STANDARD OPERATOR

Universal Installation & Users Manual - Mk II

Rev: 804061

(For electrical installation only, go to page 5)

Contents:

Grifco Advanced Users
QUICK START GUIDE

CONNECTING POWER
- Open enclosure
- Feed leads through conduit entry
- Attach power leads to correct positions on power terminal block (Refer page 5)
- Connect controller using 6 metre cable (RJ45 sockets)

IF DOOR DIRECTION IS INCORRECT:
- While holding STOP, press the SET button 3 times
- The limit indicator will flash
- Hold stop for 10 seconds until limit indicator flashes quickly
- Press stop to exit (or proceed to *SET LIMITS)

TO SET LIMITS
- While holding the STOP button, press and release the SET button 3 times
- The limit indicator will flash
- *Move door into closed position
- Press SET, indicator will flash quickly
- Move door into open position
- Press SET, indicator will flash quickly, then go off

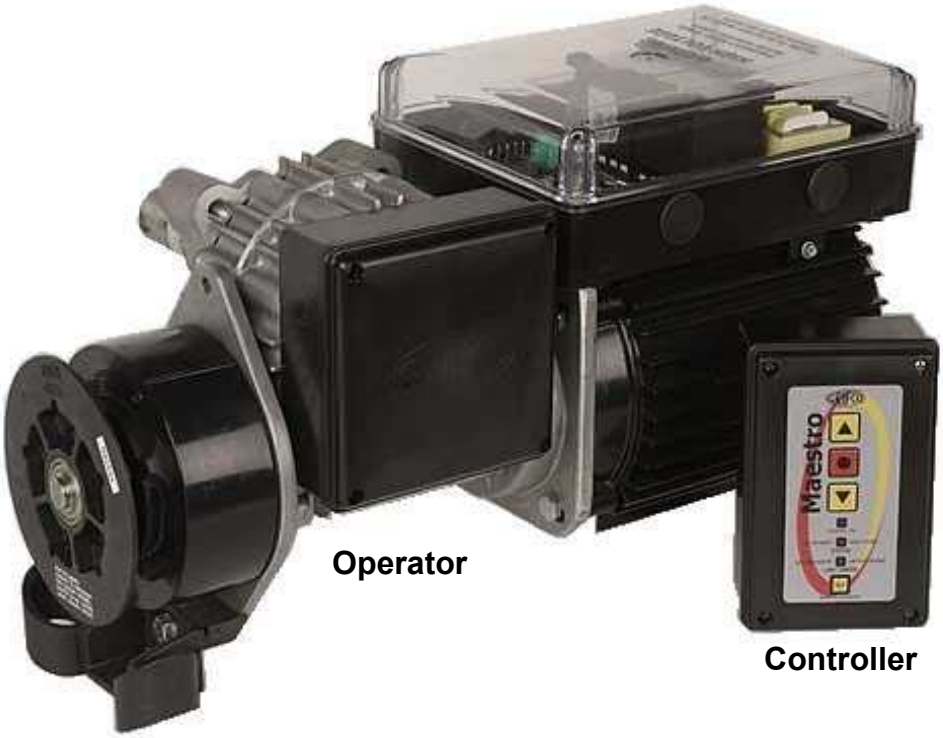
For a more detailed explanation on installation, setup, and operation please read booklet

Introduction

Congratulations on your purchase of the Grifco Maestro Industrial Operator unit. The Maestro is a state-of-the-art operator using sophisticated digital electronics and a robust gear head that provides a balance of user friendly operation and high level technology.

The new Maestro series begins a revolution in electronic control flexibility and functionality for industrial doors.

Identifying your Maestro kit



Appearance may vary with different motor, gearbox and controller types

- Your standard Maestro includes the Operator, Mounting Bolts, and Controller (containing Controller cable and glands)
- Some optional accessories may also be included such as a Mounting plate, Sprockets and chain

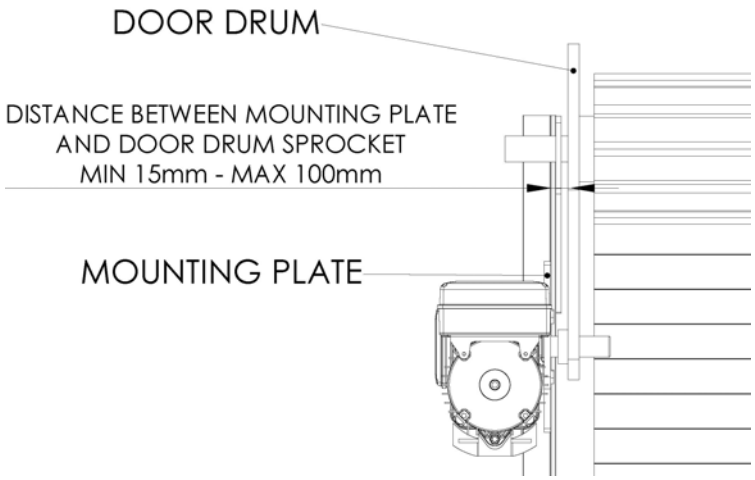
Installation

Mounting the unit

The Maestro is typically flag mounted below the door drum so that the operator shaft points toward the door opening and lies beneath the sprocket of the door drum. For mounting you will need to either secure the operator to the roller shutter head plate with prepared holes or slots, or use a mounting plate that will need fixing via a wall angle or similar existing fixture.

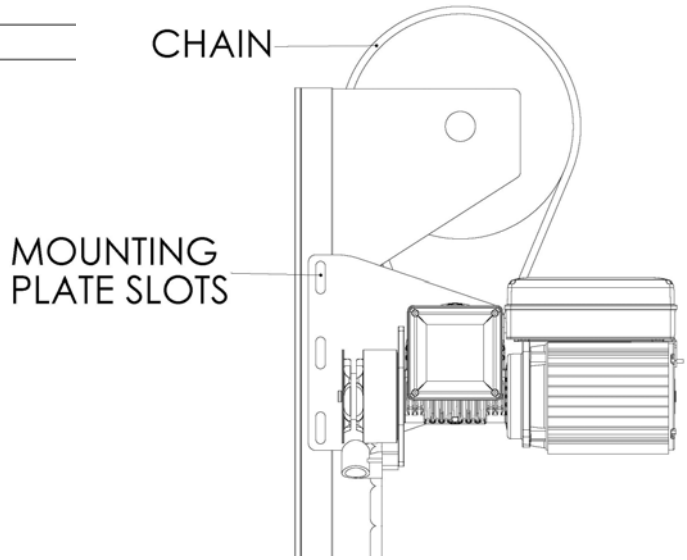
Note: The Maestro is not designed to be inverted. The chain guide must not be repositioned.

When assessing and selecting an appropriate mounting location, the following considerations should be taken:

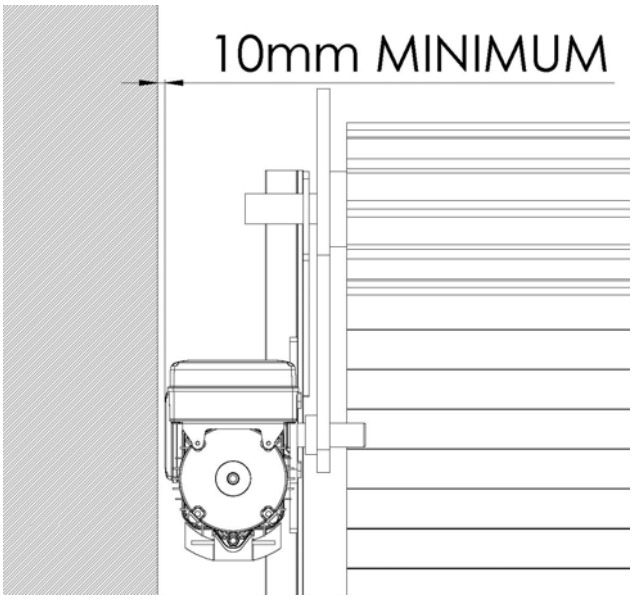


Alignment of door sprocket to output shaft of Maestro (see left)

Mounting plate slots allow the chain tension to be adjusted through vertical movement of the operator (see right)

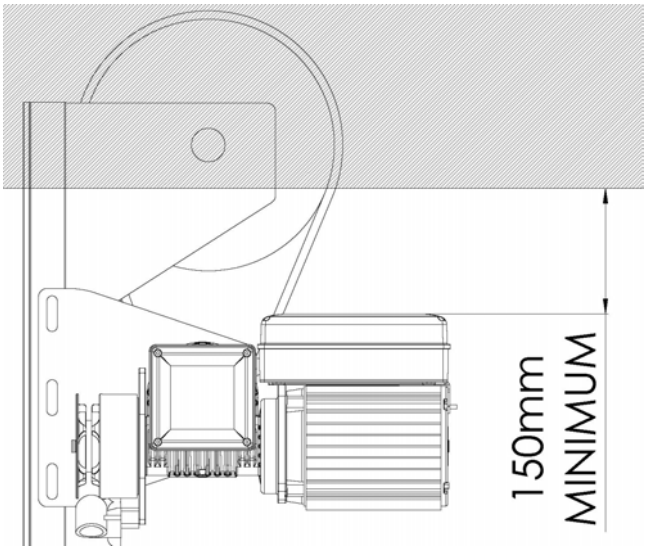


Clear path for manual chain to hang downward (see left)



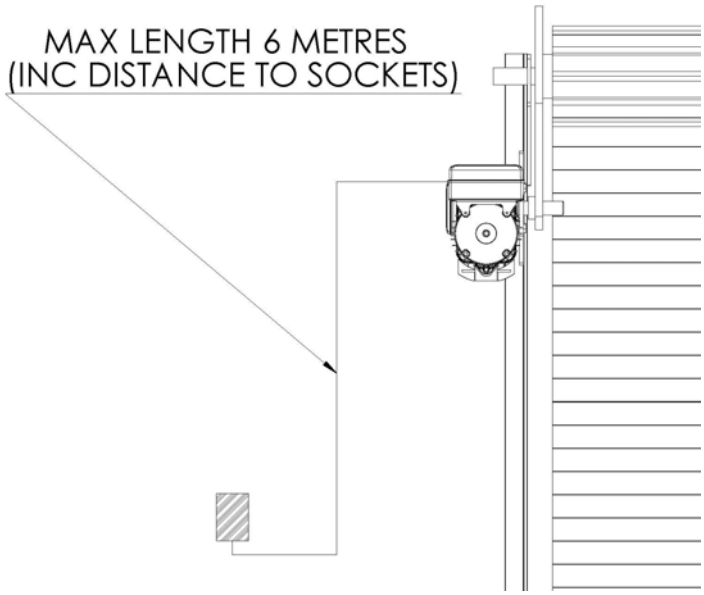
Side room to imposing structures (see left)

Note: The Maestro encoder housing is not a serviceable area and can be located within 10mm of an imposing structure without affecting installation. Where there is insufficient side room, consider using the opposite hand operator and mount inboard with a Grifco Inboard Mounting Kit, P.No. IBMK.



Limited head room to ceiling (see right)

*Note: The Maestro main control housing is a serviceable area and will need to be accessed by service personnel. See * below for options of how to overcome problems in which sufficient head room is not available.*



* If there is insufficient head room above the Maestro operator to allow servicing then a Grifco Wall Mount Kit (Part No. WMK1) or Grifco Rotation Bracket (Part No. RBK1) can be used to reposition the main control housing. Please contact your local roller shutter dealer or Grifco for more information.

Location of Controller (see left)

Note: Controller has 6 metres of cable with RJ45 ends ready to connect the Maestro Operator to the Controller. Maestro Controller Extension Kit (P.No. ESK01) is available if needed.

When Securing the Maestro Operator with the 4 x M12 x **40mm** long fasteners (based on a 8mm mounting plate) and spring washers provided, it is critical to ensure that the applied torque is between 80-90Nm. When mounting through thicker sections, ensure a minimum of 30mm of screw thread is engaged with the female thread. Use of incorrect fasteners or torque may cause serious product damage and/or personal injury. When fixing through a slotted plate, ensure that the slots are no wider than 13mm as a spring washer may not be adequate in outside diameter to support the hexagon head.

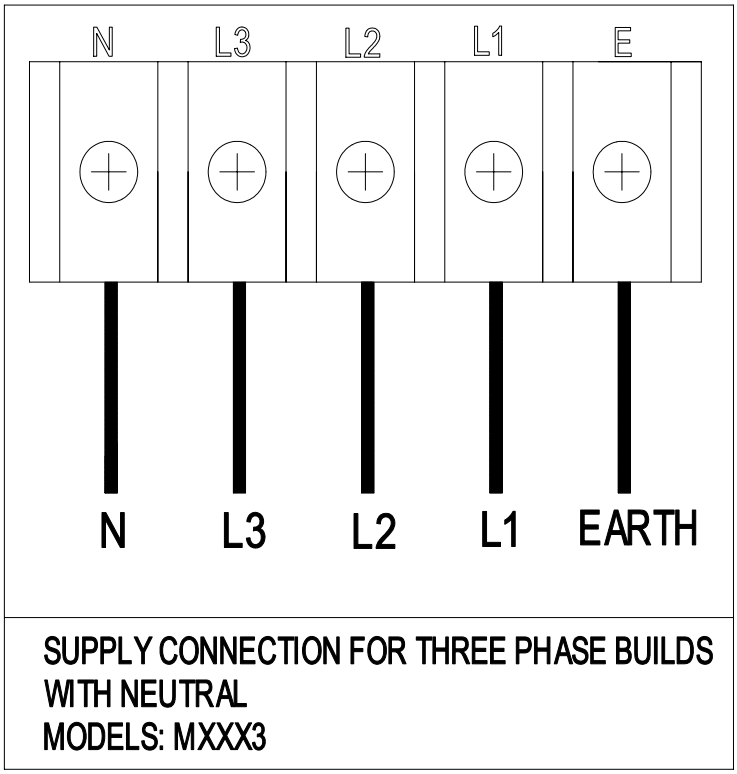
Connecting Power

Precautions-

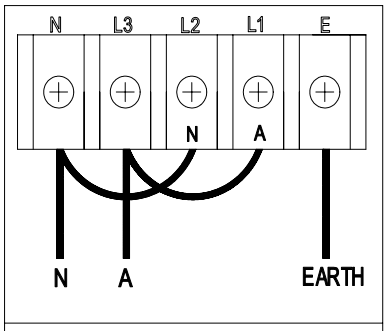
The Maestro Operator ***must****:*

- *be connected via a device that is capable of being locked for maintenance*
- *be connected via a suitable circuit breaker that disconnects all live conductors*
- *have a handle of supply easily accessible and in the vicinity of the motor*
- *be connected in accordance with the wiring rules of the country in which it is installed*
- *not have control enclosures left open for extended periods (excess dust will void warranty)*

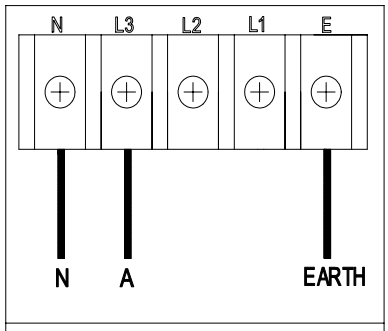
The Maestro Operator is available in both single and three phase models. The operator model can be identified by the label located on the MCB contactors or mains fuses cover. Carefully match the wiring of the operator to the correct configuration shown below.



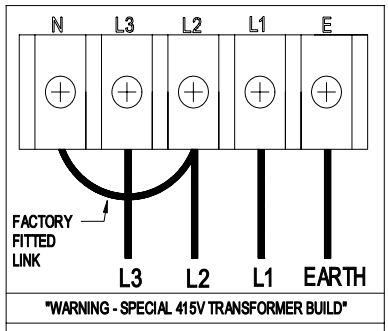
SUPPLY CONNECTION FOR THREE PHASE BUILDS
WITH NEUTRAL
MODELS: MXXX3



SUPPLY CONNECTION FOR SINGLE PHASE BUILDS
4 WIRE CONFIGURATION
MODELS: MXXX2



SUPPLY CONNECTION FOR SINGLE PHASE BUILDS
3 WIRE CONFIGURATION
MODELS: MXXX1



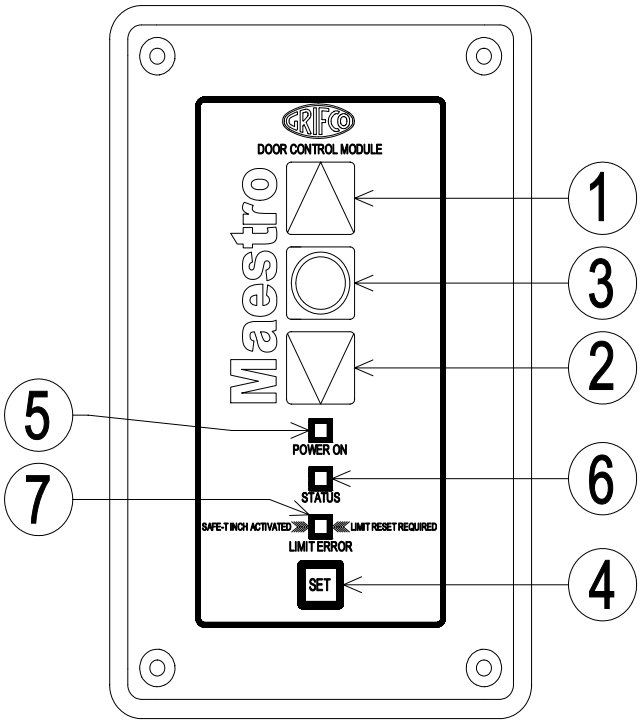
"WARNING - SPECIAL 415V TRANSFORMER BUILD"

SUPPLY CONNECTION FOR THREE PHASE BUILDS
WITHOUT NEUTRAL
MODELS: MXXX3 N

It is recommended that 1.5mm^2(max.) wire size is used to avoid unnecessary crowding and difficulty when making connections. Avoid lengthy cable ends that may cause undue pressure on delicate components. Cable ends should be crimped with fork or loop connectors to ensure a secure fixing in the terminal block.

Controller

The Maestro Controller is the user interface for the Operator. It consists of four buttons for control and setup, as well as three indicators to display the operator status.



1) UP - Moves the door upwards

2) DOWN - Moves the door downwards

3) STOP - Stops the door

4) SET - Used to set limits

5) POWER ON - Shows when the unit is mains powered

6) STATUS - Shows the status of the unit (refer page 14)

7) LIMIT ERROR – When lit indicates limits (or stopping positions) are not set and only SAFE-T-INCH will be active until limits are set. Refer page 8

Installing the Controller

The Controller is connected to the MCB via a low voltage control cable provided within the Controller enclosure. Using the glands provided (also enclosed) you may choose to run the cable “as is” and route neatly down the wall of the building, or otherwise use conduit or convenient cable duct (available from Grifco) for a heavier duty finish. It is recommended to install the Controller with the **cable entry facing downward**. Any moisture entering the Controller will cause malfunction.

To connect the Controller to the Maestro operator, identify the most appropriate entry of the MCB enclosure for your installation. Open the MCB enclosure and fit the applicable gland or conduit fitting, allowing enough cable to reach the controller (RJ45) socket. Place the opposing end of the controller cable through the conduit entry of the Controller Enclosure and pull through any excess cable. Plug the RJ45 end into the socket located within the Controller assembly. Use the space provided within the Controller enclosure to neatly coil any excess cable.

Note: If the supplied 6m controller cable is not long enough for your installation, use a Grifco Controller Extension Kit, available from your local Roller Shutter dealer or Grifco (Part No.ESK01).

Stickers Enclosed: The sticker outlining the limit setting instructions (shown below) should be placed on or around the Controller as a quick reference for users. The ACEM label should also be fixed in close proximity to the Controller. There will be a number of “WARNING” stickers also enclosed that must be fixed as described after **SETTING LIMITS**.

TO SET OPEN AND CLOSED DOOR POSITIONS

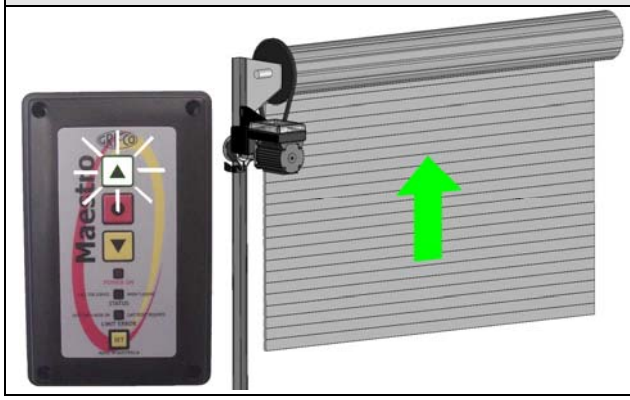
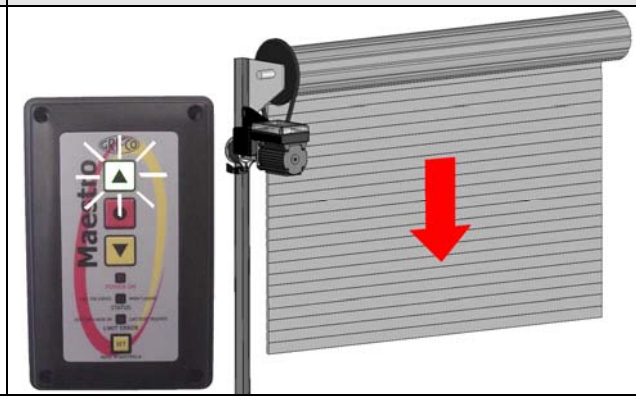
- While holding STOP button, press SET button 3 times
  The limit indicator will flash slowly
- Position the door at the closed position and press SET
  The limit indicator will flash quickly, then resume to a slow flash
- Position the door at the open position and press SET
  The door is now ready for use

Getting Started / Setup

Once the installation of the Operator and Controller is complete it is time to test the operation. Make sure the door is away from the ground or the top door stops. This will prevent damage to the door if the direction of the operator is incorrect.

Checking Power and Door Direction

1. Ensure the unit is powered by checking that the *POWER ON* indicator on the controller is lit. You should also notice that the *LIMIT ERROR* indicator (orange) is lit which signifies that there are no limits set. **Warning!** If the installation is **new** and the limit indicator is **not lit**, open and close the door with extreme caution as the **stored positions may not be correct**.
2. Check the direction of the doors movement. If the direction of door movement is the opposite of what is shown on the control box, refer below to **Changing Door Direction**.

CORRECT	INCORRECT
	

If the direction is incorrect continue through section *Changing Door Direction.* If the direction is correct skip forward to the *Setting Limits* section on the next page

Changing Door Direction

To reverse the doors direction first put the unit into limit setting mode. To do this:

1. While holding STOP, press the SET button 3 times.
   The *LIMIT ERROR indicator will start flashing signifying limit setting mode.*

2. Press and hold STOP for 10 seconds until the LIMIT ERROR indicator flashes quickly.

The direction of the doors movement will now be reversed.

The LIMIT ERROR indicator will remain flashing as the unit is still in limit setting mode. You can now set limits (go to step 2 on next page)

Or to exit, press STOP.

When the door direction is changed any set limits will be erased. Please reset limit positions after changing door direction.

IMPORTANT NOTE

- **This unit is supplied with a pre charged limit memory and should maintain set limit positions for extended periods (several months) without an initial charge.**
- **On new installations, the orange limit light should be lit after initial power up. If not, DO NOT operate door unless in limit setting mode or serious damage or injury can occur.**
- **It is recommended that limits are set only after mains power is connected permanently, or there has been at least 5 hours of power applied prior to temporary shutdown.**

Setting Limits

1. While holding STOP, press the SET button 3 times.
   The LIMIT ERROR indicator will start flashing signifying limit setting mode.
2. Position door into the desired CLOSED position.
   The manual hand chain can be used to accurately position the door before pressing set.
3. Press the SET button to save this as the CLOSED position.
   The LIMIT ERROR indicator will flash quickly then return flashing slowly.
4. Position door into the desired OPENED position.
5. Press SET again to save this as the OPENED position.
   The LIMIT ERROR indicator will flash quickly then will go out.

The Closed and Open limits have now been set. If at anytime you need to exit limit setting mode, just press the STOP button.

Once set, run the door between limits a few times to check they are suitable. If not, return to step 1.

Operation

To Operate the Door

Press the UP button on the Controller to open the door, press and hold DOWN to close. For optional behaviour, refer to the following page.

Manual Operation

The hand chain provided allows manual operation of the door at all times in which the motor is not in use. Use of the hand chain during powered operation of the door may result in damage to equipment or injury to the user. Ensure power is shut off before using manual chain.

Standard installation of the Maestro Industrial Operator is now complete

Please refer to the following page for further installation instructions of optional Maestro products

Installation of Additional Features and Accessories (optional)

Door Behaviour and Obstruction Detection Inputs

The Maestro is capable of controlling the behaviour of the door in 3 distinct modes depending on its intended use and if it is connected to an obstruction detection device.

Latch Up/Inch Down (Default) Mode:
The door will travel upwards with only a single press and release of the UP button. The door will stop at the set limit. This mode is latching upwards.
The door will only travel downwards when the DOWN button is held. The door will stop at the closed limit or when the button is released. This mode is inching downwards.

Inch Up and Down Mode:
The door will only travel whilst the UP or DOWN buttons are being held. The door will stop at the limits or when the button is released. To set this mode set **DIP switch 4** to **ON** (ref. table below).

Latch Up and Down Mode:
The door will travel upwards and downwards with only a single press and release of the UP or DOWN button. The door will stop at the set limit or when the STOP button is pressed. To set this mode either **DIP switch 2 or DIP switch 3** must be set to **ON** (ref. table below).
Note: This mode is only used in conjunction with an Obstruction Detection Device such as a PE beam or a Safety Bump Edge. Failure to do so may result in damage to property or injury to persons.

Setting Door Behaviour

To set the Door Behaviour modes, adjust the DIP switches on the corner of the MCB as shown over the page. The different combinations suit different behaviours and obstruction detection devices installed.

Desired Behaviour	PE beam Installed	Safety Bump Edge Installed	DIP 1	DIP 2	DIP 3	DIP 4
Latch Up Inch Down (Default- all DIP switches set to off")	N	N	OFF	OFF	OFF	OFF
	Y	N	ON	OFF	OFF	OFF
	N	Y	OFF	OFF	**OFF	OFF
	Y	Y	ON	OFF	OFF	OFF
*Latch Up Latch Down	Y	N	ON	ON	OFF	OFF
	N	Y	OFF	ON	**OFF	OFF
	Y	Y	ON	ON	**OFF	OFF
Inch Up Inch Down (This behaviour must be set for **Coles & BI-LO** electrically operated roller door installations)	N	N	OFF	OFF	OFF	ON
	Y	N	ON	OFF	OFF	ON
	N	Y	OFF	OFF	OFF	ON
	Y	Y	ON	OFF	OFF	ON

*Must be set to latch up and down if Grifco Elite Expansion Board is being used
** If using a 8k2 resistor type Safety Bump Edge, then set DIP 3 to ON

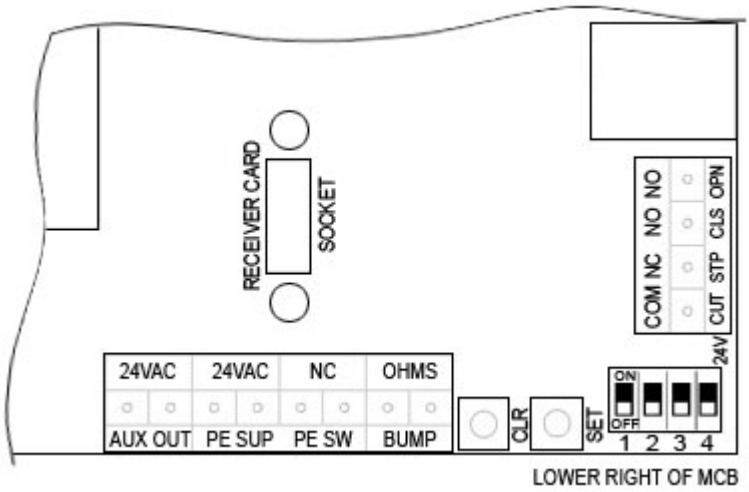
Inch Up / Inch Down

This behaviour must be set for **Coles & BI-LO** electrically operated roller door installations

Installing Obstruction Detection Devices

Devices such as PE beams and Safety Bump Edges allow safe automatic closing of the door and can be wired directly into the MCB via an appropriate cable entry. The devices are wired into the obstruction inputs located next to the behaviour pins on the MCB.

PE SUP (or AUX OUT): Supply power for PE beam (24VAC, max *150mA)
PE SW: Switch input from PE (Normally closed)
BUMP: Bumper edge input (Normally open or resistor type)



LOWER RIGHT OF MCB

PE Beams (Part No. PB008) and **Terminal Blocks** (Part No. TB210) are all available from your local industrial door dealer or Grifco.

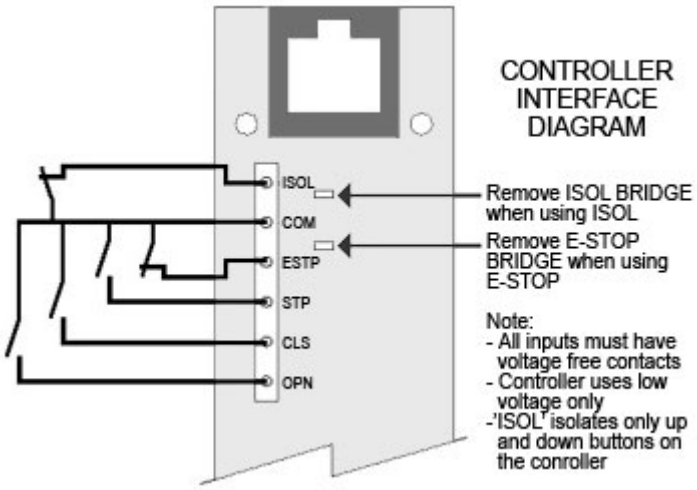
Additional Switchgear / Accessories

The Maestro can be easily interfaced by either the MCB terminals (refer Page 11 No.5) or the reverse side of the Controller push button panel (Refer to adjacent diagram). To do so you will need terminal blocks (Part No. TB210) available from your local industrial door dealer or Grifco.

NOTE:

- A CONTROLLER MUST ALWAYS BE PLUGGED IN (REFER PG 11 NO. 2) FOR THE OPERATOR TO FUNCTION**.**
- IF USING THE AUX STOP INPUT (REFER PG 11 NO. 5) THE LINK (REFER PG 11 NO. 13) MUST BE CUT.

***Important warning:** Additional devices must not draw current from the MCB 24 volt circuit exceeding 150mA. Excessive load from connected devices will cause malfunction of the Maestro operator. This generally allows for up to 2 x photo beams (Grifco supplied). For additional loads, use a separately mounted power supply.



Optional Third Limit

The Third Limit is a handy option for high doors that rarely need to be fully opened. The third limit is a door position above the open limit position which can be accessed when needed. Having this upper stopping position allows a mid height limit to be set as a first opening point, while a further press of the open button takes the door to a higher set position.

Setting the Third Limit

Once the Open and Closed limits have been set:

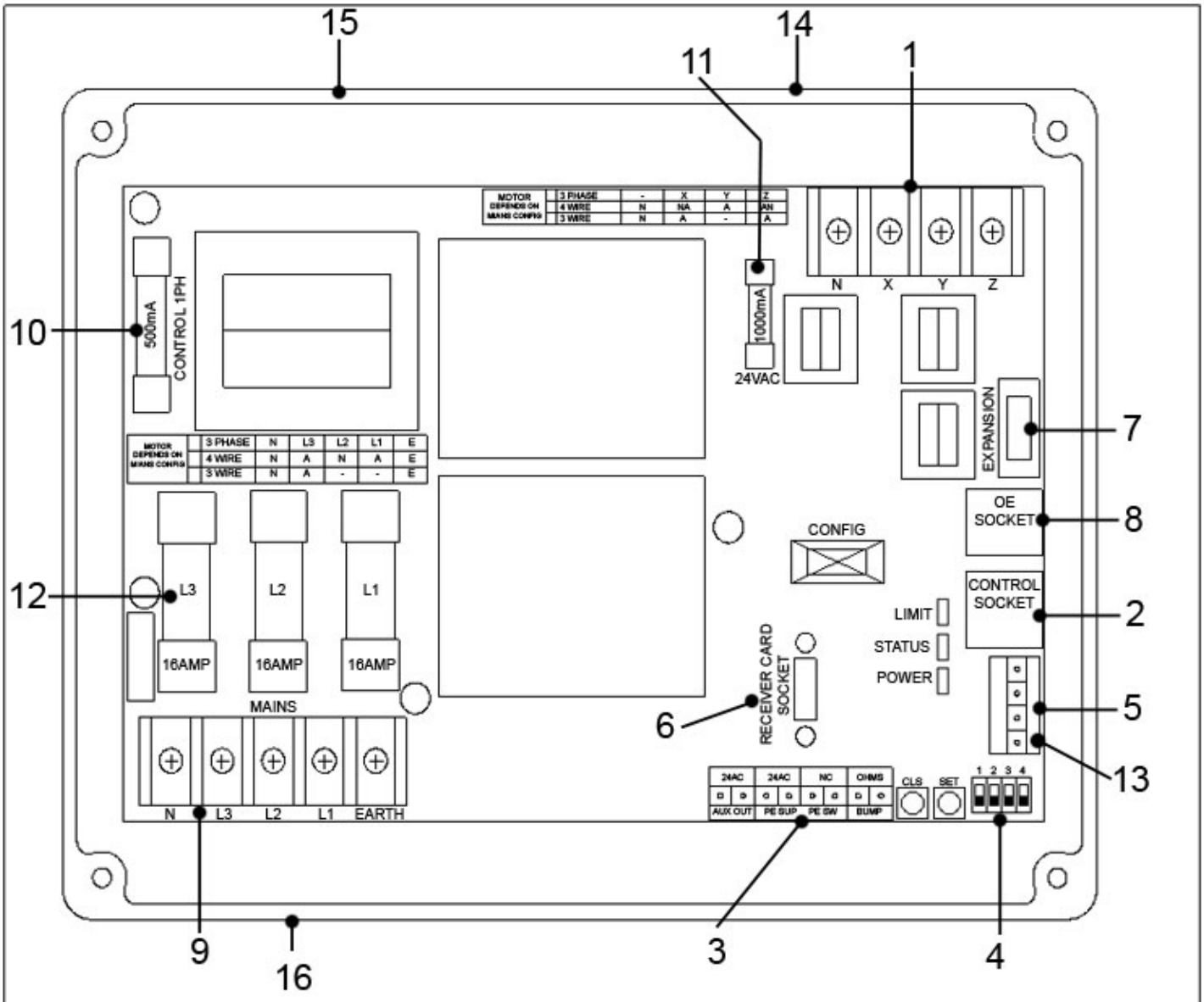
1. Position the door at the open limit position
2. While holding the UP button, press the SET button 3 times.
   The LIMIT ERROR indicator will flash.
3. Now open the door further until the door is in the desired extended open position.
4. Press SET to save this as the extended open position.
   The LIMIT ERROR indicator will quickly flash then go out.

Accessing the third limit:

1. Open door to first upper limit
2. Press the UP button

Main Controller Board (MCB)

The MCB is the heart of the Maestro. The diagram below provides an overview of the major components and access points.



1	Motor Terminals	9	Power Supply Terminals
2	Controller Connection Socket	10	High Voltage Control Fuse (500mA)
3	Obstruction Detection Inputs	11	Low Voltage Control Fuse (1000mA)
4	Door Behaviour Dip Switches	12	Main Supply Fuses (16A)
5	Open / Close / Stop / AUX Inputs	13	Auxiliary Stop Track
6	Remote Control Card Input	14	Mains Power Cable Entry (typical)
7	'ELITE' Expansion Board Input	15	Controller Cable Entry (typical)
8	Encoder Socket	16	Spare Cable Entry

ACCESSORIES

Remote Control Card and Transmitter (optional)

Create a wireless link between you and your Maestro with Grifco's own Remote Card and Transmitter. With the remote card and transmitter you can operate the Maestro from a distance of up to 50m away.

Features:

- Virgin card technology
- Wireless programming
- High security encoding

Model: GTRK

The Grifco Remote Card and Transmitter kit is available from your local industrial door dealer or Grifco (Part No. GTRK).

Other Controller Options

If required, Grifco has a range of "plug in" Controller options to add secure functions and features to your Maestro (some examples below).

C21B- Isolating key switch

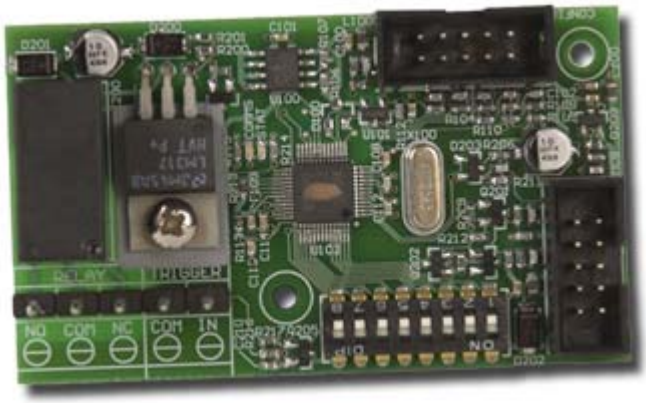
C41C – Open / Close key switch (Metal enclosed)

C21C – Open / Close key switch

These and many other Controller options are available from your local industrial door dealer or Grifco.

ACCESSORIES *(continued)*

Mini Expansion Board (MinEB)



The MinEB is a low cost plug in solution to provide an array of features such as:

- 24VDC to open or close
- dock leveller isolation signal
- door "closed" status

…and more

The Grifco ***MinEB*** is available from your local industrial door dealer or Grifco.

ELITE Expansion Board Upgrade Kit (optional)

This Grifco Expansion Board is a full featured addition to any *Maestro* operator, turning the standard Maestro into the Maestro Elite. This hardware adds more features to the unit, giving more options and more control.

Some features include:

- 4 relay outputs for controlling external devices
- Auto close with adjustable delay time
- Control over obstruction behaviour
- Programmable Trigger input
- Connection to a variety of radio cards
- Other inputs for advanced door behaviour

The most common version features a Controller with Auto / Man key switch, Weather proof polymer housing, 0-8 metre photo electric beam, and Remote Control Kit. (Part No. E21D41)

The Grifco Expansion Board Upgrade Kit is available from your local industrial door dealer or Grifco.

Elite Kit – E21D41

Elite Kit (left) – Shown Fitted

Troubleshooting

Status Indicator (Green) Flash / Problem Table

No. flashes/ Problem	Meaning	Possible causes	Possible Solutions
Solid ON	Motor running		
1	Running on EB battery		
2	Photo beam and/or Bump edge obstruction	▪ PE beam obstructed ▪ Bumper edge pressed	• Clear obstruction • Remove pressure from bump edge
3	Bump edge failure (Resistor type only)	▪ Bumper edge connection lost	• Check / repair wiring of resistor type bump edge
4	MCB error	▪ Internal Error ▪ Severe close range frequency	• Power off, and on, or replace MCB
5	EB internal error	▪ Fatal Error ▪ EB disconnected from MCB	• Replace EB • Return EB to the installation
6	Maximum starts per hour reached	▪ Operator used above maximum rated starts per hour	• Use operator less frequently • Upgrade to a high cycle operator
7	Max run time reached	▪ Operator used above maximum rated running time	• Use operator less frequently • Upgrade to a high cycle operator
8	Current Imbalance	▪ Phase missing (only applicable to 3 phase operators)	• Check mains wiring • Check fuses • Check motor connections and / or phase current
9	Locked Rotor overload	▪ Motor stalled	• Check for objects causing interference to door operation • Check for damage to motor • Upgrade to a larger operator
10	Severe Running overload	▪ Extreme load on door	• Check for objects causing interference to door operation • Check for damage to motor • Upgrade to a larger operator
11	Running overload	▪ Excess load	• Check for objects causing interference to door operation • Check for damage to operator • Upgrade to a larger operator • Reduce size of operator sprocket or increase size of door sprocket • Increase overload setting (warranty will be voided)
12	Thermal overload	▪ Motor overheating	• Use operator less frequently • Upgrade to a high cycle operator
13	Travel time high	▪ Motor fault causing slow speed ▪ Excess load on door ▪ Optical limits damaged	• Check door for mechanical failure • Open OE enclosure and check for damage or dust
14	Direction error	▪ Motor connections altered ▪ Optical Limits damaged ▪ Bad connection to OE reader	• Change door direction and reset limits • Open OE enclosure and check for damage or dust • Carefully spray RJ11 MCB & OE socket with CRC 2.26 Contact treatment
15	Under speed	▪ Motor running under speed ▪ Excess load on door ▪ Optical limits damaged ▪ Bad connection to OE reader	• Check door for mechanical failure or motor fault • Check *clutch adjustment (*Where fitted refer clutch manual) • Open OE enclosure and check for damage or excess dust • Carefully spray RJ11 MCB & OE socket with CRC 2.26 Contact treatment
Constant flash	Due for service	▪ Door is due for routine service	• Contact your local door dealer to arrange service
No Lights Displayed	Power failure – No lights on MCB or Controller *With lights on at MCB	▪ Blown fuse ▪ Power supply not correctly connected ▪ *Bad connection to Controller	• Check all fuses • Check power supply wiring • *Refer below if lights are on at MCB and not on Controller
Push button not responding	Operator does not drive up and / or down	▪ Bad connection to Controller ▪ Faulty Controller cable ▪ Controller buttons forced and dislodged from rear of lid	• *Check RJ45 plugs are clipped in securely at Controller and MCB • *Carefully spray RJ45 Controller & MCB socket with CRC 2.26 contact treatment • *Replace Controller cable • *Replace Controller
Open or Close button not responding but green light comes on	Coil failure if green light on whilst holding up or down button and operator does not move in one direction	▪ Extreme vibration or impact during transit	• Replace MCB

IMPORTANT NOTE:

If a problem is found with an installation, be sure to read the troubleshooting guide thoroughly and if the problem persists call Grifco for technical assistance on ***02 43233877*** or email ***technical@grifco.com.au***

Maintenance

The Maestro is equipped with smart logic to indicate when your industrial door will require servicing. When the STATUS indicator constantly flashes quickly, please contact your industrial door dealer to arrange a routine door service.

Overload Adjustment and Settings

This process is not necessary for typical applications. Varying overload levels from the Factory Set level will void warranty.

To view full load current (FLC) overload setting (with NO limits set)

- Press and hold STOP, whilst holding STOP, press CLOSE
- Release STOP (do not release CLOSE), then press and hold STOP again with CLOSE for 10 seconds
- Status LED will light up indicating number of amps
- To read number of amps, perform the 'Reading Status Flashes' routine described below

To view max amps (with NO limits set)

- Press and hold STOP, then press and hold CLOSE
- Release STOP, and continue to hold CLOSE for 10 seconds
- After 10 seconds and while still holding CLOSE, press and release the STOP button
- Status LED will light up indicating maximum amps drawn
- To read max amps, perform the 'Reading Status Flashes' routine described below

To view full load current (FLC) overload setting (with limits set)

- Drive door to closed limit
- Press and hold STOP and CLOSE for 10 seconds
- Status LED will light up indicating number of amps
- To read number of amps, follow the 'Reading Status Flashes' routine described below

To view max amps (with limits set)

- Drive door to closed limit
- Press and hold CLOSE for 10 seconds
- After 10 seconds and while still holding CLOSE, press and release the STOP button
- Status LED will light up indicating maximum amps drawn
- To read max amps, follow the 'Reading Status Flashes' routine described below

To change full load current (FLC) overload setting

- While holding STOP, press the SET button 3 times
- The LIMIT ERROR indicator will start flashing signifying limit setting mode
- Press and hold the STOP button
- While holding STOP, press either UP or DOWN to increase or decrease the FLC by 0.1A with each press
- The LIMIT ERROR indicator will flash with every successful increment/decrement
- The FLC can be modified a maximum of 1.5A per session
- Once done release the STOP button, then press the STOP button again to exit

Reading Status Flashes

- STATUS indicator will start flashing to signify the value of the least significant digit of the overall number, or in the case of amperage values this will be the value after the decimal point. A solidly lit indicator stands for zero
- Press set to view the next digit
- Continue previous step until the STATUS indicator flashes quickly for 1 sec then goes out. This signifies that the entire number has been displayed

To reset error

(This process indicates there has been a severe problem. Persistent resetting will void warranty and may do damage to the door or operator)

- Hold the STOP button for 10 seconds
- While still holding the STOP button, press and release the SET button
- The STATUS indicator should flash quickly for 1 second. Any errors that were flashing should have stopped.

WARRANTY / GUARANTEE

Chamberlain Australia Pty Ltd herein referred to as "The Company"

(a) The Company shall guarantee the goods for a period of two years from the date of invoice against any defects in construction or operation arising solely from faulty design, materials or workmanship subject to the following clauses.

(b) The Company shall at its option, repair, modify or replace defective parts or units at its own expense and within a reasonable time but the Company shall not unless otherwise agreed in writing be liable for costs associated with removal, replacement, transport or travelling expenses incurred by the Purchaser in obtaining the goods and returning them to the Company.

(c) The Company does not guarantee the goods where:-

(I) the defect rises from materials supplied by the Purchaser or a design requested by the purchaser; or

(ii) the defect arises from ordinary wear and tear, neglect or misuse by the Purchaser, accident, lack of care, insufficient maintenance, incorrect installation or improper use of the goods; or

(iii) the defect arises from force majeure; or

(iv) the Purchaser has in any way modified or repaired the goods without the Company's prior written consent; or

(v) the Purchaser has not complied with any written or oral instructions concerning the operation and maintenance of the goods; or

(vi) the Purchaser is in default in the observance or performance of any other provisions of the contract; or

(vii) The Grifco electric motors are used in conjunction with controls other than those assembled and supplied by the Company.

(d) Where warranty is approved for goods in a used condition, such goods will be repaired or replaced and returned to the purchaser as the Company sees fit. Refunds or credits will only be considered for goods not used and in new, undamaged condition.

(e) The Company's liability under this guarantee will be strictly limited to repairing or replacing a defective product at the Company's premises, as it may elect.

(f) The provision of sub-clauses (a) and (b) are stipulated for the benefit of the Purchaser only and are not intended for the benefit of any third party.

(g) Save for sub-clauses (a) and (b) the Company does not give any warranty or guarantee or make representations whatever in respect of the goods or the fitness of the goods or any part thereof or any particular purposes (whether or not that purpose is known to the Company).

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