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## PLATFORM DRIVE CONTROL MODULE

(S/S ENCLOSURE MODEL)
INSTRUCTION

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


Corkill Systems Ltd


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A Telarc Q-Base registered company

## C.S.L. Platform Drive Module Installers Instructions

## Installation

The Module is provided in its own enclosure (IP55 stainless steel), to be mounted in the dairy switch gear room.
The Module can also be mounted in the switch gear cabinet, without the enclosure. Specify if enclosure is not required when ordering.
This module is designed to meet the "2006 Dairy Platform Safety Guidelines".

## Cabling

The Module is designed to be permanently wired on a dedicated circuit. Power supply cable to be 3 phase plus earth, 1.5 mm minimum. Cable to electric motors recommended to be screened, minimum size 4 by 1.5 mm , CBS type preferred. Cabling to Consoles ( 14 core, .22 dia minimum) screened and not run in parallel with heavy current carrying cables. Console and external switches are all 24 volt DC with 24 VAC terminals for heater.

The power supply cable to the drive can be non screened TPS or similar. We recommend all controllers be electrically isolated when not in use, usually via a slave relay interlocked with the vacuum pump, note the relay contacts must be 16 Amp minimum rated, or via a slave contactor. Three phase models all require as a minimum 10 amp circuits wired in 1.5 mm cable. Single phase input units and larger three phase controllers require 20 Amp circuits ( 2.5 mm ) cable.

A Mains and RF filter is factory fitted internally in all controllers, this has usually been adequate however we recognize there are certain areas within NZ where this filter will not be sufficient to suppress all radio interference, please contact your supplier for more information if this is the case.

## 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 controller but could damage other electrical apparatus.

## Connections

The motors must be wired in $\mathbf{4 0 0}$ Volt configuration, normally STAR.
Connect all inputs and outputs according to the connection diagram attached.

## Operation Features

1. Variable Speed and Direct-On-Line (DOL) built in with a switch on the cabinet.
2. All safety and operation switches including the Emergency Stop, Pull switch, Breech switch, On Platform Stop, Gate Stop, Aux 1+2 Stop, Forward and Reverse all work in both Varispeed and DOL.
3. Pressing FWD or activating Pull switch will start and stop the platform.(PLC Model)

Press FWD, then the pull switch will start and stop the platform. (Relay Model)
4. Reverse only operates while pushbutton is pressed.
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". Microswitch and mounting instructions are supplied. The speed should be limited to 6 minutes per round using the preset in terminal 53 of the Danfoss Drive.
6. Terminals provided (looped) to connect a wash hose hang-up switch if required
7. Motor overload protection for two or four motors built in (Specify motor numbers and sizes when ordering).
7a. (Relay Model) LED indication on all control relays to show status at a glance without opening enclosure lid.

7b. (PLC Model) Input indication on PLC shows status at a glance without opening enclosure lid.

## Commissioning

The Danfoss drive has been pre-programmed to suit this application.
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. Test DOL controls and motor directions before using VARI position.
3. Turn power on, Danfoss drive will display "FR. 00. (This is a frequency readout) and will read the same as the console meter. If the display is flashing press "start".
a. (Relay Model) Breech relay R5 will be on. Pull switch relay R7 will latch on \& off when the Pull switch is activated or when Fwd button is pushed..
b. (PLC Model) Breech switch input 6 on PLC will be on. Pull switch input 3 on PLC will momentarily come on when pull switch is activated or when Fwd button is pushed.
4. Turn the VARI-OFF-DOL switch to DOL. Relay R6 will operate on relay Model, input 11 PLC model.
5. Press FWD p/button and the FWD contactor will come in. 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 $\mathrm{p} /$ buttons and meter will not operate in DOL and the platform will travel at constant speed.
8. Turn the VARI_OFF_DOL switch to VARI, the VARI contactor will come in. (Left side of the three lower contactors). Relay 6 will drop out(relay model). Inputs 11 and 12 will come on(PLC model)
9. Press FWD on console. R1 relay will operate. (Relay Model) input 1 (PLC Model) If Pull switch or FWD button are activated Danfoss unit will ramp up to 15 Hz , platform will go forward. Check that the Pull switch, Emergency pull switch, Stop p/button, Emergency p/button and Breech switch (and any other Stop functions used) will stop the platform.
Display meters are reading the same as Danfoss drive screen.
10. Check Speed Up and Speed down $\mathrm{p} /$ buttons then press stop.
11. Press and hold in REV on console, R2 relay will operate.(Relay Model) input 2 (PLC Model). Check that Pull switch, Emergency pull switch, Stop p/button, and Emergency Stop (and any other Stop Functions used) will stop the platform. The Breech switch does not work when reversing.
12. If Park position is used. Turn Milk/Wash to wash, relay 3 operates (Relay Model) input 8 (PLC Model). Press FWD. Platform will speed up to a set high speed and stop at the park position. The platform will not operate untill the switch is turned back to Milk, and FWD or REV is pushed
13. If Wash Hose Microswitch is used. When the wash hose is out of its cradle the platform cannot operate in either Milk or Wash.

## Safety Description.

1. Breech switches stop Forward motion, one for the kick rail and one for the breech rail.
2. Safety on underpass gate stops platform if gate is left open.
3. "On platform stop" used by herd testers to stop platform.
4. Bridge stop on entry and exit bridge, to stop platform.
5. Emergency stop red rope pull switch, with or without reset feature, will ramp stop for emergency situations.

## 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 tradepersons.
- 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 subsidised.

## Trouble Shooting

Common Error Messages.
WARNING/ALARM 4 Phase fault (MAIN PHASE FAULT ). 3 phase platform only 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 VLT 2800 Handbook on page 67 to 70.

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 "start" 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) 7617531

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 subcontractor 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.


June 26, 2017


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| 24VAC SCHEMATIC FOR |  |
| PLC PLATFORM MODULE |  |
| 2007 |  |
|  |  |
| CSLPXCMP-SCHEMATIC-2AAC-2007.PUB |  |

June 26, 2017


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## CSLPXCMP PLC PLATF ORM 2007 PLC TROUBLE SHOOTING GUIDE CRUZET MILLENIUM 3 PLC

INPUT

OUTPUT


INPU

| Q 1 | Q 2 | Q 3 | Q 4 | Q 5 | Q 6 | Q7 | Q8 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |

INPUT


## NORMAL AT REST

Input: 11 will be on if in d.o.l
" 12 will be on if in vari
" 8 will be on unless platform is at Wash position.
" 9 will be on if in wash
" 3 will show when pull switch is pulled

FWD

Input: 8 will pulse as platform passes Wash position.
". 1 comes on while Forward p/button is pressed.
Output: 1 indicates Forward function is active.
Output 7 or 8 on depending if in d.o.l or vari
Output 3 or 5 on depending if in milk or wash.

## REV

Input: 8 will pulse as platform passes Wash position
". 2 comes on while Reverse $p / b u t t o n$ is pressed.
Output: 2 indicates Reverse function is active.
Output 7 or 8 on depending if in d.o.l or vari
Output 3 or 5 on depending if in milk or wash.

## PARK

Input: 7 is off when platform is in Park position.

## WASH

Input: 9 comes on when Milk/Wash switch is in Wash.
Output: 5 indicates Wash speed is active.

## BREECH

Input: 6 goes off when breech switch is activated.




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## C.S.L. Platform Drive Control Panel

Corkill Systems Limited, 5 Tasman Street, PO Box 16, Opunake, NZ Phone 067617531 or Fax 067617336 or e-mail: 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 INTE NDED ONLY AS A GUIDE TO SHOW HOW THIS SWIT CH IS NORMALLY MOUNTED

