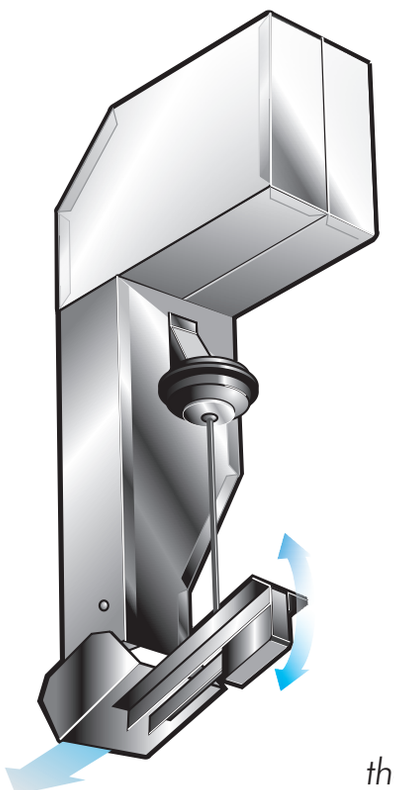
FEEDER FOR ROTARY PARLOURS INSTALLATION

Version - March 2010



For Feeding using the Digital Control Only

Part Number - 39-0330

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GOOD PRACTICE: Mains Supply.

- A separate mains supply and earth running directly from the consumer meter is essential.

- Avoid routing the mains cable to the power supply close to other supplies especially those providing intermittent current- motors that are starting and stopping continually or high power heaters with thermostatic control.

- Terminate in a sealed, fused, double pole switched outlet fitted with a 13Amp (Type 1362) fuse or trip. A 3-pin ring main socket is not suitable in parlour conditions. All mains cabling must be contained in a firmly secured durable conduit.

Power Supply: Siting.

- Fix the power supply to a wall or suitable brackets in a well ventilated area sufficiently high to avoid physical contact or damage, leaving a gap of at least 250mm (10") between the top of the power supply casing and the ceiling.

- Position the power supply so that the output (low DC voltage) cables are as short as possible even if this means extending the mains supply.

ATL Power Supply: Output Voltages.

- ATL power supply outputs are factory set and should not be adjusted. The DC output is set to:

Feeder Supply: 13.6volts.

- The feeder supply is electronically fused at 33Amps.

- There are two indicators fitted to the base of the power supply casing; red indicates that the mains is present and green that the regulated feeder supply is available.

Control and Feeder Cables and Conduit.

- Cables must be kept as short as possible running directly from point to point. Cut out any excess cable rather than leaving it coiled.

- Wherever possible cables should be contained in a waterproof conduit using the correct csa cable specified in the diagrams.

- Entries must be made into the bottom of power supply or control casings. Entries in the top will invalidate the warranty.

- Strip existing cables back to bright copper before connection.

- Keep multicore cables away from other cables especially those carrying mains or heavy currents. Cross only at 90° where necessary and do not enclose in conduit with other cables.

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FEEDER FOR ROTARY PARLOURS INSTALLATION: **1**

About the Dump Box Feeder

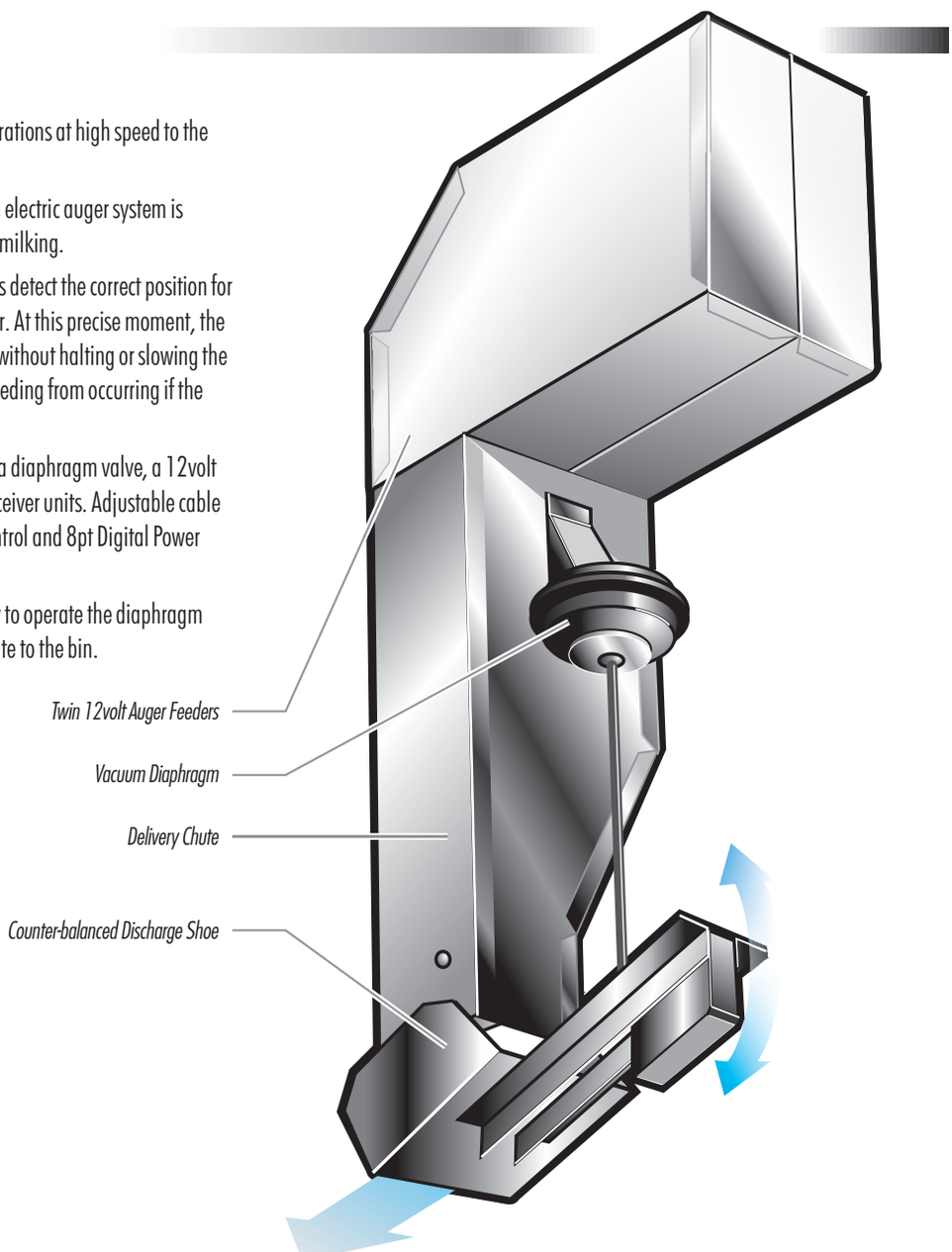
This compact feeder uses a 'dump' principle to deliver rations at high speed to the centre of mangers fitted to rotary parlours.

A large feed bin is provided for concentrate storage. An electric auger system is recommended to deliver concentrate to the bin during milking.

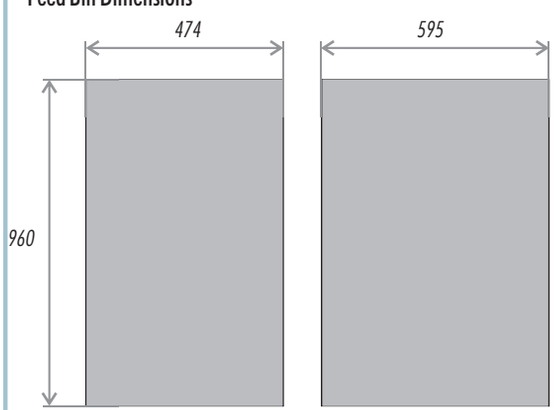
Twin electric feeders fill a dump box and optical sensors detect the correct position for the ration to be 'dumped' into the centre of the manger. At this precise moment, the diaphragm valve opens a flap and 'dumps' the ration without halting or slowing the rotary table / platform. The Digital Control prevents feeding from occurring if the table reverses for any reason.

The kit of parts includes the dump box feeder and bin, a diaphragm valve, a 12volt DC vacuum solenoid valve and Omron transmitter / receiver units. Adjustable cable suspension is supplied for the bin. A Digital Feeder Control and 8pt Digital Power Supply Unit are also required.

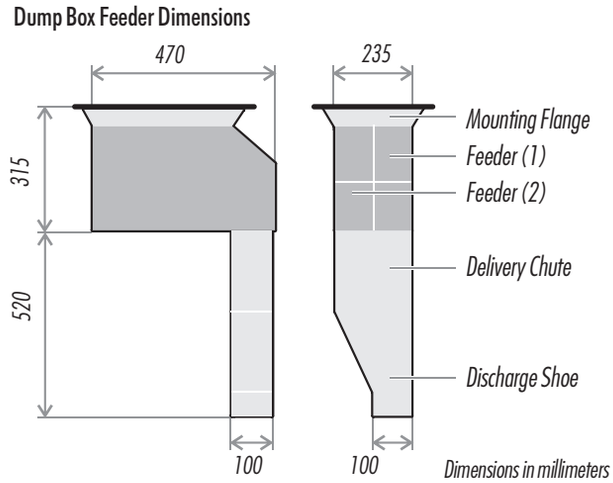
Not supplied and required on site are a vacuum supply to operate the diaphragm valve and an electric auger system to deliver concentrate to the bin.



Feed Bin Dimensions



Dump Box Feeder Dimensions



Dimensions in millimeters

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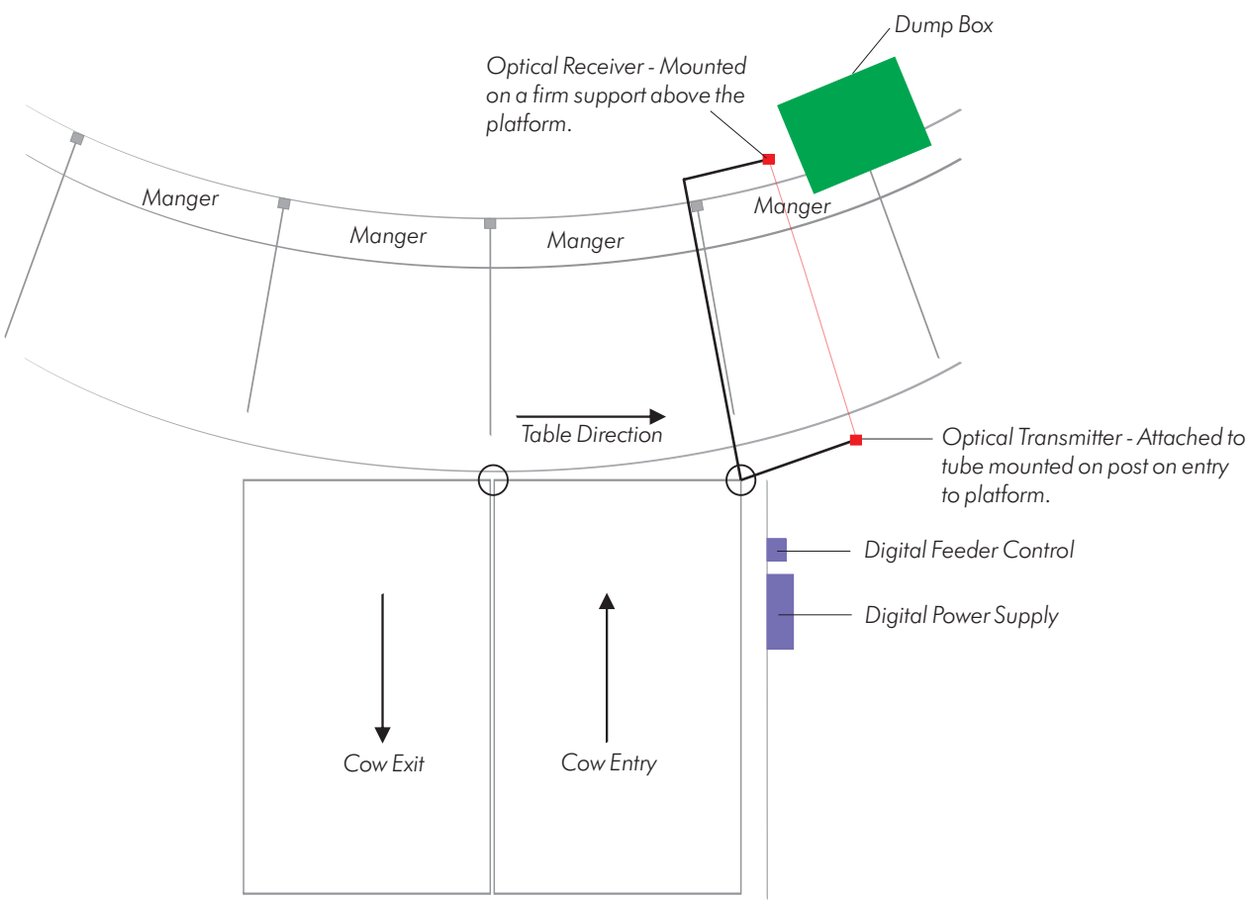
System Layout

The diagram below illustrates the positioning of Dump Box Feeder on a rotary parlour:

Please Note: For Systems with Rotary ID please consult ATL for positioning guidelines.



Notes on Installation

Please read the following information. Not doing so may involve expensive re-adjustment to ensure the system works as intended.

The objective of the Dump Box is to enable rations of up to 5kg to be placed accurately in the mangers of a rotary parlour.

To achieve this accuracy, optical sensors are used to open the Dump Box outlet flap at the correct position above the manger as the table rotates. Ideally the outlet flap should start to open when the outlet flap is about a third of the way across the manger. This will then allow adequate time for the ration to be dumped within the manger. Any later and part of the ration may be fed to the wrong cow in the adjacent manger.

Do not mount the parts of the sensor on vertical posts, horizontal adjustment is essential. Ideally both parts of the optical sensor should be mounted on horizontal tubes at least 750mm long to allow adequate adjustment for the correct alignment of the outlet flap over the manger.

To test that the flap is opening at the correct position, the control unit must be set up correctly. The instructions for this are included later in this manual.

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Installation of the Dump Box Feeder

To achieve the correct operation, the dump box feeder must be installed in the correct position relative to the entry stall.

The dump box feeder MUST NOT be welded onto a fixed framework, it will need to be adjusted to obtain the correct position after installation.

The dump box feeder should be suspended about half a bail after the bail where cows enter onto the platform.

Ideally it should be suspended from the roof joists so that it can be adjusted to achieve the ideal position relative to the mangers.

Stainless steel wire and various fixings are provided to suspend the bin and dump box.

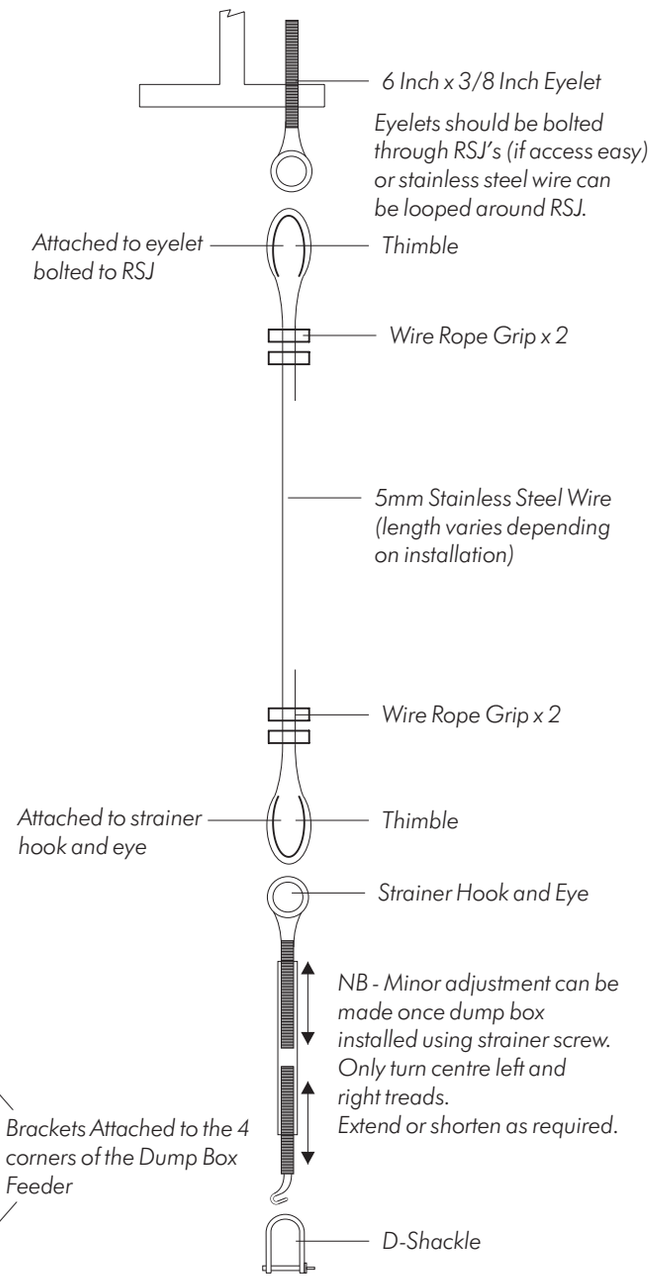
The outlet flap should be positioned as far away from the cows as possible. Ideally the feed should be fed onto the front sloping panel of the mangers so that it flows down into the manger without spreading into the adjacent stalls. Height and distance forward are the best methods of preventing access to the outlet flap by the cows.

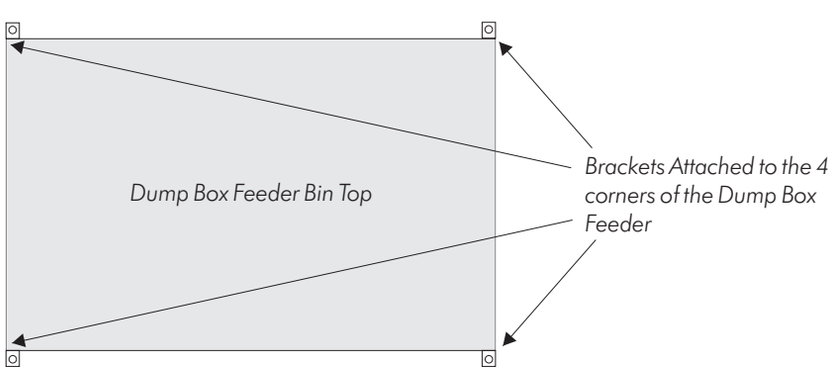
The following items are supplied with each dump box feeder in order to attach it to the roof joists.

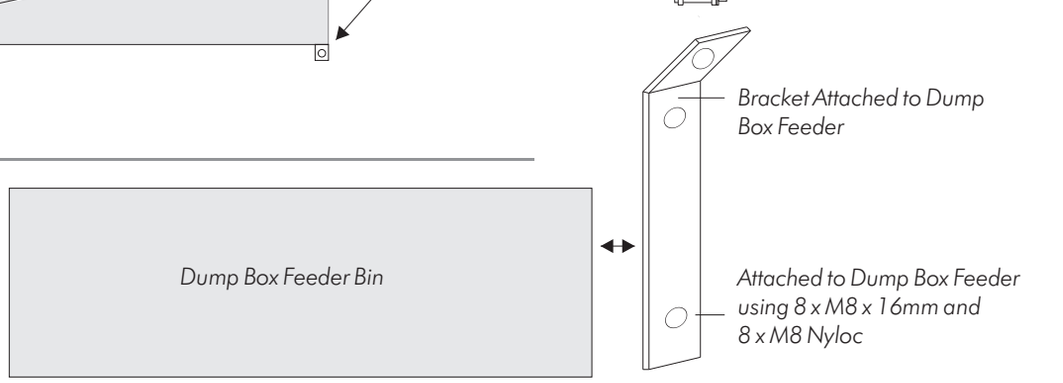
- 50 metres of 5mm diameter stainless steel wire (to be cut into 4 lengths);
- 16 x wire rope grips (4 per cable);
- 8 x 5mm thimbles (2 per cable);
- 4 x strainer hook and eyes(1 per cable);
- 4 x D-Shackles (1 per cable);
- 4 x Eyelet nut and washer (1 per cable).

Attaching the Dump Box to the Roof Support Joists (RSJ's)

The diagram below shows the parts required to attached the dump box feeder to the roofing joists. It should be noted that 4 such cable assemblies are required to safely anchor each corner of the dump box feeder.







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Installation of the Optical Sensors

The optical sensor consists of a transmitter (10L-G) and receiver (10DM4T-G). These determine the position the cake is dumped relative to the manger. Ideally it should be dumped in the centre of the manger so that there is no danger of the cake being fed to the wrong cow.

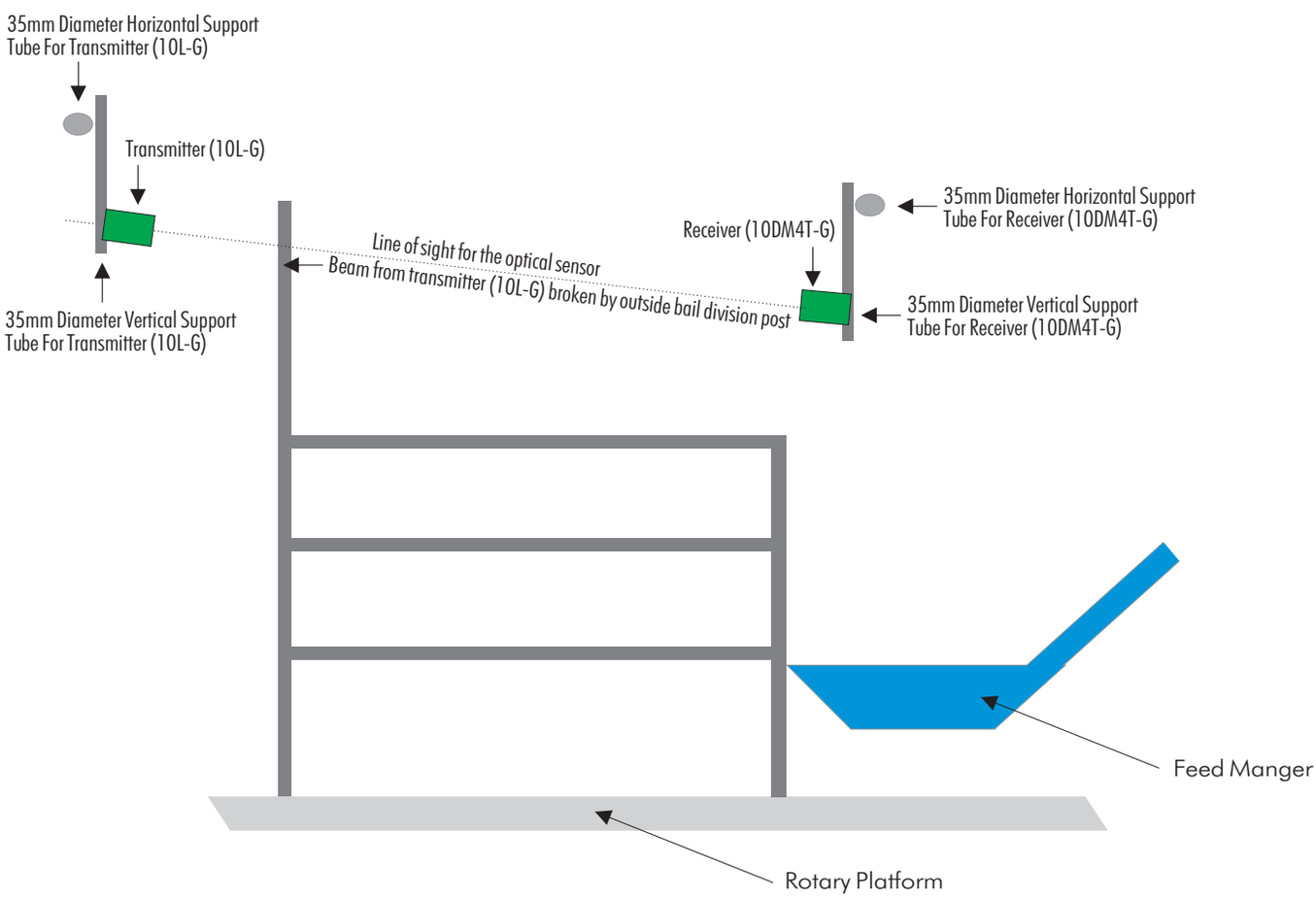
Both the emitter and sensor must be mounted so that there is plenty of adjustment both vertically and horizontally. The objective is to dump feed into the centre of the correct manger. They should be mounted onto firm structures in order to prevent movement which can cause incorrect operation of the flap.

Ideally the transmitter (10L-G) should be mounted outside the outer edge of the table on a horizontal tube (at least 750mm long) which can also be adjusted vertically, so that the upright of the bail division breaks the beam.

The receiver (10DM4T-G) should be mounted above the inner side of the table, opposite the transmitter. Ideally it should be mounted on a firm structure which cannot move if the dump box feeder is disturbed by the cows. It must be mounted so that there is at least 750mm adjustment to allow for the dump box feeder outlet to be located over the centre of the manger when it opens. There should also be enough vertical adjustment to enable the beam to be broken by the upright of the bail divisions, ensure alignment with the transmitter and to dump the feed in the correct position in the manger.

Both the transmitter (10L-G) and the receiver (10DM4T-G) should be positioned so that the beam is well above the back of the cows and only broken once by the upright or ACR of each bail divisions. It is important to make sure that there are no other obstructions such as vacuum pipes or tubes which can break the beam and cause the flap to be opened at the wrong time. If this occurs the flap may be closed when feed is being dispensed which can lead to feed being trapped between the flap and the outlet. This prevents the outlet closing correctly and therefore feed is able to dribble across the manger divisions.

The transmitter (10L-G) and receiver (10DM4T-G) operate with a powerful but narrow beam which can operate over a distance of about 5m. For reliable operation, the transmitter and receiver must be aligned accurately.



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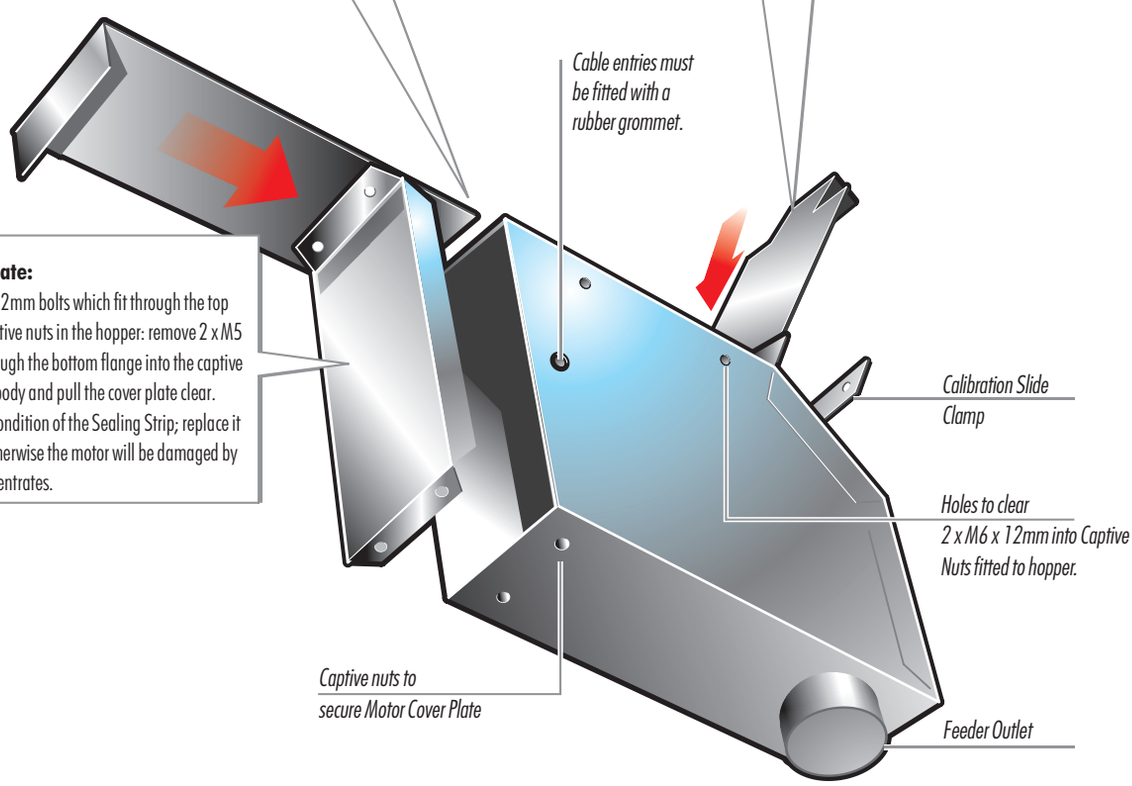
The ATL 12volt DC Electric Timed Feeder

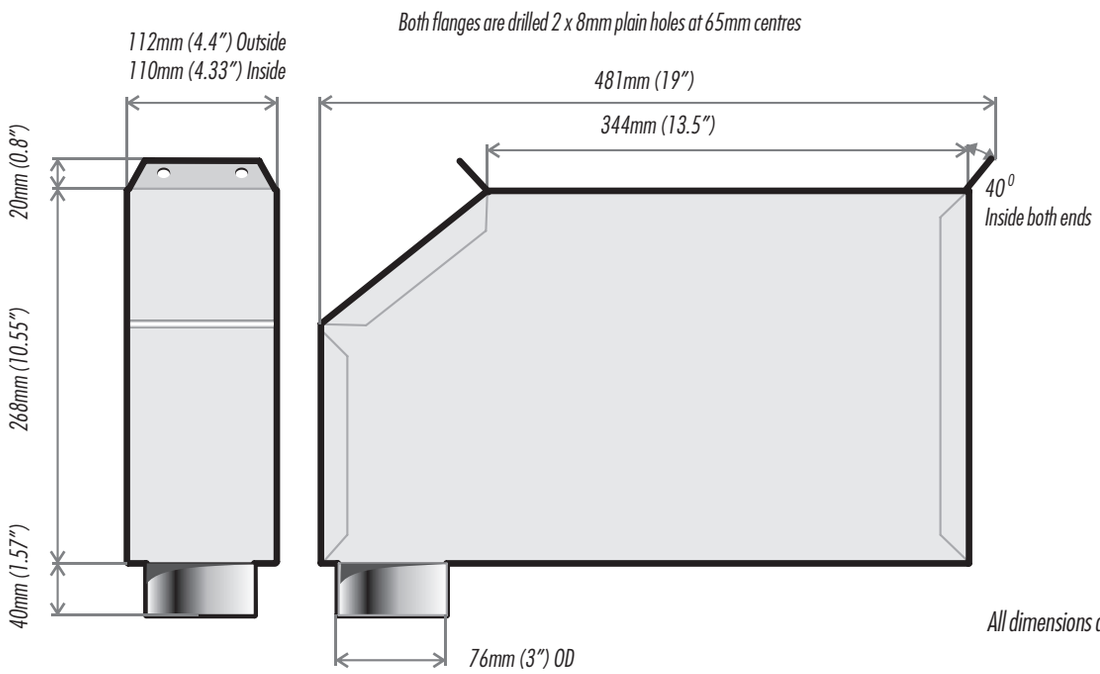
Cut Off Slide:
Prevents cake spilling out of the hopper when the feeder is removed. Remove the Motor Cover Plate and fit the Cut Off Slide into the narrow slit above the motor compartment and below the hopper flange. Keep the slide horizontal so that it rests upon the two rivets at the rear of the feeder body and the captive nuts at the front. With the slide in position the feeder may be removed from the hopper.

The Calibration Slide:
Used to 'adjust' the flow of cake to the auger to ensure both the feeders deliver the same ration in a given time, the Calibration Slide fits into the narrow slot between the hopper mounting flange and the feeder end and MUST rest upon the fixing rivet.. The Clamping Plate and 2 x M6 x 12mm stainless steel bolts lock the slide in position when calibration is complete. The slide is factory fitted to the feeder.

Motor Cover Plate:
Remove 2 x M6 x 12mm bolts which fit through the top flange into the captive nuts in the hopper: remove 2 x M5 x 10mm fitted through the bottom flange into the captive nuts in the feeder body and pull the cover plate clear.

Check the condition of the Sealing Strip; replace it if it is damaged otherwise the motor will be damaged by dust from the concentrates.





All dimensions are nominal.

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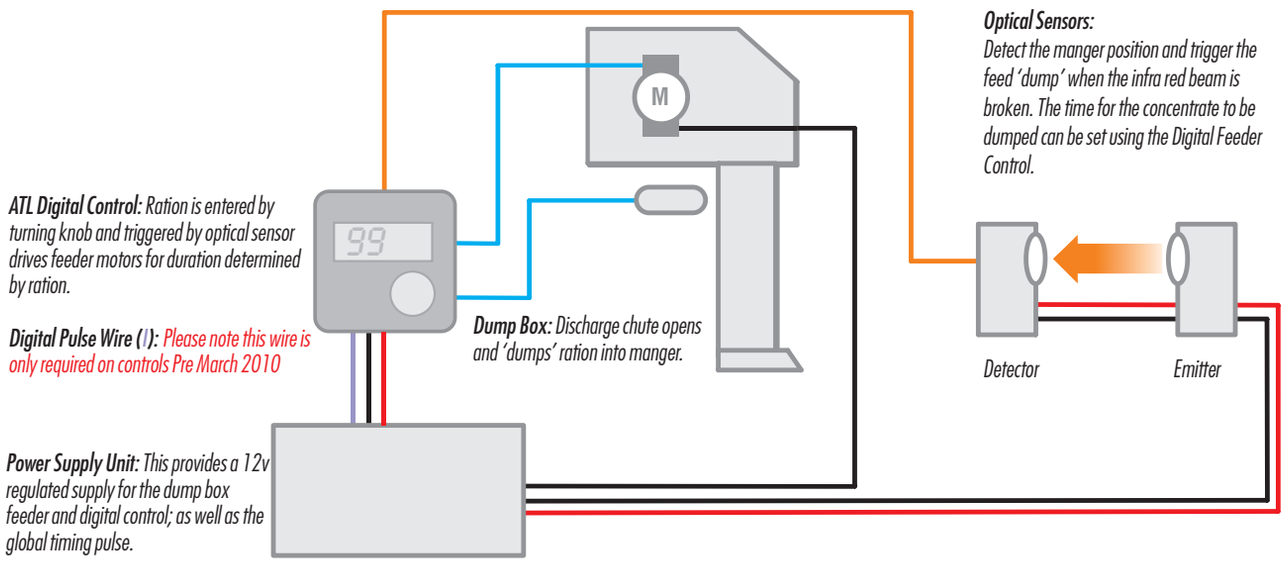
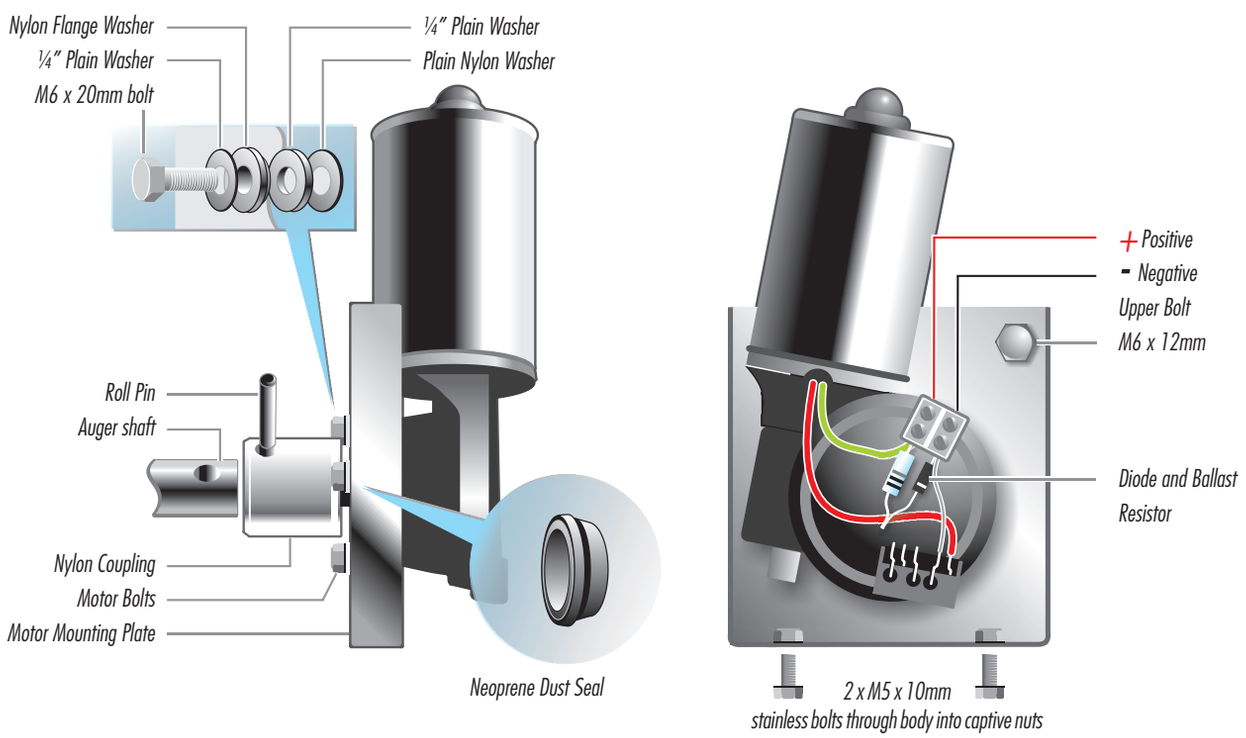
Rotary Parlour Dump Box Feeder System Wiring Overview: Variable 'Dial-up' Ration using ATL Digital Control programmed as 'Return to Ration' : Post February 2009



ATL Standard 12volt DC Feeder Motor Connections, Mounting Plate and Coupling details.



FEEDER FOR ROTARY PARLOURS INSTALLATION: **7A**

Feed Inhibit on Table / Platform Reverse and Omron E3JMIR Sensor Wiring: Post February 2009

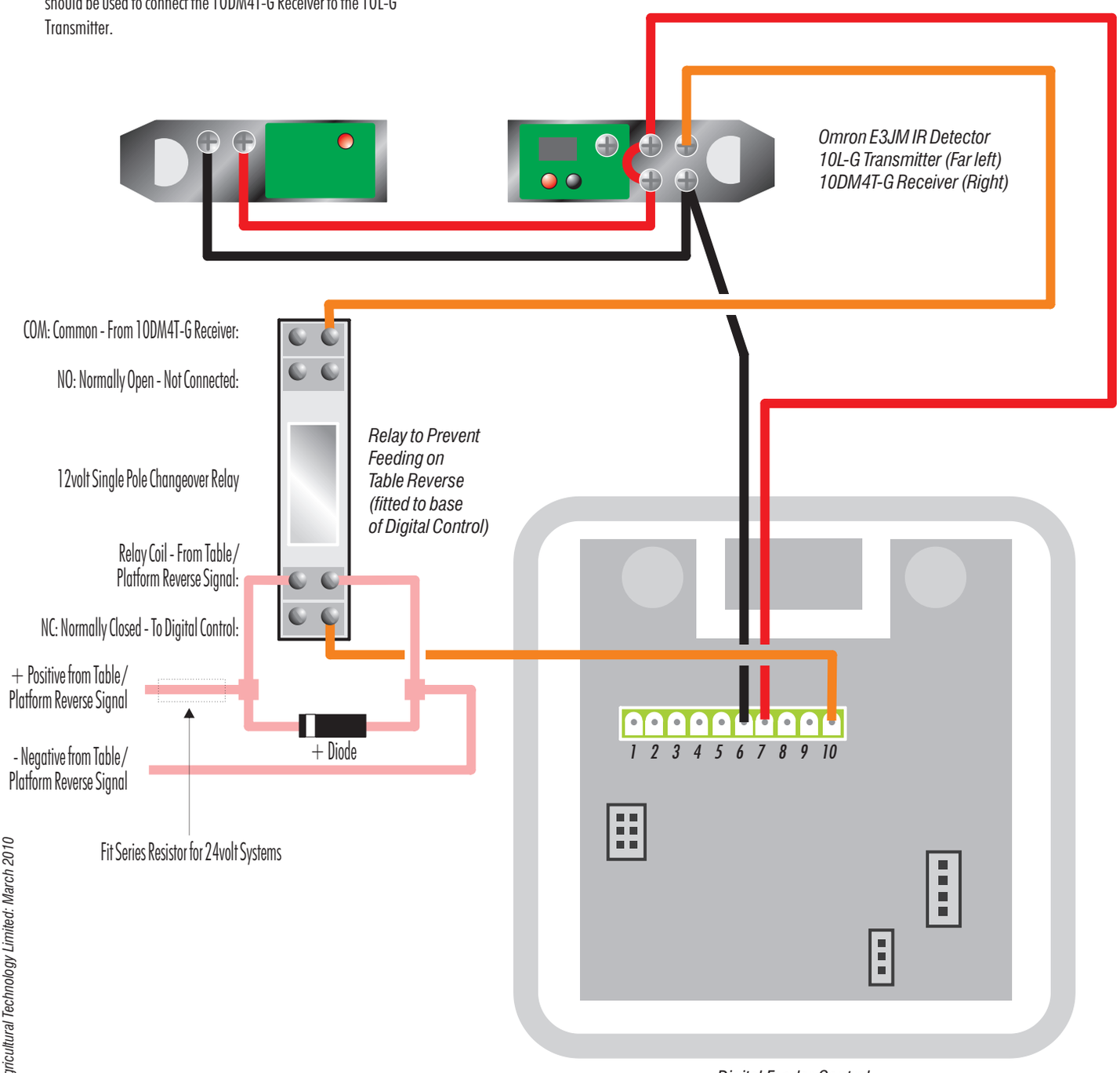
IMPORTANT - WIRING FOR INHIBIT WHEN REVERSE SIGNAL 'HIGH'

NB - This wiring inhibits the Digital Control from feeding when the table / platform is reversing.

IMPORTANT - A 3-core 3A cable should be used to connect the Digital Control to the 10DM4T-G Receiver and 2-core 3A cable should be used to connect the 10DM4T-G Receiver to the 10L-G Transmitter.

Wire Colour Coding:

- *+13.6v DC Regulated*
- *Negative DC Regulated*
- *Trigger (+) going from IR Sensor*
- *Table / Platform Reverse Signal*



FEEDER FOR ROTARY PARLOURS INSTALLATION: **7B**

Feed Inhibit on Table / Platform Reverse and Omron E3JMIR Sensor Wiring: Post February 2009

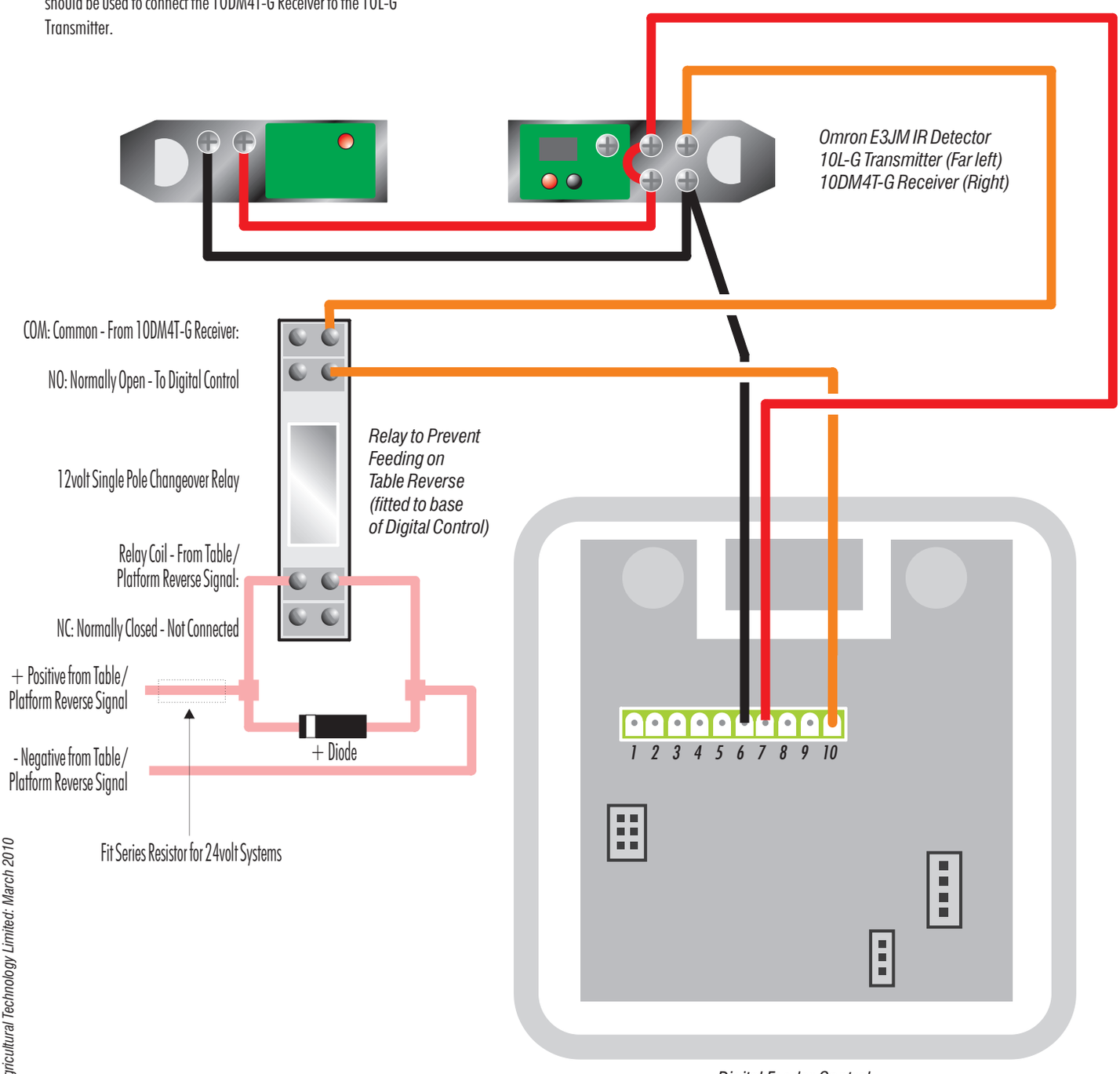
IMPORTANT - WIRING FOR INHIBIT WHEN REVERSE SIGNAL 'LOW'

NB - This wiring inhibits the Digital Control from feeding when the table / platform is reversing.

IMPORTANT - A 3-core 3A cable should be used to connect the Digital Control to the 10DM4T-G Receiver and 2-core 3A cable should be used to connect the 10DM4T-G Receiver to the 10L-G Transmitter.

Wire Colour Coding:

- *+13.6v DC Regulated*
- *Negative DC Regulated*
- *Trigger (+) going from IR Sensor*
- *Table / Platform Reverse Signal*



FEEDER FOR ROTARY PARLOURS INSTALLATION: **7C**

Feed Inhibit on Table / Platform Reverse and Omron E3JMIR Sensor Wiring: Post February 2010

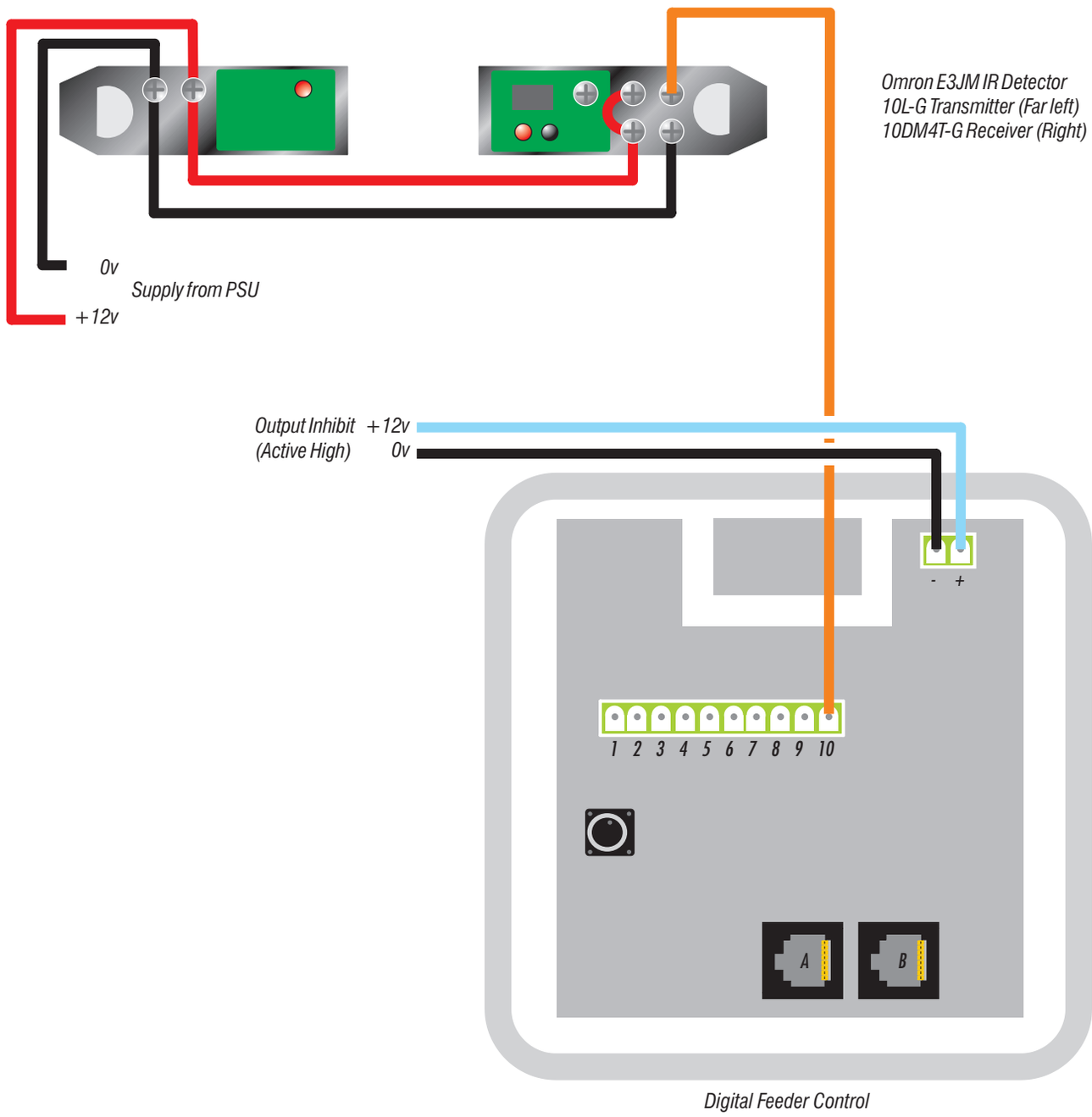
IMPORTANT - WIRING FOR OUTPUT INHIBIT

NB - This wiring inhibits the Digital Control from feeding when the table / platform is reversing.

IMPORTANT - A 3-core 3A cable should be used to connect the Digital Control to the 10DM4T-G Receiver and 2-core 3A cable should be used to connect the 10DM4T-G Receiver to the 10L-G Transmitter.

Wire Colour Coding:

- *+13.6v DC Regulated*
- *Negative DC Regulated*
- *Trigger (+) going from IR Sensor*
- *Table / Platform Reverse Signal*



Digital Feeder Control

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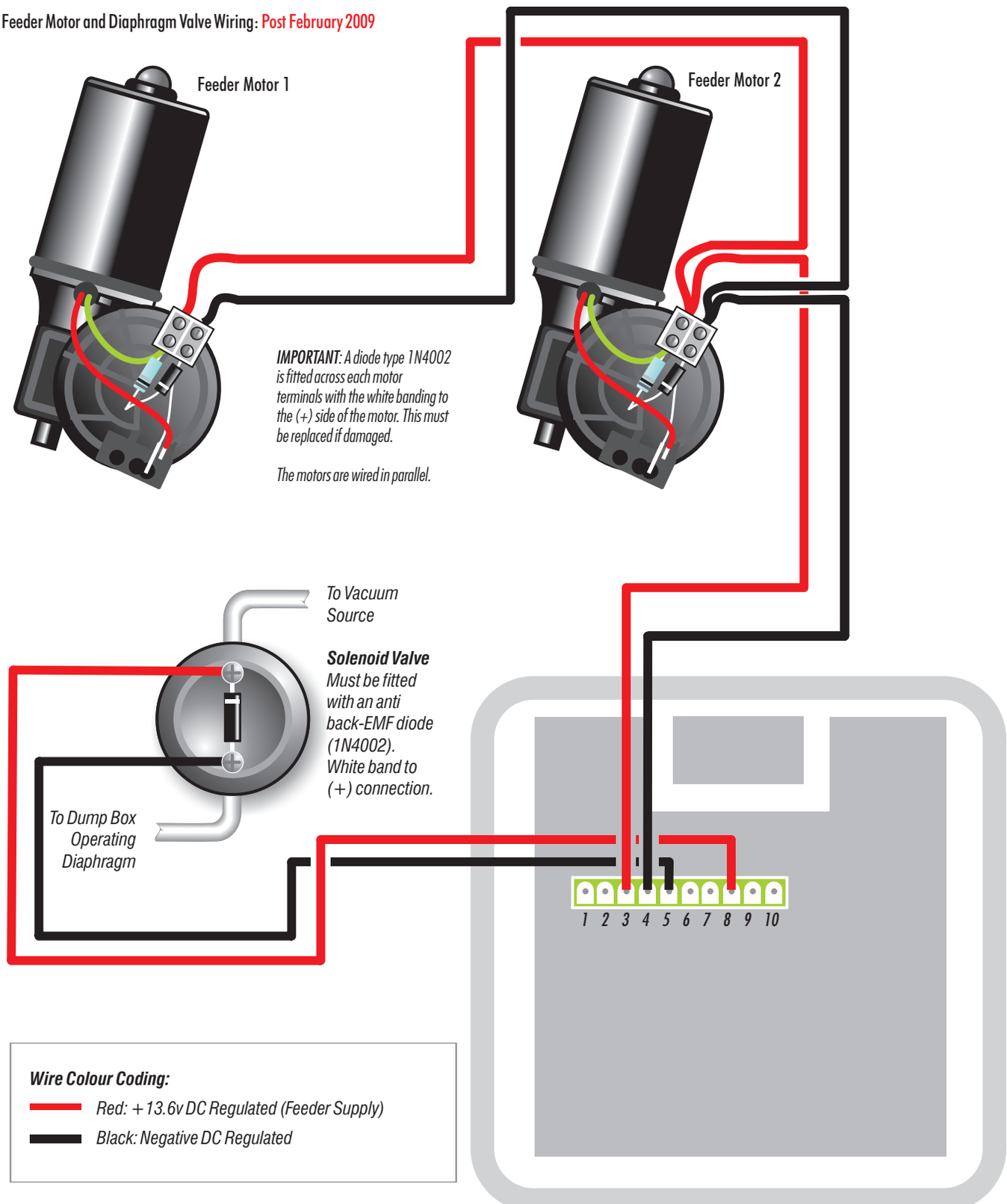
Feeder Motor and Diaphragm Valve Wiring: Post February 2009



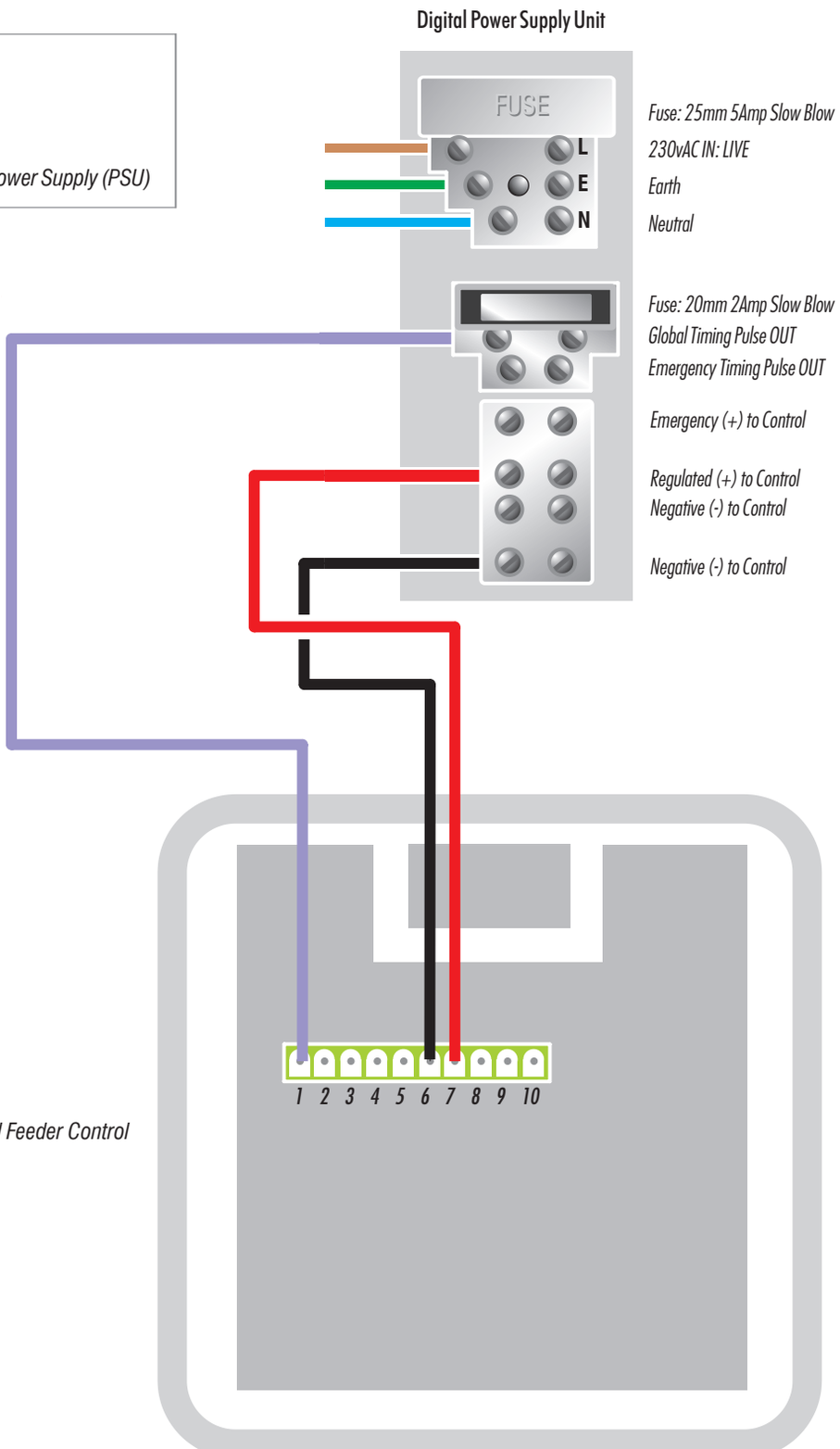
FEEDER FOR ROTARY PARLOURS INSTALLATION: **9A**

Power Supply Unit Wiring: Pre March 2010

Wire Colour Coding:

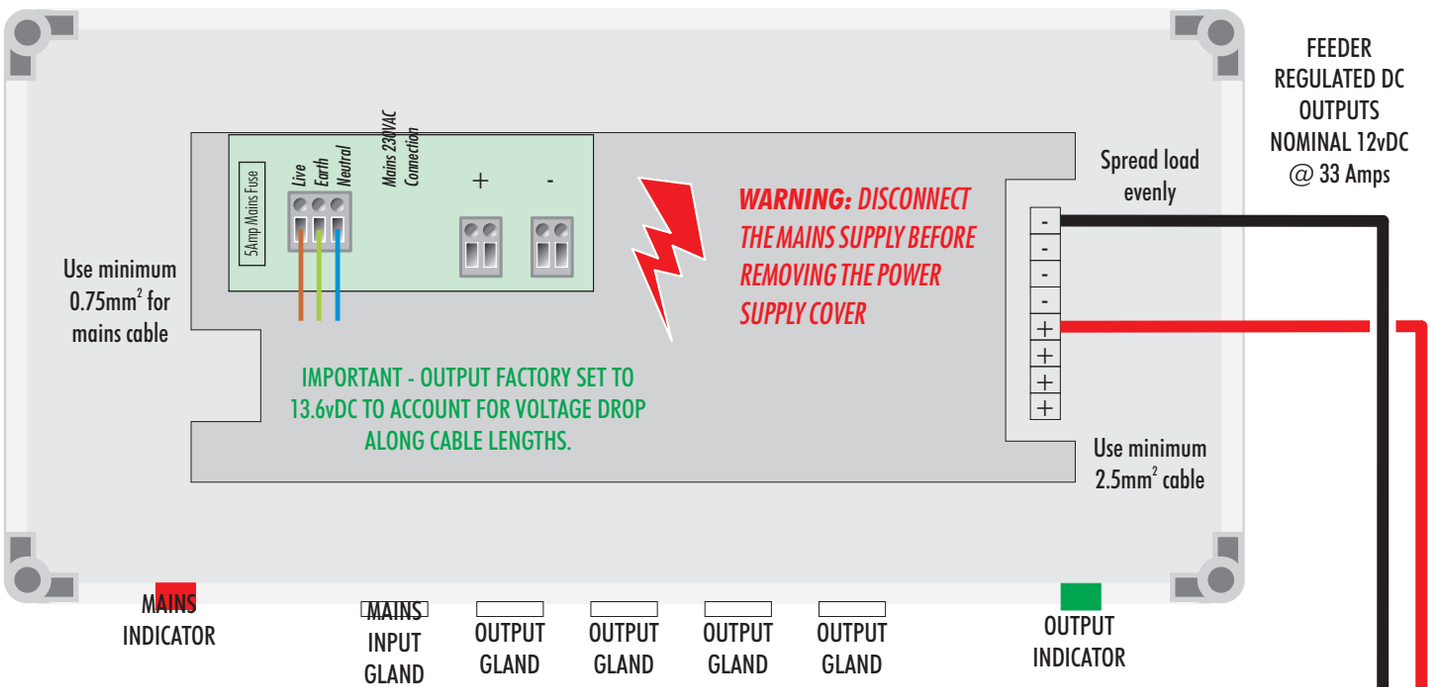
- *+13.6v DC Regulated*
- *Negative DC Regulated*
- *Global Timing Pulse from Power Supply (PSU)*

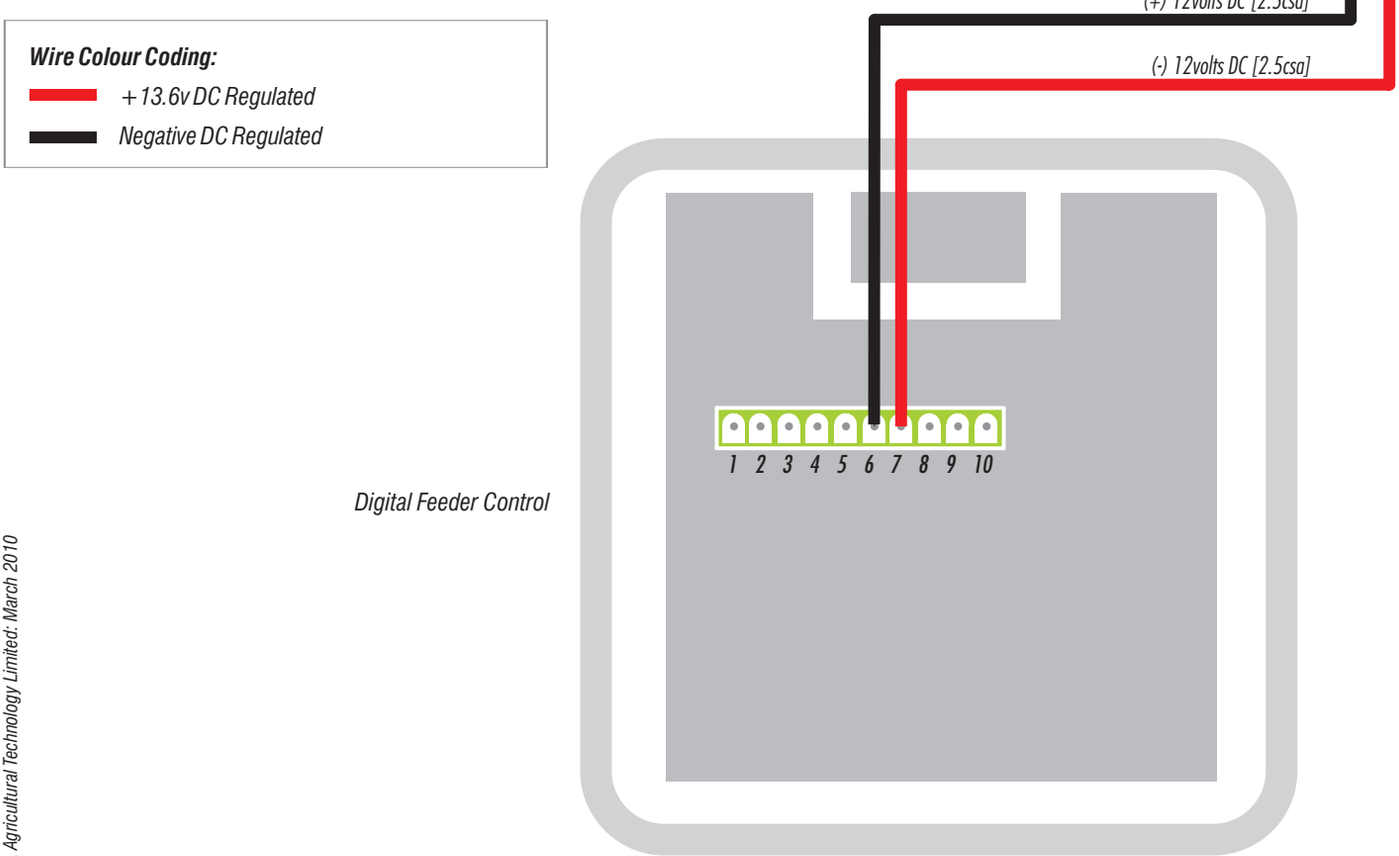
WARNING: *DISCONNECT THE MAINS SUPPLY BEFORE REMOVING THE POWER SUPPLY COVER*



FEEDER FOR ROTARY PARLOURS INSTALLATION: **9B**

Power Supply Unit Wiring: Post March 2010





Wire Colour Coding:

- *+13.6v DC Regulated*
- *Negative DC Regulated*

FEEDER FOR ROTARY PARLOURS INSTALLATION: **10**

The Digital Feeder Control from ATL is programmed to operate as an automatic batch feeder when used in conjunction with the ATL Dump Box Feeder on a rotary parlour.

Operating the Control

The Ration Selector is a rotary switch; it has no end stops and can be rotated through 360 degrees in either direction. As it is turned, the display increments or decrements, depending upon direction. The display number represents the multiple of portions (to a maximum of 99) set up using the Timing Pulse. So, for example if the installation was calibrated to deliver 500gms (about 1 pound or 1 unit), a figure of '7' units in the display window represents 7 x 500gms or 3.5kilograms.

The Digital Control on a rotary parlour is repeatedly triggered by an optical sensor when the outlet of the ATL Dump Box Feeder is positioned correctly over each manger. By this means, feed is dumped precisely into the centre of the manger with no wastage.

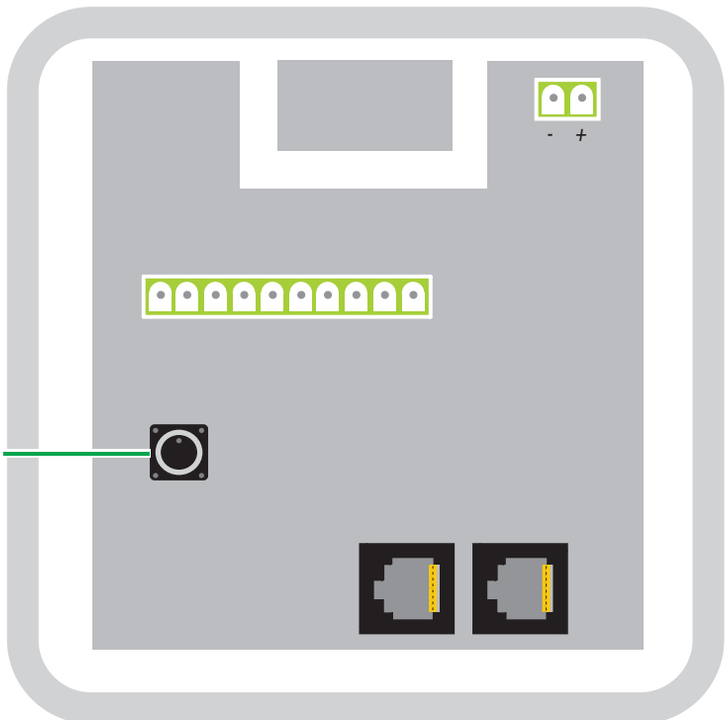
If the Motor Running Indicator(s) fail to illuminate when the Feed Switch is pressed and the Ration Display flashes 'FS', then there is a fault with the feeder and the electronic thermal trip inside the Control may have tripped out and interrupted the feeder power supply. This generally means the feeder motor is drawing too much current- it may be jammed, badly worn or has short-circuit windings. Release the switch, turn the Ration Selector until the display reads 'zero, allow the thermal trip to cool for a minute or so and try again. If the fault persists check and service the feeder motor.

Even when the feeder is running it is possible to increase or decrease the ration simply by turning the Ration Selector.Setting the Ration Display to zero and pressing the Feed Switch will deliver cake continuously for as long as the switch is held over. This is a convenient stand-by feature.

FEEDER FOR ROTARY PARLOURS INSTALLATION: **11**

Entering Setup Mode:

To enter the setup mode, please press the function select button once on the printed circuit board in the Digital Feeder Control enclosure and 'Cn' should be shown in the ration display window.



Master Control: On / Off: Default = Off

Enter the setup mode, by pressing the function select button once.

- 'Cn' will be shown in the ration display window;
- 'Cy' is not supported on rotary feeders.

Press the function select button to move onto the address setting.

Setting The Control Address: Default = 01

This sets the address of the Digital Feeder Control. This should be set to '01' for rotary parlours for the first feeder, and '02' for the second.

- 'Ad' will flash alternately and then '01' if the address is set to 1;
- Rotate the ration selector clockwise to increase or anti-clockwise to decrease the address number;

Press the function select button to move onto setting up the feeding mode.

FEEDER FOR ROTARY PARLOURS INSTALLATION: **12**

Setting up the Digital Feeder Control 1

Setting The Feed Mode: F1 / F2 / F3: Default = F1

The Digital Feeder Control has 3 feeding modes. These are:

F1 - When the feed switch is flicked, the counter will count down to zero (00), the ration display will stay at zero (00) and a new ration has to be dialled up to feed another ration. **This mode is not supported on Rotary Parlours**

F2 - When the feed switch is flicked, the counter will count down to zero (00), the ration display will then return to the previous ration value and is ready to feed another ration immediately. **This mode is not supported on Rotary Parlours**

F3 - **Rotary mode. This setting must be selected for rotary dump box feeders**

This enables individual feeding using the ATL dump box on a rotary parlour.

Select the feeding mode as follows:

- 'F1' will be shown in the ration display window;
- Rotate the ration selector clockwise once and 'F2' or rotate clockwise twice and 'F3' will be shown in the ration display window;
- Rotate the ration selector anti-clockwise to return to the previous feeder mode.

Press the function select button to move onto setting the feeder type.

Setting The Feeder Type: P0 / P1 / P2 / P4: Default = P0

The Digital Feeder Control has 4 feeder types available. Timed electric and 1, 2, and 4 pulse.

P0 - Timed feeders;

P1 - 1 pulse feeders;

P2 - 2 pulse feeders;

P4 - 4 pulse feeders.

See table below for example feeder type settings. Select the feeder type as follows:

- 'P0' will be shown in the ration display window;
- Rotate the ration selector clockwise once and 'F1', rotate clockwise twice and 'P2', rotate clockwise three times and 'P4' will be shown in the ration display window;
- Rotate the ration selector anti-clockwise to return to the previous feeder type.

For the ATL Dump box the 'P0' setting must be used as ATL Feeders are Timed.

Press the function select button to move onto selecting the flap open delay.

Vacuum Operated Feeders:

As a general guide, the major makes should be set as follows:

Manufacturer	Pulse(s)	Feed/Pulse(grms)
Fullwood Rationmaster	1 or 2	500
Alfa Laval	2 or 4	500
Orby	1	500
Somerset	4	100
Westfalia EP	1	700
Westfalia M Type	1 or 2	100

Setting up the Digital Feeder Control 2

Setting The Flap Open Delay: Fo; Default: 1.5 Seconds

The Digital Feeder will open the flap to the dump box for a variable amount of time. The value fo time can be entered in seconds and tenths or a second into this setting.

Please note:

- The setting here will affect the overall speed of the dump box.
- After the Flap Open Delay has been run, the Flap Close Delay will be run.
- After the Flap Close Delay has been run, the feeder will feed again, and then wait for the trigger signal to dump.

Setting The Flap Close Delay: Fc; Default: 1.5 Seconds

The Digital Feeder will allow for a variable time to close the flap to the dump box. The value fo time can be entered in seconds and tenths or a second into this setting.

Please note:

- The setting here will affect the overall speed of the dump box.
- After the Flap Close Delay has been run, the feeder will feed again, and then wait for the trigger signal to dump.

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Setting up the Digital Feeder Control 3

Selecting The Timing Pulse Source: Internal Or External: Default = Internal

A timing pulse is used to calibrate the feeders operated by the Digital Feeder Control. This is a clock pulse that ensures all feeders drop the same amount of feed. The global timing pulse sources are as follows:

Pi - Pulse Internal - For Digital Feeder Controls connected to 60 Watt or 396 Watt 12vDC power supplies.

PE - Pulse External - For Digital Feeder Controls connected to 4pt, 8pt or 12pt digital power supplies with global timing pulse (i.e. replacing a faulty control) and a single timing pulse cable links all of the controls together. See page 15 for calibration.

Select the timing pulse as follows:

- 'Pi' will be shown in the ration display window;
- Rotate the ration selector anti-clockwise once and 'PE' will be shown in the ration display window;

Press the function select button to either exit the setup routine if 'PE' selected or move onto calibrating the global timing pulse if 'Pi' selected.

Calibrating The Internal Timing Pulse: Default = 2.2

The internal timing pulse is used to calibrate the feeders. Depending upon whether the digital control is connected to timed or pulse feeders, each 1 timing pulse setting is equal to 0.1 seconds. NB - Setup allows calibration in tenths of seconds (i.e. 0.1) for calibration values less than 10 seconds and in seconds (i.e. 1) from 10 to 99 seconds.

TIMED - For timed feeder motors. Runs motor for 0.1 seconds.

1 PULSE - Gives 1 'ON' pulse and 1 'OFF' period every 0.1 seconds.

2 PULSE - Gives 2 'ON' pulses and 2 'OFF' periods every 0.1 seconds.

4 PULSE - Gives 4 'ON' pulses and 4 'OFF' periods every 0.1 seconds.

Calibrate the internal timing pulse as follows :

- Use the table on the right, select the appropriate value for the internal timing pulse.
- Press the function select button to exit the Digital Feeder Control setup routine.
- Rotate the ration selector until the digit '4' is displayed in the ration display window.
- Flick the feed switch either left or right. The associated feeder motor should start and feed will be delivered.
- Weigh the quantity of feed delivered; if it is less than 2kg, go back into the setup routine and increase the internal timing pulse value. If it is greater than 2kg, decrease the internal timing pulse value. Repeat steps 1, 2 and 3 until the desired weight of feed is delivered.

This process should be repeated at any time when the feed formulation or density changes.

Timed Electric Feeders.

A broad indication of running time per 500grms of feed delivered for motorised feeders is:

Manufacturer	Voltage	Running (Secs)	Calibration Setting
ATL	12	2.2	2.2
Gascoigne	12	5.0	5.0
Hosier	12	1.5	1.5
Simplex Aluminium	12	2.0	2.0
Westfalia EZ (Early)	24	21.0	21
Westfalia EZ (Late)	24	12.0	12
Westfalia M Type	24	5.0	5.0
Augermaster	24	15.0	15

FEEDER FOR ROTARY PARLOURS INSTALLATION: **15**

The Global Timing Pulse: Pre March 2010 Power Supplies

The Digital Feeder Control system calibration is controlled by a global timing pulse from the Power Supply. The calibration is adjusted by two, small rotary controls, one provides a coarse time adjustment and the other a fine adjustment. ATL power supplies have four controls grouped together; only the two marked in the figure should be adjusted.

 # Set both the coarse and fine timing pulse controls to the mid-point.

 # Turn the power on and rotate the Ration Selector on a single Control until the digit '4' is displayed in the window.

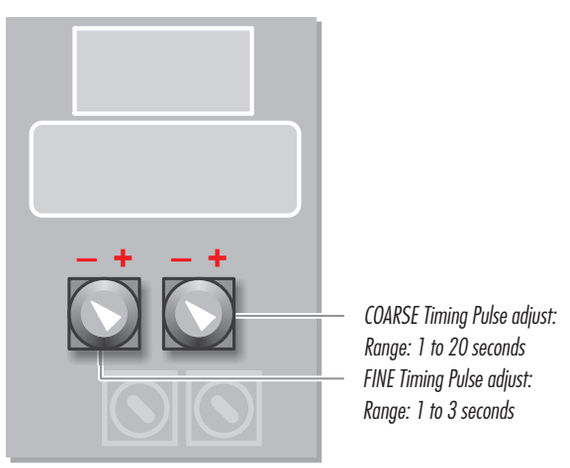
 # Push the FEED switch either right or left. The feeder motors should start and feed will be delivered.

 # Weigh the quantity of feed delivered; if it is less than 2kg, turn the Coarse Timing control clockwise. For a delivery larger than 2kg turn the Coarse control anti-clockwise. Push the FEED switch for another delivery and repeat the process.

 # Get as close as possible to the desired portion of feed using the Coarse control and then 'fine-tune' the amount using the Fine control.

This simple process can be repeated at any time when the feed formulation or density changes.

If the Ration Display flashes 'PF', there is a fault with the global timing pulse within the power supply unit.



Location of Timing Pulse Controls in the ATL Power Supplies.