

VARIVAC™

2006 B & PLUS Models

The original award winning Variable Vacuum Pump Controller
 NZ National Fieldays 1998 Prototype award.
 NZ National Fieldays 1999 New Product award.
 ECANZ Innovative Product Award 1999.
 Taranaki Medium Business of the year 1999.

INSTRUCTION & INSTALLER'S MANUAL



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Health &
Safety
AS/NZS
4801

Varivac™ Installation Manual

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1. General Information

Varivac is a protected Trademark belonging to Corkill Systems Limited, unauthorised use of this name will lead to prosecution.

Varivac is available in standard motor sizes from 4 kilowatts to 30 kilowatts, model CSLV4 has a 4 kilowatt capacity, CSLV5.5 is 5.5 kilowatt, etc. The suffix “T” refers to a Tandem Varivac, this model controls two motors simultaneously and has individual motor circuit-breakers inside to protect the motors. The Varivac should be sized for the combined rating of the motors, for example, 1 x 11kw + 1 x 7.5kw motor = 18.5kw, therefore the model Varivac should be CSLV18.5T. Twin pump set ups are discouraged where for example the larger vacuum pump is controlled by a Varivac and the second pump is “called” as required. This system is cheaper to purchase but leads to problems as the primary pump wears and the second pump is called more frequently causing a “blip” in the vacuum as the pump comes in and is switched off again. Tandem pump systems have been documented to be more economic to run even with two motors running plus the total reserve in the combined motors is instantly available when required.

All enclosures are rugged Stainless Steel, be wary of mounting the Varivac in such a way that the thermostatic controlled booster fan will not draw in moisture or steam when it

starts. Although all Varivacs have booster fans fitted, cooling is very rarely an issue and covers are available to blank the fan off if moisture is the greater problem.

CABLING AND MOTOR

The Varivac is designed to be permanently wired on a dedicated circuit with protection according to the controller Specification sheet current ratings. Cables to the electric motor must be screened, minimum size 4 X 2.5mm, CBS type preferred. The Cable between the Varivac and transducer is to be of minimum 0.2mm 2 core screened and not to be run parallel with heavy current carrying cables. Belden type cable is preferred and is supplied with the Varivac.

The power supply cable to the drive can be non screened TPS or similar

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

In suspect poor power areas, should the incoming voltage drop below the unit tolerance levels, the unit will trip on error 13. This requires a complete shut down and restart. 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.

The voltage tolerance level with three phase controllers is 380 volts.

2. Mounting and Wiring

Single Pump & Motor Combination

This system consists of one motor with one or more vacuum pumps attached.

1. Generally mount the Varivac adjacent the vacuum pump.
2. Re-use the existing isolator normally at this point.
3. Remove power factor capacitor if connected (Varivac does this function).
4. Remove motor cable from the motor and re-terminate into the Varivac supply terminals L1, L2 & L3. Connect the Earth to the screw/terminal provided.
5. Fit a new cable (screened cable preferred) from the Varivac to the motor.
6. If the starter is at the switchboard, remove the overload and continue using this starter to start the Varivac and any auxiliary equipment.
7. If the starter is adjacent the pump, remove completely and switch any Auxiliary equipment via the relay provided in the Varivac (not more than 5 amps!)
8. If a Star/Delta Starter is being replaced, connect motor in Delta
– check the motor name plate for correct configuration!



Tandem Pump & Motor Combination

This system consist generally of two motors wired separately each with one or more vacuum pumps attached. These motors may be of different sizes, this does not matter !

1. Generally mount the Varivac adjacent the switchboard.
2. Re-use the existing isolators normally by the motors.
3. Remove power factor capacitors if connected (Varivac does this function).
4. Connect a new cable from a circuit-breaker or fuses sized to handle the combined vacuum pump motors full load current to the Varivac.
5. Either replace the motor cables with screened cables (this may not always be practical) or re-route and connect the existing motor cables to the Motor Circuit-breakers in the Varivac. Set the correct motor currents on the overloads in the Varivac enclosure.
6. If the starters at the switchboard are used to control auxiliary equipment, connect these to the auxiliary relay in the Varivac, Terminals #6 & #7 – not more than 5 amps please !
7. If the starters are adjacent the pump, remove completely and connect to the isolators.
8. If Star/Delta Starters are being replaced, connect motors in 400 volt configuration, Delta on 400/600v motors and Star on 230/400v motors – check the motor name plate.



Twin Pump & Motor Combination

This system is not normally used unless the plant has a huge vacuum over-capacity, it consists generally of two motors wired separately each with one or more vacuum pumps attached. These motors may be of different sizes, this does not matter!

1. Generally mount the Varivac adjacent the switchboard.
2. Re-use the existing isolators normally by the motors.
3. Remove power factor capacitors if connected (Varivac does this function).
4. The largest motor is connected via the Varivac.
5. Either replace the motor cable with screened cables (this may not always be practical) or re-route and connect the existing motor cable to the Varivac.
6. If the starter at the switchboard is used to control auxiliary equipment, remove the overload and use this contactor to start the Varivac, Terminals #6 & #7 in the Varivac should be used to start the secondary pump contactor or soft starter (a soft starter is highly recommended for this system).
7. If the starters are adjacent the pumps, mount the Varivac in the place of the largest motor starter and connect the second starter to the Varivac.
8. If a Star/Delta Starter is being replaced, connect the motor in 400v configuration
– check the motor name plate!
9. A check valve will need to be fitted to the secondary pump inlet side to stop air being pulled into the system via the vacuum pump exhaust when this pump is on standby.



3. Transducer Installation

General; mount the transducer as close to the action as possible, the sensing face is **VERY** sensitive and easily damaged, be very careful with it.

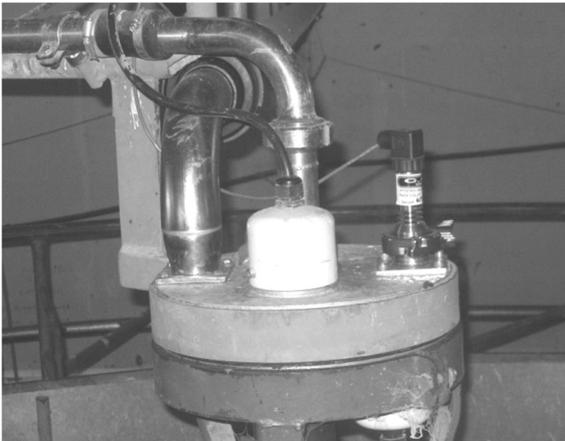
Only mount the transducer in the Vacuum Interceptor when no other option is practical – it will still work well but in high vacuum loss situations the vacuum at the cups will be lower than at the transducer sensing face due to friction losses in the plant pipe work.

Herringbone Dairy – mount in the Hygienic Can as first choice or Milk Receiver as second choice. The Hygienic can be drilled and a standard mounting kit used or insert in the Milk Receiver, this will require the tri-clover fitting welded in (see photo) and creates a point that must be cleaned periodically and therefore provides a risk of damaging the transducer.



Rotary Dairy – mount as close as possible to the gland, in the installation photos below the tee moves the transducer out of direct air flow – this is good. There is often a spare outlet in the gland this is a good point to mount the transducer – beware of the transducer being accidentally knocked by operators or moving pipe work. If possible always mount the transducer upright to protect against moisture ingress.

Protect the transducer Belden cable through the duct with conduit or flexi-conduit vibration can crush the cable or rodents may chew it



Connections:

Single pair screened belden cable is supplied with the Varivac, connect the white to terminal #1 at both Transducer and Varivac and Black to terminal #2 with the drain wire connected to Earth at both ends

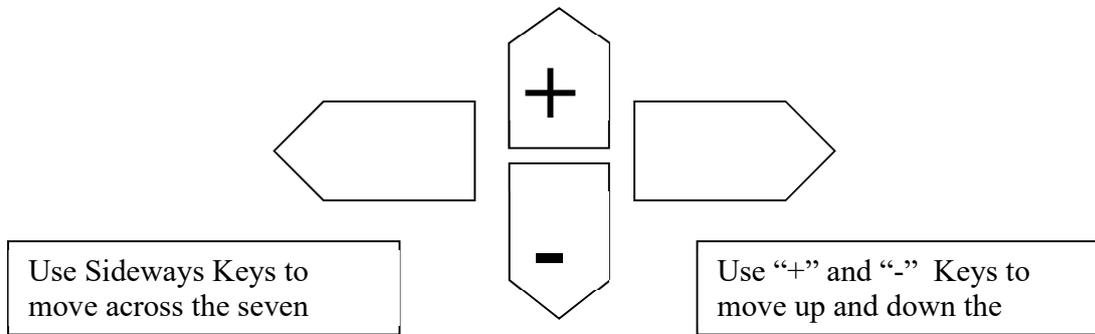
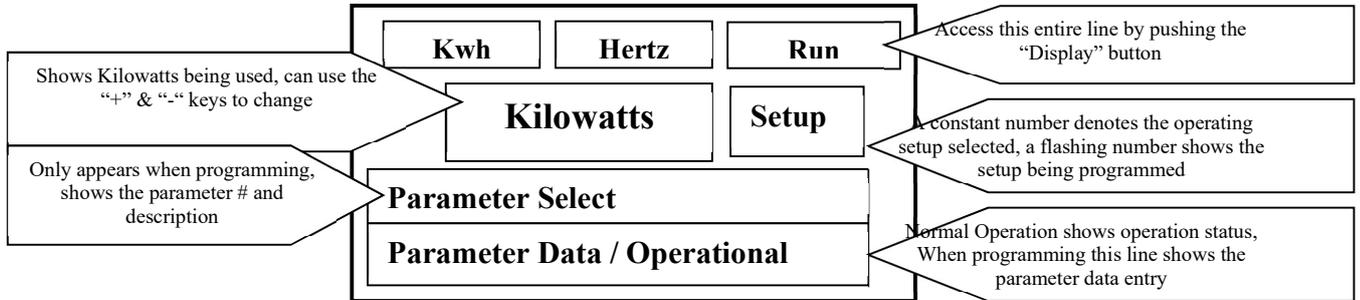
Avoid running the transducer cable parallel with high current and/or voltage cables as interference can be induced into the cable.

**Do not mount the transducer ever like the following picture
This is Very Bad !!!! – all kinds of stability problems !!! – too close to the vacuum
pump and welded directly into a very small main air line.**



4. Set Up and Automatic Motor Tuning

Programming To make program changes press “Menu” to start, make the changes and press “Display” to end.



0. Keyboard & Display. 000 001 002 003 004 005	1. Load & Motor 100 101 102 103 104 105 etc	2. Ref & Limits 200 201 202 203 204 205 etc	3. Inputs & Outputs 300 301 302 303 304 305 etc	4. Special Functions 400 401 402 403 404 405 etc	5. Serial Comms 500 501 502 503 504 505 etc	6. Tech Functions 600 601 602 603 604 605 etc
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1. After all connections are made, turn the “Test/Off/Auto” switch to “Off” and power up the Varivac
2. Check Vacuum Pump Motor direction(s) by briefly turning the “Test/Off/Auto” switch to “Auto” and then “Off” again. Turn the power completely off to the Varivac to inter-change motor phases and change at the Varivac motor output (singles) or the appropriate motor circuit breaker (Tandems). Re-power Varivac.
- 3.
4. Press the “Display” followed by the “Menu” button on the Danfoss Controller Key-pad (LCP). The upper screen data line plus “0.Keyboard & Display” in the lower screen should be showing plus a “1” at the right side of the screen. If a “3” is showing at the right side, turn the “Milk/Wash” switch (or remote control of this) to “Milk”- it should change back to Setup #1.
5. For Single Motor Installations only, press the right side arrow key once, “1. Load & Motor” should be displayed. Repeat press the “+” key and check that the motor name plate details are the same as you progress through from parameter #102 to parameter #107. Change any details by pressing “Change Data” and then using the “+” or “-“ keys. The curser can be moved by using the right and left arrow keys. When the correct data is entered, press “OK” to save. At parameter #107, press “Change Data” and select “ENABLE (RS,XS)” and press “OK”. Turn the lid switch to “Auto”, the motor will not start and noises will be heard as the controller tunes to the motor – this takes about 5 minutes. Alarm 21 will be displayed when the tuning is complete. Turn Off the lid switch before pressing “Stop/Reset” on the LCP or else the motor will start!
6. Step 4 is NOT to be carried out for Tandem Varivacs.
7. The Varivac is ready to operate.

5. Vacuum Level Adjustment

Setting the air regulator or air regulators.

There are two types of air regulators remote sensing and standard types, remote sensing types have a long pipe attached to the air regulator and attached to the sensor within the air line or close to the gland in rotary sheds. All air regulators have an adjustment screw in them that is used to set the vacuum in the plant, most remote types have the adjustment at the sensor. Partial disassembly of some types are necessary, but usually are contained within a rubber or plastic cap on the top or side usually in the center of the device and quite often contain a locking nut or screw to stop vibration altering the device.

Firstly now that the varivac is all set up to run you must first check the existing vacuum level on the gauge within the shed and note this down, do this running the varivac in “TEST” mode and getting the plant up to vacuum.

After you have found the adjustment screw for the air regulator you can adjust the air regulator or air regulators one at a time by unscrewing one at a time and blocking off the hole with something and turning the screw until the vacuum is set between four and six kpa above the vacuum level as noted before.

Adjusting the milking and wash vacuum level.

Switch the Varivac into the “AUTO” letting it ramp up to speed making sure the plant is up to vacuum.

Release the lock on the vacuum ten turn adjustment potentiometer labeled “MILK” and wind SLOWLY clockwise for higher vacuum and anti-clockwise for lower vacuum. **On Water Ring vacuum pumps this adjustment should be carried out with one cluster open.** While at idle the vacuum level in a dairy with a Water Ring vacuum pump will be just above the operational setting, the higher parameter #201 is above the seal collapse point, the higher this idle point will be. As soon as the first cluster is opened, the vacuum will immediately move to the set point and stay there until the maximum pump speed is reached. On systems with the transducer a long way from the sensing point, the vacuum set point may vary according to the friction losses in the vacuum line by up to 1 Kpa. This can only be rectified by moving the transducer closer to the incoming air point. Make sure that the potentiometer is relocked after adjustments have been made.

The same procedure can now be carried out in “Wash” mode. In general use a higher setting to achieve a hotter wash (water boils at lower temperature) or a lower setting if the milk pumps struggle to remove the wash water (they will be more efficient at a lower vacuum level). The VARIVAC™ reacts more slowly to vacuum requirements in “Wash” than in the “Milk” position. Washing the plant in “Milk” mode with an Air Injector operating may cause the controller to overload due to the fast response times to the frequent high volumes of air being admitted to the vacuum system. When the settings are optimum, write the potentiometer settings inside the lid with a marker pen for future reference.

Try opening clusters until the controller is unable to hold the vacuum level, close again quickly to test whether the original Air Regulator(s) will pull in, if they do, adjust the regulator in “Test” to a higher level.

When the pump has reached maximum speed (pre programmed to 55Hz) with a number of clusters open, verify the kilowatt draw shown on the display against the name plate data. Parameter #202 can be moved up or down to set the kilowatts at approximately 15% higher than the nameplate data. This will give the plant a greater vacuum reserve.

Warning; long periods with the pump at maximum speed will cause overloading and a higher power usage. A balance between extra vacuum reserve and power saving should be according to the farmers wishes.

Turn the “Auto/Off/Test” switch to off. Allow the pump to stop. Turn the switch to “Test”, the controller will start and run at 50Hz constant and the air regulators will come in. This is a “Manual” operation mode which can be used by machine fitters to establish vacuum reserve in the conventional mode. Remember that the “Auto” mode will give an additional approximately 15% reserve depending on parameter #205 setting and pump/motor/plant size, in Setup 1. Setup 2 will come in automatically after 60 seconds and reduce loading to the rated motor load until overload situation has been rectified. It will then revert back to Setup 1.

6 Idle Speed adjustment

Water Ring Vacuum Pumps.

Start up the varivac in “AUTO” and get the plant up to vacuum with the selector in “Milk” and then open one cluster.

Close the cluster and listen to the pump, the vacuum level may rise slightly at this point, this is normal. If the pump hunts, go to parameter #203 and raise the setting until the pump just stops hunting (the water ring is collapsing causing this effect).

If the pump does not hunt but the vacuum rises significantly, lower this setting to just above the seal collapse position. This setting will need to be changed for “wash” also.

If the system is a two pump & motor set up (twin), this setting will also need to be changed in Setup #2 PLUS parameter #225 will need setting at 2.5Hz above this setting.

Maximum speed is set at 55 Hz; by opening clusters until the top speed is reached (this can be seen on the top of the screen by pressing the “Display” button). The speed can be raised until the kilowatt reading is approximately 15% above the nameplate rating. If doing this with a two pump & motor set up, parameter #226 in Setup #1 will need to be set to 2.5Hz below the new maximum setting.

Blower and Oil vane Vacuum Pumps.

Start up the varivac in “AUTO” and get the plant up to vacuum with the selector in “Milk” the vacuum level may rise slightly at this point if so lower the minimum speed of the pump using parameter #201 to return to the normal milking level normal milking level parameter #439 will have. This setting will need to be changed for “wash” also.

If the vacuum seems to be about right when it is running in auto adjust

If the system is a two pump & motor set up (twin), this setting will also need to be changed in Setup #2 PLUS parameter #225 will need setting at 2.5Hz above this setting.

Maximum speed is set at 55 Hz, by opening clusters until the top speed is reached (this can be seen on the top of the screen by pressing the “Display” button). The speed can be raised until the kilowatt reading is approximately 15% above the nameplate rating. If doing this with a two pump & motor set up, parameter #226 in Setup #1 will need to be set to 2.5Hz below the new maximum setting.

High speed or high performance types of vacuum pumps may clatter when running at low speeds when all of the clusters are closed off this is normal and will go away when the cups are placed on the cows.

This is caused by the vanes of the pump dropping as there is not enough centrifugal force to spin them out this happens because the pump has such a huge vacuum over capacity in the plant (over spec pump for plant). This can be over come by increasing the minimum speed of the pump such that it minimizes the clatter and doesn't increase the vacuum too much at idle.

Maximum speed is set at 55 Hz, by opening clusters until the top speed is reached (this can be seen on the top of the screen by pressing the “Display” button). The speed can be raised until the kilowatt reading is approximately 15% above the nameplate rating. If doing this with a two pump & motor set up, parameter #226 in Setup #1 will need to be set to 2.5Hz below the new maximum setting

Trouble Shooting

RUNNING FIRST TIME FAULTS Drive won't start.

Remote start not wired properly, drive in local stop after performing ama, overloads tripped (tandem models only).

Cause/Remedy: check to see if overloads tripped (tandem models only) reset if necessary and set them to the correct current rating for the motors.

Check to see if remote start is wired correctly by placing a wire link between terminal 3 and 4 of the remote start terminals.

After doing an ama you will need to reset the drive it may show local stop on the display you will need to press "RESET" and then "START" on the control panel on the Danfoss Drive.

RUNNING FIRST TIME FAULTS Drive won't speed up in auto

Drive pots are set incorrectly, Break in transducer cabling or transducer wired incorrectly into Varivac

Cause/Remedy: check to see if Varivac is working by temporally shorting terminals 1 and 2 by placing long nose pliers into the terminals drive should speed up indicating that there is a fault with the pot adjustment or transducer.

In the main display use the up or down button to check the transducer current on terminal 60, if the current is 0 then there is a fault with the transducer cabling or the wiring of the transducer wiring it's self.

If the current is above 4ma then the pots for vacuum adjustment simply need adjusting to the correct vacuum level in the plant.

RUNNING FIRST TIME FAULTS Drive won't slow down in auto

Short in transducer cabling, forced into setup four, air regulator set to close to varivac, plant not gaining vacuum

Cause/Remedy: check that the plant is up to vacuum and check the vacuum level, check that the drive is in the correct setup 1, 2 or 3.

If drive is in auto but showing setup 4 then the setup is forced and you need to go into parameter 4 and select multi setup.

In the main display use the up or down button to check the transducer current on terminal 60, if the current is 20ma then there is a fault with the transducer cabling or the wiring of the transducer wiring it's self.

RUNNING FIRST TIME FAULTS Drive won't switch setups or runs at 50 Hz in auto or is controlled in test. Drive is forced into a setup.

Cause/Remedy: check that drive is switching setups by switching the milk wash switch when in auto.

If drive is not switching setups need to go into parameter 4 and select multi setup.

Common Error Messages.

WARNING/ALARM 4 Phase fault (MAIN PHASE LOSS).

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 Varivac, 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 Varivac 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 Varivac is too low for it to operate. E.g. there could be a fault with the power lines. The voltage will need to be returned to normal for the Varivac 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: Too many cups open for too long, too many ramps in “Milk” when the Varivac should be in “Wash”. Excessive air emissions, incorrect motor data has been put into the drive. Turn off the Varivac 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: Too many cups open for too long, excessive air emissions, incorrect motor data has been put into the drive. Turn off the Varivac 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 motor or in the motor itself. Make sure no power factor capacitor is fitted to the motor.

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 Varivac 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 output, this could be in the cable, isolator or 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 Varivac back on to prove the controller is OK.

Turn off the Varivac completely for 40 sec then back on, “RESET” and then “START” may need to be pressed on the control panel on the Danfoss Drive.

Corkill Systems Limited - TERMS AND CONDITIONS OF SALE

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.

VARIVAC™ Installation Data Sheet

Customer Name..... Installation Date.....

Postal Address.....

Delivery Address.....

Phone Fax..... Mobile.....

Email..... Purchased from.....

Installer Business Name.....

Installer Technician Name.....

Postal Address.....

Delivery Address.....

Phone Fax..... Mobile.....

Email.....

VARIVAC Model #..... Serial #..... VLT Model.....

Manufacture Date..... Program..... Software Version.....

Tested by..... Signed.....

Shed Type..... Shed Size.....

Master Vacuum Pump Type..... Model.....

Slave Vacuum Pump Type..... Model..... Starter Type.....

VARIVAC Mounting position..... Transducer Mounting position.....
(ie switchboard/machine room/store) (ie Interceptor/Sanitary Can)

Check Valve installed on Master Pump Inlet / Exhaust Y / N Slave Pump Inlet / Exhaust Y / N

Master Pump Motor Make..... Model..... Kw.....

RPM..... Nominal Voltage..... Amps..... Hz.....

Auto Motor Adaption done ...Y / N Program uploaded to LCP..... Y / N

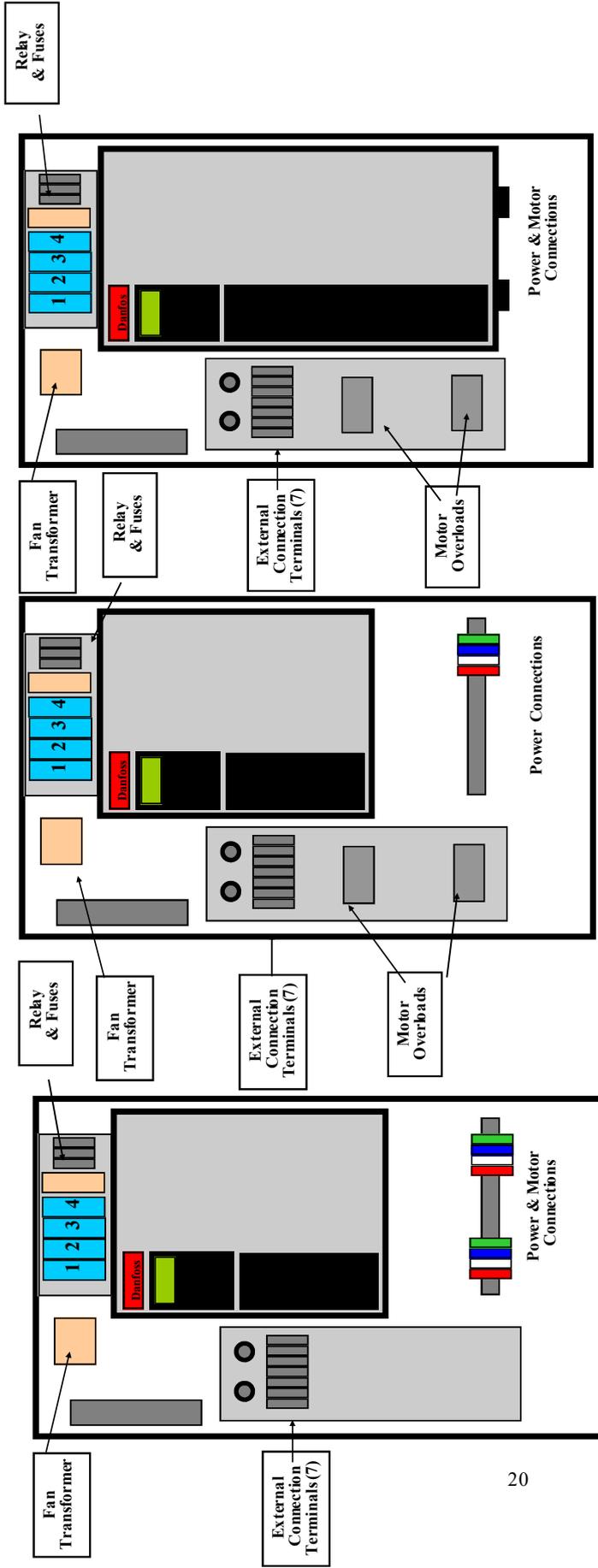
Installer Name..... Signed.....

for any concerns or comments, please note separately and fax with this form

Models CSLV4, CSLV5.5 and CSLV7.5

Models CSLV4T, CSLV5.5T and CSLV7.5T

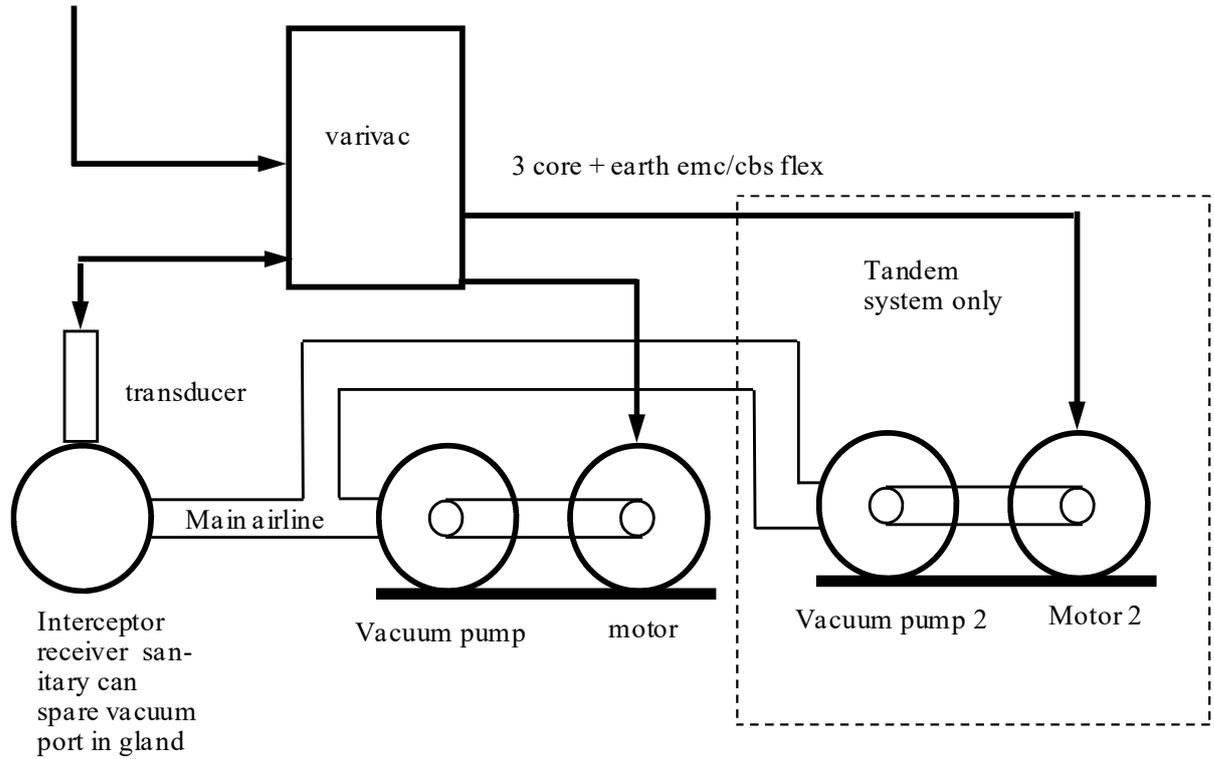
CSL V11 - V30



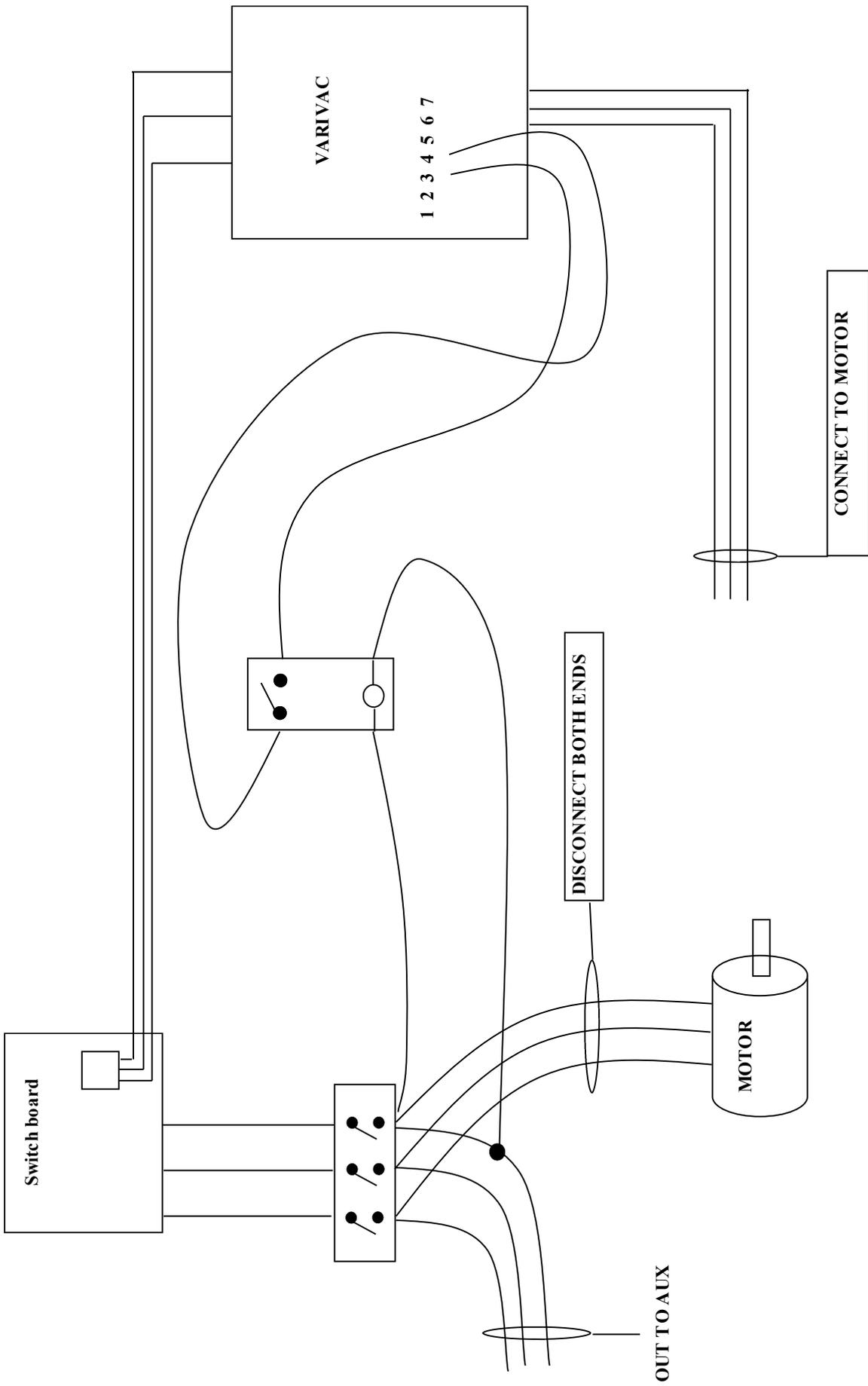
20

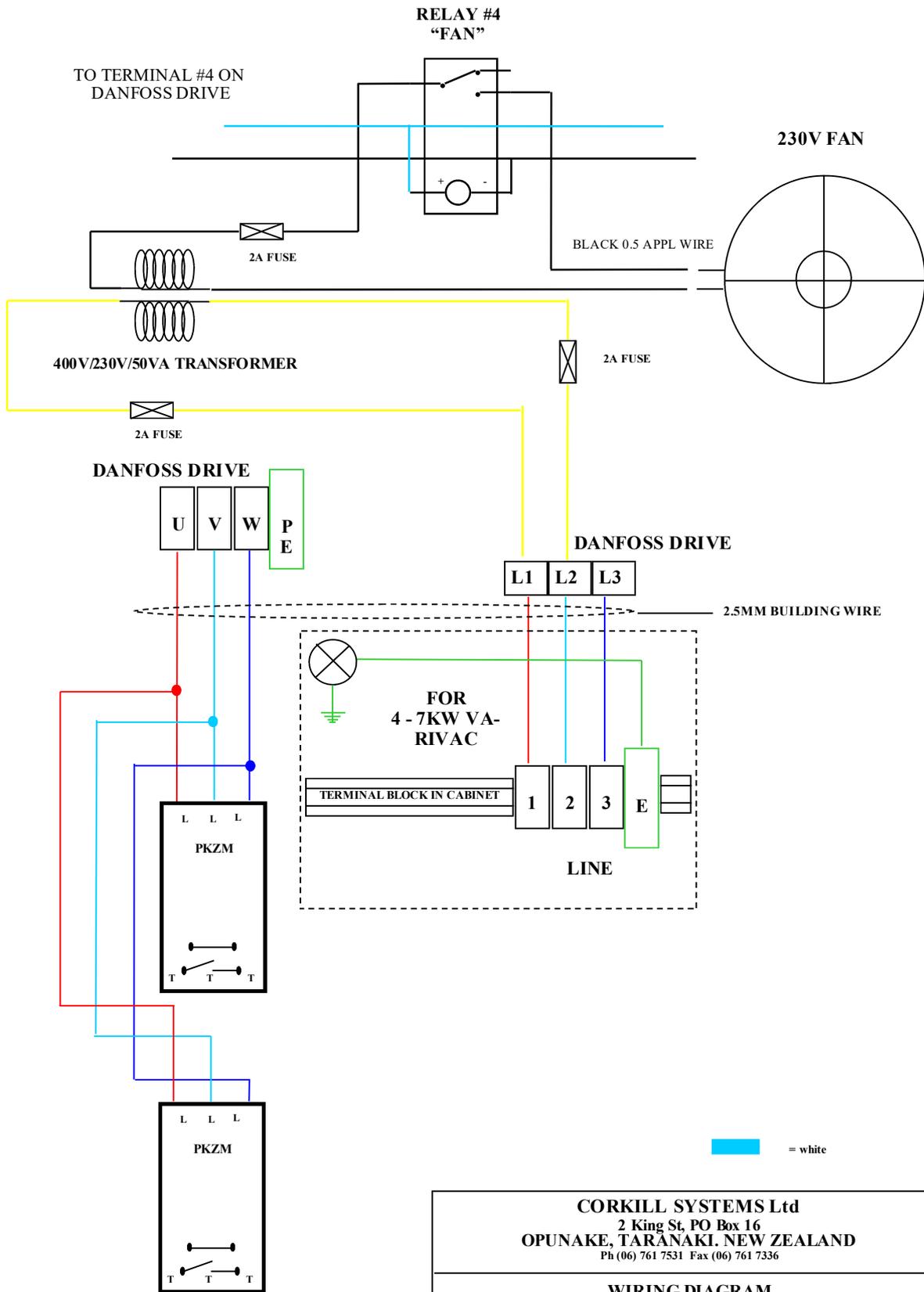
<p>VARIVAC™ 2006 Controller Equipment Layout</p>
<p>CORKILL SYSTEMS LTD 2 King St, P O Box 16 OPUNAKE, NEW ZEALAND Ph (06) 761 7531 Fax (06) 761 7336 Web: www.corkillsystems.co.nz</p>
<p>CSLXXXX-LAYOUT-2006.pub Thursday, 16 March 2006</p>

3 phase mains supply
3 core +earth tps



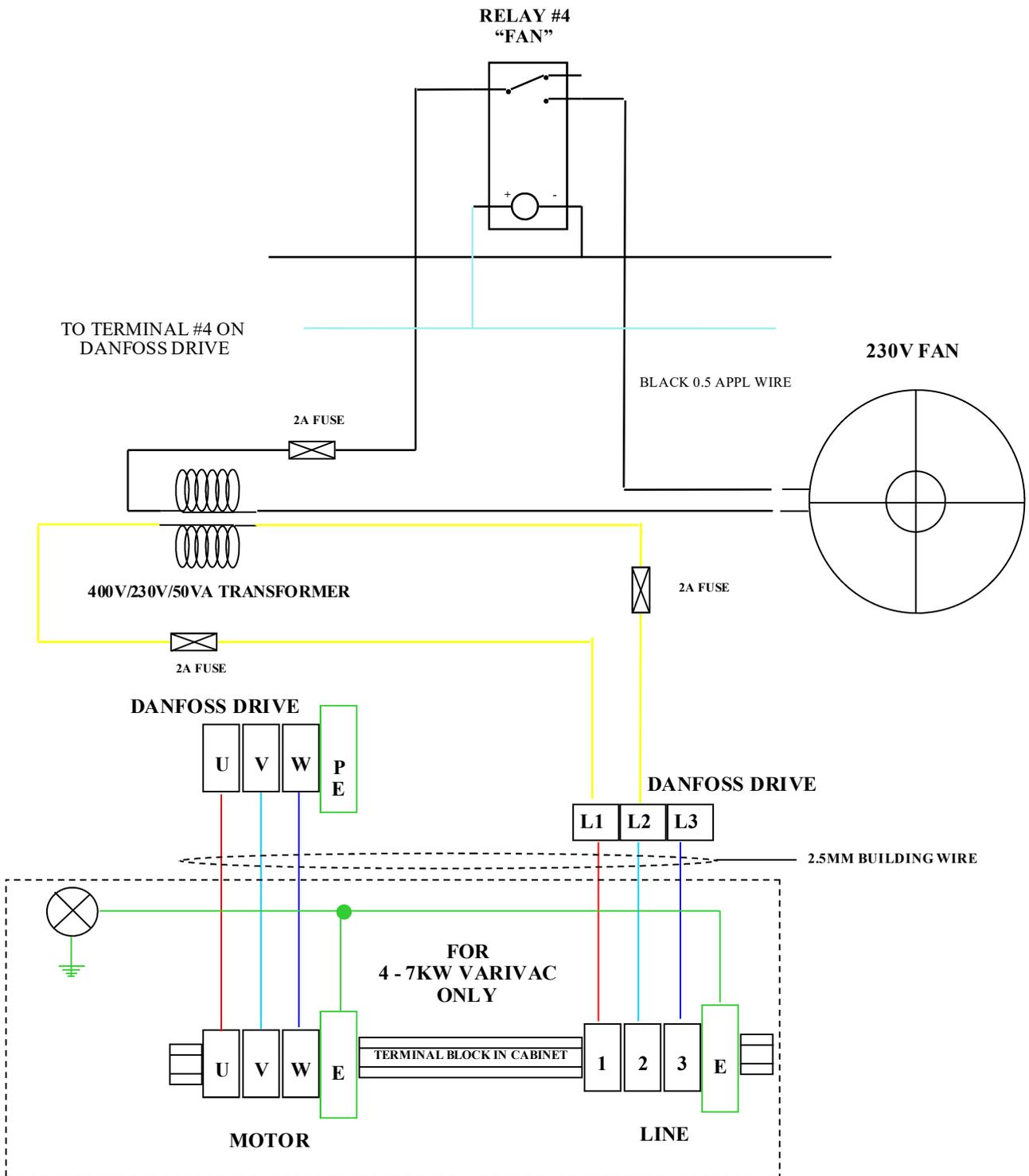
CORKILL SYSTEMS Ltd
2 King St, PO Box 16
OPUNAKE, TARANAKI, NEW ZEALAND
Ph (06) 761 7531 Fax (06) 761 7336





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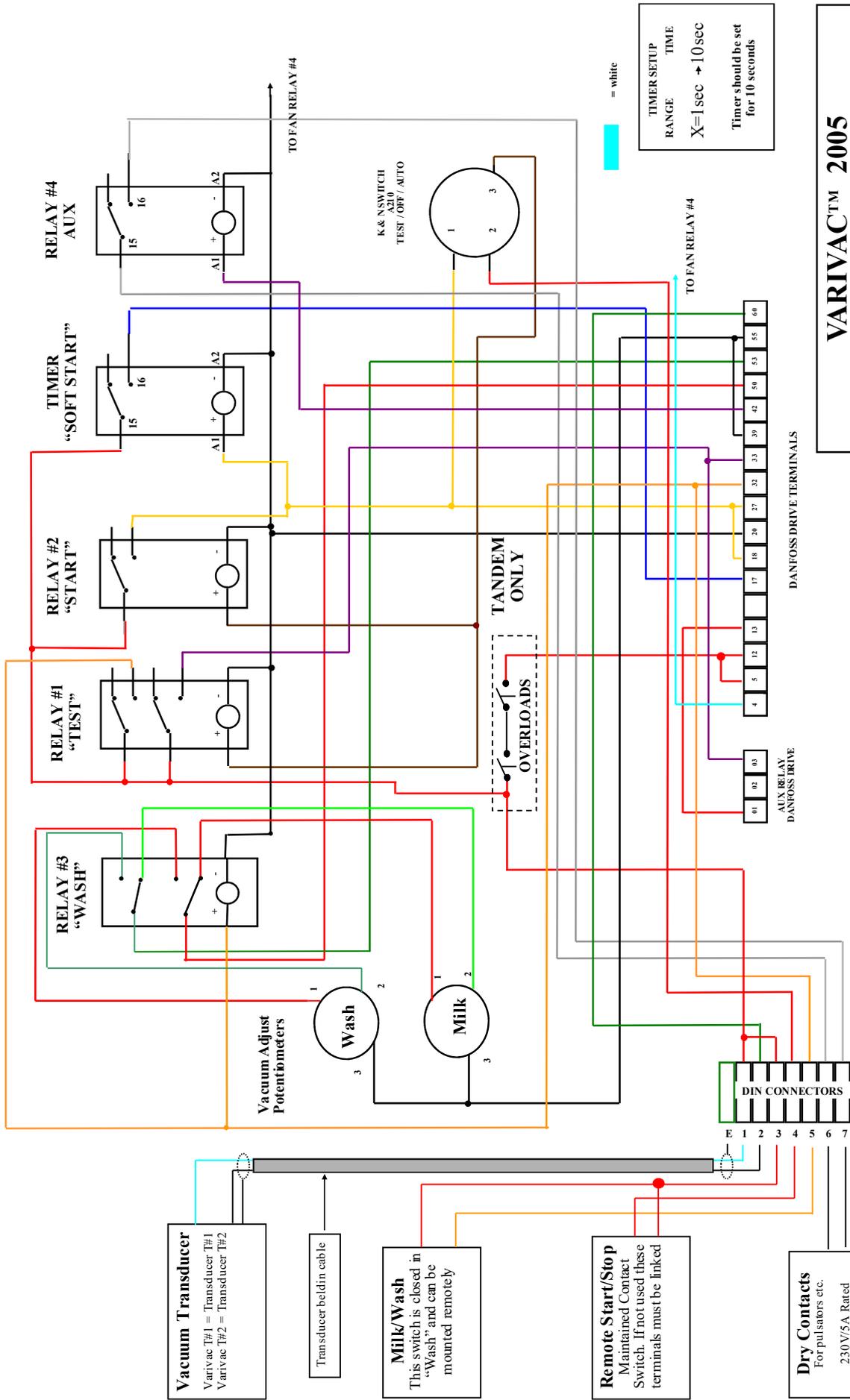
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WIRING DIAGRAM FOR CSLVXXT AC CIRCUIT 2006
CSLVXXT-AC-WIRE-2006.PUB Wednesday, 8 March 2006



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**WIRING DIAGRAM
FOR
CSLVXX AC CIRCUIT 2006**

CSLVXX-AC-WIRE-2006.PUB Thursday, 16 March 2006



VARIVAC™ 2005
Controller Internal Circuit Wiring Diagram
Tandem model

CSLVXX-24DC-WIRE-2006.pub
 12/04/2006

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