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## INTRODUCTION

**Congratulations** on purchasing your DURASWING gate motors. D.A.C.E has proven to be a leader in the automation field and strives to manufacture high quality products using the latest technology available.

D.A.C.E. is constantly working on upgrading their products to bring you, the customer, a product of the highest quality. Other products manufactured by D.A.C.E. include:

- DURASLIDE 500 SERIES
- DURAOPTICS INFRARED BEAMS
- DURATRONIC REMOTES AND RECEIVERS

It is recommended that an experienced gate installer is used to install your gate motors. If you intend to install the motors yourself, please read this manual carefully before any installation begins.

This automatic gate operator is **NOT** a security device. It is designed to make access to a premise undemanding.

## LEGAL REQUIREMENTS AND WARNINGS

- It is recommended that your local E.C.A. (Electrical Contractors Association) is contacted to obtain the legal wiring regulations pertaining to the area.
  - Electrical Shock may occur while installing this equipment.
  - Injury or death by electrocution may lead to law suits against the installer/homeowner.
  - This D.A.C.E. motor is supplied with a plug in type 16 VAC transformer. This transformer should be plugged into a normal plug socket. DO NOT open the transformer.
  - D.A.C.E will not be held liable for any accident / incident resulting in damage, injury or death ensuing from the installation of the automatic gate motor.
  - Although the DuraSwing has built-in collision sensing, substantial damage may occur due to a collision. For this reason INFRARED SAFETY BEAMS should be used on all installations.
  - **Do not** allow children to play near or with any gate, gate motor or remote control.
  - It is the responsibility of the installer to ensure that the gate is in good working condition before automating the gate.
- It is strongly recommended that any high voltage cable (220 VAC) is installed by a registered electrician, as this can lead to legal problems if it is not done according to strict legislation rules.**

## SPECIFICATIONS

Motors .....12v/dc (battery operated with charging system)  
Maximum gate size.....2.5 m per gate  
Maximum gate mass.....100 kg per gate  
Maximum number of operations.....100 per day  
Maximum operating degrees .....120 ( recommended 90 degrees)  
Charging system.....16 v/ac transformer and 1 amp 13.8 v/dc trickle charger.  
Battery .....12v/dc 7 amp/hour  
Limit detection.....Mechanical micro switch

## GENERAL INFORMATION

### WARRANTEE

D.A.C.E. products carry a TWO year **WALK -IN** warrantee. The following conditions apply:-

- Warrantee covers factory faults only.
- Warrantee covers the following items. Electric motor, gearbox, P.C.Board, Pedestal, crank arm and con-rod.
- Warrantee does not cover the following. Lightning , flooding, insect infestation, Vehicle damage or incorrect installation as laid down by D.A.C.E.
- Warrantee is void if any attempt is made to repair / modify or change the motor , P.C. board e.t.c. Unless authorised by D.A.C.E.
- The product **MUST** be returned to D.A.C.E. for inspection before any warrantee claim will be entered into.

### TROUBLE SHOOTING

It is important to note that a multi-meter must be used when fault finding in order to get an accurate reading of voltages and to check fuses.

Most problems are simple to fix, this normally requires a systematic approach.

The correct voltages that should be found are as follows:-

A/C power onto the charger card = 16v/ac

D/C power coming off the charger card = 14.2v/dc

D/C power at the battery leads = 13,8v/dc

D/C power on the battery (no load) = +/- 13v/dc

D/C power on battery (with load) = < 1 volt drop on no-load reading.

A voltage drop of no more than one volt must be allowed when running the motor. If the voltage drop is more than one volt, the battery may need replacing.

FAULT	REASON	ACTION
Gates open slightly then close automatically or gate closes in small jerking motion	Battery flat	Check charger card or transformer or replace old battery.
One gate does not operate at all or operates erratically	Motor fuse (8 amp) blown or micro switch faulty	Replace 8 amp fuse or replace micro switch.
Gates stops when closing and then re-opens automatically.	Over current.= Gate jamming.	Check gate / hinges / con rod / crank arm. Return to manufacturer for repairs.
Gates opens without any trigger input. (opens on its own)	Neighbour has same transmitter code Motor wires are the wrong way.	Change code on transmitters and receiver or change motor direction. (see pg 15)
Gates are jammed and will not move at all.	General shut down.	Remove all power and re-connect power.
Gates do not operate from the remote but will operate using the test button on the p.c.board.	Receiver faulty or loose wire connection or 3 amp fuse blown on p.c.board.	Replace receiver or tighten wire connections or replace fuse.

### Before installing these DURASWING motors please read the following instructions.

There are a number of different methods of installing swing gate motors. The main factors that influence the methods are as follows.

#### Direction of swing

Inward swing method. — The gates open towards the motors.

Outward swing method — The gates open away from the motors.

The above two methods are normally determined by the type of gate and / or slope of the driveway.

#### Mounting method

The mounting method can be done using one of two methods available.

Pedestal mount. — a steel pedestal is buried in the ground and the motor is mounted on top of the pedestal.

Wall mount. — A steel wall mount bracket is bolted to the wall / pillar and the motor is mounted on to the bracket.

The gates must be checked to be in good working order before installation begins. The following points must be checked.

The gates must swing easily i.e. the gate must swing through the full arc using the force of two fingers only.

The gates must not exceed 100 kg per gate.

The gates must be no longer than 2,5m per gate.

The gate must **not** be constructed of solid material i.e. wood, fibreglass sheeting e.t.c.

The gate posts must be solid and the hinges must be in good working order.

## 3. TERMS AND DEFINITIONS

- AUTO-CLOSE- allows gate to close automatically after a selected time period
- PEDESTRIAN ACCESS- gate will open partially and will autoclose after 6 secs.
- PARTY MODE- this allows autoclose to be overridden and gate can remain open for as long as needed.
- MULTI USER- commonly used in a town house/complex situation. The gate will open completely, regardless of any other trigger received. Thus preventing accidental closure.
- COLLISION SENSING- in the event of a collision while closing, the gate will stop and then re-open. If collision occurs while opening, the gate will stop.
- BATTERY- 12 volt 7 amp/hour, drives the motor.
- CHARGER MODULE- delivers a trickle charge to maintain a constant 13,8 V/DC in the battery.
- TRANSFORMER- receives 220 V/AC from the mains supply and delivers 16 V/AC to the CHARGER MODULE.
- MAIN P.C. BOARD- this is the printed circuit board that contains all the electronic components that operate the motor. (Fig.8)  
**NOTE** : always remove the power from the P.C. Board before connecting any inputs.
- RECEIVER- this is an external component that will trigger the motor via the P.C.BOARD
- REMOTE / TRANSMITTER- this is a device that will trigger the motor via the receiver
- INTERCOM- there are many types of intercoms available, an intercom allows communication between the gate and the house. Most intercoms have trigger buttons to operate the gate.
- TEST BUTTON- is found on the P.C. BOARD and is used to activate the motor

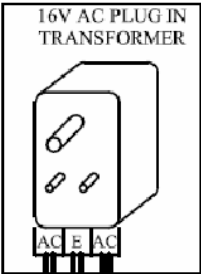
## INSTALLATION

### ELECTRICAL WIRING

**WARNING !!!** THESE DURASWING MOTORS ARE DESIGNED TO USE 16 V/AC. BEWARE OF RUNNING 220 V/AC AS THIS MAY LEAD TO LEGAL IMPLICATIONS

The electrical wiring should be done before the motors are installed. The DURASWING motors are designed to be installed without the use of an electrician. The plug-in transformer supplied with the motors must be plugged in to a household type wall plug. A three core 2.5mm cable should be run from the transformer to the charger board ( found next to the main P.C.BOARD). All wiring must be in a waterproof conduit and should be buried underground. There should be no joins in the cable underground.

The transformer must be plugged into the wall socket, then the cable must be connected to the transformer at the connector block. There are three outputs on the connector block. (see diagram below)



The electrical wiring from the transformer to the motor should be done by using a good quality three core cable. It should be noted that all other accessory wiring should be run at the same time, using a minimum of 8 eight core communication cable. Do not connect the transformer to any type of automatic timing device e.g. swimming pool pumps etc, as this may cause battery failure.

- The cable should be in a waterproof conduit under the ground.
- The transformer must be plugged into a normal household plug socket.
- 16 V/AC is then run directly to the battery charger
- The conduit must be terminated inside the motor through the hole in the bottom of the foundation plate

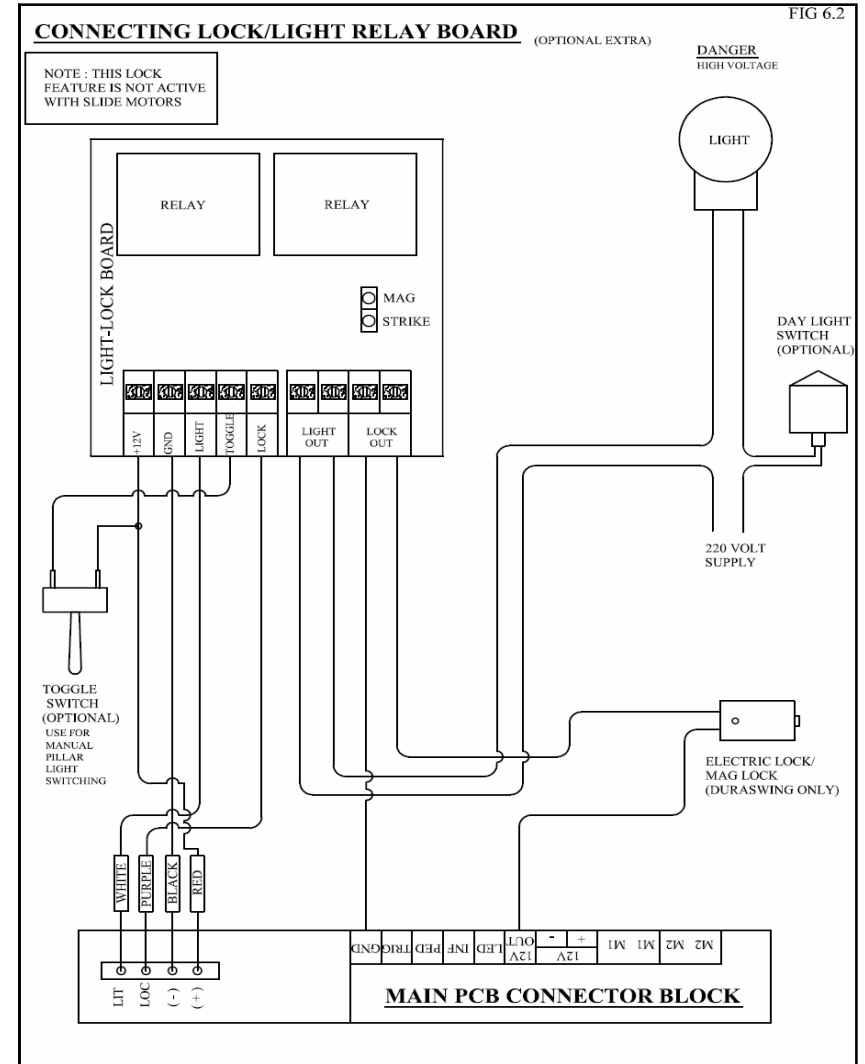
- **NB. D.A.C.E .** Will not be held responsible for any damage to the motor caused by incorrect or faulty wiring.

### EARTHING

The motor and the transformer should be earthed.

The cable running from the transformer connector marked E should be connected to the green cable on the main P.C.BOARD marked HOUSE EARTH.

For further protection an EARTH SPIKE can be inserted into the ground 2 meters away from the motor and connected to the earth lead on the P.C.BOARD.



**NB To avoid electrical shock, ensure all power is switched off before any connection is done.**

The lock light card is an optional extra that can be plugged onto the MAIN P.C.B. this will allow pillar lights to be activated when the gate motor receives a trigger. The lights will remain on for four minutes. There is a further option of connecting a switch on to the light lock card (toggle) to allow the lights to be switched on for as long as is required.

The lock section of the board is used for swing gate applications only. The lock type can be selected by simply placing the jumper onto the relative pins i.e. MAG / STRIKE.

## CONNECTING AUXILIARY EQUIPMENT

### CONNECTING AN INTERCOM.

There are many different types of intercoms available on the market today. The wiring of these intercoms can vary in some ways, but the general wiring is the same. The three main types of intercom are as follows:-

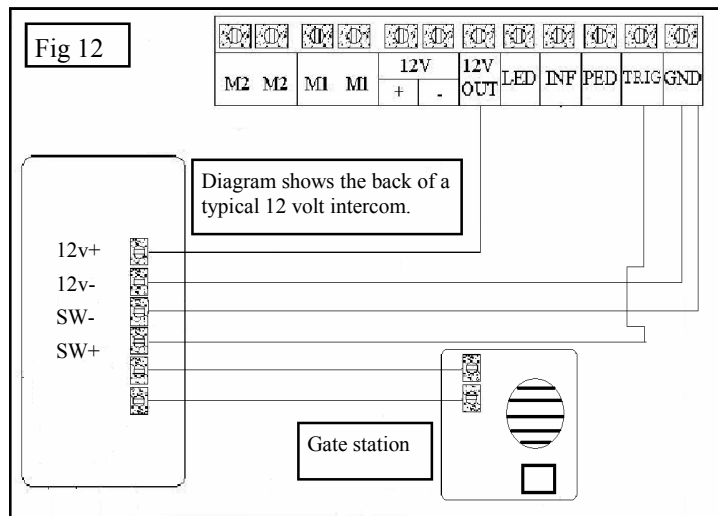
**220 volt.** This type normally plugs into the house mains, (220 volt supply) and then four wires are run from the handset (inside the house) to the gate station (outside at the gate) and the motor (trigger) see fig 12.

**12 volt.** This type normally gets its power from the motor (12 v/dc). This means that a minimum of six wires are needed to run from the handset. Two wires to the gate station and four wires to the motor. See fig 12.

**6 volt.** This type is battery operated, normally using 4 penlight type batteries for power. Only four wires are needed to run from the handset. Two wires to the gate station and two wires to the motor (trigger) see fig 12.

The mounting of the intercom is the same with each type. The handset is placed inside the house / office and the gate station is placed at the point of entry, this is normally the gate. The gate station is normally mounted by means of a "gooseneck"

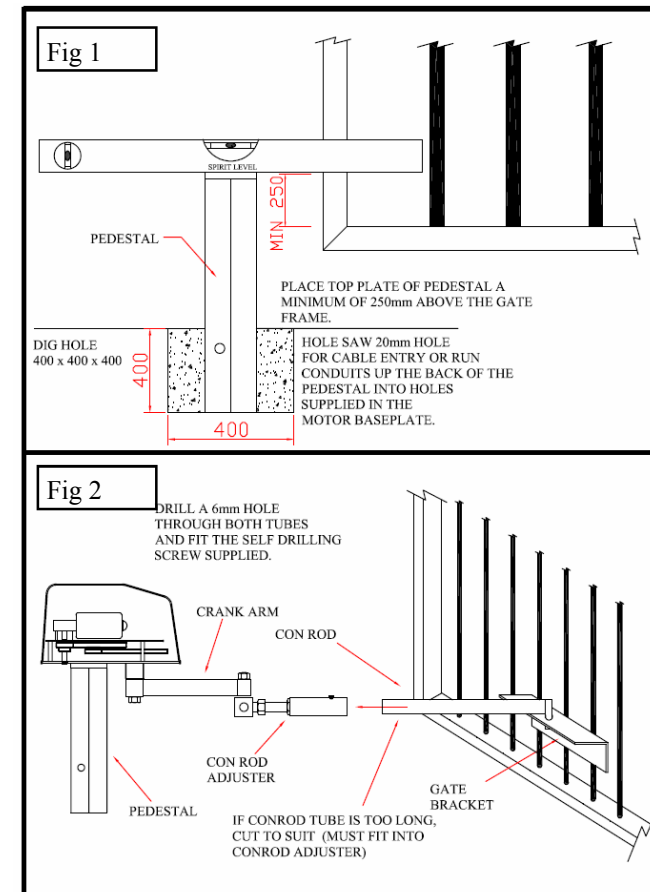
**It is important to note that the communication cable MUST be run in a conduit and NO high tension cable (220 volt) can be run in the same conduit.**



## PEDESTAL MOUNT

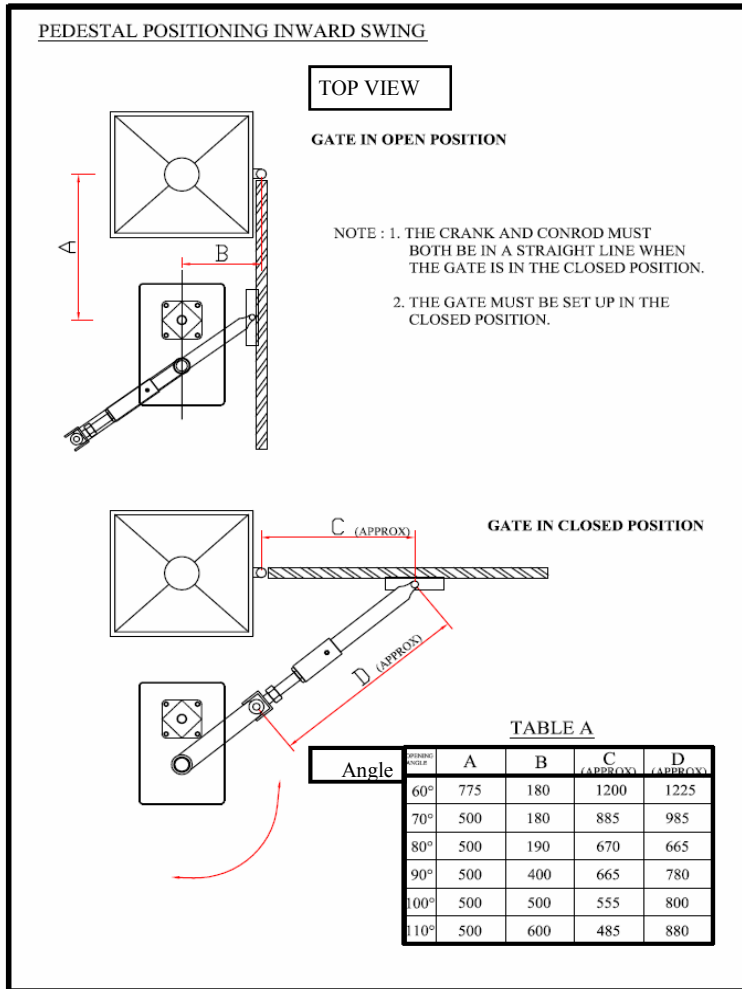
Before digging the holes for the pedestals it is recommended that the measurements are checked using the tables supplied. The measurements are given for each separate method of installation. These measurements are a guideline only as each installation may be slightly different.

Once the hole has been dug and the pedestal inserted, it is very important that the concrete is allowed to cure fully before the motors are mounted on to the pedestals. Ensure that the pedestals are level before mounting the motors. A 20mm hole should be drilled into the pedestal before it is set into the concrete and the cable conduit should be placed inside the pedestal. This is to allow the cables to exit at the top of the pedestal mounting plate. If this is not done then the conduit can be run up the outside of the pedestal.



**PEDESTAL MOUNT**

**Fig 3**



The above diagram shows the correct position for the pedestal when installing an inward swing pedestal mount.

NOTE measurements A, B and C are all taken from the hinge of the gate.

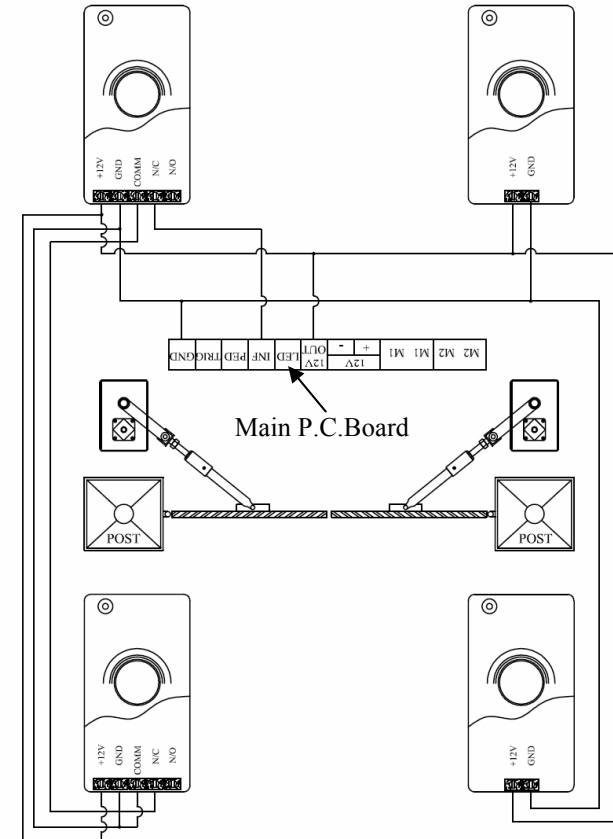
It is very important that the gate is set up in the closed position and that the crank arm and the con-rod are in a straight line.

When the gate is in the open position the crank arm should be directly over the con-rod

**CONNECTING AUXILIARY EQUIPMENT**

This is the recommended method for wiring double beams in swing installations. This is to stop the gate closing even if the vehicle is past the first set of beams but it may still be in the path of the closing gate.

**RECOMMENDED**  
CONNECTING TWO SETS OF INFRA RED BEAMS  
FOR A DOUBLE SWING INSTALLATION.



## CONNECTING AUXILIARY EQUIPMENT

**CONNECTING INFRA-RED BEAMS.** It is strongly recommended that infra-red beams are installed and connected to all automatic gates. If auto-close is to be selected it is essential that infra-red beams are used for safety reasons.

To connect infra-red beams:

Set the beams up so that they are directly across the driveway and are level with each other. The beams consist of a transmitter and a receiver. The receiver has 5 connections on the board, they are GND, 12V, COM, N/C, and N/O.

The transmitter has two connections only they are GND and 12V.

It is important that the covers do not get mixed up as the lenses are specially designed to work as a transmitter and a receiver.

Wiring the infra-red beams: Using a multi core communication cable or similar. Connect the wire from the GND on the receiver beam to the GND on the main P.C.BOARD.

Connect the 12v on the receiver board to the 12v on the main P.C.BOARD.

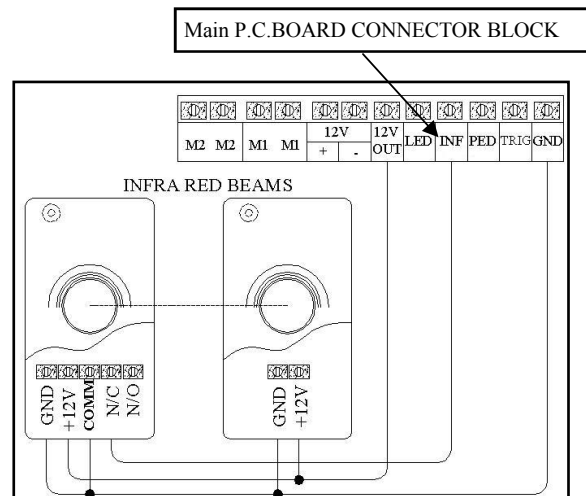
Connect the N/C (normally closed) on the receiver board to the INF on the main P.C.BOARD.

Connect the GND on the receiver board to the GND on the transmitter board.

Connect the 12v on the receiver board to the 12v on the transmitter board.

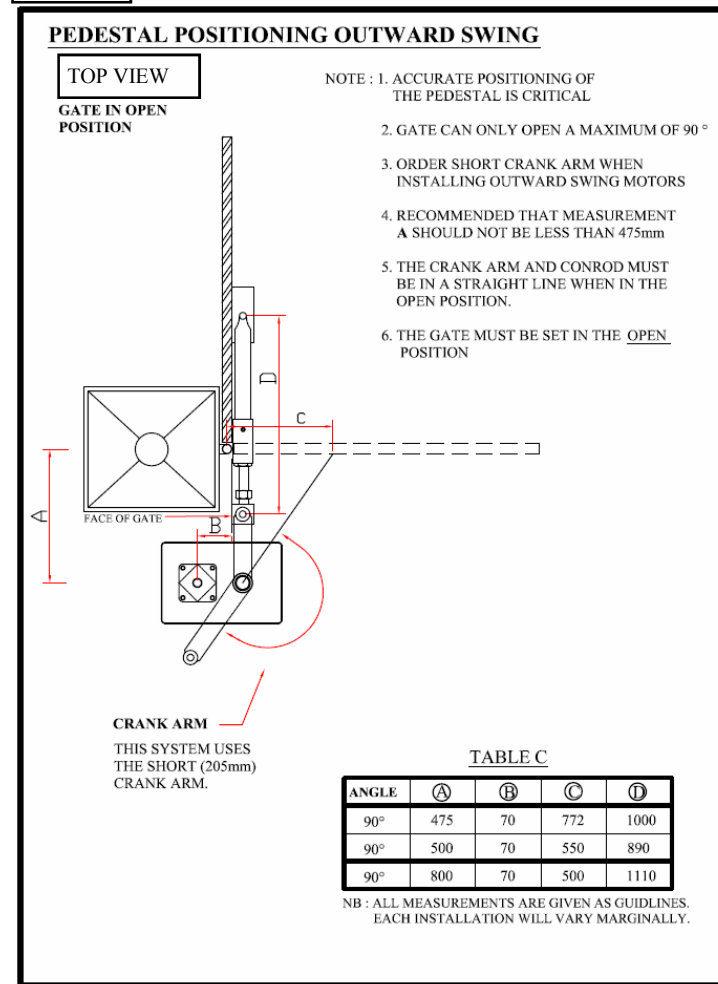
Connect the COM on the receiver board to the GND on the receiver board. (loop) (see fig 11)

**Fig 11**



## PEDESTAL MOUNT

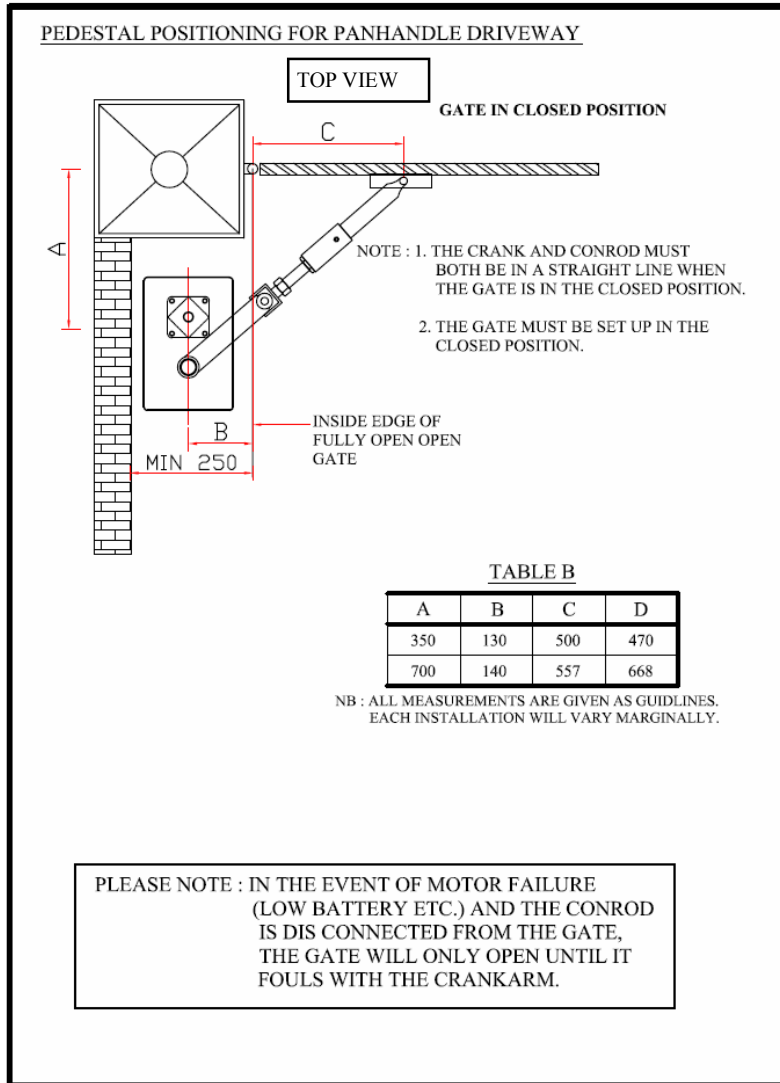
**Fig 4**



**NOTE.** When an outward swing method is used it is very important to note that the motor will protrude into the driveway approximately 200mm each side. Do not attempt to place the motor further away from the driveway, as this will cause the gate to whip and the motor will shut down and may even cause damage to the motor.

**PEDESTAL PANHANDLE**

**Fig 5**



**CONNECTING AUXILIARY EQUIPMENT**

**NOTE.** When connecting any auxiliary equipment to the P.C.BOARD ensure that **ALL** power is removed from the P.C.BOARD.

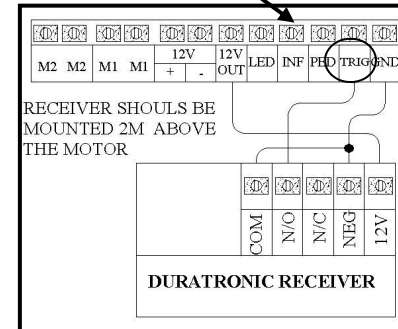
Most auxiliary equipment is connected using Communication Cable, normally called "Comm's Cable." This is available in different sizes. The most common sizes are 8 core and 10 core cable. This is a single outer sheath with 8 or 10 solid individually coated copper wires inside. Each wire has a different colour. Care should be taken when using Comm's cable as it can be broken easily.

**CONNECTING A RECEIVER.** An external receiver should be connected to the P.C.BOARD in the following manner. Using a multi core communication cable or similar. Connect the 12v (positive) wire to the 12v output on the P.C.BOARD. Connect the negative wire to the GND on the P.C.BOARD. Connect the N/O (normally open) wire to the TRG on the P.C.BOARD. The COM and NEG on the receiver must be "looped" (JOINED) (see fig 10)

**Fig 10**

**FULL OPENING**

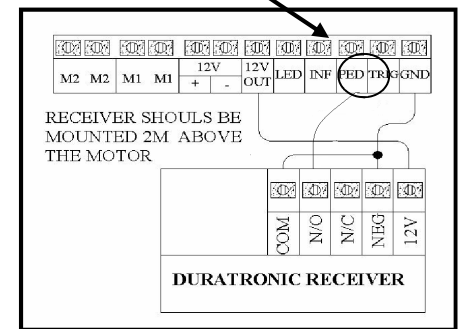
Main P.C.BOARD connector block. See fig 8



**Fig 10.1**

**PEDESTRIAN**

Main P.C.BOARD connector block. See fig 8



**PEDESTRIAN OPERATION**

A separate receiver, key-switch or key-pad must be connected in order to operate the gate in the pedestrian mode. The connection is done in the same manner as the above diagram with the exception of the N/O connection, as this connection must be connected to the PED connector on the main P.C.BOARD. (see fig 10.1)

## OTHER FUNCTIONS

**PARTY MODE (AUTO-CLOSE OVERRIDE)** This allows the auto-close function to be over- ridden. This function is normally used when higher than normal traffic volumes are expected. To operate the party mode set up: Push and hold the trigger button until the gate starts to open. Release the trigger. The gate will now stay open until it is re-set into normal operating mode. To re-set the gate into normal operating mode: push the trigger twice within three seconds. The gate will now operate as normal.

**OVER-CURRENT SENSING.** The P.C.BOARD is designed to detect OVER-CURRENT this means that if the gate hits an object or is stuck by some other means, the gates will stop driving. The results of an OVER-CURRENT are different, depending on what the gate is doing at he time of the OVER-CURRENT. If the gate is closing and an OVER-CURRENT is detected, the gate will stop and then re-open. If the gate is opening and an OVER-CURRENT is detected, the gate will stop and will not move until it receives an other trigger or the auto-close time is reached. If the gate senses an OVER-CURRENT 5 times in succession, the gate will stop working regardless of any trigger. To re-set the gate the AC power must be disconnected for 5 seconds then re-connected. The gate will operate as normal.

### SETTING THE OVER-CURRENT SENSITIVITY.

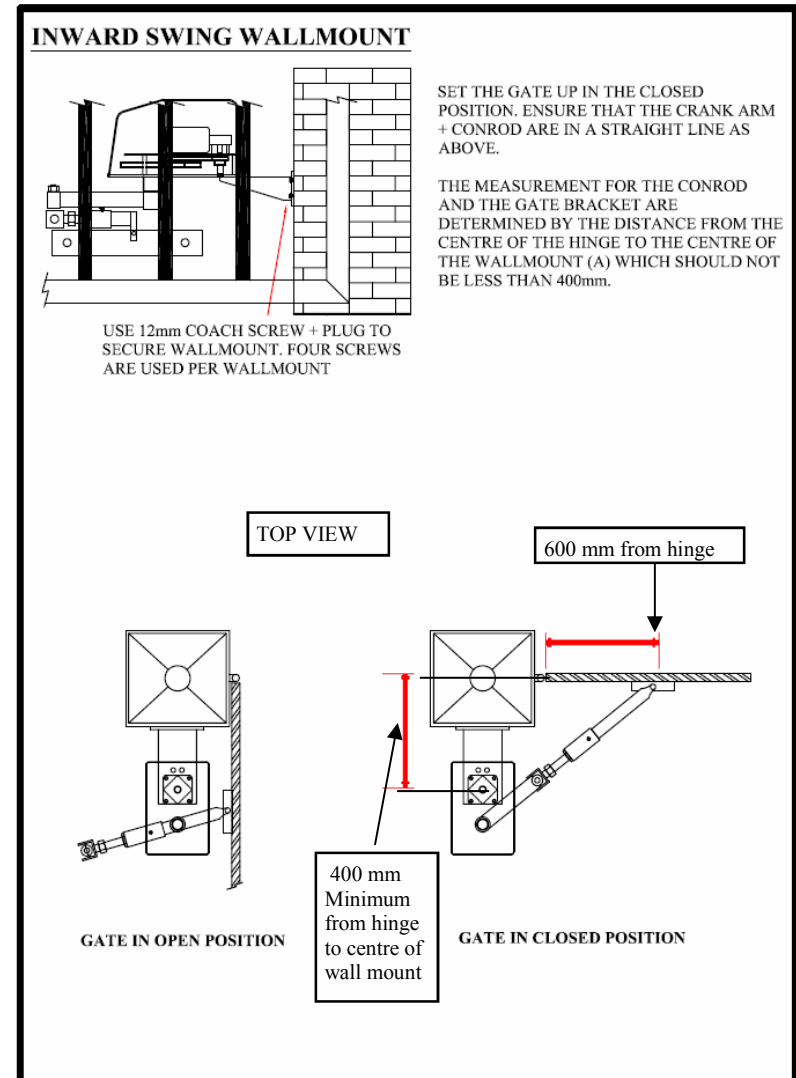
The sensitivity of the over-current is set in the factory, this can be adjusted, but it is advised that this is only done if it is necessary. It must be noted that if the sensitivity is decreased, the gate will drive harder when an object is encountered, this means that damage or injury to a vehicle / pedestrian will increase if sensitivity is decreased. This should only be done if the gate over-currents without striking an object or is not being jammed by any other means. Before adjusting the sensitivity check that the gate is operating correctly. i.e. hinges rusted, branches or garden growth hindering operation etc.

To set the over-current sensitivity: there are two "POTS" found on the P.C.BOARD. (fig 8) One pot is to set the open sensitivity and the other is to set the close sensitivity. To decrease sensitivity, (heavy gate) using a small flat screwdriver, turn the pot clockwise. The adjustment should be done in very small increments. Until the desired sensitivity is achieved.

To increase sensitivity, (light gate) turn the pot anti-clockwise. Take care not to set the pot too sensitive as this may cause the gate to over-current due to other external forces such as wind etc.

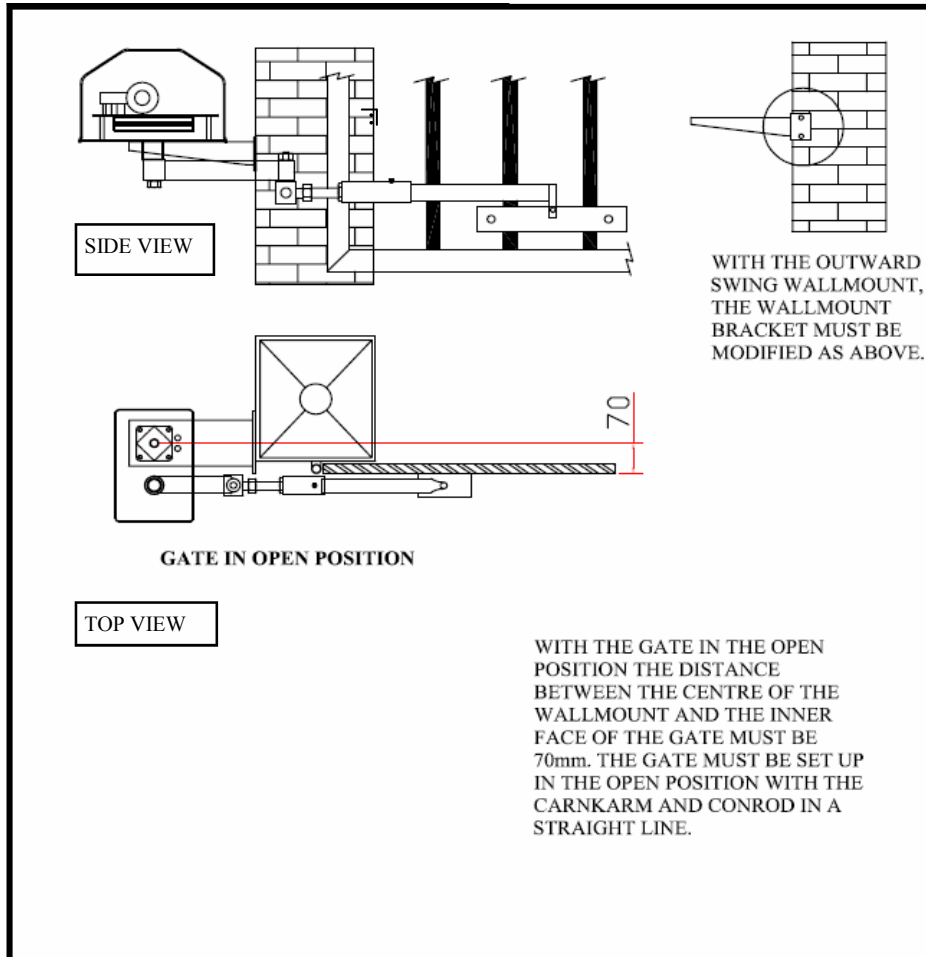
## WALL MOUNT INWARD SWING

Fig 6



WALL MOUNT OUTWARD SWING

Fig 7



**L.E.D. OPERATIONS.**

There are four L.E.D.s on the P.C.BOARD there are three red and one green L.E.D.

The three red ones are as follows:

**STAUS**— this L.E.D. has a number of functions it displays the following .  
 Flashing once every two seconds = gate closed and AC power is connected.  
 Flashing once per second = gate moving.  
 On solid (no flashing) = gate open.  
 Off = AC (mains) power disconnected.

**CLOSE** — this L.E.D. is on when the gate is closing or is in the closed position.

**OPEN** — this L.E.D. is on when the gate is opening or is in the open position.

**GREEN L.E.D.**— this L.E.D. is on when the AC power (mains) is connected. If this light is not on the battery will continue to operate the gate, but the battery will eventually run down and the gate will stop working.

**CHECKING MOTOR DIRECTION.**

The DURA SWING motors are set to default to the CLOSED position when power is received for the first time.

This means that when the battery is connected to the P.C.BOARD the motors will turn until a limit switch is struck, this will be the closed position. The closed L.E.D. on the P.C.BOARD will be on.

If the gate is not in the same indicated position as the L.E.D. display on the P.C.BOARD i.e. gate open when close L.E.D. is on. Then the crank arm must be loosened and the motor must be triggered. This will allow the motor to turn while the gate does not move.

Allow the motor to turn all the way until the limit switch is struck. The L.E.D. should now show the actual gate position. i.e. gate open and the open L.E.D. is on. When the gate is in the corresponding position in relation to the L.E.D. the crank arm must be tightened again.



## CONTROLLER CONNECTIONS

The following connectors are found on the connector block on the main P.C.BOARD (see fig 8)

**NB Ensure that all power is disconnected from the P.C.BOARD before any connections are made. Failing to do this will result in electrical shorts and major damage may occur to the P.C.BOARD.**

**M1 and M2.** These two connectors are high current 12 V DC outputs. These deliver current to the motors.

**12 V +/-.** These are the 12 volt 7 amp/hour Ni –Cad battery connectors. They supply the power to the P.C.CBOARD and the motors. **It is very important that the battery is connected the correct way.** Failure to do so will result in major damage to the P.C.BOARD. The positive battery lead (red) is connected to the positive (+) connector. The negative battery lead (black) is connected to the (-) connector.

**12v.** This connector is used to supply 12V DC to any auxiliary equipment used i.e. intercom , receiver, infra-red beams e.t.c. There is a 3 amp fuse for protection. (see wiring diagrams for more details on wiring auxiliary equipment ).

**L.E.D.** This connector can be used to connect a remote Light Emitting Diode (LED)(OPTIONAL) The anode (+) must be connected to the L.E.D. connector and the cathode (-) must be connected to the GND connector. The remote L.E.D. will give the same indication as the STATUS L.E.D. on the P.C.BOARD.

**INF.** This connector is used to connect infra-red beams to the motor. (OPTIONAL) The beams will work in the following manner. If the gate is closing and the beam is broken, the gate will stop and re-open. If the gate is opening and the beam is broken it will have no effect on the gate. (see wiring diagrams for more details on wiring infra-red beams)

**PED.** This connector is to accommodate a pedestrian trigger. (OPTIONAL) This allows the gate to open partially. The opening distance is pre-set and can not be changed. When the pedestrian trigger is used the gate will open partially and will close automatically after 6 seconds.

**TRIG.** This connector is the FULL TRIGGER input, this will open the gate fully. This is normally used for the receiver and /or intercom trigger. The trigger input has various actions when used. The following will happen when a trigger input is received.

- If the gate is closed—the gate will open all the way.
- If the gate is open. — the gate will close all the way.
- If the gate is closing . — the gate will stop and re-open all the way.
- If the gate is opening .— the gate will stop.

**GND.** This connector is used as a common ground for all auxiliary equipment.

## DIPSWITCH SETTINGS

There are eight dipswitches found on the main P.C.BOARD. (see fig 8)

The dipswitch settings on the swing motors are as follows:

**NO 1.** Must be **Off** for swing motors.

**NO 2.** The CURRENT SENSING dipswitch is used to operate in the high or low current range.

If the switch is **on** it will operate in the **high** current range i.e. for a heavy gate.

If it is **off** it will operate in the **low** current range (light to medium weight gate)

**NO 3.** This switch is the MULTIUSER Mode dipswitch, this must be selected when the motor is in a complex / multiple user type environment. This allows only one trigger at a time when the gate is opening. **NOTE** Auto-close **must** be selected for this switch to work. (SEE BELOW)

**NO 4.** BLANK . NOT USED.

**NO 5-8.** These are the AUTO-CLOSE settings. They can be operated individually or in sequence. (SEE TABLE BELOW)

**It should be noted that it is not safe to select AUTO-CLOSE without infra-red beams installed.**

Auto-Close	Switch 5	Switch 6	Switch 7	Switch 8
5 Sec	<b>ON</b>	OFF	OFF	OFF
10 Sec	OFF	<b>ON</b>	OFF	OFF
15 Sec	<b>ON</b>	<b>ON</b>	OFF	OFF
20 Sec	OFF	<b>OFF</b>	ON	OFF
35 Sec	<b>ON</b>	<b>ON</b>	<b>ON</b>	OFF
40 Sec	OFF	OFF	OFF	<b>ON</b>
75 Sec	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>