Fastfeed

FEEDER CONTROL BOX

INSTALLATION AND OPERATION MANUAL

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1.0 OPERATING INSTRUCTIONS

"Fastfeed" is a sophisticated, micro - processor based feeder control, designed to operate a wide range of feed dispensers. Rations from 0-15 units of feed can be entered for each feeding stall at the press of a single button. Once the rations have been entered "Fastfeed" will ask you if you are ready to feed. Answering "Yes" initiates feeding and answering "No" allows you to go back and start again. Fastfeed automatically switches from one side of the parlour to the other. A manual override is also provided. A "Batch" mode is also available which allows ultra-fast setting of the same amount of feed for each stall. For "Auger" type feed dispensers, a semi-automatic calibration system is provided.

1.1 Normal Mode of Operation

"Fastfeed" is simplicity itself to operate. The installing engineer will have set up the unit to suit the type of feed dispensers and the parlour size, and in the case of Auger-feeders, will have performed the initial calibration process.

When the "Fastfeed" is ready for operation, the top left hand corner of the display will show either "L1" or "R1". Slightly left of centre on the top line of the display, immediately below the word "Feed", there will be a flashing black rectangle which is commonly referred to as the cursor. The bottom line of the display will show "Enter feed". The letters "L" and "R" refer to the left and right hand side of the parlour. If the display shows "L1", then the Red LED above the left arrow will be switched on. Pressing the right arrow key will result in the LED above the left arrow being switched off, the LED above the right arrow switching on and the stall display now showing "R1". To switch back to the left hand side of the parlour simply press the left arrow.

Each cow entering the parlour can be fed between 0-15 units of feed simply by pressing the appropriate key on the keyboard. Say the first cow is to receive 5 units. Pressing the "5" key will result in the cursor alternately flashing between the number 5 and the black rectangle. The stall display will now have changed to "L2" indicating that the "Fastfeed" is ready to receive the feed amount for the cow in the second stall. Say this animal is to receive 14 units of feed. Pressing the "14" key results in the feed display showing the number 14 with the flashing black cursor over the number 1. The stall display now shows "L3"

indicating that "Fastfeed" is ready to receive the feed amount for the third stall.

On say an 8 a-side parlour, another 6 numbers have to be entered corresponding to the number of units of feed required for each of the remaining 6 animals. If for any reason there is an empty stall, then pressing the "0" key will ensure that no feed is dispensed to that stall.

As soon as the amount of feed has been entered for the last stall, the bottom line of the display will change to the message "Ready to feed?". If the operator is not certain about the amounts of feed he has entered, then he can restart the process by pressing the "X" key which is used to indicate a "No" answer. If he presses the "X" key then "Fastfeed" will go back to the beginning, stall display will show "L1" and the bottom line of the display will show "Enter feed".

If the operator is happy that he has entered the correct amounts of feed, he can initiate the feeding process by answering "Yes" and pressing the tick key. At this point the bottom line of the display will change to the words "Feeding" and the row of LED's above the main display will indicate the state of the feeders. For Pulse type feeders, the LED's will switch on and off to show that the feeders are being operated. In the case of Auger Feeders, the LED's will indicate when the Auger motors are running.

When all feed has been dispensed the stall display will change to "R1", the flashing cursor will appear in the feed display and the bottom line of the display will change to "Enter Feed". This indicates that "Fastfeed" has automatically switched over from the left to the right hand side and is ready to accept feed amounts for the right hand side. The operator can override this automatic side change by pressing the left and right arrow keys.

1.2 Batch mode of operation

There will be occasions when the operator will wish to feed the same number of units to each stall. This is very easily accomplished by pressing the "Batch" key. The stall display will now change to either "LB" or "RB" depending on which side of the parlour is being fed. To feed 3 units to each stall, simply press the "3" key. The bottom line of the display will now change to "Ready to feed ? ". If the feed amount is correct, then feeding can be initiated by pressing the "Yes" key .

Pressing the "No" key, will result in the display showing the message "Enter feed" and the flashing cursor will again appear in the feed portion of the display.

To revert to the normal mode of operation, simply press the "Batch" key again and the display will now return to either "R1" or "L1" depending on which side of the parlour is selected.

1.3 Cow Totalizer

Pressing the "Cow" key will result in the display showing the total number of cows milked since the counter was last reset. The bottom line of the display shows the message "Reset (Y/N)". If the operator wishes to leave the counter at its current value then he should press the "No" key. If the operator wishes to reset the counter then he should press the "Yes" key.

1.4 Feed Totalizer

In the same way, pressing the "Feed" key will indicate the total number of portions of feed dispensed since the counter was last reset. Again the operator has the option to leave the counter at its current value or to reset it to 0 either by pressing the "No" or the "Yes" keys.

1.5 Calibration Mode - Auger Type Feeders Only

Pressing the "Cal." key will result in the bottom line of the display changing to the message "Calibrate (Y/N)". Please note that this will only work if the "Fastfeed" has been set up for "Auger" type feeders. If the operator does not wish to proceed with the calibration, then he should press the "No" key. If he wishes to calibrate, then he should press the "Yes" key.

The bottom line of the display will now change to the message "Seconds/Portion". Auger type feeders vary dramatically in the rate which feed is dispensed. Some will take as little as 1 second to dispense 500 grams while others will require 25 seconds. The operator must be aware of the approximate running time of the auger to dispense the required portion size. Let us say for instance that a portion size of 500 grams is required and that this takes approximately 5

seconds. The operator now presses the 5 key. The display will change to a 5 with the flashing cursor immediately afterwards. If this has been entered correctly, then the operator can then proceed to the next stage by pressing the "Yes" key. If the number has been entered incorrectly then he can start again by pressing the "No" key.

As soon as the number of seconds per portion has been entered correctly, the bottom line of the display will change to the message "Enter Grams/Unit" and the centre portion of the top line display will show the default value of 500 grams. The default value can be entered by simply pressing the "Yes" key. If another value of grams per unit is required then this can be entered on the keyboard. Again if the amount entered is correct, the operator can proceed by pressing the "Yes" key. If the amount entered is incorrect then he can start again by pressing the "No" key.

Please note that the number of seconds per portion must be in the range of 1 to 30 seconds and the grams per portion can not exceed 599 grams. If the operator attempts to enter a value outside this range, the "Fastfeed" will flash up a message indicating that the amount is "Out of Range". It will then wait for a corrected value to be entered. When the number of seconds per portion and the number of grams per portion have been entered, the bottom line of the display will change to the message "Set Pot Central". At the bottom left hand corner of the control box is an adjusting potentiometer which can be used to compensate for changes in feed density, once the system has been calibrated. During calibration, this potentiometer should be set in its central position. This can be done by slackening the hexagonal nut, and turning the potentiometer fully anti-clockwise using a screwdriver. The potentiometer should now be turned precisely 3 full turns in a clockwise direction. The lock nut can now be tightened again. Please note that hand pressure only is required on this lock nut. Pressing the "Yes" key will now result in the bottom line of the display changing to the message "Calibrating.....". "Fastfeed" will now dispense 5 units of feed to each stall. If the seconds per portion have been set to, say, 5 seconds then the auger motors will be run for a period of 25 seconds (providing the adjusting potentiometer has been set correctly). In certain circumstances, particularly on larger parlours, the installing engineer may have selected the second auger mode of operation, which means that the feed dispensers will be operated in groups of 4. As soon as all the feeders have been operated, the bottom line of the display will change to the message "Enter weight" and the feed portion of the display will show the portion size selected x 5. The operator must now weigh the contents of each manger in turn and enter the feed amount using the

keyboard. If the portion size has been set to the maximum possible of 599 grams, the feed display will show 2995. If the actual amount of feed is say 2450 grams then this amount should be entered on the keyboard. When the amount has been entered correctly, the operator can proceed to the next stall by pressing the "Yes" key. If the amount is incorrect then the operator can start again by pressing the "No" key. The weight for each manger is entered in turn for the first side of the parlour.

Please note that the accuracy of the calibration depends on the accuracy of the original estimate of the running time per unit of feed required. If for instance, we have selected 500 grams per unit the Fastfeed will expect a weight of approximately 2500 grams. If the actual weights show a variation of more than say 20% i.e. are either below 2000 grams or above 3000 grams, then the calibration process will not be as accurate as possible, and the operator should recalculate the number of seconds per portion and restart the calibration process.

Let us assume that we originally set the "Fastfeed" for 5 seconds per portion and 500 grams per portion. If the estimate of the running time per unit has been accurate, then we would expect to be getting 2500 grams in each manger. If we are actually getting weights of, say, 5000 grams then the auger is obviously running for twice as long as is required and the calibration process should be started again using, say, 2 seconds per unit. If on the other hand the weights are of the order of 1250 grams, then the augers are obviously running for half as long as they need to and the calibration process should be repeated using 10 seconds per unit. The calibration process can be terminated at any time by switching off the power to the Fastfeed, waiting 10 seconds, and switching the power on again. The operator can then go into the calibrate mode again simply by pressing the "Cal." key. If the amount of feed in the manger is within 20% of the expected amount, then the actual amounts can be entered for each stall in turn. The operator can then go on to repeat the process for the second side of the parlour. As soon as the calibration process has been completed for the second side, the Fastfeed will revert to its normal mode of operation.

1.6 Changes of Feed Density

The semi-automatic calibration process, effectively allows "Fastfeed" to take into account variations between the feed dispensers. Once the calibration process has been completed the feeders should remain

accurate unless there is a change in the density of the concentrates being dispensed. When a new load of concentrates is received, it may not be necessary to go through the full calibration process. Minor variations can be corrected using the density control potentiometer. To perform the calibration, the operator should select "Batch" mode and feed say 5 units of feed to 1 side of the parlour. The contents of several mangers should now be weighed. If there is a considerable variation from 1 manger to the next, then the whole calibration procedure should be followed as outlined above. If, however the weights in the mangers are very similar but are either all high or all low, minor variations can be corrected using the potentiometer. Turning the potentiometer in a clockwise direction will increase the amount of feed dispensed, and conversely, turning in an anti-clockwise direction will reduce the amount of feed dispensed. Please note that the lock nut should be slackened by hand prior to any adjustment, and once the adjustment is complete, the lock nut should be tightened up again, by hand.

1.7 Power Supply Considerations

"Fastfeed" has been designed to be as immune as possible to the affects of surges on the mains supply. However, during severe electrical storms, transients may cause the units to "Lock up". The display will appear to freeze and pressing the keys will have no effect. The unit can be reset simply by switching off the power for approximately 10 seconds and switching it back on again.

Please note that "Fastfeed" has a small rechargeable battery which is used to retain vital information during power cuts. To ensure that this battery is kept charged, the "Fastfeed" should always be left switched on. This also generates gentle heat within the control box which helps to ensure that the electronics is kept dry.

1.8 Emergency Standby

In the event of a fault in the "Fastfeed" control box, a manual standby system is provided. To use the standby, the operator should first switch off the power, remove the lid of the unit and disconnect it from the base. Two connections require removal, These are a 3-pin plug which is orange in colour, and a black connector which plugs into the relay card at the back of the unit. To remove this connector, the ejector clips at each end of the connector should be moved outwards. The connector will then "pop" out. The manual standby has a grey ribbon cable fitted with a similar plug. Please note that this connector is polarised and will

only fit one way. One side of the connector has a small bump which locates in a slot on the mating connector on the relay panel. The feeders can now be operated by selecting the side of the parlour using the toggle switch, selecting the stall using the 12 position rotary switch and pressing the feed button.

To refit the control box lid, the ribbon cable to the manual standby must first be removed by moving the ejector clips on each end in and outward direction. The ribbon cable from the lid can now be plugged into the connector. This process should obviously be performed with the power to the unit switched off. The orange plug can now be reconnected to the lid. Please note that this plug is also polarised. Careful examination of the plug will show that one side is flat and the other side is made up of 3 curves. Examination of the mating connector in the lid will show that it has a similar shape. Please note that forcing this plug into the socket the wrong way around will cause severe damage to the "Fastfeed".

2.0 ROUTINE MAINTENANCE AND SERVICE

The "Fastfeed" is housed in a strong, waterproof enclosure. It must be noted however, that this enclosure is not suitable for washing with a high pressure hose. Any cleaning required should be done using luke warm soapy water and a soft cloth. Direct blows to the front of the unit should be avoided and sharp objects should not be allowed to come in contact with the waterproof membrane.

"Fastfeed" is fitted with devices which are designed to minimise the effect of electrical interference. No devices are available which will protect against violent transients such as are caused by thunder storms. During a thunder storm it is recommended that the system power unit is disconnected from the mains supply.

The waterproof membrane which is the front label of the "Fastfeed" should be checked at regular intervals to ensure that it is not damaged. If the membrane has been accidentally punctured, then your installing agent should be contacted as soon as possible in order that a replacement label can be fitted. In most cases this should be a simple matter of peeling away the old label and fixing on a new one. If the membrane remains punctured for a long period of time water may get into the box and may cause long term and expensive damage to the unit.

3.0 PRODUCT SPECIFICATION

3.1 "Fastfeed" is a simple yet versatile controller which allows the operator to select rations from 0 - 15 units for each stall, at the press of a single key. A "Batch" mode is also available which allows ultra-fast setting of the same amount of feed for each stall. The controller automatically switches to select right or left (manual over-ride is available), and is therefore suitable for herring-bone parlours up to twelve a side.

The equipment comprises of four main working parts:-

a) The electronics card which is located in the lid of the unit.
b) The output relay card which is located at the rear of the unit.
c) A voltage regulator which is located in the right hand side of the base.
d) A manual standby system which is located in the left hand side of the base.

Interconnection between the lid and the base is via a ribbon cable, and the interconnection between the lid and the regulator is via a three pin plug. This means that the lid is easily detachable from the base, for instance, during installation. All external connections are made to the output relay card. The manual standby system is only connected to the base when required.

3.2 There is a large variety of feed dispensers available, some operated by vacuum and others having a small "Auger" powered by an electric motor. Some feed dispensers require 12 volts D.C. and others require 24 volts D.C.. "Fastfeed" is designed to cope with as many of these variations as possible. The basic unit is fitted with an output relay card suitable for 12 volt D.C. operation. However, a 24 volt D.C. card is available upon request, at no extra charge. The electronics card will function at either voltage and is therefore completely interchangeable.

The electronics card has a "Parlour size" switch which must be set to the correct value. For a 16/16 parlour, the switch should be set to "8" i.e. the switch setting represents the number of feeders on each side of the parlour. Three additional controls are available which enhance the overall versatility of the unit.

3.3 The first of these is a switch which allows the installing engineer to select either "Pulse", "Auger1", "Auger2" or "Feedback" type feed dispensers. In "Pulse" mode, the controller will send pulses of voltage to the dispenser to switch a solenoid on and off. Each time the solenoid is switched on and off again, the dispenser will dispense one unit of feed. In "Auger1" mode, the controller will send voltage to the dispenser for a time interval proportional to the number of units of feed, all the feeders on each side of the parlour being operated at the same time. In "Auger2" mode, the feeders are operated in groups of four. This option is useful on larger plants to reduce the size of the power unit required. In "Feedback" mode, the controller will send voltage to the dispenser until it receives a signal via a special terminal card, which tells it that the correct amount of food is in the weighing tray. As soon as this signal is received, the driving voltage is switched off and remains off until the feedback signal indicates that the tray is empty again. If further units of feed need to be dispensed, then the driving voltage is switched on again and the process repeats until the correct number of units of feed have been dispensed.

3.4 The second control is a "X1-X2-X4" switch which in effect gives a coarse calibration. Most "Pulse" type feed dispensers are set to dispense 1 lb. or 0.5 kg of feed. Some dispensers however will only deliver a quarter or a half of this amount at each operation and some method is required of increasing the number of times the dispenser is operated, in order to dispense reasonable amounts of feed. When the "X1-X2-X4" switch is in the "X1" position, and the cow in stall L1 is programmed for five units of feed, the "Fastfeed" will send five pulses to the feed dispenser. If the "X1-X2-X4" switch is in the "X2" position, then the "Fastfeed" would send ten pulses to the feed dispenser. In exactly the same way selecting "X4" will give twenty pulses. Where "Auger" type feed dispensers are being controlled, the "X1-X2-X4" switch has no effect.

3.5 The third control is a "Speed" potentiometer which allows the installing engineer to vary the feeding rate. Some "Pulse" type dispensers are much slower in operation than others and the speed control allows the "Fastfeed" to be set up to cope with any such variations. In the case of "Auger" type dispensers, the amount of feed dispensed is directly proportional to the running time and the "Speed" control is therefore necessary for fine adjustment to compensate for variation in feed density. In either "auger" mode, "Fastfeed" has a semi-

automatic calibration facility. Please refer to the section entitled "Operating instructions" for further details.

3.6 Where a "Fastfeed" is required to replace an existing controller, a new power unit may not be required. As outlined above, the electronics card will function at D.C. voltages in the range of 12 to 24 volts. Please note that if the power unit 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 and the solenoids can usually be operated from the same power supply providing suppresors have been fitted in accordance with the schematic diagrams at the end of this manual. Fastfeed will operate the solenoids so that all even stalls are operated together, and all odd stalls are operated together. Thus on an 8-a-side parlour, with all feeders dispensing feed, the maximum number of solenoids switched on at any time is four. If each of these is rated at 0.75 amps, the maximum load is 3 amps. Allowing 1 amp for the Fastfeed itself, the power unit must therefore be rated at 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. power unit to supply the Fastfeed, and a separate power unit 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. If each motor is rated at 3 amps, on an 8-a-side parlour, the power unit needs to be rated at 24 amps in "Auger1" mode. In "Auger2" mode, only 4 motors will operate at once and the capacity then needs to be 12 amps. To ensure accuracy of feeding, the auger power supply should have a regulated output. For 12 volt motors, a Davlec PU2 can be used. This has a 12 volt 25 amp capability. It also has an unregulated output which can be used in place of the separate 2 amp supply. For further information, see section 8 and the schematic diagrams at the end of this manual.

4.0 INSTALLATION AND CALIBRATION

4.1 The "Fastfeed" is normally installed on the bridge arm at the cow entry end of the parlour. In certain circumstances, the customer may have special requirements regarding the siting of the unit. "Fastfeed" is housed in a strong, waterproof enclosure. The waterproofing of this enclosure is however, only as good as the arrangements that are made to connect conduit to it. 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. 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. It is impossible for a compression gland to provide a waterproof seal around two individual wires. In the very rare and extreme cases where it is necessary to drill the top of the box, then all the conduit joints must be adequately sealed together with any inspection elbows or tees above the control box. A little care during this part of the installation process will pay dividends in terms of the long term reliability of the control box.

4.2 During the installation process, the lid of the control box may be detached from the output relay panel and taken to a safe place. 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 5 amps, a considerably larger cable may be required. It is advisable to follow the manufacturers recommendations on these cable sizes.

4.3 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 "Fastfeed" 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.

4.4 The individual feeders may then be connected to their respective output terminals which are labelled quite clearly on the output relay card. The "Fastfeed" follows the conventional numbering system where stall "Left 1" is the stall furthest away from the operator on the left hand side of the parlour, as viewed from the cow entry end of the parlour. In the case of "Pulse" type dispensers where the solenoid current is less than 1 amp, then 1 mm square cable is perfectly adequate. In the case of "Auger" type feed dispensers then the conductor needs to be larger. Again the manufacturers specification should be followed.

4.5 The output relay card is fitted with a 3 amp fuse which protects the control box only. The installing engineer should ensure that the power unit has its own adequate means of protection. The manufacturers of most types of "Auger" type dispensers recommend that each dispenser is fused individually and in-line fuse holders should be used for this purpose. "Auger" motors are also notoriously noisy especially when they are more than a few years old and your "Fastfeed" is supplied with suppressors to control this interference. These suppressors should be fitted across the motor terminal or as close as practically possible. Fitting the suppressors inside the "Fastfeed" control box will not give adequate suppression of interference. In any case, suppressors are already fitted on the output relay card to protect the relay contacts. The suppression

devices supplied are diodes and should be connected so that the white band around one end is to the positive terminal of the motor.

4.6 For auger type feeders, it is recommended that a seperate power supply is used for the Fastfeed itself - see section 3.6. In this case, the negative terminals of the motors should be connected to the motor power unit as outlined above. The positive motor terminals should also be to connected to the relay card with fuses and suppressors as outlined above. In this case however, the connection from the positive terminal of the motor power supply 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 power unit positive be connected to the terminal immediately above the fuse holder since this connects to the fuse itself. The second power unit can now be connected to the terminals marked "+" and "-". No connection should be made to the terminals marked "E". The voltage requirements of this second power unit will depend on whether a 12 or a 24volt relay card is being used. The output must be D.C. and must not exceed 18 volts r.m.s. or a peak value of 24 volts as detailed in section 3.6.

Where a Davlec PU2, 12 volt regulated power supply is in use on auger type feeders, it is recommended that the unregulated output is used to power the control box itself. The link on the relay card is removed, and the regulated output connected to one of the terminals marked "Feeder Power Supply" . The unregulated supply and the negative output are connected to the "+" and "-" terminals respectively, on the relay card. Schematic diagrams of all types of installation are given in the back of this manual.

4.7 Before any attempt is made to fit the "Fastfeed" lid, or to switch on the power supply, the installing engineer should ensure that the polarity of the supply is correct and that the unit is being supplied from a D.C. source. In situations where existing control boxes are being replaced, and the existing power supply retained, then the installing engineer should ensure that a rectifier is fitted to the power supply where necessary. Some types of feed dispensers may have the rectifier built into the individual control box and in these cases the existing power unit may have an A.C. output. A suitable rectifier will be supplied free of charge upon request. Please note that the rectifier must be fitted to a large metal surface to give the necessary heat dissipation.

Please note that both cables to the lid are polarised. Please refer to section 1.8 of this manual for further information.

4.8 The installing engineer must also make sure that the unit he is fitting is suitable for the supply voltage from the power supply. The "Fastfeed" lid will operate at any voltage between 12 and 24 volts 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 2810990A and the part number for a 24 volt output relay panel is 2810990B.

4.9 The "Fastfeed" lid may now be reconnected to the output relay panel. Please note that the re-chargeable battery must be switched on before power is applied to the unit. The installing engineer should now set the switches on the "Fastfeed" lid to select "Pulse" or "Auger" type dispensers and "X1", "X2" or "X4" mode of operation. For "Pulse" type feeders, in most cases the factory setting of the output "Speed" will be suitable. In some cases however, where the feeder operates very slowly, then the "Speed" control potentiometer should be turned in a clockwise direction to increase the duration of the output pulse. In all cases the calibration of the feed dispenser should be checked by using the controller to dispense say five units of feed and weighing the amount of food dispensed. If the unit is set in "X1" mode and the quantity of food dispensed is insufficient and the feed dispenser cannot be calibrated to give the correct amount, then the "X1-X2-X4" switch can be moved to the "X2" position so that two pulses are given for each unit of feed programmed. In this case obviously the feed dispenser must be calibrated to give half the desired amount per unit programmed. Please note that "Fastfeed" only reads the bit switches and parlour size switch when power is switched on. All adjustments to these three controls should therefore be made with the power switched off.

4.10 In the case of "Auger" type feed dispensers, the "Speed" control potentiometer will vary all the outputs simultaneously and can therefore be used as an overall density calibration. In order to ensure that variations in dispensing rates are catered for, "Fastfeed" has a semi-automatic calibration system. The operation of this facility is fully described the section labelled "Operating Instructions". Please note that a "Fastfeed" which is powered up for the first time, can not be used until it has been calibrated. The calibration values are stored by the micro-processor and will be retained during an interruption of the supply voltage, by the rechargeable battery fitted to the circuit board in the lid - provided of course that the battery is in a charged condition.