



**COMFORT AND SECURITY**

# DZ RIO



Technical Manual



# **INDEX**

1 - GATE OPERATOR CLASSIFICATIONS .....	4
2 - SAFETY ACCESSORY SELECTION .....	4
3 - ENTRAPMENT PROTECTION TYPES.....	4
4 - IMPORTANT SAFETY INSTRUCTIONS .....	5
4.1 – Safety Installation Information .....	5
5 - TECHNICAL SPECIFICATION .....	6
6 - REQUIRED TOOLS FOR INSTALLATION .....	7
7 - ELECTRICAL INSTALLATION .....	7
8 - PRECAUTIONS FOR ELECTRICAL INSTALLATION.....	8
9 - INSTALLING AND FIXING THE OPERATOR .....	8
10 - LIMIT SWITCH INSTALLATION .....	12
11 - INTRODUCTION: ELECTRONIC SYSTEM'S TECHNICAL FEATURES .....	13
12 - CONTROL BOARD.....	13
12.1 - Overview .....	13
12.2 - Power Supply .....	14
12.3 - Induction Motor Connection.....	14
12.4 - 'ENC' encoder connection .....	14
12.5 - 'TRAVA' Audio Alarm connection .....	15
12.6 - 'LUZ' courtesy light connection .....	15
12.7 - 'RX' separated receiver connection .....	15
12.7 - 'RX' separated receiver connection .....	15
12.8 - 'BOT' pushbutton connection .....	15
12.9 - 'HIB' end-of-stroke reeds connection .....	15
12.10 - 'SCI' connector.....	15
13 - ENTRAPMENT PROTECTION SYSTEMS.....	16
13.1 - Internal Entrapment Protection System (Type A) .....	16
13.2 - External Entrapment Protection System (Type B1).....	16
13.3 - 'FOT' closing cycle photoelectric sensor .....	17
13.4 - 'FEC' opening cycle photoelectric sensor .....	17
13.5 - Miller Edge reflexi Gard Connection .....	18
13.6 - 'ABR' audio alarm reset connection.....	19
14 - FORCE ADJUSTMENT.....	19
14.1 - 'FOP' High Speed Force Adjustment.....	19
14.2 - 'FME' Low Speed Force Adjustment.....	20
15 - GATE SYSTEM LOGIC FUNCTION .....	20
15.1 - First operation after a frequency inverter is installed on the operator (Gate travel recognition).....	20
15.2 - From the second activation on, when the control board is disconnected from the power supply.....	20
16 - INVERTER PARAMETERS PROGRAMMING .....	21
16.1 - Operator model selection.....	21
16.2 - JUMPER TST .....	21
16.3 - Adjustment of other parameters.....	21
17 - ERASING THE RECOGNIZED GATE TRAVEL .....	24
18 - APPLYING THE DEFAULT STANDARD SETTINGS .....	24
19 – ADDING A REMOTE CONTROL.....	24
19.1 – Remote control functions .....	24
19.2 - The remote control battery.....	25
20 - SELECTION OF RF RECEPTION PROTOCOL (CR/CF JUMPER).....	26
21 - ERASING ALL STORED REMOTE CONTROLS .....	26
22 - USER OPERATION.....	26
22.1 - Unlocking (manual release and operation) .....	27
23 - ACCESSORIES.....	27
23.1 - Garage Light.....	27
23.2 - Flashing lights .....	28
24 - EVENT / FAILURE INDICATION .....	28
24.1 - Microcontroller functioning indication.....	28
24.2 – Indication of over current or short circuit on the motor .....	28
24.3 – Overheating indication .....	28
24.4 - EEPROM fault indication .....	28
24.5 - EEPROM invalid data indication .....	28
24.6 - Open end-of-stroke indication .....	29
24.7 - Close end-of-stroke indication .....	29
24.8 - Capacitor load indication .....	29
24.9 - Encoder Test .....	29
24.10 - Thermal Protection.....	29
25 - MAINTENANCE.....	30
26 - REPAIR PARTS.....	29

## **1 - GATE OPERATOR CLASSIFICATIONS**

All gate operators can be divided into one of four classes depending on their design and usage. Install this gate operator only when the operator is appropriate for the construction and usage class as defined below:

### **Class I Residential Vehicular Gate Operator**

A vehicular gate operator intended for use in a home or for one to four single family dwellings with a common garage or parking area associated with these dwellings.

### **Class II Commercial / General Access Vehicular Gate Operator**

A vehicular gate operator intended for use in a commercial location or building such as a multi-family housing unit of five or more single family units, hotel, retail store or other building servicing the general public.

### **Class III Industrial / Limited Access Vehicular Gate Operator**

A vehicular gate operator intended for use in an industrial location or building such as a factory or loading dock area or other location not intended to service the general public.

### **Class IV Restricted Access Vehicular Gate Operator**

A vehicular gate operator intended for use in a guarded industrial location or building such as an airport security area or other restricted access locations not servicing the general public, in which unauthorized access is prevented via supervision by security personnel.

## **2 - SAFETY ACCESSORY SELECTION**

All UL325 PPA compliant gate operators will accept external entrapment protection devices to protect people from motorized gate systems. UL325 requires that the type of entrapment protection correctly matches each gate application.

This equipment must be installed with at least two entrapment protection means. Below are the types of entrapment protection systems recognized by UL325 for use on this operator.

## **3 - ENTRAPMENT PROTECTION TYPES**

### **Type A:**

Inherent obstruction sensing system, self-contained within the operator. This system must sense and initiate the reverse of the gate within two seconds of contact with a solid object.

### **Type B1:**

Connections provided for a non-contact device, such as a photoelectric eye can be used as a secondary protection.

**NOTE:** *UL requires that all installations must have warning signs placed in plain view on both sides of the gate to warn pedestrians of the danger of motorized gate systems.*

### **Approved Non-contact Devices (Type B1)**

The following non-contact obstruction detection devices have been approved for use with this slide gate operator (or barrier gate operator) as part of a UL325 compliant installation:

Edge Miller 4-wire pulsed (monitored) devices.

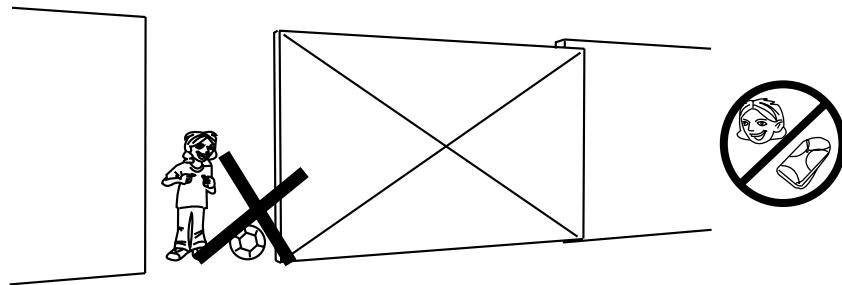
## **4 - IMPORTANT SAFETY INSTRUCTIONS**

### **⚠ WARNING**

This equipment is to be installed and serviced by a professional gate operator technician only. It is important that the specialized installer follow all instructions given in this manual.

To Reduce the Risk of Severe Injury or Death:

1. READ AND FOLLOW ALL INSTRUCTIONS
2. Never let children operate or play with door controls. Keep the remote control away from children.



3. Always keep people and objects away from the gate. NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE.
4. Test the gate operator monthly. The gate MUST reverse on contact with a rigid object or stop when an object activates the non-contact sensors. After adjusting the force or the limit of travel, retest the gate operator. Failure to adjust and retest the gate operator properly can increase the risk of injury or death.
5. Use the emergency release only when the gate is not moving.
6. KEEP GATES PROPERLY MAINTAINED. Read the owner's manual. Have a qualified service person make repairs to gate hardware.
7. The entrance is for vehicles only. Pedestrians must use separate entrance.
8. SAVE THESE INSTRUCTIONS.

### **4.1 – Safety Installation Information**

1. Install the gate operator only when:
  - a) The operator is appropriate for the construction and the usage class of the gate.
  - b) All openings of a horizontal slide gate are guarded or screened from the bottom of the gate to a minimum of 6' (1.83 m) above the ground to prevent a 2 ¼" (6cm) diameter sphere from passing through the openings anywhere in the gate, and in that portion of the adjacent fence that the gate covers in the open position.
  - c) All exposed pinch points are eliminated or guarded, and guarding is supplied for exposed rollers
2. The operator is intended for installation only on gates used for vehicles. Pedestrians must be supplied with a separate access opening. The pedestrian access opening shall be designed to promote pedestrian usage. Locate the gate such that persons will not come in contact with the vehicular gate during the entire path of travel of the vehicular gate.
3. The gate must be installed in a location so that enough clearance is supplied between the gate and adjacent structures when opening and closing to reduce the risk of entrapment. Swinging gates shall not be open into public access areas.
4. The gate must be properly installed and work freely in both directions prior to the installation of the gate operator
5. Controls intended for user activation must be located at least six feet (6') away from any moving part of the gate and where the user is prevented from reaching over, under, around or through the gate to operate the controls. Outdoor or easily accessible controls shall have a security feature to prevent unauthorized use.
6. The Reset switch must be located in the line-of-sight of the gate. Activation of the reset control shall not cause the operator to start.

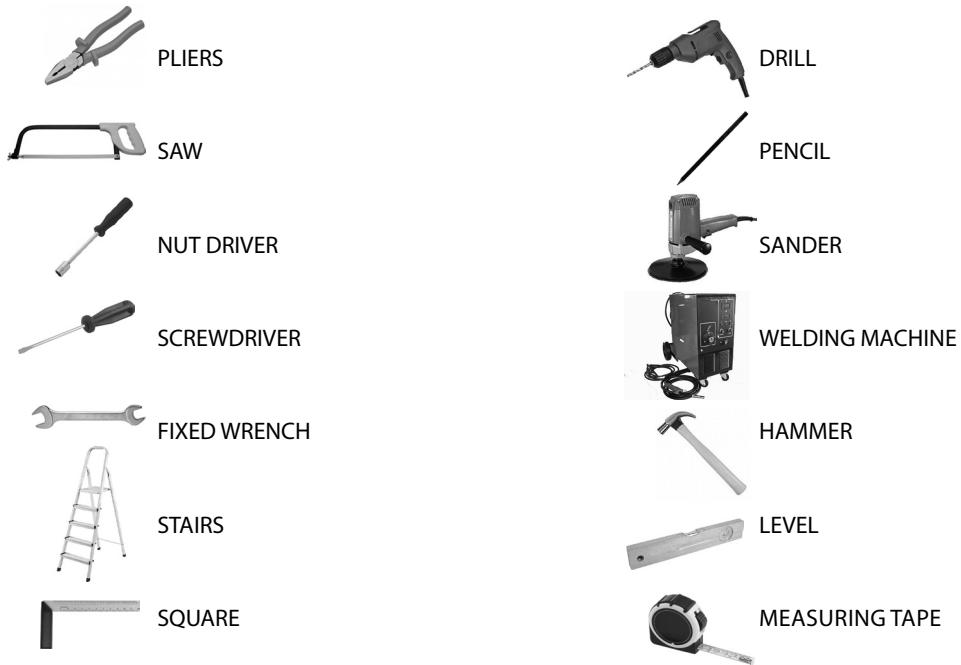
7. A minimum of two (2) WARNING SIGNS shall be installed, one on each side of the gate where easily visible.
8. For a gate operator utilizing a non-contact sensor:
  - a) Reference the owner's manual regarding placement of non-contact sensor for each type of application.
  - b) Care shall be exercised to reduce the risk of nuisance tripping, such as when a vehicle trips the sensor while the gate is still moving.
  - c) One or more non-contact sensors shall be located where the risk of entrapment or obstruction exists, such as the perimeter reachable by a moving gate or barrier.
9. For a gate operator utilizing a contact sensor such as an edge sensor:
  - a) One or more contact sensors shall be located where the risk of entrapment or obstruction exists, such as the leading edge, trailing edge and post mounted both inside and outside of a vehicular horizontal slide gate
  - b) One or more contact sensors shall be located at the bottom edge of a vehicular vertical lift gate.
  - c) A hard wired contact sensor such as the one that transmits radio frequency (RF) signals to the gate operator for entrapment protection functions shall be located where the transmission of the signals are not obstructed or impeded by building structures, natural landscaping or similar obstruction. A wireless contact sensor shall function under the intended end-use conditions.
  - d) One or more contact sensors shall be located on the inside and outside leading edge of a swing gate. Additionally, if the bottom edge of a swing gate is greater than 6"(152 mm) above the ground at any point in its arc of travel, one or more contact sensors shall be located on the bottom edge.
  - e) One or more contact sensors shall be located at the bottom edge of a vertical barrier (arm).

## **5 - TECHNICAL SPECIFICATION**

Model	DZ RIO 1/4 JET FLEX 60HZ U	DZ RIO 1/3 JET FLEX 60HZ U	DZ RIO 1/2 JET FLEX 60HZ U
Class of Operation	UL325 Class I, II, III, IV	UL325 Class I, II, III, IV	UL325 Class I, II, III, IV
Type of Gate	Vehicular Slide Gates	Vehicular Slide Gates	Vehicular Slide Gates
Main AC Supply	120 Vac, 4A (max)	120 Vac, 3A (max)	120 Vac, 3A (max)
Nominal Frequency	60 Hz	60 Hz	60 Hz
Rated Power	300 W, 120 Vac	210 W, 120 Vac	225 W, 120 Vac
Maximum Gate Weight	600 lbs	900 lbs	1100 lbs
Maximum Gate Travel Speed	1 ft/s	1 ft/s	1 ft/s
Maximum Gate Length	32 feet	32 feet	32 feet
Cycles	15	25	40
Operating Temperature	-4° F to 122° F	-4° F to 122° F	-4° F to 122° F
Inherent Entrapment Protection (Type A)	Dual – RPM (Encoder) and Current Sense	Dual – RPM (Encoder) and Current Sense	Dual – RPM (Encoder) and Current Sense
External Entrapment Protection (Type B1)	2 inputs for photoelectric devices	2 inputs for photoelectric devices	2 inputs for photoelectric devices

## **6 - REQUIRED TOOLS FOR INSTALLATION**

Below are some tools necessary to install the operator:



## **7 - ELECTRICAL INSTALLATION**

This equipment must be wired with 120V as specified in the table below (assuming max current consumption).

AC power	Wire Size (American Wire Gauge) / Max Distance in Feet					
	DZ RIO 1/4		DZ RIO 1/3		DZ RIO 1/2	
	14 AWG	12 AWG	14 AWG	12 AWG	14 AWG	12 AWG
120 VAC Single Phase	143	227	191	303	191	303

**⚠️ IMPORTANT**

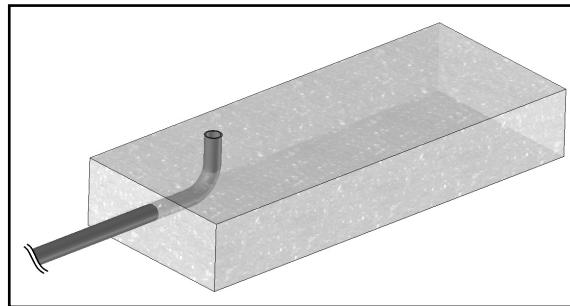
Be sure that the circuit breaker in the electrical panel is in the OFF position before proceeding with the installation.  
A separated power disconnect switch may be needed in your area.  
Check your local building codes before installing this equipment.  
The gate operator must be properly grounded, check your local electrical codes before installing this equipment.  
Install the earth ground rod as near as possible to the operator.

TO OPERATOR

CHECK NATIONAL AND LOCAL CODES FOR PROPER DEPTH

## **8 - PRECAUTIONS FOR ELECTRICAL INSTALLATION**

To avoid damage to wiring, it is important that all conduits are properly fixed to the operator. The passage of the wiring must be made through conduits, internally to floor base, ensuring that no wiring conductor is trapped or damaged.



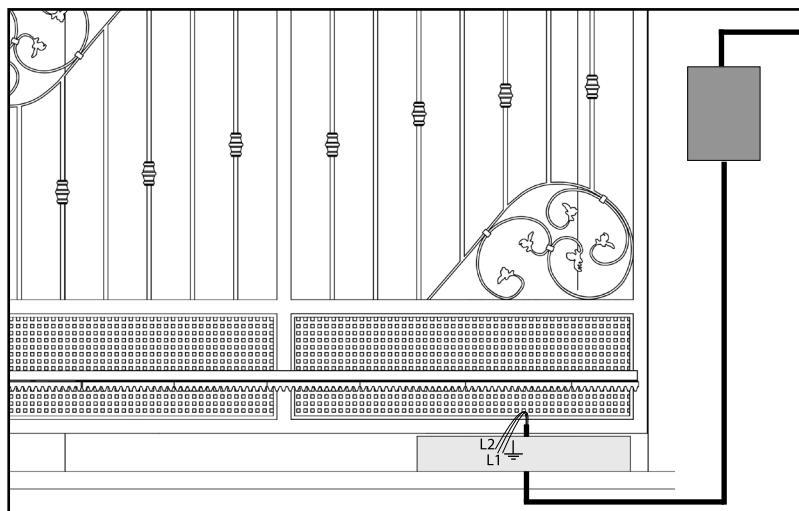
A conduit of 3/4" in diameter must be installed between the power distribution box and the total disconnect device inside the concrete base.

Install conduits for the 120 Vac.

Main power supply MUST run in separated conduits.

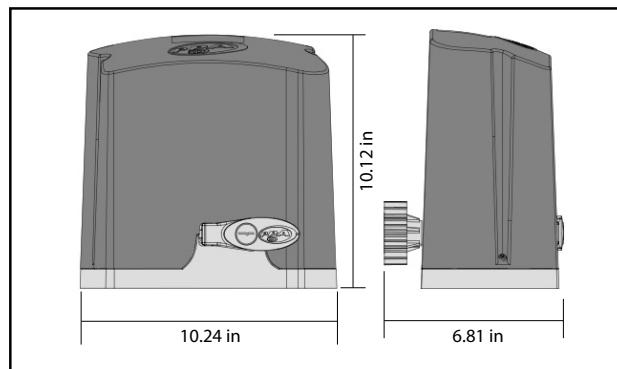
The conduit may be limited to 1/2 "in diameter for external devices like pushbuttons or sensors.

All conduits must be UL approved.



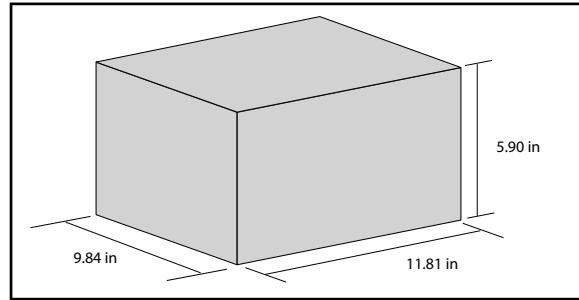
## **9 - INSTALLING AND FIXING THE OPERATOR**

Equipment dimensions

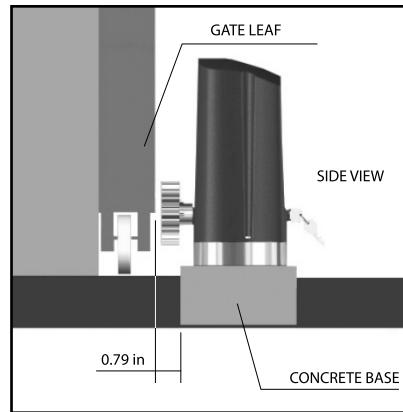


The perfect operation of this equipment depends on the instructions in this manual. To fix the equipment, follow these steps:

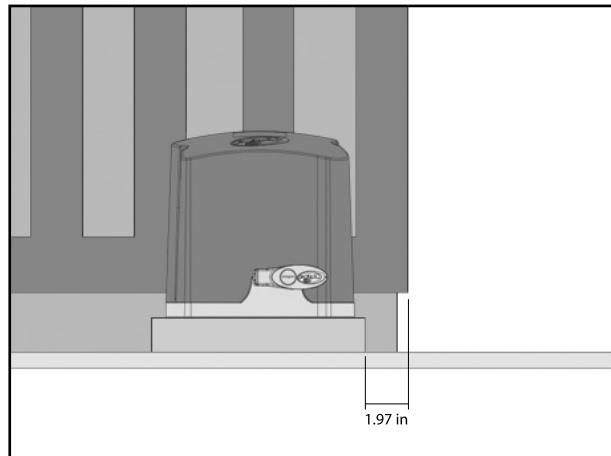
**Step 1:** Make sure the floor is firm enough so it can be screwed the equipment so that it is on the level. If it not meet the requirement, provide a concrete pad, following the guidelines below:



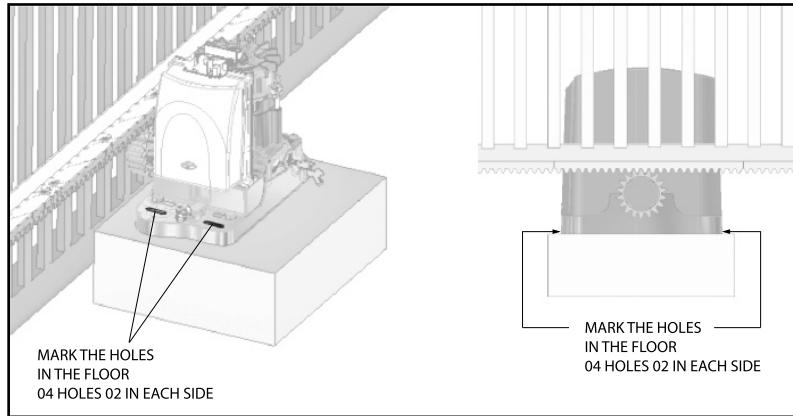
**Step 2:** The dimensions of the concrete pad shall be appropriate for the operator dimensions. The concrete pad shall be at a distance of approximately 0.79 inches from the face of gate leaf.



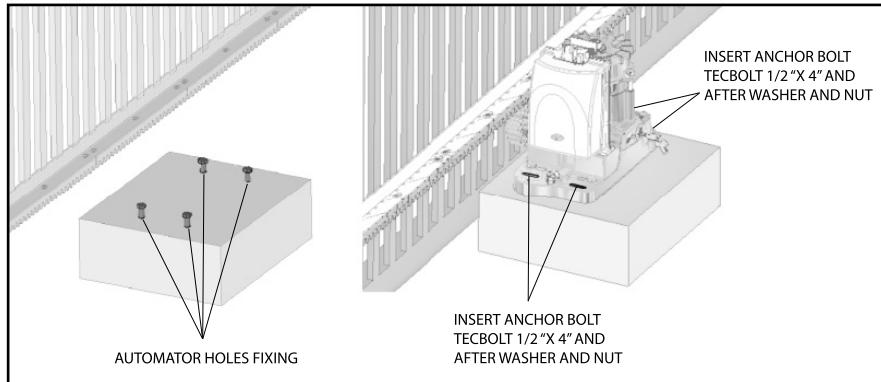
**Step 3:** After meeting the conditions, open completely the gate and position the operator near the face of the gate leaf, following the measure of 1.97 inches between the end of the gate leaf and operator.



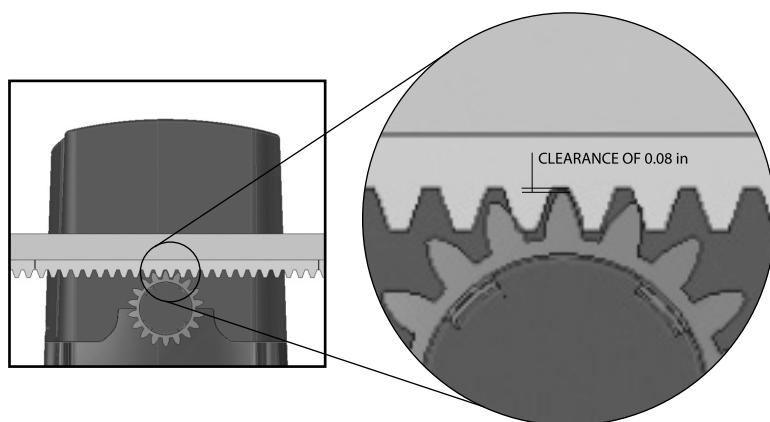
**Step 4:** Make the pre-alignment from operator to the gate, positioning the rack on the gear and leaning the set the gate. Then, mark the fixing holes in the floor or concrete pad.



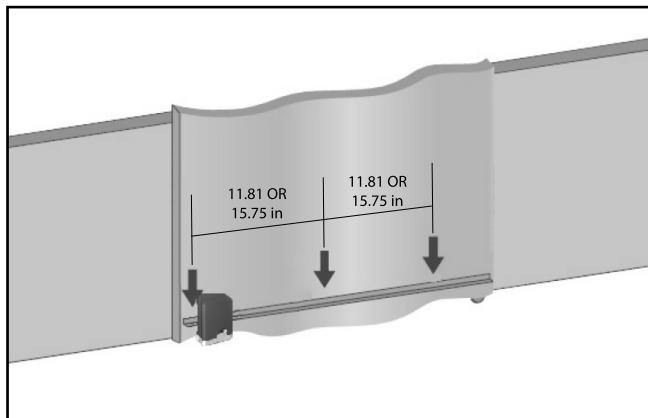
**Step 5:** Make the hole for fixing, positioning of the aligned operator to the gate and enter the anchor bolts  $\frac{1}{2}$  "x 4" without tightening them. Move the gate, check if it does not touch the operator over the course. If this occurs, back off the operator.



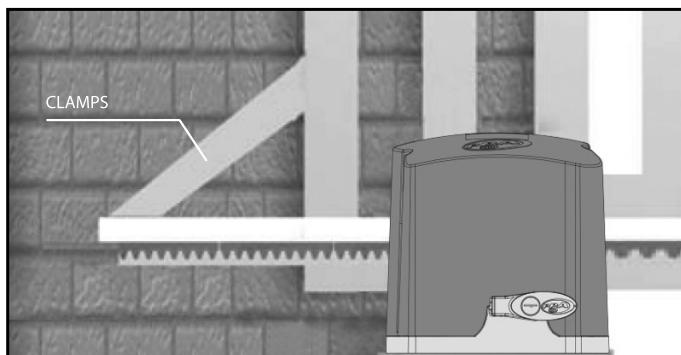
**Step 6:** With the unlocked operator, position the rack bar on the gear and aligned to the gate.  
It is necessary to leave a clearance of approximately 0.08 inches between the tooth top of the gear and rack tooth bottom.



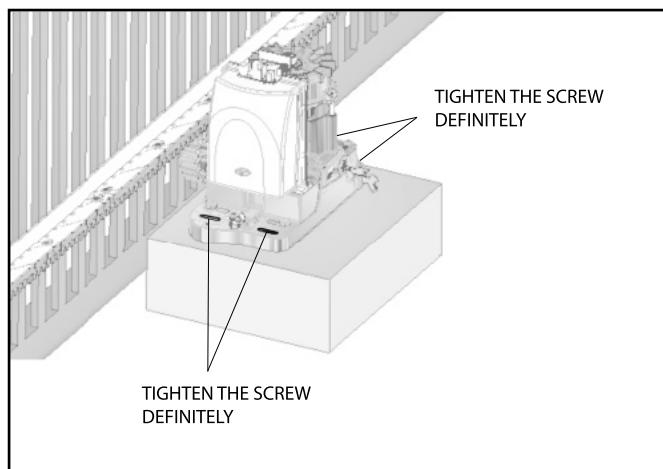
**Step 7:** Set the rack to the fullest extent of the gate leaf with solder or screw every 11.81 or 15.75 inches.



**Step 8:** If the gate leaf this warped, provide shims to ensure alignment of the rack. In some cases that the rack must pass the length of the sheet. In this case, it provides a clamps so do not skip teeth in starting the machine.

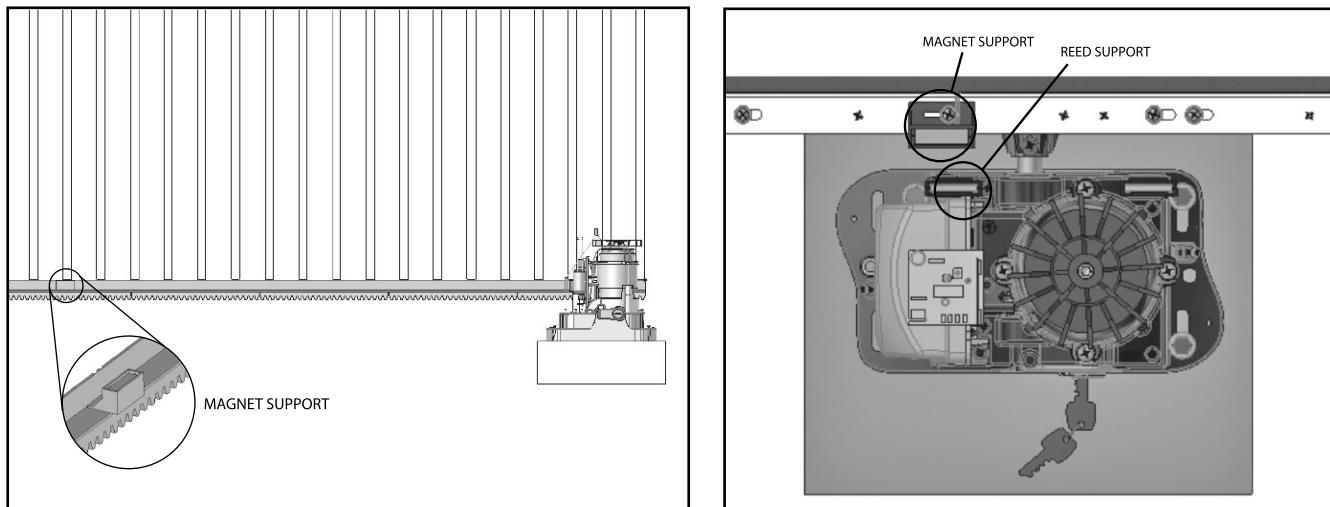


**Step 9:** After fixing the rack, definitely fix the operator on the floor or concrete base, definitely tightening the screws.

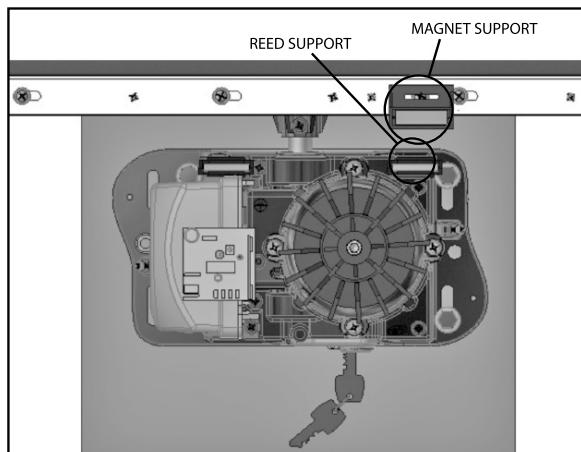


## **10 - LIMIT SWITCH INSTALLATION**

**Step 1:** With the gate closed, place the magnet support on the rack, positioned in front with Reed's operator. This magnet will trigger the close limit switch.

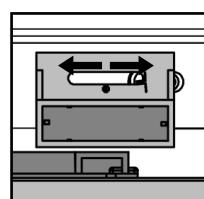


**Step 2:** Open the gate completely and place the other magnet support on the rack, in front of the operator REED. This magnet will trigger the open limit switch.



**Step 3:** Trigger the engine and see if the REED's are off properly. If necessary, reverse the board connector.

After the brackets set of magnets, make final adjustments, moving them to the right side or left side, depending on the selected setting.



**Step 4:** To finish the installation of the operator, is required before the operation, screw the fairings with 1 screw 0.24 x 0.79 inches (now available on the product).

## **11 - INTRODUCTION: ELECTRONIC SYSTEM'S TECHNICAL FEATURES**

"Triflex TOP" Control Board runs with a 32-bit processor able to perform 40 million instructions per second, with features which are specific to electric motors control. Its processor can manage the entire operator setting, such as the motor, the encoder1 and even receive a radiofrequency code from a transmitter.

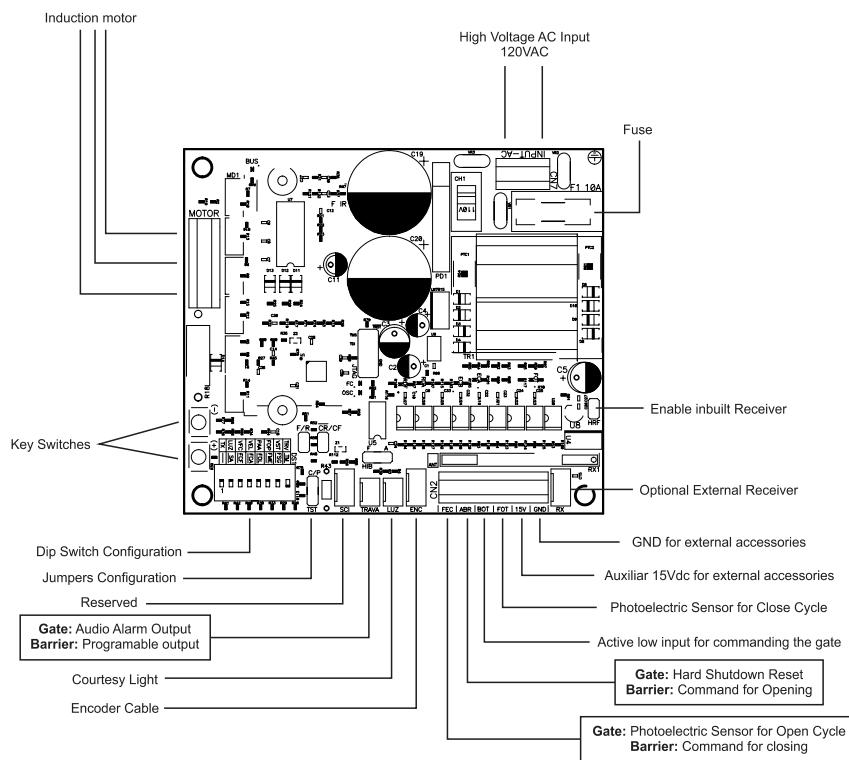
It is endowed with an EEPROM2 memory which stores the acquired remote controls' codes in an encrypted way. This memory can be removed to be used in another compatible PPA product, such as PPA's loose receiver 'Alcance' and vice versa. The control board is also compatible to rolling code remote controls, with PPA's protocol.

The system actuation can be performed via remote control through an embedded radiofrequency receiver, a loose receiver or any other device with an NC (Normally closed) contact, such as a pushbutton.

The gate's position control is performed through a PPA's patented encoder system called "Reed Digital".

## **12 - CONTROL BOARD**

### **12.1 - Overview**

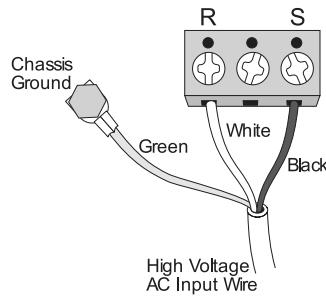


## **12.2 - Power Supply**

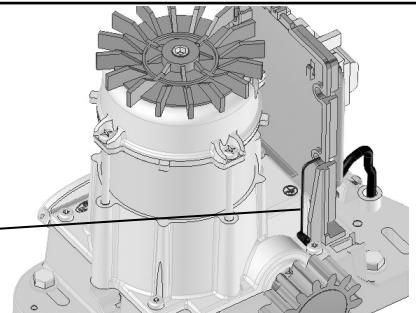
The power supply must be connected to the 'R' and 'S' inputs on the power terminal blocks, the CN7 Connector.

### **⚠ WARNING**

Be sure that the circuit breaker in the electrical panel is in the OFF position before attempting to connect any wiring to the control board.



It is required that the ground terminal to be connected to the network grounding cable.



## **12.3 - Induction Motor Connection**

The three wires of the induction motor must be connected to the "MOTOR" terminal block. THERE IS NO NEED TO FOLLOW THE WIRES' COLOR SEQUENCES.

## **12.4 - 'ENC' encoder connection**

It is used to connect, through a proper cable, the motor and the control board. There are sensors inside the gearbox which provides information on displacement direction and position of the gate during operation. Such information is essential to the operator's proper running.

There are two sensors inside the encoder and each one is represented by the ENCA and ENCB LEDs. Each one lights according to the disk position.

## **12.5 - 'TRAVA' Audio Alarm connection**

It is used to connect, through a "PPA Relay Module", the buzzer for audio alarm. This "electronic piezo" will sound when an alarm condition occurred. The operation of this output will be explained in "Inherent Entrapment Protection System".

## **12.6 - 'LUZ' courtesy light connection**

In case one opts to use the courtesy light, the 'Optional Relay Module' must be connected to this connector. The courtesy light will be always enabled.

## **12.7 - 'RX' separated receiver connection**

Input for connecting the separated receiver to the control board through the 'RX' connector. When a command is accepted, the 'CMD' (command) LED is activated. The HRF Jumper must be removed when the separated receptor is added to the system to switch off the incorporated receptor.

## **12.8 - 'BOT' pushbutton connection**

The control board acknowledges a pushbutton command when the 'BOT' terminal block is connected to the GND, i.e., a pulse to the GND.  
Terminal block 1: GND (-);  
Terminal block 4: BOT (NO Contact).

## **12.9 - 'HIB' end-of-stroke reeds connection**

The control board acknowledges an activated 'reed' when the pin corresponding to it on the HIB pin bar is connected to the GND, i.e., a pulse to the GND.

The only condition that must be followed is that the reed that represents the open gate must be connected in such a way that the 'RDA' LED lights (HIB connector pin marked with an 'A'). And the 'RDF' LED must be lit when the gate is closed (HIB connector pin marked with an 'F').

## **12.10 - 'SCI' connector**

Reserved for future use.

## **13 - ENTRAPMENT PROTECTION SYSTEMS**

### **13.1 - Internal Entrapment Protection System (Type A)**

This operator contains an inherent entrapment protection system (position sensor and current sensor) that allows the equipment to detect the presence of obstacles during either the opening or closing cycle.

The gate will reverse direction if an obstruction is detected. The system logic operation complies with following rules:

1. During the closing cycle: If an obstruction is encountered, the gate reverses.
  - 1.1 After complete the reversal cycle, the operator will hold the gate at open position and disable (if enabled) the auto-close function.
  - 1.2 During the reversal, if the equipment encounters another obstruction, the gate will reverse again for 2 seconds and enters in hard shutdown mode (audio alarm) and the operator will need to be reset.
2. During the opening cycle: If an obstruction is encountered, the operator will reverse for 2 seconds and hold the gate at this position and disable (if enabled) the auto-close function.
  - 2.1 If the operator encounters another obstruction twice consecutively, it will enter in hard shutdown mode (audio alarm) and the operator will need to be reset.

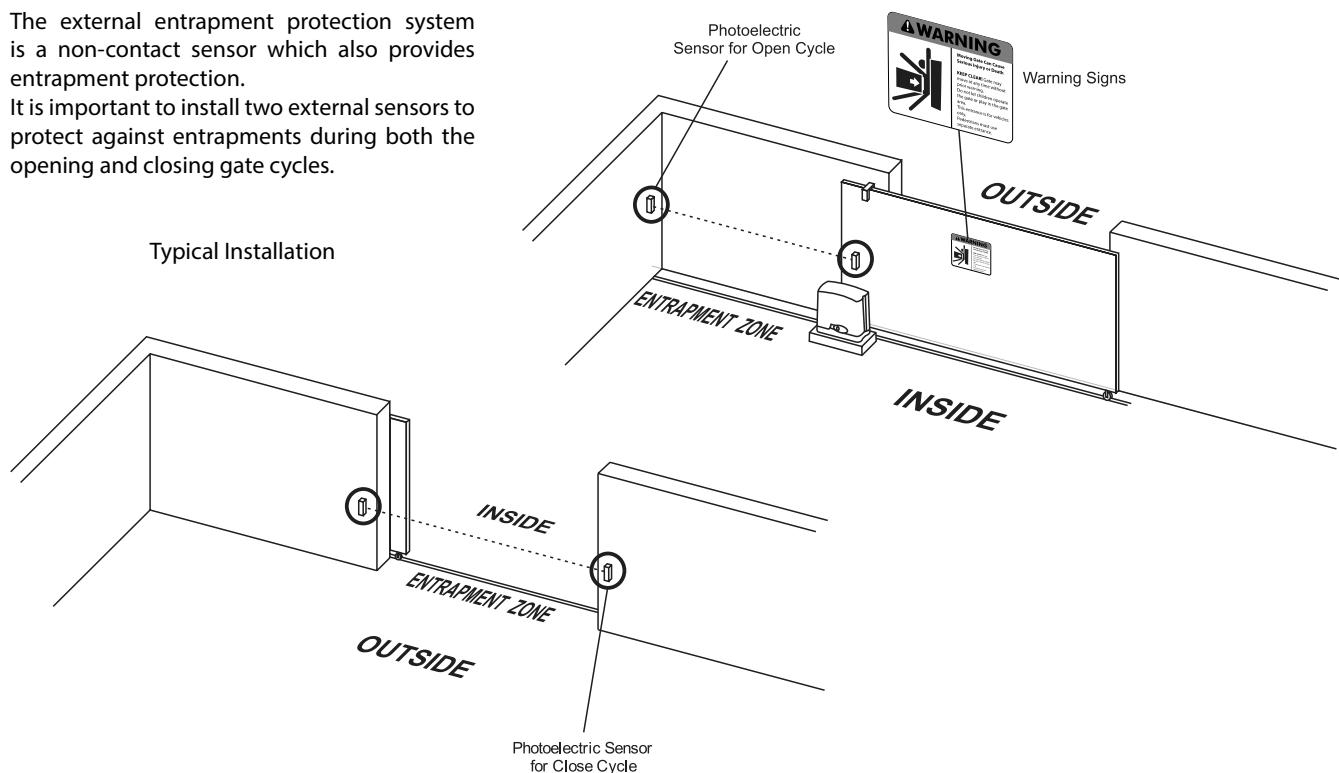
#### **! IMPORTANT**

- Note that this is a contact sensor so it will act after "physically" encountering an obstruction. For this protection to function correctly, the operator's force and limits must be properly adjusted.
- In the storage cycle (limits configuration), the inherent entrapment protection feature only has the function of recognizing the opening and closing cycle limits, that is, the route point where an obstruction is detected during the configuration is interpreted as the gate limit.

### **13.2 - External Entrapment Protection System (Type B1)**

The external entrapment protection system is a non-contact sensor which also provides entrapment protection.

It is important to install two external sensors to protect against entrapments during both the opening and closing gate cycles.

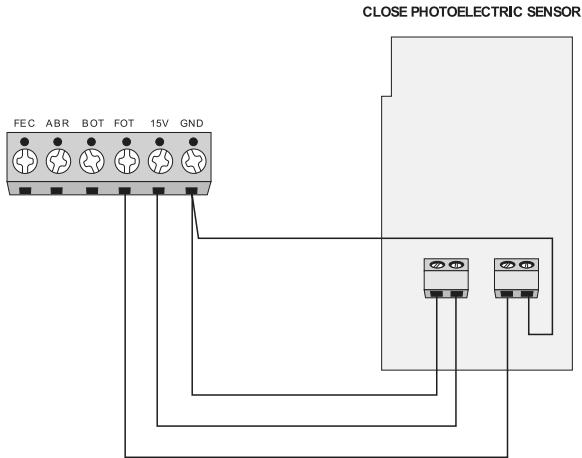


### **13.3 - 'FOT' closing cycle photoelectric sensor**

#### **WARNING**

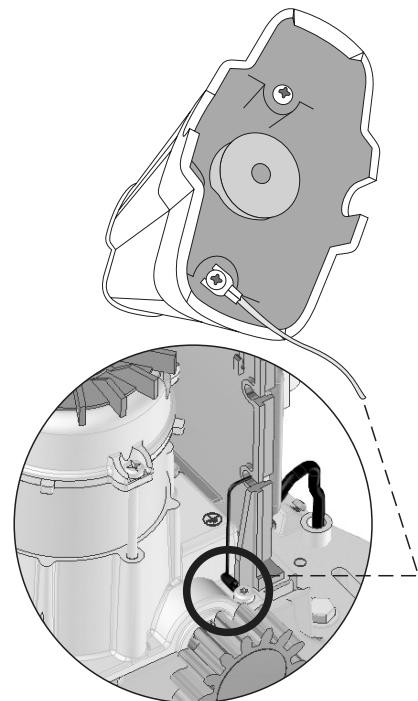
The control board only starts the closing movement when this sensor is already working properly.

Use only Miller Edge 4-wire pulsed sensors to comply with UL325



#### **IMPORTANT**

For proper operation it is important to connect the enclosure of the sensors (photoelectric receiver side) to the chassis ground of the operator.



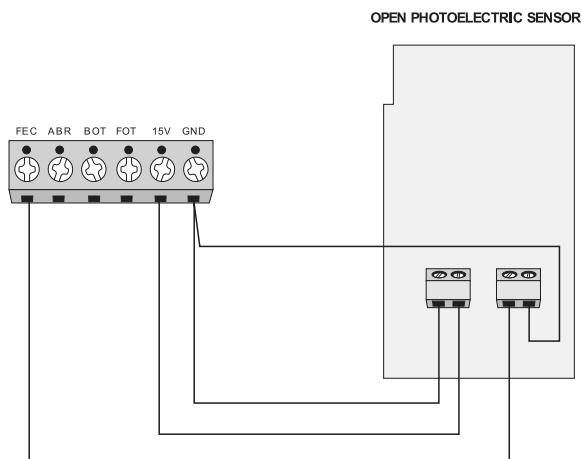
### **13.4 - 'FEC' opening cycle photoelectric sensor**

#### **WARNING**

The control board only starts the opening movement when this sensor is already working properly.

If the gate opening movement does not generate any entrapment situation, it is possible to disable the input for the open sensor (see topic 16.3 "TRV").

Use only Miller Edge 4-wire pulsed sensors to comply with UL325

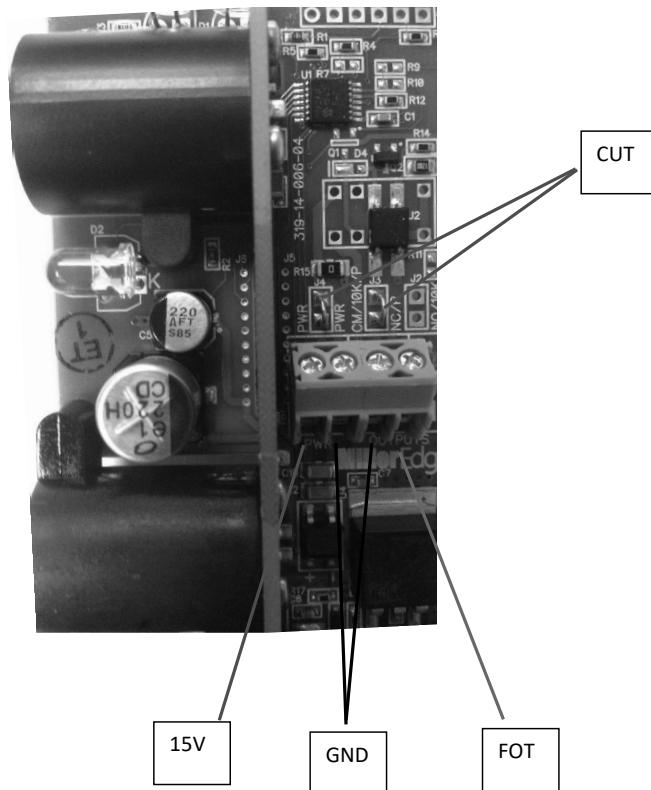


#### **WARNING**

The logic controller supplies 15V (maximum 120 mA direct current) to power photocells and receivers and IT DOES NOT HAVE OVERCURRENT PROTECTION. In case the equipment need a higher voltage or current, a further power supply must be used.

### 13.5 - Miller Edge reflexi Gard Connection

#### PREPARING PHOTOEYE



Reassemble the photoeye.

To align the photoeye assemble the hood on then reflector.

Place the photocell directed at the reflector and check the green light below the photocell lens (it will turn solid green when properly aligned).

The red light at the top of the photocell will be off whenever the photocell is aligned and unobstructed, and is on whenever something is between the photocell and the reflector.

#### TRIFLEX PROGRAM (UL 325 2018)

To **enable** the second photocell:

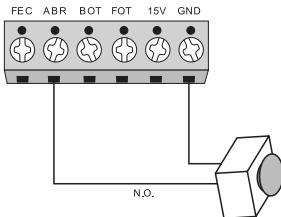
Put the dipswitch # 8 in On position, press and release the "+" button, return the dipswitch to OFF position.

To **disable** the second photocell:

Put the dipswitch # 8 in On position, press and release the "-" button, return the dipswitch to OFF position.

## **13.6 - 'ABR' audio alarm reset connection**

Connection for an external reset button. This button is used to turn off the audio alarm and to reset the operator after a Hard Shutdown has occurred.



Terminal block 1: GND (-);  
Terminal block 5: ABR (N.O. Contact).

## **14 - FORCE ADJUSTMENT**

### **⚠️ IMPORTANT**

To reduce the risk of SEVERE INJURY or DEATH:

1. Without a properly installed safety reversal system, persons (particularly small children) could be SERIOUSLY INJURED or KILLED by a moving gate.
2. Too much force on gate will interfere with proper operation of safety reversal system.
3. NEVER increase force beyond minimum amount required to move gate.
4. NEVER use force adjustments to compensate for a binding or sticking gate.
5. If one control (force or travel limits) is adjusted, FOP for example, the other control may also need adjustment (FME).
6. After ANY adjustments are made, the safety reversal system MUST be tested. Gate MUST reverse on contact with a rigid object.

### **14.1 - 'FOP' High Speed Force Adjustment**

Before starting the adjustment of the operating force, the operator must be recorded with the limit and operating normally, for more information see topics "10" and "15".

In this condition sets the Dip Switch 6 (FOP) to the ON position and press the ('-) button until the blue LED (OSC) flashes. Return the Dip 6 to OFF position and give a command to move the gate, see if the gate can move. If not, enter the FOP function again (Dip 6 ON position) and press the (+) button. Return the Dip 6 to OFF position and test again. Repeat this procedure until the gate can complete the course of opening and closing. This setting is the same for both opening and closing cycle.

In this condition, the force is the minimum required to move the gate operator. Then enter the FOP function again and increase ('+' button) 1 level to ensure that the gate performs the operation even with debris on the gate's track.

Once configured, return the DIP 6 to OFF position.

## **14.2 - 'FME' Low Speed Force Adjustment**

Before starting the adjustment of the operating force, the gate operator must be recorded with the limit and operating normally, for more information see topics "10" and "15".

In this condition sets the Dip Switch 1 and 6 (FME) to the ON position and press the (-) button until the blue LED (OSC) flashes. Return the Dip 1 and 6 to the OFF position and give a command to move the gate, see if the gate can reach the closing and opening gate catch post. If not, enter the FME function again and press the button (+). Return the DIPs 1 and 6 to the OFF position and test again. Repeat this procedure until the gate can complete the entire travel of opening and closing cycle.

In this condition, the force is the minimum required to move the gate operator. Then enter the FOP function again and increase ('+' button) 1 level to ensure that the gate performs the operation even with debris on the gate's track.

Once configured, return the DIP 1 and 6 to the OFF position.

## **15 - OPERATOR SYSTEM LOGIC FUNCTION**

### **15.1 – Getting started in gate mode (Gate travel recognition)**

When the inverter is powered up, after being properly installed on the operator, the gate should start an opening movement after an external command or if the '+' button is pressed.

If instead the gate starts a closing movement, remove the 'F/R' jumper to change the direction of the motor. After removing the jumper the gate will stop. Press the '+' button again or proceed with an external command. The gate should start opening.

Afterwards, let the gate open until it reaches the opening physical stop or the REED A (magnet limit switch) is activated. Then, it will automatically reverse the movement direction once again to close; let it reach the closing physical stop or activate the REED F.

#### ****WARNING****

The operator can work only with ENCODER (Digital) or ENCODER + REED (Hybrid), but cannot work only with a REED.

During the travel recognition only the obstruction of the external entrapment protection device can reverse the gate movement direction.

Your automatic gate opener is set and ready to use.

### **15.2 – Gate Operation after a power cycle (travel recognized)**

After the previous operation, the gate does not need to recognize the travel again. When the inverter is powered up, the gate simply closes slowly after a command ('+' button or external one), until it reaches the closing physical stop. The motor will turn off and the operator is ready to use again.

During this first closing cycle, only the photocell obstruction can reverse the gate movement direction (any other command will be ignored). In this case, when gate is fully opened the operator is ready to use.

In summary, after a reset occurs (with travel recognized – '15.1') the operator just need to get a reference of its position (fully closed or fully opened).

#### ****IMPORTANT****

When the Hybrid (ENCODER + REED) mode is used, if the gate is located in one of the magnets, it will start with full speed since it already has a reference of its position.

#### ****WARNING****

It is important to properly install a physical stop for both open and close cycle so that the control board can self adjust (minor corrections) the travel of the gate after every cycle.

## **16 - INVERTER PARAMETERS PROGRAMMING**

### **16.1 - Operator model selection**

The control board can operate, by using the same firmware, in both gates / doors and barriers.

To select the model, just remove the TST jumper and close the pines C/P (Cancel/Gate). When the function is selected the led "OSC" flashes fast for a certain period of time and then indicates its value,

The following table shows the number of flashes for each function:

Numbers of flashes	Referent Model
1	Nexus 600 / 900 / 1300 SL (SLS)
2	Nexus 2600 SL (SLS)
3	Dz Rio
4	Dz Predial / Condominium / 1500
5	Dz 2500 / 1500 HW
6	Barrier 14

The pause between flashes is three seconds and flashes occur every half second, so they are very different.

To increase the values, just press the plus button "(+)" and to decrease just press the button less "(-)".

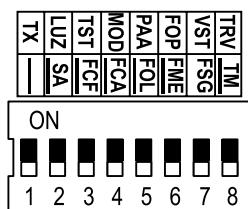
When you reach the desired template, return the jumper C / P to the TST position. Done that the plant is ready to operate in the chosen gate operator model.

### **16.2 - JUMPER TST**

When the TST jumper is removed, the control board enters in a mode that allows to position the gate operator at a given point of its travel to set limits or to verify the mechanical part.

In this mode, pressing the (-) button starts the motor clockwise rotation while the button is pressed, and when the (+) button is pressed the motor rotates in direction counterclockwise in the same manner.

### **16.3 - Adjustment of other parameters**



The control board also has other functions controlled by the DS1 DIP switch. When one selects one function, the 'OSC' LED rapidly blinks for a specific period of time and the indicates its parameter. When the 'OSC' LED blinks each half second (0.5s), the minimum value is selected; when it is off, a intermediate value is selected and when it keeps lit, the maximum value is selected. In order to increase the values, just press the '+' button; to decrease the values, just press the '-' button when the desired function is selected.

When leaving the function, the 'OSC' LED rapidly blinks again for a specific period of time, and then blinks in a one-second interval again.

Programming functions chart:

Function	Description
"_" or "TX (Switch #1)	<p>Function selector. It selects the underlined functions and selects the function to add and erase transmitters (TX).</p> <p>Function: Add and erase transmitters (TX)</p> <p>1 – Add: When this only switch is on 'ON' position, the control board is ready to add or erase transmitters (TX). In order to add a TX, press the transmitter button after activating the aforementioned switch. Observe that the 'OSC' LED blinks rapidly if it is receiving a signal. Press '+' button of the board to add it. Observe that the 'OSC' LED keeps lit when the board receives a signal already added.</p> <p>2 – Erase: In order to erase the transmitters added to the memory, press both '-' and '+' button at the same time for 10 seconds; observe that the LED will blink once per second; after the 10-second period is over, all transmitters have been erased from the memory.</p>
"SA" (Switches #1 and #2)	<p>Push-to-close function / Pause time on auto-close mode.</p> <p>Press "+" button for incrementing the pause time.</p> <p>Press "-" button for decrementing the pause time.</p> <p>Each button pressed increment or decrement the pause time from 2 seconds (1 seconds if in barrier mode).</p> <p>After the pause time, the operator will close automatically.</p> <p>To disable the auto-close function, set the pause time to zero (Led OSC blinking).</p> <p>The maximum pause time allowed is 240 seconds (Led OSC ON).</p>
"FCF" (Switches #1 and #3)	<p>Closed end-of-stroke.</p> <p>Increases or decreases the distance in which the operator starts to slow down when closing.</p>
"FCA" (Switches #1 and #4)	<p>Open end-of-stroke.</p> <p>Increases or decreases the distance in which the operator starts to slow down when opening.</p>
"FOL" (Switches #1 and #5)	<p>Gates:</p> <p>HOW TO ADJUST THE GAP BETWEEN THE GATE AND ITS STOP.</p> <p>If necessary, one can adjust the gap between the stop and the gate when the operator stops its opening / closing cycle. One can make it closer or more distant from the stop.</p> <p>The minimum level is 0 (LED blinking); it increases and decreases one level at a time up to its maximum 10 level (LED lit).</p> <div style="border: 1px solid black; padding: 5px; text-align: center;">  <b>IMPORTANT</b> </div> <p>To test the changes, it is necessary to activate the gate operator once so that it performs an opening / closing cycle.</p>
"FME" (Switches #1 and #6)	<p>HOW TO DECREASE OR INCREASE THE FORCE OF THE MOTOR DURING TRAVEL RECOGNITION.</p> <p>If necessary, it is possible to decrease the motor force during the travel recognition, for example, to avoid that the rack bar breaks. You can also increase the strength, in case it is necessary.</p> <p>Press '+' button to increase the strength and the '-' button to decrease it.</p> <p>The minimum level is 40% (LED blinking) and it increases four levels at a time (4%) up to the maximum 100% level (LED lit).</p> <p>This is the same force that will be used in the limits of the gate travel ("Low Speed Force"). This is a very important configuration because it is related to entrapment protection adjustment. For more information see topic '14.2'</p>

"FSG" (Switches #1 and #7)	<p><b>ENABLING FOLLOWER (MIRRORED) PHOTOCELL.</b></p> <p>In some facilities, such as gated communities, it is necessary to the gate to close automatically as soon as the vehicle gets out from the gate path. In order to do so, one must install one photocell and enable the 'follower' (AKA mirrored) function.</p> <p>Press '+' to enable it and include the period of time allowed before the automatic closing.</p> <p>The minimum level is zero (0 – LED blinking) and it increases one level at a time (1) up to its maximum 60-second level (LED lit).</p> <p>Example: LED blinking (function disabled). When pressing the '+' button once, the LED is turned off and the 'follower' function is enabled. The pause time before the automatic closing begins is zero (0) second. If one presses the button once more, the pause now is one (1) second. And so on, up to sixty (60) seconds, when the LED lits.</p>
"TM" (Switches #1 and #8)	Reserved for future use.
"LUZ" (Switch #2)	<p>Courtesy light timing.</p> <p>Selects the time interval the 'LG' output is kept activated after the gate closing. It increases ten seconds at a time (10s), from zero (0s) up to two-hundred forty seconds (240s). This output is automatically activated when a switch from the DIP switch is activated or the acquiring process begins.</p>
"VFC" (Switch #3)	<p>Speed at the travel's limits</p> <p>Speed adjustment for starting and stopping region</p> <ul style="list-style-type: none"> <li>• Dip 3 to "ON" ("VFC");</li> <li>• "(+)" Button increases the speed;</li> <li>• "(-)" Button decreases the speed;</li> </ul> <p>In gates, the adjustment is from 5 of 5 Hz, from 15Hz up to 30Hz.</p>
"VEL" (Switch #4)	<p>Gate: Adjust the speed of opening and closing Gate.</p> <ul style="list-style-type: none"> <li>• Key 4 to "ON" ("VEL");</li> <li>• "(+)" Button increases the speed;</li> <li>• "(-)" Button decreases the speed;</li> </ul> <p>The adjustment is from 10 to 10Hz, from 60Hz up to 150Hz.</p>
"PAA" (Switch #5)	<p>Gate:</p> <p>TURN THE PAUSE OFF THROUGH A COMMAND DURING OPENING.</p> <p>When the operator is installed on gated communities, it may be necessary to turn the function which 'stops' (pauses) the gate off when receiving a command during opening.</p> <p>Press either the '-' button to turn the opening pause off (LED blinking) or the '+' button to turn it on (LED lit).</p>
"FOP" (Switch #6)	<p><b>ADJUST OPERATOR "STRENGTH".</b></p> <p>The operator, by default, has its strength on maximum level. One can decrease it in case it is necessary. Press '-' button to decrease the strength and '+' to increase it.</p> <p>The minimum level is 40% (LED blinking) and increases four levels at a time (4%) up to the maximum 100% level (LED lit).</p> <p>If the strength is in a very low level, the gate operator won't work with maximum speed.</p> <p>For more information see topic "14.1"</p>
"VST" (Switch #7)	<p>Gate's start speed.</p> <p>To change it: press '-' button to decrease and '+' to increase.</p> <p>Minimum 20Hz (OSC LED blinking) increasing from 10Hz up to 60Hz ('OSC' LED lit).</p>

<p>"TRV" (Switch #8)</p>	<p>Photoelectric Sensor Configuration.</p> <p>"OSC" LED lit: The control board is configured to operate with both closing and opening photoelectric devices.</p> <p>"OSC" LED flashing: The control board is configured to operate with only a closing photoelectric device.</p> <p>Use the "+" and "-" button to make configuration changes.</p> <p>For more information see topic 13.</p>
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## **17 - ERASING THE RECOGNIZED GATE TRAVEL**

In order to erase the acquired path, one must simply press both '+' and '-' buttons at the same time and keep them pressed until 'OSC' LED lits. When the buttons are released, the acquired path is already erased.

**Note:** All switches on the DS1 DIP Switch must be on 'OFF' position.

## **18 - APPLYING THE DEFAULT STANDARD SETTINGS**

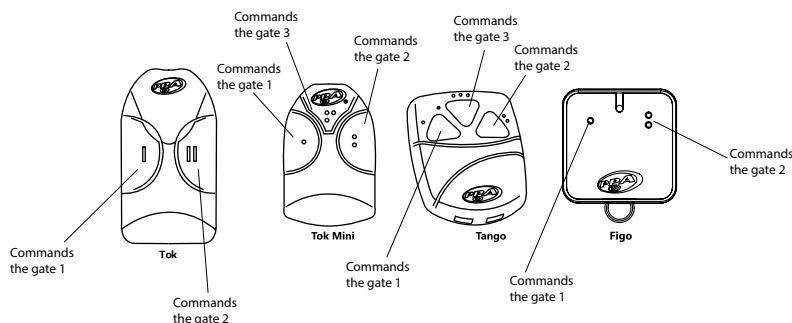
To set all patterns to the factory standard, one must simply press both '+' and '-' buttons at the same time and keep them pressed until 'OSC' LED lits; after it lits, do not release the buttons; keep them pressed until 'OSC' LED starts blinking. When the buttons are released, the acquired path is already erased and the settings are back to the default.

## **19 - ADDING A REMOTE CONTROL**

In order to add an RF transmitter, slide the key #1 of the DS1 DIP Switch to 'ON' position; then, press the button of the transmitter one wants to add and keep it pressed for at least two seconds. Afterwards, press the '+' button of the TriFlex control board. Observe that before the transmitter has been added, the 'OSC' LED blinked rapidly; after the addition process, 'OSC' LED keeps lit during transmission. 328 transmitters can be added.

### **19.1 – Remote control functions**

Depending on the model, PPA remote controls have two or three buttons. Thus, a single control may open two or three different gates. Below, the functions of the remote controls are described:



**Note:** To make the encoding of the remote control, call a gate operator qualified technician.

## **19.2 - The remote control battery**



### **WARNING**

To prevent possible SERIOUS INJURY or DEATH:

- NEVER allow small children near batteries.
- If battery is swallowed, immediately notify a doctor.

To reduce risk of fire, explosion or chemical burn:

- Replace ONLY with 3V CR2032 coin batteries.
- Do NOT recharge, disassemble, heat above 212°F or incinerate.

The lithium battery should produce power for up to 1 year. To replace battery, remove the clip, use the philips screwdriver to remove the screw (FIGO controller doesn't have screws) and open the case as shown. Insert baterry positive side up (+) for TOK, MINI TOK and TANGO controllers and positive side down for FIGO. Dispose of old battery properly. Replace the battery with only 3V CR2032 coin batteries.

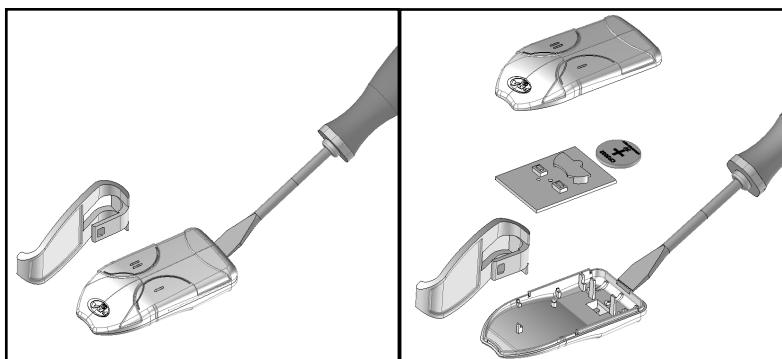
**THE REMOTE CONTROL BATTERY – MINI TOK**



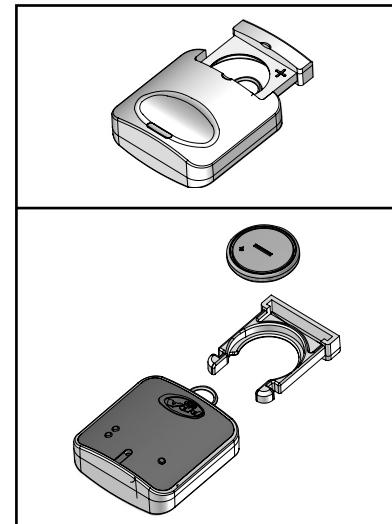
**THE REMOTE CONTROL BATTERY - TANGO**



**THE REMOTE CONTROL BATTERY - TOK**



**THE REMOTE CONTROL BATTERY - FIGO**



## **20 - SELECTION OF RF RECEPTION PROTOCOL (CR/CF JUMPER)**

Jumper Closed: Fixed Code Protocol  
Jumper Open: Rolling Code Protocol

### **! IMPORTANT**

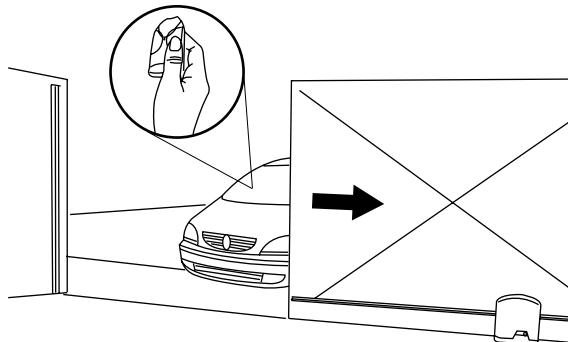
Every time this configuration (reception protocol) is changed, ALL the recorded remote controls MUST be erased. For more information see topic '21'.

## **21 - ERASING ALL STORED REMOTE CONTROLS**

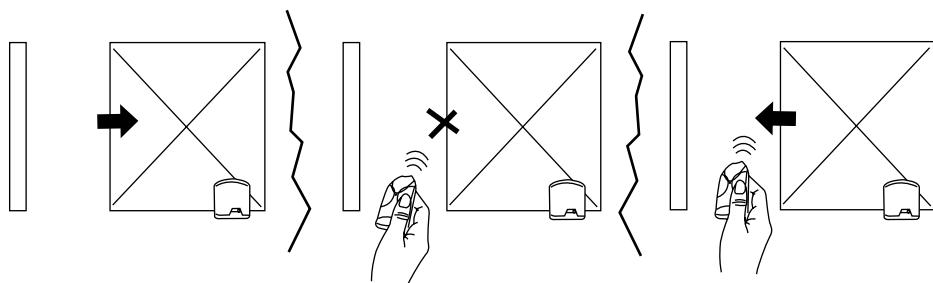
In order to erase all remote controls stored on the board memory, slide the #1 switch of the DS1 DIP switch to the 'ON' position; press both '-' and '+' buttons of the control board at the same time for 10 seconds, observe that the 'OSC' blinks once per second and after the 10-second period, the LED stops counting the time; this means all added transmitters have been erased.

## **22 - USER OPERATION**

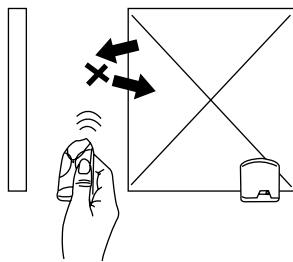
To activate your operator, press for 1 second, the PPA remote button with the machine.



If the remote control is operated while the gate is opening, the gate operator will stop and will remain that way until the remote control to fire again. When this happens, the gate will close.



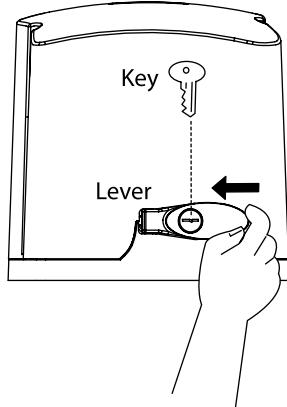
If the remote control is activated while the gate is closing, for security reasons, the gate will stop and automatically open.



### **22.1 - Unlocking (manual release and operation)**

In case of power failure, the equipment has an unlocking system to open and close the gate manually.

- 1) To operate the gate in manual mode, turn the key counter-clockwise;
- 2) Move the lever to the left;
- 3) Move the gate leaf;



- 4) To operate again in automatic mode, return the lever to the starting position and turn the key clockwise.

## **23 - ACCESSORIES**

The electronic control unit allows the installation of other accessories (NOT INCLUDED) that add functions to operator and give more comfort and safety to the user:

### **23.1 - Garage Light**

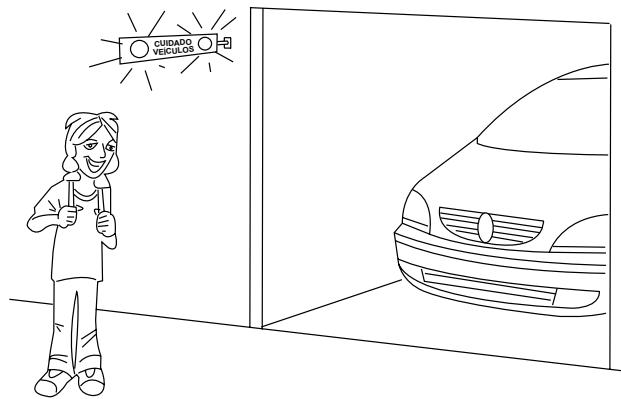
Turns the light from the garage where the operator is installed, so that it is activated to open, allowing check for any individual near the residence.

The light goes out only after the complete closure of the gate with adjustable time delay (this accessory not included).

## **23.2 - Flashing lights**

Alert the pedestrian exit or driveway in a particular location.

The flag comes into operation when the gate is activated to open and off so that it is fully closed and off (this accessory not included).



## **24 - EVENT / FAILURE INDICATION**

### **24.1 - Microcontroller functioning indication**

The main function of the 'OSC' LED is to indicate if the board's microcontroller is properly running (it blinks with a stable frequency (~1Hz), since it is connected to a power supply).

### **24.2 – Indication of over current or short circuit on the motor**

'OSC' rapidly blinks in 0.1-second intervals, to warn that the capacitors have been disarmed due to over current or short circuit on the motor. The board can normally run 10 seconds after the over current.

### **24.3 – Overheating indication**

'FC' LED rapidly blinks in 100-millisecond intervals to warn that the capacitors have been disarmed due to heat sink or environment overheating. The operator can only work again if the temperature decreases to less than 100°C.

### **24.4 – EEPROM fault indication**

'OSC' LED blinks twice when there is no memory inserted.

### **24.5 – EEPROM invalid data indication**

'OSC' LED blinks three times when there is an available memory, but it has a content that the microcontroller does not identify as a Valid Transmitter Code.

## **24.6 - Open end-of-stroke indication**

'FC' LED blinks when the gate is on an open end-of-stroke area.

## **24.7 - Close end-of-stroke indication**

'FC' LED keeps lit when the gate is on a closed end-of-stroke area.

## **24.8 - Capacitor load indication**

'BUS' LED indicates that the high voltages capacitors are charged. Do not touch them while this LED is ON (even when the control board is disconnected from the power supply).

## **24.9 – Encoder Test**

It is possible to test the operator's encoder; to do so; simply connect it to the control board and check if the 'ENCA' and 'ENCB' are blinking when the operator runs. Each LED corresponds to a specific sensor; for example, 'ENCA' LED corresponds to the 'A' sensor inside the gear motor.

## **24.10 - Thermal Protection**

The operator has a thermal protection device that shuts off the motor when it reaches a temperature above 310 °F. The control board receiving two consecutive commands during this period, it will enter in hardshutdown mode (Audio alarm will sound) and the operator will need to be reset.  
For more information see topic 13.5.

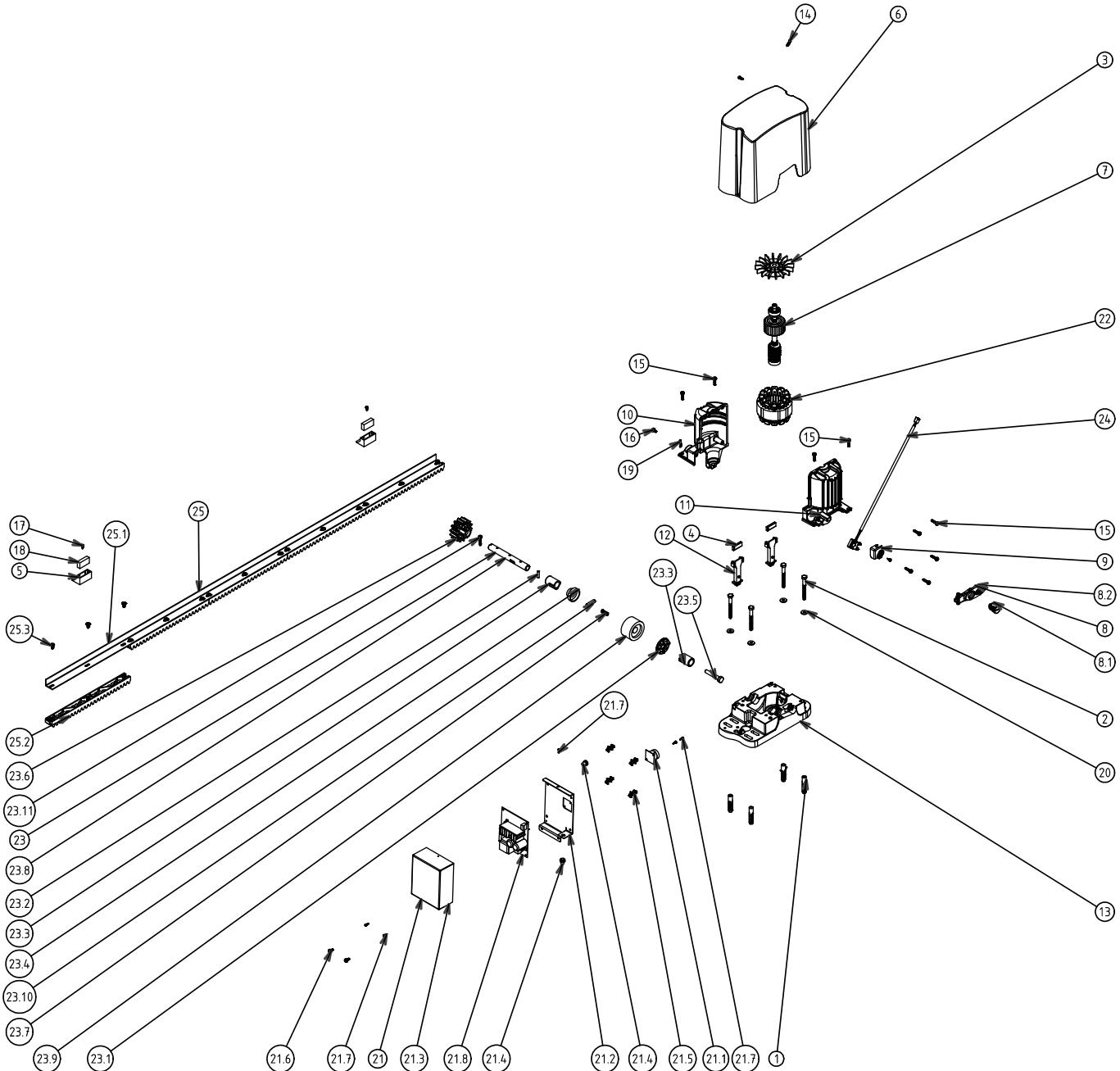
# **25 - MAINTENANCE**

On the table below, are cited some PROBLEMS - FAULTS, POSSIBLE CAUSES AND CORRECTION - which may occur in your operator. Before any maintenance, the total disconnection from the mains is required.

<b>FAIL</b>	<b>CAUSE</b>	<b>SOLUTION</b>
The gate does not correspond to the path of the place where the operator has been installed (It breaks before it reaches the stop or slams when closing).	There is an acquired path different from the place where the operator has been installed.	Press both '+' and '-' buttons at the same time and keep them pressed until 'OSC' LED lits.
Gate keeps open and whenever it receives opening commands, it closes.	Acquiring was not properly performed.	Refer to item 'First operation after a frequency inverter is installed on the operator (Acquiring)'.
'OSC' LED blinks rapidly and the motor turns itself off.	Current sensor activated. This may happen when the motor has a malfunction.	Check stator resistance. Check the motor current (It must be less than medium 3A RMS and 5A RMS peak current (2s maximum)).

## **26 - REPAIR PARTS**

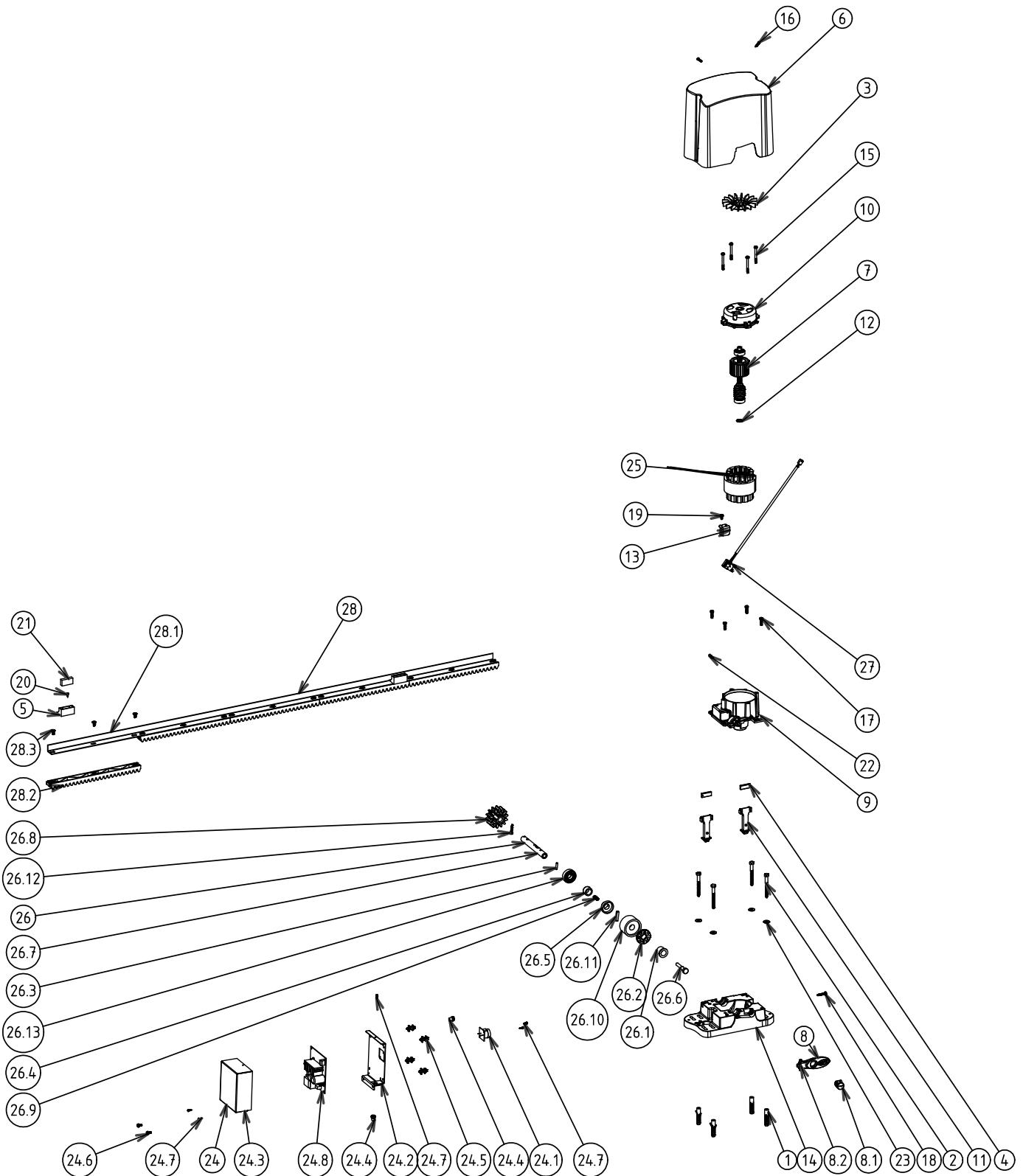
### **DZ RIO 1/4 JET FLEX 60HZ U**



## SLIDING GATE OPENER - DZ RIO 1/4 JET FLEX 60HZ U

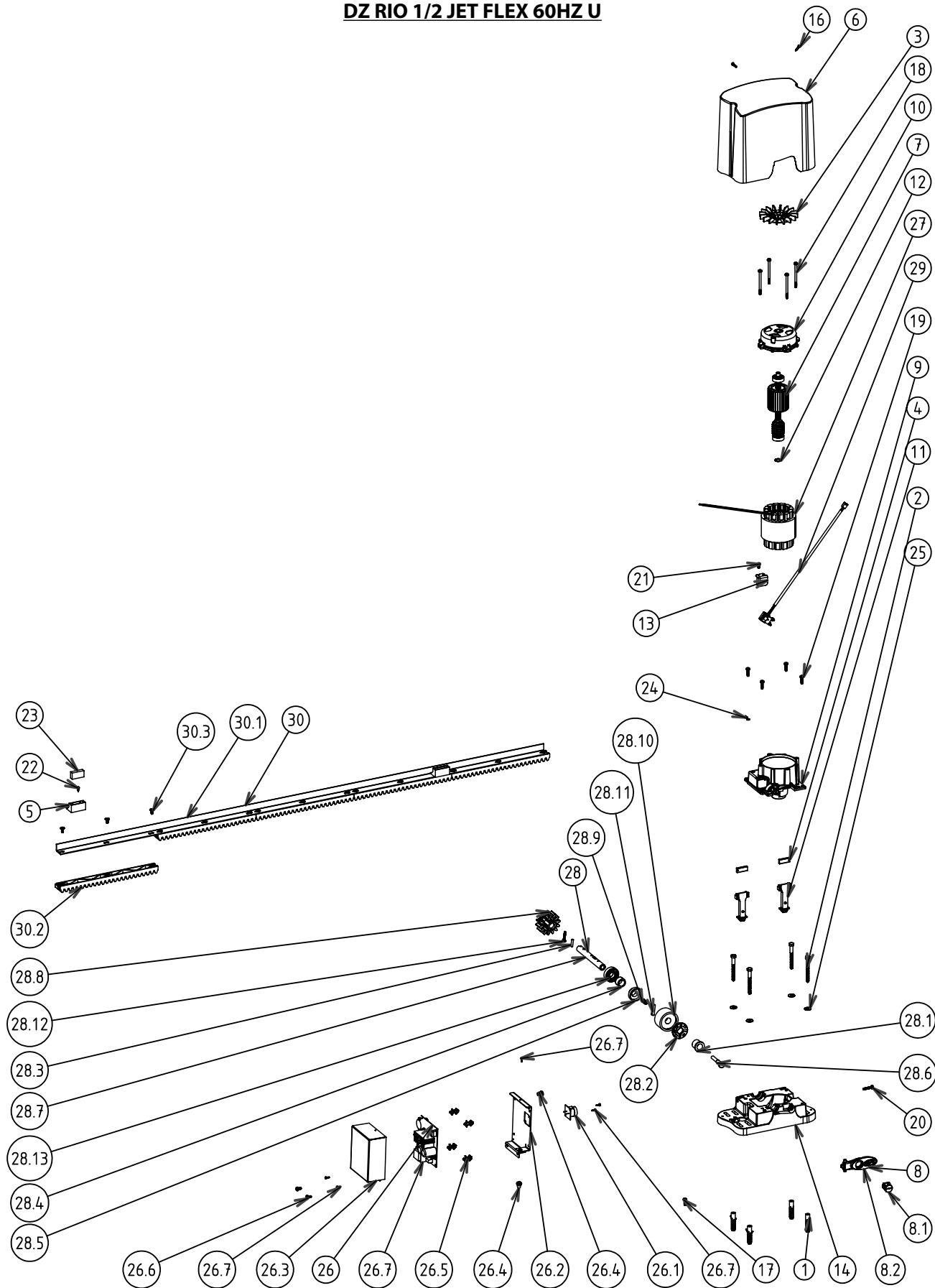
REF N°	PART N°	QTY	PARTS DESCRIPTION
1	P14200	4	S10 BUSH
2	P14199	4	1/4" X 2.1/2" HEX SCREW
3	P10670	1	MOTOR FAN
4	P10526	1	LIMIT REED
5	P10518	2	MAGNET BRACKET
6	P03569	1	PLASTIC COVER PROTECTION
7	P03089	1	30MM ROTOR SHAFT
8	P01541	1	UNLOCKING HANDLE SET
8,1	P03497	1	LOCK
8,2	P01444	1	UNLOCKING HANDLE
9	P01450	1	ENCODER COVER
10	P01448	1	LEFT MOTOR CASING
11	P01446	1	RIGHT MOTOR CASING
12	P01264	2	REED BRACKET
13	P01192	1	REDUCER BASE
14	C10938	2	3,5 X 16 PHILIPS SCREW
15	C10833	9	M5 X 20 TORX SCREW
16	C10778	1	M5 X 10 TORX SCREW
17	C10254	3	3,9 X 9,5 PHILIPS SCREW
18	C10083	2	10 X 18.8 X 36.3 MAGNET
19	C10066	1	GROUND TERMINAL
20	C10003	4	1/4" FLAT WASHER
21	A16819	1	DZ RIO CONTROL BOARD BOX (STEEL)
21,1	P27200	1	FLOYD BELL M-80 BUZZER SET
21,2	P04078	1	DZ RIO CONTROL BOARD STEEL BASE
21,3	P04077	1	DZ RIO CONTROL BOARD STEEL LID
21,4	P00681	2	OPERATOR CABLE BUSHING
21,5	C26958	4	PCB ECI 9 SPACER
21,6	C10778	2	M5 X 10 TORX SCREW
21,7	C10474	5	M3X10 PP PL SCREW
21,8	A21924	1	CONTROL BOARD TRI-FLEX 60HZ (SPARE)
22	A16489	1	120V 30MM 60HZ STATOR
23	A15647	1	SET OUTPUT SHAFT
23	P15560	1	SET UNIVERSAL DISC
23,1	C27619	1	6 X 6 X 31 KEY
23,11	C10779	1	M5 X 25 TORX SCREW
23,2	P13869	1	Ø5 X 21 BUSH PIN
23,3	P13865	2	SPACER BUSHING
23,4	P13864	1	UNLOCKING NYLON BUSHING
23,5	P01481	1	UNLOCKING PLASTIC PIN
23,6	P01412	1	Z14 GEAR
23,7	P01266	1	UNLOCKING SPRING
23,8	P01202	1	OUTPUT SHAFT
23,9	P00918	1	Z23 WORM WHEEL
24	A15415	1	SET UNIVERSAL ENCODER
25	A11612	1	RACK BARS 1,50 M (BLACK)
25,1	P18260	1	BRACKET RACK
25,2	P14201	5	RACK PIECE
25,3	C10493	15	M5X12 PR P SCREW

**DZ RIO 1/3 JET FLEX 60HZ U**



SLIDING GATE OPENER - DZ RIO 1/3 JET FLEX 60HZ U			
REF N°	QTY	PART N°	PARTS DESCRIPTION
1	4	P14200	S10 BUSH
2	4	P14199	1/4" X 2.1/2" HEX SCREW
3	1	P10670	MOTOR FAN
4	1	P10526	LIMIT REED
5	2	P10518	MAGNET BRACKET
6	1	P03569	PLASTIC COVER PROTECTION
7	1	P03090	40MM ROTOR SHAFT
8	1	P01541	SET UNLOCKING HANDLE
8.1	1	P03497	LOCK + FEATHER KEY SET (1/2 THREAD)
8.2	1	P01444	DZ RIO ALUMINIUM UNLOCKING LEVER
9	1	P01414	UPPER BASE MOTOR
10	1	P01394	UPPER COVER MOTOR
11	2	P01264	REED BRACKET
12	1	P01213	RETAINING RING
13	1	P01197	ENCODER COVER
14	1	P01192	REDUCER BASE
15	4	C13014	M5 X 50 TORX SCREW
16	2	C10938	3,5 X 16 PHILIPS SCREW
17	4	C10833	M5 X 20 TORX SCREW
18	1	C10779	M5 X 25 TORX SCREW
19	1	C10778	M5 X 10 TORX SCREW
20	2	C10254	3,9 X 9,5 PHILIPS SCREW
21	2	C10083	10 X 18.8 X 36.3 MAGNET
22	1	C10066	GROUND TERMINAL
23	4	C10003	FLAT WASHER 1/4
24	1	A16819	DZ RIO CONTROL BOARD BOX (STEEL)
24.1	1	P27200	FLOYD BELL M-80 BUZZER SET
24.2	1	P04078	DZ RIO CONTROL BOARD STEEL BASE
24.3	1	P04077	DZ RIO CONTROL BOARD STEEL LID
24.4	2	P00681	OPERATOR CABLE BUSHING
24.5	4	C26958	PCB ECI 9 SPACER
24.6	2	C10778	M5 X 10 TORX SCREW
24.7	5	C10474	M3 X 10 TORX SCREW
24.8	1	A21924	CONTROL BOARD TRI-FLEX 60HZ (SPARE)
25	1	A16477	DZ STATOR - 3 PHASE - 110V - 50/60 HZ - 40 MM (UL)
26	1	A15798	SET OUTPUT SHAFT
26.1	1	P16033	17MM FLANGE BUSH
26.2	1	P15560	SET UNIVERSAL DISC
26.3	1	P13869	Ø5 X 21 BUSH PIN
26.4	1	P13866	17MM NYLON BUSH CASING
26.5	1	P13864	UNLOCKING NYLON BUSH
26.6	1	P01481	UNLOCKING PLASTIC PIN
26.7	1	P01421	OUTPUT SHAFT
26.8	1	P01412	Z14 GEAR
26.9	1	P01266	UNLOCKING SPRING
26.10	1	P00918	Z23 GEAR RING WITH ALUMINIUM HUB
26.11	1	C27619	6 X 6 X 31 FEATHER KEY
26.12	1	C10779	M5 X 25 TORX SCREW
26.13	1	C10197	6203 ZZ BEARING
27	1	A15415	SET UNIVERSAL ENCODER
28	1	A11612	RACK BAR KIT
28.1	1	P18260	RACK CORNER - LIGHT
28.2	5	P14201	RACK BAR PIECE
28.3	15	C10493	M5 X 12 FLANGED SCREW

**DZ RIO 1/2 JET FLEX 60HZ U**



SLIDING GATE OPENER - DZ RIO 1/2 JET FLEX 60HZ U			
REF N°	QTY	PART N°	PARTS DESCRIPTION
1	4	P14200	S10 BUSH
2	4	P14199	1/4" X 2.1/2" HEX SCREW
3	1	P10670	MOTOR FAN
4	1	P10526	LIMIT REED
5	2	P10518	MAGNET BRACKET
6	1	P03569	PLASTIC COVER PROTECTION
7	1	P03091	DZ RIO 60 MM (RED 1:23) ROTOR SHAFT
8	1	P01541	SET UNLOCKING HANDLE
8.1	1	P03497	LOCK + FEATHER KEY SET (1/2 THREAD)
8.2	1	P01444	DZ RIO ALUMINIUM UNLOCKING LEVER
9	1	P01414	UPPER BASE MOTOR
10	1	P01394	UPPER COVER MOTOR
11	2	P01264	REED BRACKET
12	1	P01213	RETAINING RING
13	1	P01197	ENCODER COVER
14	1	P01192	REDUCER BASE
16	2	C10938	3,5 X 16 PHILIPS SCREW
17	1	C10896	M5 X 16 TORX SCREW
18	4	C10859	M5 X 70MM - 30MM THREAD TORX SCREW
19	4	C10833	M5 X 20 TORX SCREW
20	1	C10779	M5 X 25 TORX SCREW
21	1	C10778	M5 X 10 TORX SCREW
22	2	C10254	3,9 X 9,5 PHILIPS SCREW
23	2	C10083	10 X 18.8 X 36.3 MAGNET
24	1	C10066	GROUND TERMINAL
25	4	C10003	FLAT WASHER 1/4
26	1	A16819	DZ RIO CONTROL BOARD BOX (STEEL)
26.1	1	P27200	FLOYD BELL M-80 BUZZER SET
26.2	1	P04078	DZ RIO CONTROL BOARD STEEL BASE
26.3	1	P04077	DZ RIO CONTROL BOARD STEEL LID
26.4	2	P00681	OPERATOR CABLE BUSHING
26.5	4	C26958	PCB ECI 9 SPACER
26.6	2	C10778	M5 X 10 TORX SCREW
26.7	5	C10474	M3 X 10 TORX SCREW
26.8	1	A21924	CONTROL BOARD TRI-FLEX 60HZ (SPARE)
27	1	A16480	DZ STATOR - 3 PHASE - 110V - 50/60 HZ - 60 MM (UL)
28	1	A15798	OUTPUT SHAFT SET
28.1	1	P16033	17MM FLANGE BUSH
28.2	1	P15560	SET UNIVERSAL DISC
28.3	1	P13869	Ø5 X 21 BUSH PIN
28.4	1	P13866	17MM NYLON BUSH CASING
28.5	1	P13864	UNLOCKING NYLON BUSH
28.6	1	P01481	UNLOCKING PLASTIC PIN
28.7	1	P01421	OUTPUT SHAFT
28.8	1	P01412	Z14 GEAR
28.9	1	P01266	UNLOCKING SPRING
28.10	1	P00918	Z23 GEAR RING WITH ALUMINIUM HUB
28.11	1	C27619	6 X 6 X 31 FEATHER KEY
28.12	1	C10779	M5 X 25 TORX SCREW
28.13	1	C10197	6203 ZZ BEARING
29	1	A15415	SET UNIVERSAL ENCODER
30	1	A11612	RACK BAR KIT
30.1	1	P18260	RACK CORNER - LIGHT
30.2	5	P14201	RACK BAR PIECE
30.3	15	C10493	M5 X 12 FLANGED SCREW



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