **COMBI 12**	12A	2.8KVA

IDENTIFICATION PLATE

The GENIUS POWER COMBI regulators are recognizable by the identification plate placed both on the front of the device and on its packaging box.



1. MANUFACTURER DATA
2. AUTOTRANSFORMER SYMBOL
3. CE MARKING
4. SERIAL NUMBER
5. SHORT-CIRCUIT VOLTAGE [%]
6. OUTPUT VOLTAGE
7. ADMITTED FORM FACTOR
8. PROTECTION LEVEL
9. CURRENT OUTPUT
10. TOTAL POWER
11. SUPPLY VOLTAGE
12. REGULATOR CODE
13. REGULATOR MODEL

¡ Tampering, removal, lack of the plate does not allow reliable identification of the product and makes difficult any installation and maintenance working.

BOX CONTENTS

The GENIUS POWER COMBI regulators are delivered in a single package protected by a cardboard box. The box contains:

- 1 GENIUS POWER COMBI regulator
- 1 Instruction manual
- 1 plastic sachet containing:
    - 1 5-pin connector with quick-clamping screw
    - 1 Shell covering the connector for wall mounting
    - 4 Terminal blocks for mounting on omega bar

SYMBOLS

This manual uses the following symbols:

i **WARNING.** Actions and procedures that require special caution and adequate preparation which lack may cause malfunction and/or risks for the operator

h **SHOCK HAZARD.** Actions and procedures are to be carried out with particular attention which lack may constitute a risk of electric shock

6 **PROHIBITED**. Actions that SHOULD NOT BE MADE absolutely

INDEX

GENERAL WARNINGS

Carefully read the instructions in this manual.

- ¡ After unpacking, check the integrity and completeness of delivery and in case of non-compliance, contact Agentech srl.
- ¡ Device is intended for professional use only
- ¡ GENIUS POWER COMBI regulators are not intended for household or residential use
- ¡ Installation and maintenance of the GENIUS COMBI must be performed by a qualified electrician or competent staff
- ¡ Agentech Srl shall not be liable for damage to persons, animals or things, improper installation, adjustment, maintenance and improper use
- ¡ This manual is part of the device and therefore must be carefully retained and always accompany the regulator even if given to another owner, or transferred on another plant. In case of damage or loss, contact Agentech Srl
- ¡ Avoid using the device in places subject to vibrations or crashes
- ¡ Avoid using the device in places with temperatures above 45℃ or below -10℃
- ¡ Protect the device from excessive humidity

SAFETY RULES

- h Any maintenance or setting of the device before disconnecting it from the mains supply by setting the plant's main switch to its OFF position, is forbidden.
- 6 It is forbidden to disassemble the device
- 6 It is forbidden to modify the device
- 6 It is forbidden to keep the regulator in contact with flammable materials
- h In the event of liquid spilling on the device, immediately disconnect the power supply by placing the main switch of the plant to its OFF position
- 6 Do not occlude the ventilation openings of the device
- 6 It is forbidden attempt to repair the equipment by yourself. Always contact Agentech srl Technical Assistance Service

USAGE OF THE GENIUS POWER COMBI

The GENIUS POWER COMBI is an automatic light flux regulator and is designed to reduce the voltage on the lamps in public and private lighting systems. The benefits of this regulator are:

- Energy saving
- Reducing the costs of electricity supply
- Longer life of lamps
- reduction of maintenance costs
- Power emissions of CO_2
- Reduced light pollution

The main fields of application are as follows:

- Public and private buildings
- Industries
- Hospitals
- Sports plants
- Exhibitions
- Shopping Centers
- Public Lighting
- Parkings and squares
- Architectural and monumental lightings

The types of lamps with which you have the most significant advantages are:

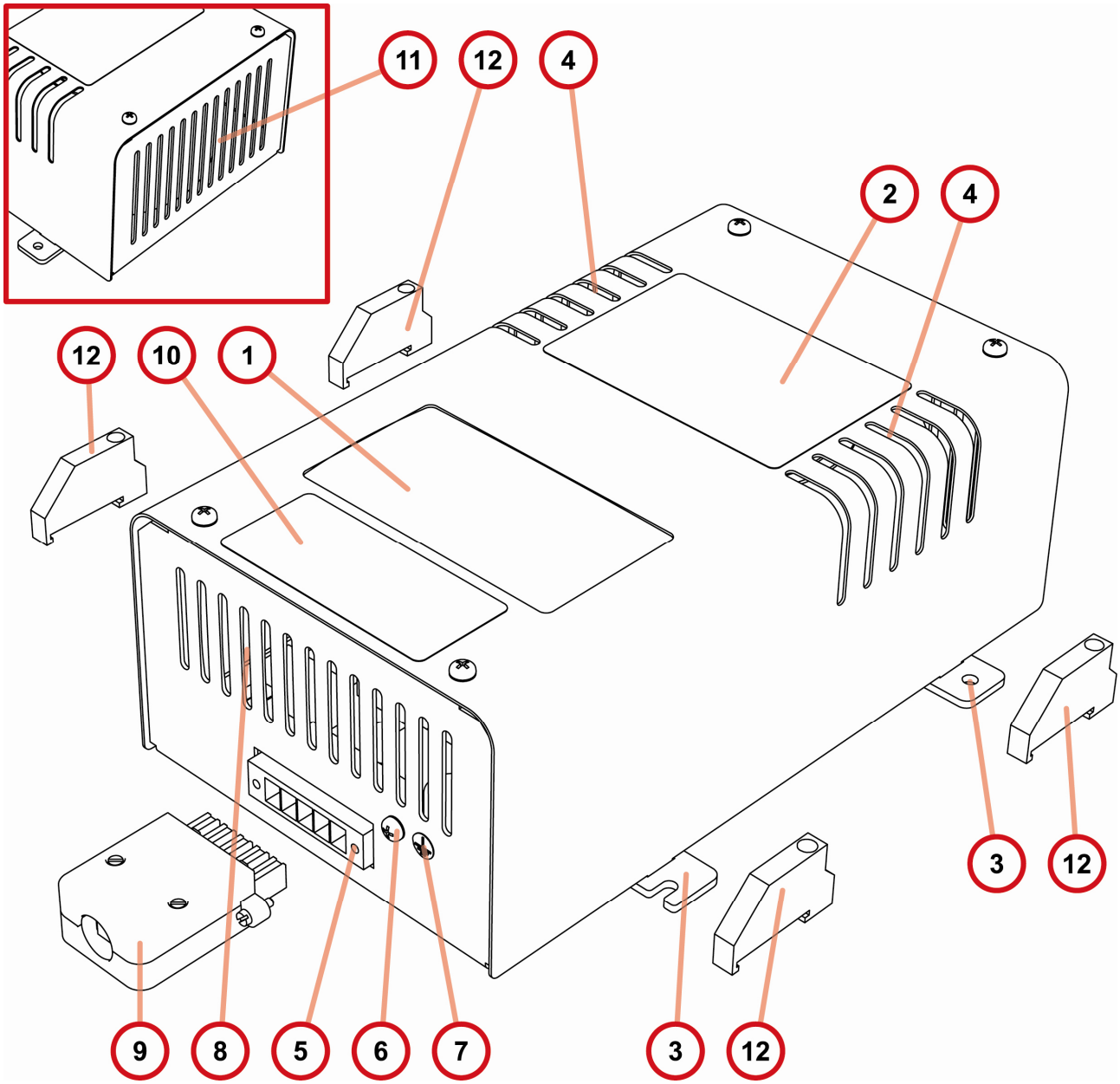
- Mercury vapors lamps
- High pressure sodium lamps
- Low pressure sodium lamps
- Halogen lamps
- Light bulbs
- Metal halide lamps
- Fluorescent lamps with electromagnetic ballast

DESCRIPTION OF THE REGULATOR

The main feature of the GENIUS POWER COMBI flux regulators is to down the harmonic distortion of the power line. These devices consist of an autotransformer and intelligent electronics that provides the voltage values at the output. You can set up to eight different voltage levels by the control panel, which is very easy and intuitive and placed on the front of the regulator. From the same panel you can set the WARM UP time and the BYPASS state. Once set the values, the regulator operates automatically without the need for further action. Like all Agentech flux regulators, the COMBI also can work with all common types of electromagnetic ballast lamps. The bypass state can also be triggered by an external command. The COMBI can be installed in power panels or wall mounting, while maintaining an IP20 protection level, and is extremely versatile thanks to its size and weight. GENIUS POWER COMBI regulators are equipped with:

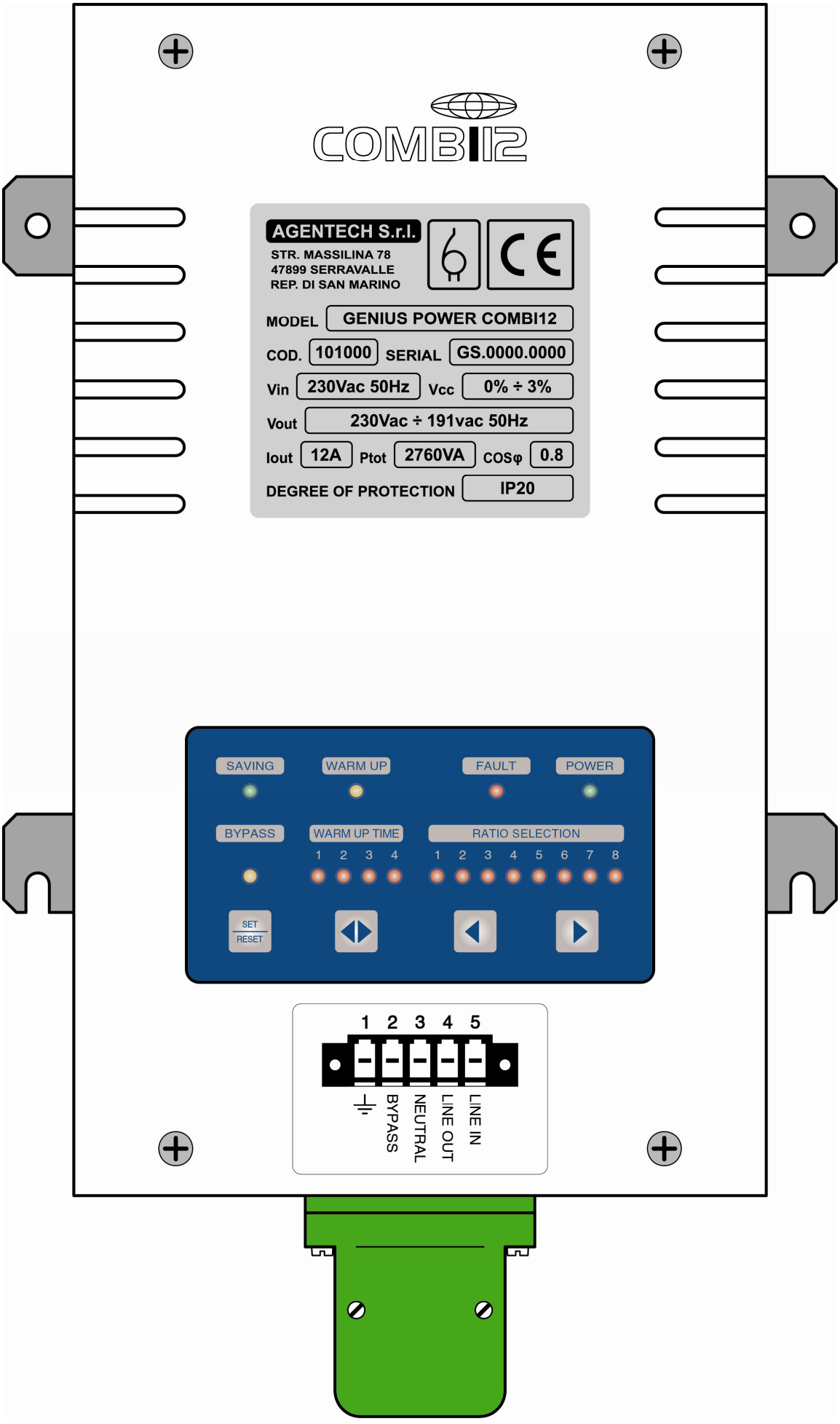
- Control Panel for settings and signals on operation modes and failures
- bracket for quick DIN rail or wall mounting
- Quick-clamping connector and protection shell for wall mounting

REGULATOR'S PARTS



1. CONTROL PANEL
2. IDENTIFICATION PLATE
3. MOUNTING BRACKETS
4. SIDE VENTILATION OPENINGS
5. MULTI-POLAR OUTLET
6. SCREW FIXING THE GROUND WIRE
7. LABEL FOR GROUNDING
8. LOWER VENTILATION OPENINGS
9. QUICK CONNECTOR
10. PLATE WITH CONNECTOR INSTRUCTIONS
11. TOP VENTILATION OPENINGS
12. BLOCKS FOR RAIL SCREW MOUNTING

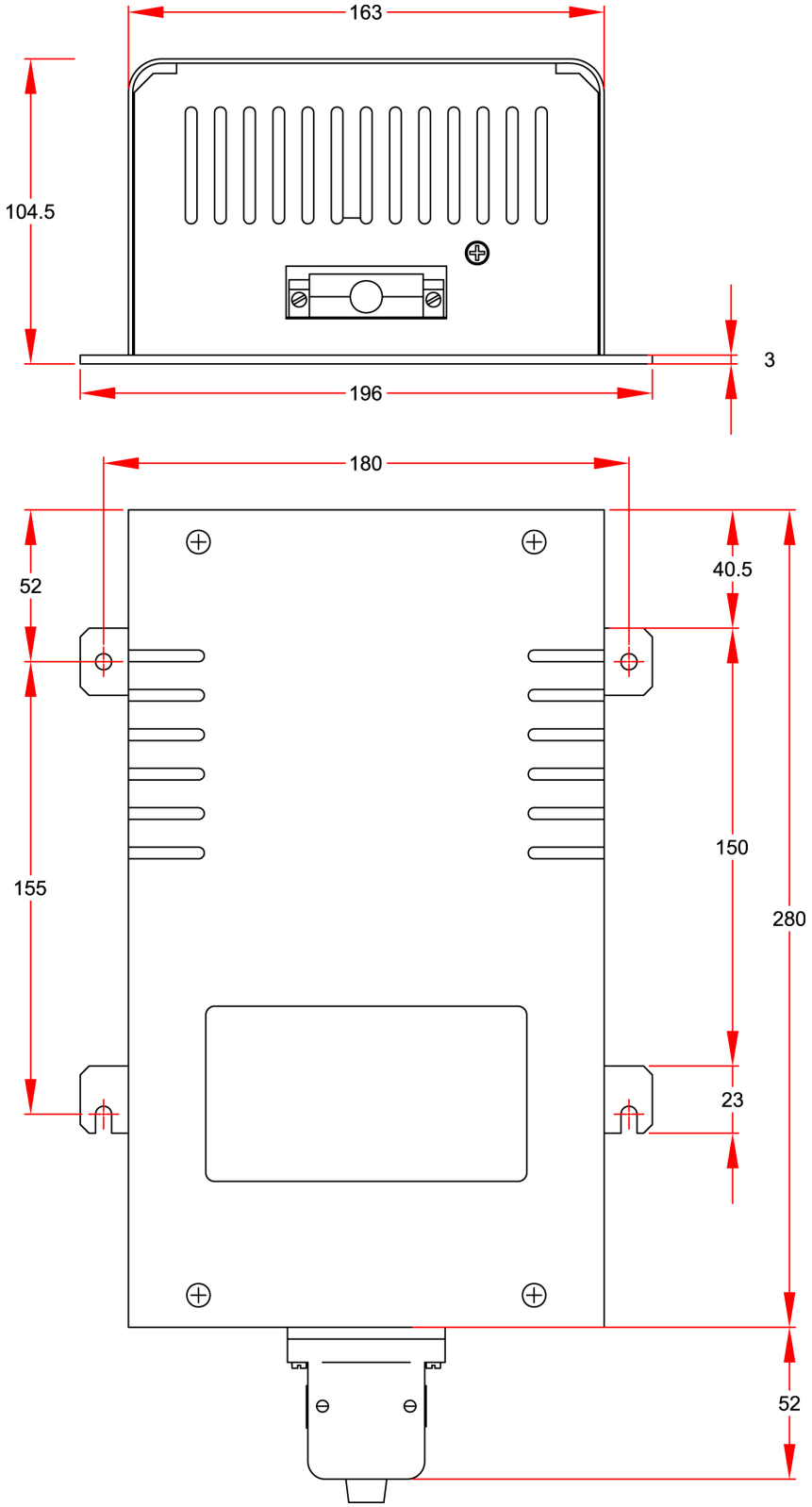
FRONTAL VIEW


COMBI12
AGENTECH S.r.l.
STR. MASSILINA 78
47899 SERRAVALLE
REP. DI SAN MARINO
MODEL GENIUS POWER COMBI12
COD. 101000 SERIAL GS.0000.0000
Vin 230Vac 50Hz Vcc 0% ÷ 3%
Vout 230Vac ÷ 191vac 50Hz
Iout 12A Ptot 2760VA COSφ 0.8
DEGREE OF PROTECTION IP20
SAVING
WARM UP
FAULT
POWER
BYPASS
WARM UP TIME
1 2 3 4
RATIO SELECTION
1 2 3 4 5 6 7 8
SET
RESET
1 2 3 4 5
BYPASS
NEUTRAL
LINE OUT
LINE IN

SPECIFICATIONS

PARAMETER	COMBI 6	COMBI 10	COMBI 12
Power	1Ph + N + PE 230V ±15% - 50Hz		
Max output current	6ARMS	10ARMS	12ARMS
Max power	1˙380VA	2˙300VA	2˙760VA
Thermal Dissipation	13W @230V	23W @230V	27W @230V
Adjustment levels [%VIN]	100% ÷ 83% VIN		
Minimum load control	80W		
Performance	99%		
Insulation class	Class I		
EMC compliance	-		
Operating temperature	From –10℃ to +45℃		
Storage temperature	from –25℃ to +75℃		
Humidity	Up to 90% without condensing		
Protection level	IP20		

MEASURES



WEIGHT

COMBI6	COMBI10	COMBI12
4,8Kg	5,8Kg	6,8Kg

INSTALLATION

The GENIUS POWER COMBI regulators can be installed into power panels on both omega bar inside cabinets and wall mount.

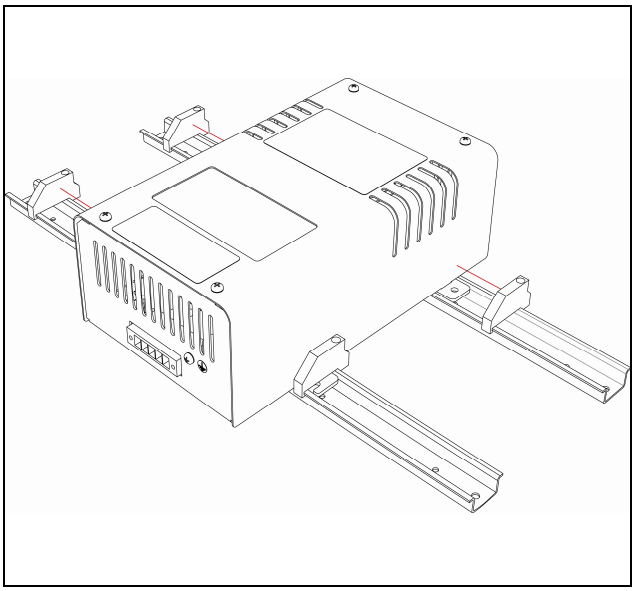


Fig. X. Subtitle

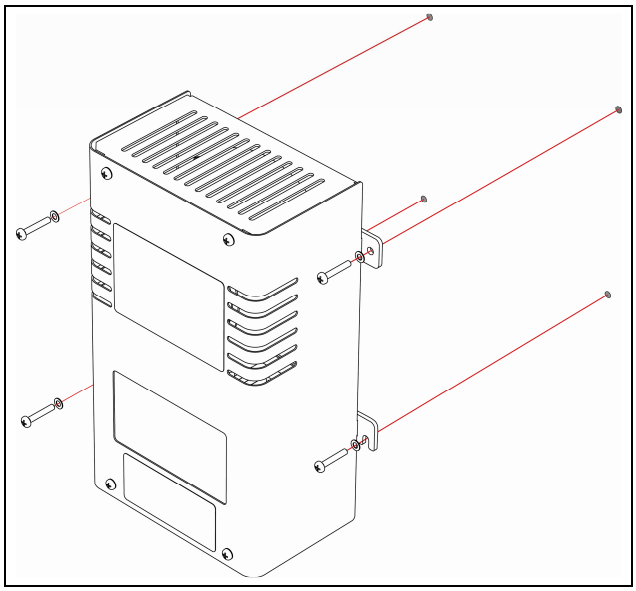


Fig. X. Subtitle

i Verify that the electrical protection level of the device is appropriate to the characteristics of the room where is to be installed

6 It is forbidden to mount the device outdoor if not properly protected

i Verify that the power panel where to house the regulator has adequate heat dissipation characteristics.

6 Do not occlude the ventilation openings of the device

i Consider an adequate room needed for accessibility to the regulator for setup and maintenance operations

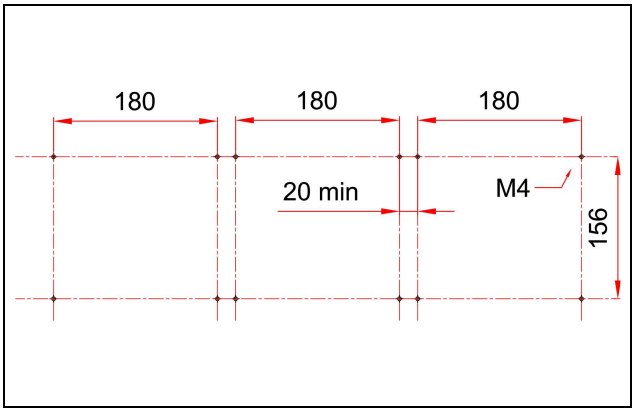


Fig. X. Subtitle

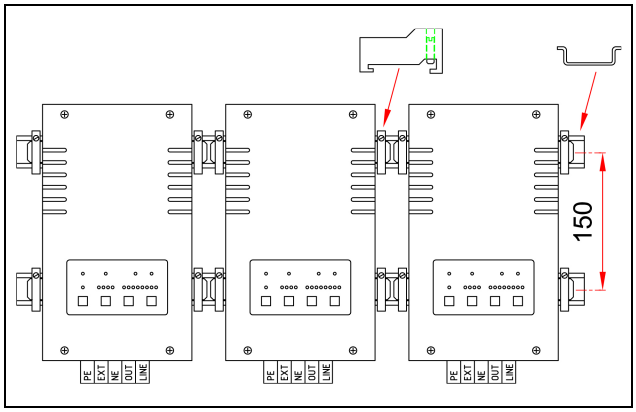


Fig. X. Subtitle

OUTPUT CONNECTOR

The GENIUS POWER COMBI provides a quick connector with 5-terminal screw tightening of the cables and their protective shells.

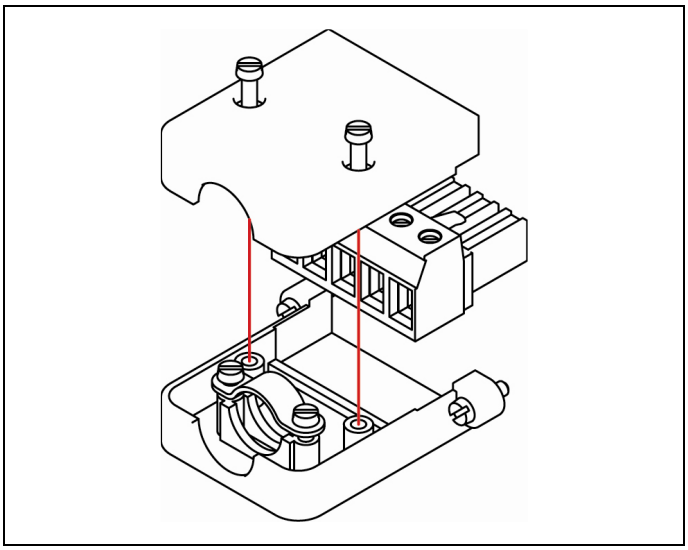


Fig. Exploded view of the connector

For wall mount you have to protect the connector with its appropriate shells.

- h If protection shells will not be used you will have direct access to the 230VAC
- 6 Do not use single core cables for connecting the device with the protective shell
- l Use H05VV-F flexible multi-core cable
- l To ensure good tightening use a multi-core cable with finished diameter ≥ 9mm

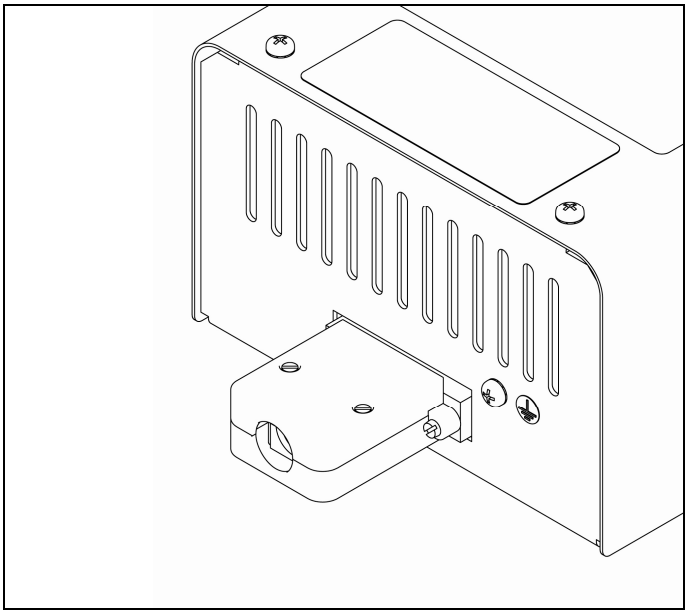
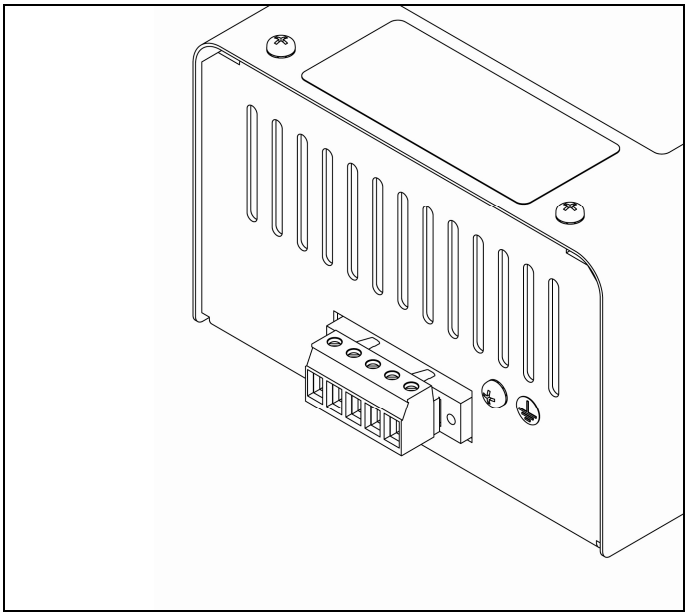
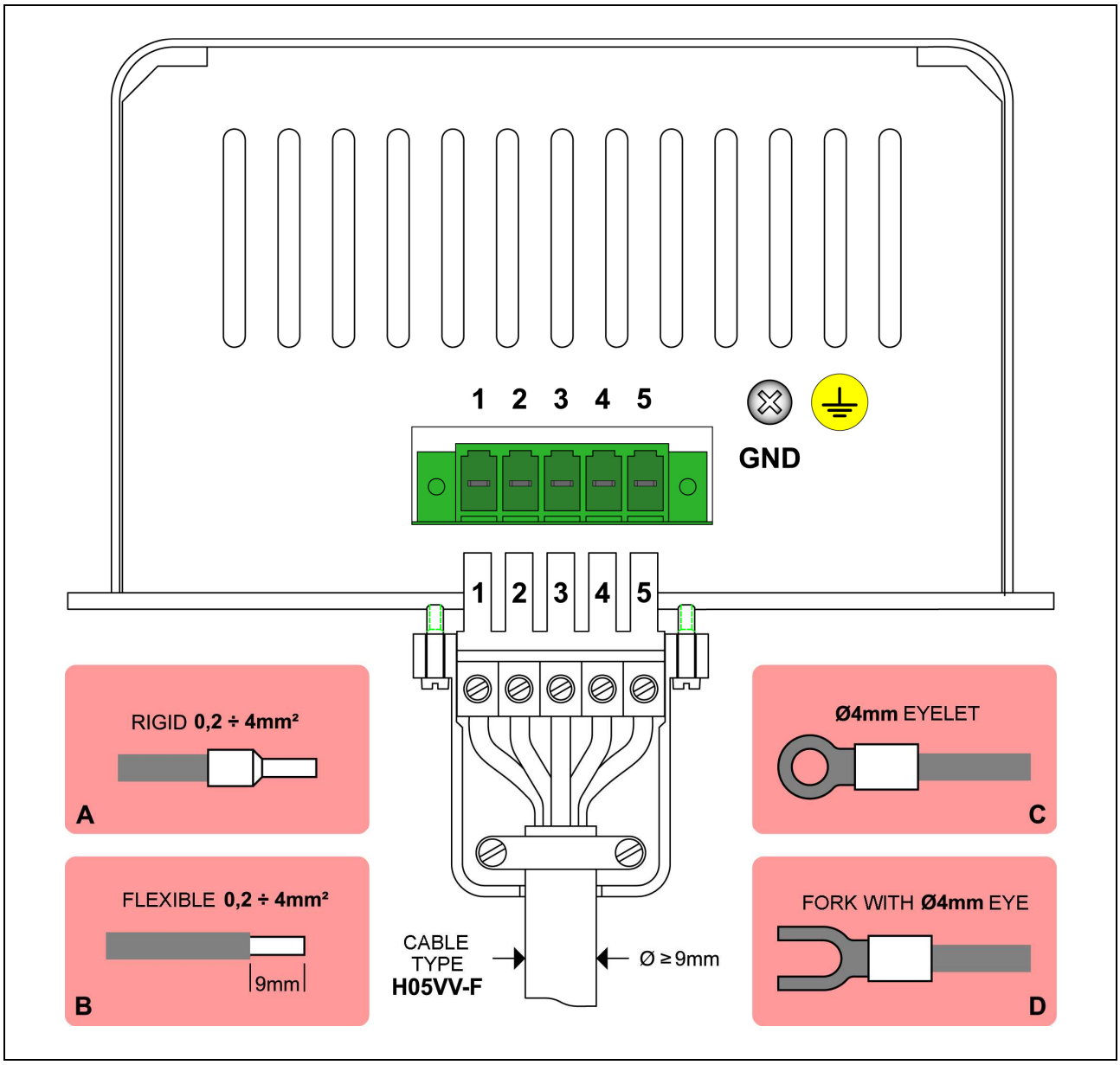


Fig. Connector with shell

For installation inside power panels is not necessary the use of protective shells. The regulator can be grounded by connecting the cable to the GND screw.



WIRES



1. **HEARTH PROTECTION.** For use in wall mounting
2. **BYPASS CONTROL.** To be used for bypass activation by remote devices
3. **NEUTRAL.** Neutral, common for input and output lines
4. **OUTPUT LINE.** Power load ≥
5. **INPUT LINE.** Power equipment

GND. Fixing screw for the ground connection, suitable for installation in power panels.

CRIMP AND WIRES SECTIONS

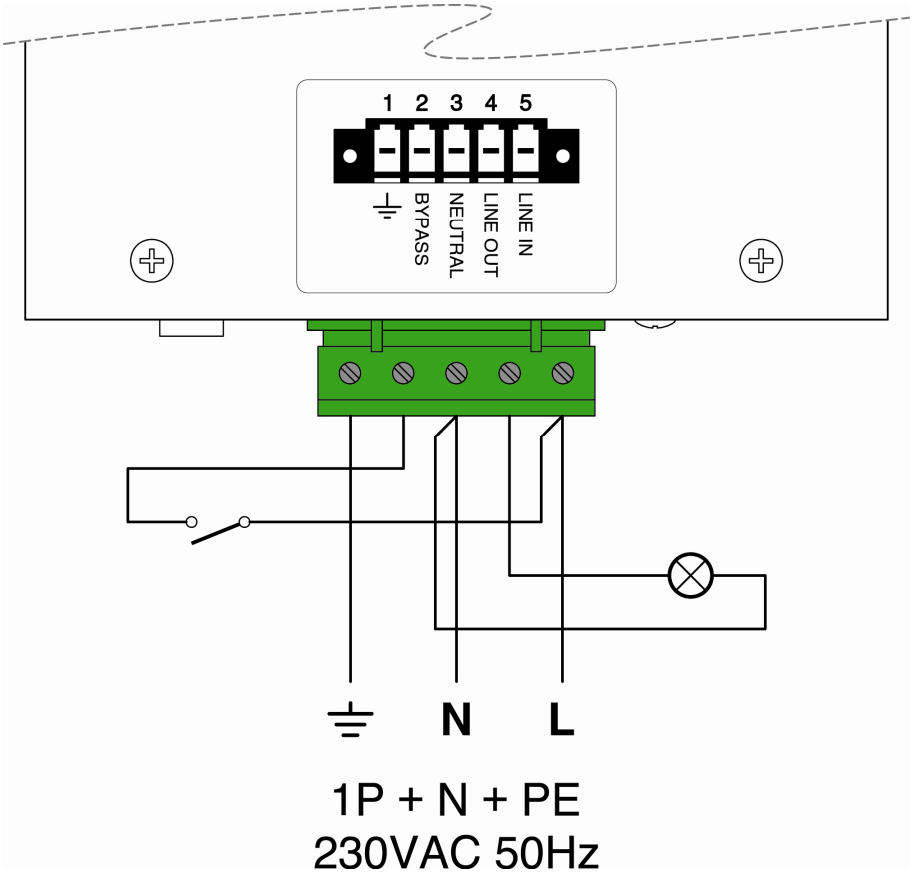
A. Wire section with tip for detachable connector

B. Wire section without tip for detachable connector

C. Eyelet terminal for GND screw connection

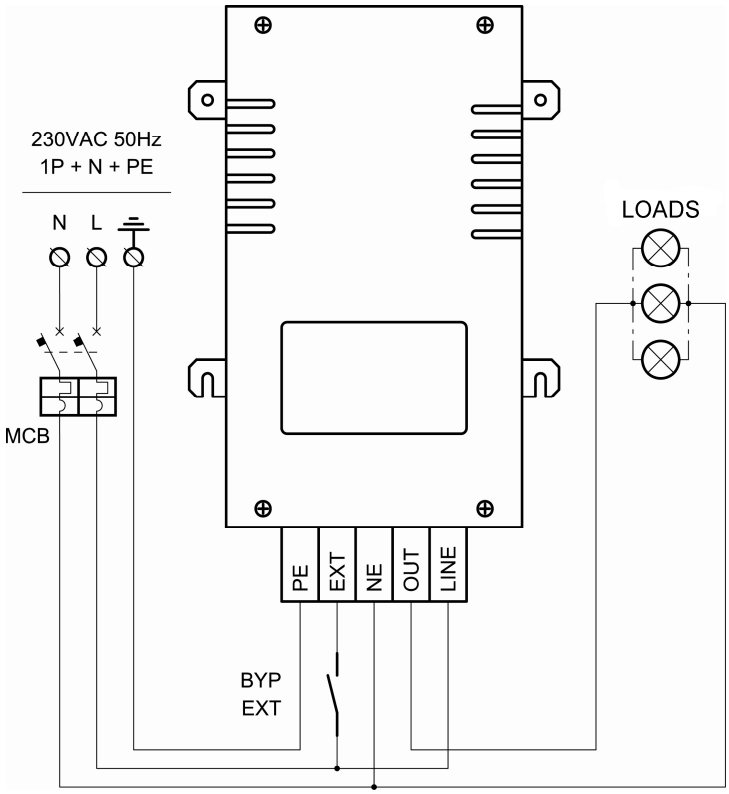
D. Fork terminal for GND screw connection

CONNECTION

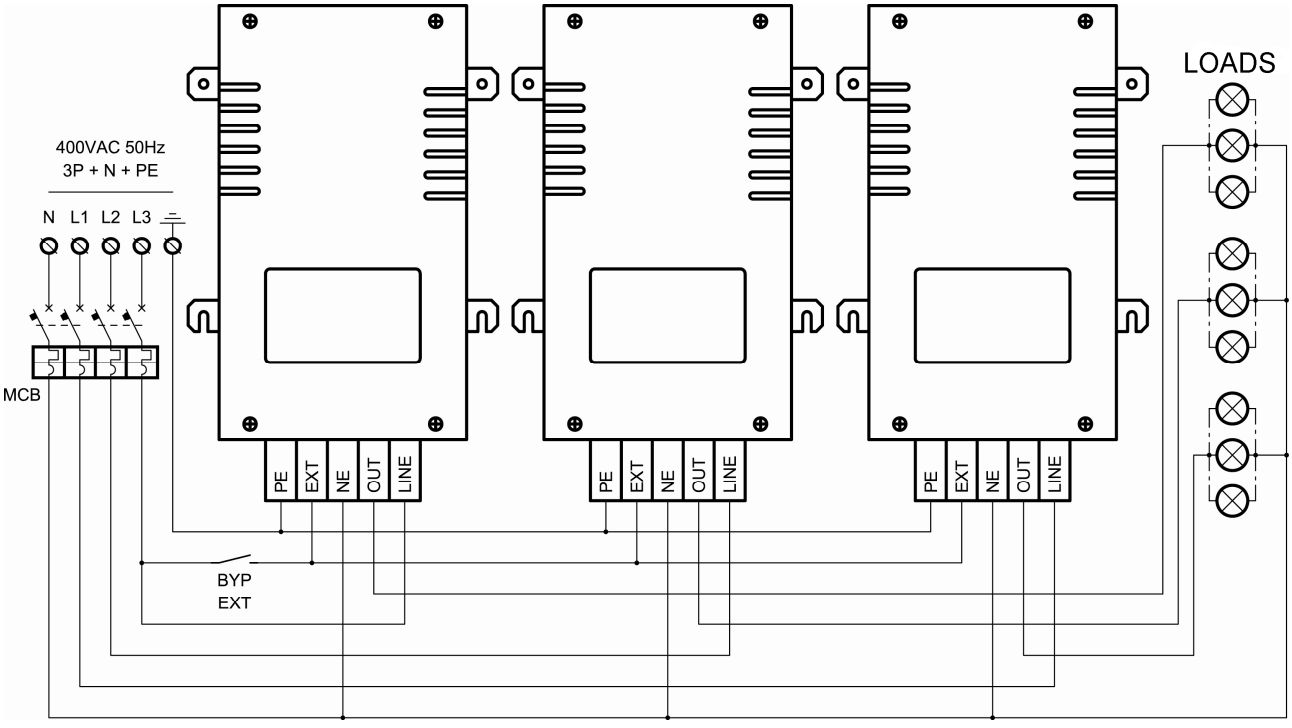


- It is required to use a circuit breaker, disconnect switch.
  Switches used to disconnect a transformer from the supply, must disconnect all poles and provide a complete separation for the overvoltage category considered.
- Always use cables with section ≥ 1.5 mm ² and follow the L (Phase) and N (Neutral) connection scheme
- Create a good ground connection, always making sure this cable is always longer than the others so that is the last to come off if subject to any stress.
- Protect the accessibility to the quick connector after installation also.
- The manufacturer is not responsible for any damage caused by the lack of grounding or inobservance of the wiring diagrams

TYPICAL WIRING DIAGRAM - SINGLE PHASE

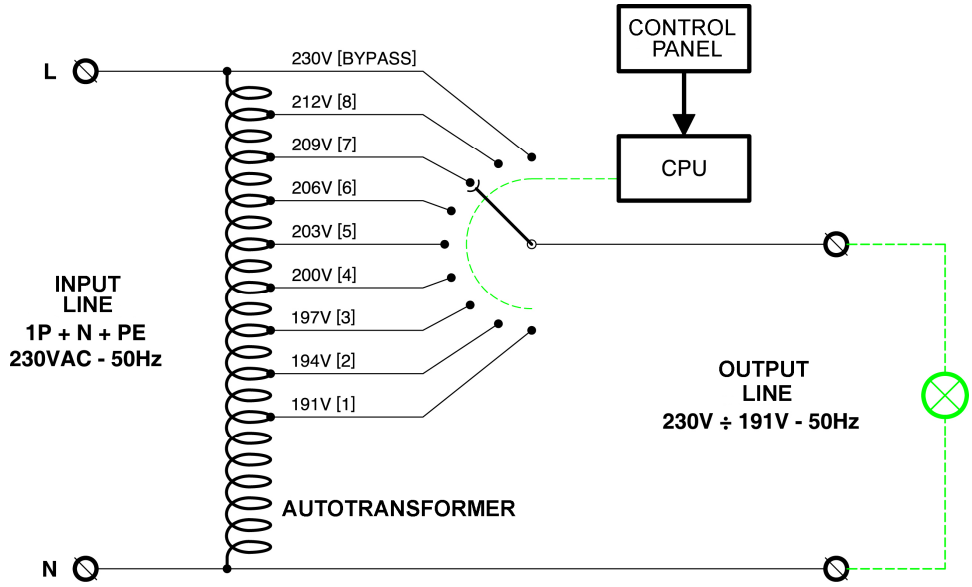


TYPICAL WIRING DIAGRAM - THREE PHASE

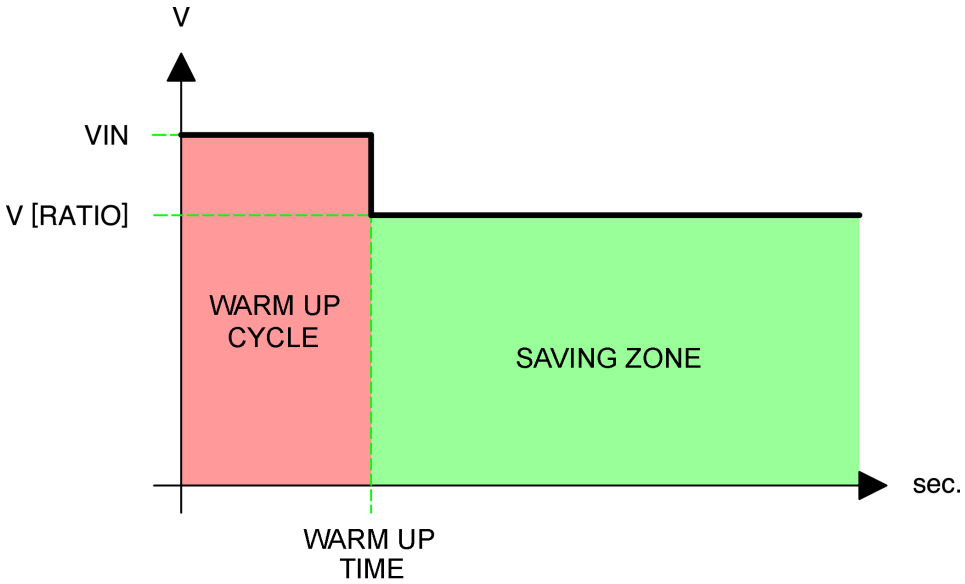


OPERATING PRINCIPLES

The operation principles of the GENIUS POWER COMBI can be summarized in the following figure:



The autotransformer has 8 outputs, each giving a different voltage. From the control panel you can set the desired voltage level. Power devices are driven through the microprocessor control unit, so that the regulator's output is directly connected to the output with its voltage level set. The output is directly connected to the 230V input line, with a variation that can range up to ± 15%, both in "BYPASS" mode and "WARM UP" cycle. As it is used a transformer, the voltage on the center output is directly affected by the variation of the input voltage VIN. For example, if there is a 5% increase of the input line, there will be a resulting voltage increase of the output line. The regulator makes the "WARM UP" cycle after its start, and then moves into the "SAVING " mode which falls in the area of savings.



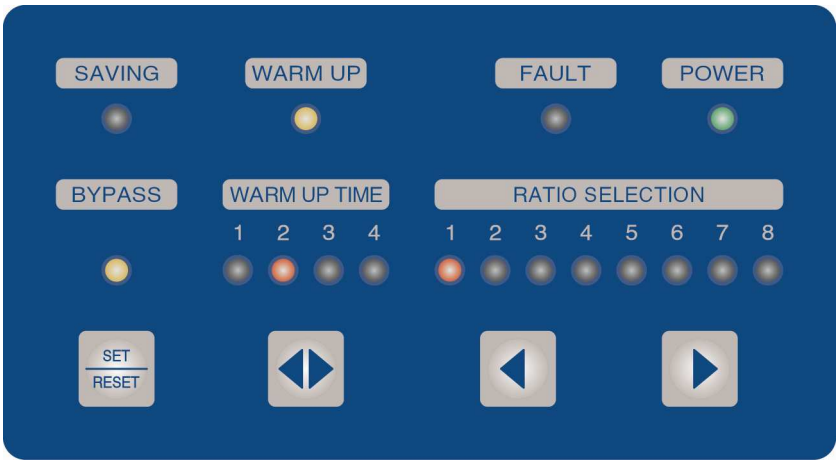
The time duration of the "WARM UP" cycle is set and displayed on the control panel under the "WARM UP TIME" section. The output voltage level is set and displayed on the control panel under the " RATIO SELECTION" section. (REFER TO THE PARAGRAPH)

FIRST START

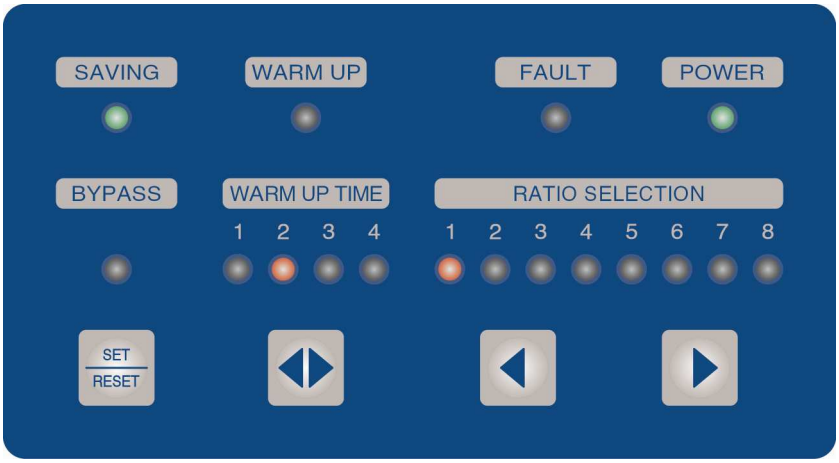
- Before switching on and perform the functional test of the regulator, it is essential to check all electrical wirings are properly made (REFER TO THE PARAGRAPH)
- Make sure the ground wire is properly connected
- Check the presence of the protective device upstream the unit, making sure it meets the requirements stated on the plate of the regulator
- Check the tightness of the connector's screws.

Power up the regulator only after having checked the above list.

If everything is ok, the lamps will light up immediately. The regulator performs the "WARM UP " cycle. Lamps are directly connected to the 230V input line. The green "POWER" led, the yellow "WARM UP" led and the yellow "BYPASS" led should light up on the control panel. Both the red "WARM UP TIME" and the "RATIO SELECTION" leds will switch on, according to the manufacturer test.



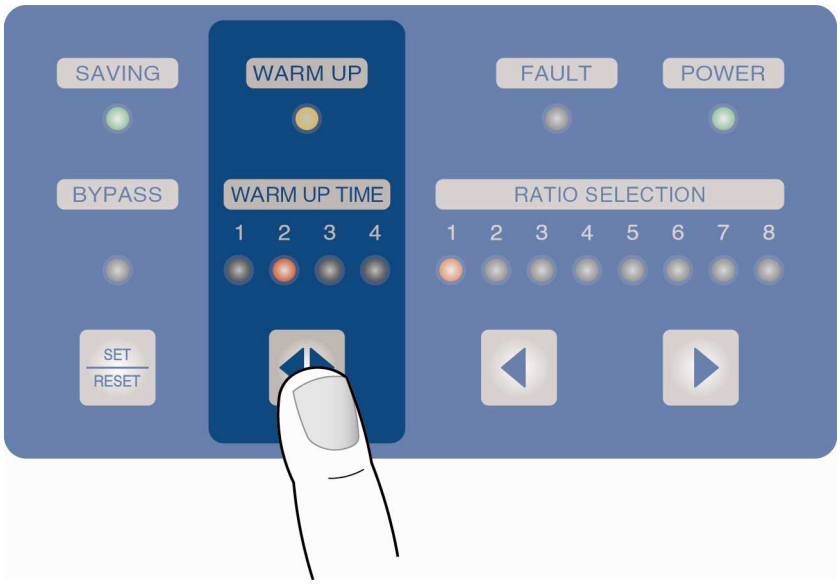
The GENIUS POWER COMBI goes into saving mode after having finished the warm-up cycle, bringing its output to the voltage set on the "RATIO SELECTION" parameter, corresponding to the lighting red led. The green "SAVING" led starts lighting and the yellow "WARM UP" and "BYPASS" leds switch off.



The regulator remains in this condition until next restarts or settings. The "WARM UP TIME" and "RATIO SELECTION" values set by the manufacturer are not always the same. If there are any anomalies, see the "TROUBLESHOOTING" paragraph.

SETTING THE WARM UP CYCLE

There are types of lamps or particular installation conditions (e.g. high length of the line that causes significant voltage drops), which make impossible for the lighting of lamps at voltages below a certain threshold. For this reason, after its switching on, the regulator starts the "WARM UP" cycle during which the lamps are connected directly to the 230V ± 15% line voltage, which guarantees their regular lighting. The duration of this cycle is equal to the time corresponding to the "WARM UP TIME" level signaled by the red led switched on, and is set by pressing the key in the "WARM UP" zone on the control panel.



WARM UP TIME

1. **10 secs.**
2. **4 mins.**
3. **8 mins.**
4. **16 mins.**

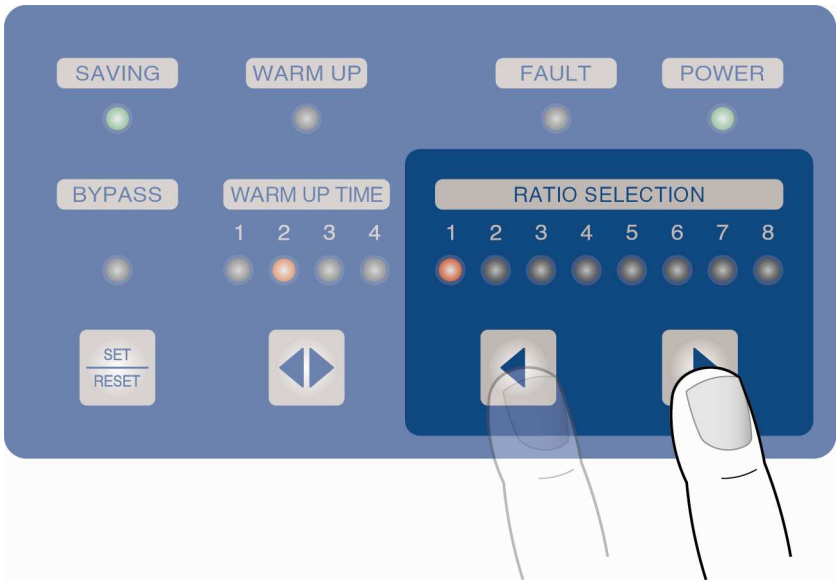
If you press this key repeatedly, you enable the next level until you return periodically to the level 1 (1 ... 2 ... 3 ... 4 ... 1 ... 2 ... etc). Changes in the warm-up time made during the warm up cycle have no instant effect, but only after the next time the regulator will be switched on. During this phase, the yellow "WARM UP" and "BYPASS" leds remain simultaneously lit.

I If you connect loads to the output of the regulator after its warm-up cycle, the voltage setting may not be sufficient to turn on some types of lamps.

If you want to exit from the warm-up cycle before the set time, just press the bypass "SET/RESET" key, so that the regulator goes on the saving mode.

SETTING THE "RATIO SELECTION" VOLTAGE LEVEL

After the warm-up cycle, the regulator goes in "SAVING" mode. The yellow "WARM UP" led turns off and the green "SAVING" led lit. In this state the regulator output is at the voltage corresponding to the level showed by the red led in the "RATIO SELECTION" area on the control panel. Act on the two keys to change the level as shown below.



RATIO SELECTION

	VOUT	V%	Wa%	Wd%
1	191	83	31%	36%
2	194	84	29%	34%
3	197	85	27%	32%
4	200	87	25%	30%
5	203	88	22%	28%
6	206	89	20%	25%
7	209	91	18%	23%
8	212	92	15%	21%

V% Output voltage in% of the VIN value

Wa% Percentage of power savings when using halogen lamps

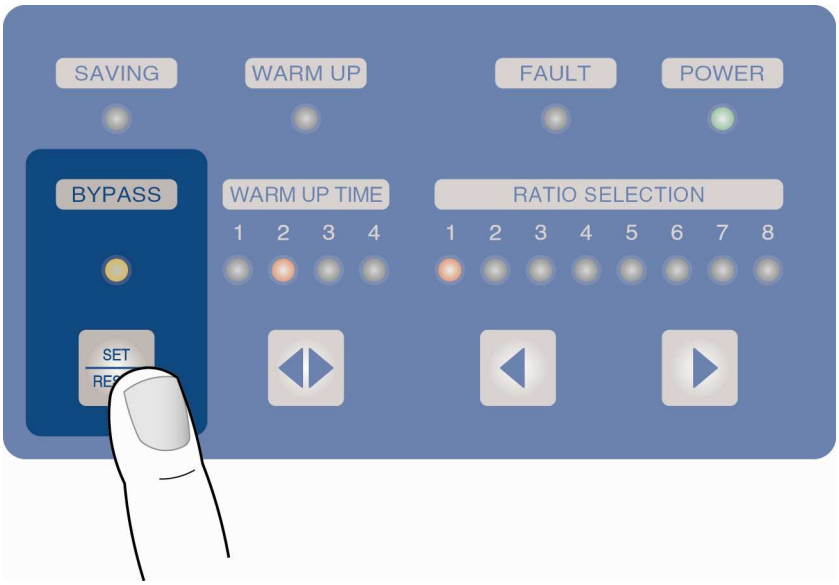
Wd% Percentage of power savings when using discharge lamps

Pressing the "◀" key takes you to the lower level, while the "▶"key takes you to the next level. When you set a new level, the value on the output voltage changes after a few seconds.

I The voltage values corresponding to the "RATIO SELECTION" levels, refer to an ideal 230VAC input voltage. Variations of the input voltage correspond to variations in output voltage.

BYPASS

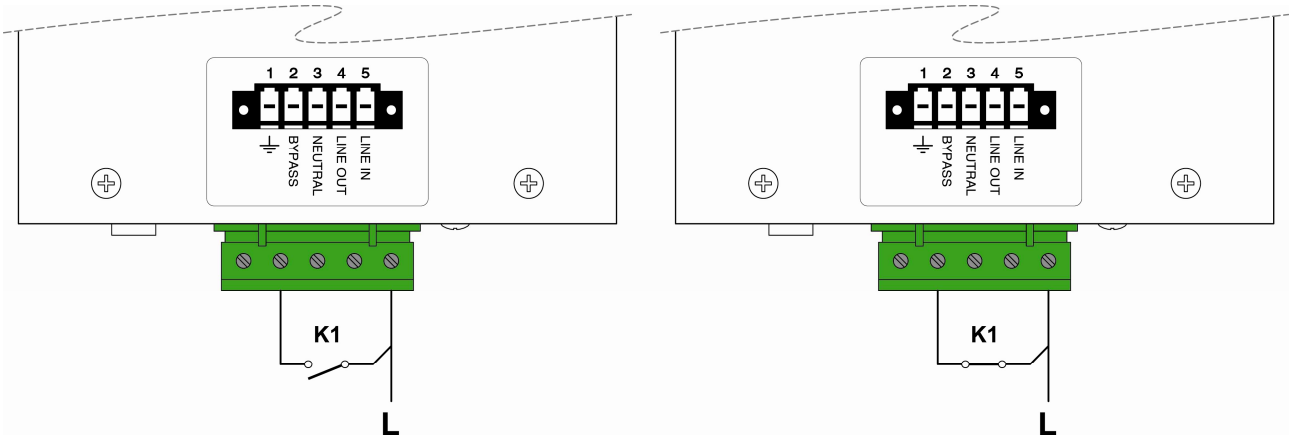
The regulator does not operate any energy savings when in “BYPASS” mode. In fact, when it goes in this mode, the green "SAVING" led turns off and the yellow "BYPASS" led automatically lit. In this condition, the regulator output is directly connected to the input line at 230V ± 15%. To enable this mode manually, just press the key in the "BYPASS" zone.



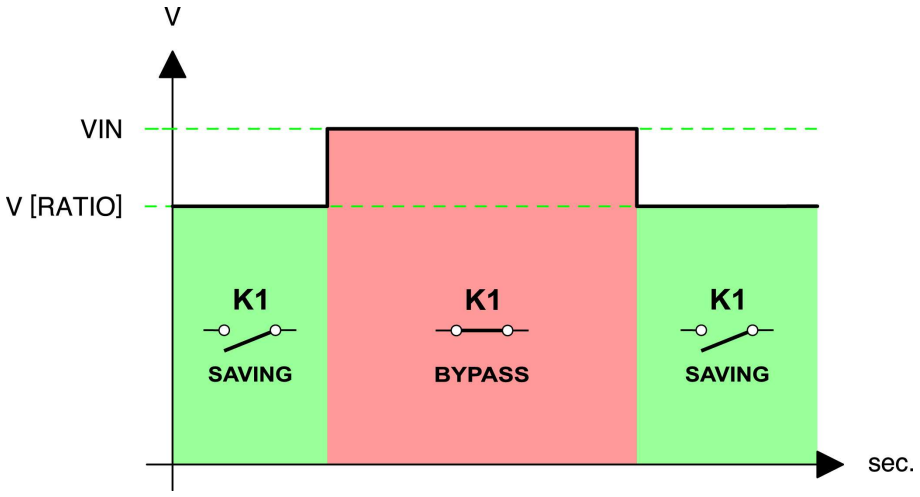
The key works in "toggle" mode then, if the regulator is in "SAVING" mode, by pressing this key it goes in "BYPASS" mode. Instead, if the regulator is in "BYPASS" mode it goes in "SAVING" mode. During the warm-up cycle, the GENIUS POWER COMBI automatically enables the "BY PASS" mode. The minimum time spent in one of these two modes ("BYPASS" and "SAVING") is about 3 seconds. You will not obtain any change if you press the key before 3 seconds. It is also possible to remotely force the bypass state, using an external control device.

REMOTE BYPASS CONTROL

If you need to force the bypass mode by using auxiliary devices, you can use the “BYPASS” contact.



In the basic diagram, "K1" is the contact of a relay or contactor. The regulator remains in "SAVING" mode when it is open, and the output voltage is equal to the value set in the "RATIO SELECTION" parameter. If the contact is closed, the "BYPASS" terminal is directly connected to the input phase. The regulator immediately goes in "BYPASS" mode, and the yellow "BYPASS" led lit and the green "SAVING" led turns off. The output is directly connected to the input line.



The regulator is in bypass mode all the time that the contact "K1" is closed.

ALERTS AND FAULTS

FAULTS	POSSIBLE CAUSES/SOLUTION
All leds and lights are off	• No power supply line; • Power connector is incorrectly inserted; • Measure the input line voltage with a multi-meter; • Check the insertion of the plug connector;
The FAULT led is lit, all others are off, lamps are lit.	• Protection fuse broken • Intervention by the thermal resistance of the transformer; • Check the fuse and replace if broken, with one having the same characteristics listed on the plate; • **CONTACT THE SERVICE CENTRE** if the machine still does not properly work;
All leds are off, the lamps are lit	• No power at the control circuits (+12 or +5); • F2 resettable fuse intervention (wait some minutes); • Incorrect connection between power board and control; • **CONTACT THE SERVICE CENTRE**
The voltage on the lamps does not match the selected ratio	• The U1 integrated circuit on the power board is not properly inserted; • Contact pasted on one of the switching relays; • **CONTACT THE SERVICE CENTRE**
The lamps are switched off, on one of the 8 selected ratios.	• Autotransformer terminal loose on its output; • **CONTACT THE SERVICE CENTRE**

If faults cannot be resolved with the above guidelines contact the service by communicating:

- the problem
- the device model
- the serial number

6 Do not attempt to disassemble or repair the regulator by yourself. Always contact your Agentech Srl Service Center.

6 Never call unauthorized technicians and do not replace parts with ones that do not comply

| Tampering or repair by unauthorized personnel will permanently void the warranty