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SL
24Vdc
Motors

Instruction manual	Series	Model	Date
ZVL317.05	SL	402409	20-01-2004

Questo prodotto è stato testato e collaudato nei laboratori della casa costruttrice, la quale ne ha verificato la perfetta corrispondenza delle caratteristiche con quelle richieste dalla normativa vigente. **This product** has been tried and tested in the manufacturer's laboratory who have verified that the product conforms in every aspect to the safety standards in force. **Ce produit** a été testé et essayé dans les laboratoires du fabricant. Pour l'installer suivre attentivement les instructions fournies. **Dieses Produkt** wurde in den Werkstätten der Herstellerfirma auf die perfekte Übereinstimmung ihrer Eigenschaften mit den von den geltenden Normen vorgeschriebenen getestet und geprüft. **Este producto** ha sido probado y ensayado en los laboratorios del fabricante, que ha comprobado la perfecta correspondencia de sus características con las contempladas por la normativa vigente.

AUTOMAZIONE PER CANCELLI SCORREVOLI CON MOTORE IN CORRENTE CONTINUA
AUTOMATION FOR SLIDING GATES WITH A DC POWERED MOTOR
AUTOMATISME POUR PORTAILS COULISSANTS AVEC MOTEUR À COURANT CONTINU
AUTOMATISIERUNG FÜR SCHIEBETORE MIT GLEICHSTROMMOTOR
AUTOMATIZACION PARA CANCELAS CORREDERAS CON MOTOR DE CORRIENTE CONTINUA



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24Vdc Motors 101/SL402409

ENGLISH



ATTENTION! Before installing this device read the following instructions carefully!

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TECHNICAL SPECIFICATIONS

- Power supply	Vac	230
- Frequency	Hz	50
- Current input	A	0,6
- Power input	W	120
- Duty cycle	%	100
- Drag speed	m/min	8,5
- Reduction ratio		1/43
- Maximum torque	Nm	32
- Operating temperature range	°C	-20°...+55
- Protection grade	IP	44

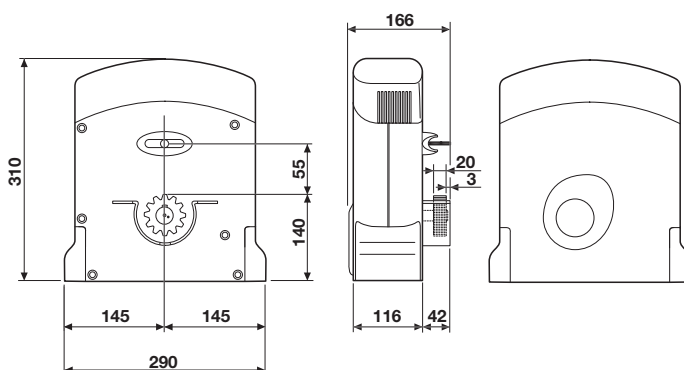
Motor data:

- Motor power supply	V dc	24
- Maximum power yield	W	38
- Nominal current input	A	1,8

Incorporated receiver card:

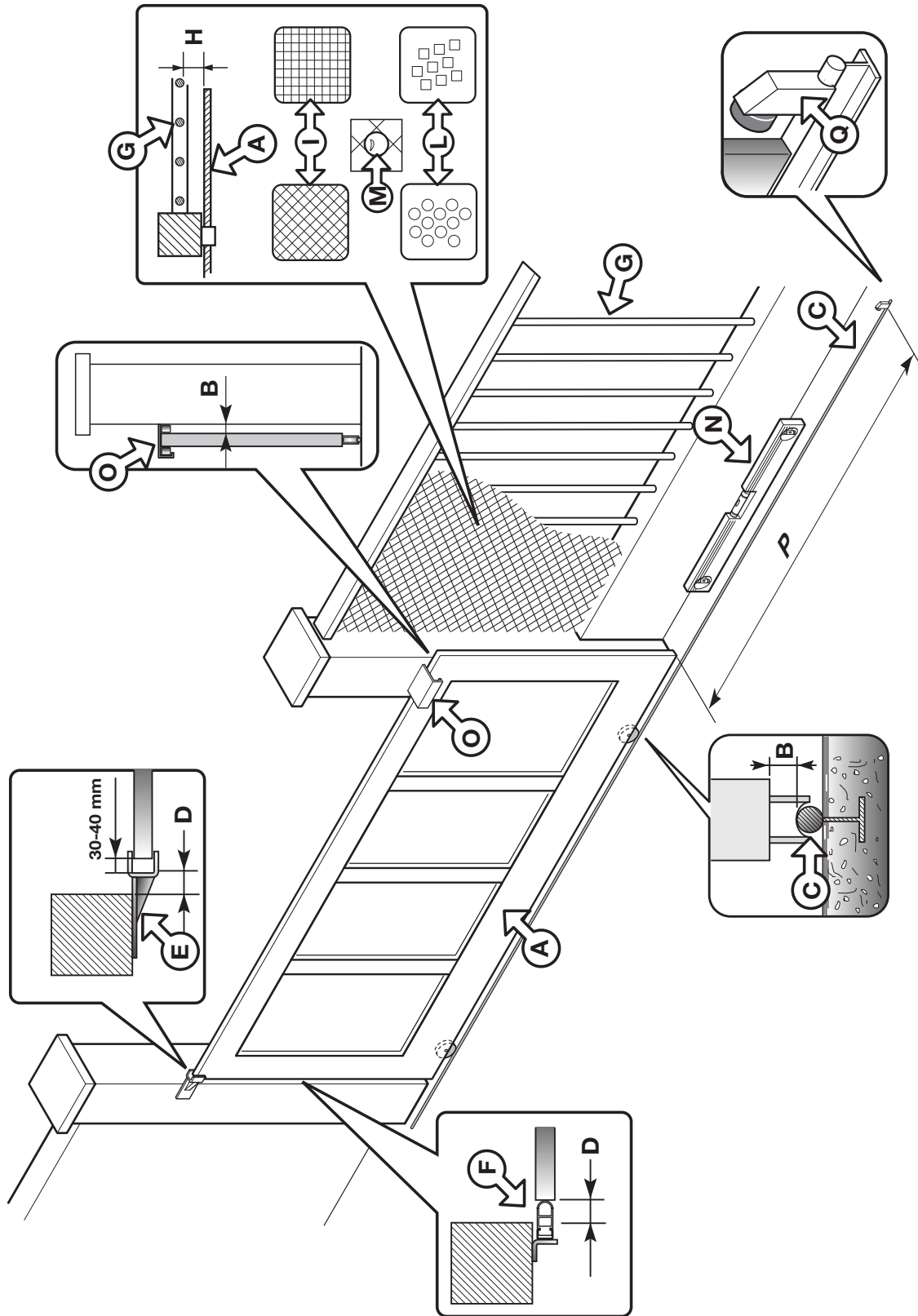
- Reception frequency	MHz	433.92
- Number of channels	N°	4
- Number of functions	N°	2
- Number of memorisable codes	N°	300

DIMENSIONI D'INGOMBRO - EXTERNAL DIMENSIONS
DIMENSIONS D'ENCOMBREMENT
AUSSENABMESSUNGEN - DIMENSIONES MAXIMAS



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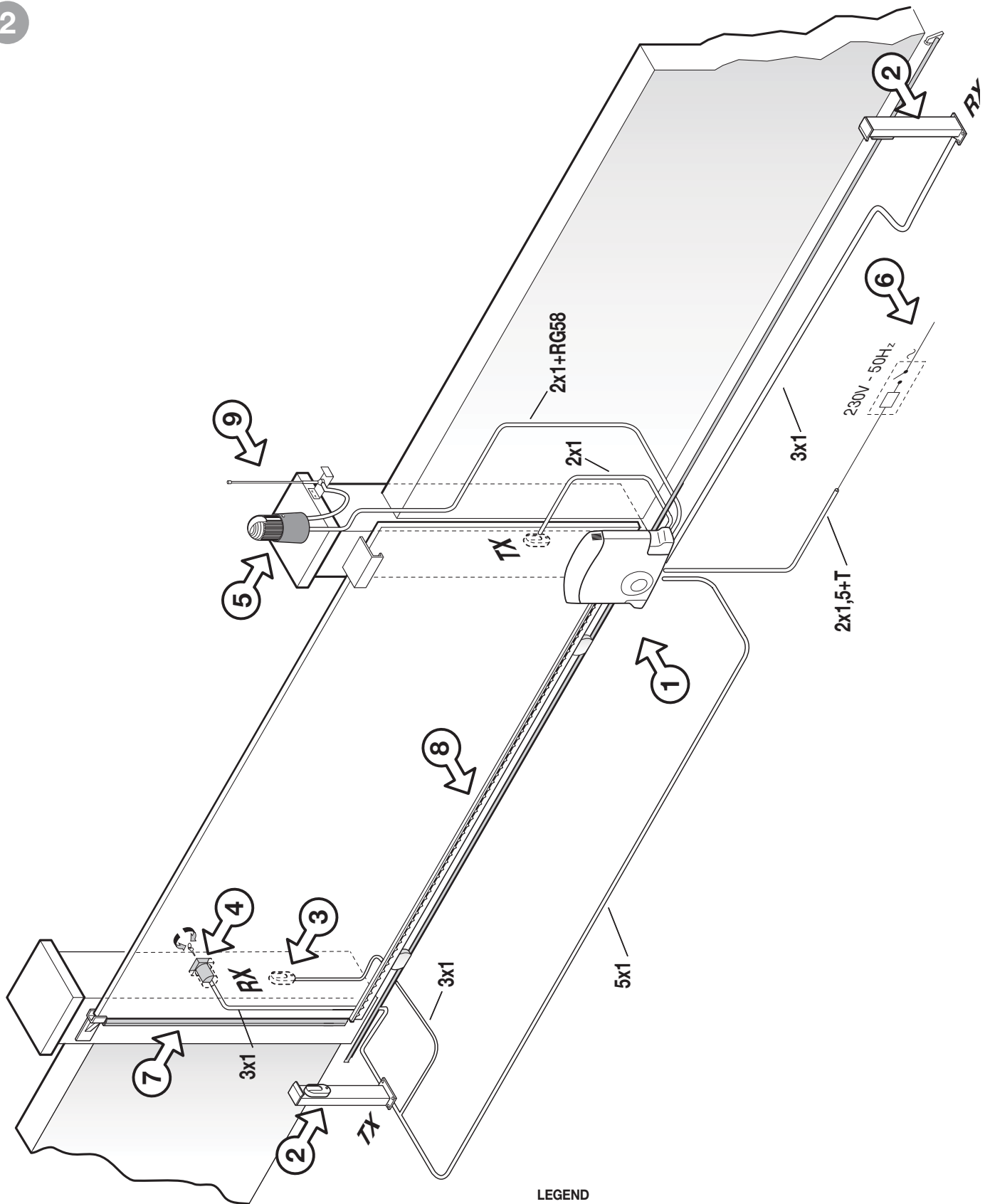
1



LEGEND

- A Gate surface
- B Distance between the fixed part and the moving parts
- C Castor guide
- D Safety distance
- E Closing mechanical travel limit
- F Rubber anticrush buffer
- G Fencing
- H Distance between the fence and the gate
- I Wire mesh
- L Punched metal plate
- M Test sphere
- N Spirit level
- O Runner guide
- P Gate travel distance
- Q Opening mechanical travel limit

2



LEGEND

- 1 Geared motor
- 2 Internal photoelectric cells
- 3 External photoelectric cells
- 4 Mechanical selector switch
- 5 Flashing warning lights
- 6 Multi-pole circuit breaker with a minimum gap of **3 mm** between the contacts
- 7 Contact safety buffer
- 8 Travel limit bracket
- 9 Toothed rack
- 10 External antenna
- (**RG58** coaxial cable with an impedance of **50 Ω**)

IMPORTANT REMARKS



TO REDUCE THE RISK OF SEVERE INJURY OR DEATH READ THE FOLLOWING REMARKS CAREFULLY BEFORE PROCEEDING WITH THE INSTALLATION. PAY PARTICULAR ATTENTION TO ALL THE PARAGRAPHS MARKED WITH THE SYMBOL . NOT READING THESE IMPORTANT INSTRUCTIONS COULD COMPROMISE THE CORRECT WORKING ORDER OF THE SYSTEM.



- These instructions are aimed at professionally qualified "**INSTALLERS OF ELECTRICAL EQUIPMENT**" and must respect the local standards and regulations in force. All materials used must be approved and must suit the environment in which the installation is situated.
- All maintenance operations must be carried out by professionally qualified technicians. Before carrying out any cleaning or maintenance operations make sure the power is disconnected at the mains.
- This appliance must be used exclusively for the purpose for which it has been made "**i.e. for the automation of sliding gates**". The unit **101/SL402409** is suitable for driving sliding gates with weights of up to **400 Kg**.

This product and all its relative components has been designed and manufactured by Cardin Elettronica who have verified that the product conforms in every aspect to the safety standards in force.

Any non authorised modifications are to be considered improper and therefore dangerous. The manufacturer accepts no liability for situations arising from the use of an electrical installation which does not conform to the local standards and regulations in force and in particular when the earthing circuit is not efficient.

- After having installed the device (**and before powering up the programmer**) proceed as follows: release the gate and move it manually (with the motor in neutral), checking that it moves smoothly and has no unusual points of resistance and that the travel limits activate correctly, then block the motor again.
- The gate can be operated in the manual mode and moved in the closing direction using the "**SEL**" button. The gate will move while the button is pressed and stop when it is released.
- The programmer is fitted with an electrical input monitoring system, which is used to block the motor in emergency conditions; however this system is not active during the following stages:
 - during the first **5** seconds of an opening stage starting from completely closed;
 - during the first **2.5** seconds of all other movement stages.

Do not therefore attempt to physically block the gate during these stages, otherwise you may risk blowing the motor circuit protection fuse "F3".



Caution! The presence of the electrical input monitoring system does not exclude the need to install photoelectric cells or other safety devices which are foreseen by the **local standards and regulations in force**.

Caution! The geared motor unit has been assembled in the factory to be fitted to the left side of the gate. Read the paragraph on page 15 "**instructions for positioning the unit**".

Caution! If batteries have been installed they should be checked at least once every six months. Read the paragraph on page 21 "**checking the batteries**".



Caution! If you need to check the status of the fuse "**F2**", disconnect the power supply to the programmer; reconnect it only after having re-inserted the fuse.

IMPORTANT REMARKS

IMPORTANT REMARKS

IMPORTANT SAFETY INSTRUCTIONS

It is the responsibility of the installer to make sure that the following public safety conditions are satisfied:

- 1) Ensure that the gate operating installation is far enough away from the main road to eliminate possible traffic disruptions and that the size of the gate, the distance from the road and the work cycle speed can in no way interfere, causing possible traffic hazards.
- 2) The motor must be installed on the inside of the property and not on the public side of the gate. The gate must not open onto a public area.
- 3) The gate operator is designed for use on gates through which vehicles are passing. Pedestrians should use a separate entrance.
- 4) The minimum controls which may be installed are OPEN-STOP-CLOSE, these controls must be installed at a height between **1,5** and **1,8 m** and in a location not accessible to children. Controls installed externally must be protected by a safety device inhibiting unauthorised use.
- 5) The gate must be in full view when it is operating therefore controls must be situated in a position where the operator can see the gate at all times.
- 6) At least two warning signs (similar to the example on the right) should be placed, where they can be easily seen by the public, in the area of the system of automatic operation. One inside the property and one on the public side of the installation. These signs must be indelible and not hidden by any objects. Make sure that the end-user is aware that children and/or pets must not be allowed to play within the area of a gate installation.
- 7) A correct earth connection is fundamental in order to guarantee the electrical safety of the machine
- 8) Before carrying out any cleaning or maintenance operations make sure the power is disconnected at the mains, the motor power cables are disconnected and the batteries have been disconnected.
- 9) If you have any questions about the safety of the gate operating system, do not install the operator. Contact your dealer for assistance.



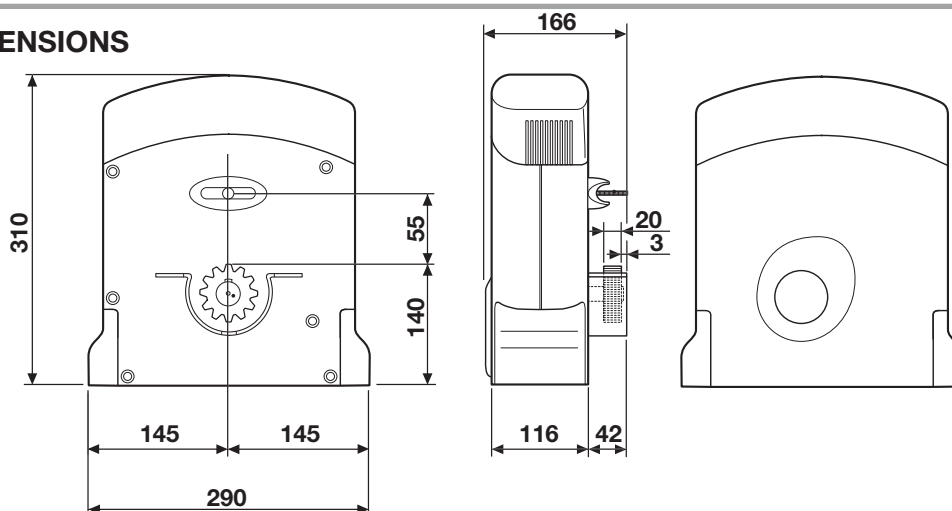
TECHNICAL DESCRIPTION

- Motor powered with a maximum voltage of **38 Vdc**.
- A two-piece shell made of die cast aluminium enclosing the reduction unit and a pair of steel gears, lubricated with permanently fluid grease.
- The reduction unit stator is made of die cast aluminium and contains a never ending screw and a helicoidal crown wheel made of thermoplastic lubricated with permanently fluid grease.
- Irreversible reduction system with a key operated manual release mechanism.
- The incorporated electronic programmer contains the power stage, the logic control and the radio receiver decoding module. The power supply is routed to the electronics card via a separate transformer which is housed in the same container and is connected to the card by Faston clips.
- Mechanical travel limits in a watertight container.
- Cover in shockproof plastic.

Accessories

- 106/SLOPC** Toothed rack (dim. **20 mm x 20 mm**) in glass fibre with a steel core for sliding gates. Model with fastening slits above (**1 m**).
- 106/SLOPC1** Toothed rack (dim. **20 mm x 20 mm**) in glass fibre with a steel core for sliding gates. Model with fastening slits below (**1 m**).
- 106/SLOAC** Toothed rack in galvanised steel, **2 m** to be welded.
- 106/SLOAC2** Toothed rack in galvanised steel, **1 m** with slits.
- 950/XLBS** Contract safety edge, lengths of **1,5** and **3,0 m** height **70 mm**.

OVERALL DIMENSIONS



3

PRELIMINARY CHECKS (fig.1, pag.2)

- Before starting the installation make sure that the structure which is to be automated is in good working order and respects the local standards and regulations in force. To this end ensure that:
 - The surface of the sliding gate "A" is smooth and has no protrusions up to a distance of **2,5 metres** from ground level. Protrusions on the gate surface which are not greater than **3 mm** and have rounded edges are acceptable. If the surface of the gate is not smooth, the entire height up to **2,5 metres** must be protected by two of the following devices:
 - a) photoelectric cells
 - b) contact safety buffer
 - the distance "B" between the fixed parts and sliding parts of the installation must not exceed **15 mm**.
 - the runner guide "C", preferably round, should be securely fixed to the ground, completely exposed and free of any imperfections which could inhibit the correct movement of the gate.
 - when the gate is closed a space of **50 mm** "D" must remain for the entire height of the front part of the gate and a mechanical travel limit "E" must be positioned on the upper part of the gate.

The free space "D" can be covered with a rubber anti-crush buffer "F" or better still a pneumatic or photoelectric contact safety buffer.
 - if the gate slides past a fixed structure "G" which has railings or bars leaving open spaces, it must be protected in one of the following ways:
 - 1) distance "H" greater than **500 mm**: no protection required;
 - 2) distance "H" between **500** and **300 mm**: wire mesh fencing "I" or punched metal plating "L" with an opening which does not allow the passage of a **25 mm** diameter sphere "M" must be fitted;
 - 3) distance "H" smaller than **300 mm**: wire mesh fencing "I" or punched metal plating "L" with an opening which does not allow the passage of a **12 mm** diameter sphere "M" must be fitted. The wires of the mesh "I" must not have a cross-section of less than **2,5 mm²** and the punched metal plating "L" must not have a thickness of less than **1.2 mm**. Protection is not necessary for the area "P" if the fixed structure with railings or bars is over **2,5 m** above the ground.
 - check the gate components, replace any worn or damaged parts and then lubricate them.
 - using a spirit level "N" check that the castor guide is in square.
 - the upper runner guide "O" must have the correct play for the gate and must not inhibit the gate's sliding action.



Caution! It is the installer's responsibility to check all critical danger points, to take action and to install any devices needed to guarantee the safety of all people using the gate (risk analysis).

Caution! Check that a mechanical travel limit (absolutely necessary) has been fitted in the opening direction and that it corresponds to the maximum travel distance "P" of the gate. The travel limit must guarantee anti-derailment and gate stability.

USER INSTRUCTIONS



Attention! Only for EU customers - WEEE marking.

This symbol indicates that once the products life-span has expired it must be disposed of separately from other rubbish. The user is therefore obliged to either take the product to a suitable differential collection site for electronic and electrical goods or to send it back to the manufacturer if the intention is to replace it with a new equivalent version of the same product.

Suitable differential collection, environmental friendly treatment and disposal contributes to avoiding negative effects on the ambient and consequently health as well as favouring the recycling of materials.

Illicitly disposing of this product by the owner is punishable by law and will be dealt with according to the laws and standards of the individual member nation.

During the opening/closing manoeuvre check for correct operation and activate the emergency stop button in case of danger.

During blackouts the gate can be released and manually manoeuvred using the supplied release key (see manual release fig.9).

Periodically check the moving parts for wear and tear and grease if required, using lubricants which maintain their friction levels unaltered throughout time and are suitable for temperatures of **-20 to +70 °C**.

In case of failure or operational anomalies switch off the power at the mains do not attempt to repair the appliance yourself.

Eventual repair work must be carried out by specialised personnel using original spare parts.

The appliance is suitable for continuous operation.

Note: The newly installed system is guaranteed and respects the laws and standards in force. It is however the user's responsibility to maintain the efficiency of the installation. You are advised to have the installation checked at least once a year by qualified personnel.

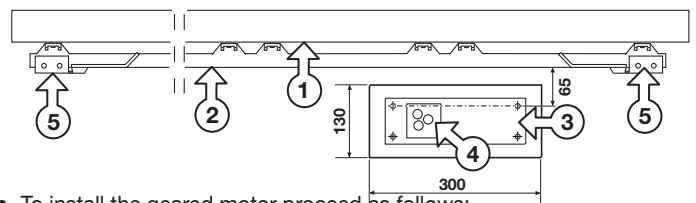
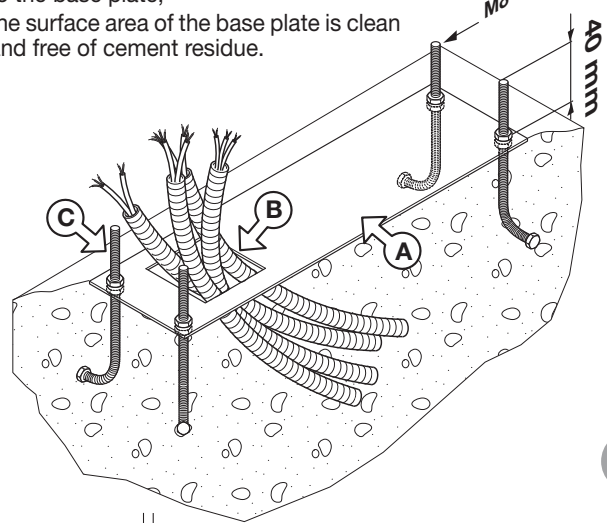
INSTALLATION INSTRUCTIONS

- The geared motor can be positioned either to the left or to the right of the passageway. Important: read the paragraph "**INSTRUCTIONS FOR POSITIONING THE UNIT**".

Anchoring the unit (fig. 4, 5, 6)

Important! Check the exact anchoring position with respect to the alignment of the sliding gate.

- Run the piping and connection wires to the position where the motor is to be installed.
- Attach the anchor bolts to the base plate "A" allowing them to protrude by **40 mm** and then tighten down using the supplied **M8** nuts.
- Prepare a cement plinth, in the position where the motor is to be installed, with a depth of **350 mm** (the base should protrude by about **25 mm** to avoid damage by pools of water building up under the appliance).
- Insert the base plate making sure that:
 - the electrical cables pass through the hole "B";
 - the anchor bolts "C" are immersed into the cement base and the base plate is perfectly level;
 - the four protruding **50 mm** threaded bolts are perpendicular to the base plate;
 - the surface area of the base plate is clean and free of cement residue.



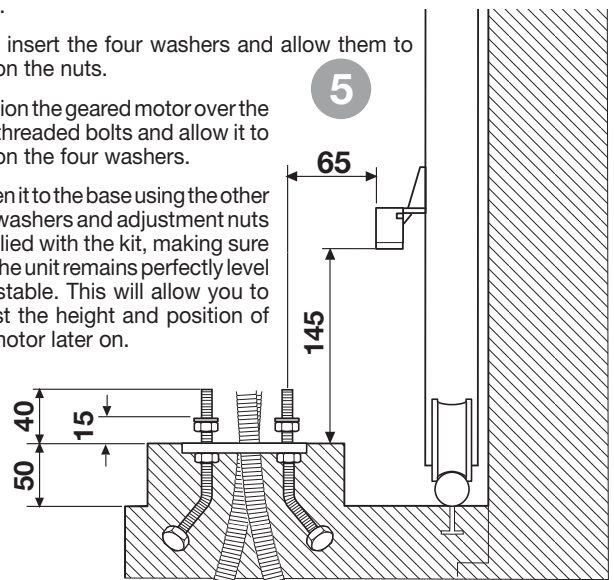
- To install the geared motor proceed as follows:

- Unscrew the four **M8** nuts on the four threaded bolts (previously used to block the anchor bolts) to about **15 mm** from the base of the anchor plate.

Then insert the four washers and allow them to rest on the nuts.

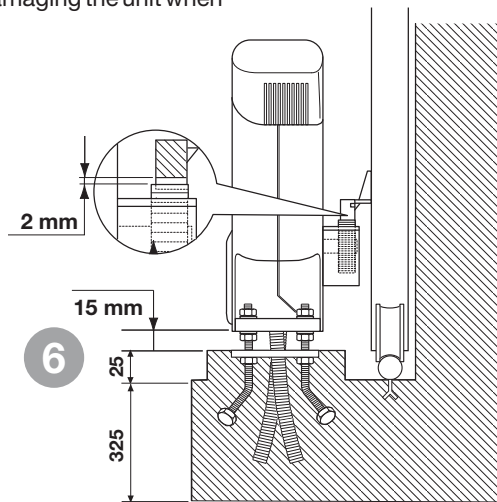
- Position the geared motor over the four threaded bolts and allow it to rest on the four washers.

- Fasten it to the base using the other four washers and adjustment nuts supplied with the kit, making sure that the unit remains perfectly level and stable. This will allow you to adjust the height and position of the motor later on.

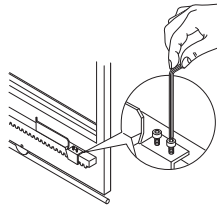


Fitting the toothed rack

- To fit the toothed rack to the sliding gate proceed as follows:
 - release the geared motor (fig.9), lay the first stretch of the toothed rack on the pinion and fix it to the gate, then fasten down all the other parts along the entire length of the gate.
 - after having fastened the toothed rack, realign the pinion (play of **1 to 2 mm** between the toothed runner and the pinion) using the positioning nuts at the base of the geared motor. This action will prevent the weight of the sliding gate from damaging the unit when working.

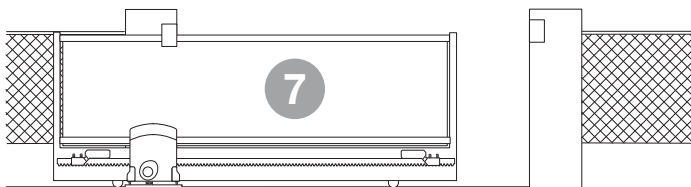


- Once the unit has been correctly aligned fasten it down using the lock nuts then position and fasten down the mechanical travel limits (opening and closing directions) mounted on the toothed rack.

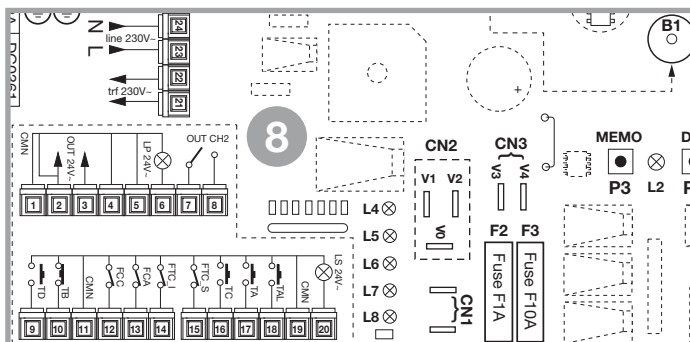


- To operate correctly the gate must stop (closing direction travel limit activated) about **1 cm** before it makes contact with the mechanical closing direction buffer on the upper part of the gate (pos. "E" fig.1). As there is a slight deceleration when the travel limit is activated ("**soft stop**", the gate moves slightly onward due to inertia), position the mechanical travel limit according to the entire travel distance.

INSTRUCTIONS FOR POSITIONING THE UNIT



- The geared motor unit has been assembled in the factory to be fitted to the **LEFT SIDE** of the gate (internal view). To install the motor to the **RIGHT SIDE** of the gate invert the motor power cables (Red and Black position "**CN3**" on the electronic card and the travel limit cables (Red and Blue binding posts "**12**" and "**13**" on the terminal block while the travel limit common wire (Black position "**11**") remains in the same position.

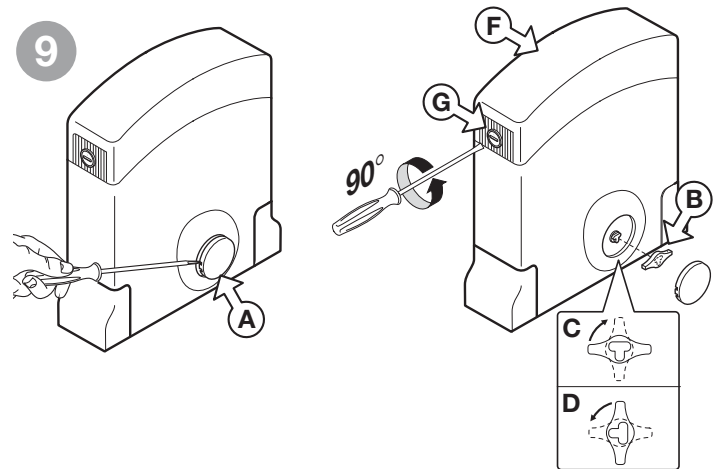


- Using the "**MANUAL MODE**" check the correct functioning of the gate.

MANUAL RELEASE MECHANISM

Manual release is carried out with the power to the motor interrupted due to a power failure.

To release the gate use the manual release key supplied with the unit. The key should be kept inside the house in an easily accessible place or stored with the unit itself.



To release the unit

Remove the cover "A" using a screwdriver and insert the key "B" over the T-shaped pin, then rotate the key through 90 degrees in the direction indicated by the arrow "C" (clockwise). This will release the clutch and separate the gears from the motor allowing you to manually manoeuvre the gate by pushing lightly on it.

To relock the unit

Follow the above instructions in reverse order rotating the key through 90 degrees in the direction indicated by the arrow "D" (anticlockwise). Close the release mechanism access cover "A".

Never use the manual release mechanism while the gate is in operation.

Access to the electronic card

To open the cover insert a screwdriver into the slot "G" and turn it through **90°** as shown in fig.9



Caution! Before opening the cover make sure that the power has been switched off at the mains.

ELECTRONIC PROGRAMMER

Electronic programmer for a dc motor with an incorporated radio receiver card, which allows the memorisation of **300 user codes** (see "remote control" page 20).

The 'rolling code' type decoder uses **433 MHz** series transmitters.

The travel speed is electronically controlled, starting slowly and increasing in speed; the speed is reduced as it nears the travel limit so as to enable a controlled smooth stop (if deceleration hasn't been excluded during programming). Programming is carried out using two buttons and allows you to configure the system, set the length of the deceleration stage and set the work and pause times. The intervention of the anticrush/antidrag sensor during the closing and opening stages causes travel direction inversion (if automatic reclosing has been activated). If activated towards the end of the movement (almost closed) it will act as a travel limit.

Soft stop

In each blocking manoeuvre (even the one preceding travel direction inversion) the stopping of the motor is carried with a slight trip stage (0.4 seconds) in which the gate leaf keeps moving due to inertia and not by the motor (which is no longer receiving power). Once this brief stage has ended the gate leaf will be definitely blocked. Consequently when you are positioning the catch which will activate the travel limit you must bear in mind that there will be a slight delay between the instant in which the travel limit activates and when the gate leaf blocks.

ELECTRICAL CONNECTION

- Open the "Standard wiring diagram". To make it easier to follow the instructions the diagram has been placed on the inside of the last page of this manual.

ELECTRONIC CARD DESCRIPTION (fig.12)

- B1** Signal buzzer "via radio" mode
- CN1** Secondary Faston connection **24 Vac** logic card power supply
- CN2** Secondary Faston connection motor circuit power supply
V0:0 Vac, V1:22 Vac, V2:30 Vac
- CN3** Battery Faston connection
- D1** Seven segment display
- F1** **1,6 A** delayed action fuse (**230 V** power supply protection)
- F2** **1 A** rapid action fuse (**24 V** circuit protection)
- F3** **10 A** rapid action fuse (motor power supply protection)
- J1** Enable transmitter memorisation via radio
- J2** Radio channel selection
- L1** LED power on
- L2** LED transmitter code programming
- L3** LED manual operation mode
- L4** LED inverting photocells activated
- L5** LED opening travel limit
- L6** LED closing travel limit
- L7** LED blocking button activated
- L8** LED stop photocell activated
- M1** Memory module
- P1** Programming button (**PROG**)
- P2** Selection button (**SEL**)
- P3** Transmitter code memorization button (**MEMO**)
- P4** Transmitter code cancellation button (**DEL**)
- R1** Radio frequency module, **433 MHz** for **S449** transmitters

- LP** Flashing warning lights
- LS** Indicator light
- FCA** Opening travel limit
- FCC** Closing travel limit
- FTC-RX** Photocell receiver
- FTC-Tx** Photocell transmitter
- PS** Safety buffer pressure switch
- SEL** Selector switch
- TB** Blocking button
- ANS400** External antenna



Before connecting the appliance make sure that the voltage and frequency rated on the data plate conform to those of the mains supply.

A multiple pole trip switch with a least **3 mm** between the contacts must be installed between the unit and the mains supply.

- Do not use cables with aluminium conductors; do not solder the ends of cables which are to be inserted into the binding posts; use cables which are marked T min 85°C and are resistant to atmospheric agents.

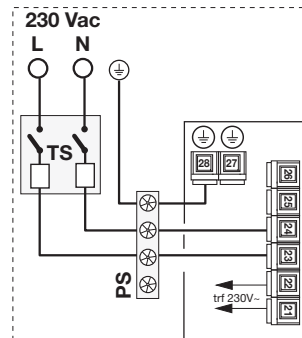
- The terminal wires must be positioned in such a way that both the wire and the insulating sheath are tightly fastened (a plastic jubilee clip is sufficient). If possible use the supplied cable clamp.



ELECTRICAL CONNECTION 230 Vac

- Connect the control and security device wires.
- Run the **230 Vac** mains power supply through the trip switch "TS" and the through the rubber cable clamp "PS" to the terminal board:

- connect the live to post 23 **L**
- connect the earth to post 28 **⊕**
- connect the neutral to post 24 **N**



Terminal board connection

- 1-2 Common for all inputs and outputs.
- 3 **24 Vac** ⁽¹⁾ in output, powering external devices
- 4-5 Common for all inputs and outputs
- 6 **LP 24 Vac 10 W** ⁽¹⁾ in output warning lights.
- 7-8 Second radio channel output:
 - max. load **ac/dc 60 VA/24 W**
 - max. voltage **30 Vac/dc**
- 9 **TD** (contact normally open) dynamic button input "Open-Close"
- 10 **TB** (contact N.C.) Blocking button input (The opening of this contact interrupts the cycle until a new movement command is given).
- 11 Common for all inputs and outputs.
- 12 **FCC** (normally closed contact) closing travel limit switch.
- 13 **FCA** (normally closed contact) opening travel limit switch.
- 14 **FTCI** (normally closed contact) Safety and control devices in input (photocells invert the travel direction when an obstruction is detected). The opening of this contact will provoke travel direction inversion during closure due to the cutting in of the safety device.
- 15 **FTCS** (normally closed contact) Safety and control devices in input (stop photoelectric cells). The opening of this contact will block all movement, until the obstruction has been removed, due to the safety device cutting in, the gate will then continue moving until it reaches a travel limit (only in the automatic mode).
- 16 **TC** (contact normally open) Closing button in input
- 17 **TA** (contact normally open) Opening button in input
- 18 **TAL** (contact normally open) limited opening button
- 19-20 Indicator light **24 Vac 3 W**
- 21-22 **230 Vac** in output powering the toroidal transformer
- 23-24 Power supply **230 Vac**
- 25-26 **230 Vac 40 W** Courtesy light in output
- 27 Programmer earth wire
- 28 Motor earth output
- 29 Outer conductor for radio receiver antenna
- 30 Inner conductor for radio receiver antenna (if an external antenna is fitted use a coaxial type cable **RG58** with an impedance of **50Ω**).

Note⁽¹⁾ If the device is fitted with batteries the output voltage during blackouts will be in direct current. It follows therefore that you must make sure that the external devices connected to these outputs can work of direct current.

ALL UNUSED NC CONTACTS MUST BE JUMPED

Switch on the power and make sure that the red indicator LEDs are in the following condition:

- **L1** Power on LED **on**
- **L2** Transmitter code programming LED **off**
- **L3** Manual operation mode LED **off**
- **L4** Safety LED for the inverting photoelectric cells "FTCI" **on**
- **L5** Opening direction travel limit LED "FCA" **on***
- **L6** Closing direction travel limit LED "FCC" **on***
- **L7** Safety LED for the blocking button "TB" **on**
- **L8** Safety LED for the stop photoelectric cells "FTCS" **on**

*The LEDs are "ON" if the relative security device is inactive (depends on the position of the gate).

Check that the activation of the safety devices switches the corresponding LEDs off.

If the **red power on LED doesn't light up** check the condition of the fuses and the power cable connection between binding posts "23" and "24" (fig. 12).

If one or more of the **safety LEDs do not light up** check the contacts of the relative safety devices and check that the unused safety device contacts have been bridged.

INDICATIONS ON THE DISPLAY (D1)

Alarm indications



Both travel limits have cut in

The letter **H**, will appear on the display and the system remains blocked. The warning lights will flash for a three second period which is repeated every six seconds. The only way to solve this problem is to check the travel limits for obstacles or damage and then restart the system.

• Once the alarm condition terminates the program will automatically reset and the programmer will consider the gate to be completely closed. It will not therefore accept closing commands.



Parameters loaded from EEPROM are wrong

The letter **E**, will flash on the display and the system remains blocked. The only way to solve this situation is to enter the program mode and reprogram the system. If the problem persists after reprogramming, the problem regards the EEPROM (incorrect memorising). Switch off the power to the system, after a few seconds switch it back on and then reprogram the system.



Time programming mode block (caused by: **TB**, **FTCI**, **FTCS**)

Function indications



defining the system configuration



waiting period between successive programming stages



deceleration time setting (value 1)



level 1 electrical input sensor



work time programming



opening stage



block



reclosing pause (only if enabled)



closing stage



updating the electrical input monitoring system

MANUAL OPERATION MODE

This can be used to close the gate (or open it) under the direct control of the operator (in this mode the electrical input monitoring system is excluded. The aim of this command is to make installation easier and to allow you to have the gate completely closed before starting the programming procedure. In this mode the Led "L3" (marked "UPL") will remain lit.

• Closing manoeuvre

This is obtained by pressing the button "SEL".

The motor will block in the closing direction due to:

- releasing the "SEL" button (takes you out of the "manual mode").
- activating the blocking button "TB" or the **FTCI/FTCS** safety devices: to move the gate again you must first release the "SEL" button and then press it again.
- activating the closing direction travel limit (if installed): pressing the "SEL" button will not cause the gate to close, but it will switch the courtesy light on.

• Opening manoeuvre

This is obtained by pressing the button "SEL", and then the "PROG" button straight away.

The motor will block in the opening direction due to:

- releasing both buttons (takes you out of the "manual operation mode").
- activating the blocking button "TB" or the **FTCI/FTCS** safety devices: to move the gate again you must first release both buttons and then press them again.
- activating the opening direction travel limit.

• Travel direction inversion

If the gate is closing: to enable an opening manoeuvre:

- press the "PROG" button

If the gate is opening: to enable a closing manoeuvre:

- release the "PROG" button

• Courtesy light

The courtesy light remains on all the time while in the "manual operation mode"; it also lights up when an opening or closing command is given but the travel limit blocks the command.

FUNCTION MODES

1) Automatic

Selected by enabling automatic reclosing (programming step 2, number **1** not flashing). When the gate is completely closed the opening command will start a complete cycle which will end with automatic reclosing and the courtesy light switching off.

Automatic reclosing starts after the programmed pause period has elapsed when the opening cycle has been completed or straight away after the intervention of a photoelectric cell (the intervention of a photoelectric cell causes the pause time to be reset).

During the pause time the symbol **1** will flash on the display and pressing the blocking button during this period will stop automatic reclosing and consequently stop the display from flashing.

The intervention of mechanical travel limits will block the gate.

The indicator light remains lit until the closing manoeuvre has terminated.

Note: The courtesy light switches on automatically each time a movement command is given either by control button or by radio. The intervention of a photoelectric cell during reclosing has no effect on the timing of the courtesy light.

2) Semiautomatic

Selected by disabling automatic reclosing (programming step 2, number **1** flashing).

Work cycle control using separate opening and closing commands. When the gate has reached the completely open position the system will wait until it receives a closing command either via an external control button or via radio control, before completing the cycle.

The activation of one of the opening travel limit causes the gate to stop and the termination of the opening. Starting from the end of the opening manoeuvre the courtesy light will switch off after the set period has elapsed. The indicator light remains lit if the gate is not completely closed.

Limited opening command function

The management of the limited opening command "TAL" is similar to the "TD" command.

- If the "open-close" mode is set for the "TD" button (programming step 1; number "1" fixed) activating the "TAL" button will start the limited opening stage (only from the completely closed position) but while the gate is opening pressing the button again will have no effect. Once the opening position has been reached pressing the "TAL" button will start closing after which pressing "TAL" again will have no effect.
- If the "open-block-close" mode is set for the "TD" button (programming step 1; number "1" flashing) activating the "TAL" button will start the limited opening stage (only from the completely closed position) pressing the button again will block the gate; pressing the button a third time will start the closing cycle. Pressing the "TAL" button again will have no effect.
- If an opening command is received during limited opening; the limited opening command will become a full opening command. If the **FTCI** photocell cuts in during the closing stage you will only have partial movement in the opening direction. When the system is operating off battery power the "TAL" command will be interpreted as a complete opening command (like "TA").
- **Note:** If you use the second radio channel function for the limited opening command (binding posts 7 and 8) you could operate both the "TD" and "TAL" functions from a two channel transmitter.

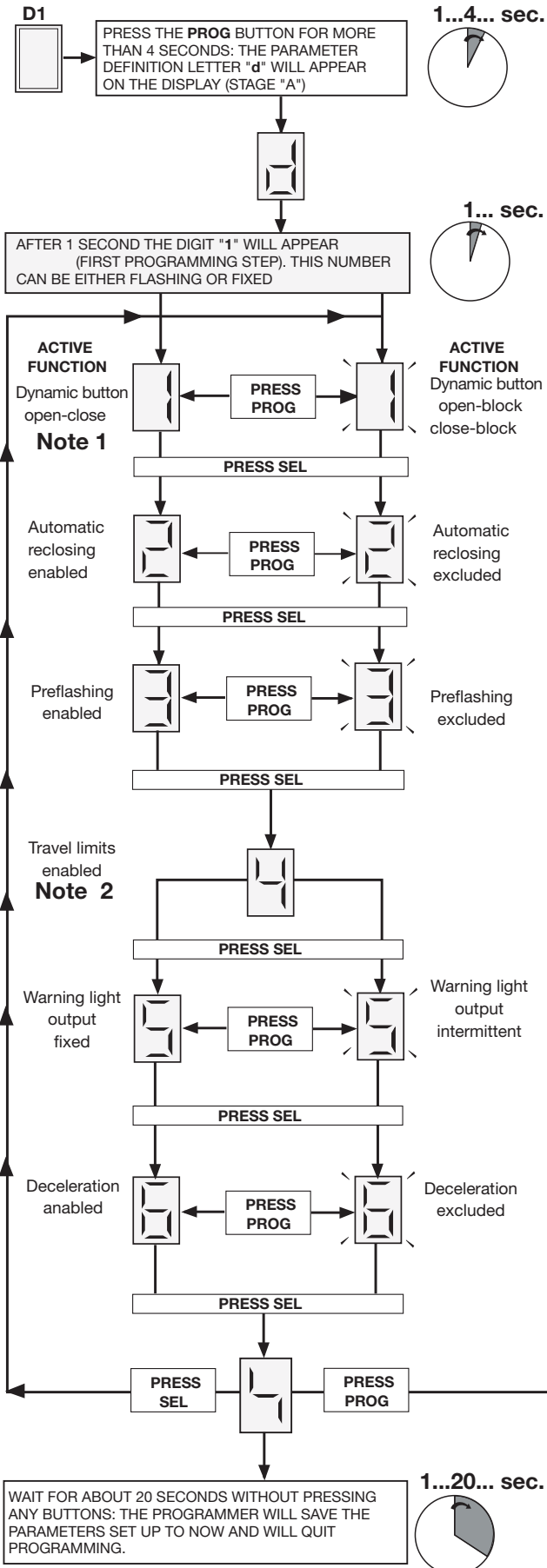
"TA" command

The "TA" command is operative even if the gate is opening or completely open. It will hold the gate in pause while the "TA" button is pressed down (clock mode). When the "TA" button is released the pause time will start after which automatic reclosing will occur. Pressing the "TB" button during the reclosing pause will block the reclosing function but you need only press a "TC" or "TD" command at this point (even using a radio control) to go back to the clock mode.

PROGRAMMING PROCEDURE (Setting the programmer and the work times)

Attention! Before starting the gate/gate must be moved to the completely closed position (**Led L6 "FCC" off**). Press the "SEL" button to move the gate to this position.

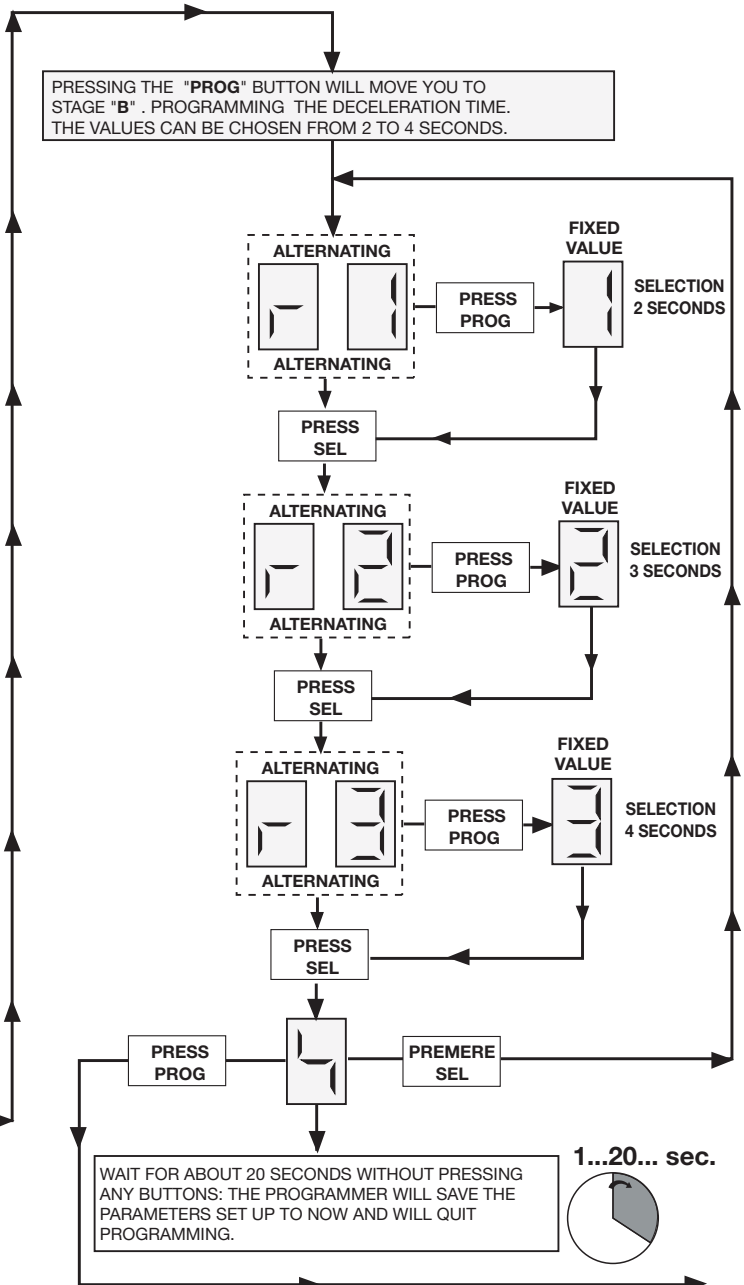
- Make sure that display "D1" is off and the LEDs "L4", "L5", "L7" and "L8" are all lit.
- Open the "Standard wiring diagram" which is folded inside the last page of this manual and carry out the programming procedure.



Importing notes regarding the programmer settings

Note 1 Travel direction inversion only during the closing stage.


Note 2 Seeing as the operating mode of the programmer for the **SL4024** is based on travel limits it is obviously not possible to deactivate them. To leave the programming order unaltered (this will help installers who are used to the product) parameter number "4" has remained assigned to that function even though that parameter cannot be modified.





CONTINUE ON PAGE 18

Important notes for work time programming

The intervention of the travel direction inversion or blocking photocell or pressing the blocking button during time programming will stop the gate, while the flashing warning light will remain lit, indicating that the programmer is in an active phase.

The figure  will flash on the display. The work time count is blocked, but once the alarm situation has been resolved or the blocking button has been released (only active while it is being pressed down) the gate movement will start up again automatically. As each new movement command starts slowly the work time calculation will be false therefore you must reprogram the work times.

-  **Warning!** Pressing the "SEL" button during time programming (after having moved the gate) will impede the completion of the procedure
-  **Warning!** Program the work time so that the gate always opens completely. The end of programming is indicated by the courtesy light switching on (the activation times of which are now already programmed).

The courtesy light time equals: opening time + pause time + closing time + 30 seconds. If you select the semiautomatic function; programming a long pause period (max. 5 seconds) will increase the activation time of the courtesy light.

The limited opening time equals: this is calculated as being a third of the programmed opening time. (eg: opening time = 30 seconds, limited opening time = about 10 seconds).

Current sensor

The programmer checks the electrical input to the motor, detecting any eventual increase in effort above the normal operating limits. To guarantee correct operation even under various climatic and mechanical conditions, the programmer recalibrates itself each time it receives an opening command from the "completely closed" position. This allows the system to detect any increase in effort which wasn't present during programming and to compensate so that the force required to block the gate remains constant, so guaranteeing optimum operation.

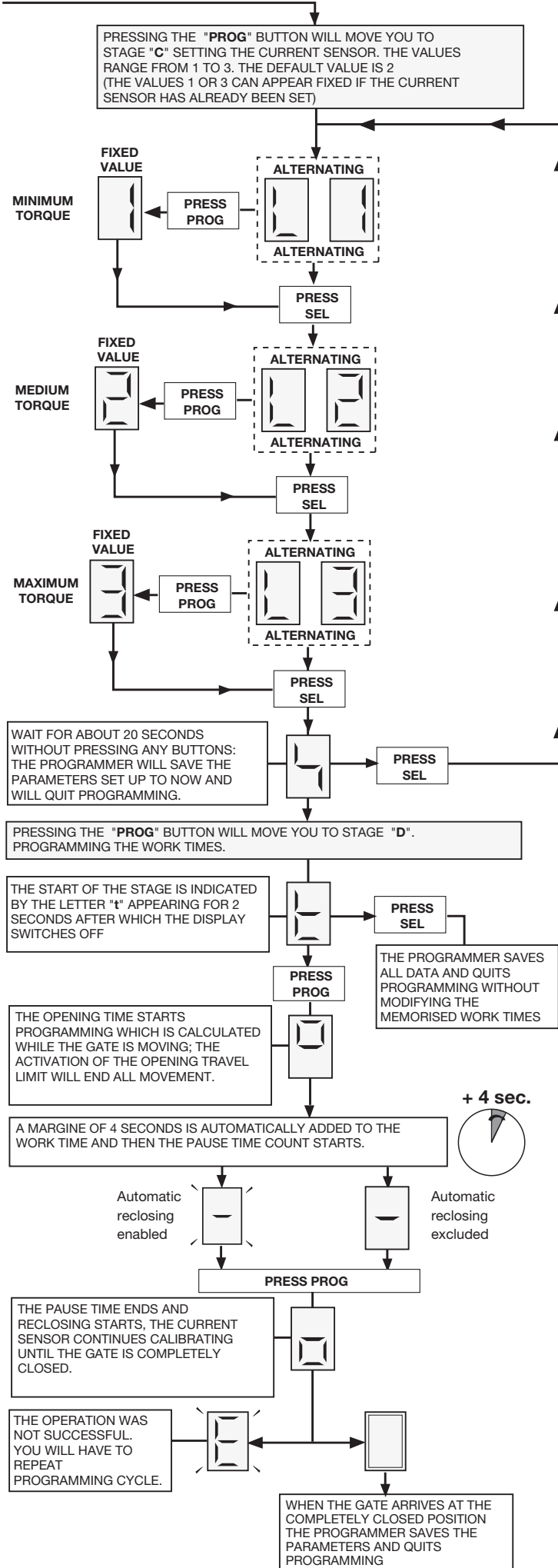
Attention: During the self-calibrating stage the electrical current monitoring system will not cut in; you must therefore avoid forcing the gate during the first seconds of the opening operation.

TIMED TRAVEL LIMITS

The work time management allows the system to control the position of the gate.

During blackouts the programmer will lose the position of the gate (unless one of the travel limits is active) which will be considered to be "completely closed" thus allowing the opening manoeuvre. Work time management also guarantees that the following closing manoeuvre will be complete.

- After repetitive travel inversion manoeuvres, with the motor stopping then restarting slowly, you may find that the time control is false and the device does not decelerate before arriving at the travel limit. Correct operation will be reset when the next manoeuvre is initiated.



REMOTE CONTROL

The motor can be remotely activated using a transmitter.

Two functions are available:

- sequential command open-block-close-block;
 - activating the C-NO potential free contact (binding posts 7/8).
- The commands can be given from any of the available channels.

S449 SERIES RADIO CONTROLS

Memory module M1

This is an extractable non volatile EEPROM type memory and contains the transmitter codes and allows you to memorise up to **300 codes** (300 channel buttons).

The programmed codes are maintained in this module even during blackouts.

- **Attention!** If the electronic card has to be replaced due to failure, the module can be extracted from it and inserted into the new card. Make sure that the module is orientated in the direction shown in **fig. 12**.

Signal LEDs "L2" (fig. 12)

- Flashing quickly: cancels a single code
- Flashing slowly: memorises a single code
- Permanently lit: memory full.

TRANSMITTER CODE MANAGEMENT



Attention! Before memorising the transmitters for the first time remember to cancel the entire memory content.

A. Memorising a channel (using the associated transmitter)

B. Cancelling a channel (using the associated transmitter)

C. Cancelling all codes in memory

D. Memorising ulterior channels via radio (without having to open the box in which the receiver is housed)

A) Memorising a channel (fig. 12):

1. Press and hold down button "P3" **MEMO**: The LED "L2" will flash slowly.
2. At the same time activate the transmitter which is to be memorised.
3. Hold down button "P3" **MEMO** until LED "L2" starts to flash again.
4. Release the button: The LED will continue to flash.
5. Activate the transmitter again (same transmitter, same channel; if the channel is different or it is a different transmitter the memorisation attempt will abort without success).
6. End of memorisation: The LED "L2" will remain lit for 2 seconds, indicating that the transmitter has been correctly memorised.

Note:

- It is not possible to memorise a code which is already in memory: if you attempt this, the LED will switch off when you activate the transmitter (point 2). Only after releasing the button "P3" **MEMO** will you be able to continue the memorising procedure.
- If after activating the transmitter for the first time you wait for more than fifteen seconds without activating the transmitter a second time the memorisation attempt will abort without success.

B) Cancelling a channel (fig. 12):

1. Press and hold down the button "P4" **DEL**: The LED "L2" will flash quickly.
2. Activate the transmitter channel which is to be cancelled.
3. The LED will remain lit for 2 seconds, indicating that the transmitter has been cancelled.

Note:

- If the user that you wish to cancel is not in memory, The LED will stop flashing; Only after releasing the button "P4" will you be able to continue the cancellation procedure.
- For both the memorisation and cancellation procedures, if the button is released before activating the transmitter the procedure will abort.

C) Cancelling all user codes from memory (fig. 12):

1. Keep both buttons pressed down ("P3+P4") for more than four seconds
2. LED "L2" will remain lit during the entire cancellation time (about 8 seconds).
3. LED "L2" switches off when the cancellation procedure has terminated.

Note: When the memory is almost full the time required to search for a user code could take up to 1 second from when the command was received. If led "L2" remains alight memory is completely full. To memorise a new transmitter you will first have to cancel a code from memory.

D) Memorising ulterior channels via radio

- Memorisation can be activated by radio (without opening the receiver container) if jumper "J1" has been inserted (fig. 12).

- 1) Make sure that the jumper "J1" has been inserted (fig. 12).
- 2) Using a transmitter, in which at least one channel button "A,B,C or D" has already been memorised in the receiver, press the button on the transmitter as shown in the figure. **Note:** all the receivers within range when the channel button is pressed (and which have at least one of the transmitter channel buttons memorised) will activate their signal buzzer "B1" (fig. 12).

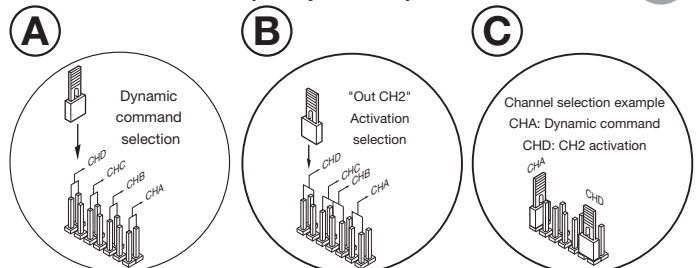


- 3) Press one of the channel buttons on the same transmitter. The receivers which do not contain that channel code will sound a five-second long "beep" and will then deactivate. The receivers which contain the channel code will sound a one-second long "beep" and will enter the "programming via radio" mode.
 - 4) Press the previously chosen channel buttons on the transmitter which you wish to memorise; the receiver will sound 2 "beeps" of half a second each after which the receiver will be ready to receive another code.
 - 5) To leave the programming mode wait for 5 seconds without pressing any buttons. The receiver will sound a five-second long "beep" and will then exit the programming mode.
- When the memory is entirely occupied the buzzer will sound 10 rapid "beeps" and will automatically leave the "programming via radio" mode. Led "L2" will remain lit on the receiver. The same signal is given each time you try to enter "programming via radio" when the memory is full.

• Second radio channel output (OUT CH2)

A normally open contact (60 VA/24 W 30 Vac-dc only resistive loads, excluding light bulbs) is available between binding posts 7 and 8. You can select a channel to associate with this contact using jumper "J2".

• Channel selection (Jumper "J2")



In the example "C" a four channel transmitter is assigned with the following functions:

- channel "A" activates the dynamic command ("TD")
- channel "D" activates the "OUT CH2" output (closes the contact between binding posts 7 and 8)

CONNECTING THE ANTENNA

The receiver is supplied with its own antenna which consists of a piece of rigid wire 345 mm in length. In alternative it is possible to connect an **ANS400** tuned antenna using a coaxial cable **RG58** (impedance 50Ω) with a maximum length of 15 m.

BATTERY CHARGER (OPTIONAL)

Function mode

This device allows the **SL402409** motor for sliding gates to work during blackouts. When the power is switched on, the battery charger relays are activated and the two transformer secondaries are directly connected to the Fastons on the main circuit board. When the power is switched off, the relays are at rest, and the battery power is supplied to the logic and motor control parts of the unit. It follows therefore that when the unit is working off battery power the voltage applied to the motor will be less than that present during normal operation and the sliding action of the motor will consequently be slower. Deceleration is not excluded.

Terminal board connections

- 1 Connect the **30 V** transformer "secondary 2" wire (**red**) to this binding post.
- 2 Connect the **0 V** transformer "secondary 2" wire (**pink**) to this binding post.
- 3-4 Inputs: connect the **24 V** transformer "secondary 1" wires (**grey**) to these binding posts.
- 5 Output to be connected to the Faston marked "**V2**"
- 6 Output to be connected to the Faston marked "**V0**"
- 7 Output to be connected to the Faston marked "**V3**"
- 8 Output to be connected to the Faston marked "**V4**"
- 9 **24 V** battery negative
- 10 **24 V** battery positive

Note: The **22 V (brown)** transformer "secondary 2" wire is to be connected to the Faston marked "**V1**". Check the connection at binding posts **7** and **8** and the fastons on the electronic card: if you invert these wires the electronic card will not receive power.

Signal LEDs

- L1:** lit when the battery is properly connected
L2: lit when the current supplied by the battery charger is greater than the battery maintenance level (about **50 mA**). The battery is charging.

Protection against battery polarity inversion

A battery protection fuse "**F4**" (avoiding reversed polarity damage) is located on the battery charger card; if the battery charger is wired incorrectly the fuse "**F4**" will trip together with the motor circuit protection fuse "**F3**" (**10A** rapid action).

The LED "**L1**" on the battery charger will light up when the battery is properly connected. The proper procedure is as follows:

- with the power to the motor switched off at the mains, connect the battery to the battery charger: if LED "**L1**" lights up, the battery is properly connected and you may therefore switch on the power to the control unit. If LED "**L1**" does not light up, invert the polarity of the battery.

CAUTION! The wires connecting the battery to the charger card must never be short circuited, this would damage the battery, and in the worst of cases could lead to burns (if metal parts are touching the skin when the contact is made). The batteries must only be installed/removed by qualified personnel. Used batteries must not be thrown into domestic rubbish bins and they must be disposed of according to the local standards and regulations in force.

- As the work time controller and the torque limiter are disabled when the battery is functioning but the travel limits and other security devices are active the following should be taken into account:
 - 1) You will not be able to stop the gate when it is moving by simply pushing against the travel direction.
 - 2) The travel limits must be installed correctly as the gate will only be stopped by them (unless other safety devices have been installed).
 - 3) Programming the PRG850 must never be carried out while the system is running on battery power.
- The self-sufficiency of the system when it is working off battery power is dependent on the ambient conditions and on the load connected to the **24V** output of the electronic programmer (power is always routed there during blackouts).

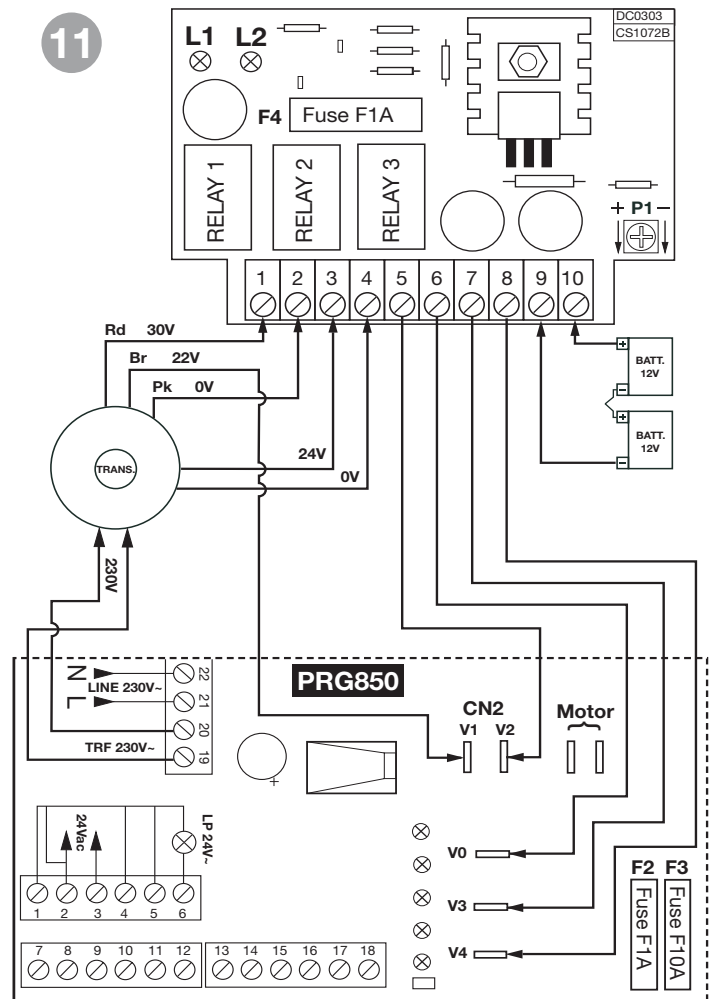
Caution: make sure that the load on the **24V** output, as well as the flashing warning lights, can work off direct current.

- If the battery voltage falls below the minimum during blackouts and the gate is completely closed the programmer will block. You will only be able to reset the programmer once the battery level has returned to the minimum required level.

Checking the batteries

Move the gate to the completely closed position: the display will be off. Give a movement command and measure the overall voltage of both batteries, which must be at least **22 Vdc**.

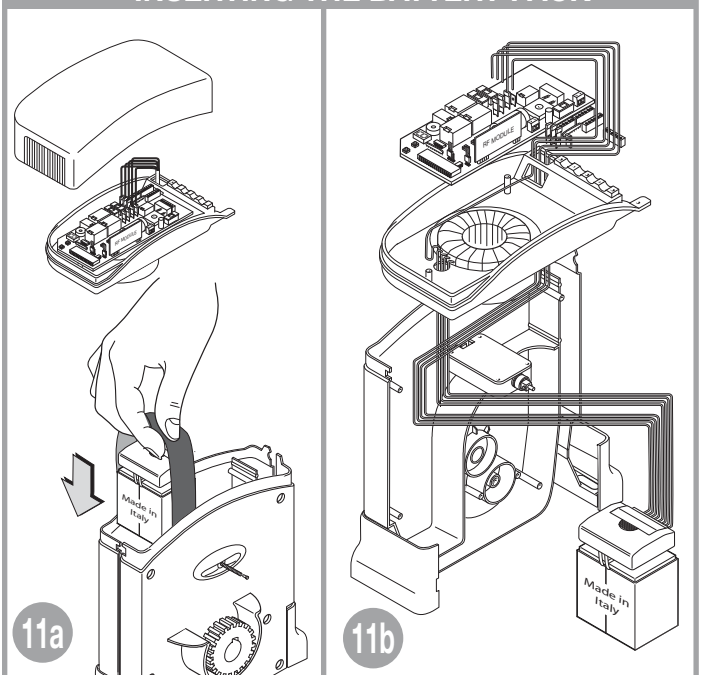
BATTERY CHARGER CONNECTIONS



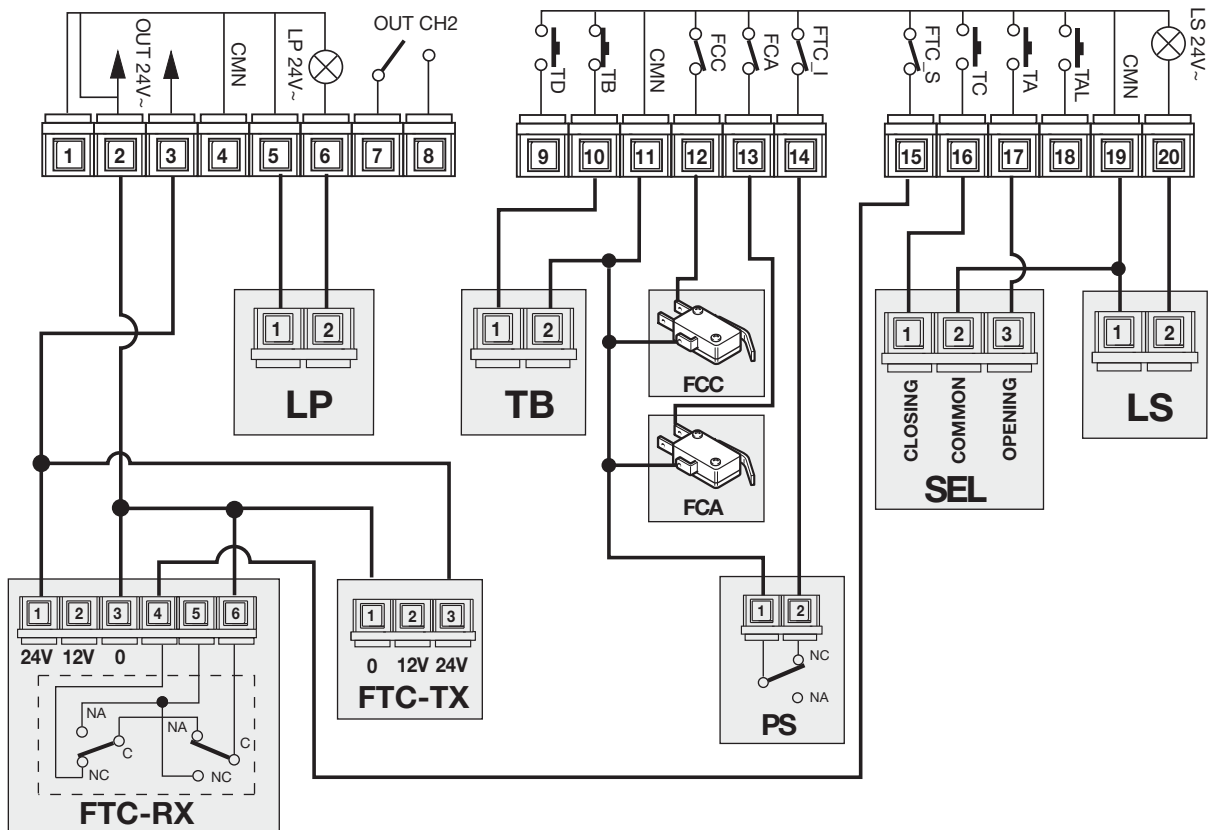
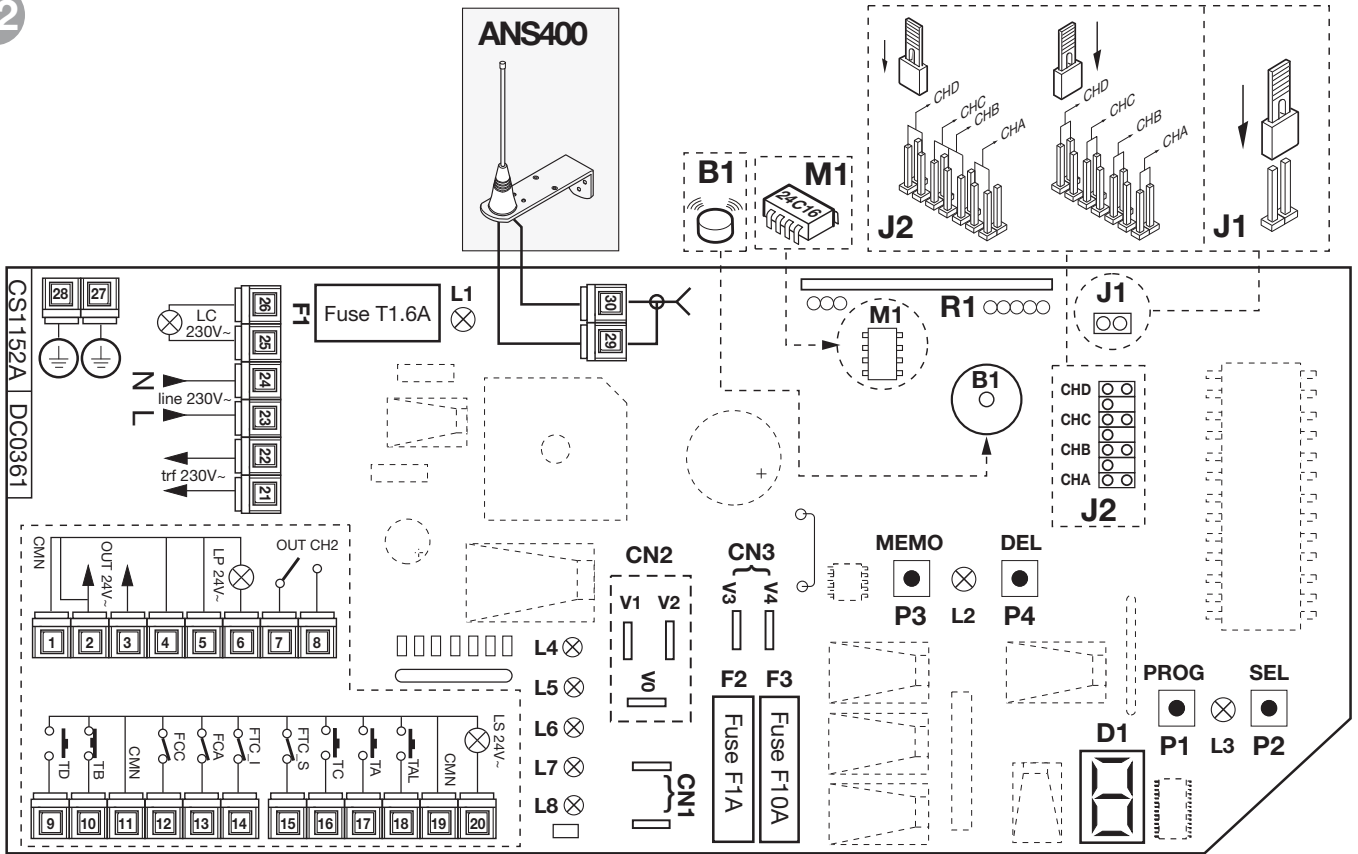
Legend

- | | | |
|---|------------------------|-----------------|
| L1 Led battery correctly connected | V0 Faston (0V) | } "secondary 2" |
| L2 Led battery charging | V1 Faston (22V) | |
| F4 Battery protection fuse | V2 Faston (30V) | } "secondary 1" |
| P1 Potentiometer load (27,8 Vdc) | V3 Faston (24V) | |
| | V4 Faston (0V) | |

INSERTING THE BATTERY PACK



12



La legenda di riferimento si trova a pagina 7 di questo libretto.
The legend for this drawing is on page 16 of this manual.
La nomenclature de référence se trouve à la page 25 de ce livret.
Die Bezugslegende befindet sich auf Seite 34 dieser Anleitung.
Las notas explicativas de referencia se encuentran en la pág. 43 de este manual.

