

# FEED CONTROLLERS

## **FASTFEED** PLUS



## Installation & Operation Manual



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## OVERVIEW

The FASTFEED<sup>PLUS</sup> control unit provides a versatile and simple to use feeding solution for your milking parlour. The *ration* model allows the operator to select cow rations at a touch of a button before auto-incrementing to the next available stall. The *memory* model allows the user to input cow numbers and retrieve pre-programmed feed amounts.

FASTFEED<sup>PLUS</sup> control features:



- Control up to 12 stalls per side (herringbone parlour).
- Individual feed or batch feed a side option.
- Calibrate individual auger motors.
- Cows fed and feed dispensed counters.
- Single ration drop enticement option.
- *Meal Time* extended feeding option.
- *Quick Feed* immediate dispensing option.
- 9999 cow storage on **memory model only**.

### FEEDING MODE (*Ration Model*)

Feeding mode screen shown below.





Before commencing any feeding please ensure that feeders are set up correctly and calibrated if necessary.


To change parlour side press either the  button for left side or  button for right side.


To enter a unit of feed press one of the numeric buttons and observe the display stall indicator increases by one stall.


To enter feed amounts greater than 9 units use:


Button  for 10 units by holding down for more than 1 sec.

Button  for 11 units by holding down for more than 1 sec.

Button  for 12 units by holding down for more than 1 sec.


Button  for 13 units by holding down for more than 1 sec.

Button  for 14 units by holding down for more than 1 sec.

Button  for 15 units by holding down for more than 1 sec.

To skip a stall either press the  button or  button.

Feeding will begin depending on how the FASTFEED<sup>PLUS</sup> is set up, either once a side has been filled up, or straight after a feed amount has been selected if *Quick Feed* has been enabled.

To cancel feeding at any time press the  button.

To batch feed a side press the  button and also observe the display stall indicator changes as shown below.

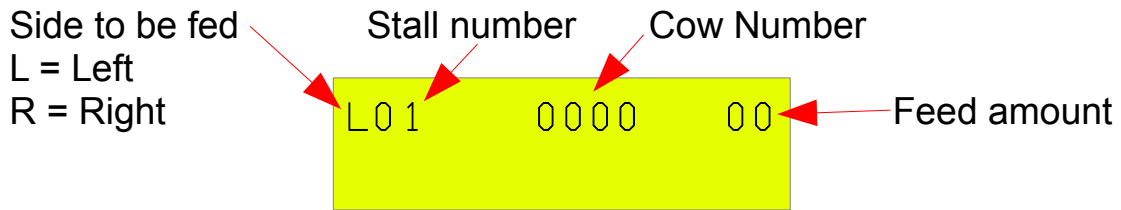
Batch mode





LB 00  
Enter Feed


## FEEDING MODE (*Memory Model*)

Cow entry screen shown below.



Before commencing any feeding please ensure that feeders are set up correctly and calibrated if necessary.

To change parlour side press either the  button for left side or  button for right side.

To enter a cow use the numeric buttons to enter the desired cow number and then press the  button.

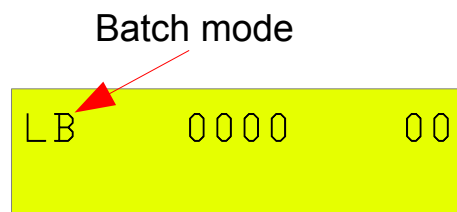
Once the user has entered a cow the stall number will increment by 1.

To skip a stall press the  button.


Feeding will begin depending on how the FASTFEED<sup>PLUS</sup> is set up, either once a side has been filled up, or straight after a cow number has been entered if *Quick Feed* has been enabled.

To cancel feeding at any time press the  button.

To batch feed a side press the  button and also observe the display stall indicator changes as shown below.






## COW COUNTER

The FASTFEED<sup>PLUS</sup> provides the user with a number of cows fed counter that can be viewed at a press of a button any time during feeding. By pressing the  button the display will show cows fed up to that point.


## FEED COUNTER

The FASTFEED<sup>PLUS</sup> provides a running total of feed units fed that can be viewed at any time by pressing the .


## SETUP MENU

To enter or exit the setup menu at any time press the  button. To navigate through the menu options press either the  or  buttons.

SETUP OPTION	DESCRIPTION
<i>Parlour Size</i>	Enter number of stalls per side (1...12).
<i>Feeder Type</i>	Change feeder type to PULSE or AUGER.
<i>Feed Multiply</i>	Feed units can be multiplied (1, 2 or 4). Default value is 1. This option is useful if for example the feeders are calibrated to 500g per unit but the user wishes to change to 1000g per stall by changing the feed multiply to 2 without re-calibrating feeders.
<i>Batch Size</i>	Maximum number of feeders that can operate at the same time (4, 6 or 12). Useful option if feeder transformer is limited in available power.
<i>Pulse Time</i>	If PULSE feeders are selected then this option allows the user to adjust the solenoid ON time (1...20 seconds).
<i>Enticement</i>	If enabled will dispense one unit of feed to stall 1 when entering rations on a new side. This can be used to encourage the cows to walk down the stalls.

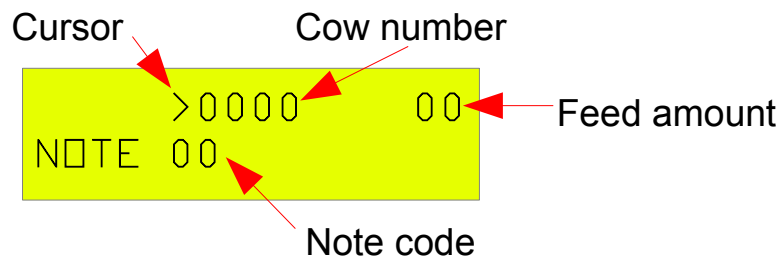
<i>Meal Time</i>	Default value is 00. This option allows the total feeding time to be determined by the user - AUGER feeders only. If for example you wish the feeding to last over 8 minutes then enter 08 into Meal Time. Feed will be dispensed as small drops over the Meal Time duration but will equate as the same.
<i>Quick Feed</i>	Default value is NO. If this option is enabled the feeders will dispense as soon as the user enters a ration amount.
<i>+/- Herd Feed</i>	Allows all stored herd feed amounts to be globally increased or decreased. Use  to toggle +/- sign. ( <i>Memory</i> model only).
<i>Calibrate Augers</i>	Auger feeder calibration routine can be started from this option.
<i>Program Cows</i>	Utility to store cow feed amounts and notes ( <i>Memory</i> model only).
<i>Ration Mode</i>	Toggle between ration mode or memory mode ( <i>Memory</i> model only).
<i>Exit Setup</i>	User can exit setup menu.

### STORING COW NUMBERS (*Memory model*)





To begin the process of entering and storing cow numbers press the  button and select "Program cows".

The display will now give the user a choice of "Batch Input Y/N". Selecting yes will enable the user to input a several cow numbers using the same feed amount. Selecting no will allow the user to input different feed amounts to individual cows.

To exit the "Program cows" utility at any point press the  button.



To program and store a cow number use the following procedure:

- 1 - Press the  button to move the cursor to the cow number.
- 2 - Use the numeric buttons to enter the cow number e.g. "0123"
- 3 - Press the  button to move the cursor to the feed amount.
- 4 - Use the numeric buttons to enter a feed amount.
- 5 - If you wish to tag a note onto the cow press the  button and enter the note code. Codes shown below. If no note is required then ignore procedure 5.
- 6 - Press the  button to store the cow number. Cursor returns to the cow number and all values are zeroed.

### COW NOTES (*Memory model*)

NOTE 1	<i>DUMP MILK</i>	NOTE 11	<i>*NOTE C*</i>
NOTE 2	<i>DO NOT MILK</i>	NOTE 12	<i>*NOTE D*</i>
NOTE 3	<i>DIVERT FOR A.I.</i>	NOTE 13	<i>CHECK R/LEFT QTR</i>
NOTE 4	<i>DIVERT FOR VET</i>	NOTE 14	<i>CHECK F/LEFT QTR</i>
NOTE 5	<i>SLOW MILKER</i>	NOTE 15	<i>CHECK R/RIGHT QR</i>
NOTE 6	<i>NERVOUS COW</i>	NOTE 16	<i>CHECK F/RIGHT QR</i>
NOTE 7	<i>INSPECT UDDER</i>	NOTE 17	<i>TREAT R/LEFT QTR</i>
NOTE 8	<i>DRY OFF</i>	NOTE 18	<i>TREAT F/LEFT QTR</i>
NOTE 9	<i>*NOTE A*</i>	NOTE 19	<i>TREAT R/RIGHT QR</i>
NOTE 10	<i>*NOTE B*</i>	NOTE 20	<i>TREAT F/RIGHT QR</i>

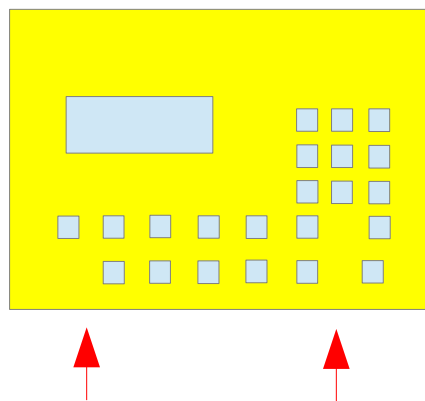
To erase all cow records press the clear button while switching on the power to the controller.



## INSTALLATION

The FASTFEED<sup>PLUS</sup> is normally installed on the bridge arm at the cow entry end of the parlour. The enclosure is strong and waterproof and should withstand the harsh working conditions of a milking parlour. The waterproofing of this enclosure is however dependant on how and where conduit adapters are fitted by the installation engineer.

Two 20mm conduit adapters are supplied to accommodate the conduit from the feeders on each side of the parlour. **It is strongly recommended that these adapters should be fitted at the back of the box as close as possible to the bottom.** Davlec accepts no responsibility for damage caused to equipment from water penetration due to poorly fitted or sited cable entry glands.



CABLE ENTRY FROM BOTTOM ONLY

There is adequate space on both sides of the output relay card for this to be accomplished. In most cases the cables from the power unit can also be brought in via one of these 20mm conduits. In some cases it may be necessary to bring a two core cable from the power supply, and a compression gland is supplied for this purpose. Please note that if the compression gland is being used, a round sheathed two core cable should be used and not two individual wires.

A little care during this part of the installation process will pay dividends in terms of the long term reliability of the control box.

## POWER SUPPLY REQUIREMENTS

Where a FASTFEED<sup>PLUS</sup> is required to replace an existing controller, a new transformer may not be required. The FASTFEED<sup>PLUS</sup> main control panel will function at D.C. voltages in the range of 12 to 24 volts. Please note that if the transformer gives an unsmoothed full waved rectified output, the peak voltage should not exceed 24 volts, i.e. the R.M.S. voltage should not exceed 17 volts.

In the case of pulse type feeders, these are vacuum or compressed air operated and controlled by a solenoid valve. These valves will be either 12 or 24 volts D.C. Solenoid valves nominally rated at 12 volts are usually operated from an unsmoothed 15-17 volt R.M.S. power supply. The FASTFEED<sup>PLUS</sup> and the solenoids can usually be operated from the same transformer providing suppressors have been fitted in accordance with the schematic diagrams at the end of this manual.

The FASTFEED<sup>PLUS</sup> will operate the solenoids so that all even stalls are operated together, and all odd stalls are operated together. For example an 8 stall herringbone parlour with all feeders dispensing feed, would have only four solenoids switched on at any time. If each of these is rated at 0.75 amps, the maximum load is 3 amps.

Allowing 1 Amp for the FASTFEED<sup>PLUS</sup> itself, the transformer must therefore be rated at a minimum of 4 amps. The output voltage must be suitable for the solenoid valves, and in turn, the voltage of the Fastfeed output relay panel must be selected to suit the power unit. The power supply is connected to the + and - terminals on the output relay card, and the link to the left of the card and immediately above the fuse holder is not removed. For further information, see section 8 and the schematic diagrams at the end of this manual.

In the case of auger type feeders, it is possible to operate the system from a single supply connected as above. However, the recommended method is to have a separate 16 volt R.M.S. 2 amp. transformer to supply the FASTFEED<sup>PLUS</sup>, and a separate transformer to supply the auger motors. In this case, the relays on the relay card will be operated from the 2 amp supply, and a 12 volt relay card is therefore suitable, even if the auger motors are 24 volts.

The 2 amp power unit is connected to the terminals marked + and - on the relay card. The link above the fuse holder is removed, and the positive terminal of the auger motor power supply is connected to one of the terminals marked "Feeder Power Supply", preferably to the M5 stud at the top left hand corner of the card.

When calculating the power supply capacity, please remember that all feeders on each side of the parlour will operate together unless the *Batch Size* option is altered to less than 12 in the setup menu. If each motor is rated at 1.5 amps, on an 8 stall herringbone parlour, it would be advisable to also factor in a 50% start up current, so the transformer needs to be rated at 18 amps minimum.

To ensure accuracy of feeding, the auger transformer should have a regulated output. For 12 volt motors, a Davlec PU1225 can be used. This has a 12 volt 25 amp capability.

### **CABLE SIZE**

The D.C. power supply should be connected to the terminals marked + and - at the bottom left hand corner of the output relay card, taking care to ensure that the correct polarity is observed.

The size of the power cable will depend entirely on the types of feed dispensers. For pulse type dispensers, where the solenoids are normally taking less than 1 amp each, then 2.5 mm square cable is perfectly adequate. In the case of auger type dispensers, where the individual running current may be as high as 3 amps, a considerably larger cable may be required. It is advisable to follow the manufacturers recommendations on these cable sizes.

### **COMMON EARTH CONNECTION**

If the feeding system is using a single transformer, the common earth connections from each side of the parlour are connected to the terminals marked "E" again at the left hand corner of the output relay panel. In general, the earth wire should be of the same size as the power supply cable, i.e. for pulse type dispensers 2.5mm square cable is normally adequate, with a larger conductor being required for auger type feed dispensers.

It should be noted that the larger the number of dispensers, the more current is required in the common earth connection and therefore the greater the cable diameter required. On auger installations where there are more than six feeders on each side, it would be advisable to connect the common negatives of all the motors on each side, directly to the negative terminal of the power unit. This will reduce any voltage drops through the connections on the relay card. It is advisable to connect one wire from the first feeder on each side of the parlour and another from the last feeder. The earth connections can then be daisy-chained to the remaining feeders.

### FUSES & SUPPRESSORS

The output relay card is fitted with a 3 amp fuse which protects the control box electronics only. The installing engineer should ensure that the transformer has its own adequate means of protection.

The relay card has over current protection on each feeder output with a breaking limit of 5 amps.

Auger motors and vacuum feeder solenoids are notoriously noisy especially when they have been in service numerous years. The FASTFEED<sup>PLUS</sup> is supplied with diode suppressors to limit this interference. These diode suppressors should be fitted across the motor or solenoid supply terminals or as close as practically possible.

Fitting the suppressors inside the FASTFEED<sup>PLUS</sup> control box will not give adequate suppression of interference. The suppression diodes should be connected so that the white band around one end is to the positive terminal of the motor.

### WIRING TWO TRANSFORMERS

For auger type feeders, it is recommended that a separate transformer is used for the FASTFEED<sup>PLUS</sup> itself. In this case, the negative terminals of the motors should be connected to the motor transformer.

The connection from the positive terminal of the motor transformer should be connected to one of the terminals marked "Feeder Power Supply" on the relay card. **The link between the two terminals must first be removed.**

On no account should the motor transformer positive be connected to the terminal immediately above the fuse holder since this connects to the fuse itself. The second transformer can be connected to the terminals marked + and -. **No connection should be made to the terminals marked "E"**. The voltage requirements of this second transformer will depend on whether a 12 or a 24 volt relay card is being used.

### CHECKING FOR CORRECT RELAY PANEL


The installing engineer must also make sure that the FASTFEED<sup>PLUS</sup> is suitable for the supply voltage from the transformer being used. The FASTFEED<sup>PLUS</sup> lid will operate at any voltage between 12 and 24 volts D.C. and it is therefore only necessary to ensure that the correct voltage output relay panel is being used. The part number for a 12 volt relay panel is 2840990A and the part number for a 24 volt output relay panel is 2840990B.

### MANUAL FEEDING


The FASTFEED<sup>PLUS</sup> manual feeding can be located on the bottom of the enclosure consisting of a push button and a toggle switch. The push button when pressed will operate the feeders for the duration that the button is held in for. The toggle switch changes feeding side. The manual feeding can be used as a quick top up while operating the FASTFEED<sup>PLUS</sup> or as an emergency method of feeding in the event of a breakdown.

**Please ensure that the toggle switch is in the left position while using the FASTFEED<sup>PLUS</sup> otherwise the side changeover will not automatically work.**

## CALIBRATING AUGER FEEDERS

To calibrate auger feeders enter the setup menu by pressing the  button and select the "Calibrate augers" option. The display should now show the following....

```
Calibrate all  
Feeders Yes/No?
```

To proceed press the  button. The next display will allow the user to enter in a time (in seconds) for a single feed portion. It is critical to get this time as close as possible to what the feed dispensers can deliver otherwise the FASTFEED<sup>PLUS</sup> may not be able to compensate any weight errors at the end of calibration. Maximum time allowed is 25.0 seconds.

```
Seconds per  
Portion 05.0
```

The next display allows the user to adjust the unit portion size (in grams). Maximum portion size allowed is 1000g.

```
Portion size  
0000 grams
```

The next display gives the user the option to drop feed to each stall and then weigh it or skip straight to the enter weights display.

```
Drop calibration  
Portions Yes/No?
```

If the user selects to drop portions then the FASTFEED<sup>PLUS</sup> will drop **FIVE** portions to each stall to get a more accurate average weight. If for example a portion size of 500g was chosen then the expected weight at each stall will be 2500g.

Dropping 5 x  
Portions left

When the FASTFEED<sup>PLUS</sup> has stopped dropping feed to the left side, weigh each stall and enter the weights to the corresponding stall on the display. If the weight entered is more than 20% greater than the ideal weight the display will show "high". Alternatively if the weight is 20% lower the display will show "Low".

Enter weight L01  
2500 grams

When the user has entered the last left side weight the FASTFEED<sup>PLUS</sup> will repeat the last two stages for the right hand side of the parlour.

### CALIBRATING TIPS

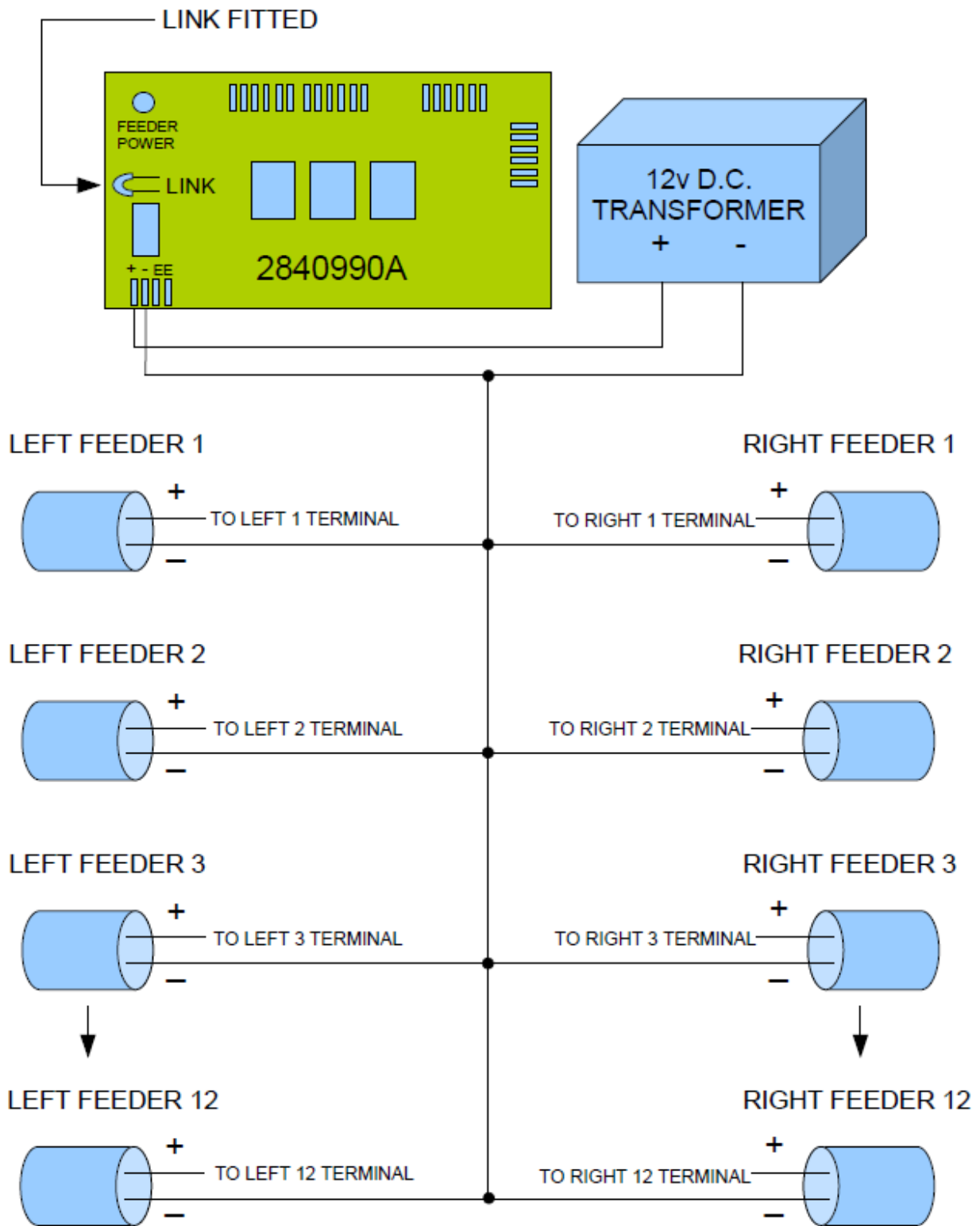
- If the portion time is not known try operating one feeder by connecting it straight to the "Feeder power" terminal and using a stop watch operate that feeder for 5 seconds and then weigh what had been dispensed. Depending what that weight is increase or decrease the time and try again until you gain your desired portion size.
- If the calibrated weights are greater than +/- 20% out from the ideal weight then the FASTFEED<sup>PLUS</sup> can not compensate.
- If all the calibrated weights are globally higher than the ideal weight then re-calibrate and decrease the portion time.
- If all the calibrated weights are globally lower than the ideal weight then re-calibrate and increase the portion time.

## PRODUCT SPECIFICATION

<b>Product Name</b>	Fastfeed Plus					
<b>Product Family</b>	Feed Controllers					
<b>Enclosure</b>						
<b>IP Rating</b>	67					
<b>Material</b>	ABS					
<b>Dimensions</b>	W	230mm	L	298mm	D	110mm
<b>Electrical</b>						
<b>Supply Voltage</b>	12/24 volt D.C.					
<b>Maximum Peak Voltage</b>	28 volts D.C.					
<b>Frequency</b>	N/A					
<b>Maximum Current Load</b>	1.5 Amps					
<b>Protection</b>	3 Amp 20mm Fuse (Relay PCB)					
<b>Environmental Conditions</b>						
<b>Temperature</b>	0 to 45°C					
<b>Humidity</b>	5 to 95%					
<b>Location</b>	Indoor use only					
<b>Approvals</b>						
EMC Conformity to:						
EN 61000-6-1:2007, EN 61000-6-3:2007, EN 55022:2006						



### SINGLE TRANSFORMER WIRING



FIT SUPPRESSION DIODES TO EACH FEEDER

**DUAL TRANSFORMER WIRING**

