Heavy Duty Sliding Gate Operator User's Manual

Model: COS-1B / COS-3B

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Important safety information

Carefully read and follow all safety precaution and warnings before attempting to install and use this operator, incorrect installation can lead to severe injury/death.

- When opening or closing the gate, do not attempt to walk or drive through the gate.
- Be careful when in close proximity to moving parts especially the rack and pinion gear where hands or fingers could be pinched.
- Children should not be allowed to play near or operate automatic gates.
- The following two auto-reverse functions must be checked during installation to ensure that the gates can auto-reverse in the event of obstruction. This auto-reverse function should be regularly inspected and adjusted, if necessary.
    - When photo beam is used, the gate will auto-reverse fully when obstruction occurs.
    - The gate will auto-reverse by 2ft and motor drive is cut-off whenever the gate is crashed / jammed for the duration of 15secs to prevent overheating. At this point, it is important to call the qualified contractor to release the safety crutch breaker and to re-calibrate the gate before letting the motor running as normal again.
- Another important safety feature to prevent overheating when using a 3phase motor, the controller will cease operate the motor operation if any single phase power source is missing.
- The motor controller is protected by anti-thunder fuse. The fuse should blow off when thunder strike and must be replaced with a new one to operate as normal again.
- It must be reminded that the motor is supplied by 415Vac for 3phase system and 240Vac for a single phase system. The operator should be switched off before repairing it.
- Be careful not to touch the high watt resistors as they may get very hot during heavy usage.
- The gate operator should be installed by a qualified technician; otherwise, serious personal Injury, death or property damage may occur.
- Install the gate operator on the inside of the property; DO NOT install it on the outside of the property where the public has access to it.
- Do not allow the control panel to be placed at the reachable place to prevent any stranger to access them by reaching through the gate.
- In the event of power failure, an emergency release key allows you to operate the gate manually.

Main features

- One speed only, courtesy with a soft start feature to cut down the high torque motor start-up
- Anti-jam mechanism: The operator is installed with a PE roller to prevent the gear rack/the gate by lifting up. This will prevent damaged to the teeth of the gear rack or the output gear and reduce the friction noises
- Safety Photo beam function - Infrared terminal (NC) for 3 phase system and (NO) for single phase system. The operator will stop and reverse if it was obstructed on closing and stop when it was obstructed on opening
- Manual clutch release design for emergency purposes
- Prevent motor overheating - Cut off motor drive after a continuous false operation (~15secs)
- Optional 240V output terminal for used with AC lamp usage (it is programmed with 3 minutes delay to cut off the output after motor has stopped)
- Heavy duty Gate drive up to 4000kg gate

Technical parameters/Specification

MODEL	COS-1B	COS-3B
POWER SUPPLY	240v AC, Single Phase	415v AC, 3 Phase
MOTOR POWER	2.0 HP	2.5 HP
MOTOR SPEED	3000rpm	3000rpm
LINEAR GATE SPEED	1ft/s (3m/10s)	1ft/s (3m/10s)
3-phase protection	NA	3-phase monitoring*
LIMIT SWITCH	Industrial Switch (jumper settings NO/NC)	
MOTOR DRIVER	6 Pin Lock	
OVERLOAD SENSING	Adjustable High-Amp Cut-off	
MAX GATE WEIGHT	MAX GATE WEIGHT 4000kg	
IR SAFETY BEAM Optional	IR SAFETY BEAM Optional	
Motor GEAR TYPE	LUBRICATION Oil Bath	
REMOTE CONTROL	REMOTE CONTROL Optional	
PACKAGING DIMENTIONS	323W x 369L x 538H	
COATING	Weather Resistant Powder Finish	

*Any one phase is absent will stop the motor to operate

Operator main structure and its dimension

The motor housing dimension is shown in Figure 1.0 below. Both the single or 3-phase motor comes with the same housing and dimension. The gearbox as well as the motor internal parts are well lubricated and soak with cooling oil, which covers the stator, the rotator of the motor, the worm gear and the worm. This will helps to cool down the motor operating temperature especially during heavy usage.

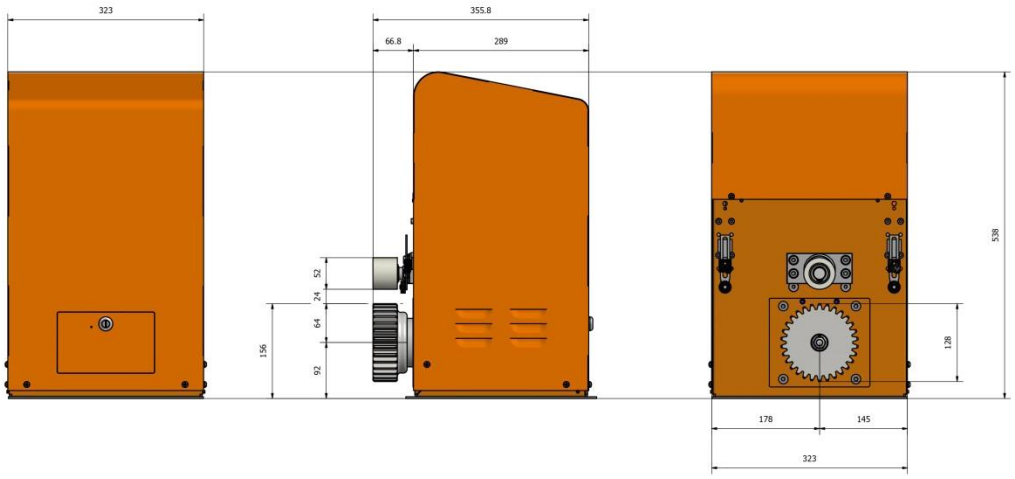


Figure 1.0 Motor housing dimension

Installation guidelines

The gear rack and the gate operator is the main mechanism that moves the sliding gate. The gear racks must be welded onto the sliding gate and must be solid. The gate operator plays a big role to drive the gear racks and thus moving the gate along. The control panel is another important part that controls the opening and closing of the gate. It is recommended to install the control panel on the wall or inside the security guard house. If flood is a concern, try installing the control panel box above the flood level. Also, photo beam provides extra safety feature and must be tested and installed properly. Another important part is the wiring must be enclosed with the PVC conduit and they should be hiding in the ground or install on the floor layer. The figure 2.0 below shows a big picture of how a typical automatic gate system is installed.

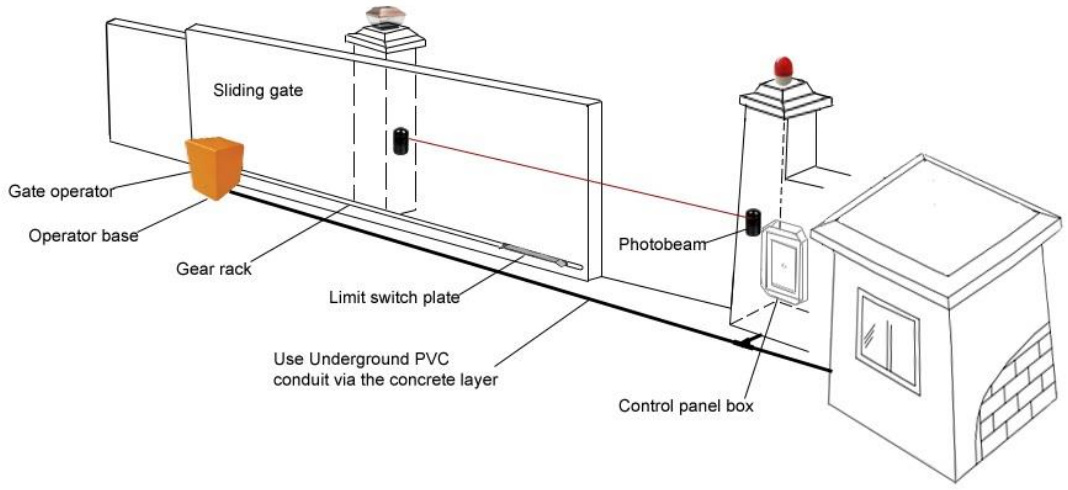


Figure 2.0 A complete sliding gate system

PVC Conduit

In order to protect the wires, conduit must be pre-set into the concrete before it gets harden. Make sure no sharp or rough elements obstruct the wires along the conduit path to prevent any unnecessary wire damage in the future.

The concrete foundation and the mounting of operator base plate

The base unit of the gate operator requires a concrete pad in order to maintain proper stability. The recommended concrete pad should be approximately 400W x 400L with 200mm deep enough to produce a solid binding with the underground. As shown in the figure 3.0 below, you can make use of the nuts, anchor bolts or J-type anchor bolts to be permanently set into the concrete before it is harden. Next, you can place the base plate onto the concrete surface layer while ensuring the cables is being pulled out from the underground conduit through the cable via hole. Leave the concrete dry itself completely before mounting the gate operator onto the base plate/concrete. Then you can mount the gate operator onto the base plate and use the nuts and washers to tighten it. It is also important to verify the alignment of the operator should be parallel to the floor. It is recommended to add some height with the washer if any one side is still not balance. Use the balancer ruler for measurement until the alignment is matching properly. The diagram below shows the instruction.

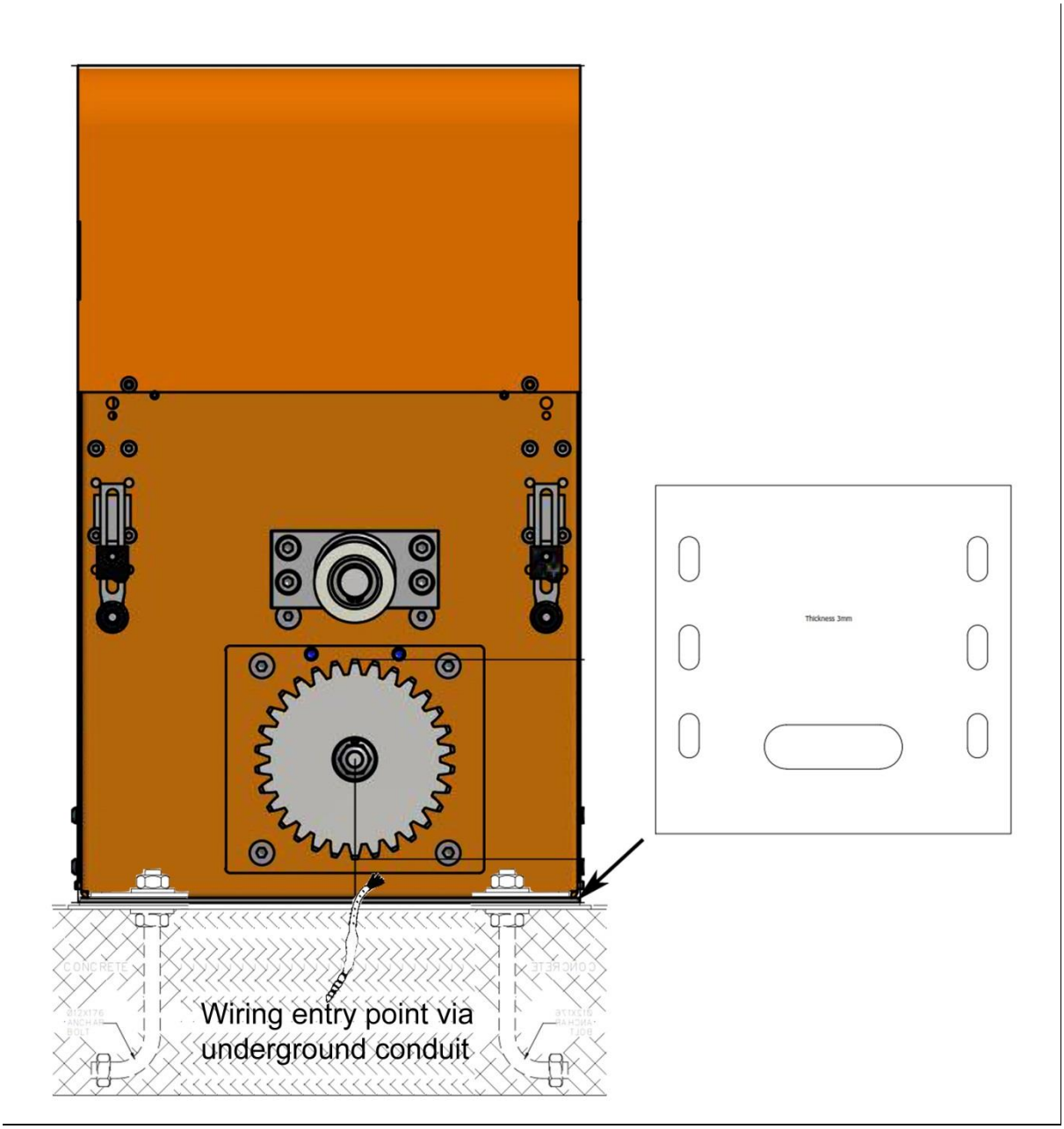


Figure 3.0 Operator and its base plate installation guides

Installation of Rack and pinion

- A standard metal rack should come with size of 100cm per pieces length. Thus if you have a 400cm gate in length, you need 4 pieces of racks.
- Fix the three gear rack's bolts (provided in the same package with rack) onto the racks.
- Lay the first piece of rack on the gear and weld the first bolt on the gate. One tip is to always lay the centre of the rack onto the gear to get hold on the centre point and you can allow the edge of the rack align to it with the use of balancer. Then, it is recommended to weld the two pieces of bolts at both edges each and follow by the centre one as shown in figure 4.0 below.
- Move the gate manually, checking if the rack is resting on the pinion gear
- Repeat the above steps for the rest of the racks while moving the gate manually
- When the rack has been installed, thoroughly moving the gate by hand to ensure it meshes correctly with the pinion gear.

- In order to let the motor output pinion gear meshes well with the gear rack, it is a good practice to ensure the gap between them is 0.5mm throughout the racks to maintain a stress free operation.

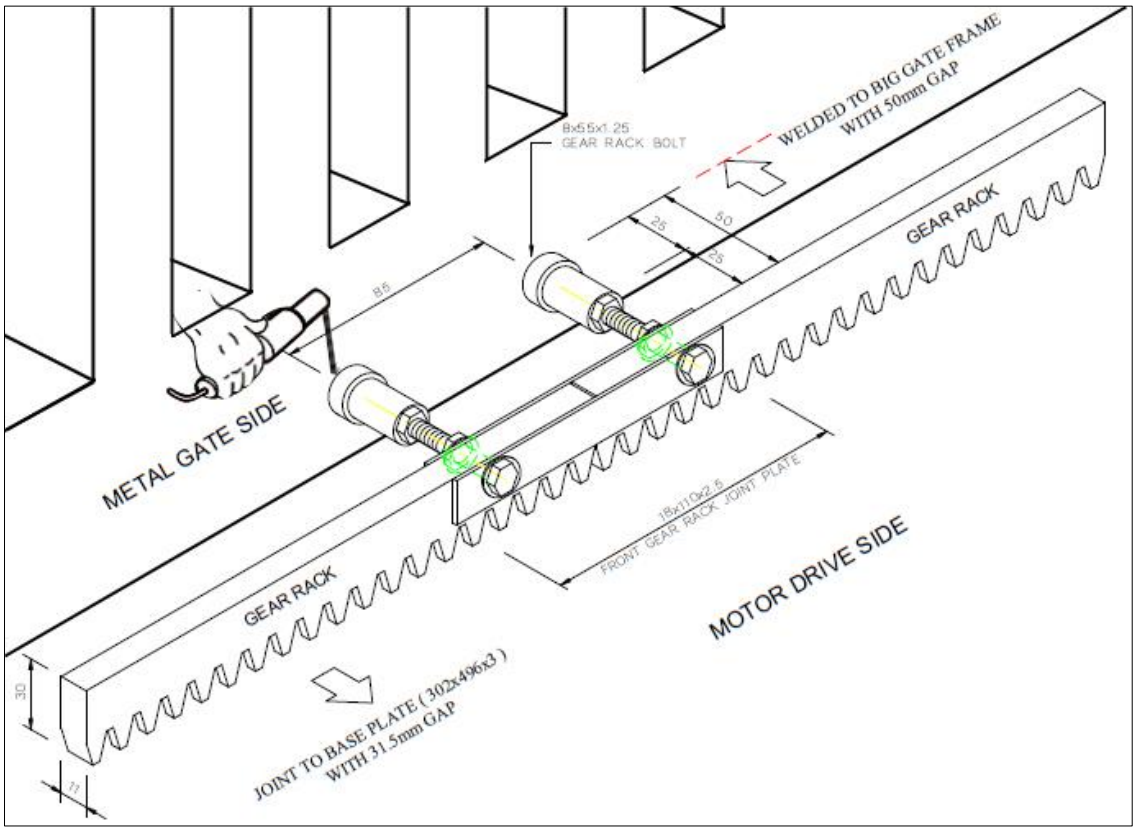


Figure 4.0 Gear rack installation guides

Motor Clutch Release function:

In case of power failure, you can release the motor clutch by turning it counter clock wise with the using of the provided L-Type hex wrench. You would able to move the gate manually once the clutch is released. Figure 5.0 below shows the motor release point.

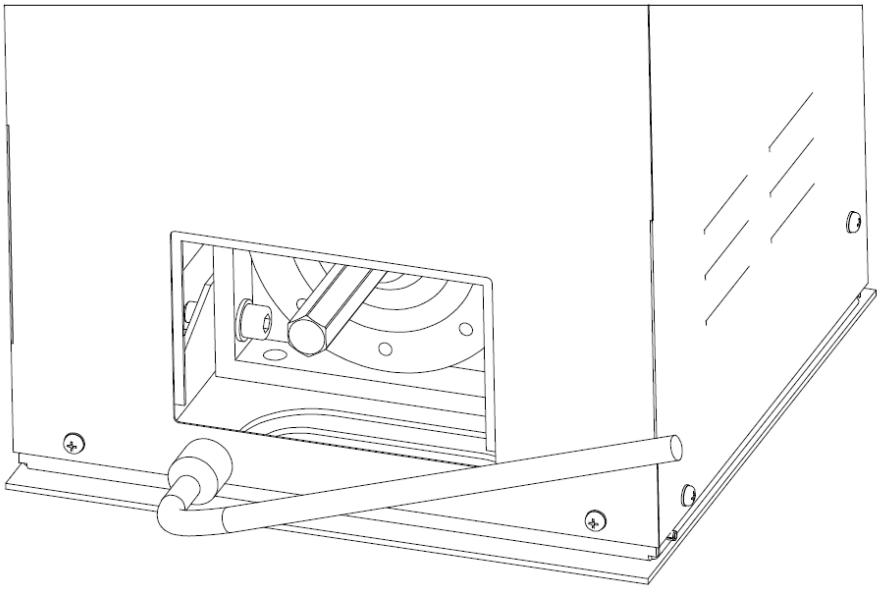


Figure 5.0 motor release point

Limit switch plate installation

Install the limit switch plate as shown in Figure 6.0 onto the gear rack. The limit switch plate is used to trigger the operator's limit switches. After the limit switch plate is installed, power up the control panel but release the gear clutch and push the sliding gate manually to pre-determine the gate position. When the switch is triggered, the controller will indicate the gate opening/closing position. Hook on the limit switch plate onto the rack as shown in the picture and then tighten it with the provided screws and nuts. Depends on the closing gate direction, assume the gate fully closing to the left side and the red LED should light up which indicate a closed position is detected. If the door is not closed perfectly or the red LED is not light up, calibrate and adjust the limit switch plate to the proper position manually until it is perfectly tuned and the red LED light up. There are two LEDs indicators, one is for closing door (red) and the other one is for opening door (green). If a wrong LED is light up, then you need to swap the motor mains wire between the Red and the yellow wire (refer to connection diagram at CONx?). Repeat the manual calibration mentioned above until the red LED as well as the gate closing function is working perfectly. Finally, apply the same test procedure above to test the gate opening. Calibrate the limit switch plate until the green LED is tuned perfectly to the gate maximum opening position.

The gear rack clipping mechanism (PE roller) is located above the operator output gear. PE roller usage is to prevent a robust factory gate (Example. the h-gate) to lift up which also helps to reduce the crashing noise generated by the output gear that meshes with the out of aligned gear rack.

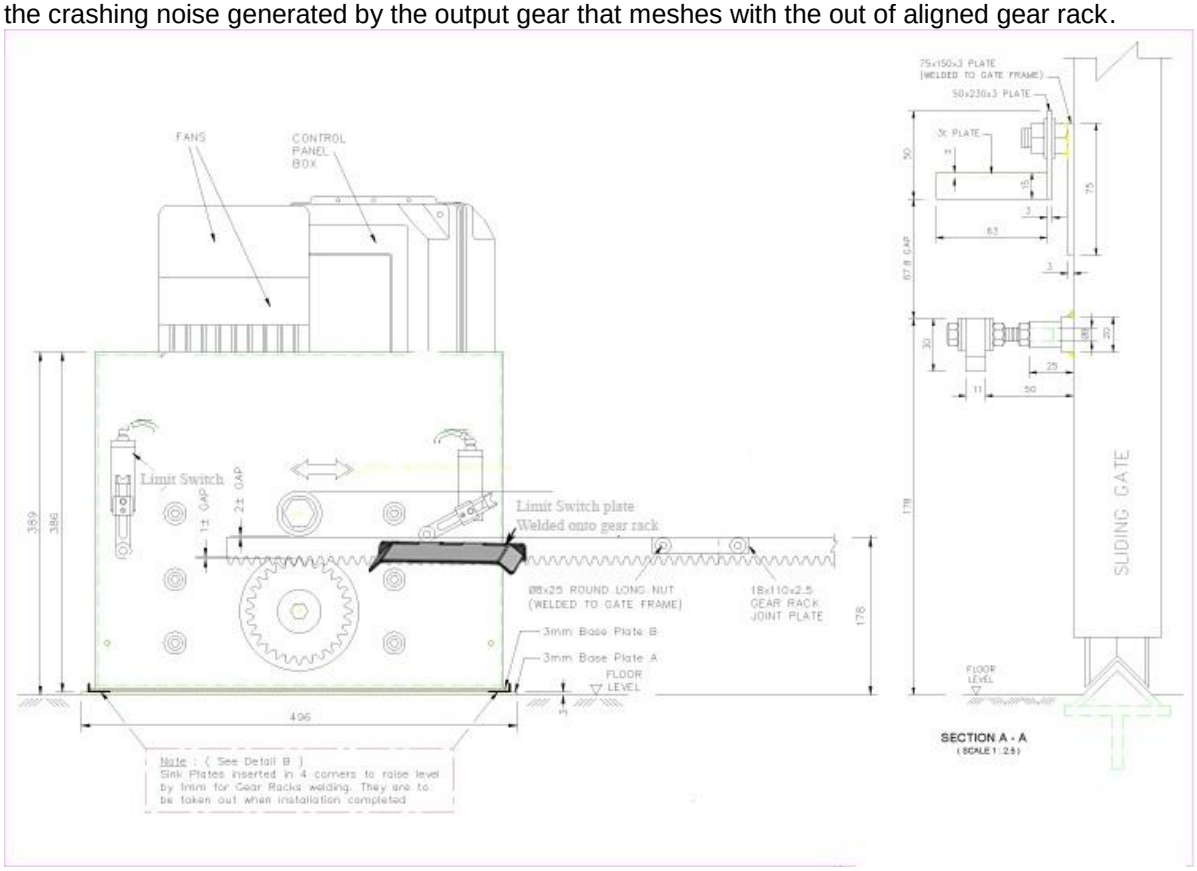


Figure 6.0 Limit switch plate installation guides

Electrical

COS-3R Sliding Gate Controller (3phase AC motor)

Operating instructions

COS-3R control panel is used in 3-phase power applications and it is designed with phase missing detection to prevent motor by overheated. Although it can also be used on a single phase motor application, it is most suited to be used for a 3-phase application. Two external contactors are needed for 3-phase application. The panel also incorporated with additional safety feature such as a high-amp sensor cut-off device whereby if a high-amp situation is sensed, the 3-phase motor will be stopped

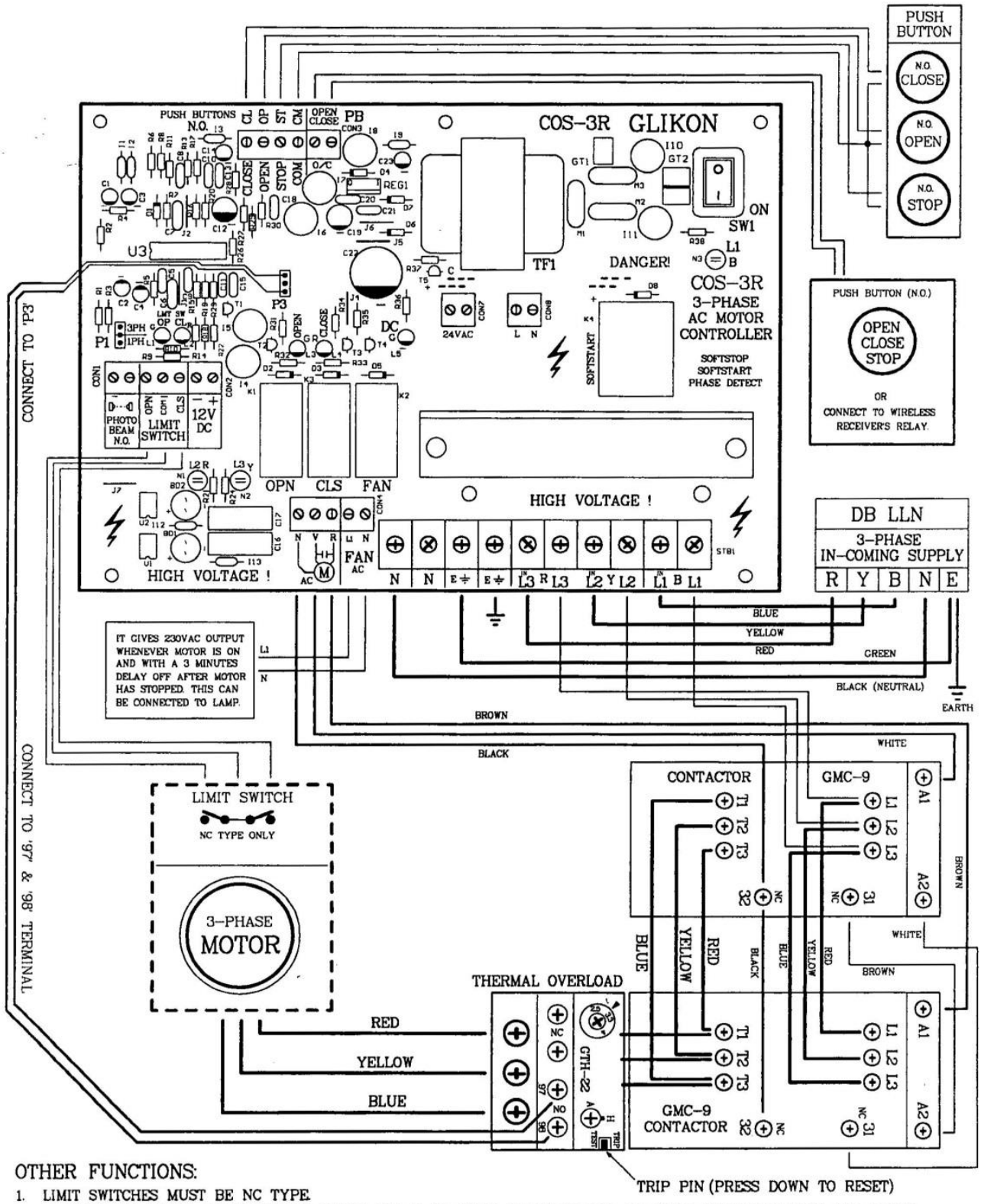
- It utilizes 3 push buttons for open, close and stop control
- Remote control feature
- Motor overheated safety feature – Prevent motor overheating, cut off motor drive if a motor is jammed for the duration of 15secs
- Safety photo beam function - auto-reverse & auto-Stop during obstruction
- Motor operating in one speed only, courtesy with soft start/ soft stop feature
- Pillar lamp lighting / AC fan usage – programmed with 3 minutes operations only
- Limit switch NO/NC settings (jumper selectable)
- Motor clutch release key

Function descriptions

photo beam input	
CON1	Photo beam device must be connected to photo beam terminal CON1 (N.O. mode) as this feature can prevent unnecessary injury or damage. When the photo beam detected any obstruction during gate closing, the motor will be reversed to open. On the other hand during the gate opening, blocking of the photo beam has no effect and gate will remain opening. Leave it disconnected if not used.
12Vdc output	
CON2	Auxiliary DC output voltage (can be used for photo beam supply etc.).
Limit switches	
In btw CON1 & CON2	It must be N.C. type. These limit switches are programmed for N.C. mode. Depends on the gate opening/closing direction, assume the gate is open to the right and close to the left. Connect the left limit switch to the "open" terminal point and connect the right limit switch to the "close" terminal point.
3Phase light bulbs	
L1, L2, L3	L1 (blue), L2 (RED) and L3 (Yellow) indicate the present / absent of the 3 phase power sources.
Push buttons	
CON3	Connected to push button or wireless receiver's output (N.O. mode). To trigger the gate opening/closing/stopping
Open push button	For open only control (N.O. mode). The button cannot be triggered by other buttons or loop detector
Close push button	For close only control (N.O. mode). The button cannot be triggered by other buttons or loop detector
Stop push button	For stop only control (N.O. mode). The button cannot be triggered by other buttons or

	loop detector
AC FAN / AC pillar Lamp output	
CON4	AC power point for AC Fan / AC pillar lamp usage. It gives 240V output whenever motor is ON and with a 3 minutes delay OFF after motor has stopped.
????Motor contactors output	
CON5	???Connect each Red, Yellow wires to terminal A1 of contactor A and contactor B respectively and connect the Neutral wire to terminal 32 of both contactors (N.C. mode). Follow the wiring diagram in figure 7.0.
????	
CON6	
24Vac power supply	
CON7	24V Auxiliary AC power supply for vehicle loop detector.
Soft start/Soft stop switch	
CON8	Connect the L & N wires to the high watts resistors provided to enable the soft start/soft stop effect. Leave it opens if not used.
1 Phase / 3 Phase selection	
P1	It is advice to use single phase mains for testing the motor controller, you can always set P1 jumper to "1PH" for this purpose. However, it must be set the jumper P1 back to "3PH" for motor normal operation as well as motor phase missing protection.
Overload sensing input	
P3	This is the input for the thermal overload breaker (N.O mode). It is advice to set the current overload tripping to 3A or below the motor current spec and the trip mode should set it to "H". When current is overloaded, the gate will be auto-reversed for 2 feet and stop. Remove obstruction prior to reset the device (by pressing the trip pin down) in order to allow the operator to work as usual again.
Anti-thunder fuse	
C16,C17	These two fuses are used to protect the components and circuitry of the control panel. The fuses break when the thunder strikes it. The fuses must be replaced to allow the control panel works as usual again.
Input power switch	
SW1	Main power switch for the control panel. It is supplied by a single phase power (blue mains).

3–PHASE CONNECTION DIAGRAM (GLIKON MODEL: COS–3R)



OTHER FUNCTIONS:

1. LIMIT SWITCHES MUST BE NC TYPE.
2. FOR TESTING USING SINGLE PHASE MAINS, SET P1 TO "1PH". WHEN IN USE, IT MUST BE SET TO '3PH' FOR MOTOR PROTECTION; WHEN ANY PHASE POWER NOT PRESENTS, THE MOTOR DRIVE WILL STOP.
3. FOR SAFETY, PHOTOBEAM DEVICE MUST BE CONNECTED TO PHOTOBEAM TERMINAL OF CON1 TO PREVENT INJURY OR DAMAGES. WHEN BEAM IS CUT DURING GATE CLOSING, THE MOTOR WILL BE REVERSED TO OPEN. DURING GATE OPENNING, BLOCKING OF THE BEAM HAS NO EFFECT AND GATE WILL REMAIN OPENNING.
4. THERMAL OVERLOAD (GTH–22) MUST BE SET AS SHOWN ABOVE, CURRENT IS SET TO ABOUT 3A AND TRIP MODE SET TO 'H'. WHEN OVERLOAD OCCURS, THE GATE WILL BE AUTO–REVERSED FOR SHORT DISTANCE AND STOP. REMOVE OBSTRUCTION AND RESET BY PRESSING THE TRIP PIN DOWN.

WARNING! – TO PREVENT RISK OF INJURY OR DEATH,
NO ONE SHOULD CROSS THE PATH OF THE MOVING GATE OR STAND NEARBY.

Maintenance:

- Regularly check any noise came from the wheels or the gear racks. Alignment adjustment and calibration needed when abnormal noise is found.
- Regularly grease the wheels and axles to ensure the gate moves smoothly.
- Ensure the operator is well earthed, and correctly terminated.
- Keep operator dry and clean at all times.
- Sand particles can damage the wheel bearings. Keep the gate area clean from sand build-up.
- Ensure the operator is covered properly.
- Ensure good ventilation inside the operator cover. A good practice is to install extra fan in it.
- Keep any crawling insects (ants, cockroach etc.) away from laying eggs within the operator cover. A good practice is to apply bugs killer powder on any holes or entry points.
- If flood incident happens, power off the operator and do not power on until the flood receded and ensure the control panel is dry.
- If thunder strikes your operator, the anti-thunder fuse of the control panel will blow off and the MCB inside your house might trip off. Contact the contractor to replace the fuse.
- Regularly change the motor oil. Depends on how heavy the motor operates, plan to change the motor oil one or twice times per year

Troubleshoot:

TROUBLE	POSSIBLE CAUSE	SOLUTIONS
Motor only runs in one direction	Wire loosen at one of the output terminal block CON5	Check wire connection, make sure all Yellow, Red and Neutral wires are plugged in CON5 correctly
	wire loosen at one of the contactor input terminal A1	Check the contactors input wire connection, make sure it is plugged in A1 correctly
	Wire loosens at one of the limit switch terminal block CON?	Check wire connection, make sure all open, close and common is plugged in CON? correctly
	If all above is not the cause, then it should be the on-board components faulty	Send it to StarGuard for further inspection, the PCB board is either repairable or need to be replaced
The gate will not open or close	Wires loosen at the connector output terminal block CON3	Check wire connection, make sure all open/close/stop wires are plugged in CON3 correctly
	Wire loosens at the limit switch terminal block CON?	Check wire connection, make sure all open, close and common is plugged in CON? correctly
	The power switch of the control panel might be OFF	One quick check to see whether the power is ON is to look at whether the on-board LEDs have red/green lights ON. If the LEDs not working, try switch ON the on-board power switch.
	If all above is not the cause, then it should be the on-board components faulty	Send it to StarGuard for further inspection, the PCB board is either repairable or need to be replaced

The Soft start is not function as usual anymore	wire loosen at the output terminal block CON8	Check wire connection, make sure both L & N wires are plugged in CON8 correctly
	The high watt resistor are broken	Replace the high watt resistors
The gate couldn't open/close fully as usual anymore	Either the limit switch plate or the limit switch itself is out of tune/ loosen	Tighten the limit switch and re-calibrate the limit switch plate position to allow the gate open/closed fully again
The gate stop in mid-way or reverse itself before reaching the full limit position	Gate is obstructed. photo beam sensed the obstruction	Remove the obstruction
Annoying noise occurred during the opening/closing of the gate	Noise should be coming from the moving things such as the wheel, the rack and the motor pinion gear. One of the wheel's bearing might be rotten or over burden due to imbalance floor level. Consequently lead to the misalignment of racks which would burden the motor pinion gear. The worst case happens when the motor is damaged as the consequences of noise ignorance.	Regularly check the condition of the gate's wheel. Try release the motor clutch and manually move the gate and check the gate should be moving freely. If not, replace the worn out wheels.
The motor is running but the gate not	The motor clutched is loosen / is being released by someone	Tighten the motor clutch by turning it clock wise with the used of the L-type hex wrench
Why is the motor overheated?	The thermal overload breaker might not be function properly or the wires are loosen at the input jumper P3. Which causing thermal breaker will never cut off the motor when overcurrent incident occurs	Check the current setting of the thermal overload breaker; it should be set below the motor current spec. Also check wire connection, make sure the wires are plugged into P3 (N.O. mode) correctly. Replace the thermal breaker device if damaged.
Remote control not working	The indicator light of remote control does not light up, battery weaken	check the batteries on your remote control and replace it if weaken
	Remote control not able to synchronize with the receiver	Send it to StarGuard for further inspection, replace with a new remote control if the device cannot be repaired
	Broken Receiver	Replace the receiver if the hardware cannot be repaired
The remote control operating distance is too short	Signals are probably shielded by a metal related substance such as the operator metal cover or even the metal gate	Move the receiver away from the metal related substance or fix a better antenna on the wall vertically which replaced the old antenna
	Bad position on the receiver	A good practice is to fix it proximity to the control panel box or inside the panel box. Best is to fix it on the concrete wall with adequate open space area as shown in figure 3.0 above.