



FC PLATFORM DRIVE CONTROL MODULE

2010 INSTRUCTION & INSTALLER'S MANUAL

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



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C.S.L. FC Platform Drive Module

Installers Instructions

Installation

The platform drive unit is based on a Danfoss FC302 automation drive and is available in IP55 or IP66 depending on where the unit is to be installed.

Please specify the enclosure type when ordering the FC platform controller unit.

This system is designed to meet the "2006 Dairy Platform Safety Guidelines".

Cabling and Motor

The Controller must be permanently wired on a dedicated circuit with protection according to the controller specification sheet current ratings. The FC platform controller needs a continuous supply to withstand its work environment (often damp and cold) and to allow for the ramp down function to work correctly.

Motor cables must be EMC type, 4 core screened with a dedicated earth conductor. This is an essential factor in lowering the SCC in the plant.

This drive is C-Tick and CCC compliant and to comply with installation procedures **metal glands** must be used on both the motor and controller. Example of a metal gland is shown below.



If metal glands aren't used, bond the screen using the supplied clamp at the Controller. "Pigtail" earths should be avoided at all times. The EMC cable screen must be bonded to earth at both ends. Keep the motor tails as short as possible and clear of the incoming cable to prevent an aerial effect.

Any breaks or joins in the motor cables must be joined using a metal enclosure with metal cable glands entering and exiting the enclosure such as motor isolators and or an external motor overloads for running multiple motors.

There is a motor overload add-on kit called the tandem, triple or quad kit to be attached to the motor terminals of the main controller it is specially designed to reduce any effect of emf/rfi if installed correctly. (Specify motor numbers and sizes when ordering).

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 point (do not strip the screen at the base of the switchboard and then run motor tails adjacent to other wiring - the RFI effect will be transferred into any adjacent cables).

The cable between the Controller and external switches etc... is to be of minimum 0.2mm screened and not to be run parallel with heavy current carrying cables. Belden type cable is preferred or screened multi core cables.

The power supply cable to the drive can be non screened TPS or similar cable, if the distance to the drive is more than 15 metres, either step the above recommended cable size up or run a separate large Earth conductor.

A Mains and RF first environment filter is factory fitted internally in all controllers, this is normally adequate however we recognize there are certain areas where this filter may not be sufficient to suppress all radio interference, please contact us for more information if this is the case. The filter system meets both Class I and Class II of the international standards that all controllers are required to meet in Australasia for installation on networks containing either or both commercial and residential installations.

Section 3 of the FC300/FC200 Danfoss Operators Manual supplied with this controller has more information regarding cabling and termination of VSDs, we strongly recommend reading this section of this manual before commencing installation.

Some additional bonding may be required in order to remove RFI, talk to us if you think this may be required.

Cabling

Power supply cable is to be 3 phase plus earth, 1.5mm minimum. Cable to electric motors recommended to be screened, minimum size 4 by 1.5mm, CBS type preferred.

Cabling to Consoles (25 core + earth, .22 diameter minimum) screened and not run in parallel with heavy current carrying cables. Console and external switches are all 24volt DC.

(Remember to install at least a 1.5mm 3 core cable for the console heaters if fitted to the consoles).

We recommend all of the associated safety switches to be wired back to a common point such as the console or a junction box in the pit area to simplify the installation and aid in the ease of fault diagnosis in the future.

Installing the platform controller under the platform next to the drive motors is a good idea as it will minimize the length of expensive screened cables and minimize the effect of RFI we recommend the drive to be an IP66 version when installing into the wetted area of the cow shed.

The power supply cable to the drive can be non screened TPS or similar. Three phase models all require as a minimum 10 amp circuits wired in 1.5mm cable. Single phase input units and larger three phase controllers require 20 Amp circuits (2.5mm) cable. Do not undersize cables, larger is better to assist removal of RFI.

Voltage

In suspect poor power areas, should the incoming voltage drop below the unit tolerance levels, the unit will stop and wait until the voltage level rises above the tolerance level again. The client should talk to their electrician or network supplier if this condition persists as the Electrical Regulations state minimum mains supply voltage levels. This requirement is well above the controller Low Voltage tolerance level, please note that this low voltage condition will not damage the drive.

**The Low Voltage tolerance level with three phase controllers is 380 volts.
The Low Voltage tolerance level with single phase controllers is 198 volts**

Voltage levels below this will cause nuisance tripping of the drive plus is likely to cause damage to other electronic equipment in the dairy, contact your electrician or network supplier if low voltage trips persist.

Motor Connections

If Star/Delta Starters are being replaced on three phase installations, connect motors in 400 volt configuration, Delta on 400/600v motors and Star on 230/400v motors. **On single phase installations, connect motors in 230 volt configuration, Delta on 230/400v motors and Star on 110/220v motors –as a general rule configure the motor in the same configuration as the intended supply voltage.**

Operation Features

1. Pressing FWD or activating Pull switch will start and stop the platform.
2. Reverse only operates while pushbutton is pressed.
3. Quick stop to ramp the motor down in the event of an emergency.
4. Breech switch to stop the platform in the event of a cow becoming crushed on the entry race.
5. Wash cycle, platform returns to wash position at high speed in forward and is disabled until the “Wash” switch is turned back to “Milk”. Micro Switch and mounting instructions are supplied. The speed should be limited to 6 minutes per round using the preset motor speed low limit in the wash menu.
6. Terminals provided (looped) to connect a wash hose hang-up switch if required

Commissioning

The Danfoss drive has been pre-programmed to suit this application.

1. After connecting all required external switches. Ensure the other external switch terminals are operational.
2. Release the platform drive wheels to check individual motor direction.
3. Turn power on, Danfoss drive will display 0.0 hertz. (This is a frequency readout) the console should read the percentage of the current available speed 0.0 %
5. Press FWD p/button or pull switch and the drive motors will operate.
6. Check motor directions, if correct, tighten wheels until platform rotates.
***Do not over tighten!!**
7. Check Stop, Emergency stop, Pull switch, Reverse, Breech switch. Breech switch will stop the platform going forward but not in reverse. Reverse can be used with the switch activated. The speed up and down p/buttons
8. Check the display meters are reading the same as Danfoss drive screen.
9. Check Speed Up and Speed down p/buttons then press stop.
10. Press and hold in REV on console and the platform should continue in reverse while being held down, and Emergency Stop (and any other Stop Functions used) will stop the platform. The Breech switch does not work when reversing.
11. If Park position is used. Turn Milk/Wash to wash. Press FWD Reverse or the pull switch. Platform will speed up to a set high speed and stop at the park position. The

platform will not operate until the switch is turned back to Milk, and FWD or REV is pushed

12. If Wash Hose Micro Switch is used. When the wash hose is out of its cradle the platform cannot operate in either Milk or Wash.

Safety Description And Uses For Additional Stop Inputs.

1. Breech switches stop Forward motion to avoid crushing cows in the entry race, one for the kick rail and one for the breech rail.
2. Safety on underpass gate stops platform if gate is left open.
3. The On platform stop is used by herd testers to stop platform.
4. Emergency stop red rope pull switch, with or without reset feature, will ramp stop for emergency situations please do not use this as a regular stop or over time it may destroy the gearbox on the platform motors as it is designed as a severe safety stop for emergency situations.
5. The park switch will stop the platform from operating when it is parked in the wash position
6. The wash hose hang up switch will not allow the platform to start if the hoses are still connected to the wash connectors on the platform

Warranty

All units are warranted twelve (12) months from the date of purchase by the manufacturer subject to the following conditions;

- All electrical equipment to be installed and commissioned by qualified trade-persons.
- Adequate measures to be taken against moisture and/or mechanical damage.
- Recommended cabling procedures to be followed and circuit protection to be provided.
- Unauthorized dismantling/repairs/modifications will void the warranty.
- Goods will be charged to an account holder with Corkill Systems Ltd until all faulty components are returned.
- The unit has been paid for in full.

In the event of a unit or component failure, all faulty parts will be repaired or replaced free of charge, consequential equipment damage and/or labour and/or travelling will not be subsidized.

Trouble Shooting

Common Error Messages.

WARNING/ALARM 4 Phase fault (MAIN PHASE FAULT). 3 phase platform 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 VSD 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.

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

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 or windings.

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 platform 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 platform 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 platform controller box for the affected motors

All faults will be displayed in number codes on the LCD on the Danfoss drive. The error message will flash on the display; a list of these messages is in the FC302 automation drive Handbook.

Please record the fault number or message before phoning for assistance to help us help you. "trip-Lock" faults require the controller to be shut down for one minute and restarted to clear.

The reset on the keyboard may also need to be pressed after

Re-powering with some faults, followed by pressing the "reset" then the "auto on" button

If problems are encountered that cannot be overcome, phone the following 24 hr number, and state your problem, we will be happy to assist.

(06) 761 7531

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, and are 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 authorize 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 subsidized. Any unauthorized 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.

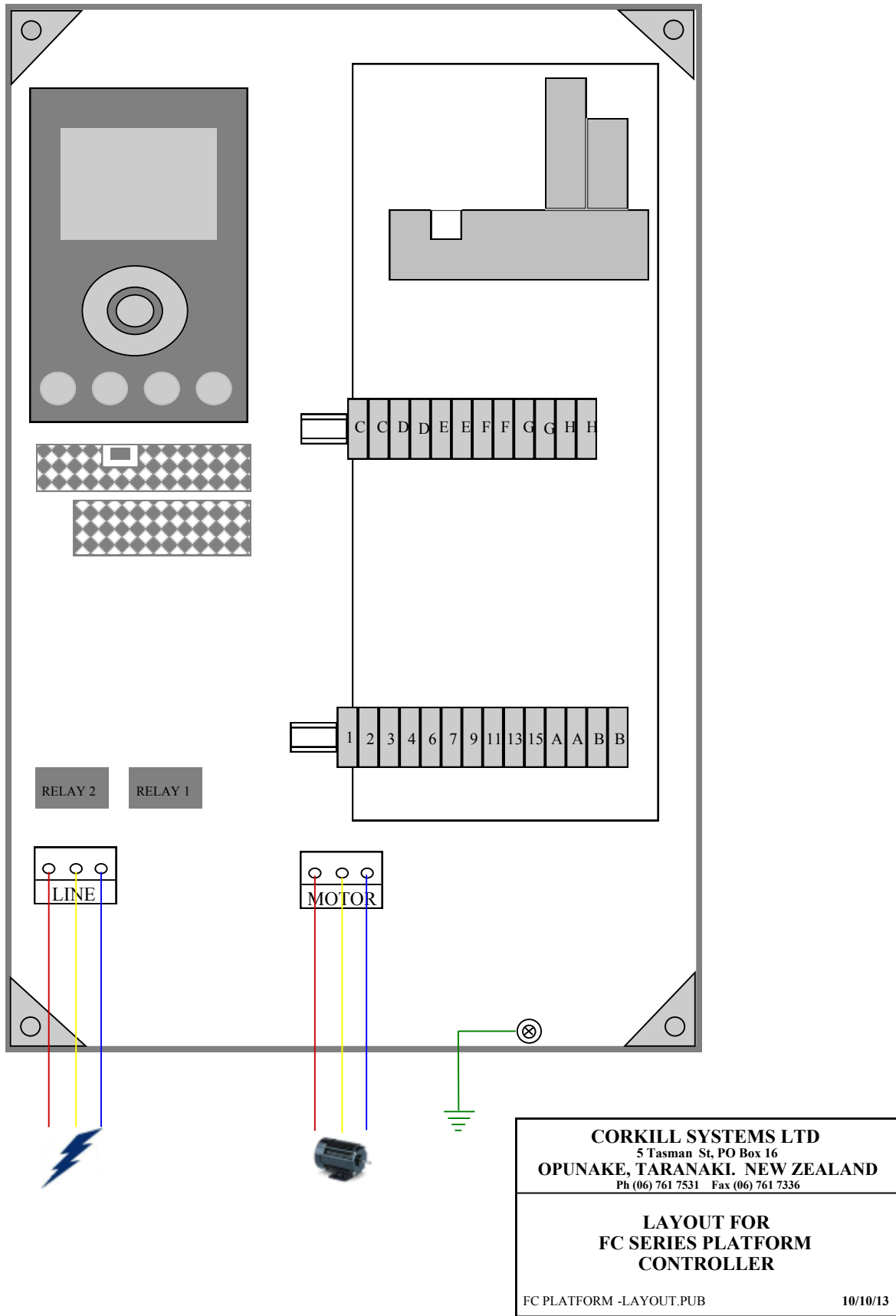
11. **GOVERNING LAW** This agreement shall be construed according to the laws of New Zealand.

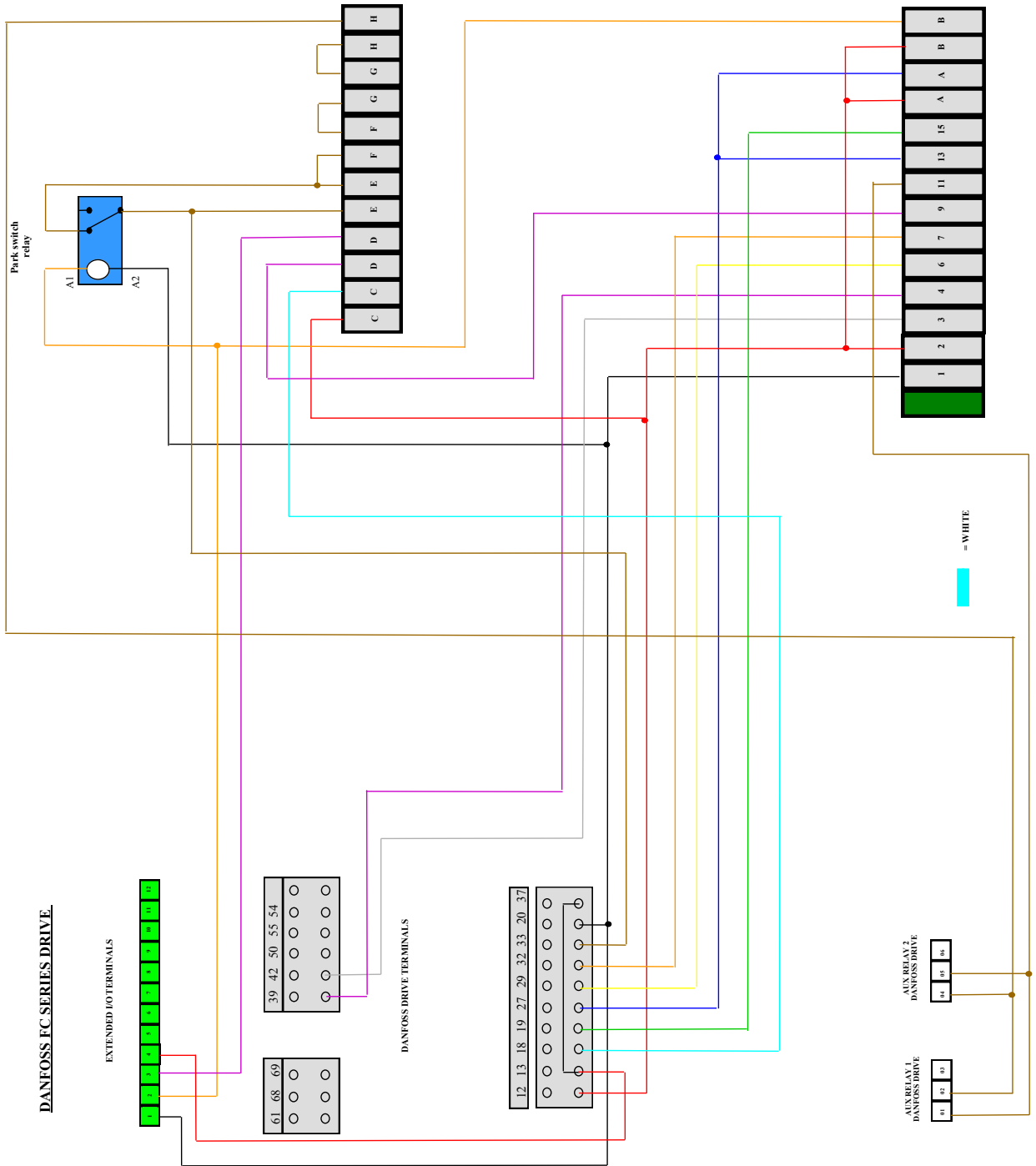
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AUTOMATION PLATFORM DRIVE CONTROL MODULE 2011 QUALITY CHECK LIST

	VARISPEED MODE FEATURES		
1	SPEED UP/SPEED DOWN IN FWD		
2	REVERSE ONLY WHILE BUTTON HELD IN		
3	STOP BUTTON and EMERGENCY STOP P/BUTTON		
4	PULL SWITCH		
5	BREECH SWITCH		
6	STOP FUNCTIONS: GATE, ON PLATFORM STOP, AUX 1+2, EMERGENCY STOP.		
7	WASH CYCLE		
8	PARK SWITCH		
9	WASH HOSE HANG UP SWITCH		
10	CALIBRATE DIGITAL METER		
11	CHECK ALL LABELING		
12	SUPPLY MILK/WASH SWITCH		
13	SUPPLY PARK MICROSWITCH		
14	DANFOSS MANUAL		
15	Supply metal glands and or gland plate depending on order		

DRIVE TYPE: fc3 _____	SERIAL No.
ORDER NAME/No.	TESTED BY:
INSPECTED BY:	DATE: ____ / ____ /20

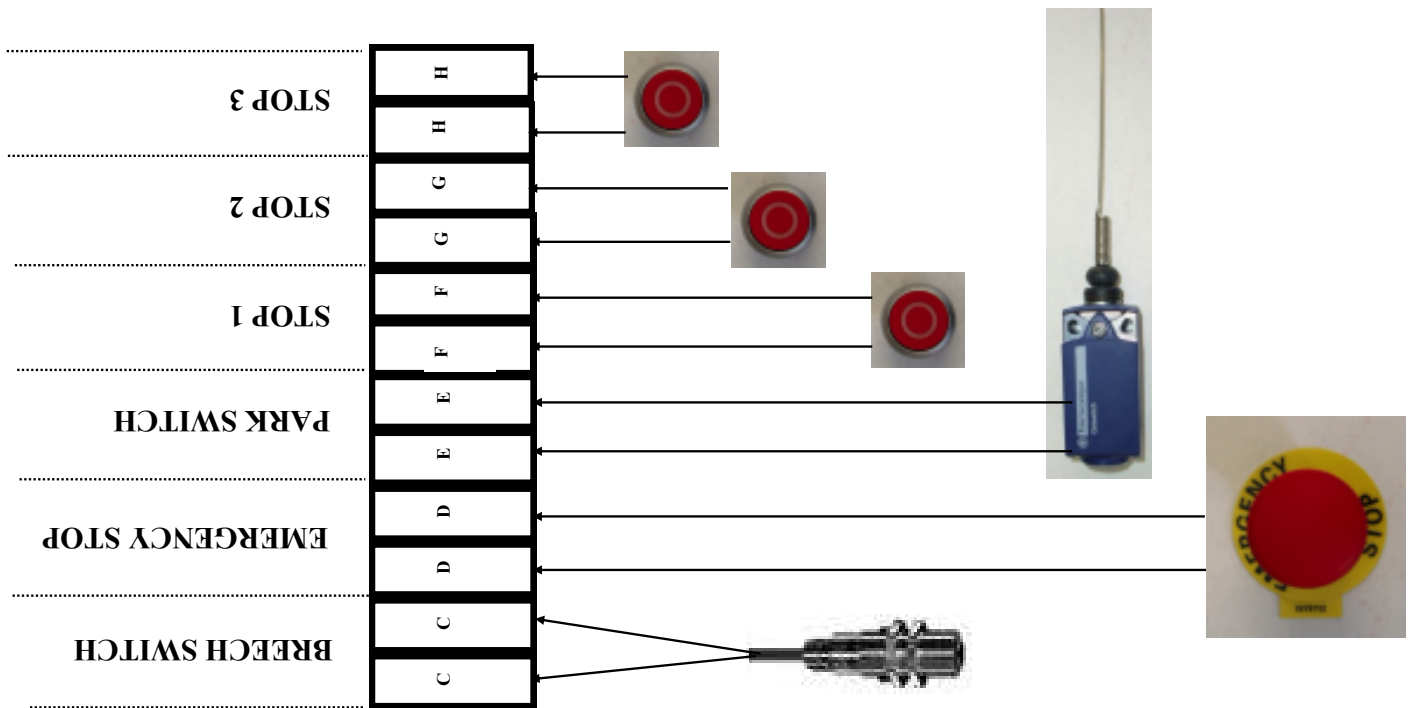




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**WIRING DIAGRAM FOR
 FC PLATFORM DRIVE MODULE**

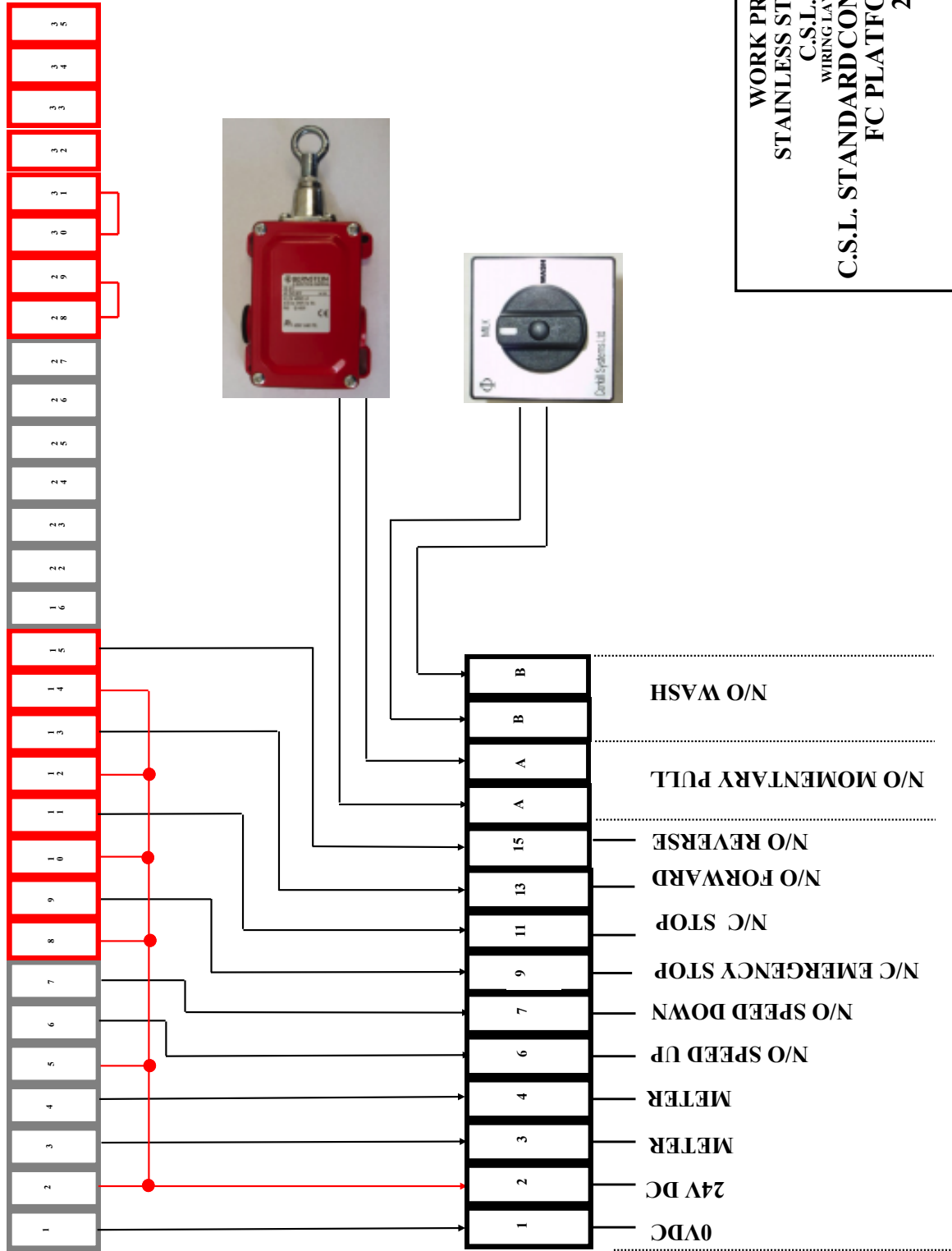
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 FC-PLATFORM-WIRE 2000.PUB
 19 April 2010



WORK PROCEDURES
STAINLESS STEEL CONSOLES
C.S.L. 9/18 XX
WIRING LAYOUT DIAGRAM
C.S.L. STANDARD CONSOLE CONNECTION TO
FC PLATFORM MODULE
2010

CONSOLE/MODULE CONNECTION 2010.PUB
 Thursday, 22 January 2015

Standard CSL console connection



Standard CSL FC platform module connection

WORK PROCEDURES
 STAINLESS STEEL CONSOLES
 C.S.L. 9/18 XX
 WIRING LAYOUT DIAGRAM
**C.S.L. STANDARD CONSOLE CONNECTION TO
 FC PLATFORM MODULE
 2010**

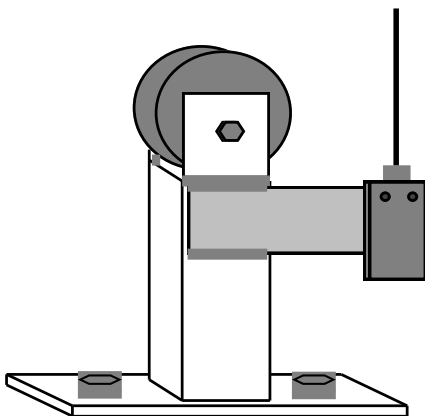
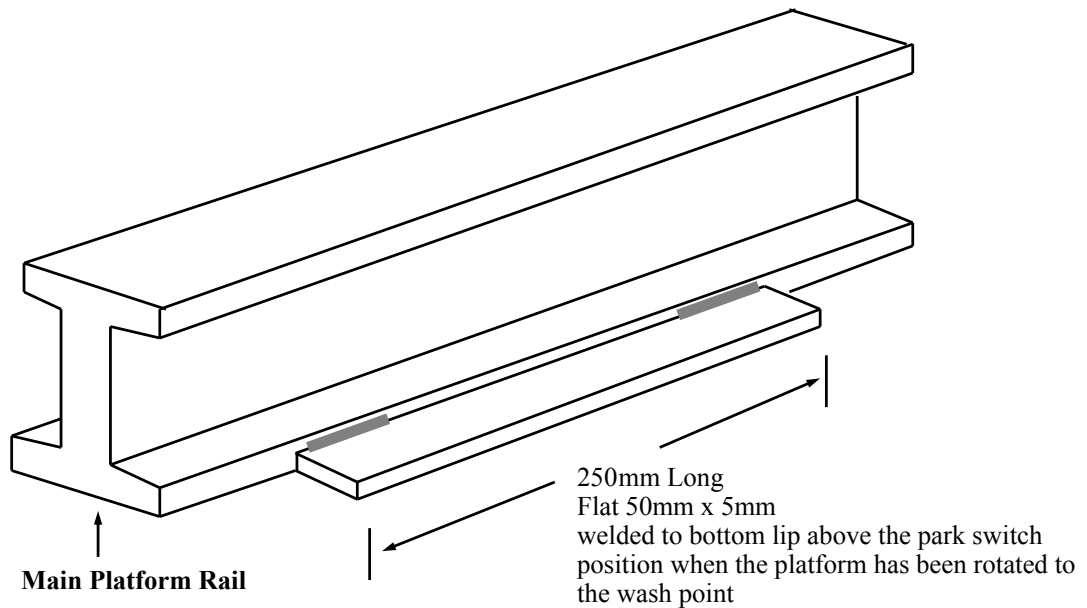
CONSOLE-MODULE CONNECTION 2010.PUB

Thursday, 22 January 2015

C.S.L. FC Platform Drive Control Panel

Manufactured by
Corkill Systems Limited, 5 Tasman Street, PO Box 16, Opunake, NZ
Phone 06 761 7531 or Fax 06 761 7336 or email: info@corkillsystems.co.nz

Mounting arrangement for wash park switch



Park switch mounting arrangement

weld flat steel to roller pedestal at a height where the lever switch is positively activated

This is normally mounted on the the roller pedestal adjacent the platform drive motors (for easy cable access)

NB

PLEASE NOTE THESE DIAGRAMS ARE NOT TO SCALE AND INTENDED ONLY AS A GUIDE TO SHOW HOW THIS SWITCH IS NORMALLY MOUNTED

