MODEL

GT250A128TAVZZ

REFERENCE

S01000

DOCUMENTATION FOR THE ELECRIC REGULATOR DEVICE

INSTRUCTIONS FOR USE AND MAINTANANCE

AGENTECH SRL
STRADA MASSILINA 78
47899 SERRAVALLE - R.S.M.

INDICE

1. GENERAL INFORMATION

1.1. Preamble: limits and liability

Agentech s.r.l. will not be held liable in case of modification, alteration or connecting operations carried out which do not comply with the instructions set in this manual and may hinder the health and safety of people, objects and animals close to the electric equipment.

- As far as its use and maintenance are concerned, the electric equipment supplied is bind to:
- All rules, set by law and relevant regulations, in particular with regard to the upstream plant where the electric equipment is installed and its connection;
- All further instructions and warnings for its use included in the technical/graphical documentation attached to the electric equipment.
- It must be installed, protected, used, maintained and finally disposed of so as to prevent any damage to people, objects or animals. Furthermore, the necessary maintenance must be carried out.
- It should be used only for the activities intended and described in the chapter on functioning and in the scheme supplied.
- All technical and organizational measures so that other people, apart from specified operators, do not use the equipment, must be taken.

1.2. Limits to warranty

The manufacturer will be held liable exclusively if the product is acknowledged as defective at the time of delivery. The right to warranty by the purchaser is subject to articles 1490, 1491, 1495, 1667 of the Italian Civil Code.

Agentech s.r.l. guarantees a warranty service on its supplies for maximum:

- **12 (twelve) months** for electric components
- **24 (twenty-four) months** for electromechanical components

after the delivery date, under the following conditions:

- The purchaser shall not carry out repairs autonomously, unless previously authorised by Agentech s.r.l., otherwise Agentech will not incur liability since such intervention may modify the essential safety requirements and impair its correct functioning;
- Warranty extends to all components acknowledged as defective due to materials or workmanship and does not extend to damage due to an incorrect use of the electric equipment supplied or due to the breach of the precautionary measures concerning its use and maintenance included in the documentation;
- Warranty does not include any kind of expense related to the delivery of spare parts, labour costs and freight costs;
- Warranty on components is valid only if our suppliers guarantee the replacement of defective material;
- Warranty does not include any kind of compensation for the period of time the plant remains idle;
- Warranty does not extend to components subject to wear and consumables;
- General Sales Terms and in particular Warranty and Assistance Terms are valid only if the electric equipment is installed and maintained according to the “Installation, Use and Maintenance Manual”.

1.3. Purpose and content of the Manual

The purpose of the Installation, Use and Maintenance Manual is to provide the purchaser with all necessary information so that, besides correctly using the electric equipment supplied, he/she will be able to use it autonomously and in the safest way possible. In particular it contains provisions aimed at guaranteeing:

- The safety of people and goods;
- An easy maintenance.

It includes information on technical aspects, installation, use and maintenance. Before any kind of intervention or action on the electric equipment, operators and qualified technicians shall read and understand the instructions set in this manual carefully. If there is any doubt on the correct interpretation of the instructions, they should contact the manufacturer so that he can clarify on such points: collect the necessary information.

1.4. To whom the Manual is addressed

The current Manual is meant for all operators and technicians qualified to Install, Use and Maintain the electric equipment. The person in charge of prevention and protection services must read through this Installation, Use and Maintenance Manual, taking all suitable technical and organizational measures in order to reduce risks linked to the use of the equipment by potential users and to guarantee a correct use of the device. The person in charge of prevention and protection service must also take into account any possible emergency situation which can arise during the installation, repair, maintenance, cleaning, dismantling and demolition, considering the working environment where the equipment had been used.

1.5. How to keep this Manual

- This Installation, Use and Maintenance Manual must be kept close to the plant where the electric equipment is installed, inside a special box and away from liquids or anything which may hinder its readability.
- Keep the manual for any future doubt and deliver it to any new owner of the equipment.
- The Manual contains instructions and warnings and is part of the documentation which shall always accompany the product, because otherwise the product would lack of one of its essential safety requirements.
- The manual is to be kept carefully and made available to all stakeholders.
- Warnings are meant to ensure the safety of people exposed to any potential risk.
- Instructions are meant to describe the most suitable way to use the plant as envisaged by the manufacturer.
- No part of it may be duplicated, copied or disseminated in any form or by any electronic, mechanical or photographical mean without the express consent of the manufacturer.

1.6. Symbols

This manual can make use of typographical symbols, pay attention to the following symbols when reading the manual:

SYMBOL	MEANING	DESCRIPTION
	Important:	read before starting any operation
	Caution:	warning messages describe procedures which are to be followed in order to avoid the bad functioning and/or risks/dangers, even serious ones
	Notes:	include suggestions, procedures, practical advices and specific cases

1.7. Staff prerequisites

The staff who works with the electric equipment supplied must:
- have read and understood all safety provisions set in the Installation, Use and Maintenance Manual;
- be in normal psyco-physical conditions;
- have been previously instructed and trained on:
- risks and dangers of injuries and other damage which may be caused by direct or indirect contact;
- risks and dangers caused by over temperature, electric arcs or radiation;
- risks and dangers different from electric ones which may be caused by electric material;
- risks and dangers to which they may be exposed when carrying out specific activities set in this manual;
- be in possession of (or receive adequate training):
- an adequate educational level in order to understand the content of this Installation, Use and Maintenance Manual and correctly interpret the electric schemes and all technical figures;
- knowledge on main technical and accident preventive measures;
- know how to behave in case of emergency;
- know where to find individual protective devices and how to use them properly if prescribed by the manufacturer or when collective protective measures are inadequate;

 The staff who work with the electric equipment is divided into three categories:

Skilled person: “Qualified person in possession of a specific education and experience in order to avoid dangers which may be caused by electricity”.

Instructed person: “Qualified person, who was adequately instructed by skilled people in order to avoid dangers which may be caused by electricity”.

Non-expert person: “non-expert person who has not been trained on electric activities”.
In particular, people who can autonomously work only when there is no electric risk or under the eye of a skilled or instructed person when there is any electric risk.

1.8. Product Conformity

The electric regulator device described in this manual complies with all current provisions and regulations on health and safety, in particular, all switchboard panels sold in the EU market and manufactured by Agentech s.r.l. comply with all relevant directives and harmonised standards as declared by the manufacturer in the official “Conformity Certificate” and the special “CE mark” as follows:

1.9. CE Conformity Certificate

This document is part of the documentation supplied with the electric device. It enables the manufacturer to declare, under his/her responsibility, that the product complies with all essential safety requirements set by directives and harmonised standards.

1.10. CE mark

Products traded by Agentech s.r.l. are marked with the CE mark on purchasers and users’ health and safety. This mark present in all switchboard panels is also used to identify the product and to verify technical data of particular importance during the installation, use and maintenance of the product.

1.11. CE mark position

Products traded by Agentech s.r.l. are marked with the CE symbol on purchasers and users’ health and safety. This mark present in all switchboard panels is also used to identify the product and to verify technical data of particular importance during the installation, use and maintenance of the product.

2. GENERAL DESCRIPTION

Agentech produces advanced systems in the electronic and electrotechnical fields that are innovative in the management of the light sources and their integrations. By applying the experience of the energy conversion in the management of the fluorescent light sources, sodium vapours, mercury vapours and metallic iodides, Agentech proposes their optimisation with regulation of the required luminosity, in established time periods and in function of the sun irradiation, in order to have always the best lighting engineering level and the best management required in the specific application.

2.1. Fields of application

The main economic advantages are registered for both state and private fields, in particular:

- public lighting plants
- Shopping centres
- hypermarkets and supermarkets
- Industrial selling and service areas
- public, private and industrial buildings
- sporting facilities, parking areas, squares, stations, warehouses, hospitals, industries, public service areas, railway and airport junctions and terminals, areas destined to indoors and outdoors parking, roads and highways, tunnels.

2.2. Technology

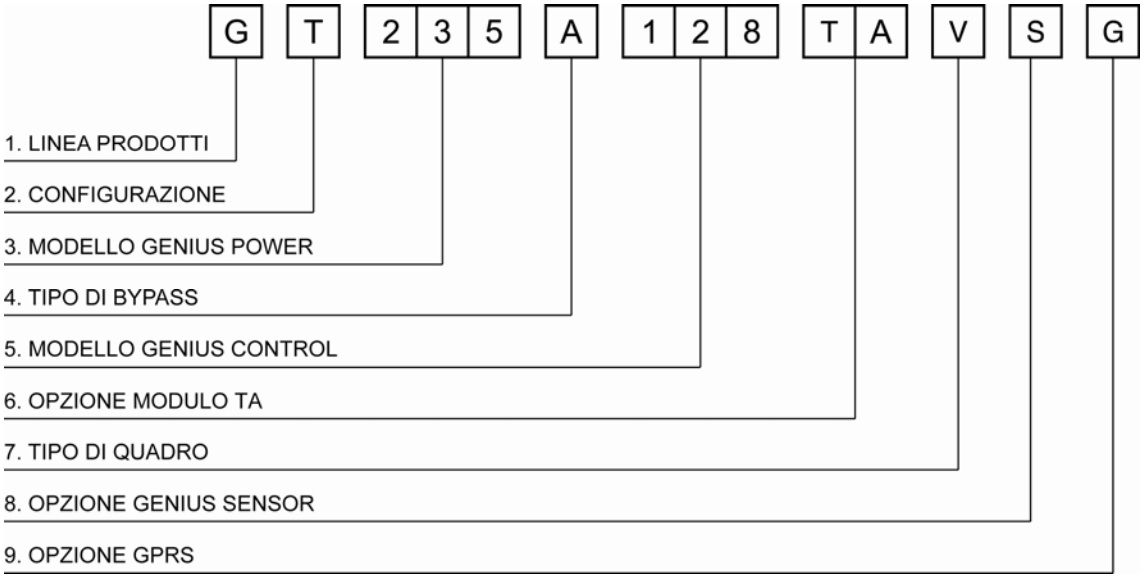
“GENIUS” regulator was projected in this light. Power control technology offers great advantages: economic benefits, reliability (being it a static device), duration, efficiency over 99%, reduced size and weight, stabilization speed. The fully static system guarantees both single-phase and three-phase output power with an efficient variable value. In the three-phase power system, the three single-phase powers can be set independently in order to reduce the different
light flux in each phase. Electromechanical components in movement (such as relays or brushes) are not used, reducing costs of maintenance and offering further energy savings thanks to the reduction of voltage exceeding the nominal value (5-7%).

2.3. Power stabilization

Thanks to the beneficial effect of line power stabilization bulbs can improve the useful life stated by the manufacturer (even by 100% on plants using new bulbs) as well as their light flux.

2.4. Switchboard panel identification codes

Switchboard panels distributed by Agentech s.r.l. can be identified by the following codes. These symbols identify 90% of the applications required by customers. However, special switchboard panels which meet specific customers' needs may differ from the following scheme.



1. RANGE OF PRODUCT

G	GENIUS SERIES

2. SETTING UP

M	SINGLE-PHASE
T	THREE-PHASE

3. GENIUS POWER MODEL

118	GENIUS POWER 1 BASE 15A
125	GENIUS POWER 1 BASE 25A
135	GENIUS POWER 1 BASE 35A
218	GENIUS POWER 2 BASE 15A
225	GENIUS POWER 2 BASE 25A
235	GENIUS POWER 2 BASE 35A
250	GENIUS POWER 2 BASE 50A
16K	GENIUS POWER BOOSTER 16KVA
22K	GENIUS POWER BOOSTER 22KVA
27K	GENIUS POWER BOOSTER 27KVA
S53	GENIUS POWER SIN 53A

4. TYPE OF BYPASS

A	AUTOMATIC BYPASS
M	MANUAL BYPASS
0	INSTANTANEOUS AUTOMATIC BYPASS

5. GENIUS CONTROL MODEL

640	GENIUS CONTROL CTRL-64
64F	GENIUS CONTROL CTRL-64 4F
128	GENIUS CONTROL CTRL-128
010	GENIUS CONTROL 010
000	STAND ALONE MODE

6. TA OPTION

TA	GENIUS WITH TA
NN	WITHOUT TA

7. TYPE OF PANEL

F	PHENOLIC PLATE
M	METALLIC PANEL
P	PANEL IN POLYCARBONATE
V	PANEL IN FIBERGLASS

8. GENIUS SENSOR OPTION

S	WITH GENIUS SENSOR
Z	WITHOUT GENIUS SENSOR

9. GPRS OPTION

G	WITH GPRS
Z	WITHOUT GPRS

2.5. Switcboard panel description

The swithchboard panel includes a regulator system for lighting plants assembled in one single equipment. It requires a three-phase power system with neutral. Thanks to this system, it is possible to distribute evenly 3 GENIUS POWER 2 regulators with the same power (among those available in Agentech's catalogue) in one lighting plant. The switchboard panel is provided with a single general magneto-thermal disconnecting switch with one single power supply control, which optimizes wiring costs and time and at the same time offers the opportunity to select each load individually, such as the BYPASS 3F control function.

2.6. Technical data on switchboard panels

PARAMETER	VALUE
Nominal power supply voltage	230VAC ± 15%
Nominal frequency	50 Hz
Max output nominal current (I_n)	25 A
Phase number	3P + N ~/PE
Auxiliary control circuit nominal voltage	230VAC
Auxiliary pilot circuit nominal voltage	12 VDC
Nominal power (apparent)	5,75 kVA
Insulation nominal voltage (U_I)	500 V
Expected maximum short circuit current at input terminals I_{cc}	6KA RMS SYM
Max altitude	2000m s.l.m.
Protection degree	IP44
Operating temperature	Da –5°C a +40°C
Storing temperature	Da –15°C a +75°C
Total weight per unit	45Kg
Size in mm W X D X H	715 X 1285 X 235

3. TRANSPORTATION, HANDLING AND STORING

3.1. Handling and Transportation

Agentech s.r.l. uses adequate packaging in order to guarantee the integrity and preservation of the switchboard panels and accessories during transportation until delivery to the customer.

In order to guarantee the equipment's stability and integrity and to avoid mechanical stress during transportation and handling, switchboard panels, regardless their shape or morphology, must be handled with care and by using adequate lifting means (if necessary).
All necessary precautionary measures should be taken when handling the switchboard panels in order to avoid overturning.

Nevertheless, those who receive the goods shall check all packages carefully. Any comment/remark should be written on the freight document and countersigned by the carrier.
The conditions of the equipments delivered must be checked at the time of delivery. Checks can be undertaken by removing the equipments from the box and verifying its perfect integrity. Agentech s.r.l. accepts no liability if faults and damage occurred during transportation are not reported promptly at the time of delivery and as described above.

3.2. Lifting

Lifting must be carried out with means suitable to its weight (its rough weight is indicated in chapter 3.1 technical data table) in order to avoid damage to people and/or objects. Once the switchboard panel is loaded in the mean which will move it, it will be necessary to fasten and protect all protruding parts with specific protection elements.

Do not lay two devices one upon the other during their transportation and storing

3.3. Storing

Agentech s.r.l.'s switchboard panels are covered by a plastic wrapping and laid on wooden pallets when delivered. If the panel delivered is not installed immediately, it must be stored in a clean and dry place, keeping it away from dust, without removing the plastic wrapping. Do not stick labels, plastic substances or similar to the surface because, if left for too long, they may damage its external structure. Environmental storing conditions must comply with values indicated in chapter 3.1 (Technical data). If environmental conditions are different from the ones indicated, a special packaging shall be used.

3.4. Packaging disposal

Packaging materials shall be sorted according to their nature and disposed of according to the relevant legislation in force in the country.

4. INSTALLATION

4.1. General Information on Safety

Read carefully all instructions in this manual and those applied directly on the switchboard panel both in the form of written text and warning symbols; in particular instructions concerning safety against dangers of electric nature (danger of electrocution, tetanisation and burn) must be fulfilled.

Staff working with such equipment during its whole life must possess specific technical skills as well as acquired and acknowledged expertise in the specific sector. They should also be able to use the necessary working tools and adequate safety protection means (pursuant to D.Lgs 626/94).
If such requirements are not met, damage to people's health and safety may be caused.
Use switchboard panels only as intended by the manufacturer.
Improper uses may cause risk to people's health and safety s well as economic damage.

4.2. Normal Use

The switchboard panel was projected and manufactured in order to minimise, or even eliminate, dangers of any nature which may arise during its normal use, as long as:

- Its installation is carried out as indicated;
- Its use complies with the instructions provided;
- Individual protective devices are used as envisaged;
- Safety procedures are correctly applied.

Improper behaviours by operators may be the cause of residual risk.

Dangers and risks caused by:

- Operator's lack of attention;
- Non compliance with information and provisions set in this manual;
- Alterations of the switchboard panel and/or its safety devices;
- Alterations of fixed repairs; because of their manufacturing typology they cannot ensure integral protection.

The following uses, which cannot be prevented by the manufacturer, yet are not allowed but reasonably possible, entail the following residual risks:

- Working on electromechanical and electric parts during their functioning;
- Working on electromechanical and electric parts when power is connected.

4.3. Residual risks

When using and maintaining the electric equipment, operators are exposed to certain residual risks which, for the very nature of these activities, cannot be eliminated:

Dangerous power: before undertaking maintenance operations, disconnect the power cable and start the general disconnecting device (see paragraph 6.5);

Residual power: components installed inside the electric equipment may contain condensers, where residual power may be present even when the device is off and the power cable is disconnected.

4.4. Non-intended uses

4.4.1. Contaminating agents

If not otherwise specified in the agreement or clearly stated in the order, the whole electric equipment supplied is not suitable for outdoor uses where contaminating agents are present such as fine dusts, acids, corrosive gases, salt and similar.

4.4.2. Potential explosion-risk environments

If not otherwise specified in the agreement or clearly stated in the order, the whole electric equipment supplied is not suitable for use in explosion-risk environments. The switchboard panel and its components are not made according to ATEX standards.

4.4.3. Ionising and non-ionising radiations

If not otherwise specified in the agreement or clearly stated in the order, the whole electric equipment supplied is not suitable for use in environments with ionising and non-ionising radiations such as: microwaves, ultraviolet rays, X-rays and similar.

4.4.4. Vibrations

When the device is installed and maintained in compliance with this manual, vibrations which may produce dangerous situations do not occur. After the installation of the electric equipment, undesired effects of vibrations and shocks shall be avoided opting for a suitable assembling system or by using antivibrating supports.

4.4.5. Warning, protection and information signs

Agentech s.r.l.'s switchboard panels, according to their use and location, are provided with specific warning signs against risks which may incur inside the equipment as well as in the surrounding environment. With regard to potential risks, individual protective devices to be used are also displayed. Symbols usually stuck on switchboard panels and their meaning are as follows:

The client must change immediately all safety and warning labels which because of the wearing of the time may no longer be readable. If the client cannot find them, he can ask the manufacturer Agentech s.r.l. Should one of these labels be omitted, warranty will cease to have effect and Agentech will not be held liable for damage caused to people, environment or objects.
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4.5. Warning signs against danger

Danger of electrocution (put on the switchboard panel and/or junction boxes)

Danger of electric shock (put closet o active conductors and under-voltage parts)

Danger of burn (hot surface)

DO NOT use water to control fires (put on the switchboard panel)

Put on the front side of the switchboard panel. It means:
danger of electrocution due to electromechanical and electronical parts installed in the switchboard panel. Agentech's switchboard panels do not have a door lock switch. Boxes or protective devices labelled with a triangle and a thunder stands for caution if opened by unauthorized or not qualified staff.

4.6. Protection and mandatory signs

Protect you face

Use dielectric gloves

Wear dielectric shoes

Check warning manual before undertaking any intervention

4.7. Installation and connection

"Installation and connection" operations are of remarkable importance since operations/interventions not carried out according to the following instructions may damage the equipment, the power supply system or harm operators. Specific tools (such as crosshead, flat-tip screwdrivers, hexagonal spanner, etc.) depending on screws must be used during all installation and connection operations. Attention should be paid on all labels on the components to be disconnected and close to terminal boxes (see paragraph 5.1.4 of this Manual)

4.7.1. Location

The conditions of the environment where the equipment is installed must fulfil the specific values for each type of switchboard panel as shown in the "Technical Data" table, chapter 3 of this Manual

4.7.2. Ventilation

In order to ease steam dissipation, 30 cm of free space should be left around the sides of the panel, excluding the back side. Natural air circulation inside the panel should be allowed avoiding to put objects which may obstruct even partially air circulation on cooling eyelets.

4.7.3. Fixing

Switchboard panels and all separate elements are projected preventing their overturning, fall off or accidental movement during their use. Regardless their shape and morphology, they must be put in a standing position and fixed to the main structure.
When used, they must be fixed to the wall and inside the specific wrapping with a proper fixing system to the bottom of the box which will have to stand its weight on a perfectly flat and vertical surface.

In order to guarantee adequate stability, techniques and specific fixing tools (for ground and wall fixing) are hereby described

4.7.4. Ground fixing

- Make sure that the switchboard panel lays evenly on the ground;
- Position on fixing points and draw a mark where holes should be done;
- Make holes in the ground on the four corners of the switchboard panel;
- Clean the holes from dust;
- Put the fixing supports into the holes in the ground through the holes in the panel;
- Screw in all screws properly.

4.8. Electric installation

Installation must comply with the legislation in force in the country of installation. Great attention must be paid during the installation of the electric system, in order to avoid dangers during its normal functioning.

4.8.1. Power mains

Power intensity and type must meet the instructions on the panel (see chapter 3.1 Technical Data of this Manual and the first page of the electric scheme). If it is connected to higher voltage, components will be fatally damaged; Upstream power supply device requires specific protection coordinates against blackout and overload which must correspond to the panel's features, as indicated in the label. Even when a differential device is installed, it must be coordinated with the protection circuit, in compliance with provisions and regulations in force in the country of installation.

4.8.2. Connecting power supply conductors

Power conductors must pass through the specific parts and close to exit terminals [L1-L2-L3-N/PE]. It must be a single piece, without interruptions from the device in order to avoid overload in the connecting points of the panel.

Conductors' terminals must be provided with crimp terminals. Cables must be 2mm wide, suitable for the nominal voltage indicated in the label and in the "Technical Data" scheme.
Remove all protections in order to have access to switch and box terminals.
First connect the protection conductor (yellow/green earthing conductor) to the relevant terminal labelled [PE] and then all other neutral and phase conductors in sequence.

4.8.3. Connecting lighting load conductors

Electric equipment must be connected to the plant according to the following technical provisions:

- The connection of cables coming from the plant where it is installed must be carried out according to the protection degree of the switchboard panel, avoiding any impact on it;
- Cables from the plant must pass through the specific parts and close to the relevant terminal boxes as shown in the picture (terminal box Q.E.).
- Cables' section and features must comply with provisions set in the "electric chart". Cables with different section from the size indicated may change current short-circuit values, thus reducing their protection level in case of faults;
- Conductors' terminals, if the component to which they are connected requires it, must be provided with a crimp terminal.
- Connections must be carried out carefully following technical instructions and using suitable tools.
- Connect only one protection conductor to each earthing terminal.
- Fulfil all manufacturer's provisions for all components connected to the electric plant.

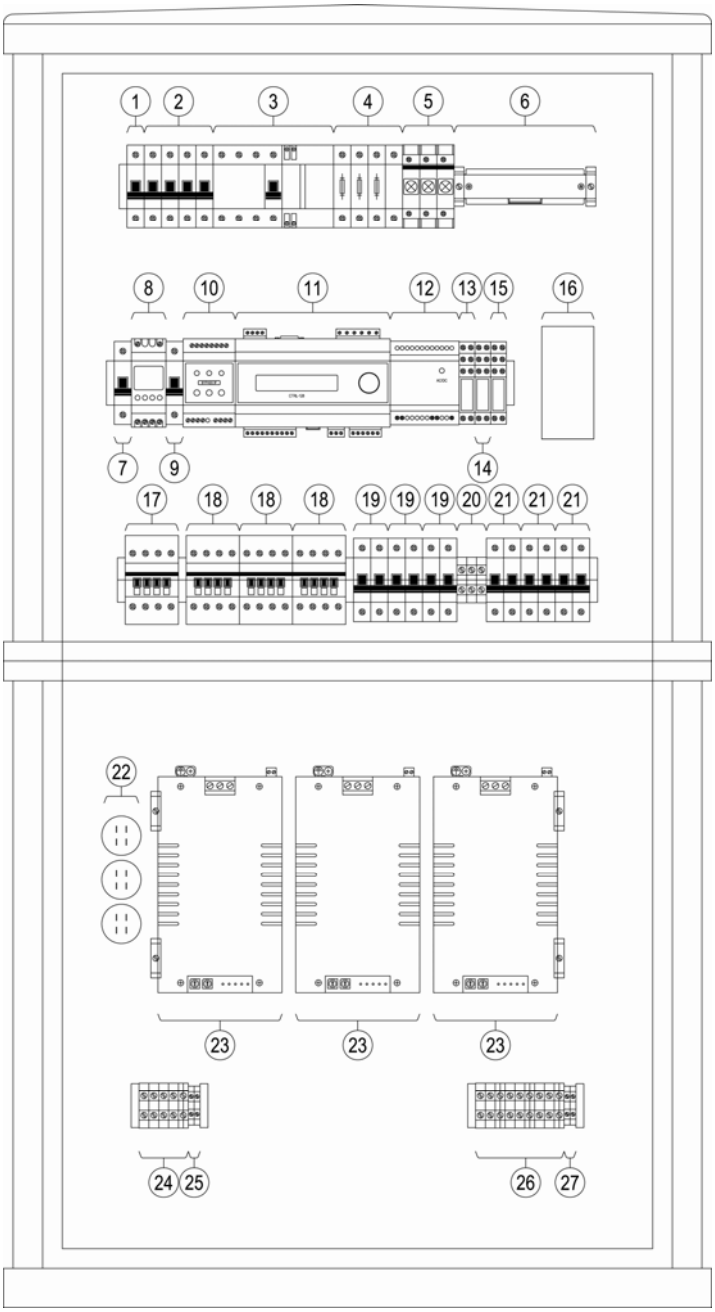
5. WORKING AND COMMISSINING

"Commissioning" is allowed only after conformity with provisions envisaged in paragraph 5 "Installation" of this Manual is declared. Close all boxes and check that all operations set in this Manual have been carried out properly before connecting the electric equipment.

5.1. Description of installed components

All components in the three-phase switchboard panel are listed below, according to their position in the plate (with corresponding nomenclature):

1	General switch release
2	General magneto-thermal switch
3	Resettable differential switch
4	Auxiliary circuit protection fuses
5	Voltage signal lens
6	**GENIUS MODULE TA 3 X 50A**
7	Mode selector Selettore TIMER/MANUAL
8	Astronomical clock
9	Twilight bypass selector
10	GENIUS BYPASS 3F
11	**GENIUS CONTROL CTRL128**
12	AC/DC converter
13	BYPASS alarm control relay
14	REGULATION mode control relay
15	BYPASS starting control relay
16	GPRS self-control module
17	Line contactor
18	BYPASS system contactor
19	Magneto-thermal regulator switch
20	NEUTRAL connection terminal box
21	Output magneto-thermal switch
22	Re-phasing condenser
23	**GENIUS POWER 2**
24	Mains power supply input terminal box
25	Twilight switch terminal box
26	Load power supply output terminal box
27	Bypass alarm control terminal box



5.3. Preliminary check on commissioning

Before commissioning the switchboard panel, the following conditions should be checked.

- Check that the neutral cable is correctly connected to the corresponding terminal before connecting the electric equipment, otherwise there will be a three-phase electric power instead of specific phase electric power in the terminals of loads feeded between phase and neutron. The same holds true for the remaining conductors to phase terminals in input line (Fig. 5.1 – 24). If conductors are reversed components including all GENIUS POWER 2 flux regulators would be fatally damaged.
- Check that the earthing conductor (yellow/green) of the mains cable is connected to the PE terminal (fig. 5.1 – 24). If there is no protective circuit, protection against indirect contacts is not possible.
- Check the voltage mains in the terminals inside the terminal box (fig. 5.1 – 24) with a specific tool (volmeter) and verify that the Uf line voltage in the terminals [R - S - T] corresponds to voltage indicated in the label. Also check that the voltage between each terminal [R - S - T] and [N] is equal to Uf /√3, that is GENIUS POWER flux regulators' voltage.
- Check the correct tightening of all bolts to terminals in terminal boxes.
- Check the presence of an upstream protective device in the switchboard panel and that it complies with the provisions on the label and referred to in this Manual.
- Check that all switches and disconnect switches in the regulator panel are OFF and or 0 before starting the switchboard panel.

The regulator device can be started only after all conditions have been checked.

5.4. Commissioning phases

Figures into brackets (X) refer to components shown in fig. 6.1

STEP 1 Make sure that switches (2), (3), (19) e (21) are all OFF

STEP 2 Make sure that switches (7), (9) are in position ON

STEP 3 Turn ON the general magneto-thermal switch in the panel (2)

STEP 4 Check that the three phases R, S, T, are present, verifying that illuminated lens are on (3)

STEP 5 Turn ON the magneto-thermal switches (21)

STEP 6 Check that the system moves to the bypass mode, verifying that the three red leds on the GENIUS BYPASS 3F are on. In this mode, all loads are directly connected to the power supply line.

STEP 7 Check that load works properly, verifying that each lamp is on. Keep the system under-load for approximately 10 minutes.

STEP 8 Turn OFF the general magneto-thermal switch (2) and keep the system off for approximately 15 minutes enabling the lamps to cool down

STEP 9 Turn ON the magneto-thermal switches (19)

STEP 10 Turn ON the switch (7)

STEP 11 Turn ON the general magneto-thermal switch in the panel (2)

STEP 12 Check that the voltage in the output terminals (25) is equal to 210

STEP 13 Adjust the GENIUS CONTROL CTRL128 (6) according to the needs of the application where the system is installed

Check the Manual annexed to the technical documentation

STEP 14 Turn OFF the switch (17), thus enabling the automatic mode of the plant, according to the GENIUS CONTROL CTRL128 (6) control unit setting

If the twilight switch is connected to the system, turn OFF the switch (8)

5.5. Turning off the switchboard panel

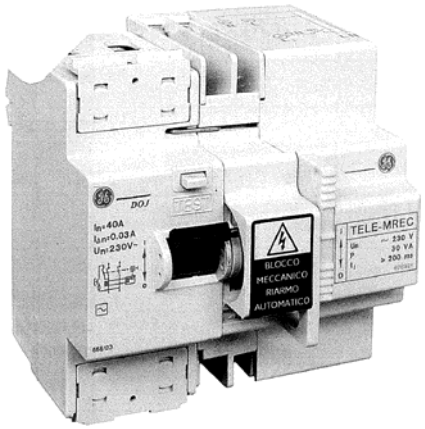
In order to turn off the lighting plant, the general switch must be set to the OFF position.

It is advisable not to disconnect the switch when under-load; therefore regulators and by-pass systems should not be working. Turning off the device when under load may cause dangerous electric arcs although components are properly sized.

5.6. Resettable differential

REC Plus differential switch automatically resets the differential switch in case of sudden opening or earth faults.

REMEMBER TO BLOCK THE AUTOMATIC RESETTING MODE EVERYTIME THE SWITCH IS MANUALLY OPENED. OTHERWISE THE SWITCH WILL INTERPRET THE OPENING AS A SUDDEN EVENT AND WILL PROCEED TO ITS CLOSING AFTER 10 SEC.



6. WARNING ON MAINTENANCE

Agentech's regulators do not generally have maintenance problems. Anyway, it is advisable to periodically carry out the checks herein described. Deadlines can be customised according to its conditions after the first checks.

6.1. General warnings on safety

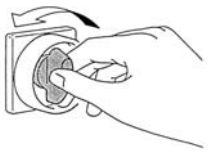
Attention must be paid to all labels put on the machine and the electric device.
During its use, safety device should not be altered or turned off for any reason.

Before starting the maintenance a sign should warn that operations are being carried out on the device. The device should be restarted only when all operations have safely concluded and all protective supports have been reinstalled.

6.2. Power supply insulation

Before carrying out any cleaning or maintenance operation, the electric equipment should be brought to zero energy condition.

Make sure that the protective device upstreaming the power supply line is locked in 0 position with special lockers.



6.3. Visual inspection of the whole panel

6.3.1. Checking connections every 12 months

The tightening of all screws which allows electric connections and the mechanical fixing of electric devices should be checked. Any trace of oxidation should be removed with a smooth abrasive action. Junctions should be protected with a narrow layer of conductive fat. If the junction is highly oxidized, it is better to replace the support device, the terminal and restoring ex-novo the connecting cable header, after removing the end of the cable where copper was oxidized. Such check should be carried out on all removable switches auxiliaries' plug and socket connectors.

6.3.2. Checking the efficiency of protective devices (fuses, switches) every 12 months

Open the device and check the conditions of fuses and automatic protection and disconnecting switches.
If there are no visible traces of oxidation or overheating, fuses and switches can be reassembled. Otherwise, they should be all replaced since the excessive overheating of a component can no longer guarantee a good electric contact.
In particular, checking the correct functioning of by-pass switches and minimum voltage coils as well as minimum exciters is highly advisable.

6.3.3. Checking protective circuit (earthing system) every 12 months

Check that the earthing terminal is efficiently connected to the ground earthing system. Connections should be opened both on the ground bar and on a real earthing support. Check the efficiency of contact surfaces and clean them. Connect and grease the external part of the juncture with Vaseline or conductive grease.
Such check is fully effective only if the ground earthing system is in perfect conditions. The ground earthing system must be checked regularly according to the legislation in force in the country of installation.

6.3.4. Ventilation functioning check (if present)

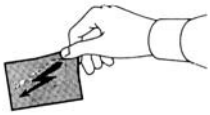
Check the correct functioning of the air ventilation devices in "Genius Power" regulators and of any extractor located on the side of the switchboard panel.

6.4. Cleaning

All cleaning operations must be carried out only when the electric equipment is off and disconnected (see paragraph 6.5). Any dust should be removed with a normal vacuum cleaner after turning off the panel. Removing dust with compressed air is not enough since it can go back or just be moved inside the device. Conductive dusts, coil or similar, or fuel dusts, wood dusts, cereals or similar should not deposit on it.

In order to clean the electric equipment and its components, do not use petrol, solvents or flammable and/or corrosive liquids. Only use solvents that are not flammable, toxic and that are traded and homologated.

Do not purposely alter safety supports; do not remove or hide warning labels. If labels are damaged or unreadable, ask the manufacturer to replace them.



6.5. Parts replacement

All parts of the electric equipment which need to be replaced are to be reintegrated with suitable components with the same features. Modifications to the original features of the electric equipment shall be notified and approved by the manufacturer.
After significant repairs or replacement operations, before starting the equipment, checks, registrations and tests indicated in this warning Manual must be carried out.

7. DISPOSAL

Disposal of switchboard panels must fulfil regulations in force in the country where it is disposed of. Switchboard panels are made of the following raw materials:

- steel parts
- plastic parts
- copper parts (wires)
- electric components (insulators and semiconductive components)

Switchboard panels must be disposed of sorting electric components and wires; the empty electric cupboard will be put together with metals, while electric components and wires will be put separately. Switchboard panels should not be considered as a household waste, but should be taken to a waste collecting point for electric and electronic parts to be recycled.

By properly disposing of this product, you can contribute to avoid potential negative consequences which may be caused by an improper disposal of the product. For more detailed information on how to recycle this product, contact the relevant municipal office, the local waste disposal service or the distributor where the product was bought.

8. BILL OF MATERIAL

N. 1	Shunt trip release device 230VAC CHINT 50017
N. 1	Automatic magneto-thermal switch 4P C40A 10KA CHINT 51411
N. 1	Fuse carrier disconnector 3F + N 10,3 X 38 with CHINT 80540 fuses
N. 1	Automatic differential switch 4P C40A 10KA CHINT 51411
N. 1	GENIUS BYPASS 3F AGENTECH
N. 1	GENIUS CONTROL CTRL128 AGENTECH
N. 1	2 switch relay 12V FINDER 405290120000
N. 2	Switch 1P 16A ABB EF9012
N. 3	Automatic magneto-thermal switch 2P C40A 10KA CHINT 55211
N. 3	quadripolar contactor (2 NO, 2 NC), power supply 230VAC, contact capacity 45A ABB EN3537
N. 1	GENIUS MODULE TA 3 X 50A AGENTECH
N. 3	Power factor correction device 20Uf 400VAC
N. 3	GENIUS POWER 2 35A AGENTECH
N. 1	Automatic resetting differential switch 4P 40A TELEREC Basic GE 676952
N. 3	Illuminated len 230VAC CHINT 81000/230
N. 1	Digital astronomical clock VEM VE048500
N. 1	switching feeder IN 120-240VAC / OUT 12VDC/3.5A 15VDC/3A CABUR CSD50B
N. 2	2 switch relay 230V FINDER 405282300000
N. 1	Modem GPRS FALCOM TANGO55/I
N. 1	Tripolar contactor (3NO), power supply 230VAC, contact capacity 45A a263010 ABB EN1036
N. 3	Automatic magneto-thermal switch 2P C20A 10KA CHINT 55208

ANNEXES

GENIUS POWER 2 BASE

The GENIUS POWER 2 regulators are the first evolution of the GENIUS POWER range. Based on the same principle of the phase cut on II° and on IV° quadrants, these models maintain the same characteristics of efficiency above 99%, compactness and lightness. The logic of control of the power components is established by a microprocessor that grants to obtain the real effective value of the tension. Moreover it surveys the load current for the protection of the device from short circuits in output. Every model can operate in combination with the products of the GENIUS CONTROL range, or they can be controlled by digital signal RS232. Furthermore, also the stand-alone function has been implemented with two tension levels that can be set by a dip switch. They have been projected to be placed in switchboard panels. The GENIUS POWER 2 range consists of the models in the following table:

CODE	MODEL	I_{OUT}	P_{TOT}
100302	GENIUS POWER 2 **BASE** 18A	18A	4,14KVA
100303	GENIUS POWER 2 **BASE** 25A	25A	5,75KVA
100304	GENIUS POWER 2 **BASE** 35A	35A	8,05KVA
100305	GENIUS POWER 2 **BASE** 50A	50A	11,5KVA

FUNCTIONAL CHARACTERISTICS

Stabilization of the output tension
Thermal protection
Short circuit electronic protection
Over temperature signalling
Over load signalling
Signalling of the presence of input signal
Signalling of the presence of feed tension
Predisposition for quick fixing to DIN bar
Controllable by all models of GENIUS CONTROL
Controllable by external signal RS-232
Independent regulation in two phases with selectable tension level, temporized by external timer
Independent lamp lighting cycle
VBUS input self-powered in independent regulation option

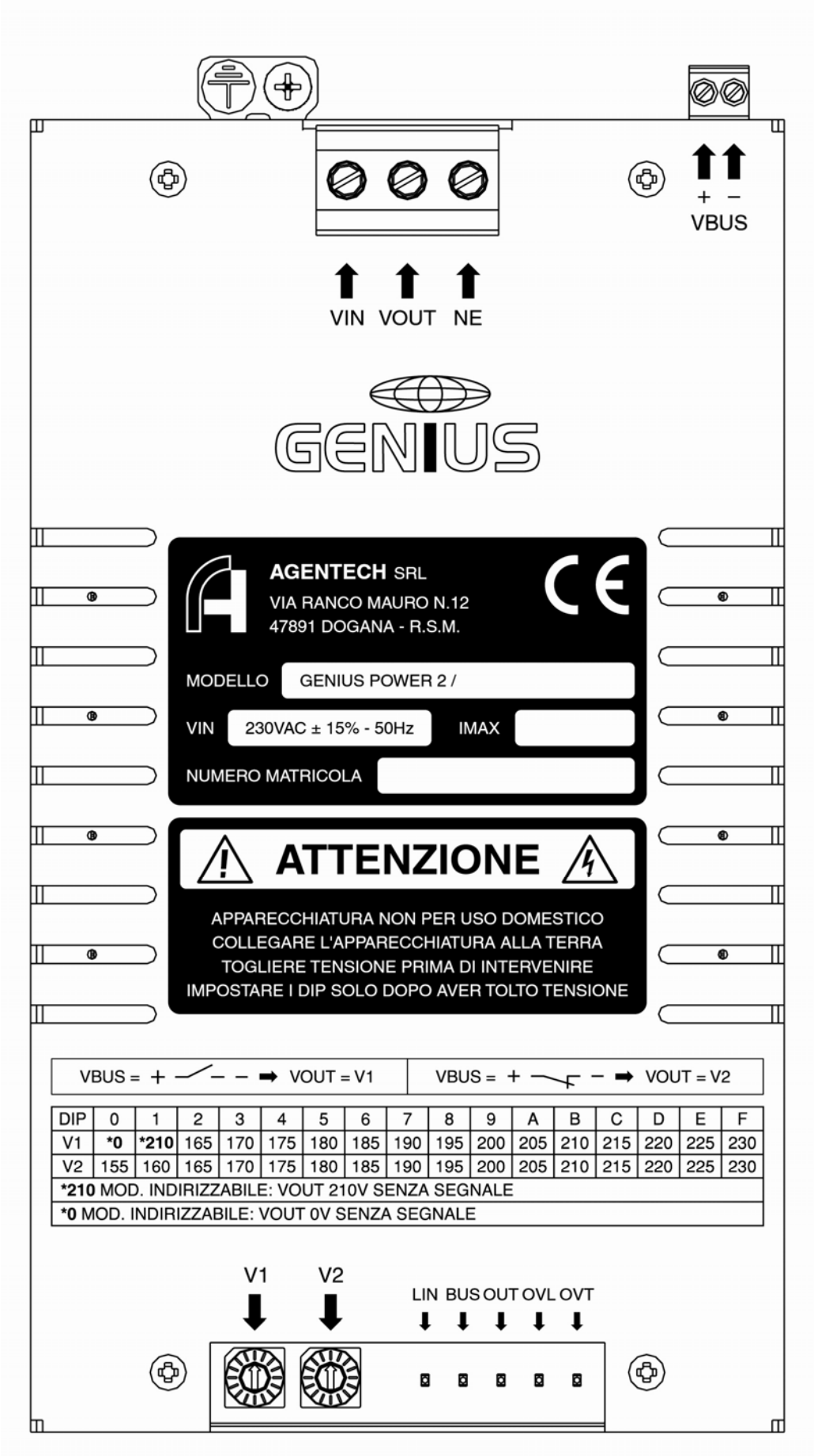
EQUIPMENT

Screw terminal board with 3 poles for 10mm^2 conductor for connection of VIN, VOUT, NEUTRAL
Red led signalling OVT (OVER TEMPERATURE)
Red led signalling OVL (OVER LOAD)
Stainless steel lid for protection against shocks
Screw terminal board with 2 poles for 1,5mm^2 conductor for connection of signals and external controls
Spring-system for quick fixing to Din bar
Cooling fan
2 rotating Dipswitches with 16 positions for the setting of the tension levels

TECHNICAL CHARACTERISTICS

PARAMETER	GENIUS POWER 18A	GENIUS POWER 25A	GENIUS POWER 35A	GENIUS POWER 50A
Power	230V ±15% - 50Hz			
Maximum output current	18ARMS	25ARMS	35ARMS	50ARMS
Thermal dissipation	36W @230V	57W @230V	80W @230V	115W @230V
Regulation range	From VMIN 170V to the power tension VIN			
Output voltage	Stabilized with a precision of 1,5%			
Stabilization speed	50V/Sec.			
Regulation minimum load	80W			
Performance	99%			
Class of isolation	Class I			
EMC Compliance	In accordance with EMC 89/336/CEE; 93/68/CEE; 98/79/CEE			
Operating temperature	From –10°C to +45°C			
Storage temperature	From –25°C to +75°C			
Humidity	Up to 90% without condensate			
Protection degree	IP20			
Weight	2,8Kg			
Dimension [mm]	126 x 220 x 15			

FRONTAL WIEV

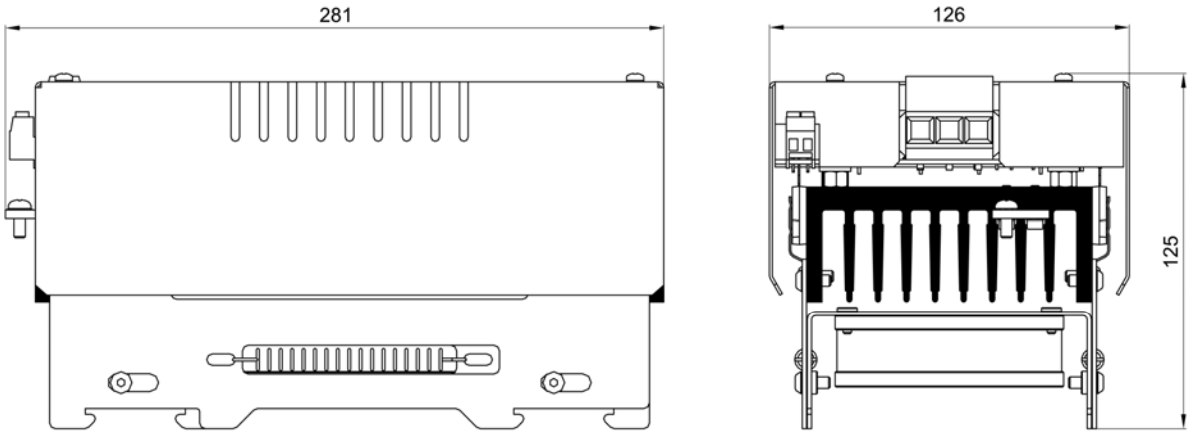


DIP	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
V1	***0**	***210**	165	170	175	180	185	190	195	200	205	210	215	220	225	230
V2	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230

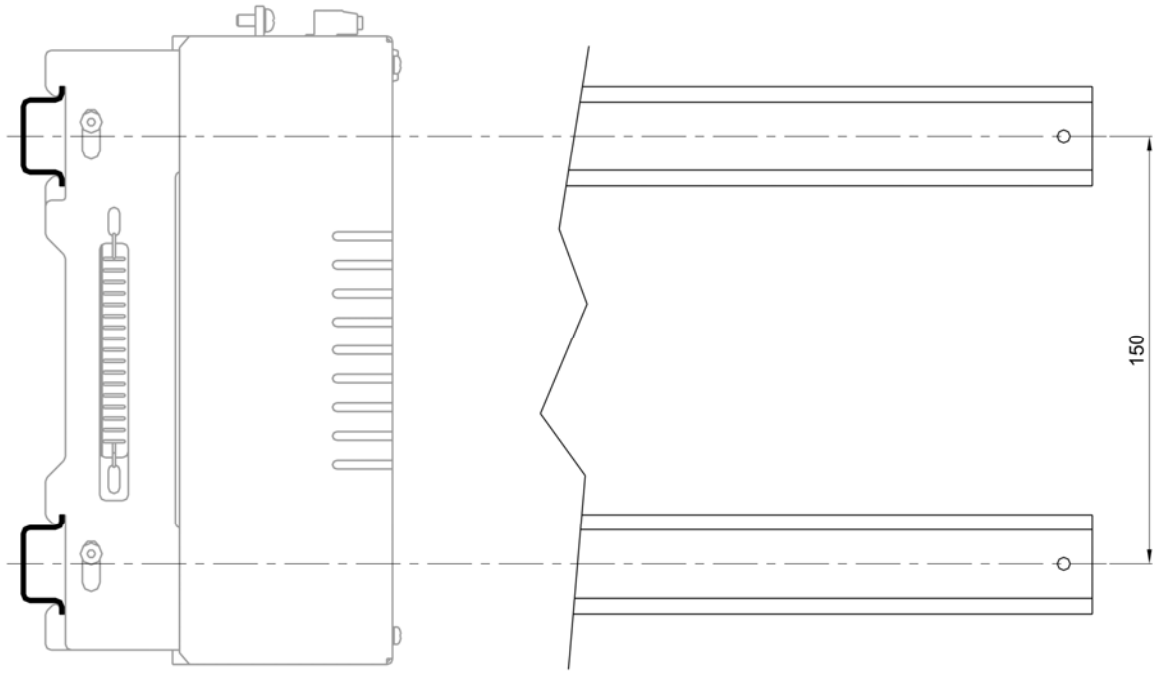
***210** MOD. INDIRIZZABILE: VOUT 210V SENZA SEGNALE

***0** MOD. INDIRIZZABILE: VOUT 0V SENZA SEGNALE

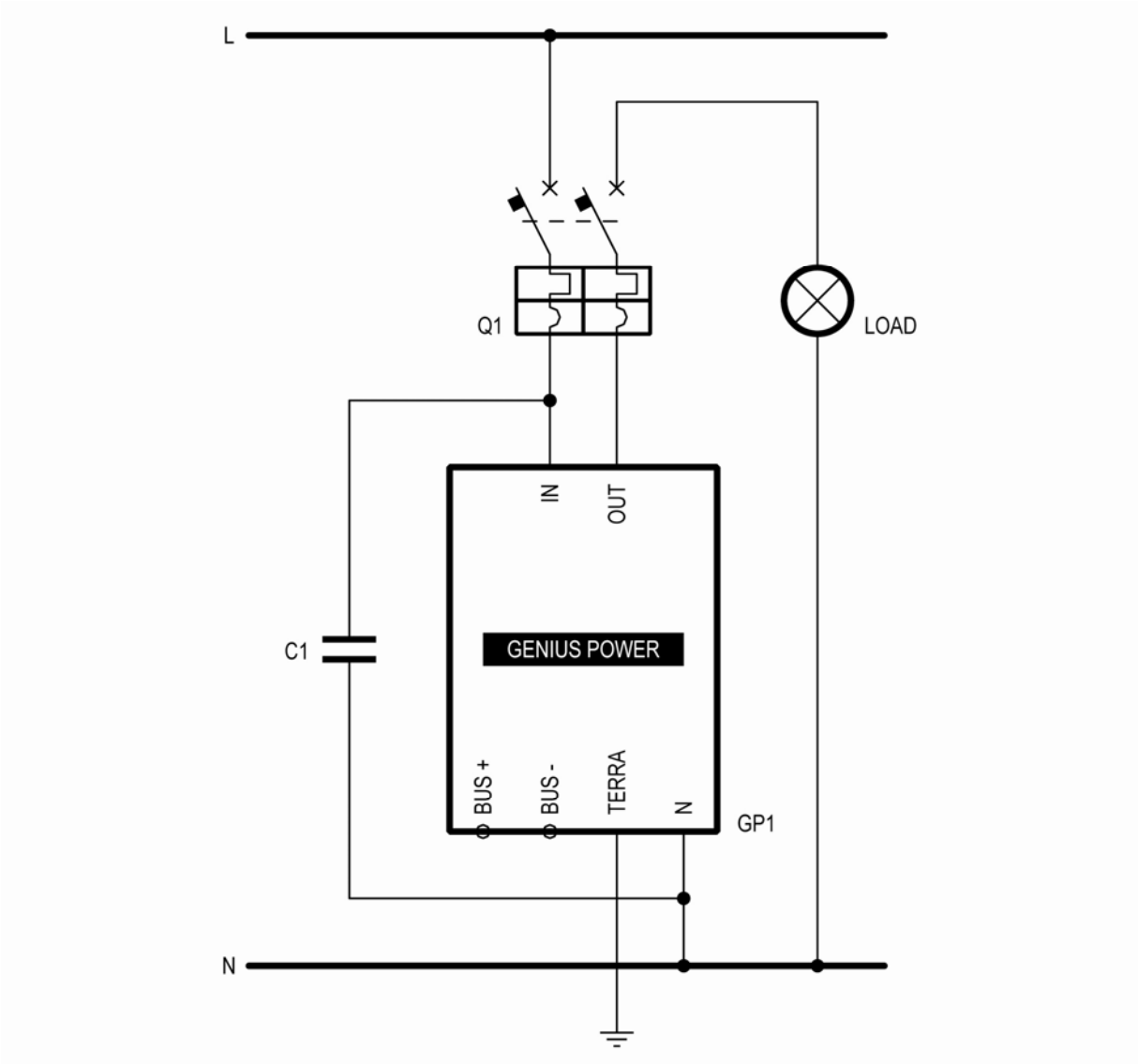
MECHANICAL DIMENSIONS



MOUNTING DETAILS

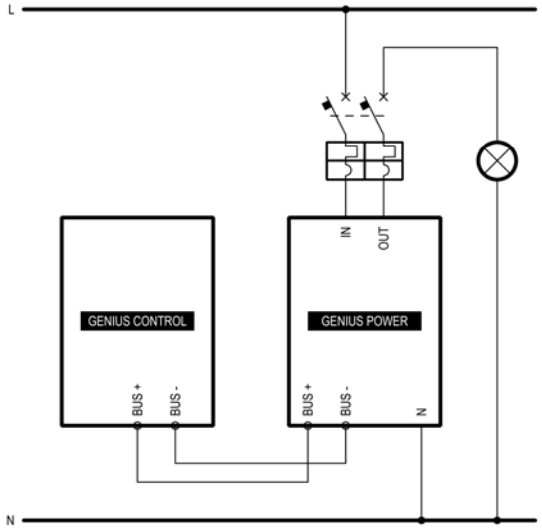


BASIC CONNECTION DIAGRAM



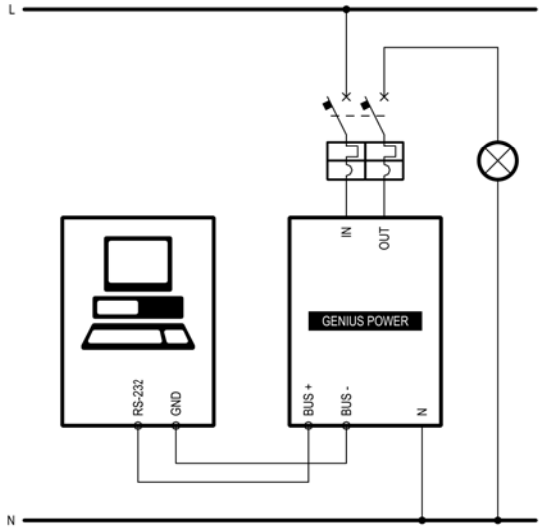
GP1 MODEL OF REGULATOR	**LOAD** MAX LOAD CURRENT	**Q1** THERMAL MAGNETIC CIRCUIT BREAKER	**C1** POWER FACTOR CORRECTION CAPACITOR
GENIUS POWER 2 BASE 15A	18A MAX	20A CURVA C	-
GENIUS POWER 2 BASE 25A	25A MAX	32A CURVA C	-
GENIUS POWER 2 BASE 35A	35A MAX	40A CURVA C	20µF 400VAC
GENIUS POWER 2 BASE 50A	50A MAX	50A CURVA C	40µF 400VAC

BASIC CONNECTION DIAGRAM



DRAWING 1

Connection of the GENIUS POWER 2 BASE with the controls of the GENIUS CONTROL range



DRAWING 2

Control of the GENIUS POWER 2 BASE with RS232 signal originated by a PC

DATA PACKAGE FORMAT (WITHOUT ADDRESS)

SPEED : **2400 baud**
BIT : **8**
PARITY : **NONE**
STOP BITS : **1**

SYNC 55h	**DATA**	**CHK**

SYNC	**DATA**	**CHK**
Fixed value 55h Shows the start of the package.	Directly indicates the voltage in Vrms to be implemented to the gate. Value 0 indicates that it is off.	Indicated the package validity. It is calculated carrying out XOR operation on the BTh fixed value and on package data. CHK=BTh XOR SYNC XOR DATA

DATA PACKAGE FORMAT (WITH ADDRESS)

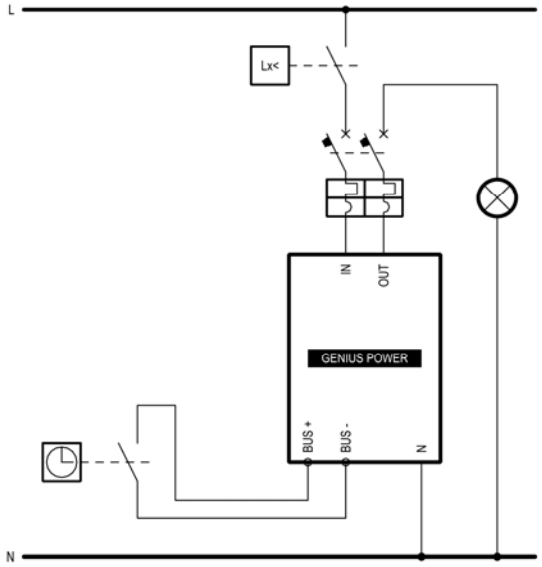
SPEED : **2400 baud**
BIT : **8**
PARITY : **NONE**
STOP BITS : **1**

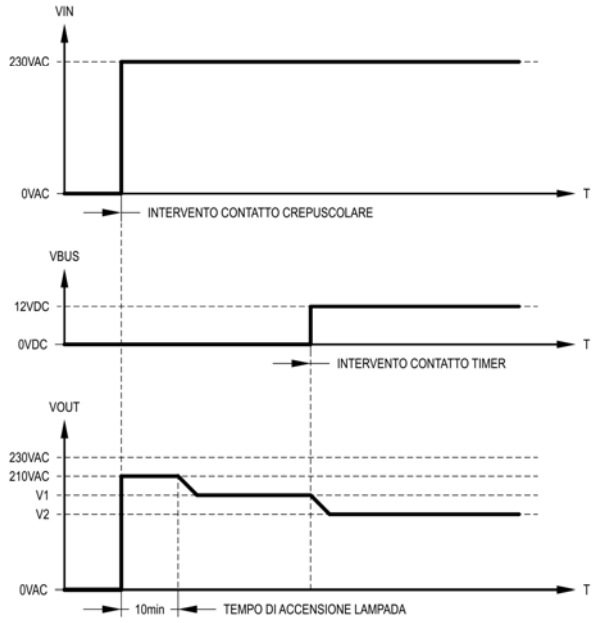
SYNC 56h	**DATA**	**CHK**

SYNC	**ADDR**	**DATA**	**CHK**
Fixed value 56h Shows the start of the package.	Device address. Value from 0 to 15.	Directly indicates voltage value in Vrms to be applied to the gate. Value 0 indicates that it is off.	Indicates the package validity. It is calculated carrying out XOR operation on the BEh fixed value and on package data. CHK=BEh XOR SYNC XOR DATA

Time span between one character and the following one should not exceed 100ms, otherwise the package is rejected.Time span between a valid package and the following one should not exceed 3s, otherwise the regulator detects the lack of serial communication and starts autonomous mode.

STAND ALONE FUNCTIONING AND DIPSWITCH SETTING





DRAWING 5

Typical situation of the GENIUS POWER 2 BASE in independent mode in the road application

DRAWING 6

VOUT variation in time related to the intervention of the external devices

When the crepuscular sensor closes the power contact, the GENIUS POWER DIP starts the lighting cycle of the lamp that keeps the output tension at 210V for 10 minutes (adjustable). Afterwards the output tension turns to the level selected on the DIP SWITCH V1. When the timer closes the contact putting in short circuit the ± VBUS, the output tension is brought to the level selected by the DIP SWITCH V2. On the contrary of the GENIUS POWER DIP, the VBUS is self-powered and does not require any external power.

DIP-SW V1

The value of output voltage in autonomous mode when serial communication is absent with open gate. Data package with address is accepted only if V1 is in position 0 or 1, thus V2 acts as device address and the output value in autonomous mode is the same in case of both open and closed gate. If the autonomous mode starts when the gate is closed and value V1 is different from 0 or 1, the regulator runs a pre-heating cycle at 210V for 10 minutes. In autonomous mode output voltage variation is equal to 12s/V (5V/min)

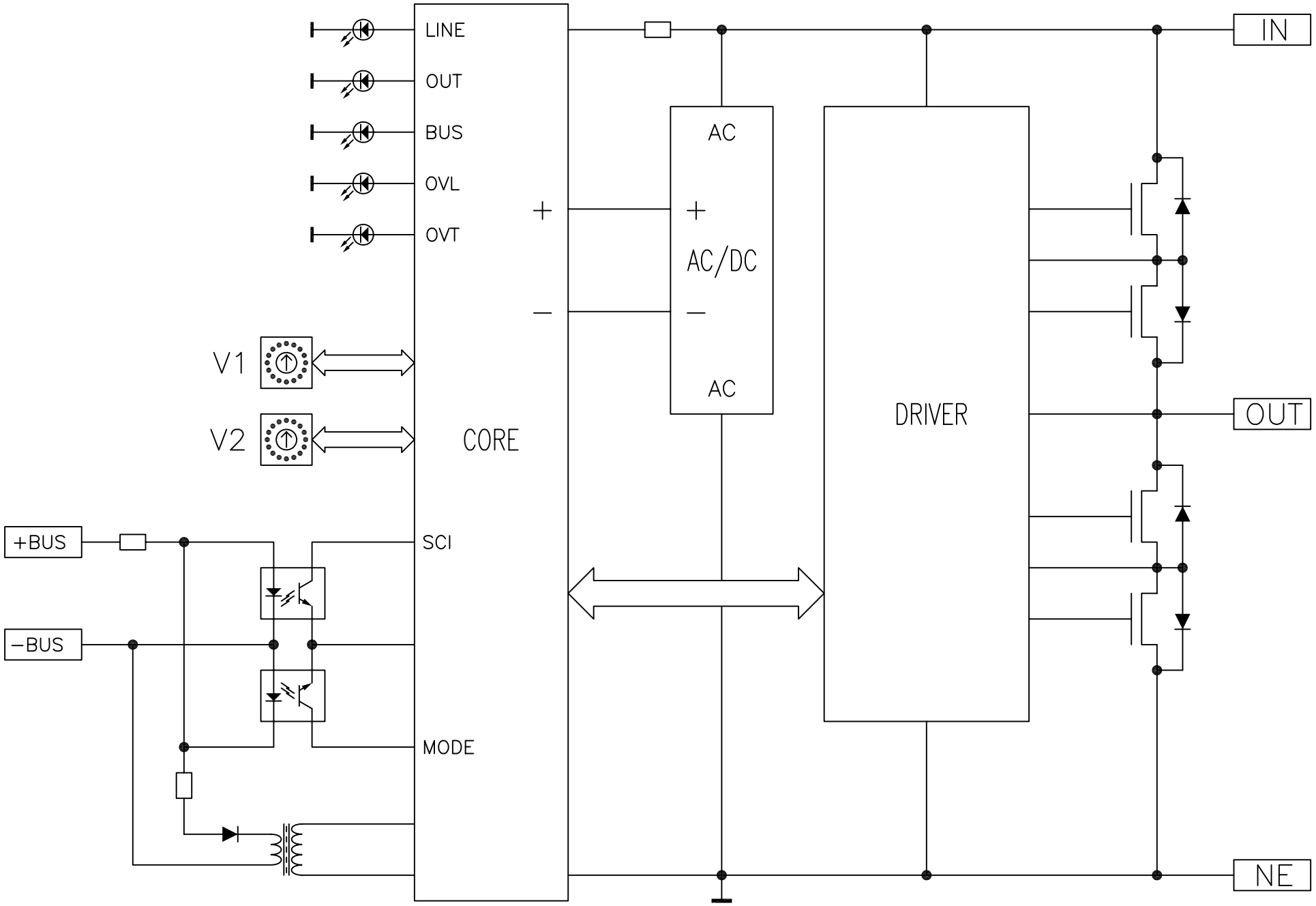
DIP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
V2	*0	*210	165	170	175	180	185	190	195	200	205	210	215	220	225	230

***0** MODE CAN BE SET WITH ADDRESS FROM V2. OUTPUT VOLTAGE FROM 0V WITHOUT SIGNAL
***210** MODE CAN BE SET WITH ADDRESS FROM V2. OUTPUT VOLTAGE FROM 210V WITHOUT SIGNAL

DIP-SW V2

Value of the output voltage in autonomous mode when serial communication is absent and gate is closed. Device address with V1 in position 0 or 1.

DIP	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**A**	**B**	**C**	**D**	**E**	**F**
V2	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230



GENIUS POWER 2 *Schematic block diagram*

GENIUS SINLE-PHASE E THREE-PHASE BYPASS

GENERAL INFORMATION

This bypass model, that can be either single-phase or three-phase, has been projected to control directly an auxiliary telebreaker. The intervention occurs when the tension on the lamps drops below 50% of the network tension. Such intervention is signalled by red led and by an “open collector” output alarm. The putting back in operation is automatically carried out upon restart of the regulation system. Furthermore it is possible to activate or deactivate the bypass status with the button located in the front of the device or through an input for the remote control. The single-phase version is manufactured in 2 units modular container, while the three-phase one is in 3 units modular container. They are both predisposed for omega bar rapid fixing.

CODE	MODEL
100892	GENIUS CONTROL BYPASS 1F
100893	GENIUS CONTROL BYPASS 3F

FUNCTIONAL CHARACTERISTICS

- It surveys the difference between network tension and output tension of the GENIUS POWER
- Direct control of the exchange contactors for the bypass state
- Activation, deactivation and remote signalling of the bypass state
- Manual activation and deactivation of the bypass state
- Visual signalling of the bypass state
- Manufactured in modular box for omega bar fixing

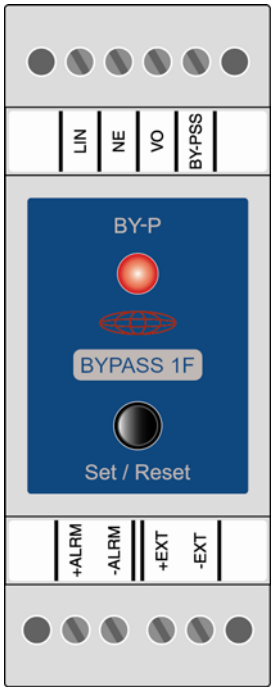
EQUIPMENT

- Red led signalling the bypass state
- Set/Reset buttons for each phase
- Serial communication gate RS232 with implemented BUS protocol
- Photo triac outputs for exchange contactors regulation
- Open collector outputs for the bypass state signalling

TECHNICAL CHARACTERISTICS

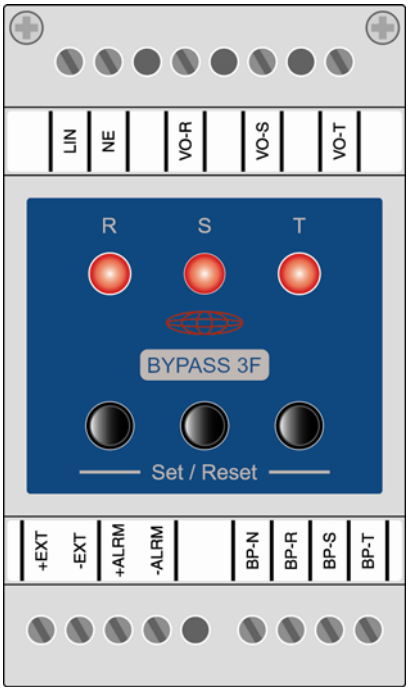
PARAMETER	BYPASS 1F	BYPASS 3F
ΔV max (VIN-VOUT)	120V ±20%	
Reaction time	10÷15 seconds	
Isolation class	Class I	
Operating temperature	From –10°C to +45°C	
Storage temperature	From –25°C to +75°C	
Humidity	Up to 90% without condensate	
Protection degree	IP20	
Weight	20g	40g
Terminal section	Solid conductors 2.5mm²	
Dimension [mm]	90 x 35 x 60	90 x 52,5 x 60

BYPASS 1F CONNECTIONS

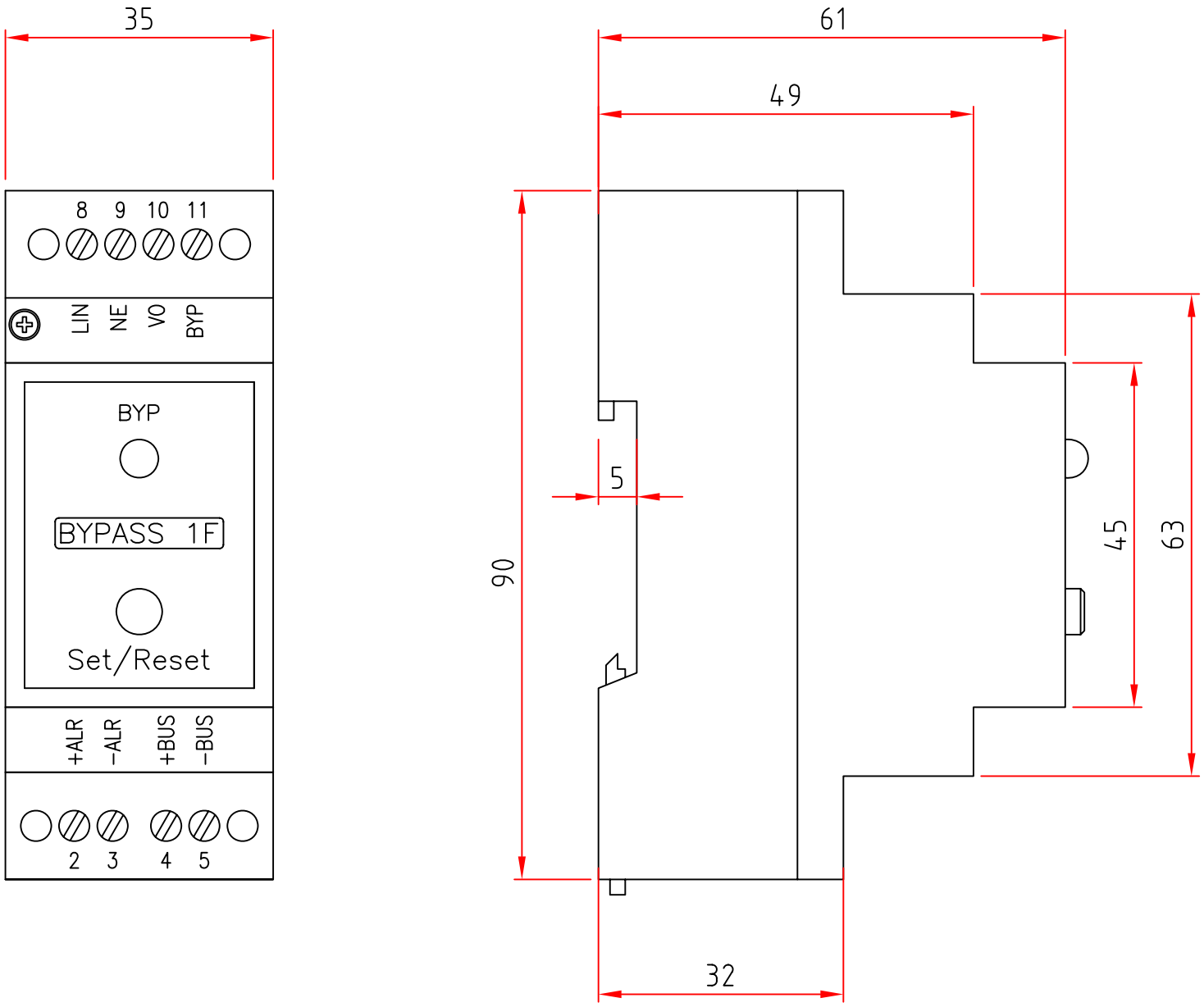


CONTATTO	DESCRIZIONE
+ALRM	OUTPUT OPEN-COLLECTOR ALLARM SIGNALLING
-ALRM	
+EXT	INPUT REMOTE CONTROL BYPASS STATE
-EXT	
LIN	POWER INPUT 230VAC
NE	NEUTRAL
VO	INPUT READING OF OUTPUT TENSION
BY-PSS	COMMAND ACTIVATION BYPASS

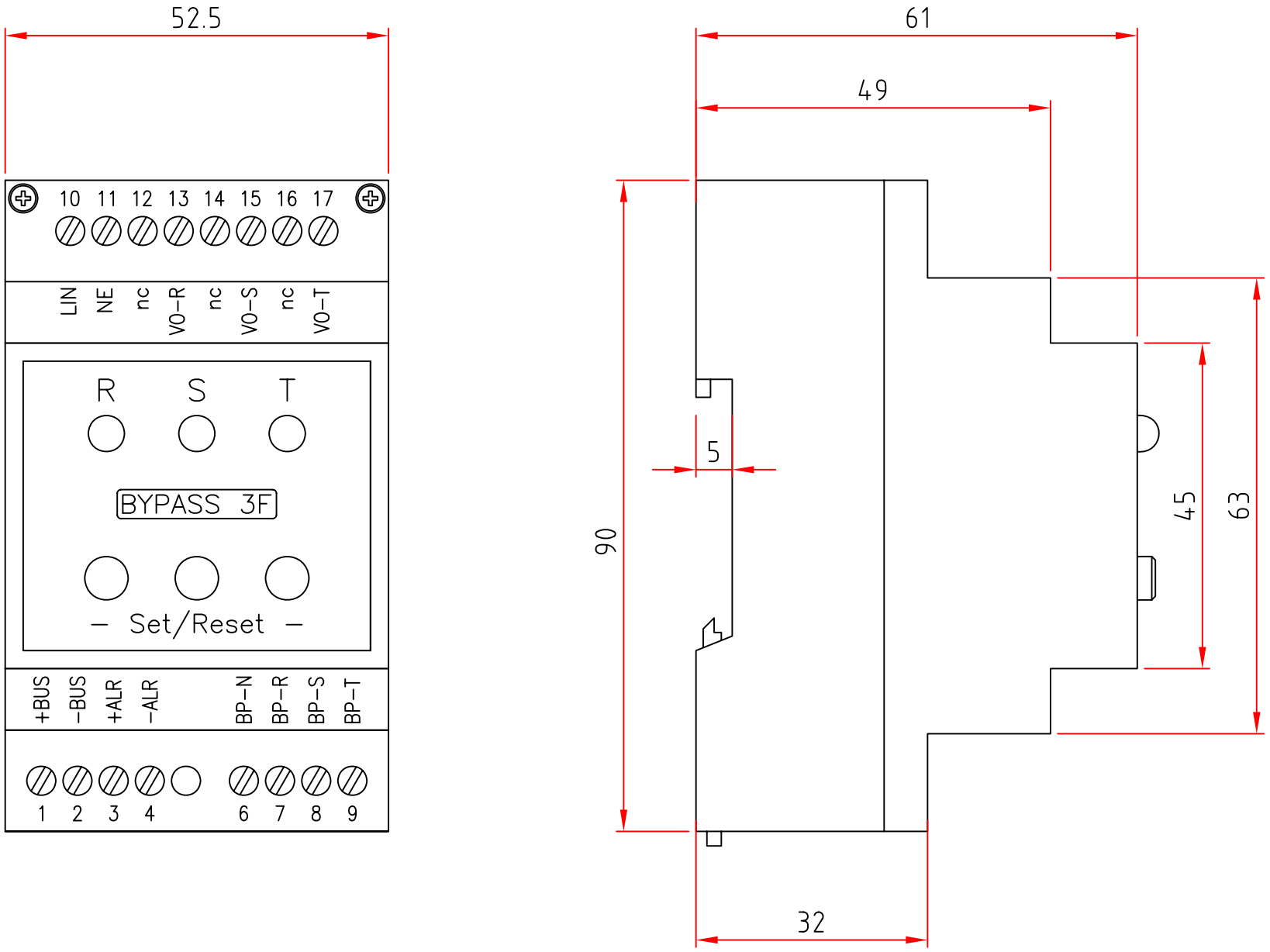
BYPASS 3F CONNECTIONS



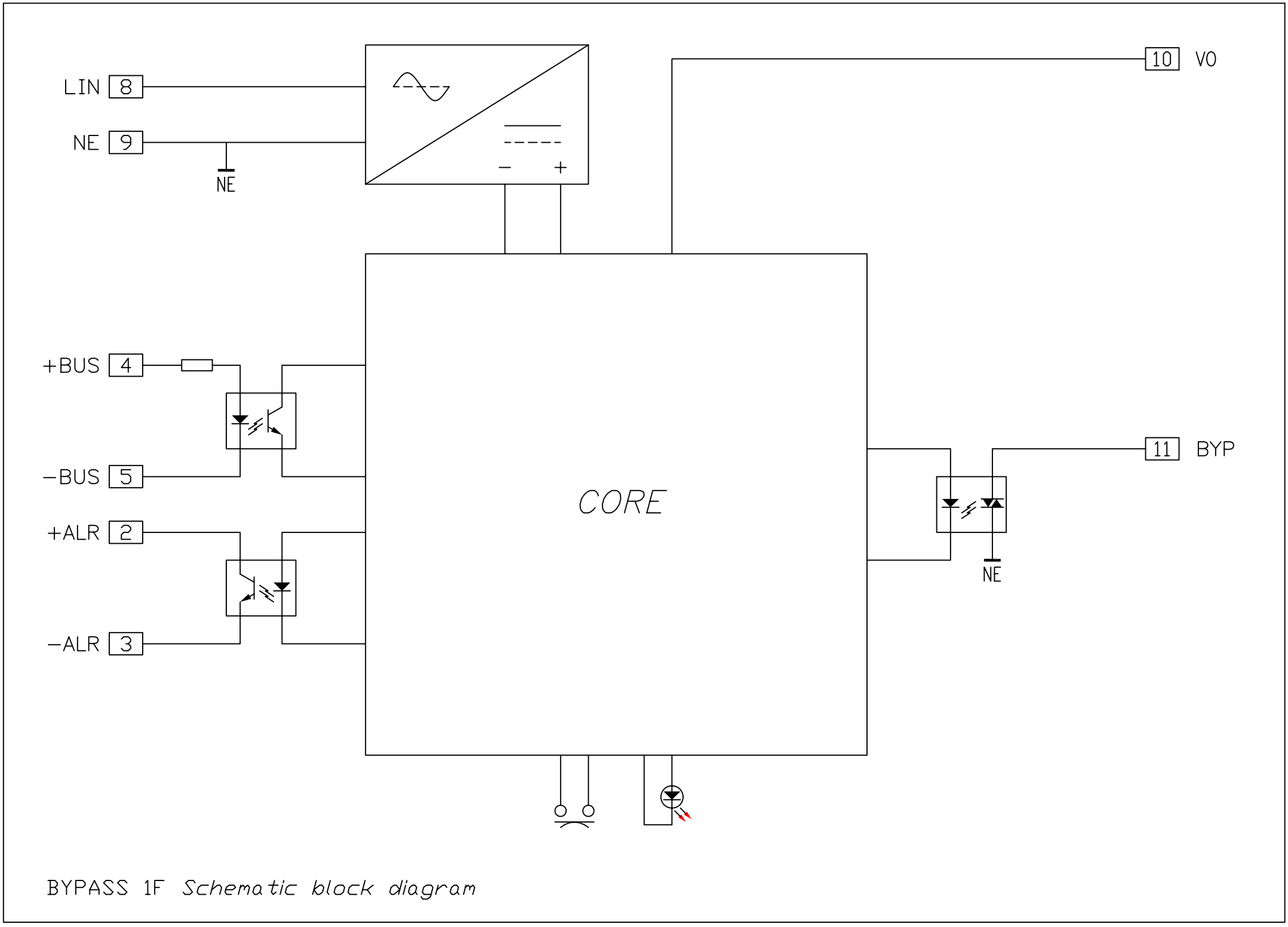
CONTATTO	DESCRIZIONE
+EXT	INPUT REMOTE CONTROL BYPASS STATE
-EXT	
+ALRM	OUTPUT OPEN-COLLECTOR ALLARM SIGNALLING
-ALRM	
BP-N	NEUTRAL REFERENCE FOR BYPASS ACTIVATIONS
BP-R	COMMAND ACTIVATION BYPASS PHASE R
BP-S	COMMAND ACTIVATION BYPASS PHASE S
BP-T	COMMAND ACTIVATION BYPASS PHASE T
LINE	POWER INPUT 230VAC
NE	NEUTRAL
VO-R	INPUT READING OF OUTPUT TENSION PHASE R
VO-S	INPUT READING OF OUTPUT TENSION PHASE S
VO-T	INPUT READING OF OUTPUT TENSION PHASE T



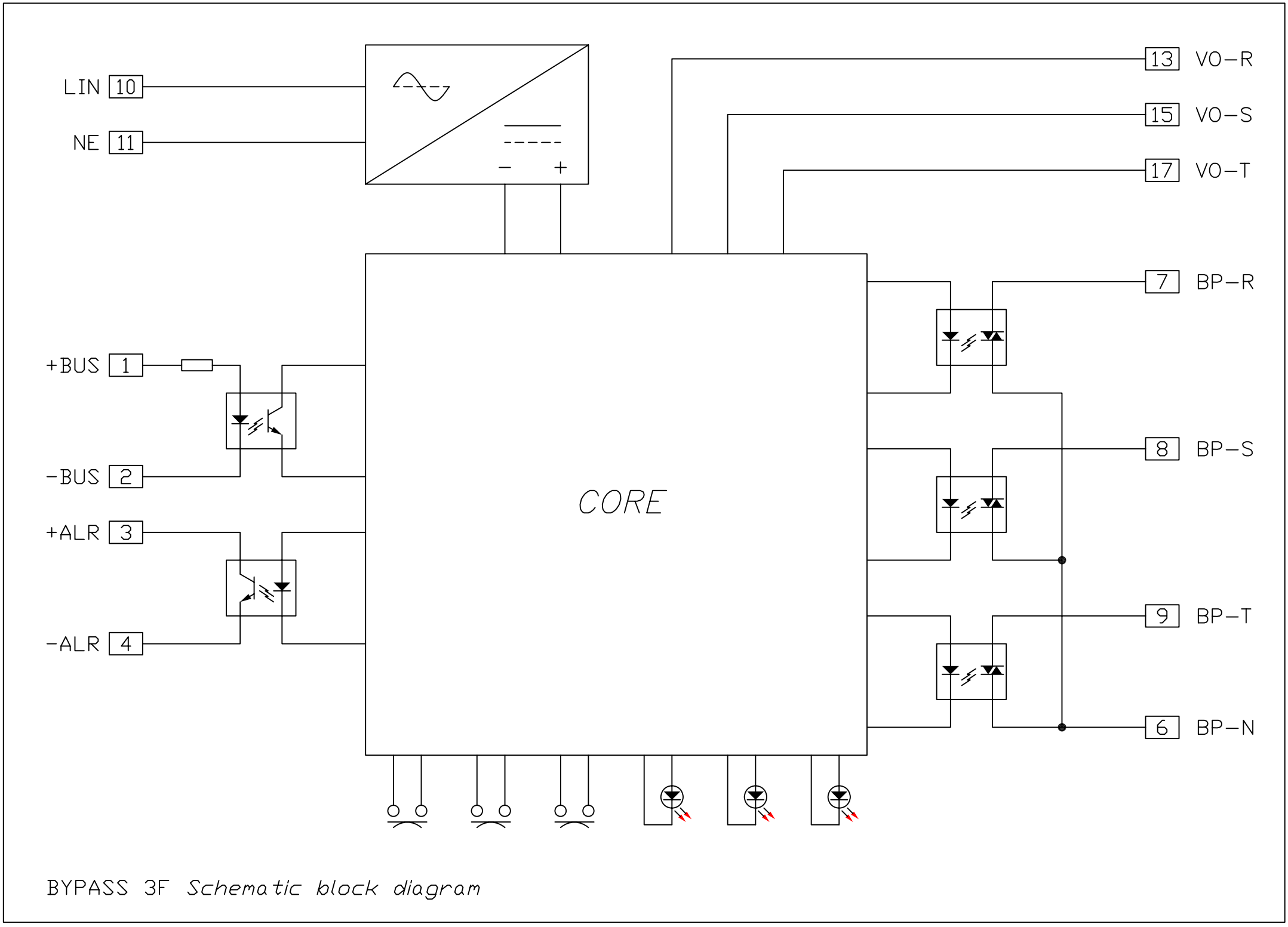
BYPASS 1F *Dimension Drawing*



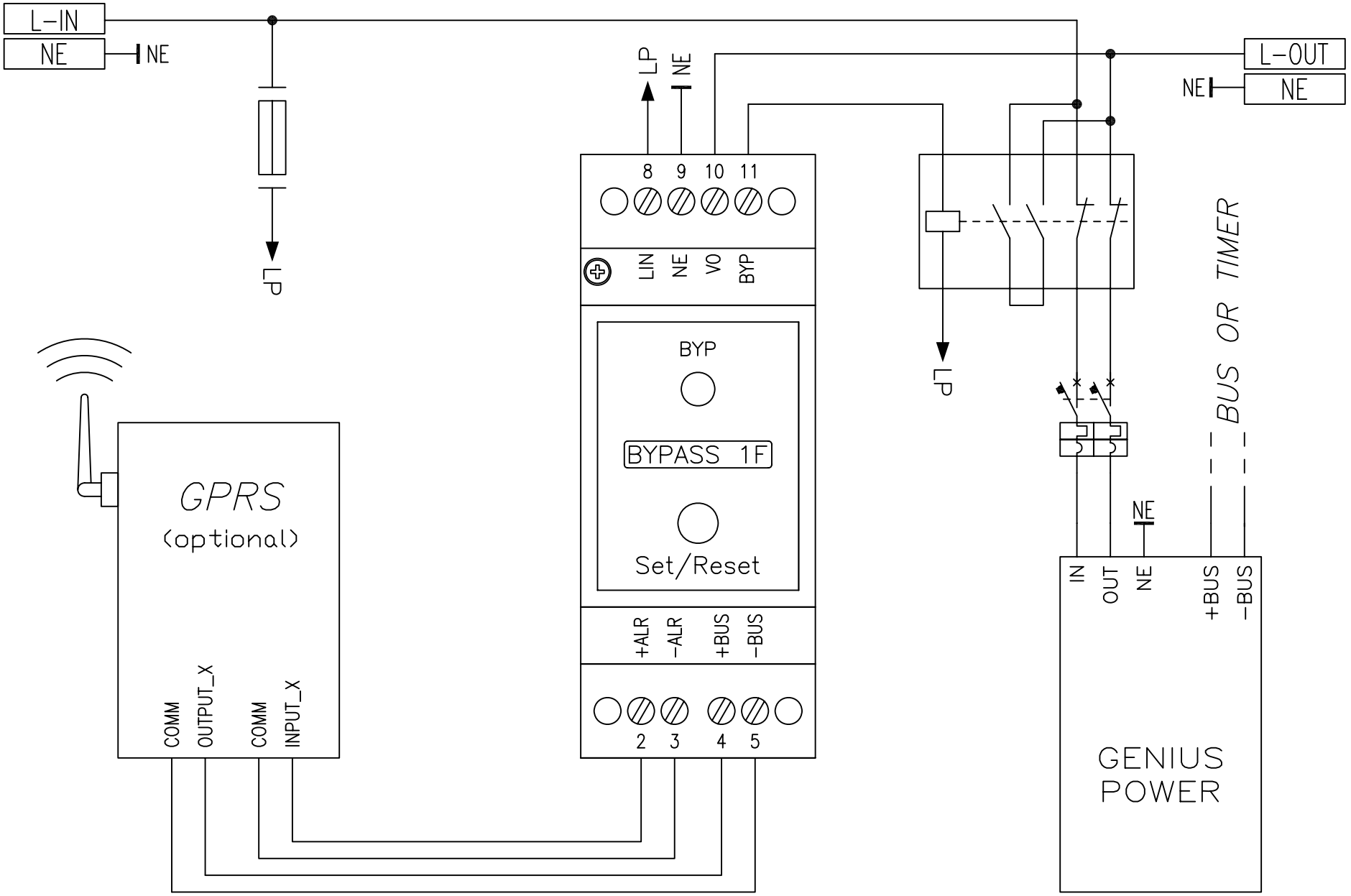
BYPASS 3F *Dimension Drawing*



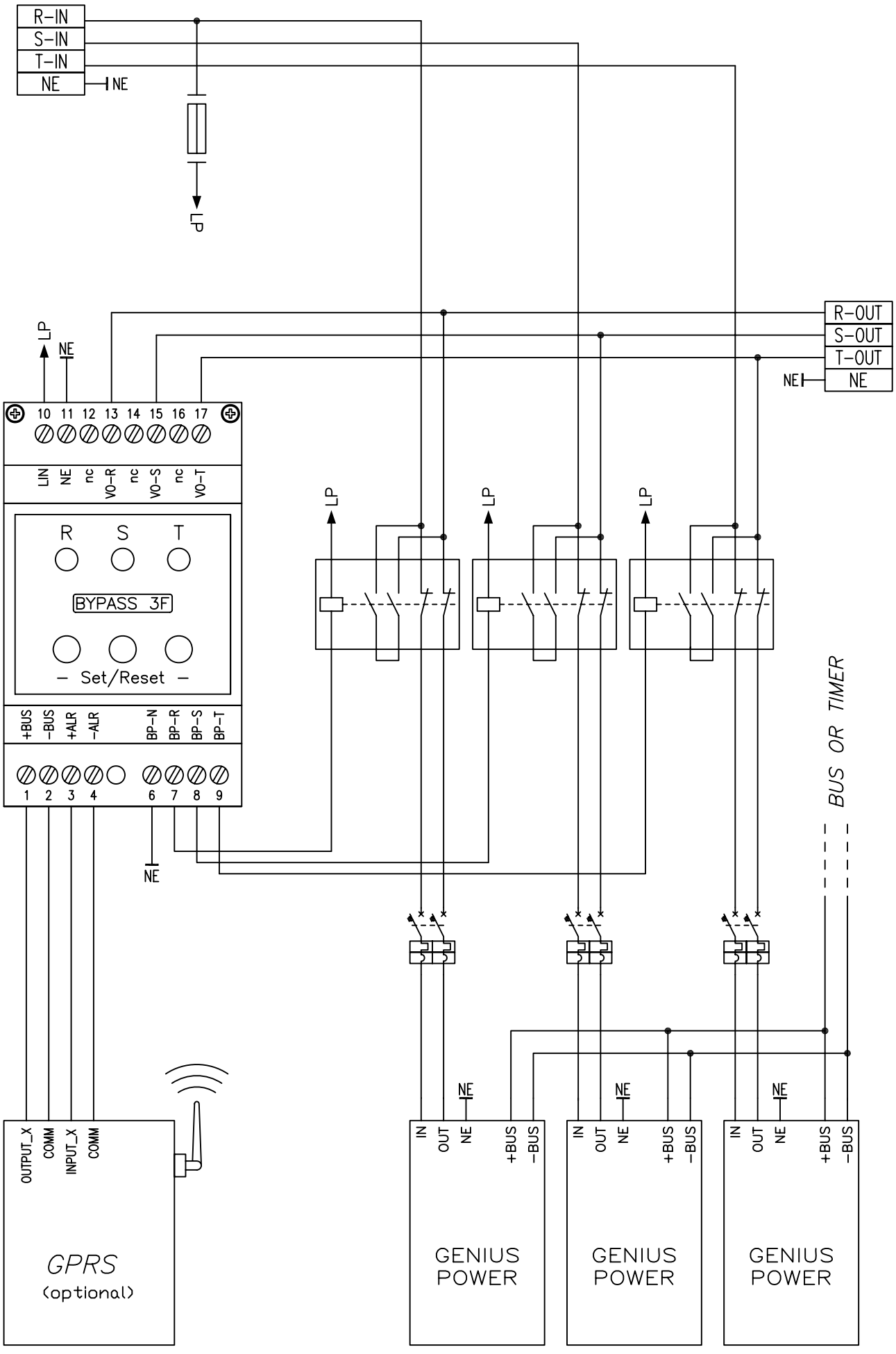
BYPASS 1F *Schematic block diagram*



BYPASS 3F *Schematic block diagram*



BYPASS 1F *Tipical Application*



BYPASS 3F *Tipical Application*

GENIUS SENSOR TA 3X50 MODULE

GENERAL INFORMATION

Accessory device of the GENIUS CONTROL CTRL128 used for the reading of the regulation system currents with a precision of 0,5%. It can survey currents up to 50Arms. Extremely compact, light and simple to be installed on a omega bar inside switchboard panels. The connection with the GENIUS CONTROL is carried out through quick insertion screw connectors.

CODE	MODEL
100995	GENIUS SENSOR TA 3X50 MODULE

FUNCTIONAL CHARACTERISTICS

- It measures currents up to 50Arms with a precision of 0,5%
- It operates in combination with the GENIUS CONTROL CTRL128
- Planned for installation on standard omega bar
- Compact, light and simple to be installed

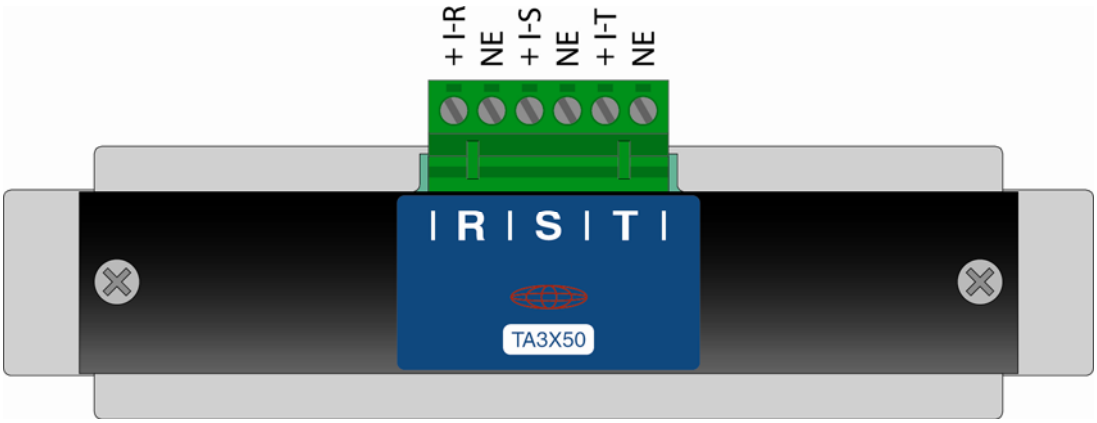
EQUIPMENT

- Terminal blocks for omega bar fixing
- Terminal board clutch for a rapid wiring

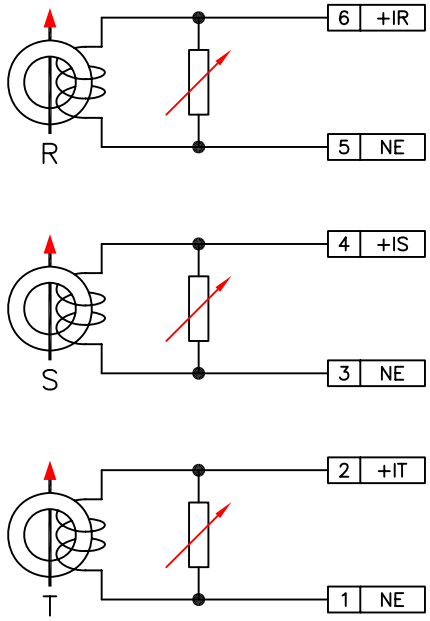
TECHNICAL CHARACTERISTICS

PARAMETER	VALUE
Irms max	50A
Tolerance detection	0,5%
Isolation class	Class I
Operating temperature	From –10°C to +45°C
Storage temperature	From –25°C to +75°C
Humidity	Up to 90% without condensate
Protection degree	IP20
Weight	200g
Terminal cross section	Solid conductor 2.5mm²
Dimension	90 x 35 x 60

DISPOSITION OF CONTACTS



CONTACT	DESCRIPTION
NE	NEUTRAL
+ I-R	OUTPUT MEASURING PHASE R CURRENT
+ I-S	OUTPUT MEASURING PHASE S CURRENT
+ I-T	OUTPUT MEASURING PHASE T CURRENT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5 NE
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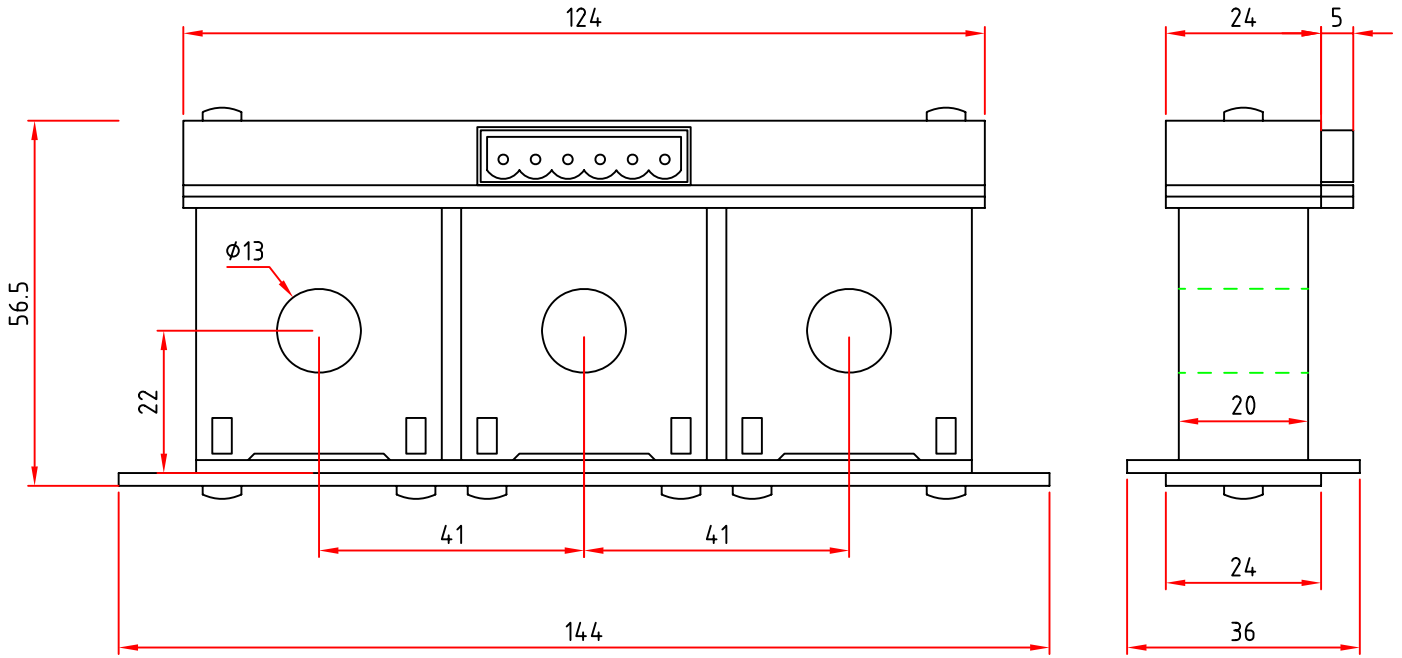
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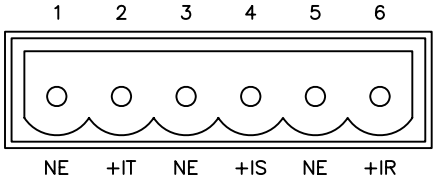
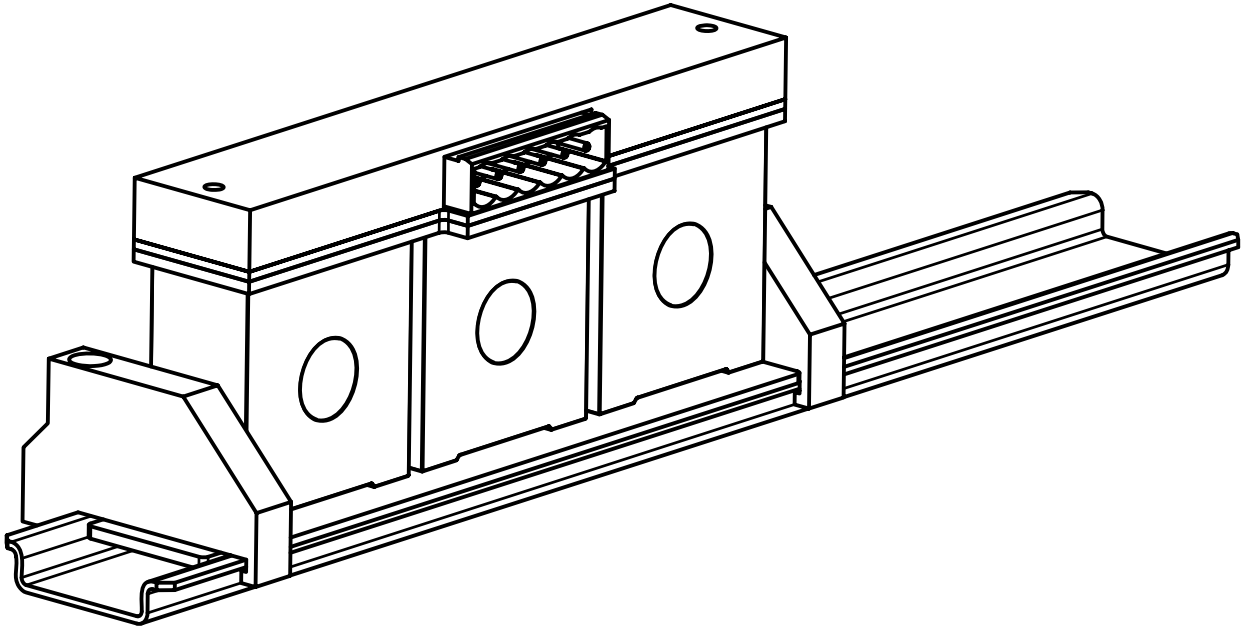

1 2 3 4 5 6
NE +IT NE +IS NE +IR



V3IS00393-020

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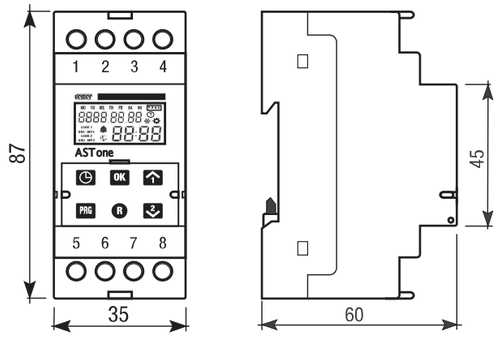
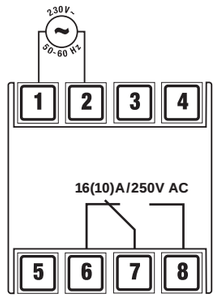
Mod. **AST one**

Dimensions



Connection diagrams



User Manual
ASTRONOMICAL TIME SWITCH
Read all the instructions carefully

The **AST one** device is an electronic time-switch to manage electrical appliances from sunset to dawn, according to the geographic area set. It performs type 1B actions and is designed for household and similar purposes in enviroments with normal pollution degree and overvoltage category III

SAFETY WARNINGS

To guarantee correct installation, proceed as follows:
1) The device should be installed by a competent operator
2) The device should be installed in a panel in such a way as to guarantee that the terminals are inaccessible after fitting
3) Connect the device as shown in the alongside diagrams
4) Before touching the connector terminals make sure that the wires to be connected or already connected to the device are not live
5) Do not power or connect the device if any part of it is damaged

NOTA: the appliance is switched off when supplied, to avoid unnecessary use of the battery. To switch it on, press " R ".

Code	Model	Description
VE048500	AST one	Astronomical Time Switch

TECHNICAL SPECIFICATIONS

- Power supply voltage: 230V AC (-15%/+10%) 50/60Hz
- Absorption: 8VA (2W)
- Outputs: relay 16(10)A/250V AC
- Contact capacity for lamps: - incandescent/halogen 1500W 240V AC
  - fluorescent 600W 240V AC
- Annual clock with calendar up to 31.12.2172
  - clock precision ±1s per day
  - precision of sunrise/sunset calculation ±1 minute
  - programming resolution 1 minute
  - charge reserve (with lithium battery) 4 years approx. (if not powered)
- LCD rear lit display
- Automatic change of summer/winter time with settable change mode
- Simplified programming in two languages:
  - Italian: provincial capital
  - English: latitude, longitude, time zone
- Operating timer for each channel max 99999 h
- Daily update of sunrise/sunset times
- Manual forcing of the temporary and permanent outputs
- 2 DIN module container
- Operating temperature: 0 ÷ +50 °C
- Relative humidity: 10% ÷ 90% non condensing
- Storage temperature: -10 ÷ +70 °C
- Protection level: IP20 at the connector terminals IP41 on the front panel
- Insulation: reinforced between live parts and accesible parts and between power supply and load

SETTING THE ASTRONOMICAL PARAMETERS

Note: for correct operation, it is essential to enter certain items of information (astronomical parameters) to enable the device to identify the geographical area in which it is to be installed.

- This operation is important as the instants of sunrise and sunset in calculated by the **AST one** appliance depend not only on the date set but also on the geographical location of installation.

The procedures to be followed for this setting depend on whether the device is to be installed in Italy or abroad.
If the device is to be installed in Italy, the procedure is simplified, as it is not necessary to know the latitude or longitude of the place of installation, but merely to enter the code for the Italian province (see the **"Province code / Capital"** table). When the device is to be installed outside Italy, it is necessary to know the geographical data (latitude and longitude).

INITIAL SETTING (selection of language and place of installation)

- Press the " R " key followed by the " PRG " key within 3 seconds. The message **"SELECt YOUr COUntrY"** will move across the screen.
  Use the " ▲ " and " ▼ " keys to make the selection between " ItAL IAn" and "OthEr COUntrY".
  Press " OK " to confirm and go on automatically to the astronomical parameter menu.
  The programming menu for Italy or abroad will appear, depending on the selection made.

SETTING THE ASTRONOMICAL PARAMETERS FOR ITALY

- If installation in Italy was selected in the previous point, the message **"SELECt ItAL IAn Prou InC IAL CAP ItAL"** will move across the screen. To select the code for the provincial capital, see the "Province code / Capital" table.
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the values that can be set range from 0 to 103)
- The message **"SUnSEt t IME OFFSEt"** will move across the screen
  Due to the characteristics of the location (altitude, surrounding mountains and other geographical features), the sunrise and sunset times may differ from those calculated, and this parameter provides a correction in minutes with respect to the sunset time
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the value of this parameter may range from +120 min to -120 min)

- The message **"SUnr ISE t IME OFFSEt"** will move across the screen (this parameter provides a correction in minutes with respect to the sunrise time)
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the value of this parameter may range from +120 min to -120 min)

- DISPLAY / ZEROING OF THE RELAY OUTPUT TIMER
  The number of hours for which the relay will be on is displayed (displayed as CH1). The timer can be zeroed by pressing the " PRG " key for at least 3 seconds
  The timer does not move forward if the device is not connected to the power supply
  - Press " OK " to confirm the information and go to Normal operation (the parameter range is 0-99999 h)

- The message **"SEt PASS PEr bLOCCo"** will move across the screen
  This is the password to disable the settings guard.
  The default password is "123".
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirrm the information and go to NORMAL operation (the parameter range is 000÷999)

SETTING THE ASTRONOMICAL PARAMETERS FOR FOREIGN INSTALLATION

- This involves entering the degrees of latitude and longitude for the location This information can be obtained from an atlas.
- If you have selected **"OthEr COUntrY"** from the "place of installation/language" settings, the message **"LAt ItUdE nOrth = PLUS SIGn"** will move across the screen
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the parameter range is -60° ÷ +64°)

Note: the degrees latitude for the northern hemisphere are preceded by the plus sign

- The message **"LOnG ItUdE EASt = PLUS SIGn"** will move across the screen
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the parameter range is ±180°)

Note: the degrees longitude for the eastern direction are preceded by the plus sign

- The message **"t IME ZOnE EASt = PLUS SIGn"** will move across the screen.
  This parameter stands for the hours of difference from Greenwich meridian zero. The value proposed for this field is based on the previous latitude and longitude selection.
  If necessary, this can be modified in the following way:
  - Press the button " ▲ " or " ▼ " to increase or decrease the field
  - Press " OK " to confirm the information and go to the next stage in the programming (the parameter range is ±14 h in steps of 30')

Note: the plus sign corresponds to eastern longitudes

- For the other parameters (correction of sunset/sunrise time and display/zeroing of timer output), see the instructions for the "Setting the Astronomical Parameters for Italy" menu

Note: the "Astronomical Parameter Setting" menu can be entered in two ways:
- automatically after setting the installation zone and language
- later by holding down the " PRG " key

SETTING THE TIME AND DATE

- Press " ⏱ " to synchronise the seconds
  - Press " ▲ " to synchronise to the next minute
  - Press " ▼ " to synchronise to the current minute
  (the seconds will flash in the field month with to the symbol " and the day of the week will disappear)
- Press " OK " to terminate the adjustment of the seconds and go on to the minute setting
  - Press " ▲ " to increase the minutes
  - Press " ▼ " to decrease the minutes
  (the seconds will disappear and YYYY.MM.DD and the minutes will appear in flashing mode)
- Press " OK " to terminate the minute setting and start the hour setting
  Proceed in the same way to adjust the hours, year, month and day. On completion, press " ⏱ " to return to normal operation with the automatic update of the day of the week and flag ("☼" or "❄"), summer or winter time and the relay status.
  Normal operation is restored even if no key is pressed for 30 seconds.

PROGRAMMING THE CHANGE BETWEEN SUMMER AND WINTER TIME

- This is used to enable and disable the automatic change between summer and winter time. It also defines the time change method. The time change is enabled in Italian mode by default:

	in Italy	in UK	in North America
winter summer	last Sunday in March	last Sunday in March	1st Sunday in April
summer winter	last Sunday in October	4th Sunday in October	last Sunday in October

hold down " ⏱ " for at least 3 seconds to see the **"ChAnGE t IME EnAbLE"** message move across the screen with the symbols "☼" or "❄". Select ON or OFF with the " ▲ " and " ▼ " keys.
Press " OK " to confirm the information and go to the next stage in the programming.
If the previous parameter is OFF the programming will terminate, if ON the time change modes will be displayed. To modify, press " PRG ". The following selections are possible:
1) in a pre-determined month and day (every year)
2) on the same day of the last week of a pre-determined month
3) on the same day of week 1, 2, 3 or 4 in a pre-determined month

SUMMER / WINTER TIME MODIFICATION

- After setting the winter time change mode, the symbol "❄" stays on. During the time change setting for summertime, the symbol "☼" stays on.
- Press " ▲ " and " ▼ " to select the time change mode (**LAST, 1st, 2nd, 3rd, 4th, DATE**): the display shows:

LAST	If the time change takes place on a determined day of the last week of a pre-determined month
1st	If the time change takes place on a determined day of the first week of a pre-determined month
2nd	If the time change takes place on a determined day of the second week of a pre-determined month
3rd	If the time change takes place on a determined day of the third week of a pre-determined month
4th	If the time change takes place on a determined day of the fourth week of a pre-determined month
DATE	If the time change takes place on a precise date (month and day)

press " OK " to confirm the selection.
- For LAST, 1st, 2nd, 3rd and 4th modes, the month, day of the week, hour and minutes have to be set (during modification, the parameter flashes in the relevant field); press " ▲ " and " ▼ " to select and " OK " to confirm
- For DATE mode, the month, number of the day, hour and minutes have to be set (during modification, the parameter flashes in the relevant field); press " ▲ " and " ▼ " to select and " OK " to confirm. Press " OK " consecutively to go to winter time setting

ADVANCED OPERATIONS

MANUAL OUTPUT FORCING

- From normal operating mode, it is possible to modify the status of output using the " ▲ " key.
  The forcing of the output is temporary, up to the next programmed event (the current status is reset at the following midnight or when the programming parameters are modified), at which time the output will return to the status set in the programming.
  The output may be permanently forced if key " ▲ " is held down for 3 seconds approx.
  In this way, the programming has no influence on the status of the output.
  The status of the output is indicated on the display:
  - temporary forcing is indicated by the flashing of the current relay status and permanent forcing is indicated by the "LOCK" message

SWITCHING THE DEVICE ON AND OFF

- When " R " followed by " OK " are pressed, the message **"ASt OFF"** will appear on the display, then the device will switch off completely (use this method to avoid running down the battery if the device is to be switched off for a long time). Press " R " to switch on.

Note: the relay output timer is not deleted

SETTINGS GUARD

- To enable the settings guard, hold down the keys " PRG " and " ▼ " simultaneously for at least 3 seconds (until the display reads **"bLOC"**).
  When enabled, this function inhibits keyboard operation (only the RESET key is active): after pressing of any key, the display will read **"bLOC"** for a few seconds.
- To disable the settings guard, hold down the keys " PRG " and " ▼ " simultaneously for at least 3 seconds (until the display reads **"000"**), press the keys " ▲ " or " ▼ " to select the password and press " OK " to confirm.
  Note: to restore default password ("123") press "RESET".

SUNRISE-SUNSET TIME DISPLAY

The sunrise and sunset times for the current date can be displayed alternately by pressing " OK "
The message remains on the display for approximately 2 seconds, then the device returns to normal operation

Note: the time displayed takes the sunrise and sunset correction parameters into account.

REFERENCE STANDARDS

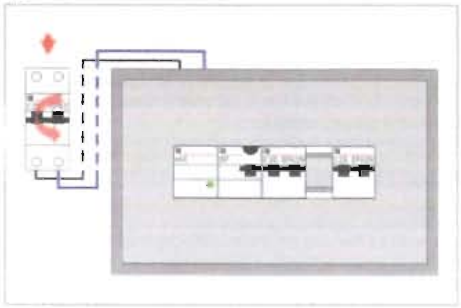
Conformity to the EU directives:
2006/95/EC (Low voltage - LVD)
2004/108/EC (Electromagnetic compatibility - EMC)
is declared with reference to the following standards:
EN 60730-2-7, EN 61000-6-1, EN 61000-6-3

PROVINCE CODE / CAPITAL

Codice *Code*	Sigla *Abbrev.*	Nome *Name*	Codice *Code*	Sigla *Abbrev.*	Nome *Name*	Codice *Code*	Sigla *Abbrev.*	Nome *Name*	Codice *Code*	Sigla *Abbrev.*	Nome *Name*
0	**[AG]**	Agrigento	**26**	**[CR]**	Cremona	**52**	**[ME]**	Messina	**78**	**ROMA**	Roma
1	**[AL]**	Alessandria	**27**	**[KR]**	Crotone	**53**	**[MI]**	Milano	**79**	**[RO]**	Rovigo
2	**[AN]**	Ancona	**28**	**[CN]**	Cuneo	**54**	**[MO]**	Modena	**80**	**[SA]**	Salerno
3	**[AO]**	Aosta	**29**	**[EN]**	Enna	**55**	**[NA]**	Napoli	**81**	**RSM**	San Marino
4	**[AR]**	Arezzo	**30**	**[FE]**	Ferrara	**56**	**[NO]**	Novara	**82**	**[SS]**	Sassari
5	**[AP]**	Ascoli Piceno	**31**	**[FI]**	Firenze	**57**	**[NU]**	Nuoro	**83**	**[SV]**	Savona
6	**[AT]**	Asti	**32**	**[FG]**	Foggia	**58**	**[OR]**	Oristano	**84**	**[SI]**	Siena
7	**[AV]**	Avellino	**33**	**[FO]**	Forlì	**59**	**[PD]**	Padova	**85**	**[SR]**	Siracusa
8	**[BA]**	Bari	**34**	**[FR]**	Frosinone	**60**	**[PA]**	Palermo	**86**	**[SO]**	Sondrio
9	**[BL]**	Belluno	**35**	**[GE]**	Genova	**61**	**[PR]**	Parma	**87**	**[TA]**	Taranto
10	**[BN]**	Benevento	**36**	**[GO]**	Gorizia	**62**	**[PV]**	Pavia	**88**	**[TE]**	Teramo
11	**[BG]**	Bergamo	**37**	**[GR]**	Grosseto	**63**	**[PG]**	Perugia	**89**	**[TR]**	Terni
12	**[BI]**	Biella	**38**	**[IM]**	Imperia	**64**	**[PS]**	Pesaro	**90**	**[TO]**	Torino
13	**[BO]**	Bologna	**39**	**[IS]**	Isernia	**65**	**[PE]**	Pescara	**91**	**[TP]**	Trapani
14	**[BZ]**	Bolzano	**40**	**[SP]**	La Spezia	**66**	**[PC]**	Piacenza	**92**	**[TN]**	Trento
15	**[BS]**	Brescia	**41**	**[AQ]**	L'Aquila	**67**	**[PI]**	Pisa	**93**	**[TV]**	Treviso
16	**[BR]**	Brindisi	**42**	**[LT]**	Latina	**68**	**[PT]**	Pistoia	**94**	**[TS]**	Trieste
17	**[CA]**	Cagliari	**43**	**[LE]**	Lecce	**69**	**[PN]**	Pordenone	**95**	**[UD]**	Udine
18	**[CL]**	Caltanissetta	**44**	**[LC]**	Lecco	**70**	**[PZ]**	Potenza	**96**	**[VA]**	Varese
19	**[CB]**	Campobasso	**45**	**[LI]**	Livorno	**71**	**[PO]**	Prato	**97**	**[VE]**	Venezia
20	**[CE]**	Caserta	**46**	**[LO]**	Lodi	**72**	**[RG]**	Ragusa	**98**	**[VB]**	Verbania
21	**[CT]**	Catania	**47**	**[LU]**	Lucca	**73**	**[RA]**	Ravenna	**99**	**[VC]**	Vercelli
22	**[CZ]**	Catanzaro	**48**	**[MC]**	Macerata	**74**	**[RC]**	Reggio Calabria	**100**	**[VR]**	Verona
23	**[CH]**	Chieti	**49**	**[MN]**	Mantova	**75**	**[RE]**	Reggio Emilia	**101**	**[VV]**	Vibo Valentia
24	**[CO]**	Como	**50**	**[MS]**	Massa	**76**	**[RI]**	Rieti	**102**	**[VI]**	Vicenza
25	**[CS]**	Cosenza	**51**	**[MT]**	Matera	**77**	**[RN]**	Rimini	**103**	**[VT]**	Viterbo

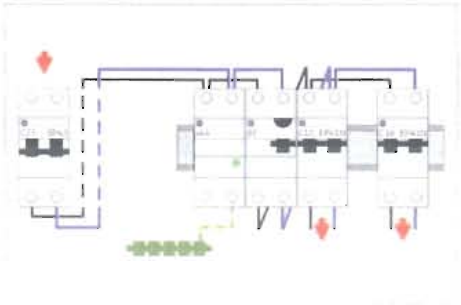
Installation instructions

1.



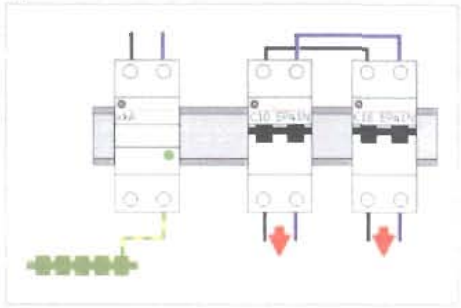
EN From the consumer unit in service, disconnect incoming circuit breaker.
SP Desconectar la alimentación del cuadro
IT Togliere alimentazione aprendo i contatti di potenza:
- dell'interruttore a protezione della linea di alimentazione del centralino (es. vano contatore).
- del differenziale/interruttore generale del quadro in questione.

2.



EN Remove the cover.
SP Desmontar el panel del cuadro.
IT Smontare il pannello frontale del quadro.

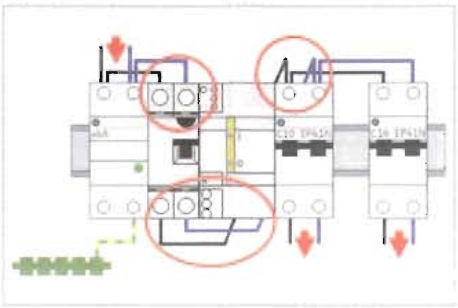
3.



EN Remove the earth leakage switch to be replaced.
SP Desmontar el diferencial.
IT Rimuovere il dispositivo differenziale da sostituire.

Instalación del aparato

4.

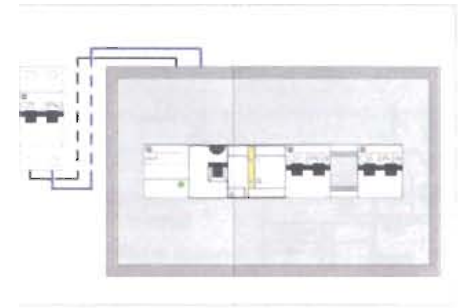


EN Connect input/output.
SP Desembornar el interruptor diferencial y desmontarlo.
IT Collegare i cavi di ingresso e uscita.

5.

EN Connect motor's auxiliary power supply from the Tele REC input.
SP Conectar la alimentación auxiliar del motor desde la entrada del interruptor diferencial del Tele REC.
IT Collegare l'alimentazione ausiliaria del motore come in figura (a monte del differenziale).

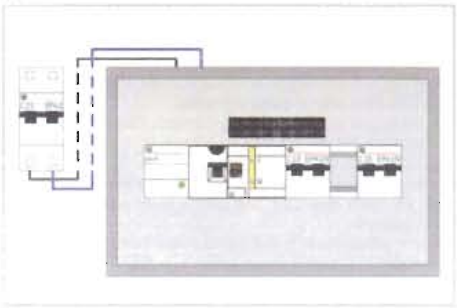
6.



EN Replace the cover.
SP Montar la tapa.
IT Montare il pannello frontale del quadro.

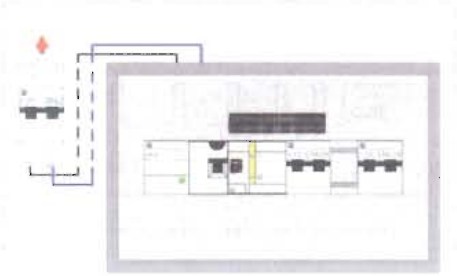
Installare l'apparecchio

7.



EN Put the two labels.
SP Poner las dos etiquetas.
IT Incollare le due etichette.

8.



EN Connect main circuit breaker.
SP Conectar el interruptor principal.
IT Rialimentare.

EN
The system will automatically switch the RCD to the ON position. If this does not happen verify that the yellow lever is in the I (automatic operation) position. Do not try to manually force the RCD to the ON position if the yellow lever is in O (locked) position, instead move the yellow lever to I.

Press the test-button of the RCD, the breaker must disconnect immediately and be automatically reconnected after approximately 10 seconds.

SP
El sistema accionará automáticamente el interruptor diferencial a la posición ON. Si esto no sucede verifique que la palanca amarilla se encuentra en posición I (posición de marcha). No trate de forzarmanualmente el diferencial a la posición ON si la palanca amarilla esta en posición O (bloqueo), en vez de esto desplace la palanca amarilla a I.

Presione el botón de test del interruptor diferencial, el interruptor debe desconectar inmediatamente y ser reconectado de forma automática después de aproximadamente 10 segundos.

IT
Il sistema commuterà automaticamente il differenziale in posizione ON ; se questa operazione non avverrà, verificare che la leva di colore giallo sia in posizione I (Modalità auto). Non forzare manualmente in posizione ON la leva di comando del differenziale se l'interblocco di colore giallo è in posizione O (blocco meccanico), prima di avere riportato quest'ultimo in posizione I.

Premere il pulsante di Test del differenziale ; l'interruttore aprirà i contatti di potenza immediatamente e si riarmerà in automatico dopo circa 10 secondi.

Tele REC

Earth leakage protection
with automatic self-reclosing

Sistema de reconexión automática

Interruttore differenziale con riarmo automatico

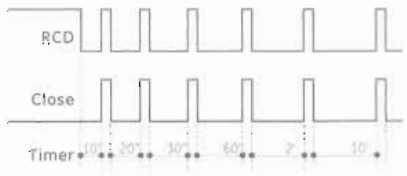
Tele REC
Operating Instructions

The Tele REC relay automatically recluses the RCCB after an earth leakage or a manual disconnect.
The realy will attempt to re-close 6 times with time intervals between re-close attempts.
It is equipped with an auxiliary contact (LI) to operate the re-closing system from a push-button.
During WORKS on the installation the Tele REC self re-closing system must be removed. To prevent switching "ON", we must lock "OFF" the yellow lever with a padlock (not supplied).

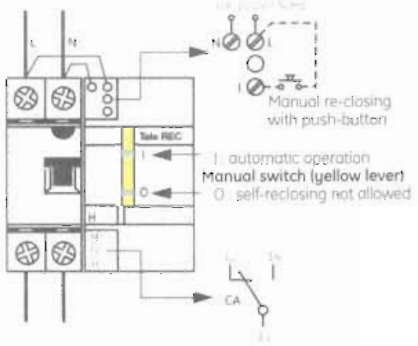
- When yellow lever is in 1 position the Tele REC is ready to work.
- When yellow lever is in 0 position the Tele REC is blocked both electrically and mechanically.
- When we move the lever to 0 position we reset the internal counter so the reconnection cycle is reset.

ATTENTION!
YELLOW LEVER OF Tele REC RELAY MUST BE FIXED IN 0 POSITION DURING WORKS ON THE INSTALLATION.

Tele REC is also equipped with a volt free output to indicate the status of the protection (connected/ disconnected). Terminals Nr 11,12 & 14)



When RCD trips, a sequence of six re-closing attempts is started. If a re-closing attempt is successful the sequence stops and if there is no further trip the relay is reset after last reconnection time. If the relay fails to successfully re-close the switching device after 6 reconnections, then it is locked out preventing any further attempts until it is manually reset.



Motor	
Dimensions	3 modules
Un	220/240V - 50/60Hz
Reclosing time commanded	0,3 s < t < 1 s
Auxiliary contact:	Imax 2A a 250VAC Imax 2A a 24VDC Imin 20mA terminal: 2,5mm²
Internal relay (inside motor)	
Reconnection number (*)	6
Timing (*)	10, 20, 30, 60, 120, 600 sec.
Reset time	= last reconnection time
RCDs	
	Same features as GE RCDs

(*) Different reconnections number and/or timing on request

Tele REC
Funcionamiento

Los diferenciales con reconexión automática Tele REC, efectúan automáticamente la maniobra de reconexión tras una desconexión diferencial o manual después de haber pasado el tiempo entre reconexiones. También puede ser posible reconectar el diferencial a distancia mediante pulsador, a través de un contacto auxiliar LI. Cuando se desee realizar tareas de mantenimiento aguas abajo del Tele REC, se debe anular provisionalmente el sistema de reconexión automática, para ello basta con actuar sobre la maneta amarilla, permitiendo enclavarla en esta posición mediante un candado.

- Cuando la palanca amarilla esta en la posición I el Tele REC esta preparado para su utilización.
- Cuando la palanca amarilla esta en la posición 0 el Tele REC esta bloqueado tanto eléctrica como mecánicamente.
- Además, al desplazar la palanca amarilla a posición 0, el contador interno de reconexiones se pone a cero.

¡ATENCION!
SIEMPRE QUE MANIPULEMOS LA INSTALACION AGUAS ABAJO DEL Tele REC SE DEBE PONER LA PALANCA AMARILLA EN POSICIÓN O.
El Tele REC también está equipado con 1 contacto auxiliar conmutado que indica la posición del interruptor diferencial (conectado o desconectado), independientemente de la causa del disparo (bornes Nº 11,12 y 14).

Cuando se produce un disparo diferencial, el sistema se activa por medio de un contacto auxiliar interno que indica que el interruptor diferencial esta abierto, iniciando el ciclo de reconexiones.
Si en alguno de los intentos la maniobra de cierre se realiza con éxito, al cabo del tiempo correspondiente al último ciclo realizado sin incidencia, se pone a cero el contador interno (P.E.: Maniobra realizada con éxito en el ciclo 2 de 20 sg, al cabo de 20segundos sin incidencia, se pone a cero el contador interno).

Si todos los intentos resultan fallidos el interruptor diferencial queda desconectado y no realiza más maniobras. Todo el sistema queda bloqueado hasta que se actúe sobre la maneta amarilla para cortar y reponer la alimentación.

Motor	
Dimensiones	3 módulos
Un	220/240V - 50/60Hz
Tiempo rearme orden externa	0,3 s < t < 1 s
Contacto auxiliar:	Imax 2A a 250VAC Imax 2A a 24VDC Imin 20mA Terminal: 2,5mm²
Relé interno (incorporado en el motor)	
Nº de reconexiones (*)	6
Tiempo (*)	10, 20, 30, 60, 120, 600 seg.
Tiempo Reset	= Tiempo último reconexión
Diferenciales	
	Mismas características que los int. diferenciales GE

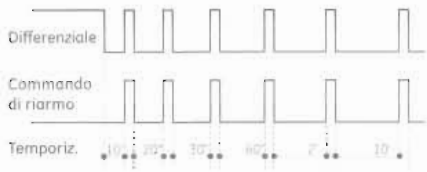
(*) Consultar para otro número y ciclo de reconexión

Tele REC
Funzionamento

Gli interruttori differenziali Tele REC, realizzano in automatico la manovra di riarmo dell'interruttore differenziale in seguito ad un apertura intempestiva, o per guasto a terra, del dispositivo in questione. L'operazione di riarmo può avvenire una o più volte come verrà spiegato nel seguito.
E'possibile riarmare l'interruttore con comando a distanza tramite pulsante, PLC, ricevitore telefonico, sistema BUS, .. attraverso il contatto LI.
Durante le operazioni di manutenzione dell'impianto a valle del dispositivo Tele REC, è possibile lavorare in sicurezza grazie ad un blocco meccanico di colore giallo che impedisce un eventuale riarmo automatico indesiderato.

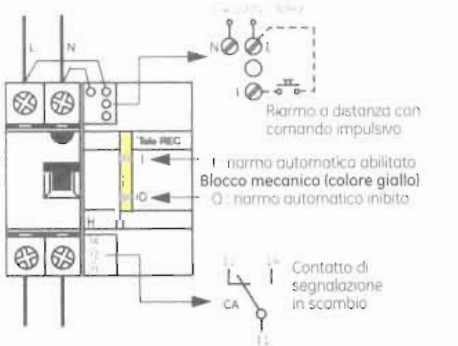
- Blocco meccanico giallo in posizione I : il dispositivo Tele REC è pronto per realizzare il riarmo a distanza o in automatico.
- Blocco meccanico giallo in posizione 0 : il dispositivo Tele REC è bloccato e non è possibile chiudere i contatti di potenza sia elettricamente che meccanicamentetramite la leva di manovra.
- Quando si sposta il blocco meccanico giallo dalla posizione 0 alla posizione I, si azzera automaticamente il ciclo di riarmo automatico.

ATTENZIONE!
RICORDARSI DI BLOCCARE IL RIARMO AUTOMATICO TUTTE LE VOLTE CHE SI APRONO MANUALMENTE I CONTATTI DI POTENZA.
Il Tele REC dispone di un contatto ausiliario in commutazione che indica la reale posizione dei contatti di potenza del differenziale e ne segnala l'apertura indipendentemente dalla causa (morsetti n°11, 12 e 14). Quando il dispositivo differenziale apre per guasto a terra o per intervento intempestivo (sovratensioni impulsive di manovra o atmosferiche, armoniche in rete), il Tele REC inizia il ciclo di riarmo automatico grazie ad un contatto ausiliario interno.



Se durante uno dei cicli di riarmo l'interruttore rimane con i contatti di potenza chiusi, il contatore interno si azzera al termine del tempo corrispondente all'ultimo ciclo realizzato senza apertura dei contatti. Ad esempio, riarmo con successo al secondo tentativo: dopo 20 secondi senza eventuale riapertura dei contatti di potenza, il contatore interno azzera il ciclo.

Come da figura, il numero massimo di tentativi di riarmo è pari a 6, con gli intervalli di tempo sopra riportati. Se dopo il sesto tentativo di riarmo il dispositivo differenziale apre ancora, il sistema mantiene i contatti di potenza aperti fino a che non si effettua un reset manuale tramite il blocco meccanico di colore giallo (portare il blocco meccanico giallo in posizione 0 e successivamente riportare il blocco giallo in posizione I).



Blocco comando a motore	
Dimensioni	3 moduli da 17,5mm
Un	220/240V - 50/60Hz
Tempo totale di riarmo	0,3 s < t < 1 s
Contatto ausiliario	Imax 2A a 250VAC Imax 2A a 24VDC Imin 20mA capacità morsetti: 2,5mm²
Sistema a relè per riarmo automatico	
Massimo numero riarmi in sequenza (*)	6
Ritardi (*)	10, 20, 30, 60, 120, 600 sec.
Tempo di Reset	= ultima sequenza di riarmo
Interruttore differenziale - RCCB	
	Dipende dal codice GE accoppiato

(*) Contattateci per richiedere dispositivi con cicli di riarmo differenti da quelli a catalogo.

The actual version of the user manual and updates you will find on our website www.falcom.de > manuals + software.
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date: 29 April 2003, version 1.00

Datasheet

FALCOM TANGO

FALCOM GmbH
Gewerbering 6
98704 Langewiesen
Germany

Internet: http://www.falcom.de

FALCOM GmbH
WIRELESS COMMUNICATIONS

Technical Data

* **Dimensions:** 111.5 mm x 52 mm x 24.5 mm (B x H x L)
* **Weight:** 82 g
* **Power Supply:** 10.8..31.2 V DC
  52 mA/12V (idle)
  155 mA/12V (Power Level 7)

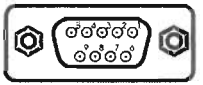
* **Temperature Range:** Storage: -30°C to +85°C
  Use: -20°C to +55°C

* **Interface A:** power supply, cable reference

Pin1: GND (brown)
Pin2: Mute (green) (currently not used)
Pin3: Ignition (yellow) (connected to positive pole)
Pin4: Power supply (white) (10.8 V – 31.2 V)

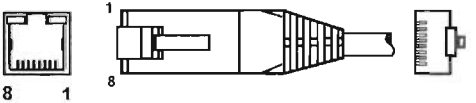
* **Interface B:** RS232/V24, 9-pin Sub-D female

Pin1: DCD
Pin2: TXD
Pin3: RXD
Pin4: DTR
Pin5: GND
Pin6: DSR
Pin7: RTS
Pin8: CTS
Pin9: RI



* **Interface C:** RJ45, 8pin shielded for audio and RS232

Pin1: 10 V DC ±5% 150 mA output
Pin2: RXD
Pin3: TXD
Pin4: GND
Pin5: SPK+
Pin6: SPK-
Pin7: MIC+
Pin8: MIC-



LED yellow: Actual connection
LED green: Status

* **Interface D:** GSM antenna, 50 Ω SMB or FME female

* **Audio interface:** Electret-Microphone
  Loudspeaker 150 Ω

Caution: **In case of firmware update, after the TANGO modem is powered on, remove the Ignition Line from high voltage level and leave it open or connect it to ground (do not use any pull up resistor on this line, it is internally pulled up). Do not begin to update the firmware if the Ignition Line is still connected to high voltage level, the modem will be destroyed.**

* **SIM card interface:** for small SIM cards

* **Digital interface:** AT commands according to ETSI GSM 07.07, GSM 07.05

Connector:	8pin RJ45, 9-pin Sub-D (female) DIN 41652
Logic:	V.24 asynchron
Baudrate:	9600 baud (programmable 1200..115.200 baud)
Parity:	None
Character format:	8 data bits, no parity, 1 stop bit
Signal levels:	CCITT recommendation V.28

* **Short message service:** GSM 03.40, GSM 07.05
  - SMS mobile originated
  - SMS mobile terminated
  - CBS text/PDU mode, 7/8 bit data

Routes:	SMS MO and MT
Mode:	text/PDU mode, 7/8 bit data

* **Data communication:** asynchronous, transparent and non-transparent
  GSM 07.01, GSM 07.02, GSM 04.21

• 300 bps V.21	• 300 bps V.110
• 1200 bps V.22	• 1200 bps V.110
• 2400 bps V.22bis	• 2400 bps V.110
• 4800 bps V.32	• 4800 bps V.110
• 9600 bps V.32	• 9600 bps V.110

GENIUS
CONTROL

CTRL-128

INSTRUCTIONS MANUAL

Rev.1

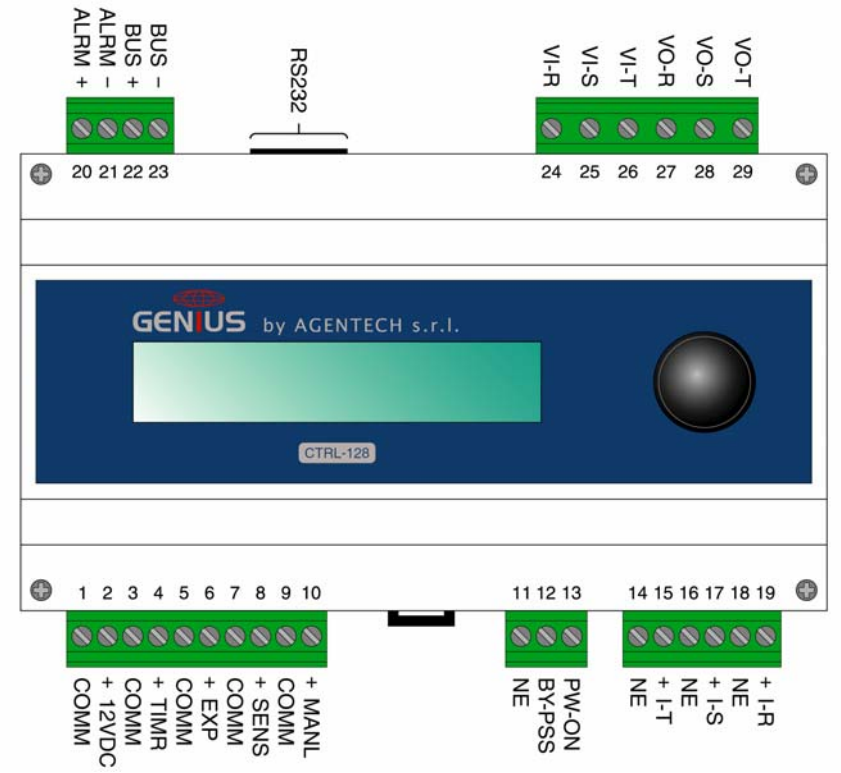
GENERAL DESCRIPTION

Genius Control CTRL-128 is a control device of the Genius range allowing the management of those regulation systems, that use the power units of the Genius Power line within single- and three-phase lighting systems. The timer mode together with one power reserve clock allow to program timing of ignition and shutoff, and also the required output tension levels. The probe Genius Sensor allows to achieve the required illuminance value according to the output tension level. The integrated measuring unit provides values of tension, current, active and reactive power, power factor and operation energy of the system; moreover it is able to gather the instantaneous and total energy saving of the system according to the operating conditions. The control of different kinds of alarm is also included. One single knob and an alphanumeric display allow to enter all the functions and to set all the operating parameters through a menu system.

TECHNICAL DATA

Feeding	12VDC ± 10% 330mA (4W)
Inputs VI-R/S/T and VO-R/S/T	max 280Vrms
Inputs I-R/S/T with module TA3X50	max 50Arms
Outputs PW-ON and BY-PSS	230VAC 200mA
Output ALARM	30VDC 40mA
Insulation	Class I
Emission EMC	in accordance with EN61000-6-2
Immunity EMC	in accordance with EN61000-6-3
Operating temperature	from –10°C to +45°C
Storage temperature	from –25°C to +75°C
Humidity	up to 90% without condensation
Protection degree	IP20
Weight	500g
Clamps section	Rigid conductor 2.5mm2
Serial interface gate	D-sub 9 poles
Dimensions (mm)	157,5 x 110 x 71

CONNECTIONS



COMM	1	COMMON FEEDING AND INPUTS
+12VDC	2	FEEDING INPUT 12VDC
COMM	3	COMMON FEEDING AND INPUTS
+TIMR	4	TIMER ENABLING CONTACT
COMM	5	COMMON FEEDING AND INPUTS
+EXP	6	EXPANSION INPUT
COMM	7	COMMON FEEDING AND INPUTS
+SENS	8	CONNECTION INPUT TO THE GENIUS SENSOR
COMM	9	COMMON FEEDING AND INPUTS
+MANL	10	LAMPS MANUAL IGNITION CONTACT
NE	11	NEUTRAL
BY-PASS	12	RELAY BYPASS CONTROL
PW-ON	13	RELAY ON/OFF CONTROL
NE	14	NEUTRAL
+ I-T	15	TA MODULE INPUT FOR SENSING THE T PHASE TENSION
NE	16	NEUTRAL
+ I-T	17	TA MODULE INPUT FOR SENSING THE S PHASE TENSION
NE	18	NEUTRAL
+ I-T	19	TA MODULE INPUT FOR SENSING THE R PHASE TENSION
+ALARM	20	OPTO-INSULATED OUTPUT FOR ALARM SIGNAL
-ALARM	21	OPTO-INSULATED OUTPUT FOR ALARM SIGNAL
+BUS	22	COMMUNICATION GATE TO THE GENIUS POWER
-BUS	23	COMMUNICATION GATE TO THE GENIUS POWER
VI-R	24	SENSING ACCESS TO THE INPUT TENSION R PHASE
VI-S	25	SENSING ACCESS TO THE INPUT TENSION S PHASE
VI-T	26	SENSING ACCESS TO THE INPUT TENSION T PHASE
VO-R	27	SENSING ACCESS TO THE OUTPUT TENSION R PHASE
VO-S	28	SENSING ACCESS TO THE OUTPUT TENSION S PHASE
VO-T	29	SENSING ACCESS TO THE OUTPUT TENSION T PHASE
RS232		SERIAL COMMUNICATION GATE RS232

FUNCTIONING

Timer

The Timer of the Genius Control CTRL-128 controls the different ignition and shutoff cycles of the lighting system. The timer parameter indicates if each cycle is daily either weekly controlled. By the daily procedure there are 4 cycles only, that are repeated every day of the week and are hence all the same. By the weekly procedure, you can program 4 cycles on Mondays, 4 cycles on Tuesdays, 4 cycles on Wednesdays and so on, making every day of the week different from the other. Every cycle is operative starting from the ignition time up to one second before the shutoff time. For example, if a cycle is programmed from 18:00 to 22:00, then it will be working from 18:00 up to 21:59:59.
If the ignition time is the same as the shutoff time, then it will be deactivated. In case of several contemporary cycles, priority is given to the highest number; it means that if cycle 2 goes from 18:00 to 19:00 and cycle 3 goes from 18:30 to 20:00 then cycle 2 will be working from 18:00 to 18:29:59 and cycle 3 will be working from 18:30 up to 19:59:59.
The lighting system is off when there is no cycle in operation.
By each cycle you can establish the required output tension level in Volts either, in combination with the luminosity probe Genius Sensor, you can assign the required illuminance value in lux at each cycle. The luminosity sensor Genius Sensor has to be positioned in order to sense the luminous intensity of the environment and not that of the lighting system. The nominal lighting parameter indicates the luminance in lux provided by the sole lighting system at a 230V nominal tension without any further luminous sources. Genius Control CTRL-128 establishes the tension to be applied to the lighting system according to the nominal lighting, to the lighting of the environment sensed by the probe, and to the illuminance value required at each cycle. During the operation, when the lighting system is on, variations of the output tension -- due to changes of the cycle or to the different results from the measurement of the illuminance data -- may gradually occur, by following a ramp, whose slope is given by the variation slope parameter.
When switching on the system, Genius Control CTRL-128 applies an ignition cycle by setting up the output tension on the value of the ignition tension parameter together with the time based on the ignition time parameter, in order to allow the pre-heating of the lamps. The operation of the timer is established by the input status + TIMR. In order to enable the timer, the input + TIMR needs to be connected to the common COMM; an example of that is the connection of the clean contact of a crepuscular switch that deactivates the timer, in order to prevent the ignition of the lighting system when there is enough sunlight, even though cycles are still in operation.

Manual Input

Genius Control CTRL-128 is provided with the manual mode, enabled through the connection of the input +MANL to the common COMM, that allows to set up the output tension anytime on the fixed value of 220V, not depending on the timer programming.

ON and BYPASS outputs

Genius Control CTRL-128 is provided with the PW-ON and BYPASS outputs implemented by static network tension relay, that connects them to the neutral NE.
The output PW-ON is enabled when the lighting system needs to be on and is provided for the connection of a relay or a contactor, that feeds the power units when the system has to be on and that stops feeding the power units when the system has to be off.
The BY PASS output is enabled when at one or more cycles there is feeding tension in the input and the timer has already started the ignition of the lighting system, but the output tension is too low and indicates the bad functioning or the intervention of the protection devices of the power units.
The BY PASS output is equipped for the connection of a relay or a contactor, connecting the output to the input and preventing the shutoff of the system. Once the bypass condition and the related output are enabled, they remain active until the next shutoff.

Measurements

The measuring unit of the Genius Control CTRL-128 measures the effective value of tension, currents and active power at each cycle and is able to calculate the apparent power, the power factor and the active power. Moreover it calculates the total active power and the saved active power and gathers energy meters and meters for saved energy.

Calibration of energy efficiency

Genius Control CTRL-128 establishes the estimated power consumption of the lighting system according to the feeding tension of the system itself. The estimate is calculated according to the data collected from the calibration of efficient energy that, step by step, feeds the lighting system with different output tension values and reveals the related active power consumption. The calibration of efficient energy makes a further check at the end of the cycle, by feeding the system at a fixed output tension value, by calculating the estimate active power consumption starting from the collected data and by verifying that it matches with the active power actually measured. The output tensions, feeding the system during the efficient energy calibration process, range between the parameters of minimum and maximum limit of the output tension.

Calculation of energy efficiency

Genius Control CTRL-128 allows to calculate the active power consumption and the gathered energy efficiency, that represent the instantaneous and total energy saving of the system, achieved through the regulation device when directly connected to the electric network. The active power consumption is equal to the difference between the active power – that the system would absorb if it was fed directly at the input tension -- and the active power actually absorbed by the lighting system itself, fed at the regulated output tension. The active power, that would be absorbed by the lighting system in case it was fed directly at the input tension, is calculated according to the data collected during the energy efficiency calibration process.

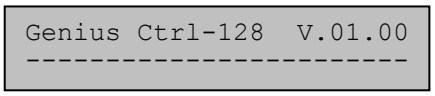
Alarms

Genius Control CTRL-128 operates several alarms conditions in order to indicate bad functioning of the regulation device and of the lighting system. At each cycle the following alarm records can be individually enabled or deactivated: absent input tension, absent output tension, open loading and abnormal loading. Conditions of absent input and output are due to a low input- and output tension, conditions of open loading are due to a low active power consumption, conditions of abnormal loading are due to an active power consumption that is different from the expected one. The expected active power is the power that should be absorbed by the lighting system when it is fed at the output tension and is calculated according to the data collected during the energy efficiency calibration process. The reporting of abnormal loading can be used to indicate the bad functioning of the lamps or the selection of parts of the system for the intervention of automatic switches. The reporting of alarm in bypass condition can also be enabled or deactivated. The alarm condition is indicated by the opto-insulated ±ALARM output.

CONFIGURATION

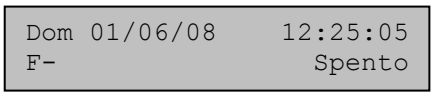
Home Page

By the ignition the Genius Control CTRL-128 displays for a few seconds the home page indicating the version of the installed software. (V.01.00).



Main Page

The main page is displayed when the menu is not active. On the main page the day, the current date and time, the operative time cycle, any bypass or alarm condition and the output status are displayed.



When the power reserve of the internal clock is over, due to a continuous absence of feeding, the current time is no longer displayed (--- --/--/-- --:--:--) and the clock functions are deactivated. In order to restore the regular functioning, the clock regulation procedure needs to be applied. The indicator of the time cycle displays the number of the current time cycle (ex. F2) either indicates that no time cycle is operative (F-). The manual mode is also indicated (Man) together with any bypass (BYP) and alarm condition (ALL). The displaying of the output status indicates the output tension (ex. 205V) or the state of rest (OFF).

Main Menu

By pressing the knob you can enter from the main page to the main menu, allowing the access to the functions of the Genius Control CTRL-128. By turning the knob all the functions of the menu are displayed, by pushing it the selected function can be entered. When there are changeable values, such values can be modified by pushing the knob; the item being modified is highlighted and can be actually changed by turning the knob. By pushing it again the modified item is confirmed and in case of further variable values you can access the following one. The change process ends when there are no more values highlighted. The last entry (BACK) allows to go back to the main menu or to the home page.

Measurements displaying

This function allows the access to the measurements displaying pages including: lighting (lx), input tension (Vrms), output tension (Vrms), current (Arms), active power (W), apparent power (VA), power factor, reactive power (VAr), total active power (W), saved power (W) energy (kWh), saved energy (kWh). The illuminance value can be displayed only when the probe Genius Sensor is connected.

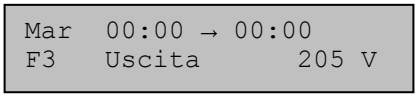
Lamp Test

This function allows a quick control of the functioning of the regulation system by setting up the output tension on a specific value.

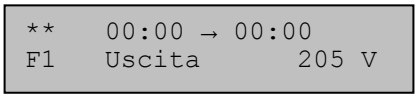
In order to enable the specific output tension value you need to press the knob and access the change of the parameter. As long as the parameter is changed, its value will be immediately applied to the output, without considering the minimum and maximum limits parameters of the output tension. When the change is over, the system will be back to the regular management of the time cycles.

Timer programming

This function allows to program the time cycles. In order to program the timer in a weekly mode, you need to turn the knob and select the week and the timing that have to be modified.

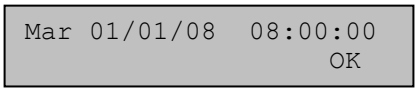


By pressing the knob you can apply the change of the starting time, of the minutes in the starting time, of the finishing time, of the minutes in the finishing time, of the output or lighting mode and of the illuminance or tension value.
The daily mode of the timer is the same, except that the day of the week cannot be selected.



Clock regulation

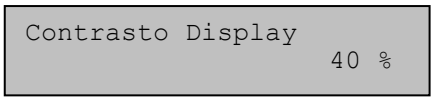
This function allows the setting of the internal clock.



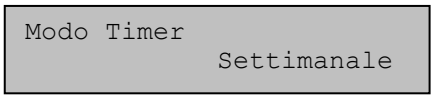
By pressing the knob day of the week, day, month, year, hours, minutes and seconds are automatically established. By selecting the OK box, the knob has to be pushed by the time-signal in order to achieve an accurate setting. The set up of the internal clock occurs in the moment the knob is pushed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can reset the operation.

Parameters Setting

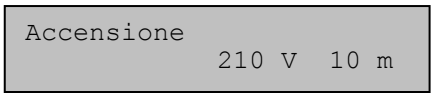
This function allows the set up of the operation parameters of the Genius Control CTRL-128.



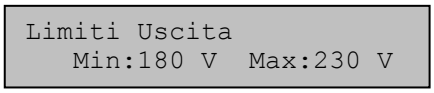
The display contrast increases as soon as the parameter increases. The pre-established 40% value is suitable to most cases, it can be reduced in case of high temperatures, that make the display darker, and can be increased in case of low temperatures making the display brighter.



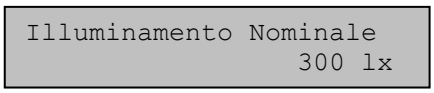
The timer manages 4 cycles in a daily mode either 4 cycles for each day of the week in a weekly mode.



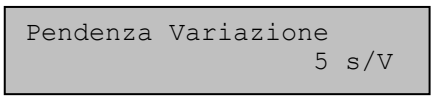
The ignition parameters indicate the output tension value and the time required for the pre-heating of the lamps of the lighting system.



The minimum and maximum limits are never overcome in the output tension calculation. The minimum limit has to be set up in order not to switch the lamps off and the maximum limit can be reduced in order to achieve a greater efficiency.



The value of the nominal illuminance is included onto the calculation of the output tension, when we apply the lighting mode for programming the cycles, and it is equal to the luminance in lux provided by the sole lighting system to the nominal 230V tension.



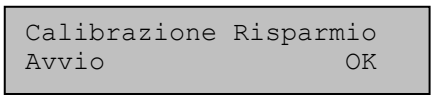
The variation slope value indicates the slope of the ramp where the output tension changes from one value to another one.

Alarm management

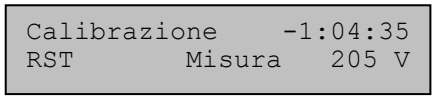
This function allows the access to the pages enabling (Att.) or deactivating (Des.) the alarm reports due to absent input tension, absent output tension, open loading, abnormal loading, bypass.

Calibration of energy efficiency

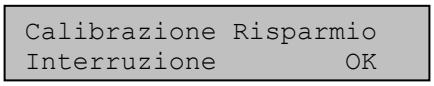
This function allows to apply the procedure for the step-by-step reporting of the active power consumption of the lighting system, fed with different output tension values.
The page of the starting of the calibration process is firstly displayed



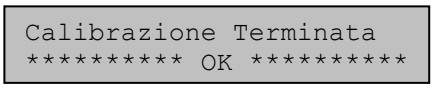
By pressing the knob the OK box is highlighted, the procedure is started the moment the knob is pressed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can reset the operation. During the calibration process the page indicating the following values is displayed: the estimated time left (for ex. – 1:04:35), the cycles where the procedure is operative (for ex. RST), if data are being measured (Measuring) or their validity is being checked (Verifying), and the output tension (for ex. 205V).



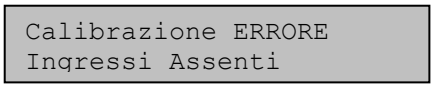
The estimated time left prior to the end of the cycle is a maximum value, the displayed value can change during the procedure depending on the operative conditions, that make the effective time shorter. By turning the knob you can access the page of stop procedure.



By pressing the knob the OK box is highlighted, the procedure is stopped the moment the knob is pressed and the OK box is active. By a second thought, if the knob is turned anticlockwise the expression on the box becomes ANN and by pressing the knob you can go back to the calibration page. At the end of the procedure, the page of the calibration ending is displayed in case of success.

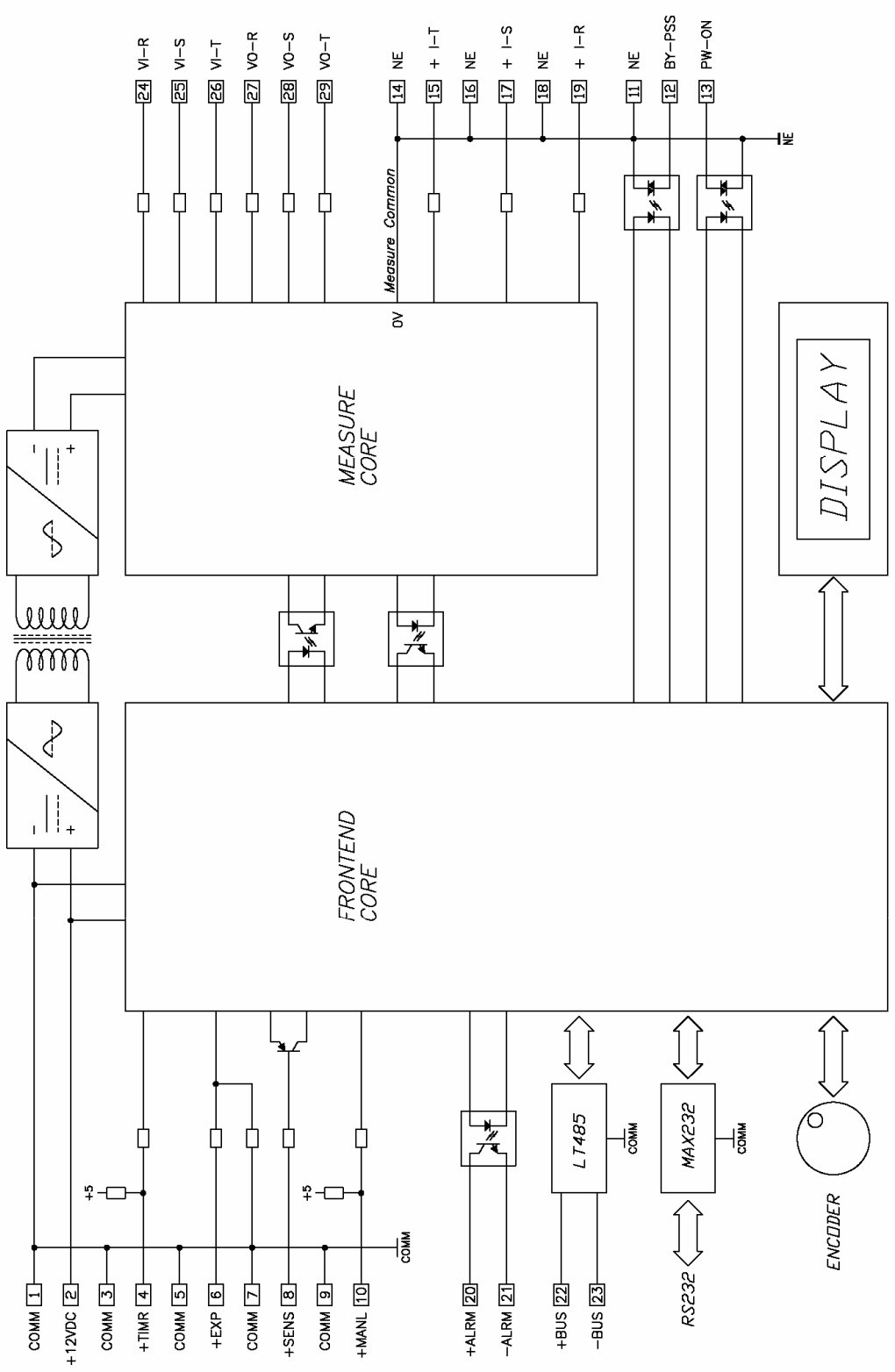


If an error occurs during the calibration process, the page indicating the reason of the error is displayed.

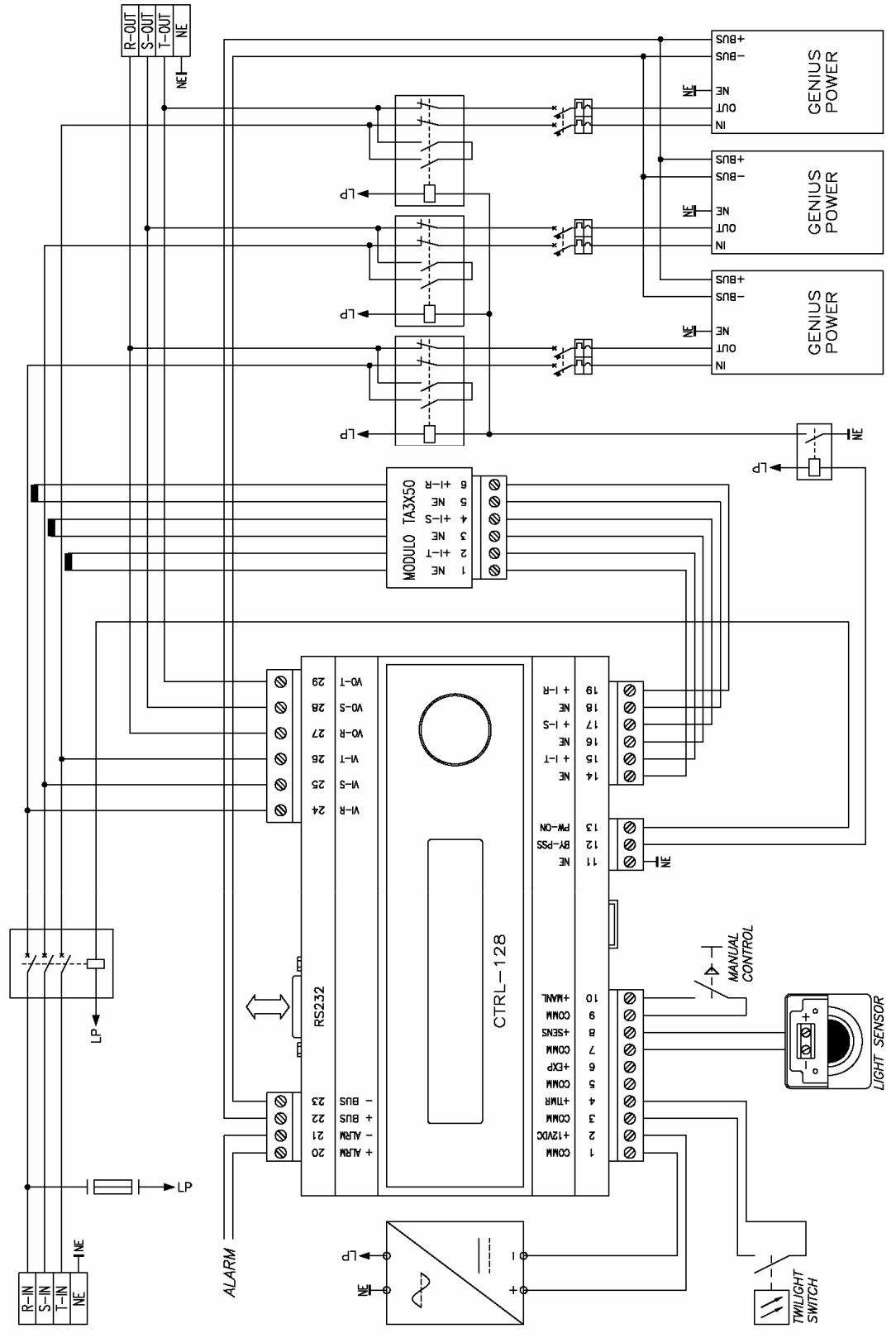


The reasons for such error might be: ABSENT INPUT if the input tension is too low, ABSENT OUTPUT if the output tension is too low, OPEN LOADING if the absorbed power is too low, OUTPUT NOT ACHIEVED if the output tension is too different from the value required by the procedure, OUTPUT MODE, if the measured output tension value is not increasing as per the values required by the procedure, POWER MODE, if the measured power consumption is not increasing as per the values required by the procedure, VALUES VERIFYING, if the value of the power consumption - calculated according to the data collected during the procedure - do not match the values actually measured, ABSENT INPUTS if by the starting of the procedure there is not enough input tension at each cycle, COMMUNICATION or UNKNOWN in case an internal communication error occur with the measuring system, STOPPED when the procedure is stopped. The error in the output mode might be caused by a variation of the input tension value, the errors of power mode and value verifying occur when the conditions of the system change depending on lamps faults, on removal either insertion of parts for the intervention of sectioning switches during the calibration process.

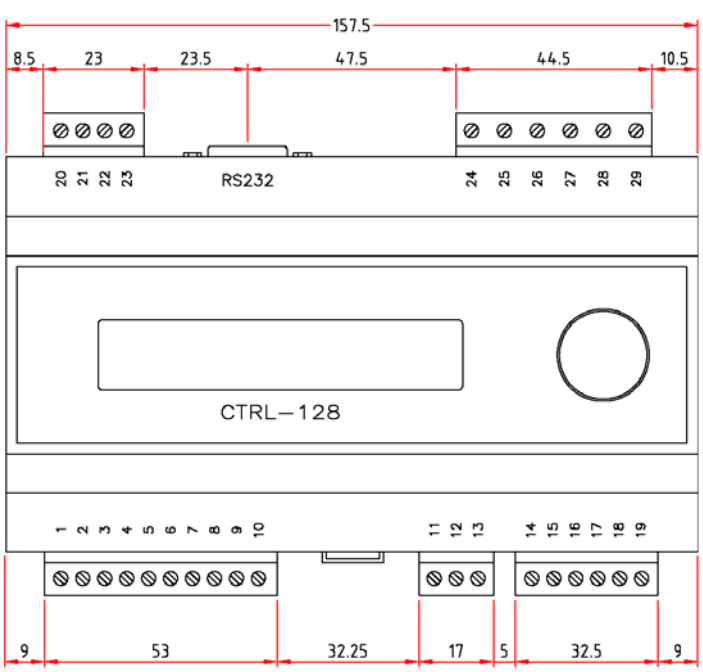
BLOCK DIAGRAM

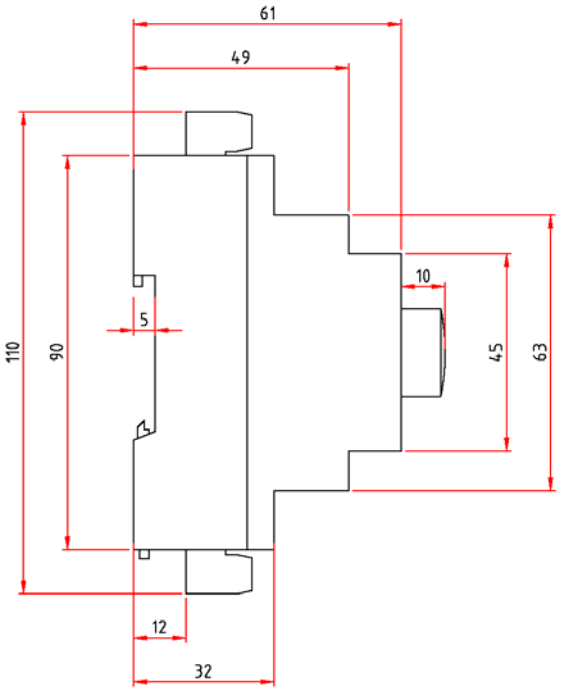


TYPICAL APPLICATION



DIMENSION


157.5
8.5
23
23.5
47.5
44.5
10.5
20 21 22 23
RS232
24 25 26 27 28 29
CTRL—128
1 2 3 4 5 6 7 8 9 10
11 12 13
14 15 16 17 18 19
9
53
32.25
17
5
32.5
9


61
49
10
5
110
90
45
63
12
32

AGENTECH

PURCHASER NAME PURCHASER	DROWING N.	S01000
		2
		3
SUBJECT THREE PHASE REGULATION SWITCHBOARD PANELS 18KVA WITH CTRL-128	PAGE	1
	NEXT PAGE	2
	TOTAL SHEET	7

REVISIONS

REV. N.	DATE	DESCRIPTION	PURCHASE	DRAWING BY	VERIFICATED	APPROVATED
00	01/01/2010	RELEASE				

FEATURES OF THE SWITCHBOARD PANEL

Type of device (CEI 17.13/1)	ANS
Reference data of the switchboard panel	S01011
Type/Structure	CELBO 2AC16P
Nominal operation voltage	400V
Nominal insulation voltage	RESIST. DI ISOLAM. >200Mhom (Misura eseguita a 500V F-PE)
Nominal voltage of the auxiliary circuits	230Vac 12Vcc
Nominal current of the main circuits	40A
Nominal frequency	50Hz
Short circuit current	<= 10KA

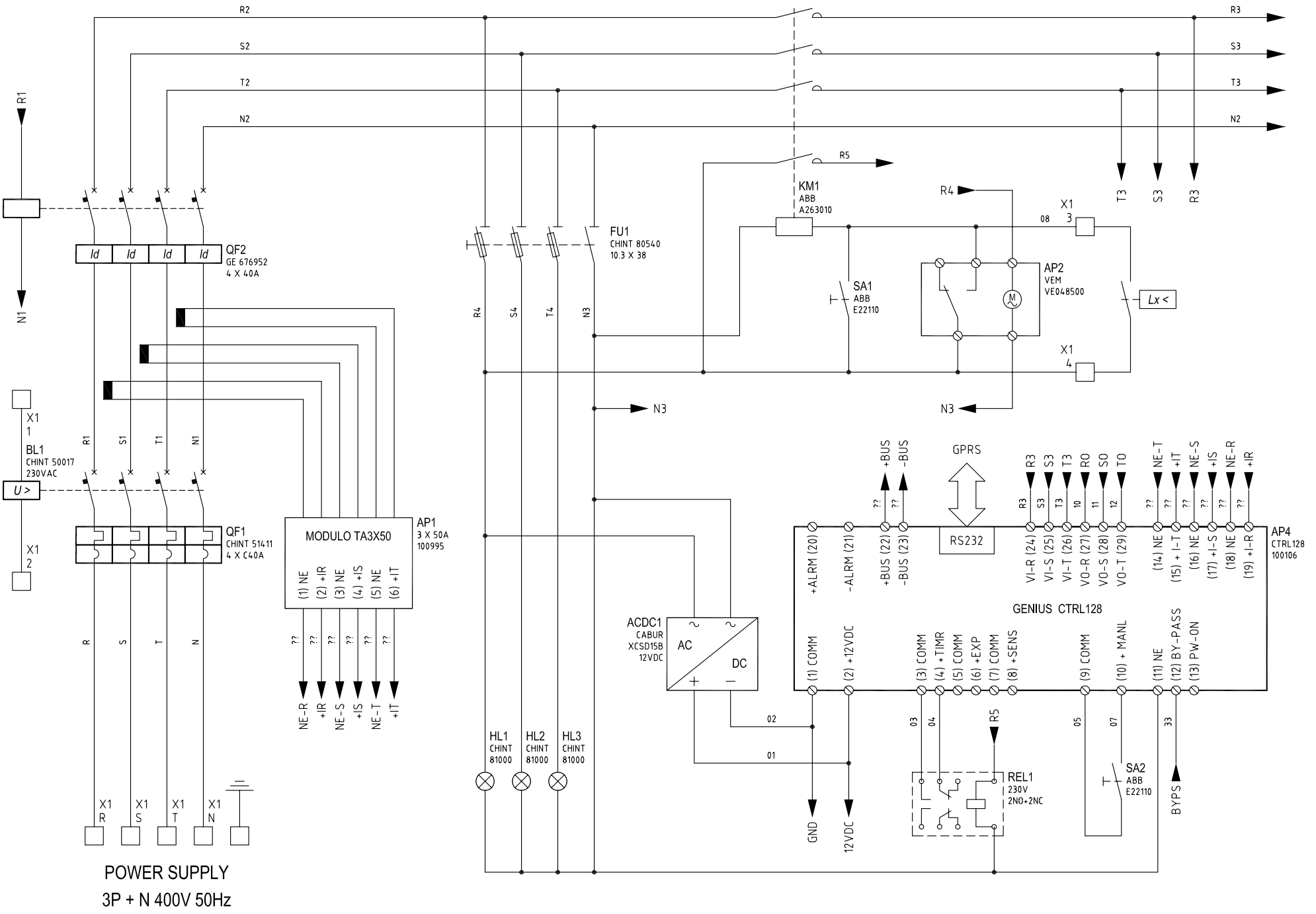
Structural feature	
Ambient temperature	30°C
Max operating temperature	45°C
IP Protection degree	IP44
Conditions for the installation	ON THE GROUND
Dimension in mm (hxLxw))	1280 X 715 X 270
Approximate weight	60
Colour of the structure	RAL 7032
Colore of the hinged doors	RAL 7032

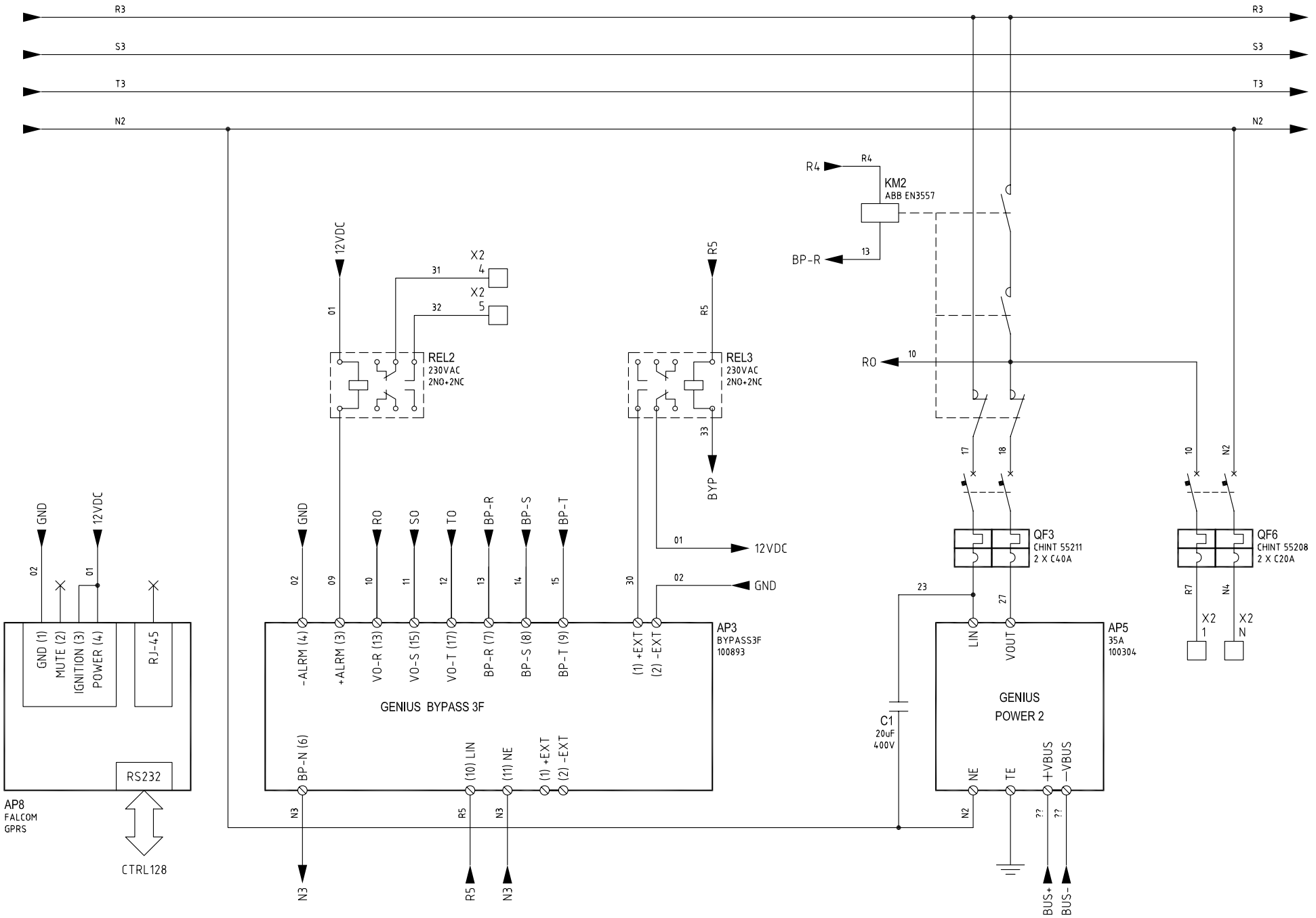
IN A	CABLE TYPE	SECTION mm²
1 ÷ 12	N07V-K	1.5
12 ÷ 16	N07V-K	2.5
20	N07V-K	4
25	N07V-K	6
32	N07V-K	10
40	N07V-K	16
63	N07V-K	25
80	N07V-K	35
80	FG7R	25
100	FG7R	35
125	FG7R	35
Voltmetric		1.5
Amperometric		2.5

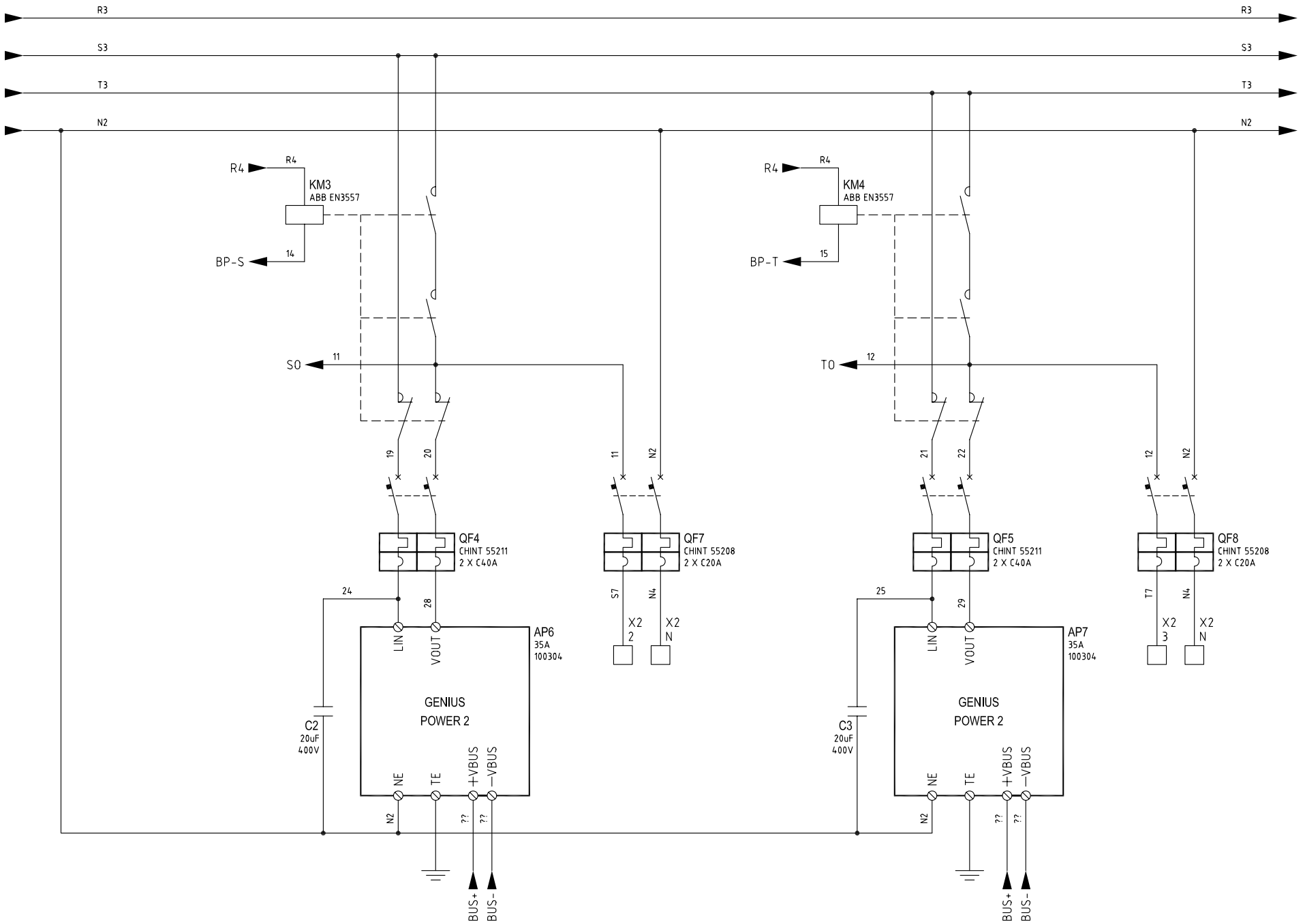
Power conductor for command motor minimal section 2,5mmq

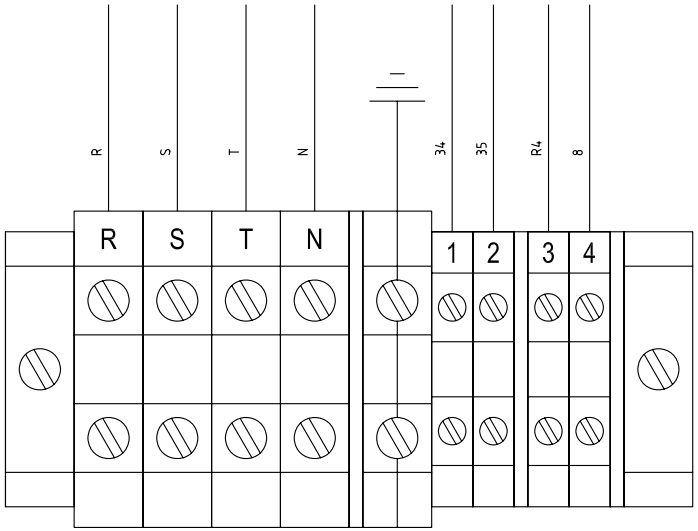
COLOR LEGEND	
Phase 380Vac	BLACK
Phase 230Vac	BLACK
Neutral 230Vac	BLUE
PE	Y.G.
Auxiliary 230Vac	RED
Auxiliary 110÷12Vac	RED
Auxiliary 110÷12Vcc	WHITE
Voltmetric	BLACK
Amperometric	GRAY
Ground cable for Lighting current arresters	BROWN

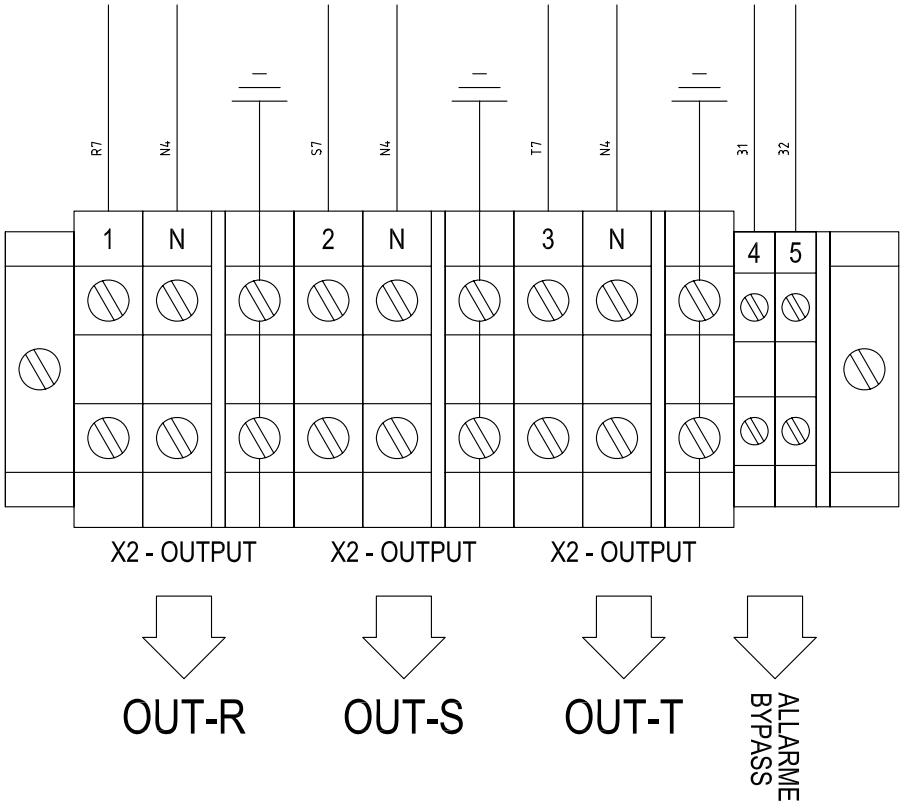
AGENTECH	PURCHASER	DRAWING	FILE	DATE	PAGE
	PURCHASE NAME	S01000	S01000	01/01/2010	3
	SUBJECT				NEXT
	THREE PHASE REGULATION SWITCHBOARD PANELS 18KVA WITH CTRL-128				4



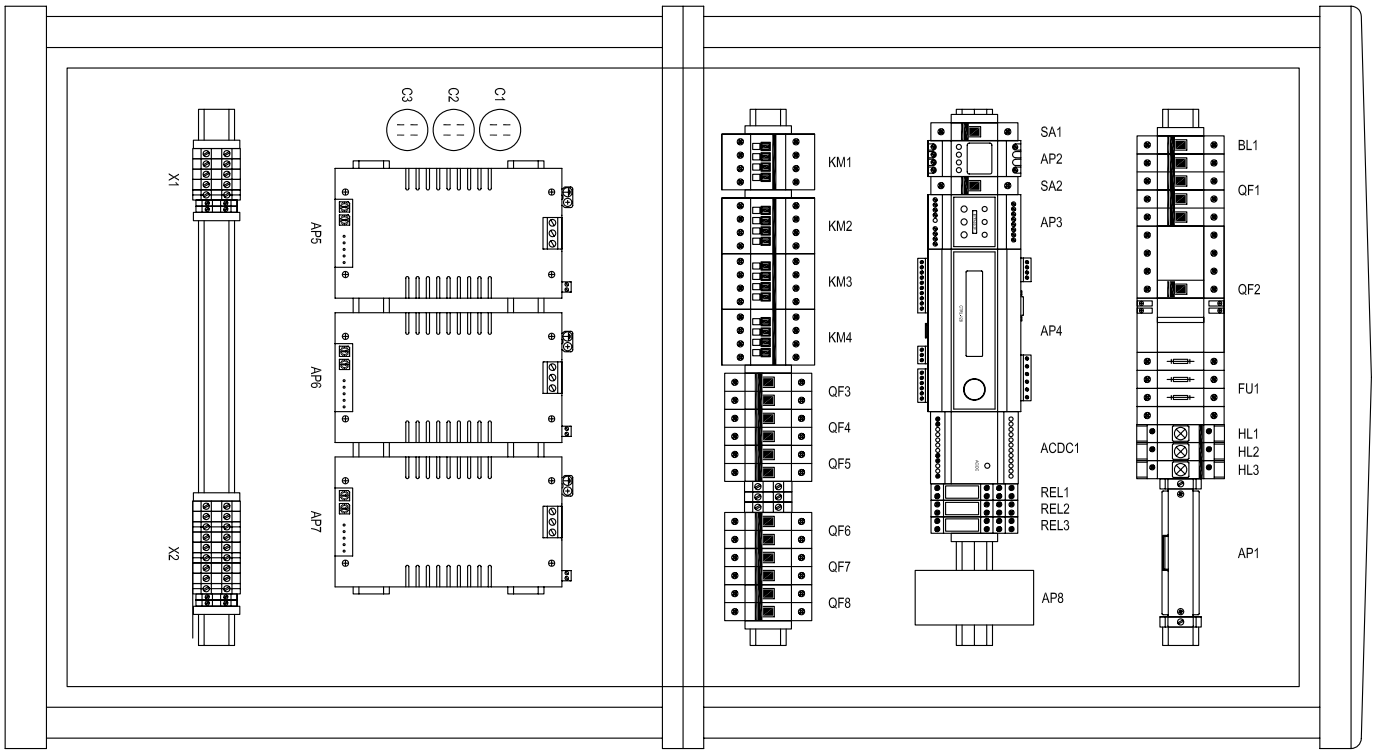

R3
S3
T3
N2
R4
KM2
ABB EN3557
BP-R
13
12VDC
X2
4
5
31
32
01
REL2
230VAC
2NO+2NC
R5
REL3
230VAC
2NO+2NC
33
BYP
01
12VDC
02
GND
RO
10
17
18
QF3
CHINT 55211
2 X C40A
QF6
CHINT 55208
2 X C20A
R7
N4
X2
1
X2
N
23
27
LIN
VOUT
AP5
35A
100304
GENIUS
POWER 2
C1
20uF
400V
NE
TE
+VBUS
-VBUS
BUS+
BUS-
N2
??
??
GND
12VDC
02
01
GND (1)
MUTE (2)
IGNITION (3)
POWER (4)
RJ-45
RS232
AP8
FALCOM
GPRS
CTRL128
09
RO
SO
TO
BP-R
BP-S
BP-T
10
11
12
13
14
15
30
-ALRM (4)
+ALRM (3)
VO-R (13)
VO-S (15)
VO-T (17)
BP-R (7)
BP-S (8)
BP-T (9)
(1) +EXT
(2) -EXT
AP3
BYPASS3F
100893
GENIUS BYPASS 3F
BP-N (6)
(10) LIN
(11) NE
(1) +EXT
(2) -EXT
N3
R5
N3
R5
N3


R3
S3
T3
N2
R4
KM3
ABB EN3557
BP-S
14
S0
11
19
20
QF4
CHINT 55211
2 X C40A
24
28
LIN
VOUT
AP6
35A
100304
GENIUS
POWER 2
C2
20uF
400V
NE
TE
+VBUS
-VBUS
N2
??
??
BUS+
BUS-
11
N2
QF7
CHINT 55208
2 X C20A
S7
N4
X2
2
X2
N
KM4
ABB EN3557
BP-T
15
T0
12
21
22
QF5
CHINT 55211
2 X C40A
25
29
AP7
35A
100304
C3
20uF
400V
12
QF8
CHINT 55208
2 X C20A
T7
X2
3

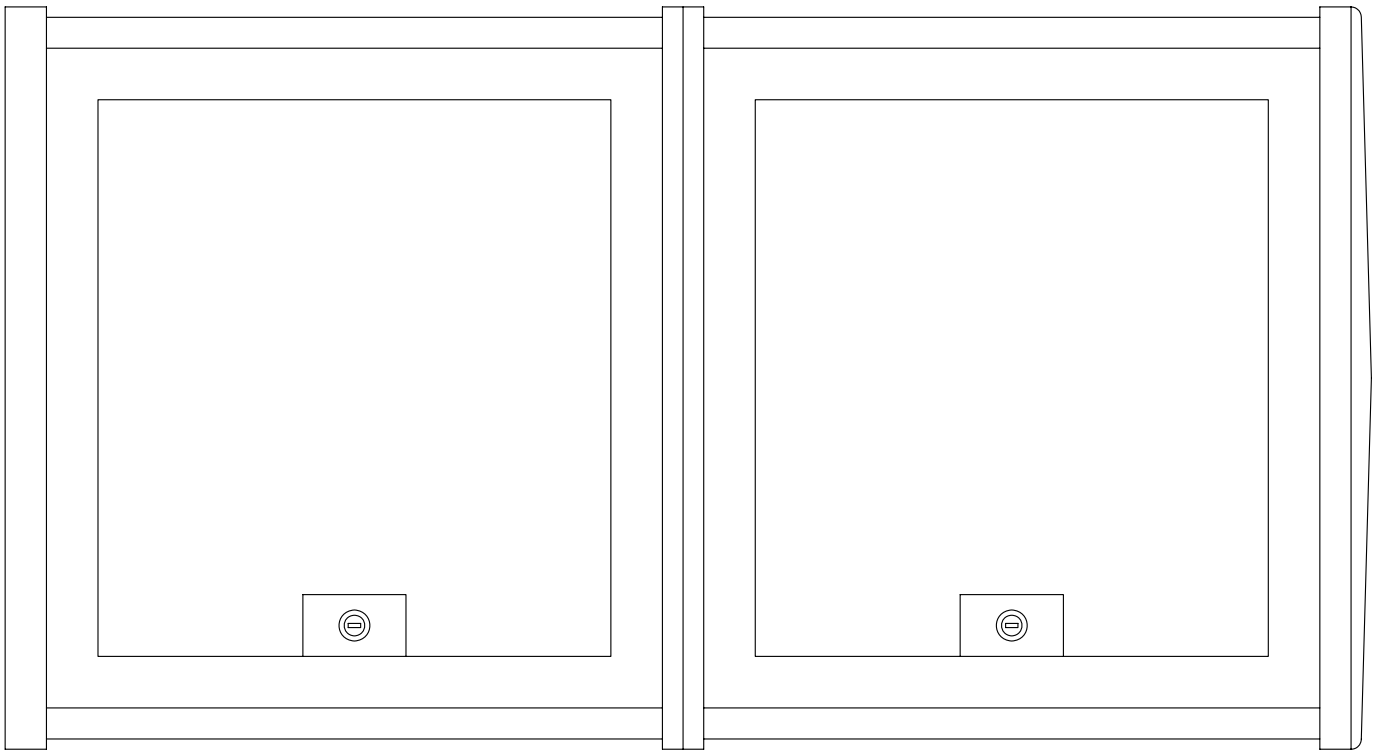

R
S
T
N
34
35
R4
8
R
S
T
N
1
2
3
4
X1 - INPUT
IN
MAIN
SHUNT RELASE
CREPUSCOLAR
CIRCUIT BREAKER


R7
N4
S7
N4
T7
N4
31
32
1
N
2
N
3
N
4
5
X2 - OUTPUT
X2 - OUTPUT
X2 - OUTPUT
OUT-R
OUT-S
OUT-T
ALLARME
BYPASS

INSIDE SWITCHBOARD PANEL



EXTERNAL SWITCHBOARD PANEL



AGENTECH

PURCHASER
PURCHASE NAME

SUBJECT
THREE PHASE REGULATION SWITCHBOARD PANELS 18KVA WITH CTRL-128

DRAWING
S01000

FILE
S01000

DATE
01/01/2010

Agenzie&Technology
Agentech srl
Strada Massilina, 78 - 47899 Serravalle R.S.M.
Ph. 0549.970496 - Fax 0549.877645
www.agentech-sm.com - info@agentech-sm.com

Conformity certificate

LOW VOLTAGE SWITCHBOARD PANEL
ACCORDING TO CEI LEGISLATION 17-13/1
IEC 439/1 – EN 60439/1

CE

FINAL CLIENT

FINAL CLIENT

PURCHASER

PURCHASER

PURCHASE

PURCHASE

BOARD

THREE-PHASE SWITCHBOARD PANEL 18KVA WITH CTRL-128

PANEL REFERENCE DATA

S01000

DOCUMENT

DOCS01000

Agenzie&Technology
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The company **AGENTECH S.r.l.**

- manufacturer of **THREE-PHASE SWITCHBOARD PANEL 18KVA WITH CTRL-128**
- type **ANS**
- reference data **S01000**
- design n° **S01000** rev. **01** fg. n° **7**

declares that the above mentioned switchboard panel was manufactured according to:
- [x] harmonized standards
- [ ] international standards
- [ ] national standards

Code of the Standards applied:
1) EN 60439-1, CEI 17-13-1
2) EN 50081-1/2, EN 50082-1/2

Title of the Standards applied:
1) Low-voltage switchgear and controlgear assemblies
- Part 1: Standard equipment (AS) subject to type test and non-standard equipment partially subject to type test (ANS).
Third edition, January 1994.
2) Electromagnetic compatibility. General regulation on emission.
- Part 1: Residential, commercial and light industrial areas.
- Part 2: Industrial area.

Serravalle: 5/03/09

AGENTECH S.r.l.

Annexes:
1) List of checks and tests to be carried out on AS and ANS devices
2) Individual test report on LT switchboard panel – ANS type.
3) List of all brands and models of the devices used.
4) Use and maintenance manual for LT switchboard panels.

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LIST OF CHECKS AND TESTS TO BE CARRIED OUT ON AS AND ANS EQUIPMENT

Purchaser: **PURCHASER**
Purchase: **PURCHASE**
Object: **THREE-PHASE SWITCHBOARD PANEL 18KVA WITH CTRL-128**
Doc. n°: **DOCS01000**

List of checks and tests to be carried out on standard equipment (AS) subject to type test and non-standard equipment (ANS) partially subject to type test in compliance with CEI standards CEI EN 60439-1 (CEI 17-13/1) paragraphs:

8.2.1 Over temperature limit check
8.2.2 Applied voltage withstand check
8.2.3 Short circuit withstand check.
Optional:
[X] Not necessary for panels with nominal Icc <10kA or limited Icc <15kA
[ ] Panel used in compliance with maximum Icc values envisaged by the manufacturer
8.2.4 Protection circuit efficiency check
8.2.4.1 Check on the connection between earth and protection systems
8.2.4.2 Check on protection circuit short circuit withstand (if Icc>10 KA or Icc limited peak value >15 KA)
8.2.5 Superficial and air distances check.
8.2.6 Mechanical functioning check.
8.2.7 Protection degree check

With regard to the abovementioned paragraphs, the manufacturer's certificates as well as a list of all components used and all the main features of the manufacturing system chosen are available on record.
With regard to paragraph 8.2.1 over temperature limit check, ANS panels implement calculation methods extrapolating AS devices which passed their type test. Such calculations are available on record.

Compliance with CEI EN 60439-1 standard (CEI 17-13/1) was successfully proved in our plant, as summed up in a specific document, paragraphs:

8.3.1 Inspection on equipment, wiring control and electric functioning
8.3.2 Insulation – applied voltage withstand check (or check as in art. 8.3.4)
8.3.3 Protection means and electrical continuity of protection circuits check
8.3.4 Insulation resistance check (if check as in art. 8.3.2 was not carried out)

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REPORT ON INDIVIDUAL CHECKS ON LT SWITCHBOARD PANEL – ANS TYPE

Purchaser: **PURCHASER**
Purchase: **PURCHASE**
Object: **THREE-PHASE SWITCHBOARD PANEL 24KVA WITH CTRL-128**
Doc. n°: **DOCS01000**

Rif. art. 8.3.1 Equipment inspection, including wiring control and, if necessary, electric functioning check

[x] Mechanical commands, blocks and locks efficiency check
[x] Visual inspection of protection degree
[x] Visual inspection of air and surface distances.
[x] Random inspection of bolted or screwed connection efficiency
[x] Identification plate presence and suitability check
[x] Device conformity to wiring circuit scheme check
[x] Check on the correct electric functioning of complex auxiliary circuits

Rif. art. 8.3.2 Insulation.

[x] Insulation resistance check (Art. 8.3.4) carried out, in place of the underneath one
[ ] Insulation between active parts connected together and device frame check carried out, according to the following parameters:

f = 50 Hz t = 1 min.

	Nominal insulation voltage Ui (V)	Test voltage (V)
[ ]	Ui ≤ 60	1.000
[ ]	60 < Ui ≤ 300	2.000
[ ]	300 < Ui ≤ 690	2.500
[ ]	690 < Ui ≤ 800	3.000
[ ]	800 < Ui ≤ 1000	3.500
[ ]	1000 < Ui ≤ 1500	3.500

Rif. art. 8.3.3 Check on protection means and protection circuit electrical continuity

[x] Protection means against indirect contacts check
[x] Visual inspection of protection circuits.
[x] Contact random trial of PE contacts on bolted or screwed connections check

Rif. art. 8.3.4 Insulation resistance check

[ ] Insulation check (ref. art. 8.3.2) carried out, in place of the underneath one.
[x] Insulation resistance between circuits and earth check, according to the following parameters:

U applied = **500** V (F-PE) U exercise = **220** V R = **200** MΩ. R ≥ 1000 Ω/V.

Legend: [x] check carried out [ ] check not carried out

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LIST OF BRANDS AND MODELS OF COMPONENTS USED

Purchaser: **PURCHASER**
Purchase: **PURCHASE**
Object: **THREE-PHASE SWITCHBOARD PANEL 24KVA WITH CTRL-128**
Doc. n°: **DOCS01000**

The company **AGENTECH S.r.l.** declares that the following components have been used:

DESCRIPTION	BRAND	MARK	CONFORMITY
Cupboard in fibreglass	CELBO	CE	CEI 23-48, CEI 23-49
Modular automatic switcher	CHINT	CE	CEI EN 60947-2 , CEI EN 60898 , IEC 898
Contactors	ABB-ELETTROCOND.	CE	IEC 947-4-1, DIN VDE 0660, IEC 158-1
Terminals	LEGRAND	CE	IEC 947-7-1 , EN60947-7-1
Wire ducts type T1-E	BOCCHIOTTI	CE	CEI 23-22, DIN 43659
Profile rail guides type OMEGA 3	BOCCHIOTTI	CE	DIN EN 50022, CENELEC EN 50022, CEI 17-18
Wire N07V-K	GENERAL CAVI	CE	CEI 20-22 II , CEI 20-35 , Tabella CEI UNEL 35752

and that selection criteria and assembling instructions as reported in the specific use and installation manuals have been fulfilled. It also declares that it did not alter in any way, during assembling operations or by means of any modifications, the performances of the material used and reported by the manufacturer.

Such performances enable the company to assert the conformity of the switchboard panel subject to the checks and tests requested to AS and ANS devices with CEI EN 60439-1 (CEI 17-13/1) standards.