

# Installation and Maintenance Manual

## *Sliding Gate Operators*

ASA 315,450,630LI WEG

*Made in Australia from Australian & quality imported components*

CFW-300



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# 1. SAFETY PRECAUTIONS



**WARNING!** FAILURE TO FOLLOW THESE SAFETY PRECAUTIONS AND INSTALLATION INSTRUCTIONS COULD RESULT IN INJURY OR DEATH AND/OR DAMAGE TO PROPERTY AND EQUIPMENT.

- Appropriately licensed and competent personnel only should install the automation equipment.
- The operators are designed specifically to open and close sliding gates or doors and should not be used for any other purpose.
- Before commencing installation, read through this installation manual.
- Check that the operator and controls are in new condition and have not been damaged in transit.
- Check the gate or door and it's associated support posts and walls to protect against shearing, compression and other various traps which could cause serious injury or death. Take into consideration the general installation and surrounding environment.
- Check the gateposts or mounting structure has the necessary strength and rigidity to support the operator and the load of the opening and closing gate motion.

**CAUTION!**



**Always incorporate the appropriate Photo Electric Cells, Induction Loops and any other safety devices to protect both equipment and personnel. Extra caution should be employed when using operator in auto close mode.**

- Display any necessary signs to indicate any danger areas and automatic operation of the gate or door.
- The operators are not designed to be used in any hazardous areas or areas subject to flooding etc.
- All electrical connections and wiring must be performed with AS/NZS 3000-2007 as the guidelines. (Or its counterpart for other countries outside of Australia and New Zealand)

**WARNING! ELECTRICITY CAN KILL**

- The manufacturer of the automation equipment is not responsible for the damage which may be caused to either the operator, gate or door and any other person or equipment when: -
  - Wrong or poor installation practices were performed.
  - No or inadequate safety devices were used.
  - Either the surrounding structure or the gate or door strength and rigidity was not sufficient for the task in hand.
  - Inefficient locking devices were employed.
  - Poor maintenance on the equipment.
  - Any other circumstances beyond the manufacturers control.
- Isolate power before attempting any maintenance, qualified personnel only to carry out maintenance
- Only original spare parts are to be used should there be a requirement for them.
- Keep loose clothing and hands clear of the gate whilst in operation or potentially able to be operated.
- The installer should provide all information concerning the use of the automation equipment as well as instructions regarding the manual override and maintenance procedures to the users of the system.

## 2. *INSTALLATION DETAILS*

### General Information regarding the GDS WEG type operators

- These operators incorporate a combined VSD/PLC in one for the driving and control of the gate.
- There is a 4 cam limit switch for 2 stage slow speed area and final stop positions.
- Different pre-defined modes are available for setting via parameter.
- Additional functions are available such as Emergency stop, Pedestrian input, drive bolt locking, etc, by using the optional IODR expansion module.

### Wiring Requirements

- 230v 10A non earth leakage protected power supply where operator is mounted.
- Low voltage cables from operator for access control. (Shielded cable if over 8m runs).
- The protective earth resistance has to be as low as possible, fault loop impedance should be tested before energising.

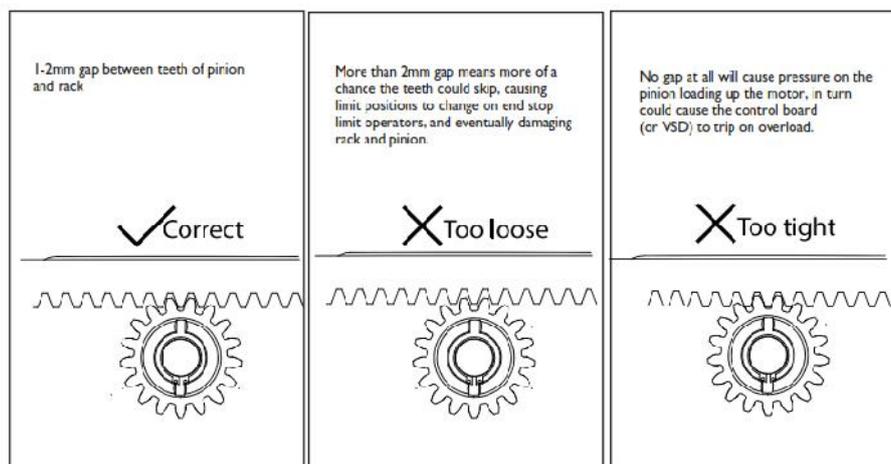
### Electrical Cabling

- An Isolator and 230v power supply should be available near to where the gate operator is to be mounted.
- Conduits and cabling preferably to enter through baseplate 'knockout' hole. The following dimensions will provide measurements for the positioning of Conduits and the appropriate position for the mounting of the operator.

### Mechanical Installation

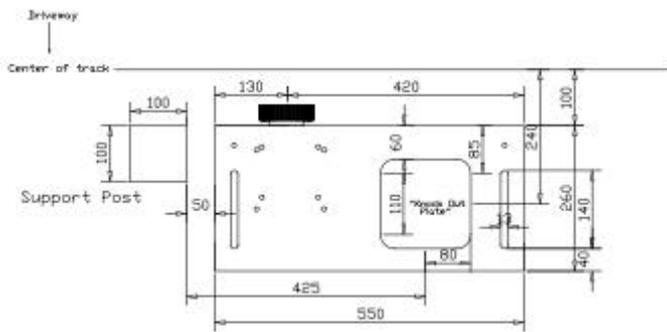
- Ensure gate rolls easily and has been installed so there is no excessive friction or binding occurring.
- A concrete base approximately 650mm long x 300 wide x 300mm deep should be laid where the gate operator is to be located.
- **IMPORTANT** ensure there are gate stops firmly installed in the fully open and closed positions. These stops need to be engineered and installed such that they will be strong enough to stop the gate should the gate fail to stop at any time.
- Remove the operator cover and position it in the approximate mounting location.
- Hold the rack next to the gate bottom rail and locate the operator the correct distance away from the gate rail (finer adjustment can be made after).
- Dynabolt or chemical anchor the base plate to the concrete mounting pad using 12 x 100mm fixings.
- Unscrew anticlockwise the manual disconnect knurled knob so the drive gear free wheels.
- Fix the rack to the gate rail ensuring there is approximately 1mm - 2mm gap between the meshing of the teeth of the rack and the drive gear (no more). Move the gate by hand from one end to the other while checking that the rack is meshing correctly with the drive gear on the operator. Check also that the rack is centred around the middle of the teeth on the drive cog, then finally tighten the operator

### Setting rack and pinion clearance



# Plan View of Installation / Operator Dimensions

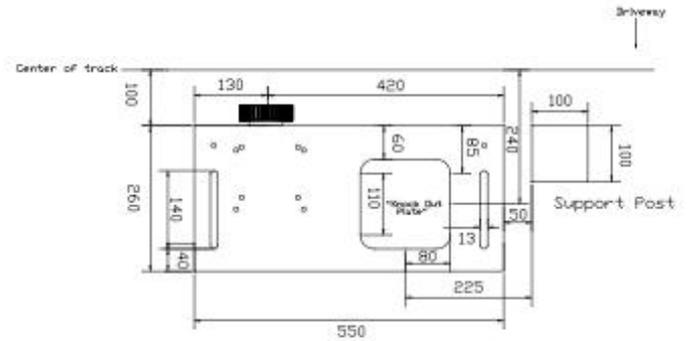
## Left hand installation



### NOTES:

- THESE MEASUREMENTS ARE ONLY APPLICABLE WHEN USING A 100x100 GATE FRAME
- THIS DRAWING IS FOR A GATE THAT OPENS TO THE LEFT WHEN LOOKING FROM THE ROAD INTO THE PROPERTY
- WITH THIS GATE OPENING SCENARIO, THE CENTER POSITION OF THE CONDUIT ENTRY IS 425mm FROM THE SUPPORT POST AND 240mm FROM THE CENTER OF THE TRACK

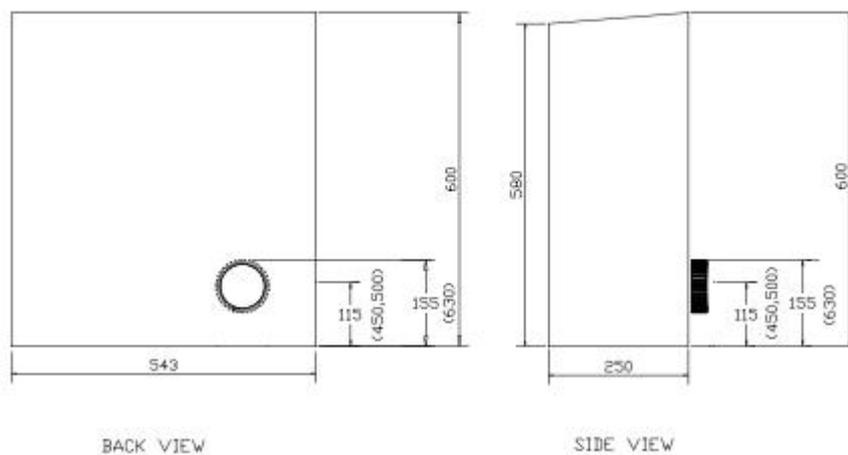
## Right hand installation



### NOTES:

- THESE MEASUREMENTS ARE ONLY APPLICABLE WHEN USING A 100x100 GATE FRAME
- THIS DRAWING IS FOR A GATE THAT OPENS TO THE RIGHT WHEN LOOKING FROM THE ROAD INTO THE PROPERTY
- WITH THIS GATE OPENING SCENARIO, THE CENTER POSITION OF THE CONDUIT ENTRY IS 225mm FROM THE SUPPORT POST AND 240mm FROM THE CENTER OF THE TRACK

## Operator dimensions



BACK VIEW

SIDE VIEW

**Specifications:** (Figures are nominal, and Subject to change without notice)

	<b>GDS 315LI</b>	<b>GDS 450LI</b>	<b>GDS 630LI</b>	<b>GDS 940LI</b>
<b>Motor</b>	: 0.75kw 4 pole 2.80A @240vac delta 1420rpm	0.55kw 2 pole 2.12A @240vac delta 2780rpm	0.75kw 2 pole 2.75A @240vac delta 2840rpm	0.75kw 4 pole with brake 2.80A @ 240vac delta 1420rpm
<b>Gearbox</b>	: Cast Iron/ oil bath 30:1	Cast Iron / oil bath 30:1	Cast Iron / oil bath 30:1	Cast Iron / oil bath 10:1
<b>Operator Weight</b>	: -	-	-	-
<b>Speed</b>	: 315mm/sec @60Hz	450mm/sec @60Hz	630mm/sec @60Hz	940mm/sec @60Hz
<b>Max Gate Weight</b>	: 3000kg	800 kg	2500kg	1500kg
<b>Max. Gate Length</b>	: 16m	8m	16m	16m

(Greater lengths achievable when using a 100:1 limit switch)

**Max Kg force:** 200Kg 80Kg 100Kg 90Kg

**Output Max**

\*Torque limiter will activate when load exceeded eg. Collision with an object, no load monitoring available. Safety devices and methods must be employed.

\*Gate lengths are recommend, larger lengths can be accommodated for upon request. Please specify gate length when ordering so limit sprocket size and ratio can be best matched to suit.

**Electrical Connections**

- A 240v 10 amp **Non Earth leakage** protected power supply is required to power up the unit

Please Note: That for field wiring connections, screened cable should be used where the length of the cable run exceeds 8 metres. Screen is to be terminated into the earth terminal.

**Standard Input functions**

**Open/OSC:** This input is used for commanding the gate to open only, or, Open/Stop/Close (OSC), by mode selection. To hold the gate open, the signal this input must be held on when using an auto close mode.

**Open limit Switch:** N/O connection to the open limit switch.

**Open limit Switch:** N/O connection to the close limit switch.

**Slow speed switch:** N/O connection to the open and close slow speed switches.

**NC Safety Beam:** The N/C safety beam input allows for the connection of safety devices (loops, PE beams) ETC, which aid in the prevention of injury and damage to personnel and equipment upon the gate closing.

**Inputs available only when using IODR expansion module**

**Pedestrian:** N/O input to command a partial opening to allow pedestrian access. OSC and Open only with auto-close Available by mode setting. Adjustable positioning available in parameter P928 via adjusting run time.

**Emergency Stop:** N/C connection for an E Stop button, safety edge, or other safety device. Shuts the gate down Immediately when the N/C circuit opens.

## Standard Output functions

**Gate running (warn/lock) D01:** N/O and N/C dry contacts to switch a warning light, mag lock, or motor Brake. **\*24v 0.5A rating only use external relay if greater load used.**

**Accessory power:** 24vac at 2A Fused supply available for accessories.

## Output functions available only when using IODR expansion module

**Drive Bolt down D02:** N/O Output signal for controlling Drive Bolt DOWN relay.

**Drive Bolt up D03:** N/O Output signal for controlling Drive Bolt UP relay.

\*Additional relay control is required to control a Drive Bolt system.

## Operating Modes

6 operating modes are selectable via selection in P 920.

**\*All modes include Gate Running output for warning light, lock, or motor brake operation.**

**\*All modes include Drive Bolt function which is factory disabled, to enable got to P 918, set to "1".**

**OSC MODE :** Also referred to as step by step. First open input opens, next input stops, next input closes. If, while the gate is closing, the PE beam is broken, the gate will return to full open Position Then wait for its next command to close.

**STANDARD :** Once gate is open, the auto-close time set in P927 will commence. After that time elapses, **AUTO CLOSE** and the PE Beam is made, the gate will start closing. If the PE beam is broken, the gate will return to full open, once open again. Once open the auto close time will commence again, then after that time, the gate again will close again.

**PE TRIGGERED:** If, while the gate is opening, the PE beam is broken, the gate will still commence **AUTOCLOSE** opening. Once the gate is open, the PE auto close time set in P 926, will commence, then the gate will start to close. If the PE is broken again, the gate will return back open, and again time out on the PE auto-close time, and close again.

**STANDARD + :** Used in modes 4,5,6. So if the gate opens and the PE beam was broken, the gate will auto close **PE TRIGGERED** after the PE auto close set time. If the gate opens and the PE beam was not broken, while the gate **AUTO CLOSE** will wait for the standard auto close time before closing again. If the PE beam this time is broken is closing, the gate will return back open and time out on the PE auto close set time, then close again.

**Mode 1:** OSC operation

**Mode 2:** OSC operation. Drive bolt function output when using IODR module. Input set for OSC only.

**Mode 3:** Standard auto close. Input set for open only.

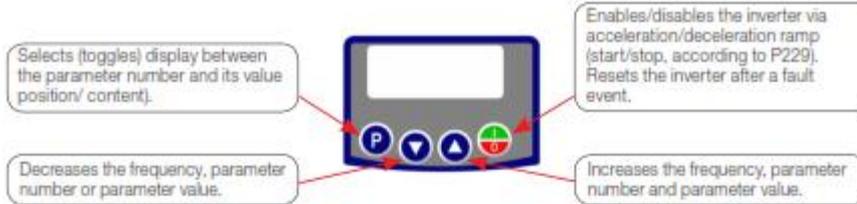
**Mode 4:** Standard auto close with PE triggered auto close. Input set for open only.

**Mode 5:** PE triggered auto close. Input set for OSC only.

**Mode 6:** PE triggered auto close. Input set for OSC only.

# Keypad Navigation

## 11 USE OF THE KEYPAD TO OPERATE THE INVERTER



### 11.1 INDICATIONS OF DISPLAY



### 11.2 OPERATING MODES OF THE HMI

Monitoring Mode			
<ul style="list-style-type: none"> <li>It is the initial state of the HMI after its successful power-up (without the occurrence of faults, alarms or undervoltage).</li> <li>Press key <b>P</b> to go to level 1 of the setting mode - selection of setting. Pressing any other key also switches to setting mode.</li> </ul>	~ rdy		
Setting Mode			
<b>Level 1:</b> <ul style="list-style-type: none"> <li>This is the first level of the setting mode. The parameter number is shown on the main display.</li> <li>Use keys <b>▲</b> and <b>▼</b> to find the desired parameter.</li> <li>Press key <b>P</b> to go to level 2 of the setting mode - change of the parameter values.</li> </ul>	~ P002 Hz		
<b>Level 2:</b> <ul style="list-style-type: none"> <li>The parameter value is shown on the main display.</li> <li>Use keys <b>▲</b> and <b>▼</b> to set the new value in the selected parameter.</li> <li>Press key <b>P</b> to confirm the modification (save the new value). After confirming the modification, the HMI returns to level 1 of the setting mode.</li> </ul>	~ 00 Hz		

- Keypad is password protected**, to make changes to parameter settings, enter into P000 Then scroll up to "2328" then press P. This will allow changes to user adjustable parameters as required.  
 \*This protection is done to stop un-authorized access to menus.

## Parameter Settings

Parameter	Default	Description
P000	0	Change to "2328" to access parameter adjustment
P911	3.0s	Acceleration rate
P912	2.5s	Deceleration rate
P913	1.5s	PE deceleration rate
P914	0.1s	E Stop deceleration rate
P915	60hz	Open speed
P916	40hz	Close speed
P917	15hz	Slow speed
P918	0	Drive bolt function disable = 0 or Enable = 1
P919	0	Input DI4 Function Slow speed switch = 0 or E Stop = 1
P920	1	Mode selection 1 to 6 ref to page 7
P921	0s	Mode 1 timer pre warn/lock time
P922	4s	D02 On
P923	2s	D02 On delay
P924	4s	D03 On delay
P925	10s	Lights output timer (courtesy light)
P926	3s	PE auto close timer (security close)
P927	15s	Standard auto close timer
P928	5s	Pedestrian open position timer
P930	5s	Slow speed bypass timer (by pass slow speed at start up)
P931	0	DI5 E stop Disable = 0 Enable = 1
P932	60s	Max travel time
P940	240v	Motor rated voltage (pre-set in soft plc)
P941	*	Motor rated current (pre-set in soft plc)
P942	*	Motor rated speed in HZ (pre-set in soft plc)
P943	50hz	Motor rated frequency (pre-set in soft plc)
P944	*	Motor Rated Power 4 = .55kw 5 = .75kw (pre-set in soft plc)

\* Refer to motor data plate for values.

## Input Status Indication

Go to **P012** to display status.

The display is given in HEX code, so needs to be converted to BINARY to then match up with the respective I/O.

With BINARY, you read it from right to left, so the first 0 (on the right) will be used for displaying the status in HEX of inputs DI1 to DI4. The second 0 for inputs DI5 to DI6 only available with the expansion module.

Inputs DI5 to DI6 ↘      ↙ Inputs DI1 to DI4

0 0 0 0

HEX      BINARY

**Example:** 0008 = 1000 which shows that input DI4 (slow speed switch) is high.

## Input status table For DI1 to DI4

1 = ON    0 = OFF

<u>P 012</u> hex	<u>DI4</u> Slow speed	<u>DI3</u> Close limit	<u>DI2</u> Open limit	<u>DI1</u> Open/OSC
0000	0	0	0	0
0001	0	0	0	1
0002	0	0	1	0
0003	0	0	1	1
0004	0	1	0	0
0005	0	1	0	1
0006	0	1	1	0
0007	0	1	1	1
0008	1	0	0	0
0009	1	0	0	1
000A	1	0	1	0
000B	1	0	1	1
000C	1	1	0	0
000D	1	1	0	1
000E	1	1	1	0
000F	1	1	1	1

## Input status table For DI5 and DI6

<u>P 012</u>	<u>DI6</u> Pedestrian Input	<u>DI5</u> E Stop
0000	0	0
0010	0	1
0020	1	0
0030	1	1

## Input status for AI1 – Analog PE input

AI1 is used for the PE input and is displayed as a percentage.

<u>P 018</u>	<u>AI1</u>
00.0	1
50.0	0

## Alarm & Fault Codes

<u>Parameter</u>	<u>Description</u>	<u>Possible causes</u>
A 712	Copy not Allowed	An attempt to copy the program
F 750	E stop Activated	E stop N/C contact has changed to open
F 751	Travel time	The gate has exceeded run time set in P 932
A 046	Motor alarm	Motor is overloading but not enough to cause fault
F 037	Motor overload	Too much loading on gate, check gate movement for friction etc.
A 050	IGBT temp alarm	IGBT more than 90° but less than 100° , improve cooling
F 051	IGBT temp fault	IGBT at more than 100° , improve cooling

## **Fault Finding**

Parameters used for reading fault codes and monitoring operation below.

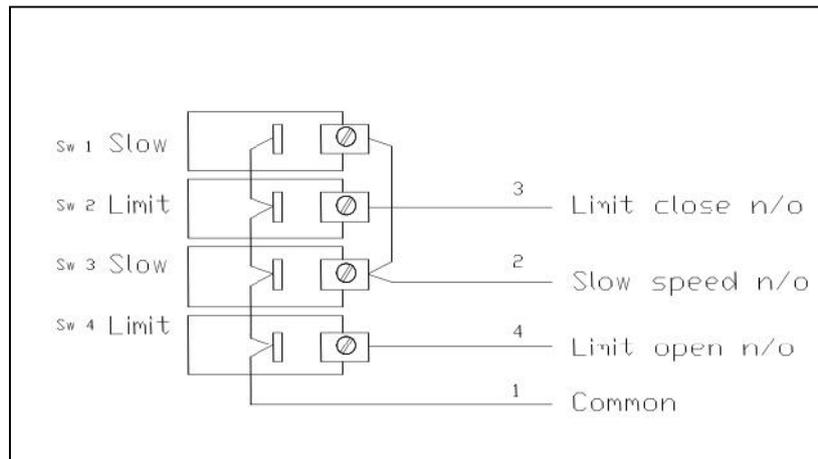
\*Refer to WEG 300 manual for full list of fault codes and information.

<b><u>Parameter</u></b>	<b><u>Description</u></b>
<b>P 048</b>	<b>Present alarm</b>
<b>P 049</b>	<b>Present fault</b>
<b>P 050</b>	<b>Last fault</b>
<b>P 060</b>	<b>Second fault</b>
<b>P 070</b>	<b>Third fault</b>
<b>P 051</b>	<b>Output current at last fault</b>
<b>P 052</b>	<b>DC link voltage at last fault</b>
<b>P 053</b>	<b>Output frequency at last fault</b>
<b>P 054</b>	<b>Temperature in the IGBT at last fault</b>

## **Monitoring Parameters**

<b><u>Parameter</u></b>	<b><u>Description</u></b>
<b>P 003</b>	<b>Motor current</b>
<b>P 004</b>	<b>DC link voltage</b>
<b>P 005</b>	<b>Output frequency</b>
<b>P 006</b>	<b>Inverter status</b>
<b>P 007</b>	<b>Output voltage</b>
<b>P 030</b>	<b>Power module temperature</b>

## Setting Gate Direction and Limits



The gate direction is set to “open to the right” (\*when standing on the inside looking at the gate), and with Sw 2 as the closed position limit switch, and Sw 4 as the open position limit switch. With the gate opening to the right, the limit cams will be turning in the anti-clockwise direction.

The 2 slow speed switches are Sw 1 and Sw 3.

The slow speed switches have to lead the limit switches so that the slow speed initiates before the limit switch activates, so varying the amount of overlap of the 2 switches will adjust the amount of slow area of the gate travel. The limit switches have to be set to activate just before the final stopping position.

If the gate opens to the left, the limit cams can be adjusted so that they approach the switch from the other side of the switch, but also the slow switch will have to be adjusted so that it initiates first. The same for the open limit and slow switch.

Alternatively, swap over the open wire no 4 and the close wire no 3 at the DIN rail terminals on the control board. The slow speed switches will still have to be adjusted to around to the opposite side of the limit switch.

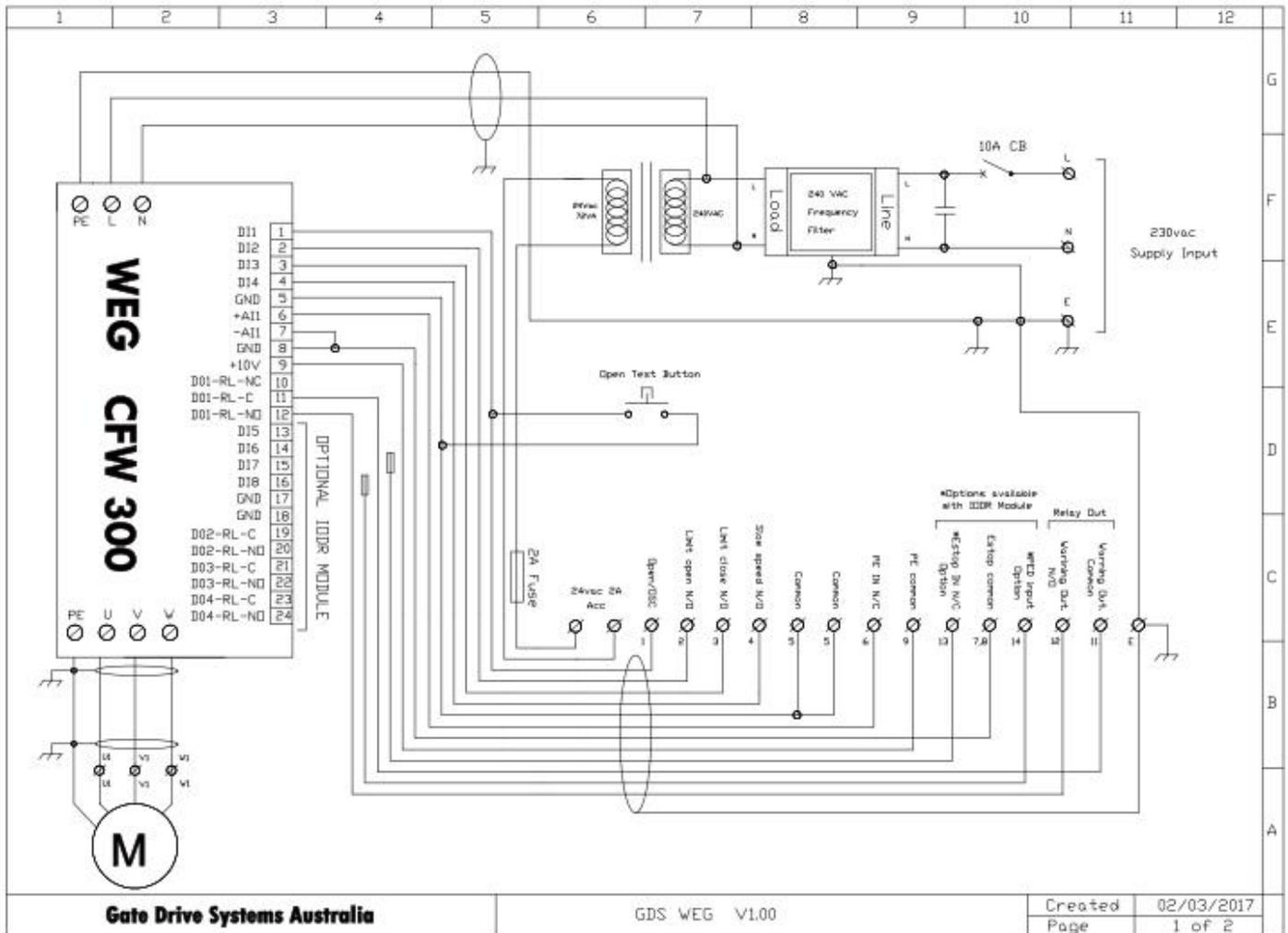
The switch will make a ‘click’ when it is switched, or limit switch status can be read in P 012 “digital input status”, which can make it easier to see when it activates as shown on last page.

When the slow speed switch is reached, this initiates a 2.5 second ramp down to slow speed. If this is too long, or not enough, it can be adjusted in P 912 to suit.

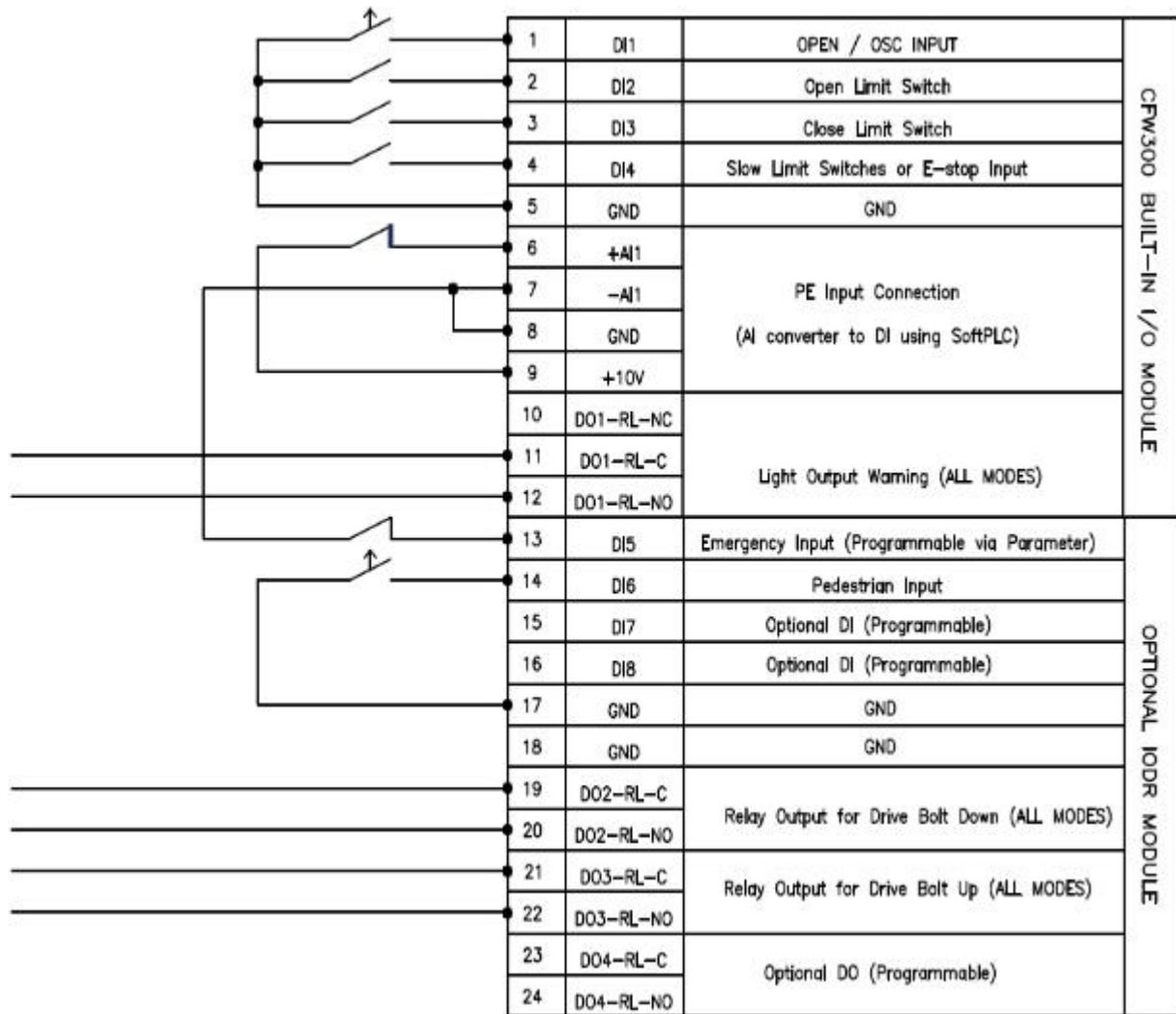
### **3. COMMISSIONING**

- Once limits are set at least roughly for now, position the gate halfway, turn the manual release knob just firm enough so the gate will drive but if it hits something it can still slip. Turn power on leaving the inverter set in MODE 1 for OSC operation. Fine adjustment of limits, and setting of required operating mode can be done later.
- If safe to do so, press the red open button, the gate should start moving in the close direction. If it moves in the open direction, stop gate by turning power off. Wait for at least one minute for the inverter to turn off, then swap over 2 motor phase wires, eg. T1 and T2, using insulated tools only. Then swap around the open and close limit switches and reset the slow speed switching again to suit the new rotation direction of the limit cams.
- Now try the gate operation again via the open button, the gate should start ramping down to slow speed once reaching the slow speed switch, and then stopping at its limit position once reaching the limit switch. Fine adjustments can now be made to the limit and slow speed switches.
- Now while operating the gate, test all safety devices, and then go ahead and set required operating modes.

# 6. OPERATOR CONTROL DIAGRAM



## 6. WEG CFW300 I/O DIAGRAM



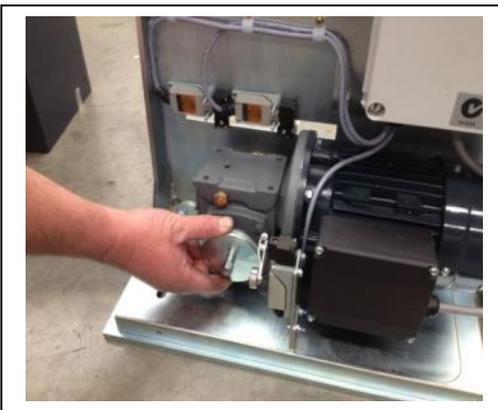
\*OPTIONAL IODR MODULE AVAILABLE UPON REQUEST.

# 1. **MANUAL RELEASE INSTRUCTIONS**

Place key in door lock, turn clockwise till released and pull door open.



Turn knurled knob anticlockwise approx.  $\frac{1}{2}$  a turn to release. With the clutch door open this disengages the door switch, which in turn inhibits the operation of the operator.



Gate can now be opened by hand.



To re-engage the clutch, move the gate by hand into approx. The half way position and turn the knurled knob clockwise until it is very tight.

If, when turning the knurled knob clockwise and It just spins, either, try spinning it clockwise with more force to release it off of the hexagonal retaining nut or hold the nut with one hand and turn the knurled knob clockwise.

Once re engaged and the door is closed the inverter will need to re find its limits. Give the gate a command to open, it will start moving open slowly, once open, it will then return slowly till fully closed. Once closed, give it another open command, it will again open slow fully. Once open, it is ready for normal operation at high speed.

# 7. Maintenance Details



## WARNING!

Failure to maintain equipment may result in injury or death and/or damage to property and equipment

Recommended maintenance to be performed on the operator and gate are as follows:-

Operator performs over 150 cycles a day	each month
Operator performs between 100-150 cycles a day	every 2 month
Operator performs between 50-99 cycles a day	every 4 months
Operator performs between 20-49 cycles a day	every 6 months
Operator performs under 20 cycles a day	every 12 months

Date: .....

Site Name:.....

Site Address: .....

**Before** commencing maintenance on the operator, isolate the electrical supply to ensure operator will not run inadvertently.

- Gate rolls freely when in manual.....
- Gate wheels and guide rollers in good condition.....
- Gate stops in good condition and not loose.....
- Gate rack is tight & correct clearances between pinion wheel & rack.....
- Gate track is not damaged.....
- Gate operator mounting bolts right.....
- No oil leaks from gearboxes.....
- Gearbox mounting bolts/nuts tight.....
- Inside operator and control box clean.....
- 'Baygon' Surface Spray around operator and control box (not on electronics).....
- All electrical connections tight.....
- Limit Switches operate in appropriate positions/ chain oiled.....
- External safety devices work effectively / cleaned.....
- Electromagnetic lock, if fitted, operates correctly and is clean.....
- Wash down of control box and cover (particularly near corrosive/sea environments)....
- General operation i.e. speed, auto close etc normal.....

Comments .....

.....

.....

Service performed by.....

## **8. WARRANTY**

- a. Gate Drive Systems Australia warrants that the goods manufactured by it shall be free from defect in manufacture for a period of 12 months from the date of invoice. Should any fault occur within that period as a result of faulty workmanship or materials, Gate Drive Systems Australia at its discretion, replace the product at no charge to the Customer except for removal, installation & freight. The appropriate Serial Number must be quoted for all warranty claims.
- b. For the goods not manufactured by Gate Drive Systems Australia, we shall pass on the manufacturer`s warranty to the Customer from the date of invoice. It is the manufacturer`s discretion to repair or replace goods deemed to be defective as a result of faulty workmanship or materials.
- c. All goods must be returned to Gate Drive Systems Australia or its representative for inspection or testing to assess if a claim is justified. It is the responsibility and at the cost of the Customer, to remove & return the goods for inspection and freight costs are the responsibility of the Customer.
- d. The warranty is negated and will not apply in the following circumstances:-
  - i. If no proof of date of purchase can be produced.
  - ii. If the product has been used in a manner beyond its design parameters.
  - iii. If the product is tampered with or repaired by personnel not authorised to do so.
  - iv. In respect of loss or damage caused by rough treatment.
  - v. If the product is not used and maintained in accordance with instructions or recommendations listed in this Installation and Maintenance Manual.
  - vi. In respect of loss or damage caused by an Act of God or any other cause not within the manufacturers control.
- e. Goods returned under warranty for repair or testing will incur a charge to be fixed by the manufacturer if no fault is found.
- f. The Customer shall bear freight charges for removing & returning the goods for inspection and for the delivery & installation of any replacement or repaired product from a justified warranty claim.
- g. Save for the express conditions and warranties herein contained all other conditions or warranties (whether as the quality, fitness for purpose or any other matter) expressed or implied by statute, common law, equity, trade custom, usage or otherwise are hereby expressly excluded provided that nothing in these terms and conditions shall exclude or limit any breach or condition implied by law, the exclusion or limitation of which is not permitted by law.