CSL ELECTRONIC BACKING GATE CONTROLLER

2014 Model

INSTRUCTION & INSTALLERS MANUAL

These instructions are to be used in conjunction with the Danfoss operating instruction manual provided.

Electronic System Designed and Manufactured By

CORKILL SYSTEMS LIMITED
Phone (06) 761 7531

A Q-Base Registered Company

THE CSL HIGH LIFT GATE CONTROLLER ELECTRONIC SYSTEM
2014

INTRODUCTION
The system is driven by a Danfoss VLT2800 series variable speed drive (VLT) which supplies 230 volt three phase to the motors at preset frequencies. The VLT has a filter fitted to protect the unit from incoming voltage irregularities and noise and to limit interference on the output. The VLT unit is controlled by an Omron CP1L-L20DR-A Programmable Logic Controller (PLC) which determines commands from the microswitches on the gate and the main push-button interfaces.

SUPPLY
Supply is Single Phase 220 - 240 Volt 50/60 Hertz, Voltage tolerance is 220 Volts ± 10%. Specialised voltage units can be built to order.

A 2.5mm single phase supply fused or circuit breaker protected to 16 Amps is required at the Main Junction Box at the yard end of the Dairy. The cable should be of the specified size as a minimum to prevent volt drop in the system due to the long distance normally between the Main Switchboard and the gate.

It is not recommended to connect the unit via an Earth Leakage device (RCD); the controller monitors earth constantly to protect the motors, and has a leakage of approximately 8 milliamps.

INSTALLATION
The Multicore cable supplied should be attached to the cable rollers at 1200mm intervals, roll this cable out with no kinks prior to attaching to the rollers to prevent twisting. Connections are as per the numbers in the cable and at the connections in the Main Junction Box and the Main Control Panel. Diagrams are on the following pages.

The Push-Button Station cable is colour coded and should be connected at the Main Junction Box as per the Low Voltage diagram. If Radio Interference is likely to be severe from non-filtered Variable Speed Drives in the vicinity, connect the screen of this cable to the Earth terminal.

Micro switches on the gate are Extra Low Voltage and to be wired to the labelled terminals in the Main Control Panel, all commons wire to Terminal #3, there are two of these terminals for convenience. They are mounted on the side of the gate closest to the control box.

The TER Rotary Limit Switch is designed to be mounted at the top of the gate in the end of the shaft of the lift motor.
The limit switch is designed to sit on the spring bracket.
DO NOT SCREW THE LIMIT SWITCH TO THE BRACKET.
The grub screw in the gear box shaft is sufficient enough to hold the limit switch in place; damage will result to the switch if this is attempted.

Care should be taken to ensure the covers are correctly refitted on the micro switches also that all glands are tight on the switches silicon may be applied to these joints as an extra precaution to prevent moisture ingress.

The Motors are to be wired in EMC type screened cable and is recommended using steel glands to connect the cable screens at both the control box and the motors to comply with C-Tick requirements. The earth conductor MUST also be attached at both ends. The motors must be wired in **DELTA** configuration (230 volt). See the High Voltage Diagram instruction in the lower right corner.
An example of a metal gland is shown below:

Installation of metal glands and screened cables is an essential factor in lowering the SCC in the dairy plant.
The minimum size of the conductors to the motors should be 1mm. Do not undersize cables, larger is better to assist removal of RFI.

The above is also critical if cow ID systems are in use or being contemplated. The screen should be retained over the cable as close as possible to the termination.

COMMISSIONING
Turn the "main" switch to the "ON" position and the VLT screen will go through a brief diagnostic phase and then read out "Fr 00.0". The PLC will have some inputs lit according to which micro switches are activated. Input "00" is the "Stop" circuit and will always be lit unless a "Stop" button is held in. See the specific chart for the PLC Inputs and Outputs.

1. Operate the "UP" Button and check that the Lift Gate travels to the fully UP position and stops. During the down travel in either an option or using the down push button. The gate will travel down for 7.5seconds, stop for 3 seconds for cows to part in the yard, then continue to travel down. This feature is designed to capture half the cows in the yard.

2. Ensure all rails are clear of obstacles, stand clear of the unit and test the "FORWARD" operation and micro switch. Repeat with the "REVERSE" operation. The siren will operate only in the Forward mode.

3. Repeat Steps #1 and #2 above at the Remote Push-button station, the operations should be identical.

SEQUENCE OPERATION
There are several available programs/ options for the gate controller as follows.

Standard program/ options:
1. Standard Program
a) Press the "Gate up" button, gate travels up until "up" limit switch operates or "stop" button is pushed.
Same for "Down", "Forward" and "Reverse".

1. (A)Up/Down Follow Command
If the up or down push button is pressed followed by either forward or reverse within 3 seconds. The gate will firstly go in either up or down direction, until the micro switch is activated, and then in either forward or reverse.

1. (B) Pressure Reverse Switch
This option stops the gate overcrowding the cows. As the gate moves forward and starts to lift on the back of the cows, it hits a micro switch and stops the gate moving forward and reverses for 3 seconds. This feature is fitted to all gates.
Note: that the pressure reverse switch only works when the gate is fully down it also operates in the “Cycle” and “Syncro” programs.

1. (C) Down Delay
During the down travel in either an option or using the down push button. The gate will travel down for 7.5 seconds, stop for 3 seconds for cows to part in the yard, then continue to travel down. This feature is designed to capture half the cows in the yard.
Note: the down delay will only operate if the down operation commences from the gate upper limit and will operate in every mode except in wash mode.

1. (D) Pull Switch, Forward Motion
The pull switch is to stop or start the backing gate. Activation of the pull switch will not reset the “Syncro” or “Cycle” program but will allow the gate to move forward.
Note: 2. Forward motion can also be controlled by pull switch when the gate is in one of the optional pulse or cycle programs.

1. (E) Gate Brake, DC Hold Program
The gate has a special program embedded within the gate to lock the shaft of the motor after travel has completed this feature will stop the gate from rolling back down the yard on sloping yards and if the gate is stopped during the down travel.
Motor over run can some times be a problem on larger wider gates because of the inertia and weight of the gate so this feature will also stop that from happening.
Note: at the end of any movement the gate brake will operate for 3 seconds and no button can be pressed in that time to commence operation to give the gate time to brake.

1. (F) Reverse Down Safety
This program has a special timer to stop the gate from travelling backward to far while the gate is down to avoid a second herd in the yard behind from getting crushed and will limit the gate from travelling back for six seconds this can be over ridden by holding down the reverse button for one second The gate will emit a beep to indicate the reverse safety has been overridden.

1. (G) Off Limit Safety Timer
This program has a special timer to stop the gate if it takes more than 5 seconds to get off the safety limit in case something goes wrong or the gate is stalled or jammed. The gate will alarm indicating that a fault has occurred by emitting 3 short tones and gap being either the down siren or the forward siren to indicate the directional limit at fault.

1. (H) Opposing Limit Safety Timer
This program has a special timer to stop the gate if it takes more than 300 seconds (or 600 seconds during wash) to get to the apposing for/rev limit or if it takes more than 25 seconds to get to the apposing up/down limit.
This program is designed in case something goes wrong or the gate is stalled or jammed. The gate will alarm indicating that a fault has occurred by emitting 3 short tones and gap being either the down siren or the forward siren to indicate the directional limit at fault.

1. (I) Bypass mode
This program has a Bypass mode if one of the limit switches should fail to enable the gate to temporally operate, to enter this mode press in the stop button and turn on the main gate controller until the siren sounds a one second pulse.
In this mode you can press the direction buttons and the gate will only move for as long as you hold the buttons down and it will ignore the limit switch so be careful.
NOTE: the optional programs will not operate in this mode as it is assumed the limit or limit switches are faulty which may cause undesired operation of the gate.
Bypass mode will have a maximum run time of 10 seconds as a safety per button operation.

1. (J) Override mode
This program has a override mode if one of the limit switches should fail to enable the gate to operate overriding the faulty limit, at any time you can press the direction buttons and the gate will only move for as long as you hold the buttons down and it will ignore the limit switch so be careful.
Override mode will have a maximum run time of 10 seconds as a safety per button operation.

1. (K) Quick
This program has two speeds in reverse and forward mode. When the "REVERSE" or "FORWARD" button is pressed the first time the speed is 50 Hz when actuated a second time, the gate motor will accelerate and travel at a higher speed (75 Hz).
Note the **Reverse down safety** must first been overridden to enable this feature the gate will emit a beep to indicate slow speed and two beeps to indicate fast speed.

1. (L) Cycle Program
Press the "CYCLE" button the lift gate travels down until the limit switch operates. The gate moves forward an incremental amount after a set period in a continuous cycle, the distance travelled per pulse or the delay pulse can be altered by carefully adjusting the preset analogue pot see pot selection and program adjustment below on how to alter this.
Note: The "DOWN DELAY" option functions in this option.

1. (M) Pulse Program
This program is the same as the Cycle program except the gate will pulse only once when the "PULSE" button is pressed.
The distance travelled per pulse can be altered by carefully adjusting the preset analogue pot see pot selection and program adjustment below on how to alter this.
Note: The "DOWN DELAY" option functions in this option.

1. (N) Synchronisation Program
Press the "SYNC" button and the lift gate will lower then count the sync micro switch on the platform, Bail gate or a photo eye sensor on the exit race. The amount that the gate will count pulses can be set by adjusting the preset analogue pot with a range of 1-20 pulses. The gate will then move forward, an incremental amount, the distance travelled per sync and the number of counts can be altered by carefully adjusting the preset analogue pot see pot selection and program adjustment below on how to alter this.
Note: the counter operated switch will only activate the sync forward after the syncro button is depressed.
Note: The "DOWN DELAY" option functions in this option.

1. (O) HB Synchronisation Program
Press the "HBSYNC" button and the lift gate will lower then wait for the sync micro switch on the gate head Bail to the exit race. The gate will wait for 60 seconds before moving forward, an incremental amount, the distance travelled per HB Sync can be altered by carefully adjusting the preset analogue pot see pot selection and program adjustment below on how to alter this.
Note: the counter operated switch will only activate the sync forward after the hb sync button is depressed.
Note: The "DOWN DELAY" option functions in this option

1. (P) Wash Program
when the "WASH" button is pressed either forward or reverse the gate will go up and travel to the opposing limit and come down, it will then drive at a slow speed while washing the yard until it gets to its corresponding limit the gate will then return to the back of the yard in the up position ready for the next milking.

The wash program can also be used to turn on the wash down pump during the washing phase of the gate wash program using the wash output terminal on the slave unit plc within the junction box.

1. (Q) Wash While Down Program
This operates the same as the **STD** program except that when the gate is down and the gate is travelling either forward or reverse the wash feature of the gate will operate.

Optional Program / options's
These options must be specified at the time of ordering and can not be enabled in the field but a simple program upgrade and slight wiring changes can enable them please contact CSL for more information

2. Midway Drain Wash Program
When "WASH" button is pressed the gate will travel up until the limit switch operates.
The gate then moves forward at high speed to the front of the yard then travels down and then slowly backwards to the centre of the yard. When the midway microswitch is operated or the centre timer is reached the gate will travel up then reverse at normal speed to the back of the yard then travel down and then forward slowly to the centre of the yard. When the midway microswitch is operated or the centre timer is reached the gate will travel up and then reverse at high speed to the back of the yard and come to rest.

3. Round Yard
Works the same as a normal gate but is used on a straight yard with a curved section at either the end of the yard. When the curved section microswitch is operated the gate will stop one drive motor and drive around the bend.
All other functions operate as normal.

1. (J) Self Alignment Feature
The self alignment feature operates the same as any given gate except that it has the ability to align the gate left or right side individually forward or reverse if the gate becomes unaligned.
This option will require an upgrade gate controller and cant be added to an existing gate controller please contact CSL if you believe you require this.

Note: only one Wash Program and Optional program option can be used at once but just about any other or combination of programs are available.
Note1: During the wash cycle and syncro functions the gate will intermittently beep every 30 seconds to warn you the gate is still in automatic operation.

Custom Programs.

If you have a feature you wish to implement that is not covered in this manual please contact this we will be happy to modify or create this feature for you we have many custom programs that are not outlined in this manual that we could offer you to suit your needs.

DISTANCE ADJUSTMENT PROCEDURE:

To adjust the distance the gate travels in any of the optional programs (pulse/cycle/sync and hbsync) turn the pot clockwise to set the desired distance timer.
The default distance is 5 seconds when the pot is set to the anti clockwise limit the pot will give adjustment from 5 to 30 seconds.

Program specific adjustment procedure (fake pot setup):

To adjust the cycle delay timer, or the sync count value press and hold in the "STOP", "UP" and "DOWN" button until the gate beeps then turn the pot clockwise to set the desired timer or counter.

The default values and adjustment range depends on the option selected as in the following table:

Program selected	Default setting	Adjustment range
cycle	1 min between pulses	1min-10min
sync	1 sync input	1-20 counts

FOR PULSE /HB SYNC
Selection of **Pulse/HBSync** is done by setting the fake pot fully anti clockwise (a different beep tone will sound when **Pulse/HBSync** is enabled.)

FOR CYCLE /SYNCRO
Selection of **Cycle/Syncro** is done by setting the fake pot off the stop limit and clockwise to set the amount of micro switch pulses per gate sync and delay time per cycle (a different beep tone will sound when **Cycle/Syncro** is enabled.

FOR FORWARD WASH
Selection of **Forward Wash** is done by wiring the wash button across the up and forward contacts .

FOR REVERSE WASH
Selection of **Reverse Wash** is done by wiring the wash button across the up and reverse contacts

Notes: After adjusting the fake pot you must re adjust the distance pot back to the desired distance settings.

The Wash Program and Optional program above are common to most gates and can be changed at will any other program must be specified at the time of ordering and can not be changed in the field.

If your gate did not accompany any optional programs at the time of ordering you must order an upgrade program package.

OMRON Programmable Logic Controller
The Omron PLC can be altered in the field with some exceptions please phone Corkill Systems to talk to a Technician for advice.

Gate upgrade programs are available by contacting Corkill Systems Limited on 06 761 7531.

Upgrade gate programs come in the form of a memory stick that plugs into the plc and are returned when programming is complete and may be preformed by any one but if additional wiring is needed a registered electrician, or a Corkill Systems technician will be required to do the necessary changes to the gate to accompany the program change.

DATACABLE UPGRADE.

There is also an optional upgrade that replaces the multicore cable up the yard with a special cable. This cable has both 3 phase power and 2 wire data communications cable embedded inside it to relay information between the junction box and the gate simplify installation.

This opens up the gate to enable additional features such as:

* Water pump control
* Solenoid valve control
* Direction indicator lamps
* Function indicator lamps
* Warning siren tones.
* longer yards from lighter cable and 3 phase upgrade
* Future expansion possibilities
* PC and PLC control possibilities
* Wireless control (See below)

This upgrade consists of a communication module to fit to the gate and a replacement junction box and cable, this enables more information to exchange between junction box and gate than the standard cable will allow.

WIRELESS DATA CABLE UPGRADE.

This is the same as the special cable but it enables control over a radio control interface.

DATA LINK CONTROL INFO.

The data cable option is preformed using the Hostlink protocol on top of RS-485 cabling.
If you wish this could be controlled by a drafting gate system such as pro-track we can provide information on interfacing with the gate from a plc or computer if you wish to implement such a control system.
We can provide you with sample code to interface with this using an Omron plc if you wish, I suggest you contact us regarding this.

ALARMS

If the unit should go into Alarm mode, the gate will stop and the siren will operate with a single tone, all buttons will be locked until the Alarm has been reset. The following will cause the Alarm to operate.

1. Overload on the Drive Motors

If either Electronic Over Current Relay (EOCR) trips due to the gate being obstructed, the Red LED will light on one of the pair of units indicating a fault. These can be reset by the Resets on the EOCR's themselves or by turning the Isolator off for 1 minute. If one EOCR repeats the alarm frequently, it may need slight adjustment to either the time or current settings.

2. VLT Alarm

There are several potential Alarm situations in the controller as the unit is monitoring both itself and the connected motors constantly (even when the motors are in the Stop position), it is also monitoring temperatures and looking for ground faults and short circuits. The screen will give a numeric message describing the fault. Reset by turning the Isolator off for at least 1 minute. All fault messages are on page 55 and 60 in the VLT2800 manual supplied. If the fault persists call for service on 06 761 7531 or contact a Danfoss Service Agent. Please note the VLT numeric message and which PLC inputs and outputs are lit before calling or have a cell phone available at the gate to be able to check the diagnostics by phone.

3. PLC Alarm

Output "00" will be flashing on the PLC, this indicates a fault in the system.
There are different alarm tones depending on the fault condition.

4. Faulty Stop Circuit
if there is a fault in the stop circuit the alarm siren will sound.

5. Faulty Limit Switches
if there is a fault where both of either the up/down or forward/ reverse limit switches are open at any given time the siren will sound indicating a fault with the gate or incorrectly adjusted or installed limit switches.

With all Alarms, check to see where the fault is coming from before resetting, if the fault persists, call for service with details of the fault.

ELECTRICAL SERVICING

1. Low Voltage
All buttons circuits can be checked by pressing the button and observing the corresponding PLC input LED as per the following chart. When output LED's are lit, those output terminals will be at + 24 VDC relative to VLT Terminal #20. All outputs are supplied by VLT Terminal #12. The PLC has a 24 VDC separate output which is used to power the alarm circuit.

PLC indicator LED Status Chart (ON = Lit, OFF = Not Lit)

BUTTON PUSHED	00 (NC) STOP	01 (NO) UP	02 (NO) DOWN	03 (NO) FORWARD	04 (NO) REVERSE	05 (NO) PULL
NO	ON	OFF	OFF	OFF	OFF	OFF
YES	OFF	ON	ON	ON	ON	ON

SWITCH ACTIVATED	06 (NO) PRESSURE	07 (NC) UP M/SW	08 (NC) DOWN M/SW	09 (NC) FORWARD M/SW	10 (NC) REVERSE M/SW	11 (no) SYNC
NO	OFF	ON	ON	ON	ON	OFF
YES	ON	OFF	OFF	OFF	OFF	ON

Fault Loop (00), this circuit includes alarm modes from the EOCR's and VLT Alarm Relay or a open "Stop" button circuit or faulty micro switches.

Please note that all micro-switches are in the Normally Closed position between stop positions and normally open when at the stop limit except the breech switch.

2. High Voltage

WARNING! The VLT can retain high voltages for a period after the power has been isolated due to the large capacitors in the power supply circuit. Wait at least 4 minutes before touching any parts.

A 1 Amp glass fuse protects the PLC and EOCR's, this is located adjacent the PLC in a DIN type fuse holder.

If checking motors with the power to the Main Control Panel, disconnect the motor plug from the VLT before touching any motor terminals as the VLT outputs a small voltage to the motor terminals even with the motor stopped to monitor the motor condition.

PROGRAMMING the Danfoss VLT2807 Controller

If the VLT program has been inadvertently altered or requires custom settings, the following is a program sheet giving the values changed from the Danfoss factory settings. Instructions to alter parameters are also in the VLT2800 Operating Instructions.

A hand programming unit (LCP) and cable to plug into the VLT communications port can be "lent" if programming is required to be done from scratch and the service person is uncomfortable with programming

#	Parameter Name	Set-up 1 Lift Motor	Set-up 2 Drive Motors	Set-up 3 Drive Motors (Wash)	Set-up 4 Drive Motors (Wash)	Parameter Setting
004	Active Set-up	5	5	5	5	

005	Programming Set-up	5	5	5	5	(Note 1)
014	Local Stop	1	1	1	1	
102	Motor Power	0.55kW	0.75kW	0.75kW	0.75kW	
103	Motor Voltage	230	230	230	230	
105	Motor Current	2.5	6.0	6.0	6.0	
123	Min.f.func.stop	0.1Hz	0.1Hz	0.1Hz	0.1Hz	
126	Dc braking time	3.0s	3.0s	3.0s	3.0s	
127	Dc brake cut in frequency	3 Hz	3 Hz	3 Hz	3 Hz	
128	Mot.therm protec	4	0	0	0	
132	Dc brake voltage	25%	25%	25%	25%	
200	Output Frequency Range	1	1	1	1	
205	Maximum Reference	100	100	100	100	(Note 2)
207	Ramp-up Time	1.0	1.0	1.0	1.0	Seconds
208	Ramp-down Time	1.0	1.0	1.0	1.0	Seconds
215	Preset Reference 1	55%	75%	75%	75	note 3
216	Preset Reference 2	-55%	-75%	-75%	-75	note 3
217	Preset Reference 3	-55%	50%	50%	20%	note 3
218	Preset Reference 4	-55%	-50%	-50%	-20%	note 3
302	Input Terminal #18	22	22	22	22	
303	Input Terminal #19	23	23	23	23	
304	Input Terminal #27	33	33	33	33	
305	Input Terminal #29	31	31	31	31	
307	Input Terminal #33	32	32	32	32	
323	Relay Output 1-3	10	10	10	10	
405	Reset Function	11	11	11	11	

Programming Notes
To enter programming mode, press “Quick Menu” and “+” simultaneously, screen will flash. Move to required parameter using “+” and “-“ keys.
To view data, press “Change Data” at the desired parameter number. At this point data value can be changed, change data by using “+” or “-” and save by pressing “Change Data” again within 15 seconds of making the changes.

Note 1:
At the normal “Stop” position, controller is in “Set-up One”, this is the program for the Gate Lift Motor, any parameters relating to lift operation can be changed at this point. To change parameters in the Gate Forward & Reverse mode, change the data value in “005” to data value “2” and save. This will need to be changed back to “5” upon completion of changes.

Note 2:
Raising or lowering the data values in this parameter will alter the overall travel or lift speeds.

Note 3:
This parameter alters motor speed and direction depending on which program is used:

Note 4:

The lift gate DC Hold programming is enabled by default but on larger gates increased current may be required to brake the gate effectively
On the Danfoss VLT 2800

Press “quick menu” and “plus” at the same time
Press “+” and go to parameter #132
Press “change data”
Use “+” key to change current value in % of motor run current.
Press “change data” within 30 seconds to save
Press “Quick Menu” to escape

The drive gate DC Hold programming is enabled by default.

Firstly change the drive into Gate Forward & Reverse mode, change the data value in “005” to data value “2” and save. This will need to be changed back to “5” upon completion of changes.

Press “quick menu” and “plus” at the same time
Press “+” and go to parameter #132
Press “change data”
Use “+” key to change current value in % of motor run current.
Press “change data” within 30 seconds to save
Press “Quick Menu” to escape

Try the gate, you should hear the whining sound at the motor as it locks the position after stopping on all forward and reverse actions. This sound will last for 3 seconds and then release.

Spike Arrestor
A 15 Ka spike arrestor is wired into the incoming phase circuit; if this fails the audible within this unit will sound to alert the operator that the arrestor needs replacement. The gate will continue to work in this situation but will not have the same surge protection.

SAMWHA Electronic Over Current Relay
The two EOCR’s protect the drive motors, in normal mode the green LED is lit, in alarm mode the red LED lights. The Alarm sounder in the controller will sound reset by pressing the reset. The following are the EOCR standard settings;

Current	2.3 Amp	Motor FLA in Delta Configuration
Operating Time	10 Seconds	Overload Time before tripping
Delay Time	0 Seconds	Delay Time before relay can be reset

ASKARI Sounder
This 24VDC sounder has two different tones; the constant pulsed tone is for an Alarm Situation and the siren tone for gate travelling forward or down. The unit has a volume control on the top of the sounder as viewed from the front of the control box. Test the sounder alarm mode by holding in the Stop Button on the control box lid for more than ten seconds.

Trouble Shooting

Common Error Messages.

WARNING/ALARM 4 Phase fault (MAIN PHASE FAULT). 3 phase gates only
A phase is missing on the supply side or the mains voltage imbalance is too high.
This message can also appear if there is a fault in the input rectifier on the frequency converter.

Cause/Remedy: Check to make sure all 3 Phases are ok to the drive, if these are ok check other 3 Phase equipment in the Dairy. E.g. to make sure your power supply is ok to the Dairy. Turn off the gate completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive.

WARNING 6 Voltage warning low (DC LINK VOLTAGE LOW).
The intermediate circuit voltage (DC) is below the under voltage limit of the control system.

Cause/Remedy: The incoming voltage to the gate is too low for it to operate.
E.g. there could be a fault with the power entering the drive. Check incoming supply and cables.
The voltage will need to be returned to normal for the gate to operate

WARNING/ALARM 9 Inverter Overload (INVERTER TIME).
The electronic, thermal inverter protection reports that the frequency converter is about to cut out because of an overload (too high current for too long). The counter for electronic, thermal inverter protection gives a warning at 98% and trips at 100%, while giving an alarm. The frequency converter cannot be reset until the counter is below 90%.
The fault is that the frequency converter is overloaded by more than 100% for too long.

Cause/Remedy: check motors for faults dry bearings or stiff gear boxes and check motor data in the drive and perform an automatic motor adaption in the lift motor. Turn off the gate completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive.

WARNING/ALARM 13 Over current (OVERCURRENT).
The inverter peak current limit (approx. 200% of the rated current) has been exceeded. The warning will last approx 1 – 2 seconds, following which the frequency converter will trip, while giving an alarm. Turn off the frequency converter and check whether the motor shaft can be turned and whether the motor size matches the frequency converter. If extended mechanical brake control is selected, trip can be reset externally.

Cause/Remedy: check motors for faults dry bearings or stiff gear boxes and check motor data in the drive and perform an automatic motor adaption in the lift motor. Turn off the gate completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive.

ALARM 14 Earth fault (EARTH FAULT).
There is a discharge from the output phases to earth, either in the cable between the frequency converter and the motors or in the motors them self..

Cause/Remedy: Either the motor or the cable to the motor has a short to earth in it.
An Electrician will have to check this.
Turn off the Gate completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive.

ALARM 16 Short-circuit (CURR.SHORT CIRCUIT):
There is a short circuit on the drive this could be in the cables to motors, motor terminals, windings or drive/lift relay.

Cause/Remedy: Either the motor or the cable to the motor has a short to earth in it.
An Electrician will have to check this.
Disconnect the drive at the motor output terminals and turn the gate back on to prove the controller is OK.
Turn off the gate completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive

RUNNING FIRST TIME FAULTS Drive won’t start.
Drive in local stop after performing ama.

Cause/Remedy: After doing an ama on the lift motor you will need to reset the drive press "RESET" and then "START" on the control panel on the Danfoss

RUNNING FIRST TIME FAULTS Siren sounds when turning on gate.
Break in Stop circuit, fault in supply cable or overloads tripped.

Cause/Remedy: check stop circuit on gate for faults (input #00 on the plc should be lit) Cable running up the yard for breaks and check and reset overloads if necessary.

RUNNING FIRST TIME FAULTS Gate won't go in direction X.
Limit switches faulty or not set.

Cause/Remedy: check the limit switches and adjust as necessary

RUNNING FIRST TIME FAULTS Gate operates in forward/reverse but stalls when in lift mode.
The ama is not preformed or motor data is not set correctly in drive.

Cause/Remedy: Check motor parameters in the drive, perform an ama on the lift motor and check gear box is free.

RUNNING FIRST TIME FAULTS Gate fails to work in cycle, sync or pulse.
The pots are set incorrectly.

Cause/Remedy: Check pots and adjust as necessary set to 1oc position and fine tune from there.

RUNNING FIRST TIME FAULTS Gate travels in wrong direction when I press button X or one of the drive motors goes in the wrong direction.
Motor or motor phases are inverted.

Cause/Remedy: invert motor phases of motor at the gate controller box for the affected motors

Manufacture Details

	Model No.	Serial No.
Danfoss Controller	VLT28	
Omron PLC	CPM1A-20CDR-A-V1	
PLC Program Options	R-	
Danfoss Program	RHLG2006.VLT	
Order Name		
Manufacture Date	/ /	

Manufactured by;
Corkill Systems Limited, 5 Tasman Street, PO Box 16, Opunake, New Zealand.
Phone (ISD 0064) 06 761 7531, fax 06 761 7336 or email: info@corkillsystems.co.nz
All equipment contained within the Controller is Y2K Compliant and is manufactured to Telarc Q-Base Quality Assurance Standards.

All equipment contained within the control enclosure is guaranteed 12 months from the date of manufacture provided that the controller has been correctly installed by a registered electrician and that all measures have been taken to prevent moisture ingression into the enclosure. Damage from lightning or High Voltage surges are not covered by the warranty.

HELP!

If all else fails phone (06) 761 7531 and state that you have a CSL Gate problem, we will be pleased to assist.

GENERAL

All quotations, orders and contracts for the sale or supply of goods or services by Corkill Systems Limited shall unless, otherwise agreed in writing, be subject to the following terms and conditions:

1. ORDERS **All orders are made and accepted on the terms and conditions here stated. Order cancellations are subject to terms agreed as at time of cancellation.**

2. PRICES **Prices quoted remain firm for 30 days but beyond that time prices may be adjusted.**

3. DELIVERY

Delivery dates given by Corkill Systems Limited are approximate and rely on prompt receipt of all necessary information regarding the order. Corkill Systems Limited will use their best effort to meet the estimated date but will not be held liable for any delay due to circumstances arising in the industry generally or within Corkill Systems Limited work due to delay in receipt of supplies from sub-contractor or any other circumstances beyond Corkill Systems Limited control. No liability will be taken for any late deliveries unless delivery date has been guaranteed by Corkill Systems Limited in writing. Otherwise Corkill Systems Limited will use its best endeavour to meet delivery dates.

4. DELIVERY CHARGES

Unless otherwise agreed in writing or at the discretion of Corkill Systems Limited, all freight will be charged to the Purchaser's account.

5. RETURN OF GOODS

No goods may be returned without prior written approval of Corkill Systems Limited and may be subject to a restocking fee.

Approval will be contemplated by Corkill Systems Limited only in circumstances where:

- **5.1 Advice of any proposed return is given within 30 days following the date of the invoice.**
- **5.2 Transportation and other costs for return are prepaid by the Purchaser**
- **5.3 Goods to be accompanied by a copy of Corkill Systems Limited Packing Slip or Invoice**
- **5.4 Goods to be accompanied by a written explanation of reasons for return.**
- **5.5 Corkill Systems Limited may charge for handling, inspection, disassembly or reconditioning stock items.**
- **5.6 Units manufactured, modified or imported as special or unique units will only be accepted for credit less the cost of converting the unit back to a standard saleable unit.**

6. TERMS OF PAYMENT

All goods shall be paid for on the 20th day of the month following delivery. Corkill Systems Limited may at any time require full or part payment in advance of delivery and the purchaser shall not be entitled to any damages or compensation arising from such requirement. Goods on time payment shall be subject to the conditions on the Time Payment contract in addition to the terms contained within this document.

7. PRODUCT SAFETY

Corkill Systems Limited products are supplied and manufactured to high standards but no electrical equipment is failsafe within itself. When risk to person or property may be involved a fail-safe device should be an integral part of the equipment, the entire responsibility for which rests with the Purchaser.

8. OWNERSHIP OF GOODS

The goods shall remain the property of Corkill Systems Limited until they have been fully paid for. Risk shall pass to the purchaser on delivery. The purchaser will insure the goods. The purchaser acknowledges that it is in possession as agent and bailee for Corkill Systems Limited and owes a fiduciary duty to Corkill Systems Limited until such time as legal and equitable title shall transfer. The purchaser's right to possession of unpaid goods shall terminate on demand by Corkill Systems Limited, which may enter or authorise an agent to enter the purchaser's premises to recover the goods.

9. PRODUCT WARRANTY

Provided that the product has been subjected to normal and proper use only, all new products supplied by the company are warranted to be free from defects in materials and workmanship from the date of shipment to the Purchaser either for one year or the Manufacturers warranty term subject to the following conditions:

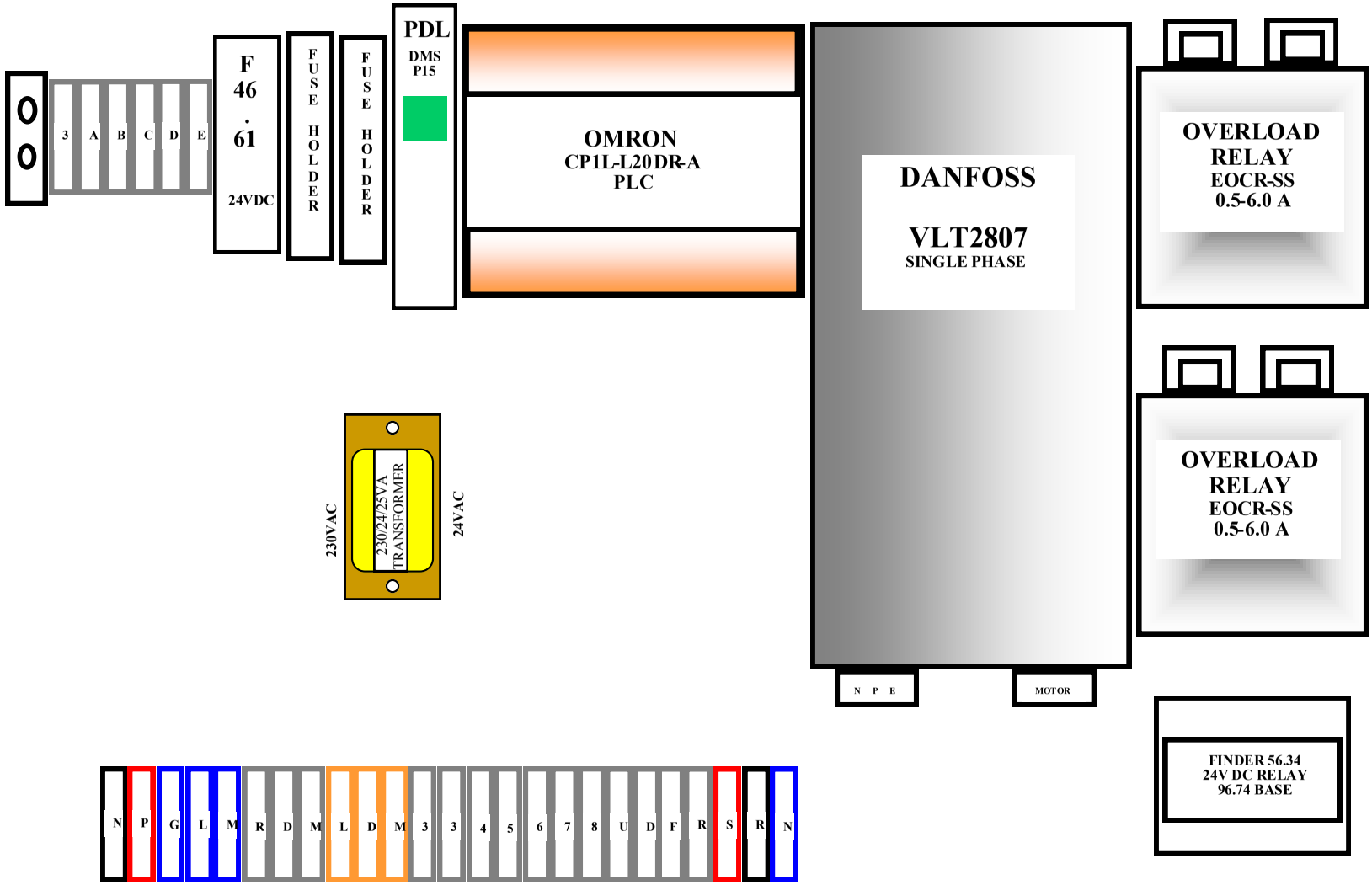
- **10.1 All electrical equipment to be installed and commissioned by qualified trade-persons.**
- **10.2 Adequate measures to be taken against moisture and/or mechanical damage.**
- **10.3 Recommended cabling procedures and/or circuitry protection must be provided.**
- **10.4 Suitable overload protection be provided and installed where required.**
- **10.5 All faulty components to be returned to Corkill Systems Limited before a credit can be made.**

In the event of equipment failure, all faulty components will be repaired or replaced free of charge, consequential loss/equipment damage and/or labour and/or travelling will not be subsidised. Any unauthorised dismantling, repair or modification voids this warranty.

10. LIABILITY UNDER WARRANTY

Corkill Systems Limited liability under this warranty or any other warranty whether express or implied in law or fact shall be limited to the repair or replacement of defective material and workmanship and in no event shall Corkill Systems Limited be liable for consequential or indirect damages.

11. GOVERNING LAW **This agreement shall be construed according to the laws of New Zealand.**



CORKILL SYSTEMS LTD
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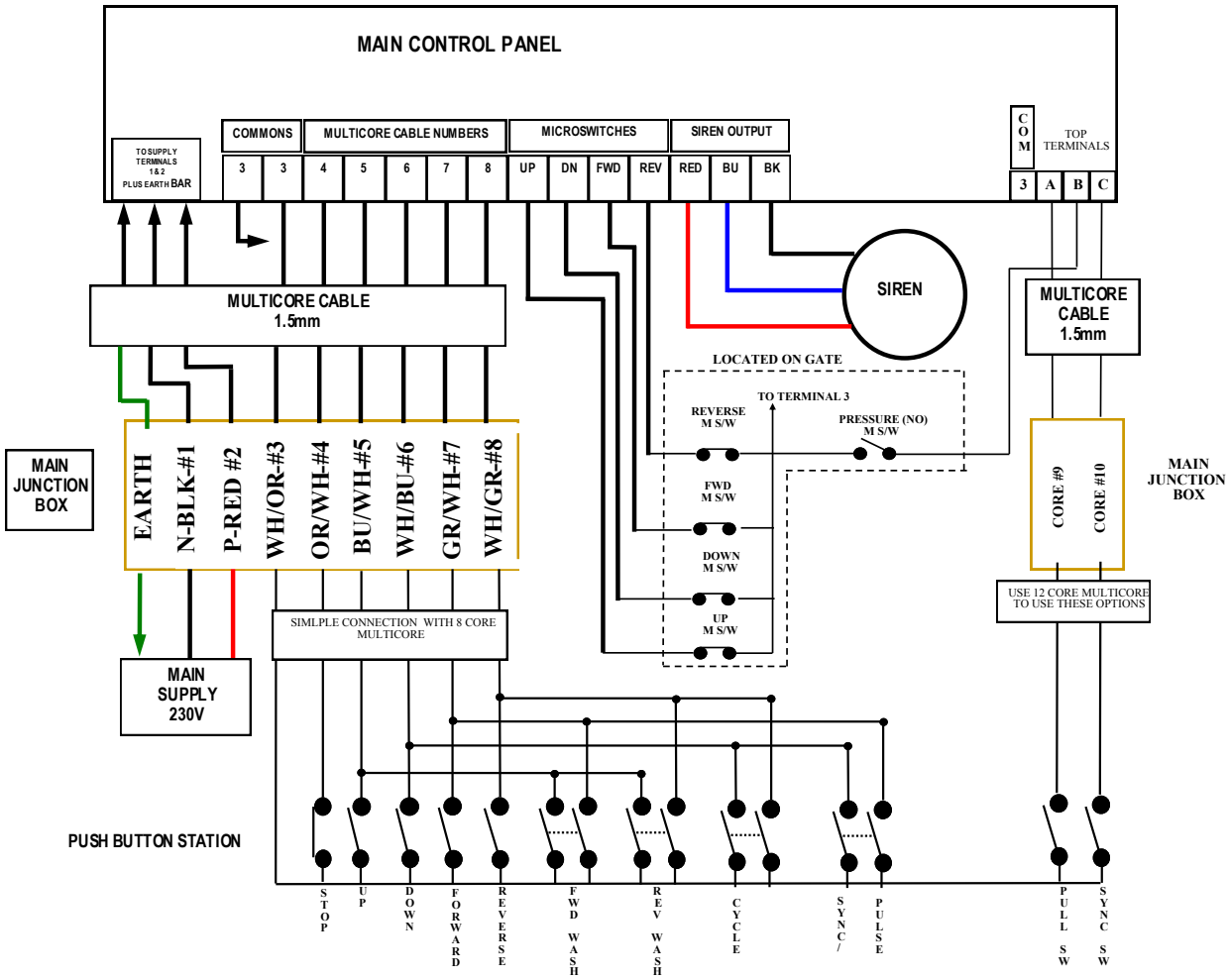
LAYOUT DIGRAM FOR
CSL HIGH LIFT GATE
2014

CSLRHLG-LAYOUT-2014.pub 17 April 2014



CONNECTIONS

1. MULTICORE CABLE:
(a) Connect corresponding numbers in the Control Box to the Multi-core cables #3 through to #8.
(b) Connect corresponding numbers in the Main Junction Box to the Multicore cables #3 through to #8.

2. Push Button Station, connect in the Main Junction Box as per the following;

Multicore #3 to White/Orange (Common)	Multicore #4 to Orange/White (Stop Button)	Multicore #5 to Blue/White (Up Button)
Multicore #6 to White/Blue (Down Button)	Multicore #7 to Green/White (Forward Button)	Multicore #8 to White Green (Reverse Button)

3. Microswitches, all switches are normally closed and open when activated, all switches share Common Terminal #3 at the Main Control Panel. The Gate Lift Microswitch only requires three cores (shared Common) and Forward and Reverse switches require two cores.

4. Siren, this is hard wired in the Main Control Panel. The sounder has two tones, the first sound (Red Wire) is for normal Forward operation, the second tone (Blue wire) will be activated if an Alarm condition is activated in the Main Control Panel. Reset by turning the Isolator "OFF" for 40 seconds and then back on after rectifying fault condition.

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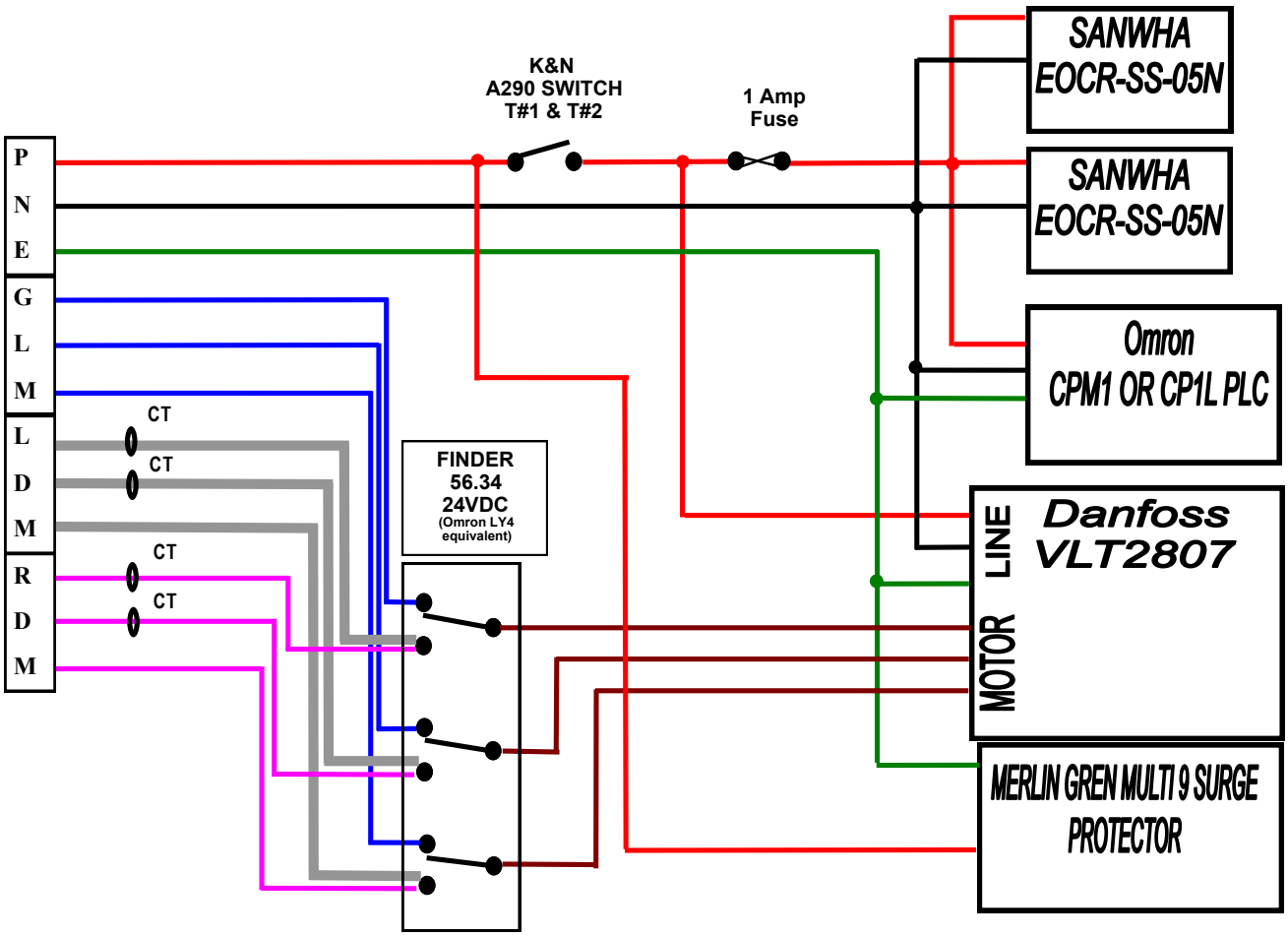
CSL LIFT GATE CONTROL
24Volts DC CIRCUIT DIAGRAM
2014 Model

CSLRHLG-WIRE-24V-2014.PUB 17 April 2014



NOTE:
This diagram relates only to the 230V high voltage connections of the control system, low voltage inputs and outputs are on the LV Diagram.

CONNECTIONS KEY

P = Phase/Live

N = Neutral

E = Earth (from Earth bar)

GLM = Gate Lift Motor (Blue wires)

LDM = Left Drive Motor (Yellow wires)

RDM = Right Drive Motor (Orange wires)

CONNECTIONS

1. Provide a 2.5mm Single Phase supply to the Junction Box position.
2. Fuse this supply to 16 Amps using either Motor Rated HRC fuses or a Circuit-breaker.
3. Connect supply to Red, Black and Green DIN connectors in the junction box provided.
4. MULTICORE CABLE:
(a) Connect wire #1 between the J/Box Phase (Red) connector and P#1 in the Control Box
(b) Connect wire #2 between the J/Box Neutral (Black) connector and N#2 in the Control Box
(c) Connect wire #3 between the J/Box Earth (Green) connector and the Earth stud in the Control Box
5. MOTORS:
Wire all motors using the CBS cable provided connecting both the Earth conductor and the screen to the Earth bar, and the motor Earth terminal. Connect motor phases to the corresponding terminals according to the KEY on this diagram (eg LGM, LDM, and RDM).

ALL MOTORS TO BE WIRED IN DELTA eg NOT STAR eg
NOTE MOTOR BRIDGE POSITIONS

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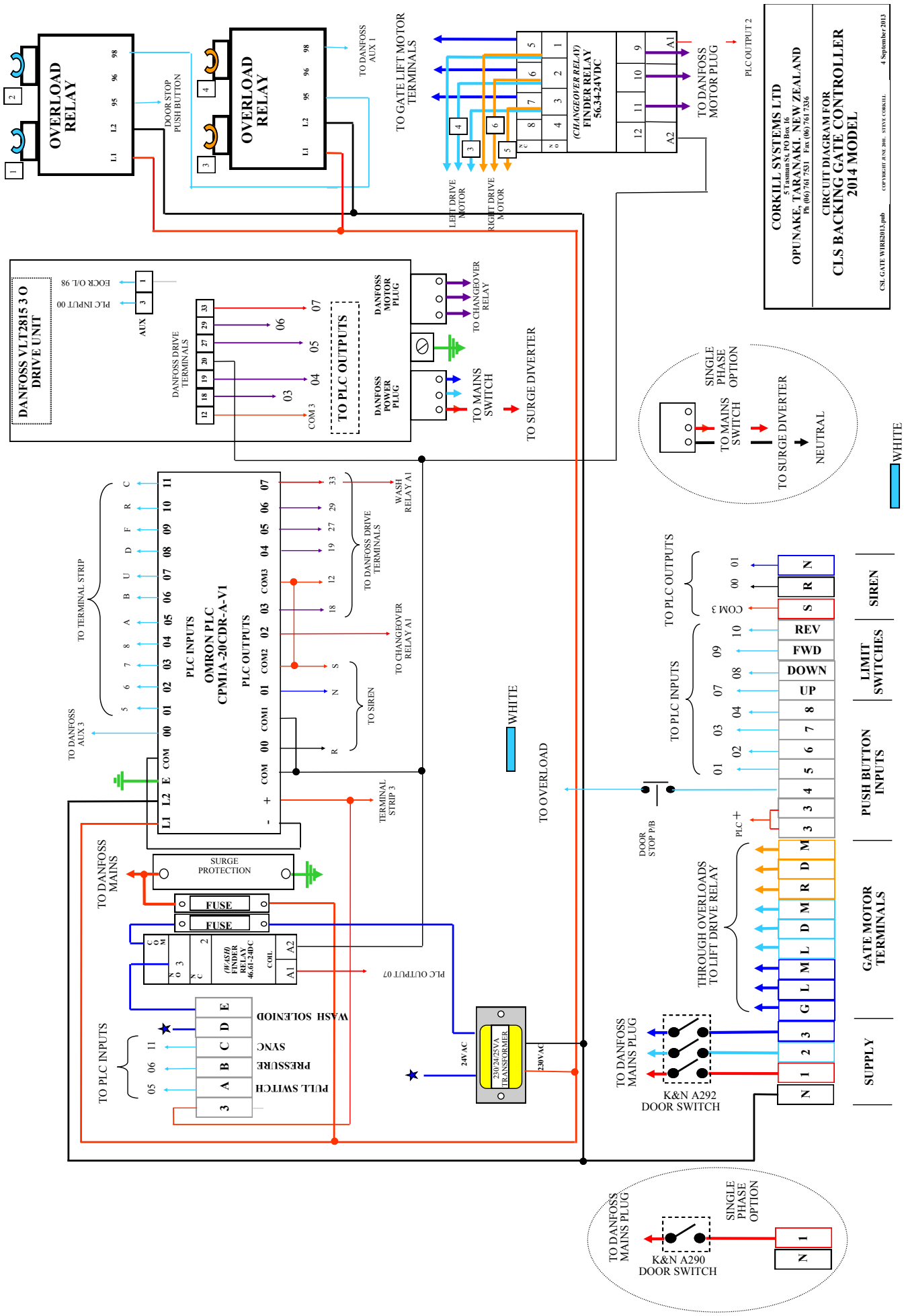
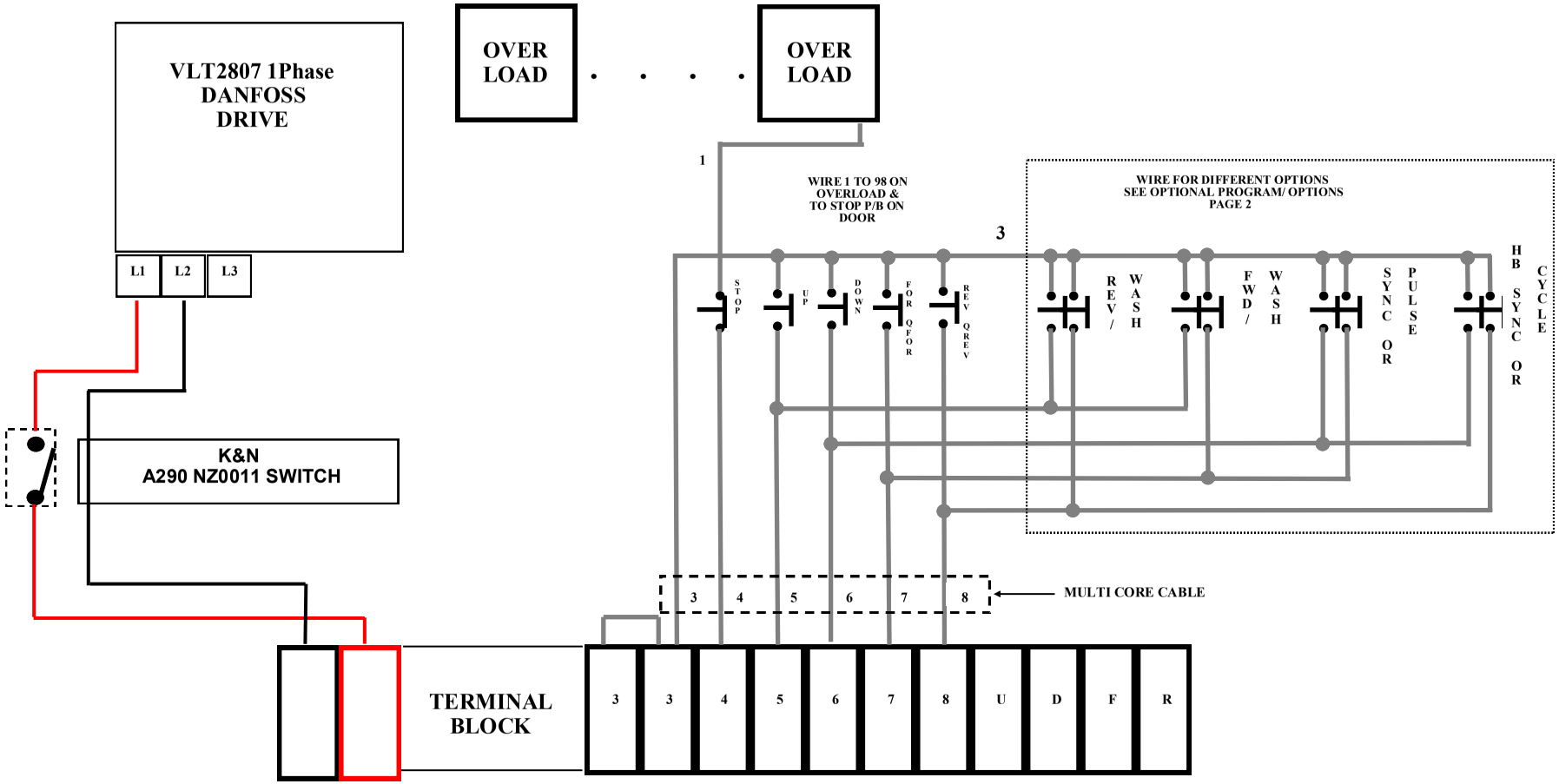
CSL HIGH LIFT GATE CONTROL
230Volts CIRCUIT DIAGRAM
2012 Model

CSLRHLG-WIRE-230V-2014.PUB 17 April 2014





DOOR LOOM WIRING LAYOUT

CORKILL SYSTEMS LTD
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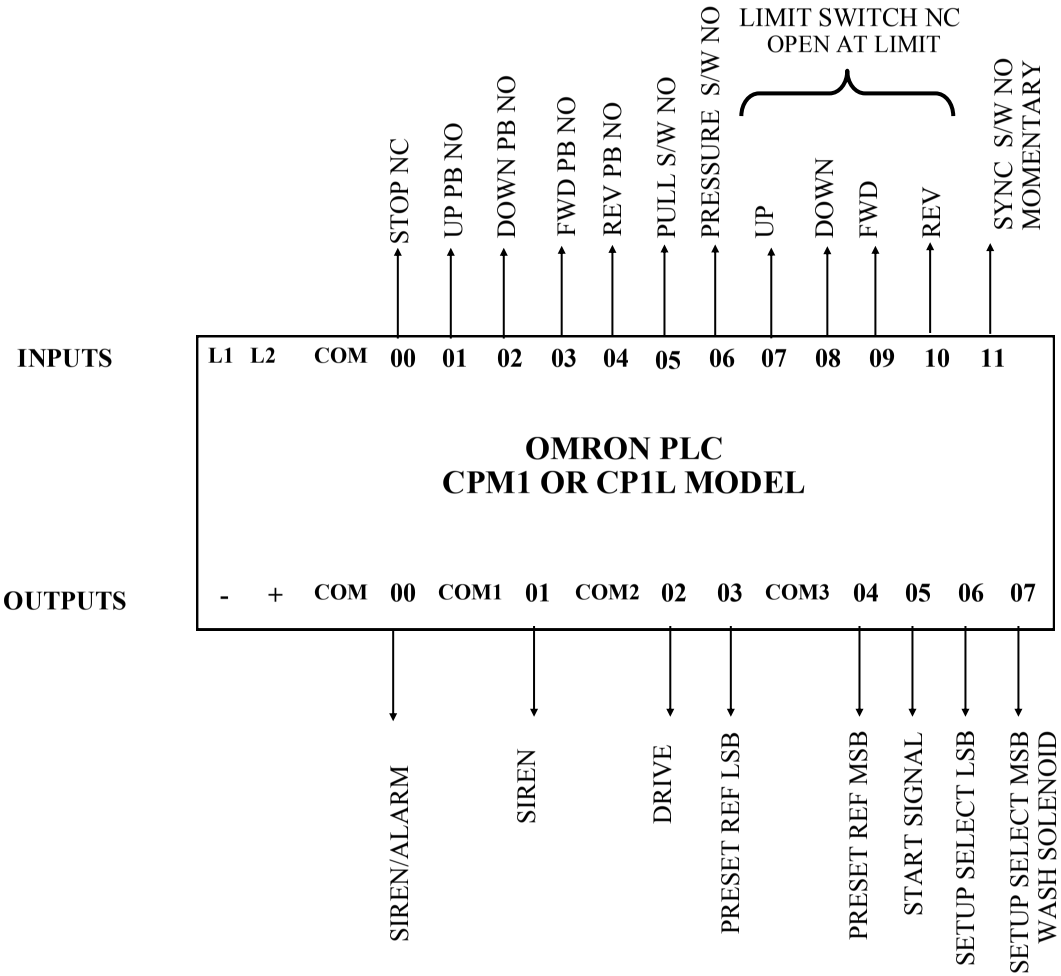
CIRCUIT DIAGRAM FOR
CSL HIGH LIFT GATE CP1L MODEL 2014

CSLRHLG4X4-WIRE-DOOR-2014pub 17 April 2014



PRESET REF MSB	PRESET REF LSB	REFERENCE
0	0	1
0	1	2
1	0	3
1	1	4

SETUP SELECT MSB	SETUP SELECT LSB	SETUP	
0	0	1	DRIVE
0	1	2	LIFT
1	0	3	SPARE
1	1	4	WASH DRIVE

If alarm siren operates straight after being reset.
This indicates limit switches are faulty.
If alarm takes 10 seconds to go off
then the stop circuit (input"0" on PLC) is faulty.

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CIRCUIT DIAGRAM FOR
CSL HIGH LIFT GATE 2012
TROUBLESHOOTING GUIDE

CSLRHLGTROUBLE 2014.PUB 17 April 2014