



**ATL AUTO CONTROL
INSTALLATION
and
OPERATING INSTRUCTIONS**

For use with Mk 2 Power Supply

**A.T.L. AGRICULTURAL TECHNOLOGY LTD
THE PARLOUR FEEDING SPECIALISTS**

Place Farm, Kirtling, Newmarket, Suffolk

CB8 9PA England

Tel: (0638) 731212 Fax: (0638) 731174

ATL AUTO CONTROL - Operating Instructions

AUTO Instructions: Issue 4:00

SECTION 1 - OPERATION

1. GENERAL NOTES

All Instructions and Notes should be read thoroughly and understood before commencing installation and operation. PARTICULARLY the notes at the end of these instructions on ELECTRICAL ENVIRONMENT and GOOD INSTALLATION PRACTICE.

ATL has accumulated a great deal of information regarding the installation of FEEDING SYSTEMS and other PARLOUR CONTROLS & as a result, we endeavour to provide a technical service that is second to none. To further this end information has been included in this Manual which will help to avoid pitfalls which can lead to unnecessary waste of time and money.

We know that pressures often mean that a manual is not consulted until something unusual happens, however, much effort has gone into compiling this information.....PLEASE USE IT! - IT WILL HELP YOU

Any notes or recommendations in these instructions that are not observed may invalidate any warranty claim. All electrical wiring should be conduited where necessary and be in accordance with current codes of practice. All conduited wiring connections should be waterproofed by using a suitable solvent welding solution and sealants where necessary. All entry points into the units should be in the base of the box. Remove the rubber plugs provided and insert a suitable cable gland or conduit connector. The Control Unit should not be positioned between runs of conduit which lead to each side of the parlour. Air flows along the conduit from one side of the parlour to the other can result in condensation in the control.

Care should be taken with the use of water, hoses and pressure washers. The boxes, whilst giving a high degree of protection, are not designed to have water sprayed over them. WARNING: Petrol & petroleum products can severely damage the boxes and overlays. If the rubber switch cover becomes split, cut or damaged, it must be replaced immediately. Any ingress of water or moisture can seriously harm the switch and components in the box. No warranty claim can be considered under these conditions.

IF IN ANY DOUBT - ASK !

2. GENERAL DESCRIPTION OF THE SYSTEM

The ATL AUTO CONTROL is a push button Feed Controller giving a fast single key operation providing a simple and quick method of controlling feed meters and dispensers. If possible the AUTO CONTROL should be left switched ON between milkings, however there are circumstances where this may not be practical, please see notes on ELECTRICAL ENVIRONMENT at the end of these instructions.

The ATL AUTO CONTROL is designed to operate from The ATL AUTO CONTROL POWER SUPPLY and it is recommended that the ATL Power Supply is used wherever possible. It will however work from some existing low volt supplies provided that the output voltage is between 14 and 40 volts DC and a few simple precautions are observed. In the standard unit the POSITIVE of the D.C. supply to the feeders is switched.

The ATL POWER SUPPLY consists of two separate low volt supplies, a heavy duty supply for the feeders, and a low power output for the control. This format reduces the level of interference that is likely to be transmitted to the control and so improves reliability even in the noisiest of electrical environments. NOTE: The Control has been designed so that with minor modifications it can be used with feeders operating on supplies up to 240v A.C. For Feeders requiring an AC supply or those that need the negative of a D.C. supply to be switched - Please consult ATL.

3. THE ATL AUTO CONTROL

The ATL Auto Control consists of four separate Printed Circuit Boards (PCB's):

The KEYSWITCH PCB is mounted directly behind the surface of the lid and contains the key switches which project through holes in the lid to the underside of the keyboard membrane.

The CONTROL PCB is mounted on the box lid and contains all the control electronics together with the illuminated Light Emitting Diode (LED) displays.

The RELAY PCB is mounted in the rear of the box and contains the output relays (one relay for each output, on the underside of the PCB) together with the DC supply and output connections for the FEEDERS and DC supply connections for the CONTROL.

The STAND-BY PCB is mounted at the left hand side of the relay PCB in the rear of the box. It also contains the voltage regulation circuits which provide the 5v supply for the main control PCB. Connection to

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both the Control PCB and to the Relay PCB is by means of a multiple wire link.

4. THE DISPLAY

A RED LED indicates the stall to be fed, a GREEN LED indicates which feeder is being operated. The Left or Right hand side is indicated by a RED LED on the Left and Right hand side of the display.

TOTAL FEED COUNTER (Optional Extra)

A 5 digit display is situated in the display window on the right hand side. Every time a ration is fed, including feeding by means of the batch feeding facility, the number displayed is incremented by the number of units that have been fed. The counter is RESET to zero by pressing both BATCH and SIDE buttons TOGETHER. Normally the counter is reset to zero when a fresh delivery of feed is received, the counter then displays the amount of feed that has been used and so provides a good guide as to the amount of feed remaining in the loft or outside bin at any time. The contents of the counter will be retained for about 4 days when the supply to the unit is switched off.

5. OPERATION OF ATL AUTO CONTROL

THE KEYBOARD

This consists of mechanical keyswitches which are operated through a plastic membrane. The Control may not be affected seriously (in the short term) by damage to the membrane since the keyswitches are themselves positioned inside the enclosure, and the ingress of moisture through any hole will not have an immediate effect, but should be replaced at the earliest opportunity. It should be noted that the membrane is necessarily thin and can be damaged by sharp objects. The keys require only very light pressure to operate. It can be damaged by finger nails so use the fleshy part of the finger.

SWITCHING ON

On 'switch on' stall number 1 will be indicated by a RED LED together with either the Left or Right hand side RED LED indicator. Check the side of the parlour to be fed and change to Left or Right if necessary by using the 'Side' key. If several LED's are illuminated when the control is switched on, it will be due to switch bounce, press 'SIDE' to reset. If possible the AUTO CONTROL should be left switched ON between milkings, however there are circumstances where this may not be practical, please see notes on ELECTRICAL ENVIRONMENT at the end of these instructions.

6. FEEDING

INDIVIDUAL RATIONS

This is carried out by pressing a KEY (1 to 15), to dispense the required ration. The stall will be stepped automatically ready for the next feed ration to be selected. All the stalls on one side can be entered as quickly or as slowly as required. Feeders may not start immediately after a key has been pressed since the start has to be synchronised with an internal electronic clock.

In the standard ** ATL AUTO CONTROL only four feeders will operate at any one time, No.5 will not start until No.1 has stopped, and No.9 will not start until No.5 has stopped. ATL feeders require about 2.2 seconds to deliver 0.5Kg and any delay is generally not noticeable. Some feeders deliver feed relatively slowly, e.g. 1/2Kg in 15 to 20 seconds and the delay can then be considerable.

** A modification is available which allows all the feeders to operate together provided that there is an adequate power supply. Please consult ATL if this type of operation is required.

BATCH CONTROL

Select the ration to be fed by pressing one of the keys marked 1 to 15, then press 'BATCH' key. All the feeders down one side of the parlour will be operated in sequence. All or the latter part of one side can be fed i.e. the first few stalls can be fed normally with individual rations and the remainder can be fed by means of the Batch control with the same ration.

The BATCH KEY can be used repeatedly without pressing another ration key while the change from left to right is automatic. If however the SIDE key is pressed, the last ration entered will be cancelled, and a new ration must be entered before the BATCH key can be used again.

SIDE KEY: The side to be fed can be changed by pressing this key (remember any rations that have been entered or are being fed will be cancelled).

STEP KEY: This key by-passes any stall for which no feed is required.

LEAD FEEDING: This can be accomplished very easily by using the STAND-BY control. With the rotary stall count set to stall No.1, the left or right hand No.1 stall can be fed by means of the stand-by toggle switch.

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7. DENSITY CONTROL

The ATL Auto Control system for timed run electric motor type feeders includes a Density Compensation facility. This allows all the feeders, at the same time, to be adjusted to accommodate differing densities of feed by using the time control system provided.

All feeders should have initially been individually calibrated (see FEEDER CALIBRATION) so that they all feed the same as each other for any selected feed ration. When a new delivery of feed is made, check density and recalibrate if necessary, or go to any one feeder, dispense and weigh, say 2kg or 4lb and if there is an error, adjust the time controls as necessary (see FINAL TIME SETTING in the FEEDER CALIBRATION section - normally at this stage, only the fine time adjustment control need be used). Re-check the same feeder to see if the time control has been adjusted correctly. All feeders have now been altered by the same rate automatically. Remember - the more checks, the more accurate the feeding will be.

8. OVERLOAD PROTECTION OF FEEDER MOTORS OR SOLENOIDS

The standard ATL Auto Control is fitted with two thermal overloads. These protect the supply and feeder motors or solenoids from damage by stalling or short circuits. One overload supplies the odd numbered stalls, the other, the even numbered stalls. The overloads are of the push button reset type and are mounted on the base of the box. Motors or solenoids which have a higher current rating than about 2.5 AMPS when running normally will require overloads with a higher rating. Please consult ATL.

SECTION II INSTALLATION

9. ELECTRICAL CONNECTIONS (see diagrams)

Pairs of terminal connectors are positioned on the top and bottom edges of the interface PCB. The even numbered feeder connections are along the top edge, and the odd numbered feeders along the bottom edge. Outputs start with number 2 on the top Right hand side and number 1 on the bottom Right hand side i.e 2, 4, 6, 8 & 10 along the top from RIGHT TO LEFT and 1, 3, 5, 7 & 9 along the bottom from RIGHT TO LEFT.

The Left and Right hand side feeders are connected to the Left and Right hand terminal of each pair e.g. number 2 feeder on the left is connected to the left hand side of the pair of terminals and number 2 on the Right hand side being connected to the Right hand side of the terminals at number 2. On the standard ATL AUTO CONTROL this is the DC positive (+) connection to either the feeder or the solenoid.

The connections on the Right hand side of the PCB are the main positive supply (+), for the feeders and negative (-) supply for the diodes which protect the relay contacts. (This negative connection must not be used for the feeders). Above and below these are the connections out to the overload circuit breakers.

When using the standard ATL AUTO CONTROL the negative (-) connection from the feeder motors or solenoids should be commoned along each side of the parlour and then be brought back to the Auto Control. Use an extra connector to join common negatives to negative supply and relay PCB if necessary. A separate negative supply wire must be used to link the control negative to the negative output of the power supply. Please read notes on 'ELECTRICAL ENVIRONMENT' at the end of these installation notes.

10. POWER SUPPLY

The ATL AUTO POWER SUPPLY is designed specially for use with the ATL AUTO CONTROL.

The ATL POWER SUPPLY has an 'electronically regulated' output voltage. This means that the voltage will not vary with fluctuations with the mains supply or with the number of motors being driven provided that the mains does not drop by more than about 15%, or the output current rating is not exceeded. The feeders will then always deliver the same amount of feed for a given time.

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In the interests of economy it is possible to use the ATL Auto Control existing power supplies provided that certain supply requirements are met. It must be noted that when other power supplies are used for motor driven feeders, they may not provide the accuracy of feeding that is attainable with the ATL AUTO POWER SUPPLY (see note below). The minimum voltage must be greater than 13.5v DC when under full load. Full load current must be adequate to power the feeder motors or solenoids without exhibiting a noticeable volt drop. If the supply is not rectified then an ATL CONTROL or 'SHORT' power supply must be used. This incorporates a bridge rectifier for the supply to the feeders or solenoids, together with a small separate supply for the control. A small capacitor is supplied for use with existing suitable DC power supplies, this MUST be fitted across the power supply output.

NOTE. Existing power supplies are not recommended for motor driven feeders since the supply often provides an unsmoothed D.C. supply, i.e. it is unregulated and the voltage is directly related to the mains voltage. Any fluctuation in the mains supply voltage will be reflected in the output voltage to the feeders, and so the output of feed will vary accordingly. The standard ATL AUTO CONTROL is designed to operate on a DC supply of between 14 and 40 volts.

OUTPUT (RMS) VOLTAGE OF TRANSFORMERS

The output voltage of a power supply having only a transformer and bridge rectifier, (no smoothing capacitor), will have a much higher peak voltage than the reading shown on a multimeter. The peak value is $1.414 \times$ the voltmeter reading. For example, a supply having a meter reading of 40 volts would in fact have a peak voltage of $40 \times 1.414 = 56.56\text{v}$, high enough to damage the ATL AUTO CONTROL circuits.

If in doubt - Ask!

11. CABLE SIZES

The positive DC (+) cables from the CONTROL to the feeders or solenoids should be a minimum of 1.0 sq mm. c.s.a. up to a maximum length of 8 metres - for lengths exceeding this, the minimum cable size should be 1.5 sq mm. c.s.a. (Cross section area).

The negative DC (-) common return cables from the feeders or solenoids, to the Auto Control (via a suitable connector if necessary) should be a minimum of 2.5 sq mm. c.s.a.

The DC (+) & (-) connections from the power supply

unit to the Auto Control (feeder supply) should be 2.5 sq mm. c.s.a.

The DC (+) and (-) (control supply) connections from the Power Supply unit to the Auto Control need only be 1.0 sq mm c.s.a.

12. SETTING UP PROCEDURE (See Diagram of rear of control PCB)

a. STALL COUNT

This is set first by turning the stall count rotary switch fully anticlockwise, and then by turning it clockwise to select the required number of stalls for one side of the parlour, by counting the 'clicks'. Check the number by observing the stall indicator LED's for the correct stall count.

b. TYPE OF OUTPUT (timed or pulsed)

There are 4 positions for the slide on the output selection switch: Timed output is with the slide towards the top, 1 pulse, 2 pulses & 4 pulses are selected as the slide is moved towards the bottom. See diagram.

13. FEEDER CALIBRATION

INITIAL CALIBRATION (timed motor driven feeders)

Set the 'FINE' time control (BLUE KNOB) to about its mid position, and the 'COARSE' time control to about the time required for 1 unit for the type of feeder from the TABLE OF FEEDERS below. The GREEN LED's (indicators) can be used to measure the running time of the feeder motors, since they are turned 'on' and 'off' with the output to the feeders.

INDIVIDUAL CALIBRATION

ATL Feeders and some of the other makes incorporate a calibration slide which enables them to be adjusted individually so that they all deliver the same amount of feed for the same length of motor running time. Set the running time from the approximate motor running times shown in the TABLE OF FEEDERS below.

Where fitted, calibration slides should be set to about the halfway position. Calibrate each feeder by feeding a ration of about 2kg or 4lb and adjusting the slide accordingly, so that they all feed the same amount for the same time. Other types of motor driven feeders do not always have this facility, please consult ATL if there is any doubt.

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FINAL TIME SETTING

Adjust the coarse time control (small square rotary control) to obtain a feed output within 10 to 15 % of the required amount (use a ration of at least 2kg or 4lb). Adjust the fine time control (Blue knob rotary control) to carry out the final calibration, trying to leave the blue knob at about the central position so that further adjustment, up or down, can be undertaken without having to alter the coarse control. This is then used for the Density Compensation control

PULSED OUTPUT SETTINGS FOR VACUUM OPERATED FEEDERS

Setting of Pulsed Time for vacuum operated feeders. The time for the 'ON' period of a pulsed output is related directly to the time settings. With 1 pulse per unit the "ON" period is equal to 1/2 of the motor running time, with 2 pulses it is equal to 1/4 of the motor time, and with 4 pulses it is equal to 1/8th of the motor time. Set the pulsed time to ensure sufficient time for pulsed sequence to operate. In most cases this also provides a facility for varying the length of the feeding cycle to suit the operator.

14. STAND-BY FEEDING SYSTEM

In the unlikely event of any failure or damage to the main electronic circuit, a separate stand-by feeding system is incorporated. This consists of a rotary stall selection switch together with a biased Left/Right selector switch with a centre off position. Both these are mounted on the left hand side of the Auto Control unit. The main control PCB can be disconnected if it develops a fault which affects the operation of the outputs to the feeders.

STAND-BY FEEDING OPERATION

Select the stall to be fed by means of the rotary stall switch (settings 1 to 10) or select the batch feed option position 11, to feed stalls 1 to 5, or 12 to feed stalls 6 to 10. Hold the three way toggle switch to the Left or Right as required, either for the period necessary to dispense the ration or switch 'on' and 'off' for a pulsed output.

ATL POWER SUPPLY STAND-BY

The ATL Power Supply has two back-up supplies.

a. There is a direct connection to the output of the rectified low volt supply from the transformer which can be used if there is a failure in the electronic voltage regulation circuit. This is the "Non Regulated" connector situated in the power supply unit at

the top of the terminal block. This connection provides an unregulated supply which will operate the system but without the accuracy of the regulated output. The feeder motors will generally run faster than normal and will consequently deliver more feed. Due allowance must therefore be made when feeding.

b. Battery connections are available as an optional extra, for use in times of mains failure. For normal operation 16 volts will be required, (most vehicles provide this when the engine is running). Operation from a 12 volt battery will depend on the condition of the battery. The feeders will run slightly slower than normal, and due allowance must be made for the resulting smaller rations. With lower voltages the unit may only operate in the stand-by mode and relays may not always operate correctly.

15. FEEDERS THAT CAN BE CONTROLLED BY THE ATL AUTO CONTROL

The ATL AUTO CONTROL is now being used to control many types of feeder including the following:

VACUUM OPERATED FEEDERS

FEEDER	OUTPUT
Fullwood Rationmaster	1 or 2 pulses per lb or 1/2 Kg
Alfa Laval	2 or 4 pulses per lb or 1/2 Kg
Orby	1 pulse per lb or 1/2 Kg
Somerset	4 pulses per lb or 1/2 Kg
Westfalia Separator EP	1 pulse per 700gm

(W.S. solenoids are 24v dc)

Note: all the above require solenoid valves to control the vacuum supply by means of an electrical signal. These may already be present in the system but it is prudent to check before carrying out the installation.

DC MOTOR DRIVEN ELECTRIC FEEDERS

FEEDER	Voltage	Approx. Time per lb or 1/2 Kg
ATL	14v dc	2.2 secs
Gascoigne	14v dc	5.0 secs
Hosler	14v dc	1.5 secs
Simplex	** 14v dc	2.0 secs
Westfalia Separator 'EZ'	24v dc	21.0 secs

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Westfalia Separator 'M'	* 24v dc	5.0 secs
Augermaster	24v dc	15.0 secs

* (4 pulses, 1.2 secs/pulse)

** Simplex Aluminium Feeders: Existing installations will be connected so that the negative (-) supply to each motor is switched and positive is common. ATL Auto Control switches the positive (+) supply to each motor and has a negative (-) common return. The connections at the motor must therefore be reversed. This can be done when fitting the diodes.

Note: Westfalia "M" type must be started with a NEGATIVE DC pulse, please consult ATL if this type of feeder is to be controlled since it requires special PCB's.

HIGH VOLTAGE MOTOR DRIVEN ELECTRIC FEEDERS

FEEDER	VOLTAGE	APPROX. TIME PER 1/2Kg
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Surge	110v ac	12 secs
Vaccar	50v ac or 110v ac	22 secs
EB	240v ac	10 secs

Note: High voltage feeders require a special relay PCB, please consult ATL if this type of feeder is to be used.

16. HIGH VOLTAGE SYSTEMS

A special arrangement is provided to position the relays in a separate control box so that the high voltage is not used at the control. Generally the connections are similar to those for a low volt D.C. supply, the switched supply to each feeder equating with the positive switched supply, and the common side of the A.C. supply equating with the common negative.

CAUTION

1. DO NOT FIT DIODES TO HIGH VOLTAGE A.C. MOTORS!

2. THE HIGH VOLTAGE SIDE MUST NEVER BE LINKED TO THE LOW VOLT DC supply.

There is no positive or negative connections in an A.C. supply. One side of the A.C. supply must be switched (equating to positive in the low volt D.C. system), while the other must be connected to all the motors in a common link (equating with the negative in the D.C. system). Extreme caution must be exercised in the connections to the feeders since the

wires are all carrying high voltages. The wires must always be installed in such a manner that the stock cannot interfere with them.....

REMEMBER HIGH VOLTAGES CAN KILL.

Where high voltage feeders are positioned near to stock it is a wise precaution to provide an isolated supply such as those used with contractors plant and electric shavers: NOT AN AUTO TRANSFORMER.

AUTO TRANSFORMERS (50v and 100v systems)

Auto transformers should NOT be used since these have a single primary winding connected across the mains supply. This winding then has a centre tapping. The feeder motors are connected between the mains neutral and the centre tapping. In the event of a fault occurring which disconnects the neutral mains supply the whole of the wiring circuit becomes 'live' at 240v relative to earth. Please consult ATL if there is any doubt regarding the type of transformer for a high voltage system. ATL can provide a 110v AC isolating transformer if required.

17. FAULT FINDING

Since the introduction of the ATL AUTO CONTROL, the unit has proved to be extremely reliable, no pattern of faults has emerged. Most of the faults reported have been due to faulty connections, moisture, or corrosion, caused by vapours given off by some of the common chemicals used in the parlour. Many of these faults have been of an intermittent nature which can be extremely difficult to identify being an annoyance rather than a major problem. The remedy is often simply to re-make all the connections; do not just re-tighten screws.

In stating this, it must not always be taken as criticism of the workmanship of the installation. When wires are clamped in screw connectors, there is a possibility that the wires pack in a pattern which can subsequently be rearranged by vibrations and the physical movement encountered during the normal use of the parlour. This may not loosen the connection markedly but it will allow the formation of an oxide layer in the relatively harsh atmosphere of the milking parlour, invisible to the eye, but which is a good insulator. The result is a faulty connection which may or may not be permanent.

IDENTIFICATION OF FAULTS IN THE PRINTED CIRCUIT BOARDS

Identification of the position of a circuit board fault is frequently a fairly easy matter, provided that the basic

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operation of the system is understood. Tests and inspection during manufacture eliminate virtually all this type of fault but unfortunately some do only reveal themselves after some period of use. If a system is working correctly after a period of about 3 weeks it is generally safe to assume that all is well and it should continue indefinitely.

BRIEF OUTLINE OF THE ATL AUTO CONTROL SYSTEM

The MAIN CONTROL PCB contains 10 individual memories together with the necessary circuitry to program them and then to direct the output signals to the relevant stall number. Any malfunction which affects both sides of the parlour is likely to originate on this board, as are faults which affect the sequence of operation or the illumination of the LED's. The STAND-BY PCB contains the voltage stabilising circuit together with the stand-by selection switches. The stand-by circuit will operate without being connected to the control PCB on the rear of the lid. The relay PCB must of course remain connected to the stand-by PCB for stand-by operation. The RELAY PCB contains the output relays (one for each feeder), together with the input and output connections.

ATL NOTES ON CONTROL OPERATING FAULTS

Quick Outline of feeding faults.

One or more outputs to Feeder not working (Relay Outputs)

1. Auto Control display.

If the red and green indicators are working correctly when an attempt is made to feed the faulty output:

The fault is not likely to be on main control PCB.

(If the green LED does not work, the relay output is not likely to be switched on for the feeder)

2. If the fault occurs when feeding on both sides of the parlour:

The fault is likely to be on main PCB.

3. Do the relays 'click'?

If YES, fault is likely to be on the feeder side of the relay, either a connection or in wiring to feeders, the relay itself (rare), or in control.

4. Are all the feeders on one or both sides affected?

Fault affecting only one side.

1. If the only the right hand side feeds, the cause could be;

a faulty connection on the pink signal wire from main PCB to stand-by PCB, or the green wire (one of 4) between the stand-by PCB and the relay PCB.

2. If only the left hand side feeds, the cause could be a faulty connection on the yellow wire between the stand-by PCB and the relay PCB.

Fault affecting one or both sides could be on;

1. On the stand-by PCB.
2. On the relay PCB.
3. Connections on the common return to the Feeders
4. Is there any sign of moisture or corrosion?

If so the fault either tracking on the main PCB due to the presence of moisture, or to a corroded connection, and either fault could be anywhere! DRY THE UNIT, move all the connections and re-test.

6. Is the fault intermittent?

If YES it is likely to be due to interference.

A more detailed Outline of faults

Faults related to one or two feeders only.

1. Control L/R and stall LED's are 'on' as normal.

If the green light does not light for a stall number, the fault is on the main control PCB. No signal is being sent to switch on the relay.

If green light is 'on' for faulty stall, main PCB is likely to be in order.

Fault is either on the relay PCB or the wiring connections to it.

Assuming Main PCB is in order:

2. Relays do not 'click' when selected.

If fault occurs when feeding both sides of parlour, fault is between the output of the main PCB and the relays.

The Left and Right Hand Side outputs use the same circuitry up to the relays. Any fault affecting both sides will be in the circuitry before the relays.

Check the wire links between the outputs on the main PCB and the inputs to the Relay PCB. The wires are colour coded with BROWN being No.1 to BLACK being No.10. When selected the voltage at the output of the main PCB changes from positive to about 4.0 volts below the positive supply.

To TEST the outputs from the main PCB:

Connect the POSITIVE meter probe to the CONTROL

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POSITIVE and use the NEGATIVE probe to test the voltage on the output wire. Meter reading should be about 4 volts when the feeder is 'fed'.

If this voltage change is present the fault is on the relay PCB.

Relays 'click' when selected, but feeder fails to operate.

If the LHS and RHS of one stall only is affected, check that the relays are operating correctly. A fault with the transistor which switches the relay coils can result in partial closure of the relay contacts. This will produce a click, but the contacts will remain 'open'. This type of fault can be confirmed visually and by testing the voltage at the output connection.

To TEST the output on the relay PCB.

Connect the NEGATIVE meter probe to FEEDER NEGATIVE and use the POSITIVE probe to test the output.

When the output is selected the voltage should change from 0 volts, relative to the FEEDER supply NEGATIVE, to about +13.5v or the same as the POSITIVE supply.

If the fault only affects one feeder on one side, it is likely to be either in one of the relays or its output connection, or in the wiring to the feeder.

Check the voltage at the output as above.

Faults affecting ALL or one SIDE of the system.

1. Relays 'click'.

If no feeders operate check POSITIVE feeder supply input to RHS of relay PCB. The voltage should be about 13.5v relative to the feeder NEGATIVE.

Check the COMMON negative supply to the feeders. If none of the feeders operate, the fault could be at the power supply, i.e. before the common is divided for the two sides of the parlour.

If only one side is affected, the fault is likely to be between the feeders and the point at which the common splits for the two sides.

2. Relays do not 'click'.

If the whole of one side fails to feed and the relays do not click, the fault will be connected with the Left/Right selection circuit for the relay coils.

The left or right hand relays are selected by a small relay situated on the stand-by PCB (or on earlier systems this is mounted between the relays on the relay PCB). Check that this relay is operating

(pressing the side button should produce a faint click from one of these relays). It is controlled by the PINK wire from the main PCB. (See below)

Testing the circuits to the relays from the Control PCB

The L/R selection wire link:

Connect the POSITIVE meter probe to the CONTROL POSITIVE and use the NEGATIVE probe to test the voltage on the pink wire.

The voltage should be 0v when the left hand side is selected, and about 4.0 volts for the right hand side.

If the voltages are in order the fault is either on the Stand-by PCB, or the wire link between the stand-by PCB and the relay PCB. (On early models, without the stand-by PCB or the 4 wire link, it will be on the relay PCB).

Check the wire link between the standby PCB and the relay PCB. This link consists of four wires. RED and BLACK wires are the positive and negative supplies (about 15v DC) to the control. GREEN wire is LHS selection, and YELLOW wire is RHS selection.

To test the GREEN and YELLOW L/R selection wires.

Testing for correct voltages in the green and yellow wires should undertaken with care since the results can be misleading.

This test should only be carried out using the L/R selection on the electronic control. Using the stand-by switch will give different results...

When the LHS is selected, the green wire will be at 0 volts relative to the BLACK wire. But the YELLOW (RHS) will be 'unconnected', i.e. it will be 'floating' usually at about 0.5 volts relative to the BLACK wire. As soon as a feeder is selected on the LHS, the YELLOW wire will be pulled up to the CONTROL POSITIVE (the RED wire) because it is linked to the positive supply by way of the transistor, (which has been turned 'on' to select a LHS relay), and the RHS relay coil.

When the RHS is selected, the GREEN wire will be left 'floating', as above.

Effects of electrical interference on Auto Control Operation

1. Feed apparently dispensed between milkings (without any key input).

If feed is dispensed between milkings, there is unlikely to be a fault with the control. This can

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occur if the mains supply is interrupted. There is likely to be a considerable amount of electrical interference at the moment of re-connection. This can disrupt the automatic reset circuit in the control and result in some feeders dispensing random rations.

Please note: once any rations have been fed in this manner the control will generally revert to the normal state with the stall indicator at the No. 1 position. There will be no indication that anything abnormal has occurred, apart from the feed remaining in the manger.

Sometimes more than one RED stall indicator LED is illuminated at switch on.

Again this is the result of a disrupted reset which may or may not cause feeders to run.

If this is found to be a problem a switch can be fitted to isolate the feeder supply so that even if the control switches on feeders, with no power to the motors, no feed is actually dispensed, (this does not apply to vacuum operated feeders, since without vacuum, no feed will be dispensed).

2. Operating problems related to electrical interference.

Severe electrical interference can affect the operation of the ATL Auto control in various ways. Generally the effect will be of an intermittent nature, the operation being quite normal for most of the time.

The electrical interference may be mains borne or from the feeder motors or solenoid valves within the system.

Interference from the motors or solenoids can usually be identified from the fact that it generally occurs at a particular time in the feeding sequence. For example always on one side of the parlour and when a particular feeder is started or more likely when it stops.

The diodes on all the motors or solenoids should be checked, together with all the connections. Any diode with corroded connection wires should be replaced, as should any corroded terminal or connector in the motor or solenoid circuit which could result in a faulty connection.

Feeder motors, (especially if they are over 10 years old) should have a motor current test. This will indicate the general condition of the motors. Worn brushes, badly grooved armatures or clogged armature slots, will result in higher than normal motor currents. This frequently results in a higher than normal level of electrical 'noise', which can

affect the operation of the control, apart from causing inaccurate feeding. Overloads may also trip out as a result of abnormal motor currents.

The following test to measure the motor currents is very easy to carry out and only takes a few minutes. A multimeter with a 10 amp D.C. current scale is required.

This is connected in SERIES with the main feeder supply (either positive or negative) from the feeder power supply as near to the control as possible (so that the meter reading can be seen easily). Use the stand-by feeding facility to select and run each motor in turn. The motor currents will generally be very similar, but will depend on the type of motor being used.

The following table provides a guide to motor currents but other factors, such as type and condition of concentrates can influence the readings.

ATL.....(12v) .between 1 & 2 amps

Simplex.....(12v) 1 & 2 amps**

Gascoigne.(12v) 1 & 2 amps.....DELCO motor*

Hosier(12v). 2 & 3 amps..SIBA or LUCAS motor

Westfalla....(24v) 1 & 1.5 amps..EZ & M type motors

Augermaster..(24v).1 & 1.5 amps

*Some Gascoigne feeders have SIBA and LUCAS motors with motor currents as those for Hosier.

**Early Mk II Simplex Feeders have Lucas motors with motor currents around 2 amps.

This test can also be used to ascertain the condition of the windings of solenoids. A shorted or partially shorted winding will exhibit a higher than normal current during its operation. Normally solenoids used for vacuum feeder control have a current demand of about 1 amp. Again a significant increase on this level may indicate a fault which could result in the production of very high voltage spikes which could affect the operation of the control.

3. Mains borne electrical interference.

This is not generally a problem. Apart from an interruption in the supply, dealt with previously, normal electrical 'noise' does not appear to affect the control. However there are circumstances where it has been found to be the cause of intermittent operating faults.

The layout of the wiring in the feeder installation is more important than the level of any electrical 'noise' in the mains circuits in the parlour.

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The 12 volt supply wires for the control supply can act as a good aerial for electrical interference. It is therefore necessary to keep these wires as short as possible. Do not run them the whole length of the parlour if at all possible.

If this is unavoidable, keep them at least 500mm away from ANY other cables, whether those cables are carrying heavy currents or not.

DO NOT run any of the feeder installation wires alongside mains wires, especially those supplying fluorescent lights and NEVER enclose them in the same conduit as mains!

18. CONDENSATION

Condensation only occurs when warm moist air meets a cold surface. See note on air flow through conduits in "GOOD INSTALLATION PRACTICE". The effect of condensation on the operation of an electronic circuit can vary from an intermittent to a permanent fault. In the early stages there is little possibility of any serious damage to either the PCB or to the integrated circuits. But condensation can cause corrosion, not the red rust kind usually associated with iron and steel, but an invisible layer of oxide on switch contacts or the cable connectors which link the PCB's. The result may be a minor fault or total failure of the control.

If a fault is suspected to be due to corrosion, then there is a simple and effective remedy. This should however be only carried out if you feel competent to carry out a rather fiddly job. Switch off the control, change the settings on the stall count and output selection switches (remember to put them back to their original positions afterwards), and move (without disconnecting) the cable connections which link the PCB's. If this works it is as well to spray the connectors with a water repellant oil to prevent a recurrence of the problem, as well as sealing the cable entries as described below in 'GOOD INSTALLATION PRACTICE'.

19. ELECTRICAL ENVIRONMENT

All Electricity supplies suffer from some degree of electrical or radio frequency interference. Any equipment, whether it be a simple tungsten lamp or a 3kW motor, will produce an effect on the supply when it is switched on or off. Interference is most easily noticed when watching television or listening to the radio. Switching on a light for example will often cause the picture to jump, or a blip on the sound. Electronic control circuits can be equated in this instance with

radios and televisions, since they are quite capable of 'picking up' the same interference.

Interference signals can be transmitted in a number of ways. The most obvious being by way of the direct cable link through the power supply. There are however a number of other less obvious but equally effective methods of transmission which must be considered. The most common of these are inductive and capacitive effects between closely positioned cables. Radio signals from for example C.B. sets are another source of interference which can occur from time to time. Unfortunately many electronic circuits operate using fairly fast 'on'/'off' pulses, i.e. 'digital' signals, as opposed to varying voltages as in radios and televisions. Consequently switching spikes (which only appear as blips on radio or t.v.) are seen as an instruction, i.e. an 'on' or an 'off' signal, and the control responds accordingly, which may result in an entirely different operation from what was required.

In spite of noisy electrical supplies the ATL AUTO CONTROL will work in this somewhat hostile environment. A number of protection devices are included in the circuitry which are designed to prevent normal levels of external interference from affecting the operation of the circuit. There are however a number of other simple precautions that should be taken.

These are listed below and although parlour installations vary it should be possible to incorporate most, which should ensure that the installation will work successfully.

20. GOOD INSTALLATION PRACTICE

1. Always use a good mains supply, preferably one with its own separate fuse, and not one which already has a load such as a heater or motor on it. DO NOT run the 'clean' supply in existing conduit with the mains cables. NEVER double up supplies from a 13A plug. A heavy current switched on another circuit connected to the same socket is likely to cause a substantial volt drop to occur across the spring contacts of the plug socket which are potentially a weak link. Fused cable outlets provide a more satisfactory method for mains connection.
2. Keep the low voltage cables between the power supply and the control as short as possible. The transformer acts as a reasonably good supply 'cleaner', but the low volt cables act as a very good 'aerial', and can undo all the good work of the transformer. Remember cables do not have to be in

ATL AUTO CONTROL - Installation Instructions

actual contact for signals to be received.

3. Do not run cables which are connected to the control alongside other cables which are carrying high currents, mains or otherwise.
4. The negative (or positive if negative is being switched) supply to the AUTO CONTROL from the power supply can be used for the common return from the feeders. Use a separate connector in the base of the control unit, if necessary, to link the common returns from the feeders.
5. Diodes MUST be fitted across all DC motor supply connections (band on the diode connected to positive).
6. Always use the correct size of cable. As a general rule, the further the distance the thicker the cable. The positive cable to each motor should be 1.5 sq. mm. c.s.a. for lengths of 8 meters or more.
7. Always use the cable entry holes that are provided in the bottom side of the box. Any additional holes must always be positioned in the bottom side of the box. Holes elsewhere will provide a 'chimney action' and cause unnecessary air flows which in turn will lead to condensation and its related problems.
8. Try to avoid fitting the AUTO CONTROL box between the ends of conduit which lead to each side of the parlour. Air flow along the conduit from

one side of the parlour to the other can occur and result in CONDENSATION appearing on the PCB's. Use a 'T' junction (or two) on to a direct link across the parlour. The cable entry into the control can also be partially sealed using a suitable mastic or sealing compound. It should be noted that a perfect seal is unnecessary since the object is to slow the rate of air flow down, rather than stop it all together, which can have even worse results.

9. Where the ATL AUTO CONTROL is being used to replace an old control, check all existing cables that are going to be retained for 'blackened' ends. The blackening is the result of corrosion and means that the conducting cable is a good deal thinner than may appear. Cut the cable back until 'bright copper' or 'tinning' is visible or replace with new cable.
10. Arrange cables neatly in the control box, avoid excessive lengths and do not coil any wires, such loops make good transmitting aerials for electrical interference.

The above measures have proved to be more than adequate for the control to work with most of the common makes of feeders that are to be found on farm installations.

Please consult ATL if You have any doubts on your installation.

A.T.L. AGRICULTURAL TECHNOLOGY LTD

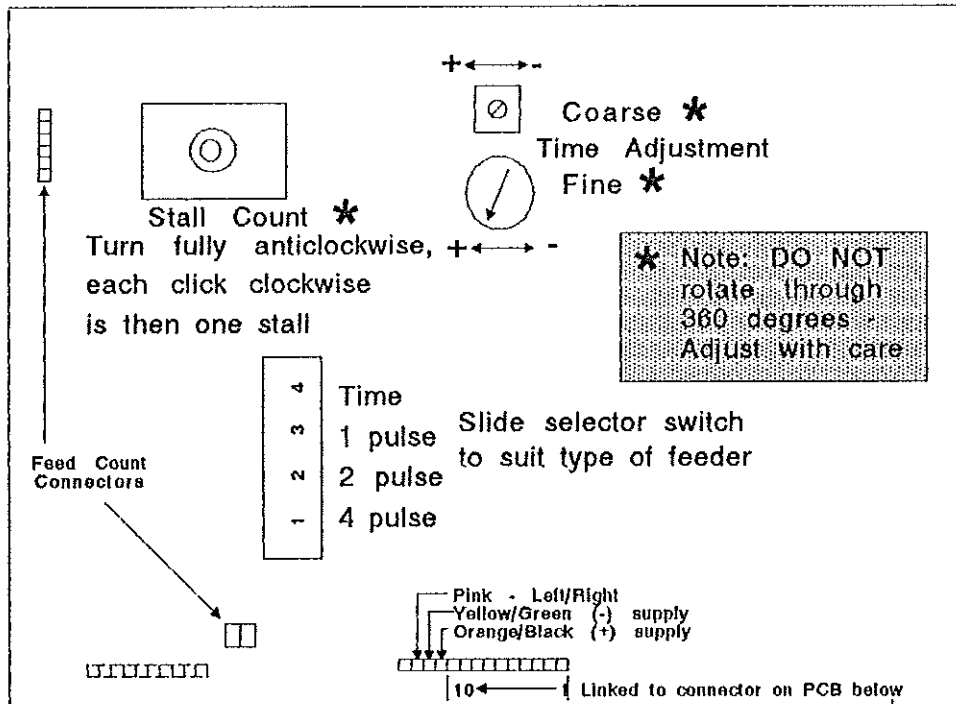
THE PARLOUR FEEDING SPECIALISTS

Place Farm, Kirtling, Newmarket, Suffolk.

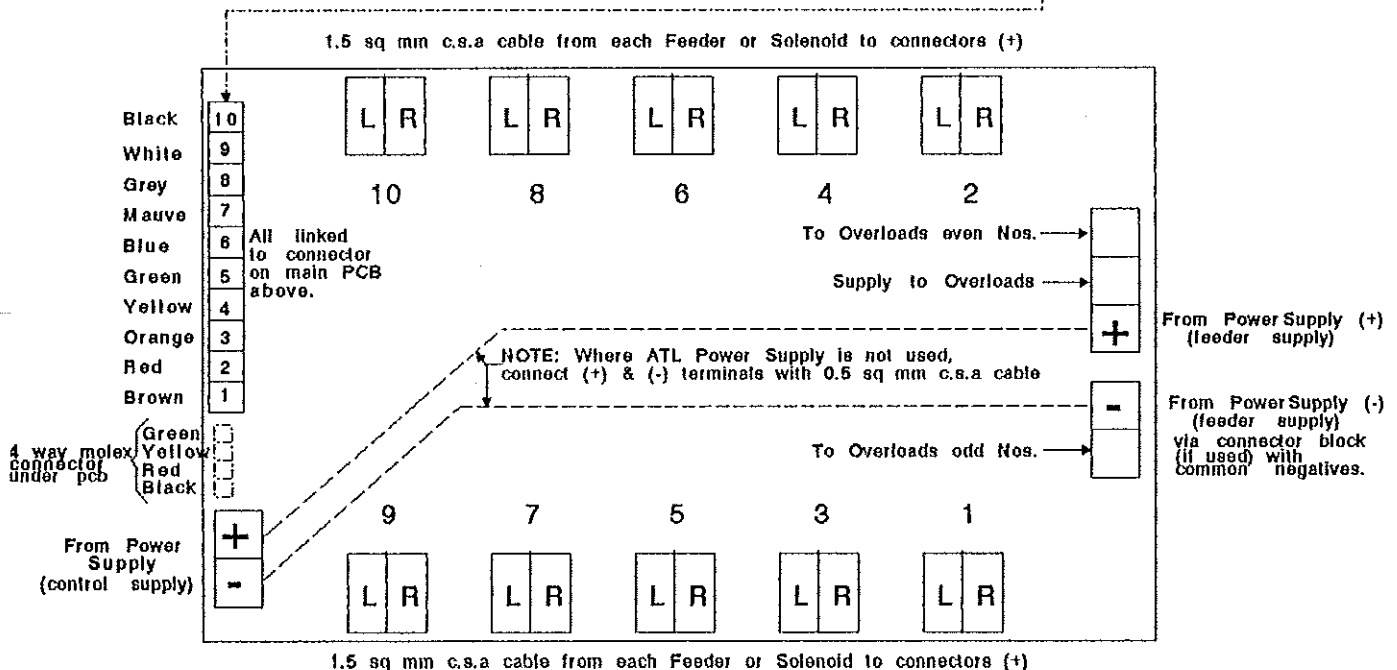
CB8 9PA England

Tel: (0638) 731212 Fax: (0638) 731174

ATL AUTO CONTROL Main Printed Circuit Boards



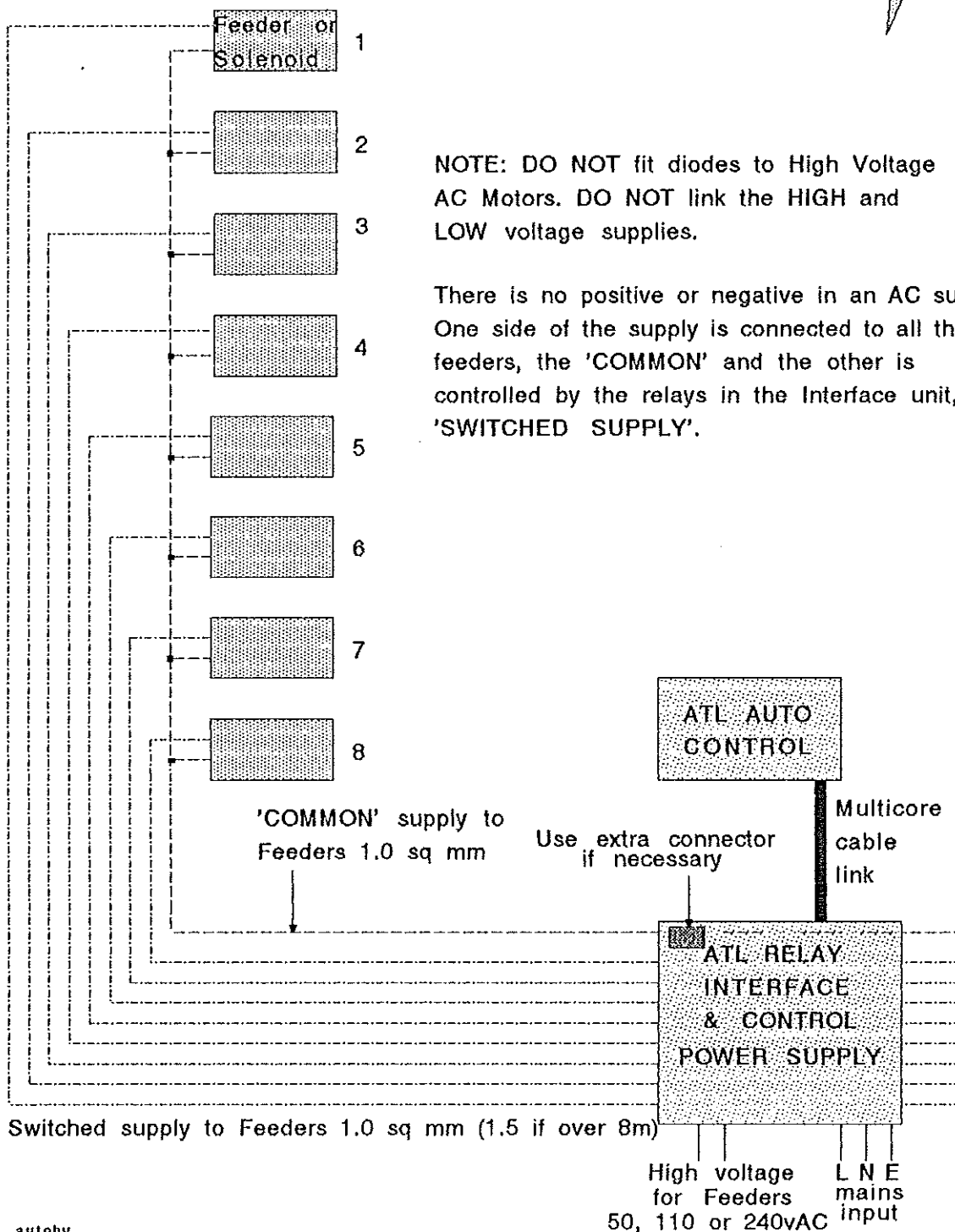
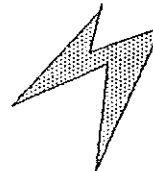
AUTO CONTROL Internal Control Settings



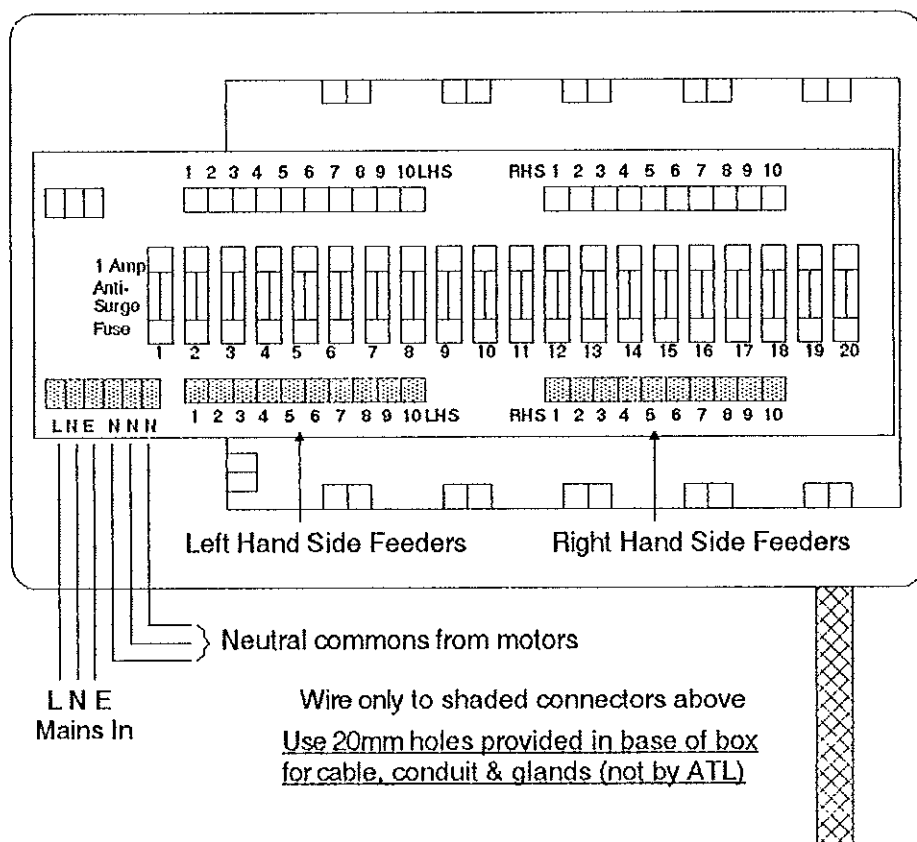
AUTO CONTROL FEEDER CONNECTIONS

Schematic wiring diagram for ATL Auto Control with For use with HIGH VOLTAGE Feeders only

Showing one side of an 8/16 parlour only

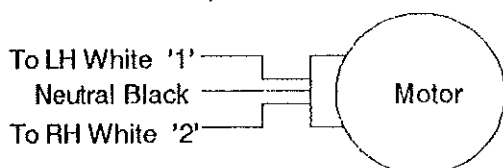


Schematic Wiring Connections for Auto Control Interface Unit with EB Colour Code Feeders

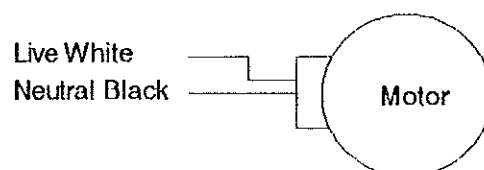


EB Motor Connections

1 Motor feeding 2 Feeders, one each side
of parlour



Individual Motors



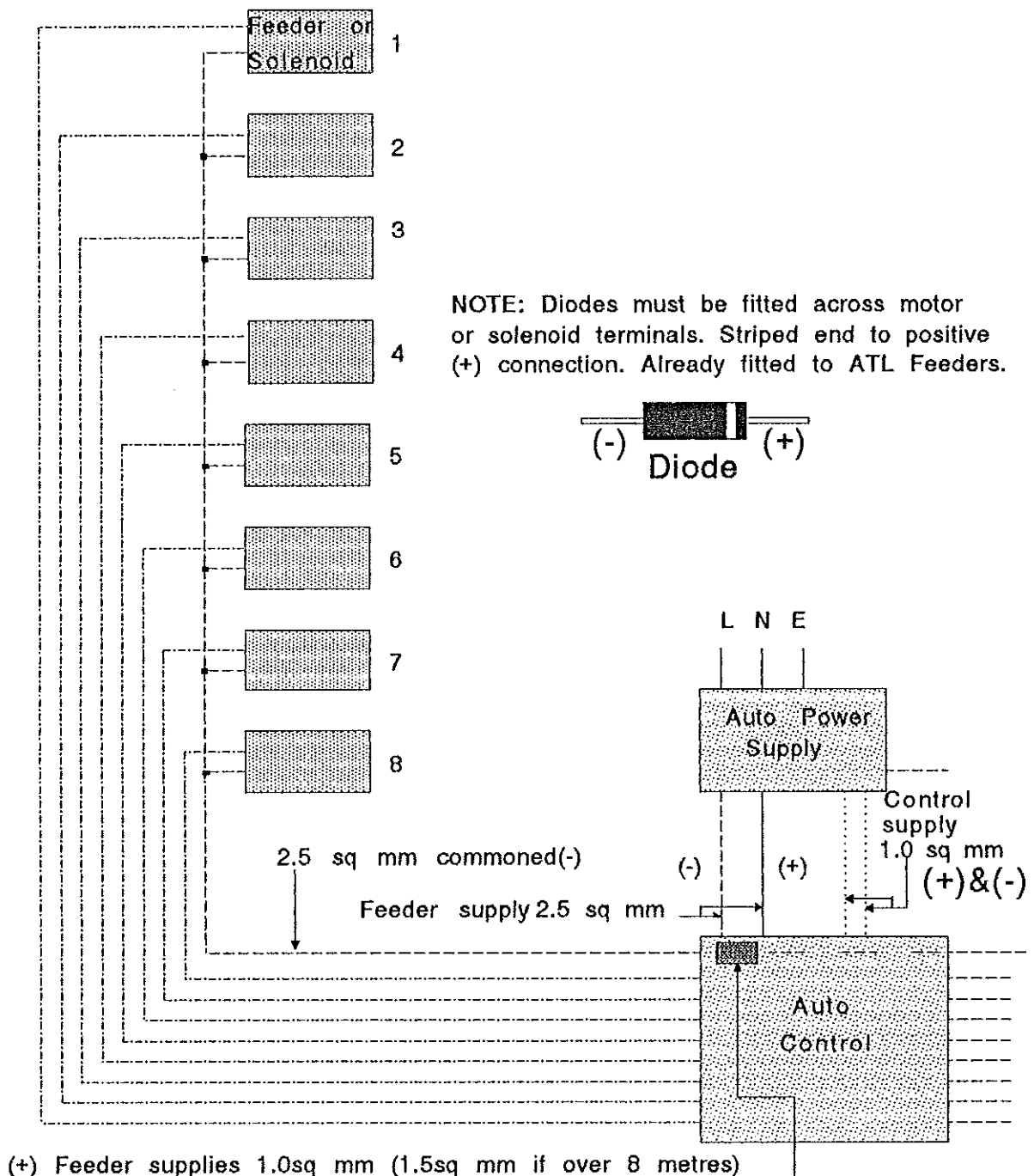
Connect supply to Black & White '1' (motor runs clockwise)
Connect supply to Black & White '2' (motor runs anticlockwise)
Motor rotates clockwise to feed one side, anticlockwise to feed the
other. Black or ODD coloured wire to neutral. Each white to a
numbered output, left & right hand on the fuse board in the
Interface Unit (see above).
DO NOT FIT DIODES.

Connect each motor to neutral and an output
on the relay interface (see above) in the same
way as a DC motor would be connected.
DO NOT FIT DIODES

NOTE: Wire colours may vary. The White wires are not numbered, trial & error
may be necessary to determine which side is being fed by which connectors.

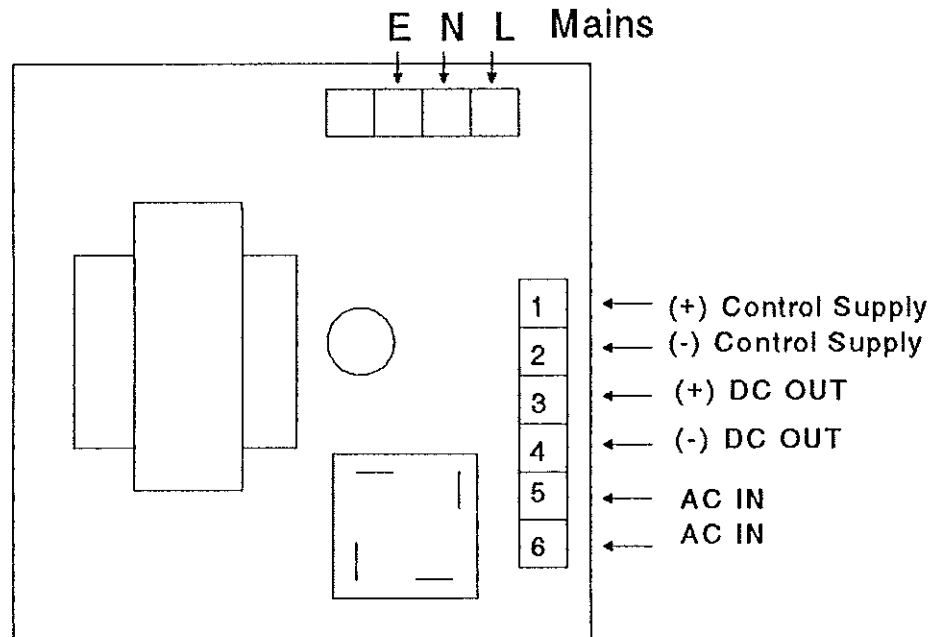
Schematic wiring diagram for ATL AUTO CONTROL with ATL POWER SUPPLY

Showing one side of an 8/16 parlour only

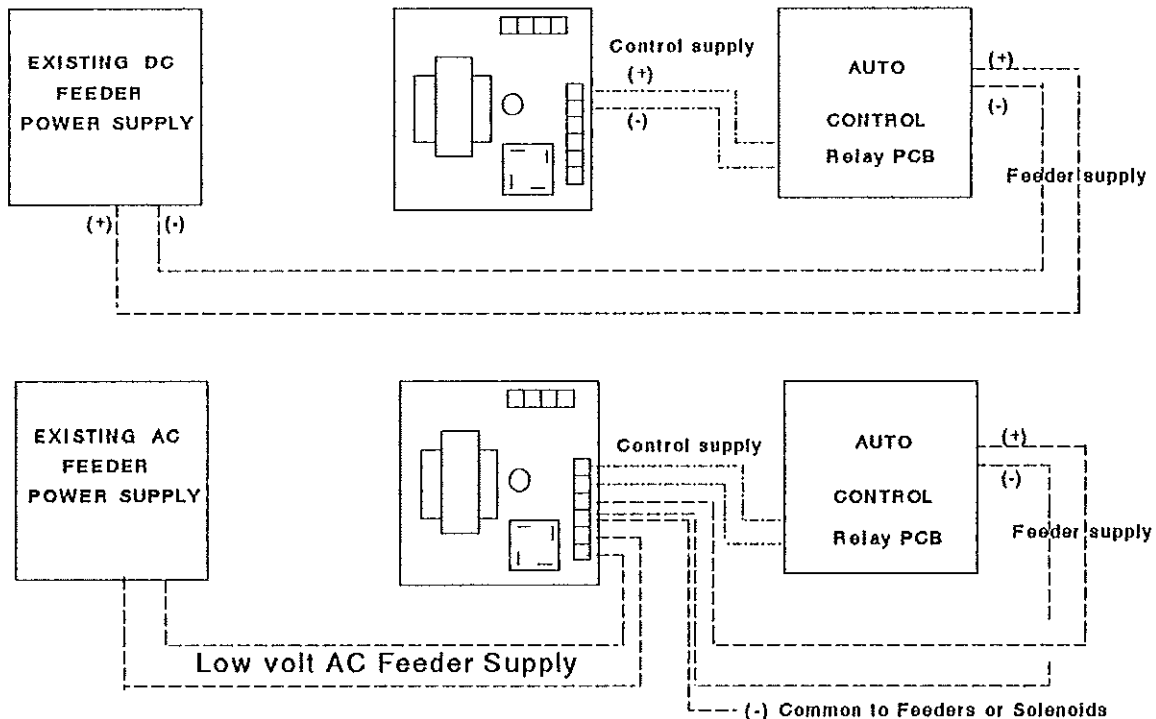


ATL CONTROL (SHORT) POWER SUPPLY CONNECTIONS

For use with existing Power Supply

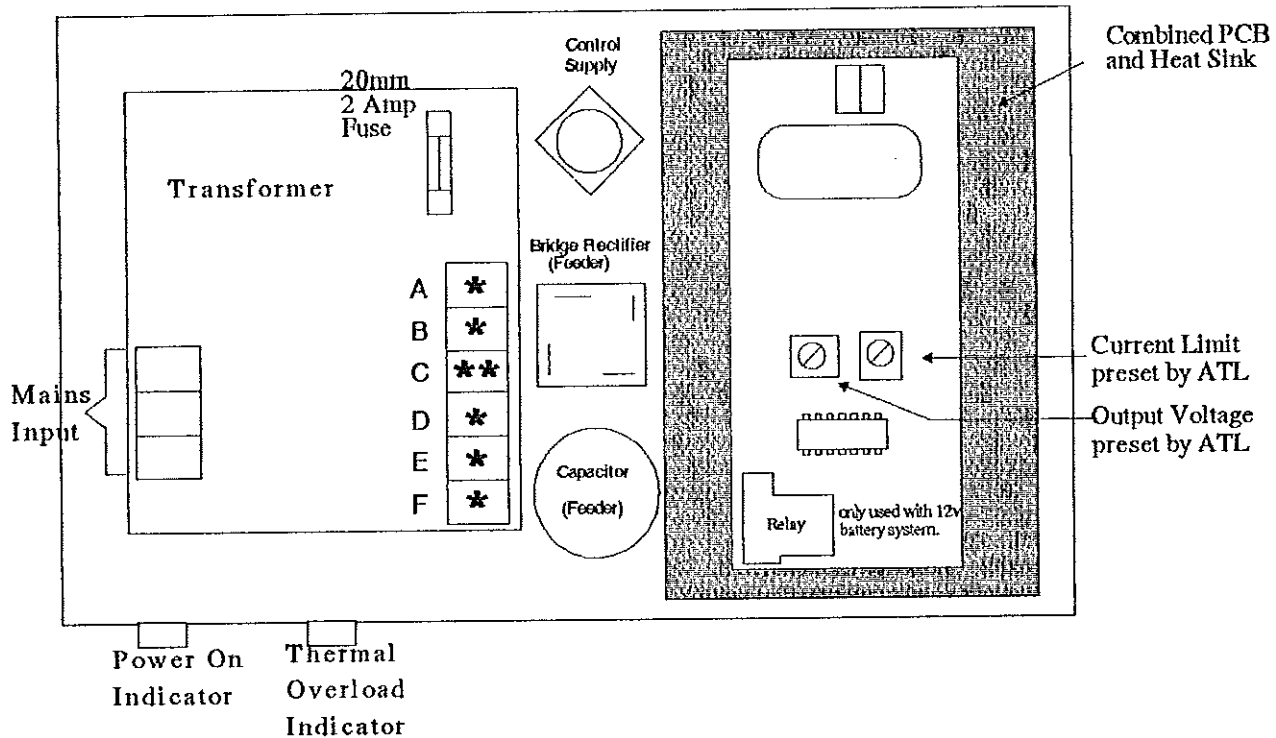


NOTE: When used in conjunction with an existing Power Supply with a DC output, connections 3 to 6 are not used. The existing Power Supply DC outputs are connected directly to the ATL Auto Control. When the existing Power Supply output is AC, then connections 5 & 6 are used for the AC input and connections 3 & 4 are used for the DC output to the ATL Auto Control.



ATL Auto Control Mk 2 Power Supply

Schematic Diagram



Connections * Normal Connections to Feed Controller

A	*	DC + to Control Supply 1.0 sq mm c.s.a.
B	*	DC - to Control Supply 1.0 sq mm c.s.a.
C	**	DC + Non Regulated Feeder Supply **
D	*	DC + Regulated Feeder Supply 2.5 sq mm c.s.a.
E	*	- Negative Feeder Supply 2.5 sq mm c.s.a.
F	*	- Negative Feeder Supply 2.5 sq mm c.s.a.

**** ALWAYS** use for vacuum systems using Fullwood Pulsetap Solenoids.
Use as STAND-by on Electric Motor Driven Feeders (i.e when a fault occurs in the regulated supply - Terminal 'D').

NOTE: Where neither an ATL Power Supply nor an ATL Control (short) Power Supply is used and an existing 12 volt DC transformer is connected directly to the ATL Auto Control, then a 0.1 microfarad capacitor MUST be fitted across the positive (+) and negative (-) terminals of the DC output from the transformer (this is supplied by ATL). It should be noted that due to certain characteristics that can occur in existing power supplies, the use of an ATL Control (short) Power Supply is strongly recommended when an existing Power Supply is being used. See separate wiring diagram.

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