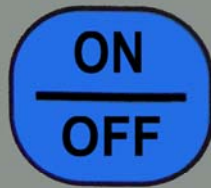
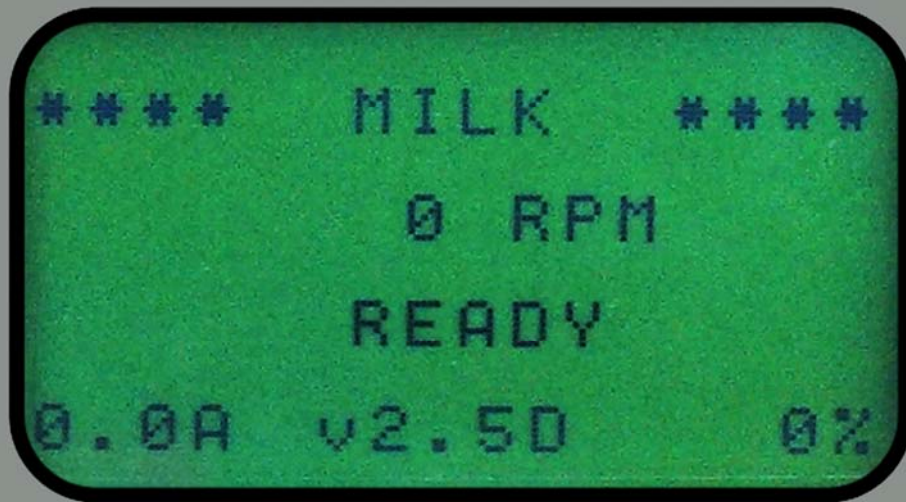
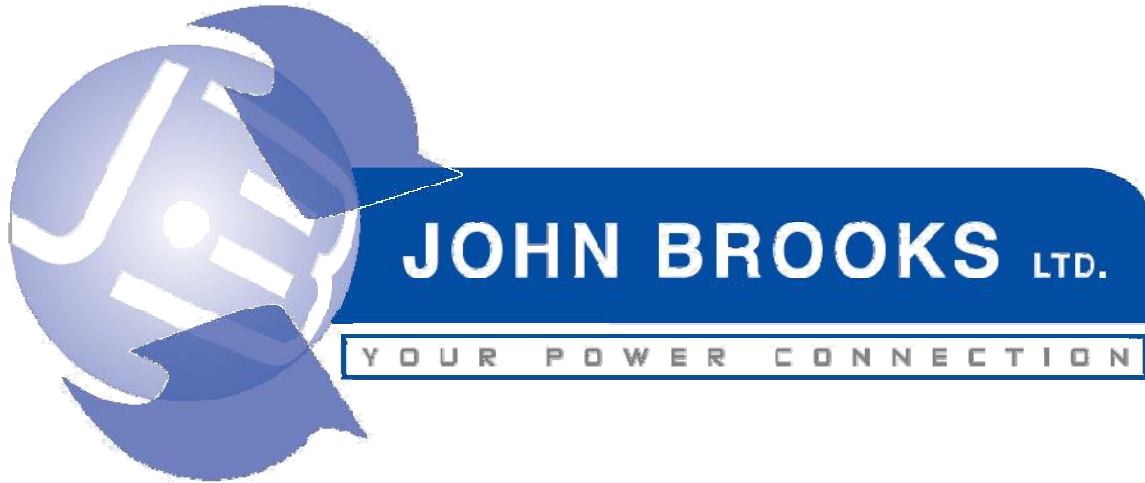


DAIRY-FLO



johnbrooks.co.nz





Available Models

Model Number	Description
DF2-1-***	Single Phase 1HP (0.75Kw)
DF2-2-***	Single Phase 2HP (1.5Kw)
DF2-3-***	Single Phase 3HP (2.2Kw)
DF4-1-***	Three Phase 1HP (0.75Kw)
DF4-2-***	Three Phase 2HP (1.5Kw)
DF4-3-***	Three Phase 3HP (2.2Kw)

Note: Replace * in the model number with the desired float length in millimeters, this is either 410 or 500.**

**All Single Phase Models are rated for 200 to 240 Vac.
All Three Phase Models are rated for 380 to 480 Vac.**

All Dairy-Flo's fully comply with EN61800.3 and are covered by C Tick registration number Z126.

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Constant Flow Technology

As supplied the Dairy-Flo is configured to use the “Constant Flow” control mode.

This is a new method of controlling the milk pumping operation and has been developed exclusively by John Brooks Ltd.

“Constant Flow” strives to keep the flow of milk through the heat exchanger as low and as constant as possible, this is to enable the heat exchanger to extract as much heat out of the milk as possible before it is delivered to the vat. The lower milk delivery temperature results in reduced electricity costs from refrigeration plant.

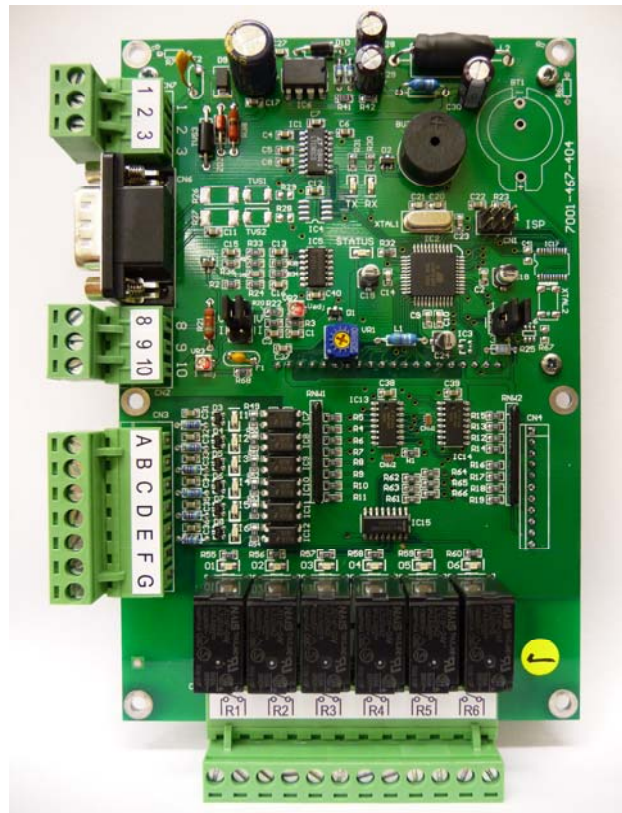
“Constant Flow” deliberately allows the level of milk in the receiving can to vary within wide limits in order to keep the Flow as constant as possible. In some installations, particularly those where there is a lot of foam present, this may be undesirable. In this case the unit can be reverted to a conventional mode of operation by changing Function 14 (F014) from the default “Constant Flow” to “Variable Flow”.

Main System Components

The **Drive** and...



...the **Controller**, which is mounted on the inside of the door.



Installation Considerations

Installation

It is the installers responsibility to ensure that the wiring in the installation complies with all New Zealand Electrical Wiring Regulations and Codes Of Practice that are current at the time of installation.

Screened cable is essential for all motor wiring.

Ambient Temperature

The Dairy-Flo is designed to work in Ambient temperatures at, or below, **40°C**. If the temperature exceeds this then a conditioned environment must be provided.

Cable selection

On long cable runs care should be taken to select an appropriate cable size so as to maintain a total voltage drop at the motor of no more than 2.5%.

Further, on long cable runs over 20m the use of a line reactor may be necessary to compensate for cable capacitance.

Important

Under no circumstances is anyone to alter any of the parameters on the drive inside the cabinet itself.

The door of the cabinet is to remain closed and sealed at all times during operation and downtime. High voltage levels can be present inside the cabinet even after the power is switched off.

Notice!

When not in use the Dairy-Flo must have the mains power removed from it, this is to prevent the unit being damaged by power anomalies while non operational. Failure to remove power when the unit is not in use **voids the Dairy-Flo's warranty!**

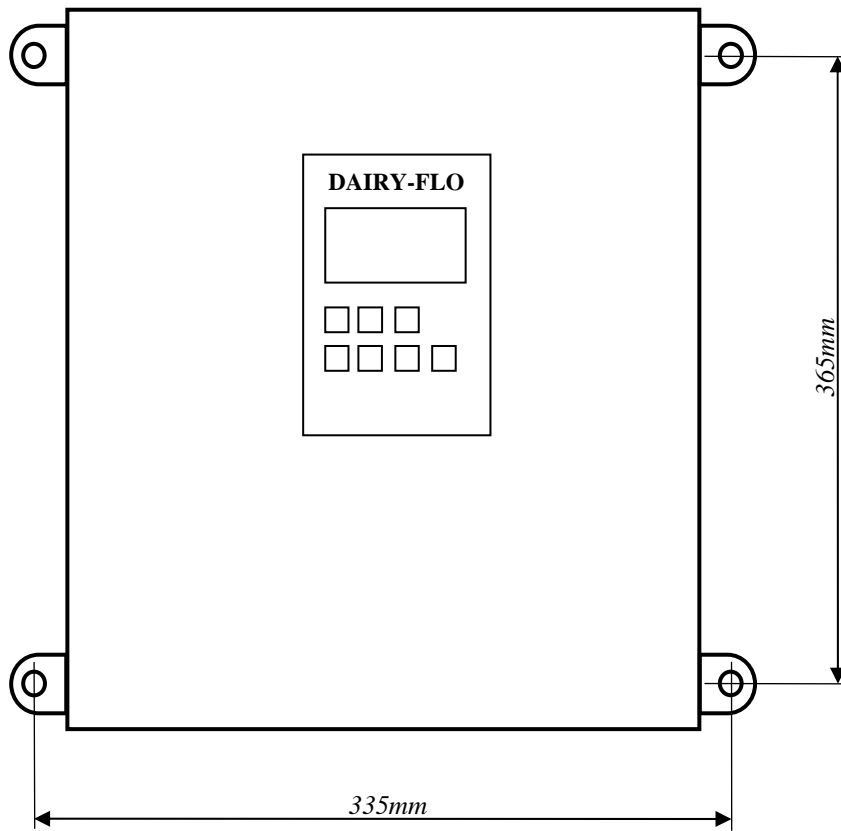
The Motor **Must** be wired in screened cable using the EMC Gland supplied. The screen must be earthed at both the drive and motor end.

The use of non screened cable can have very adverse effects on both the drive and controller and, for this reason, the use of non screened cable or the incorrect earthing of the same **voids the Dairy-Flo's warranty!**

Mounting Dimensions

Not To Scale!

The Mounting Feet Holes Are 7mm Diameter To Allow The Use Of
6mm or 1/4" Bolts



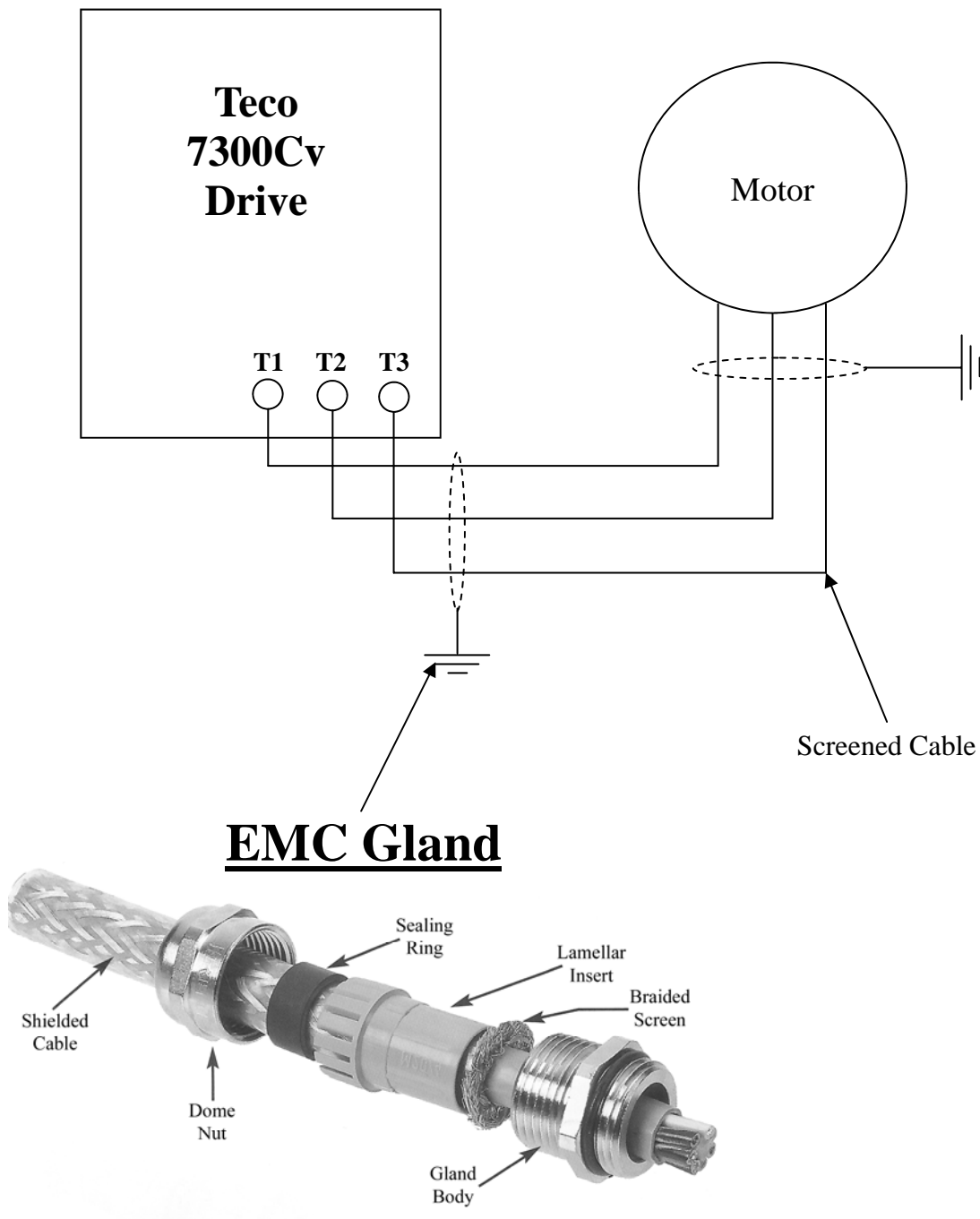
Note: To comply with EN61800-3 the following MUST be adhered to.

Wiring Diagram

Motor Connection

Note 1: The Motor Cable must run through and have it's Screen terminated to the supplied EMC Gland.

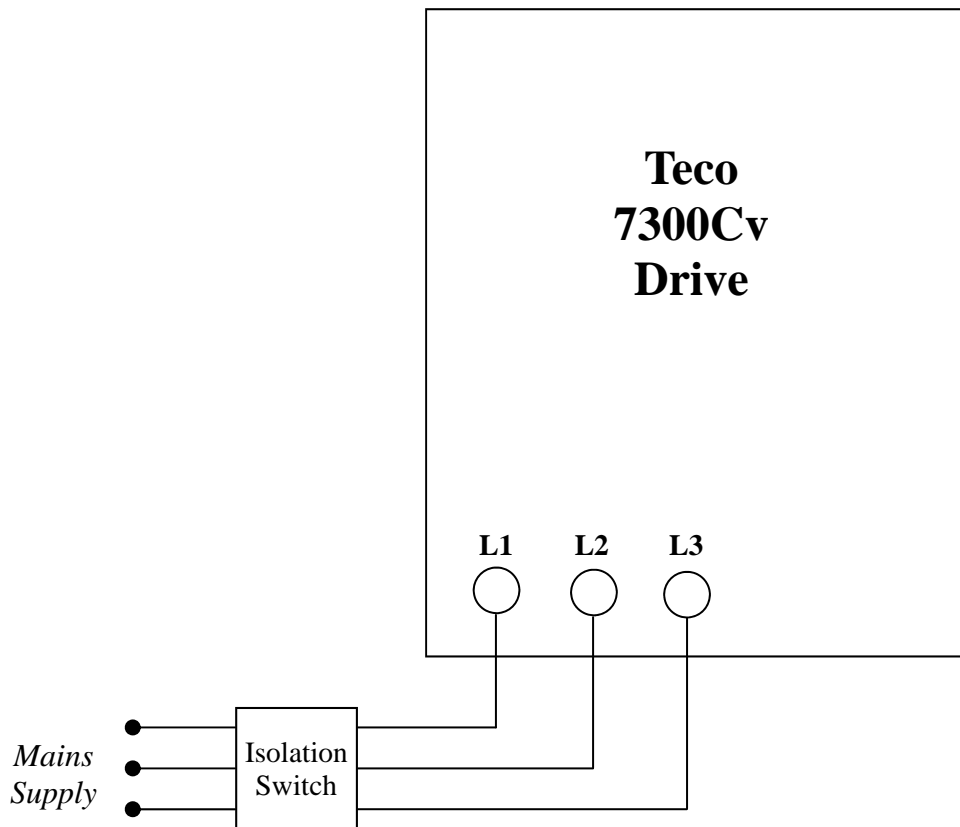
Note 2: Earth connections are not shown on this diagram. Make all earth connections to the earth stud located on the bottom of the cabinet and in the motors terminal box.



Wiring Diagram

Mains Connection

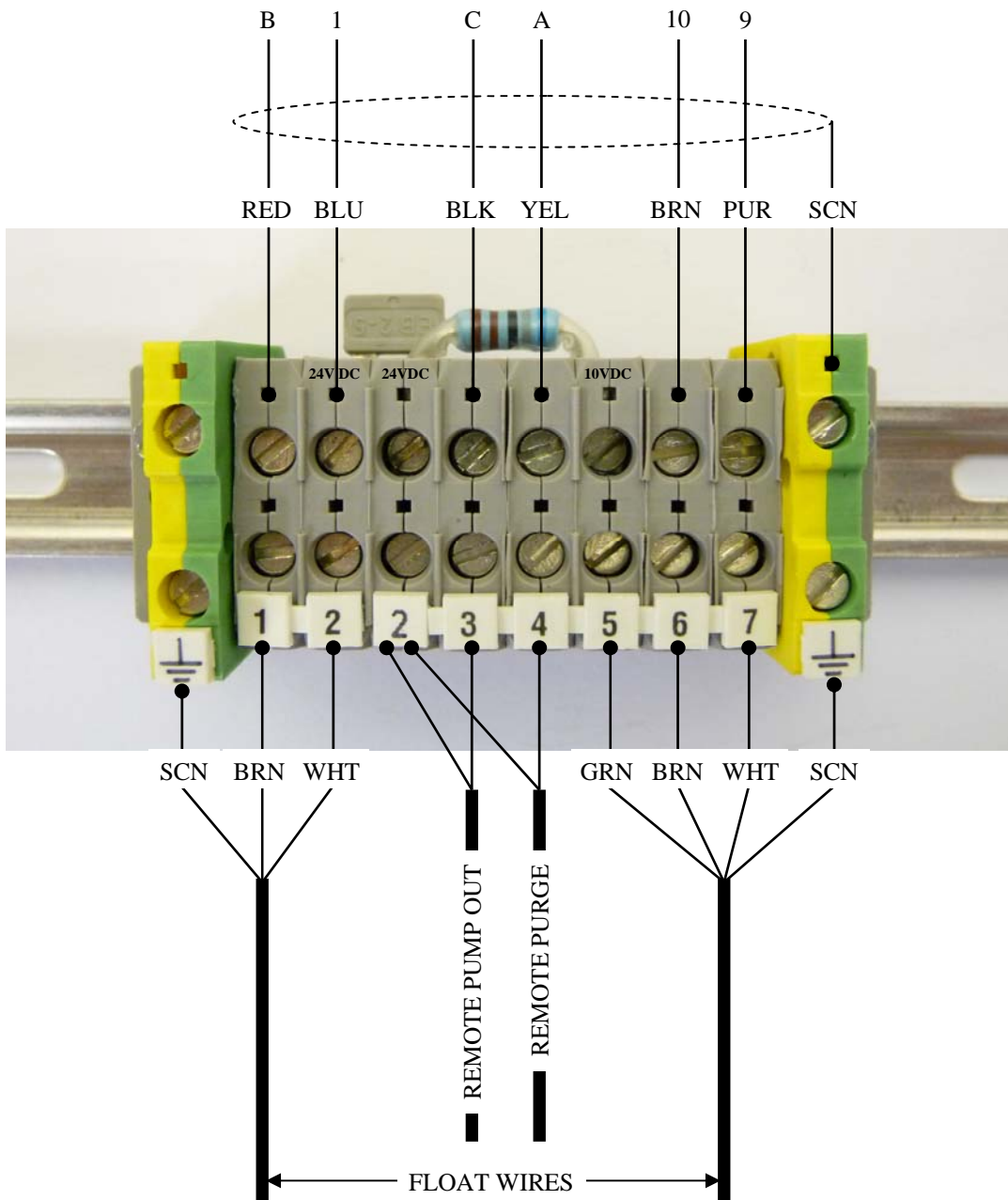
Note: Earth connections are not shown on this diagram. Make all earth connections to the earth stud located on the bottom of the cabinet.



Wiring Diagram

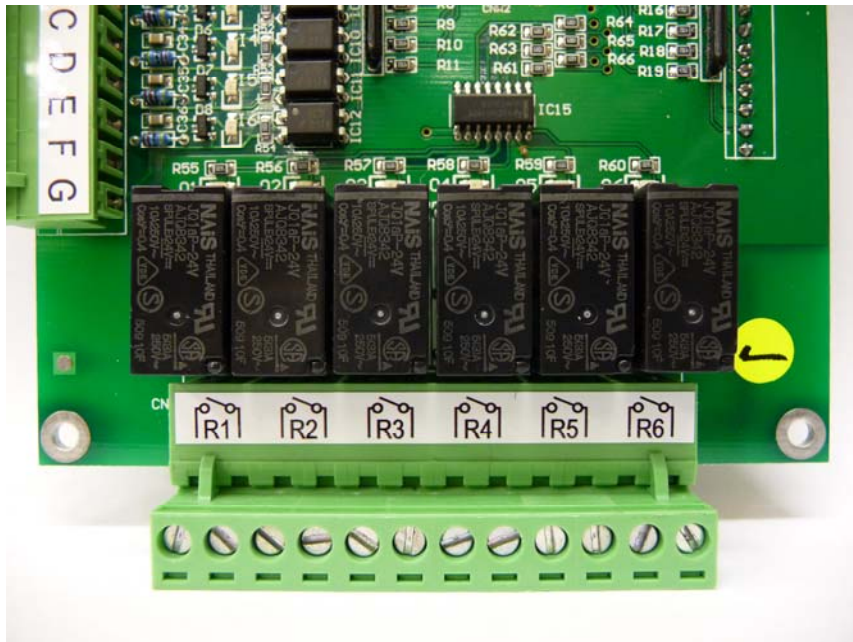
Float & *Optional Remote* Connections

Make all control connections to the bottom of the terminal strip mounted to the inside of the door. The Remote Pump Out and Remote Purge switches are *Optional*. If they are installed there is no need for the wiring to them to be screened.



Relay Connections

The bottom connector on the controller is a set of 6 Relay Outputs.



R1 and R2 are signal inputs to the drive. And should be pre-wired.

R3 Switches on and off in unison with the Dairy-Flo when it Runs or Stops. This may be used to turn other equipment, such as the heat exchanger water solenoid, on and off.

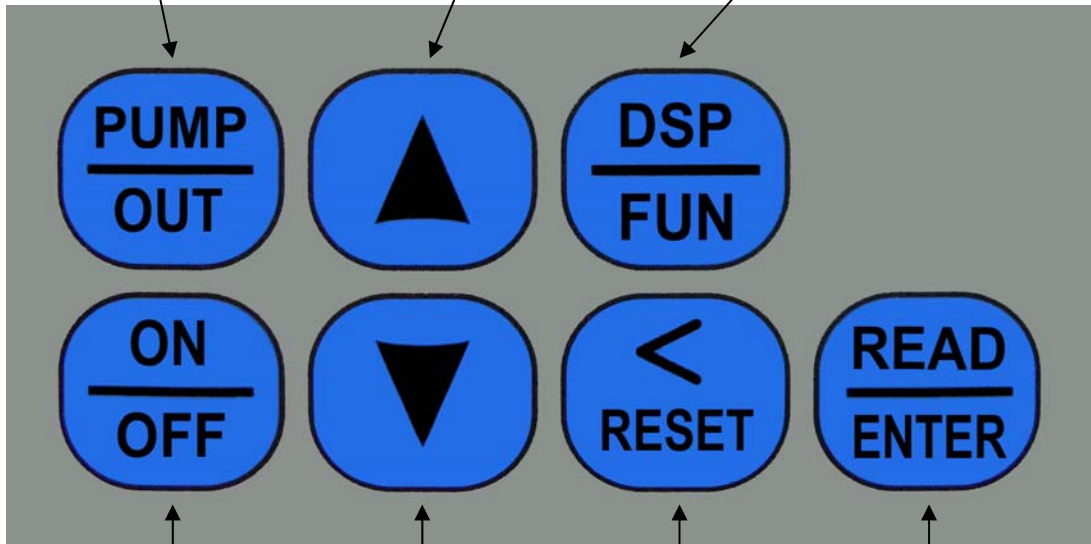
R4, R5 & R6 are for future features.

Keypad Button Functions

Press and hold to PUMP OUT the can. Note that pump keeps accelerating for as long as this key is pressed

Used to INCREASE the value of the digit which is above the cursor

Used to switch between the DISPLAY and FUNCTION menus



Used to START and STOP the pump

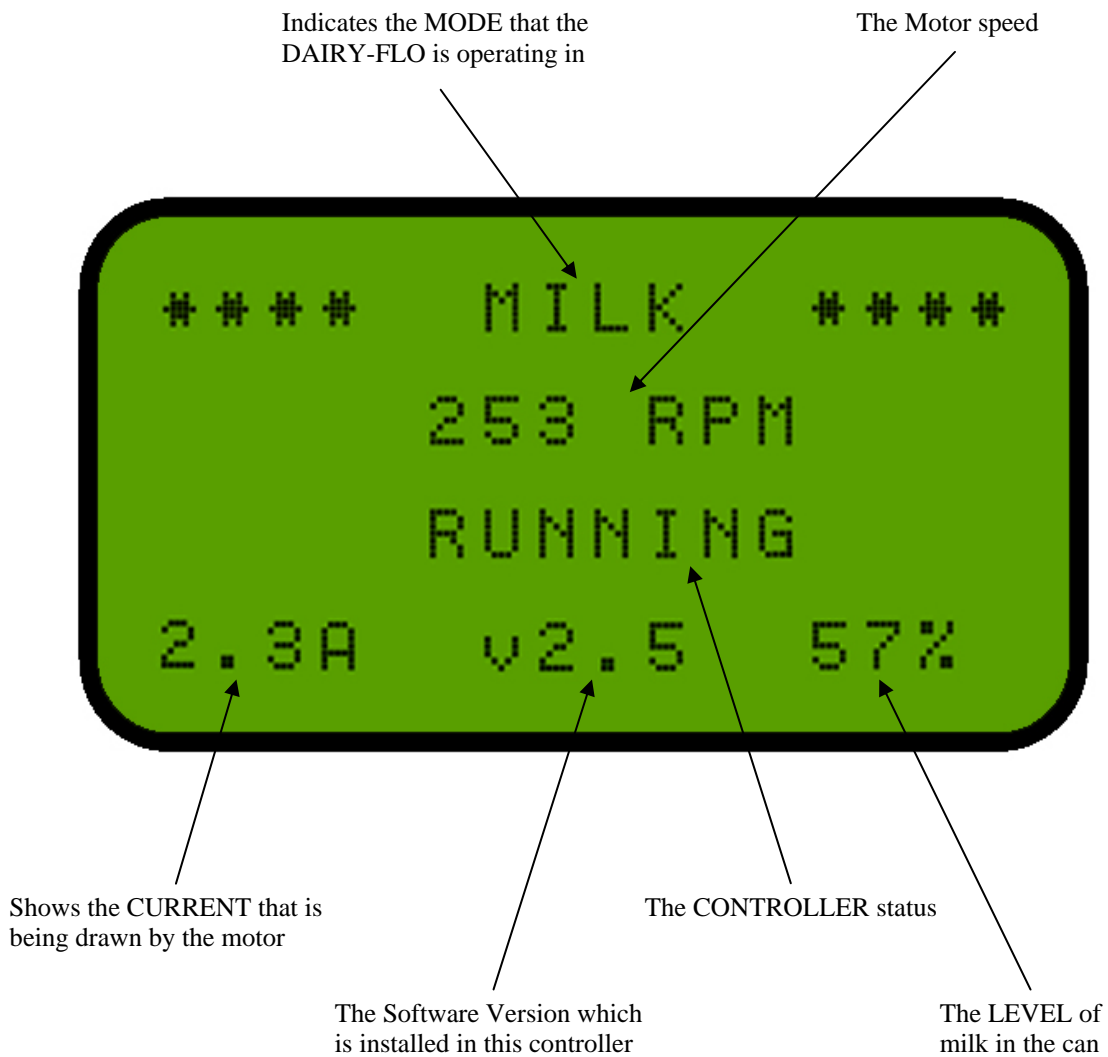
Used to DECREASE the value of the digit which is above the cursor

Shifts the CURSOR one position to the left

Used to READ a function value or ENTER data

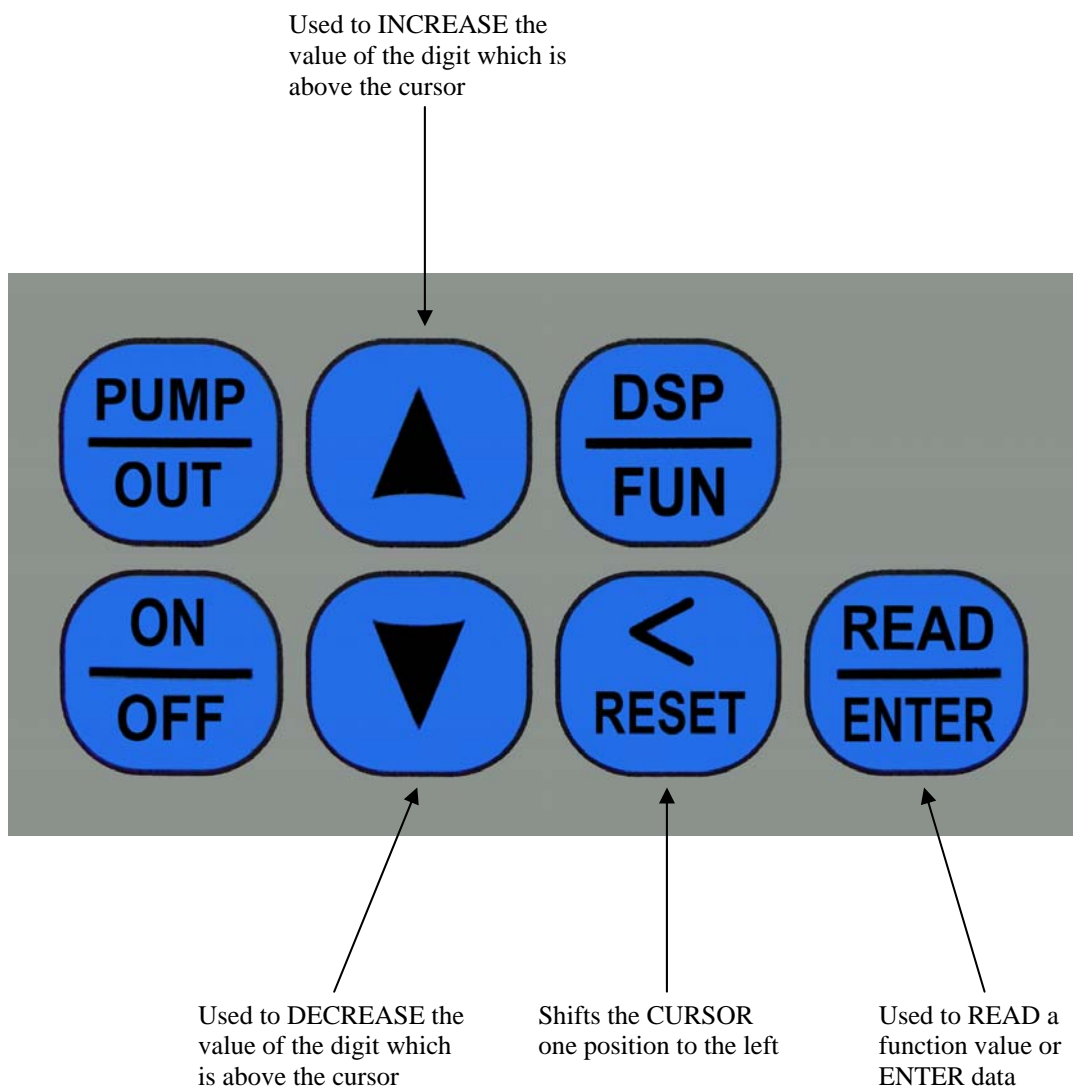
Basic Operation

At power up the Dairy-Flo will automatically come on line and, if the unit has already been set up, the main run screen will be displayed.

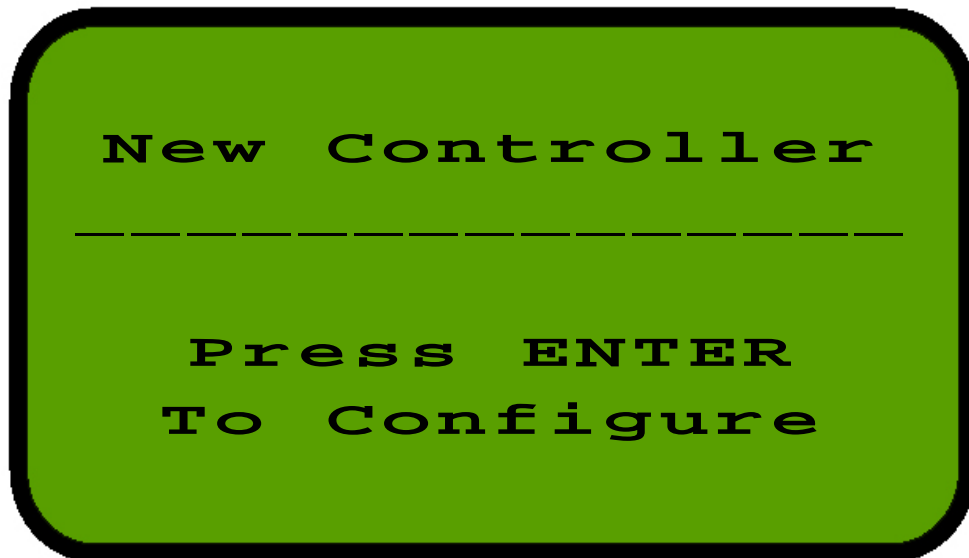


Setting Up

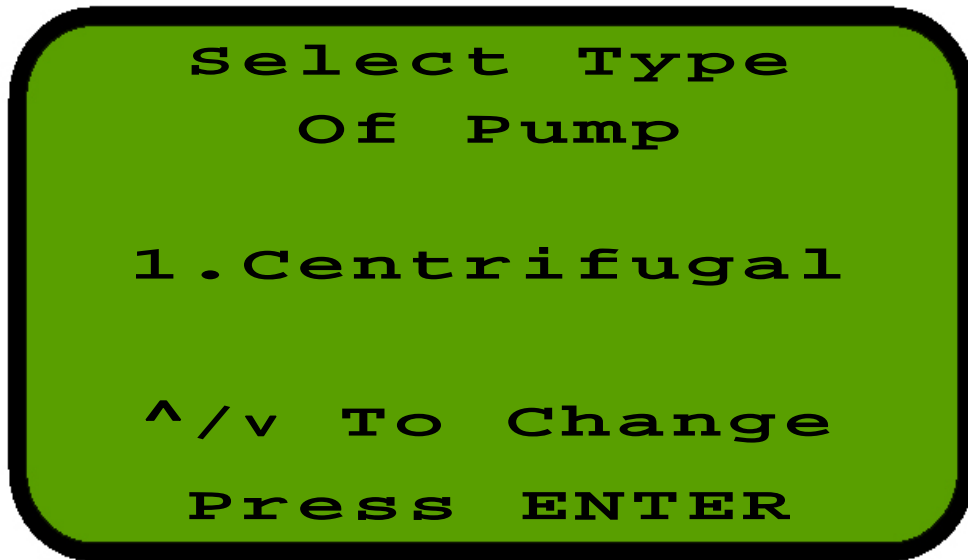
During Setup the following keys are used on the Key Pad




When you power up for the first time. The controller communicates with the drive and sees that it has not been set up. The Dairy-Flo will not run unless the setup wizard has been completed.

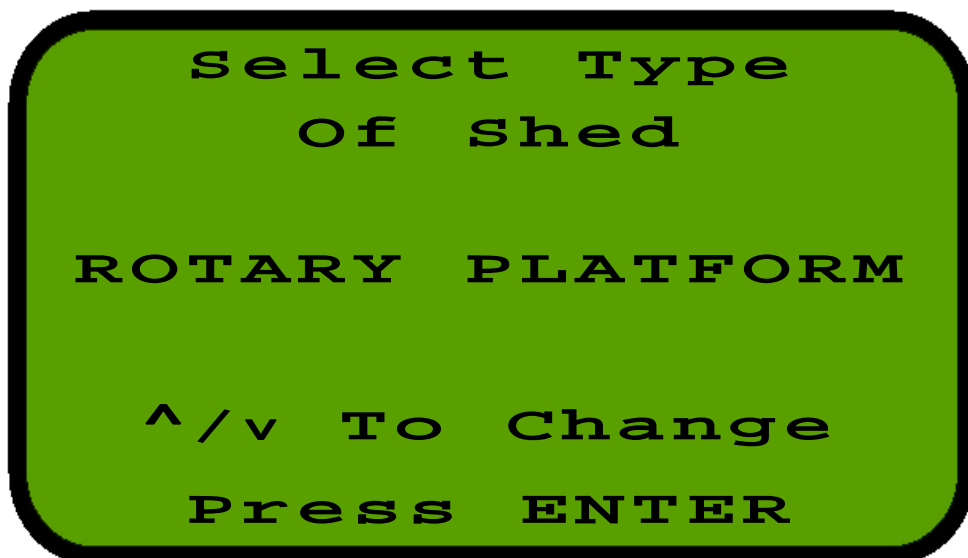



Select the Type Of Milk Pump.



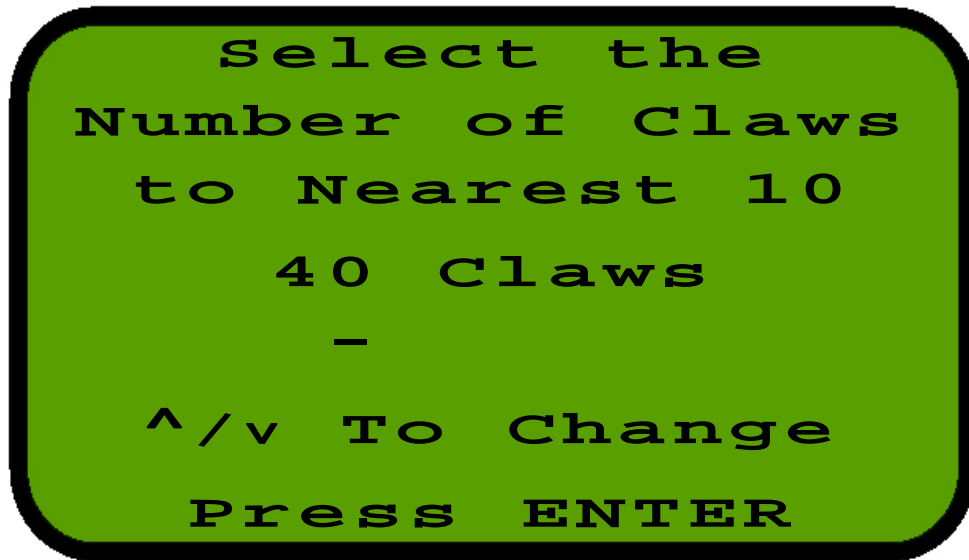
Press the ▲ or ▼ arrows to change the selection.
Press  to confirm the selection.





Select the Type of Dairy Shed.



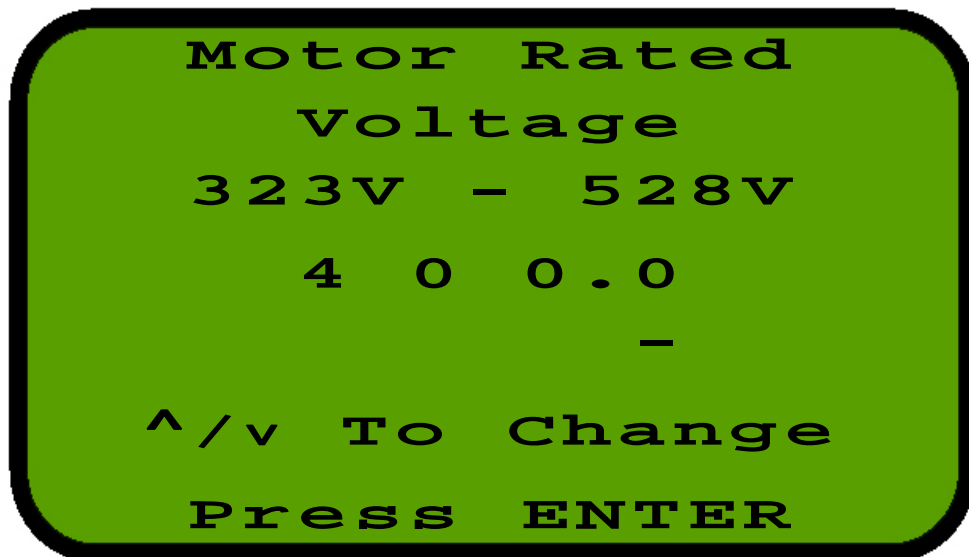
Press the ▲ or ▼ arrows to change the selection.
Press  to confirm the selection.





Select the Number of Claws to the Nearest 10.



Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

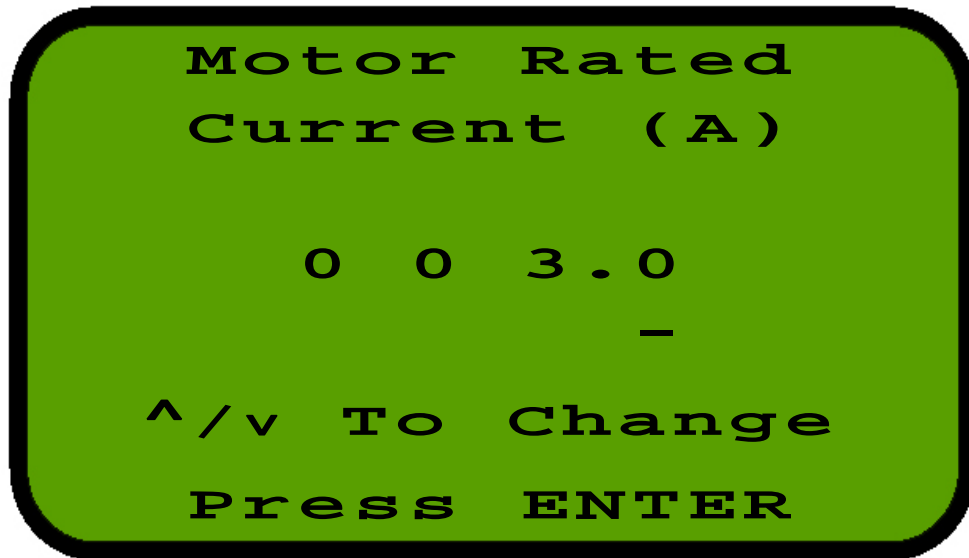
Enter the Motor Rated Voltage from the motors nameplate.







Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

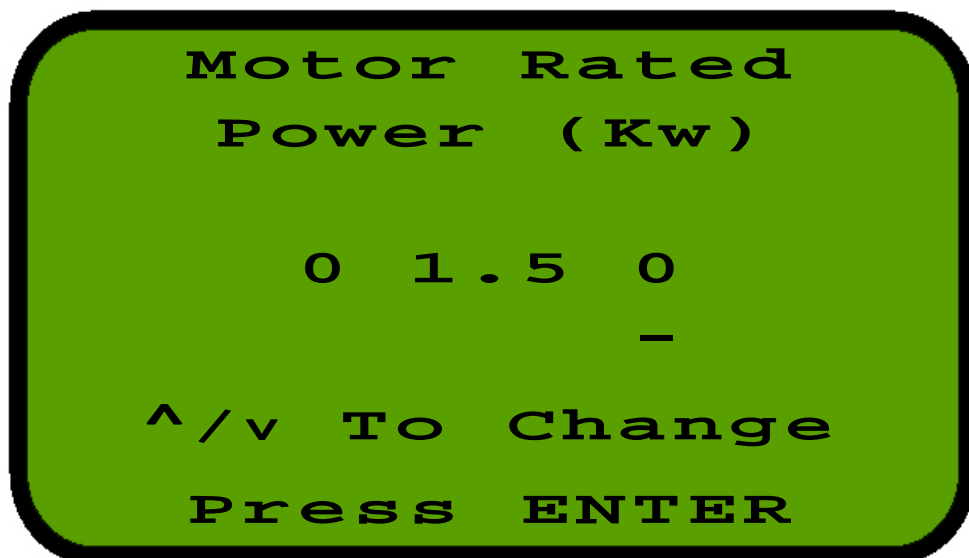
Enter the Motor Rated Current (in Amps) from the motors nameplate.





Note: Enter the exact figure that appears on the Motors Nameplate. In the past, with older controllers, it has been common practice to raise this figure but if this is done with the Dairy-Flo the Auto-Tune will not work correctly. The Dairy-Flo will automatically apply a safety margin to this figure after the Auto-Tune is complete.



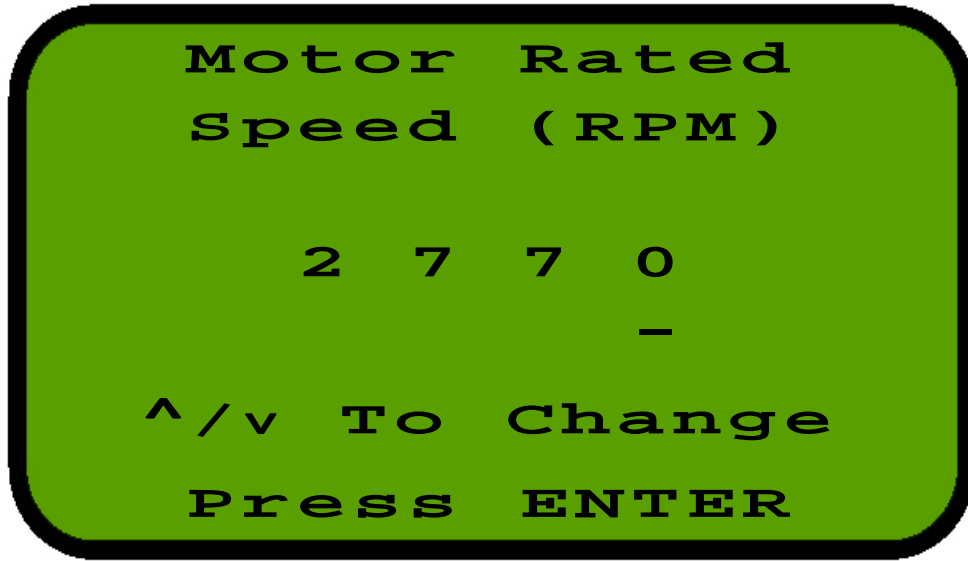
Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.





Enter the Motor Rated Power (in Kw) from the motors nameplate.



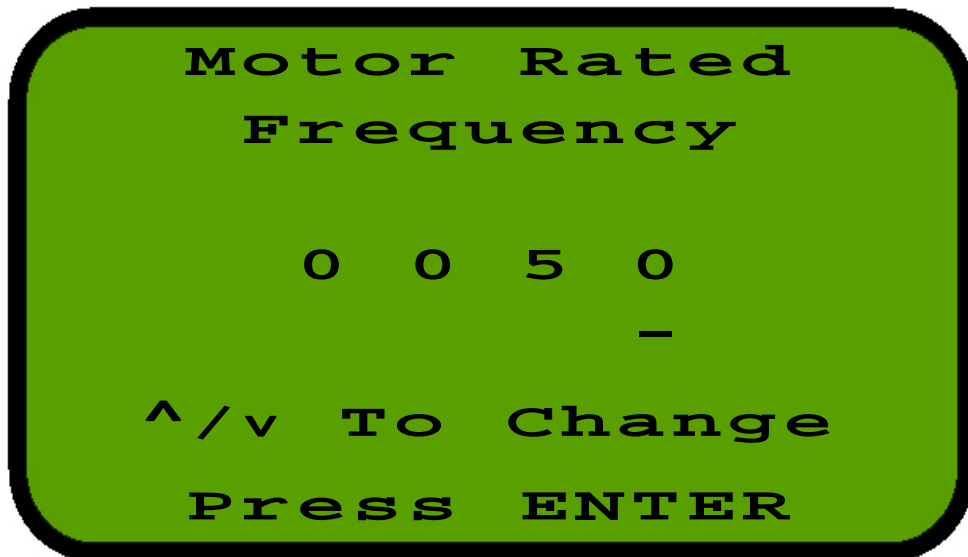
Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.





Enter the Motors Rated Speed (in RPM) from the motors nameplate.



Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

Enter the Motors Rated Frequency (in Hz) from the motors nameplate.



Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

Secure the Float in the position where you would like the Maximum Milk Level to be. This is usually at the very top ring of the float probe. A clothes peg is sometimes useful for this purpose. If it is impossible to secure the float at the top position don't worry as the Maximum Milk Level can be entered manually later if necessary.


```
Secure the Float
at the desired
MAXIMUM HEIGHT
This will be the
Max. Milk Level
      100
Press ENTER
```

PRESS 

The Maximum Level may now be altered if desired.

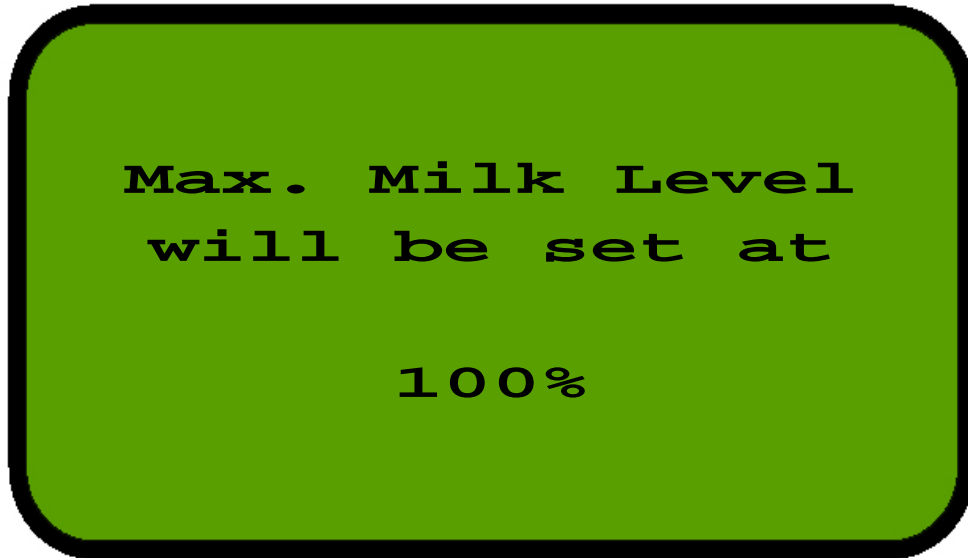
```
Maximum Level
may be changed
now if desired
      0 1 0 0
      -
^/v To Change
Press ENTER
```

Press the  or  arrows to alter the value.

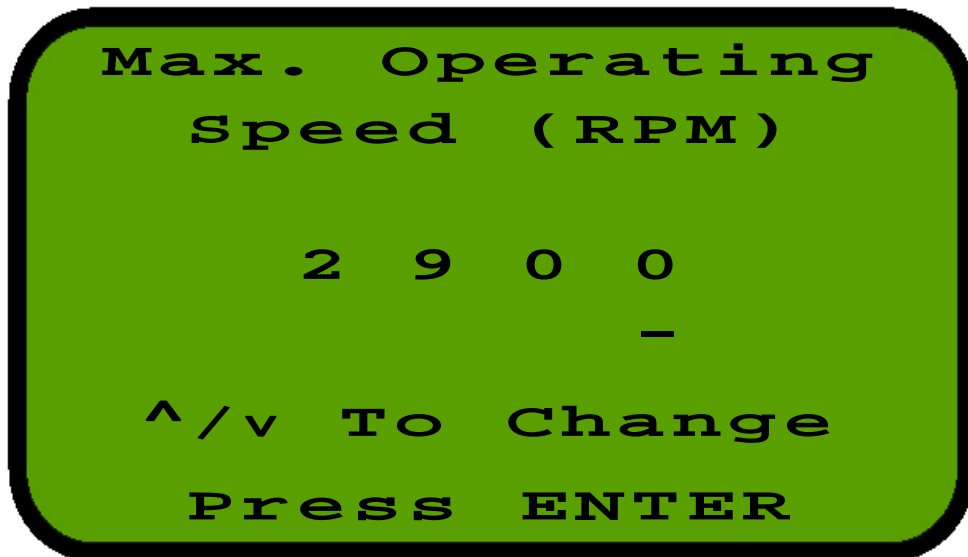
Press the  to change the position of the cursor.





Press  to confirm the value.

An informational message will now be shown on the Screen for a few seconds showing what the Maximum Milk Level will be set to. No action is required.

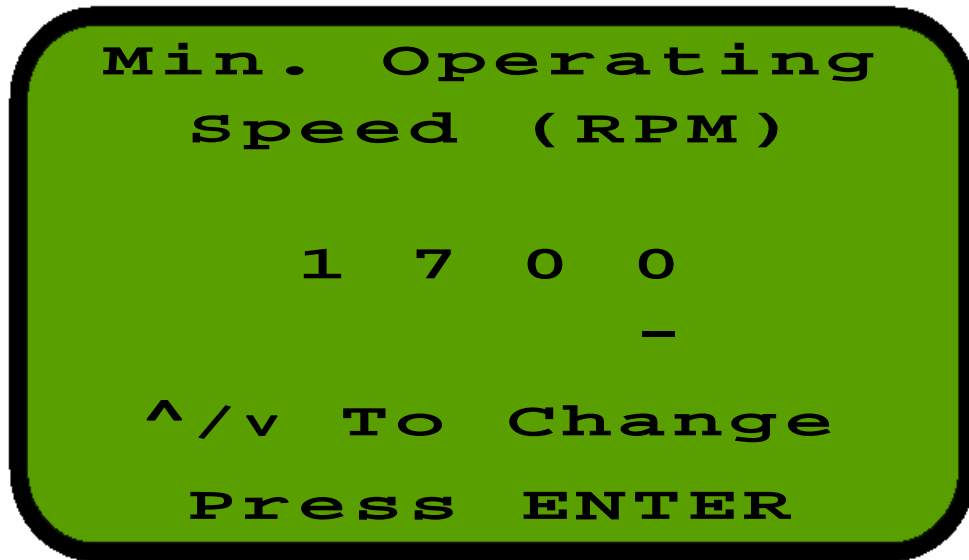






Enter the Maximum Desired Operating Speed (in RPM).



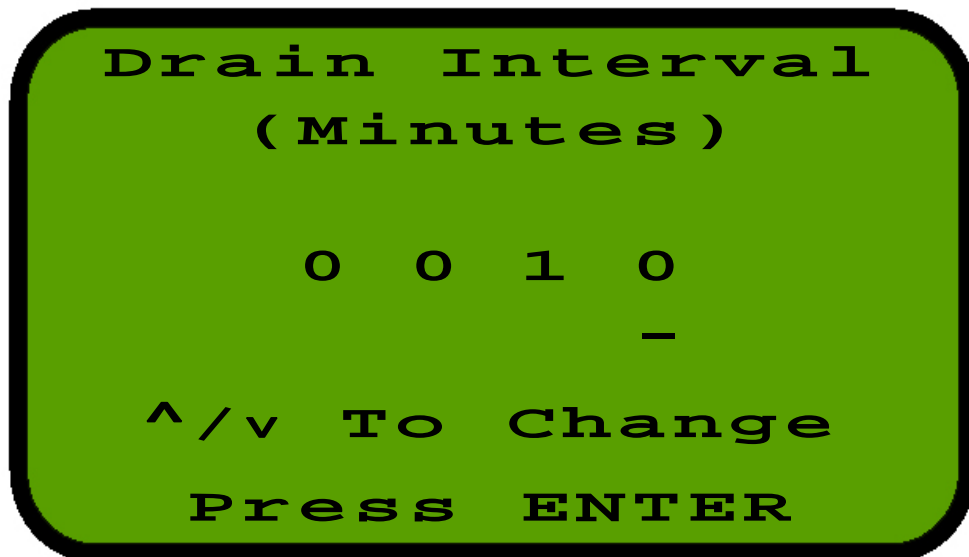
Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.





Enter the Minimum Desired Operating Speed (in RPM).



Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

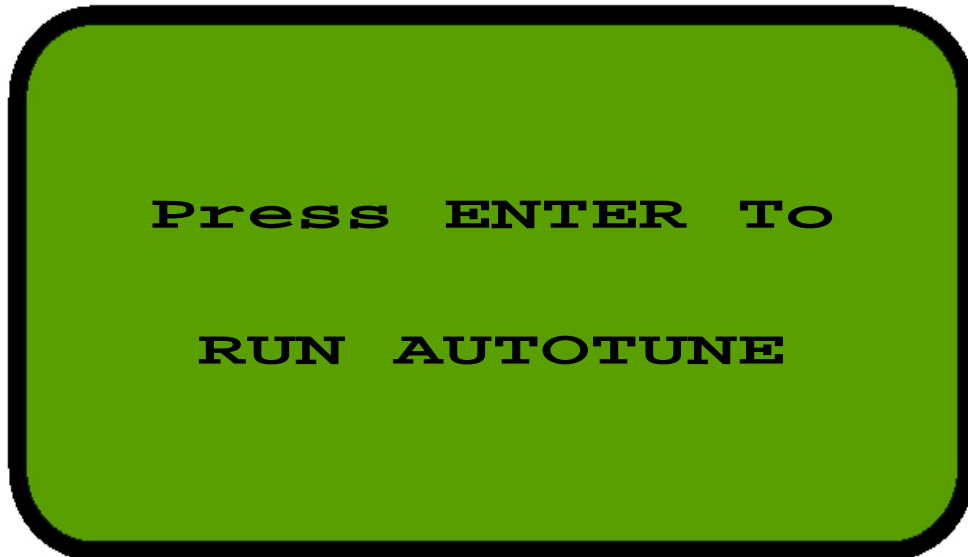
Enter the number of minutes between each Drain Interval (for assistance with froth removal).



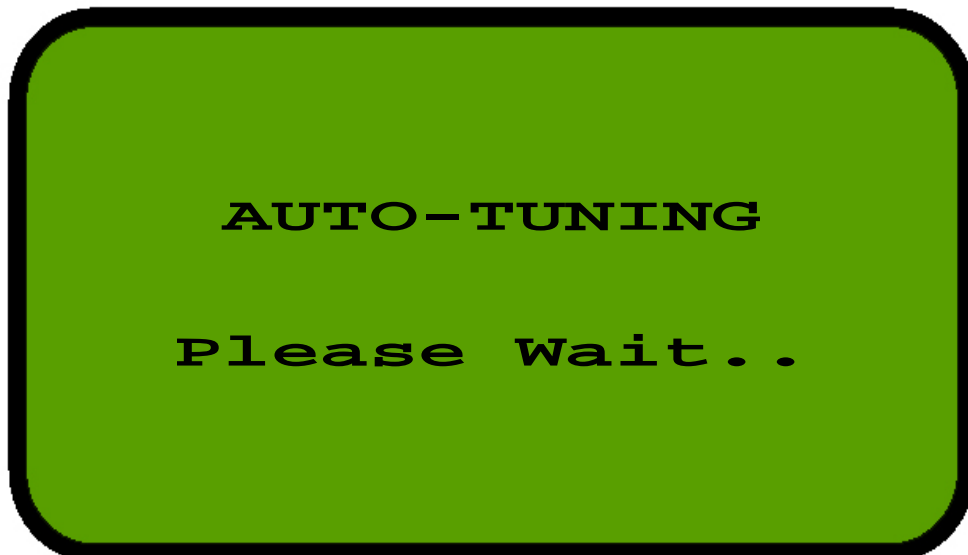
Press the  or  arrows to alter the value.
Press the  to change the position of the cursor.
Press  to confirm the value.

Auto-Tune

When running in Vector Mode, the drive needs to measure the resistance and inductance of the motor to give it greater control when running.



Press 

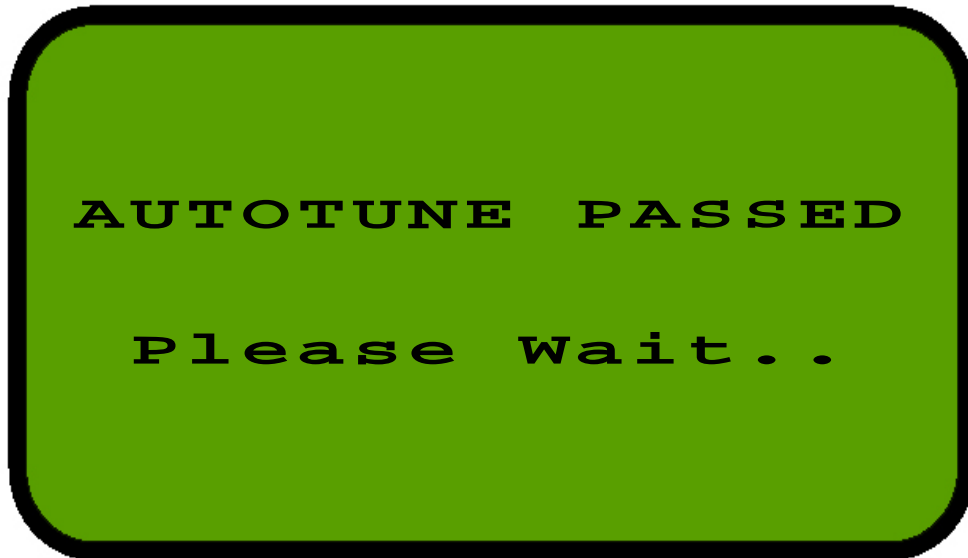


The Auto-Tune procedure takes between 10 and 30 seconds to complete.

When finished there are 2 possible results. Passed or Failed.

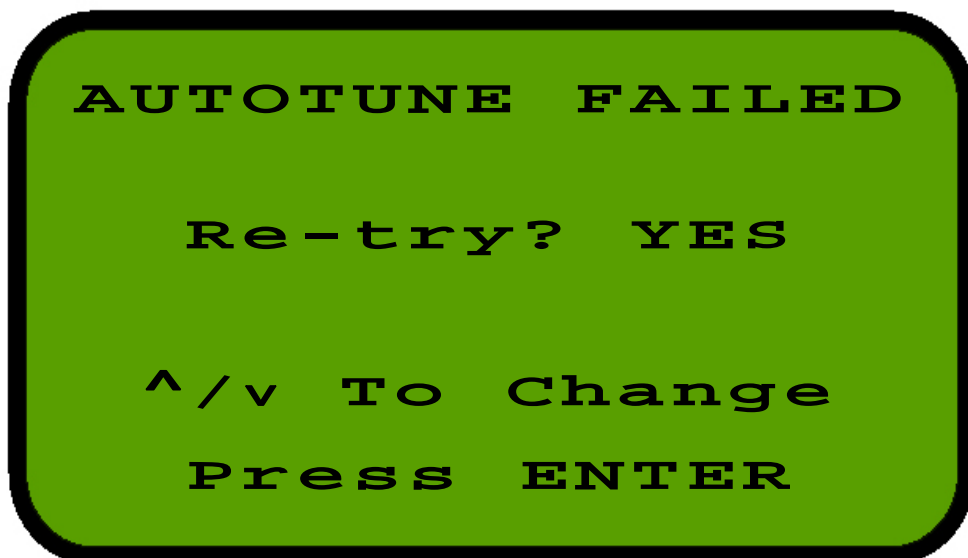
Auto-Tune Passed

If the Auto-Tune is successful, you will see the following screen. The setup wizard will resume after a short delay.



Auto-Tune Failed

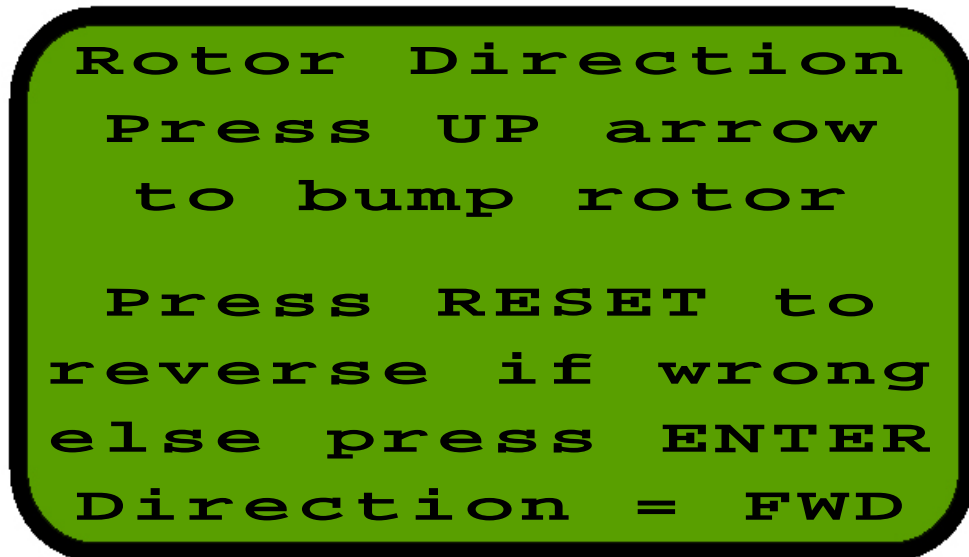
If the Auto-Tune is unsuccessful, you will see the following screen.




You can re-try the Auto-Tune, or you can revert to Volts/Hz Mode by pressing the ▲ or ▼ arrows.



Press  to continue.


Basic setup is now complete. Now you must check and confirm the motor/pump direction.




Press the  arrow, watch the fan on the back of the motor and check the direction of rotation.

If it is correct, press 





If it is incorrect press  and the motor direction will be automatically reversed. The direction can be toggled as many times as desired by pushing 

Confirm that the direction is correct and then press 

Setup is now complete wait until an informational message appears on the screen telling you this. At this point you can press  to run the unit or turn the power off. Do not turn the power off prior to being told that Setup is complete or all settings will be lost.

Function Listing

The Dairy-Flo allows you to change a number of functional parameters relating to the operation of the system. For security reasons some are password protected to prevent systems from being accidentally reset.

The parameters are accessible by pressing the  key on the main display screen. Scroll through the function parameter numbers using the  and  arrow keys. Select using the  key.

F Number	Description	Range	Password Protected
000	Control Reset	Yes/No	Yes
001	Acceleration Time (sec)	0.1–120.0	No
002	Deceleration Time (sec)	0.1-120.0	No
003	Max Desired Milk Level (%)	10-100	No
004	Minimum Speed (RPM)	0–Max	No
005	Maximum Speed (RPM)	2 x Normal	No
006	Purge Speed (RPM)	0 –Max	No
007	Purge Accel (Sec)	0.1-120.0	No
008	Purge Decel (Sec)	0.1-120.0	No
009	Password Entry	0–9999	No
010	Fault History	N/A	No
011	Timer (Run After Empty)	0-120	No
012	Motor Current (Amps)	0.3–100.0	Yes
013	Drain Interval (Minutes)	0-15	No
014	Mode Of Operation	CF/VF	No
015	User Function	N/A	Yes

Key:

No password required to access and change
Password required to access and change

Explanation of Parameters

F000: If the correct password is entered at F009 this parameter becomes visible and allows the Controller memory to be erased and the Controller made to think that it is a new installation which will cause it to guide the user through a full setup procedure again.

F001: Adjusts the Acceleration rate.

F002: Adjusts the Deceleration rate.

F003: This sets the maximum level that the milk should ever reach in the can.

F004: Sets the minimum running speed of the pump in RPM.

F005: Sets the maximum running speed of the pump in RPM. This figure is limited to double the normal full speed of the motor.

F006: Sets the pump speed in RPM that the pump runs at when the optional remote purge switch is activated.

F007: Sets the Acceleration rate for the remote purge.

F008: Sets the Deceleration rate for the remote purge.

F009: Password Entry.

F010: Displays the last 10 faults.

F011: Allows the Time that the unit will continue to run after the float hits the bottom to be set.

F012: If the correct password is entered at F009 this parameter becomes visible and allows the motor current to be adjusted.

Explanation of Parameters Contd.

F013: Sets the interval (In Minutes) between can drain outs for assistance with froth removal.

F014: Allows the operation Mode to be changed from “Constant Flow” to “Variable Flow”.

F015: If the correct password is entered at F009 this parameter becomes visible and allows a “User Function” to be selected. The user function is one that can be adjusted from the main screen without having to go into the function menu.

Warranty

It has become apparent that on occasions insufficiently qualified personnel are installing and commissioning electronic drive systems which are beyond their technical knowledge.

This is often done without fully reading the technical literature accompanying the equipment.

These systems are test run prior to leaving the factory by the manufacturer. For reasons of validity of warranty it is important that the drive is installed and commissioned by a qualified technician.

If a warranty problem occurs, John Brooks Ltd will inspect and test all equipment to assess the validity of the claim based on the above conditions being met.

Equipment to be assessed for warranty must be returned, freight paid, to John Brooks Ltd in Auckland. If the equipment has failed under a warranty condition, the system will be repaired or replaced and returned freight free.

The warranty offered from John Brooks Ltd is directly related to the manufacturers warranty of controls and motors. All units are warranted for a period of twenty four months from the date of delivery. No costs other than those specifically related to the repair of the unit will be met under a warranty claim.