Innovation In and
Out of Parlour

MM80 Milking Point Control Manual

Version - 1.0

Date - December 2018

Part Number - 39-2180

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Manual Versions

Version 1.0 - December 2018.....FirstVersion of Manual (Software v1.30)

About the MM80 Milking Point Control

The MM80 Milking Point Control is one of the most useful additions to a milking parlour, allowing the operator to save time when milking by automating the cluster removal process and allowing individual milk yields to be measured and stored (if connected to the Micro M5).

The MM80 has been designed for swingover and rotary parlours. It can be connected to the Micro M5 via a communications bus allowing milk yields, milking times, and conductivity values to be stored against individual animals. Warning flags can also be set, acknowledged and removed from animals via the flag key.

The ATL MM80 comes with the added extra of monitoring the conductivity of the milk. A flashing warning is displayed if the milk's conductivity is above a user selectable warning level, or pull off if the conductivity is above a user selectable pull off level. This extra function allows for advanced monitoring of your animals health, in a simple easy to use unit.

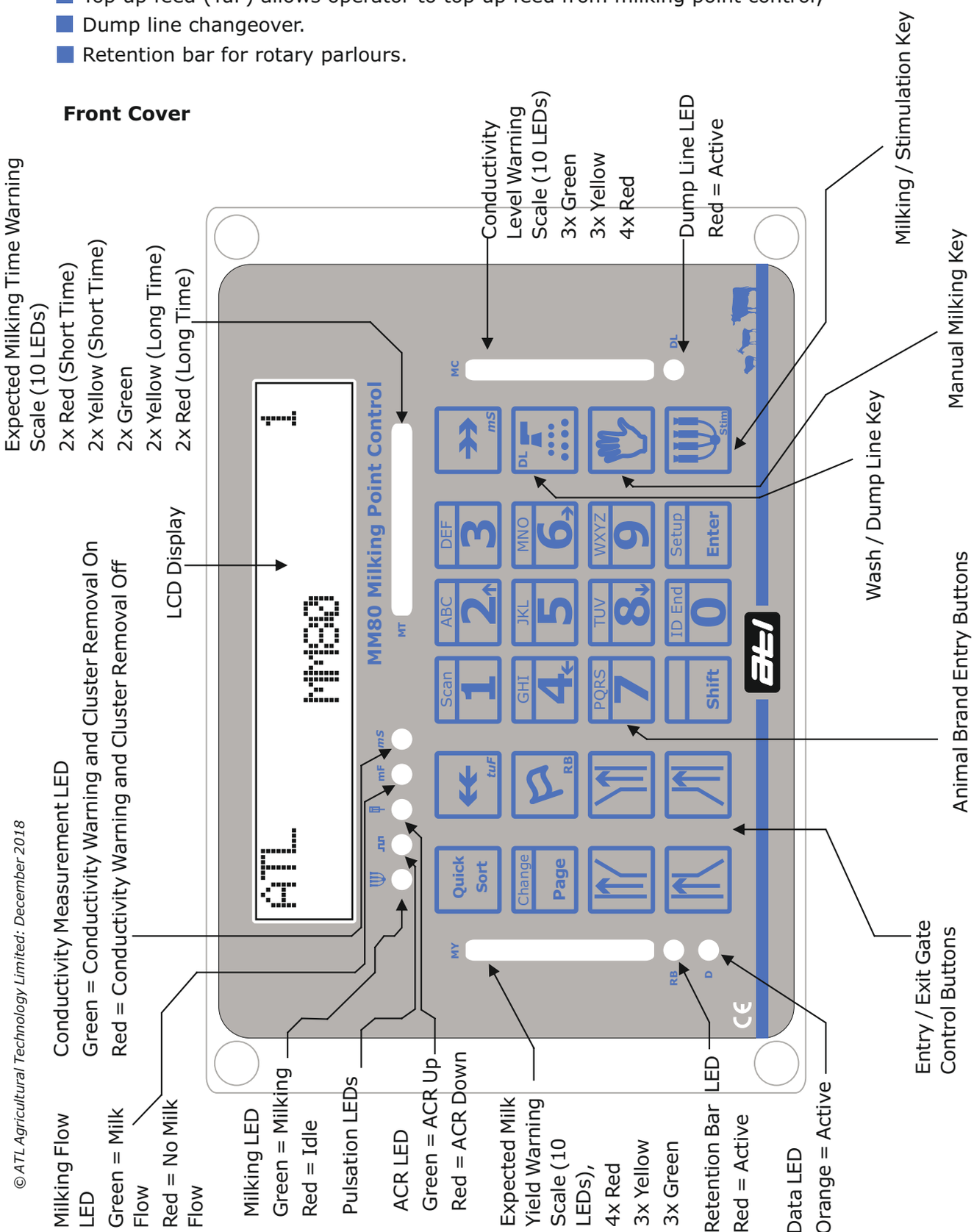
Features

- Simple numeric display of the milk yield (litres or kilos), milking time (minutes:seconds) and the milks conductivity (mS - millisiemens);
- Full Numeric Key Pad for animal entry;
- Simple, bright, graphical LCD display;
- 8 LED windows for auto milking, pulsation, ACR, milk flow, conductivity, retention bar, data and dump line;
- 3 Normal milking modes (ACR, Manual and Timed);
- 3 Additional Manual milking modes (ACR disabled, Conductivity pull off disabled, ACR and conductivity pull off disabled);
- Accurate milk yield measurement (±5%);
- Accurate milk flow measurement for ACR removal;
- Full pulsation control - 30 to 180 pulses per minute (ppm) and 35% to 75% ratios;
- Pulsation stop - pulsator only on when milking or washing;
- Stimulation pulsation with 3 stimulation modes (Automatic, Manual and disabled);
- Washing pulsation - runs pulsation at lower rate during washing to reduce liner wear;
- Automatic idle after a user selectable period of inactivity;
- User programable wash time with wash time elapsed and remaining displayed (minutes:seconds);
- User selectable conductivity warning and pull off levels;
- User selectable ACR pull off milk flow rate and time;
- Lift to start ACR input;
- Milk sweep / purge;
- Suitable for all herd / flock sizes (small or large);
- Total litres of milk measured per milking for each milk meter can be displayed and added together to easily check calibration;
- M2 communications bus - enables all Mm35 controls to be put into milk or wash from 1 control and animal data to be sent / received from Micro M5 parlour control. Data available:
    - Identifies slow milker and uses different ACR settings to prevent early removal;
    - Warns if colostrum or antibiotic milk;
    - Warns if previous milk yield lower than expected;
    - Warns if previous conductivity lower than expected;
    - Warns if milk yield lower than expected;
    - Warns if conductivity higher than expected;

Features Continued

- Warning flags can be set and acknowledged against each animal using the flag key;
- If using time-based cluster removal can change the milking time for all points from 1 milking point;
- Top up feed (TuF) allows operator to top up feed from milking point control;
- Dump line changeover.
- Retention bar for rotary parlours.

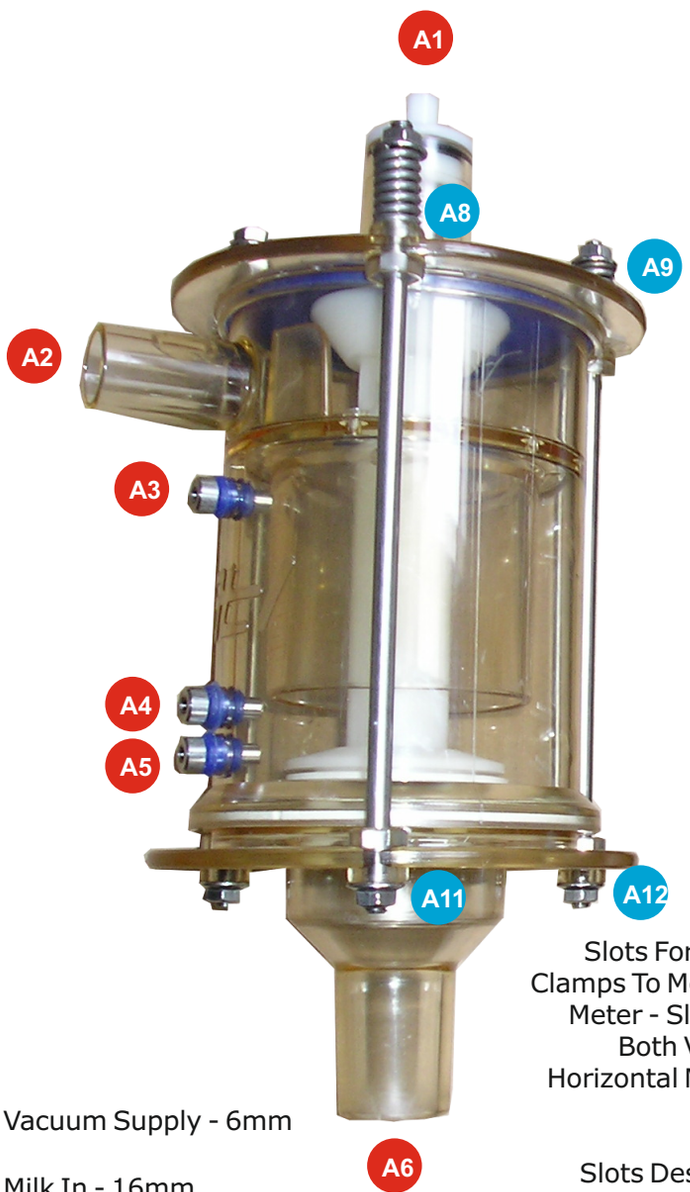
Front Cover



The Milk Meter Flask

The milk meter is despatched from ATL with the top bracket attached and milk inlet to right-hand side. Fit the milk meter onto the main bracket by releasing the M6 wing nut and slotting the top bracket onto the M6 stud. Locate the M5 flange nuts on the base of the milk meter into the 2 holes in the base of the main bracket. Make sure it is seated properly and tighten the wing nut.

NB - The milk meter flask used with sheep and goats is the same but the probe positions are different (A3, A4 and A5).

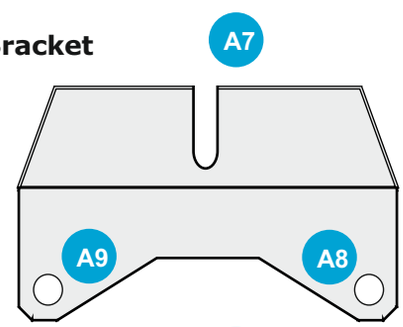


- **A1** Vacuum Supply - 6mm
- **A2** Milk In - 16mm
- **A3** Top Probe
- **A4** Bottom Probe
- **A5** Ground Probe
- **A6** Milk Out - 19mm

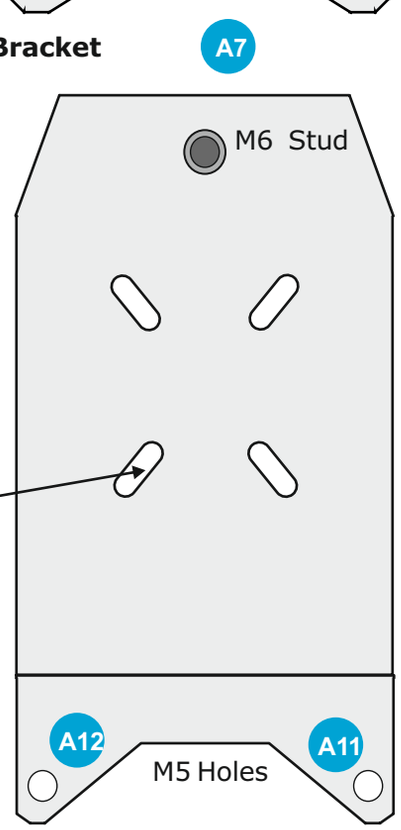
IMPORTANT

- Always install the milk meter level as the performance will be effected if not.
- The milk meter should be mounted above the milk pipe.
- Do not leave any dip in the milk out pipe - an air lock may form and performance of the milk meter may be affected if the milk meter cannot drain easily.

Top Bracket



Main Bracket



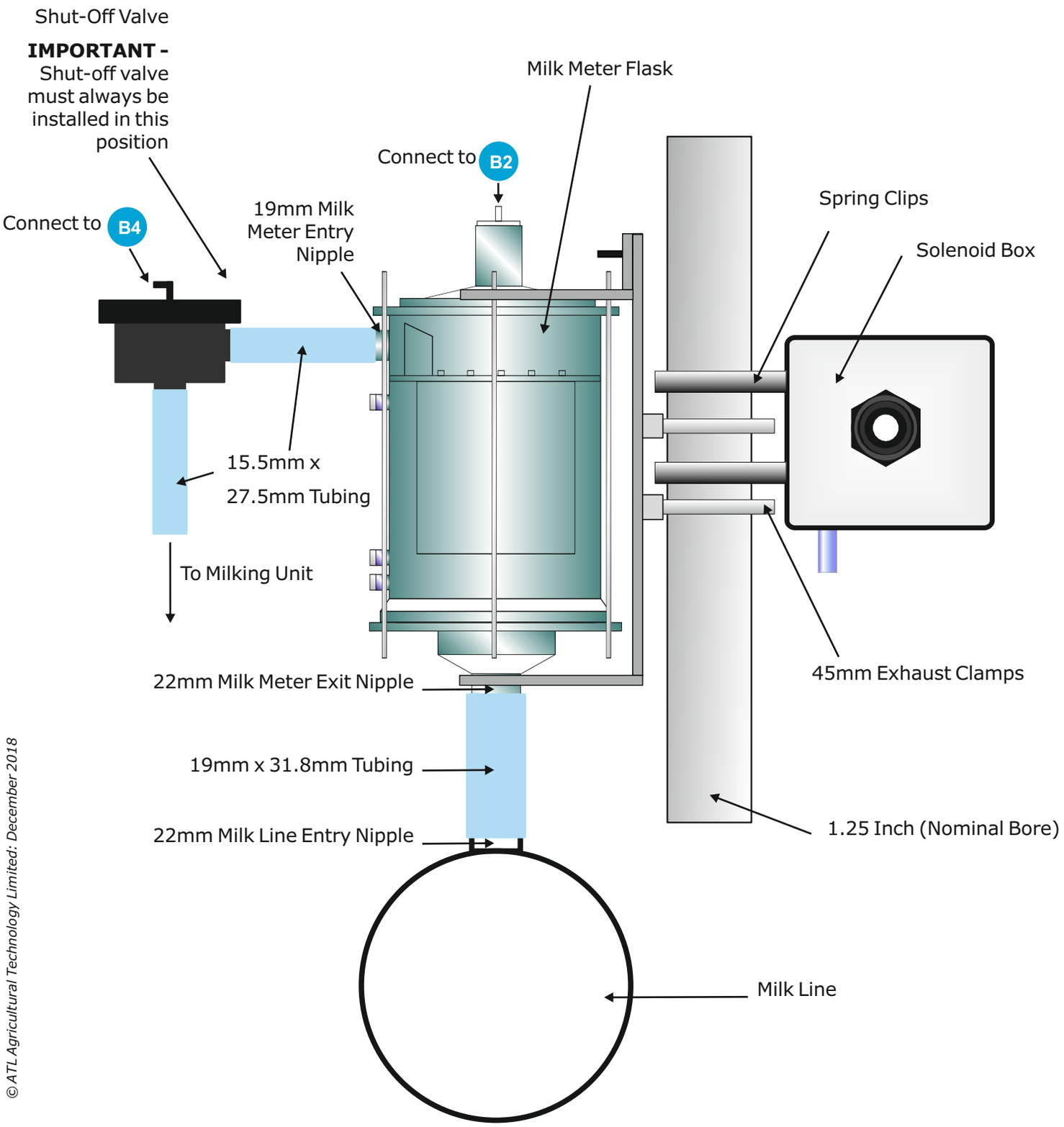
Slots For Exhaust Clamps To Mount Milk Meter - Slots Allow Both Vertical & Horizontal Mounting

Slots Designed To Accommodate 35-45mm Exhaust Clamps

ATL Supplies 45mm Exhaust Clamps As Standard - These Fix To 1.25 Inch (Nominal Bore) Tube

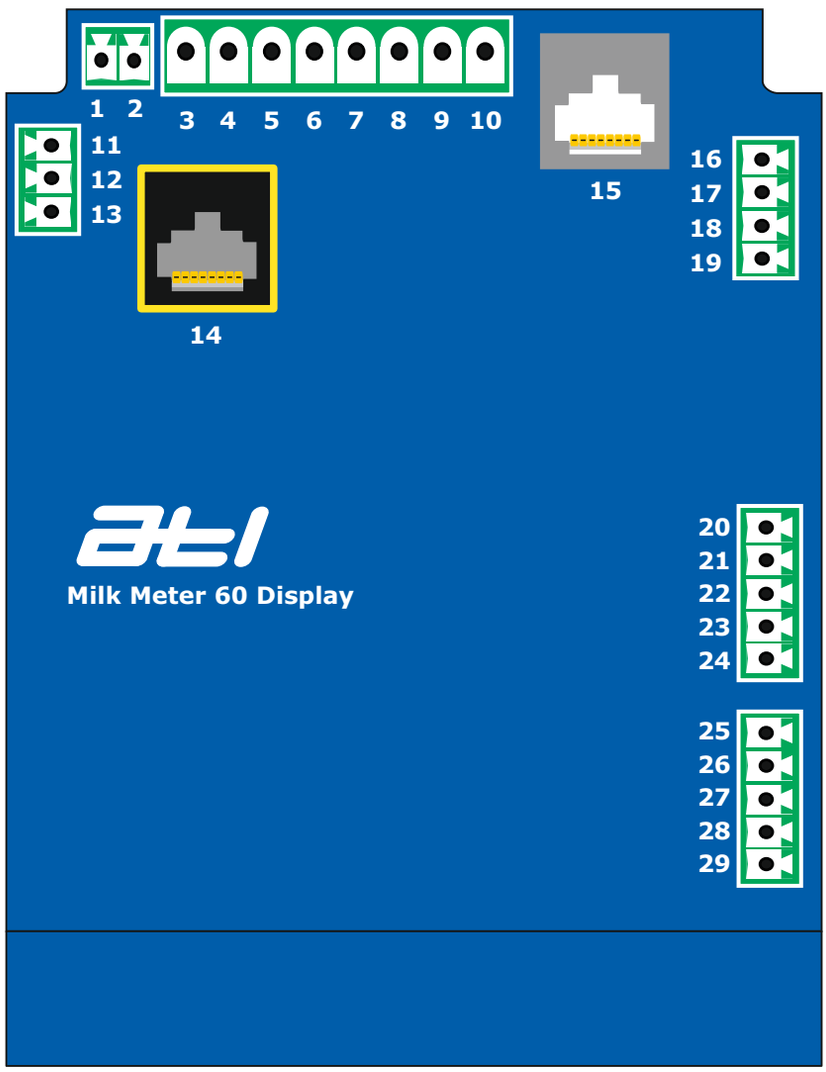
Milk Meter Flask and Solenoid Box Mounting - High Level

The milk meter and the solenoid box are mounted on the same 1.25” nominal bore tube. The diagram below shows the preferred mounting arrangement.



Milking Point Control Wiring Connections

The milking point control wiring connections are shown in the diagram and corresponding table below. The control comes with one 4 port gland. The 4 port gland can take a maximum cable OD of 6.5mm.



Number	Connects To	Cable Specification
1	Dump Line Solenoid -12vDC	Minimum 0.5mm² 0.5A cable
2	Dump Line Solenoid +12vDC	Minimum 0.5mm² 0.5A cable
3	Retention Bar Solenoid -12vDC	Minimum 0.5mm² 0.5A cable
4	Retention Bar Solenoid +12vDC	Minimum 0.5mm² 0.5A cable
5	Shut Off Valve Solenoid -12vDC	Minimum 0.5mm² 0.5A cable
6	Shut Off Valve Solenoid +12vDC	Minimum 0.5mm² 0.5A cable
7	Meter Solenoid -12vDC	Minimum 0.5mm² 0.5A cable
8	Meter Solenoid +12vDC	Minimum 0.5mm² 0.5A cable

Milking Point Control Wiring Connections Continued

Number	Connects To	Cable Specification
9	ACR Solenoid -12vDC	Minimum 0.5mm² 0.5A cable
10	ACR Solenoid +12vDC	Minimum 0.5mm² 0.5A cable
11	Pulsation Solenoid Channel 2 -12vDC	Minimum 0.5mm² 0.5A cable
12	Pulsation Solenoids +12vDC	Minimum 0.5mm² 0.5A cable
13	Pulsation Solenoid Channel 1 -12vDC	Minimum 0.5mm² 0.5A cable
14	Milk Meter System Connection Box PCB	Cat5e Yellow Cable
15	Soleniod Box PCB	Cat6a Orange Cable
16	Alternative Bottom Probe Connection	Probe Cable Red
17	Alternative Middle Probe Connection	Probe Cable Green
18	Alternative Top Probe Connection	Probe Cable White
19	Alternative Probe Screen Connection	Probe Cable Screen
20	Right Side Select Input +Ve	Minimum 0.5mm² 0.5A cable
21	Right Side Select Input -Ve	Minimum 0.5mm² 0.5A cable
22	+Ve Common for Inputs	Minimum 0.5mm² 0.5A cable
23	Left Side Select Input +Ve	Minimum 0.5mm² 0.5A cable
24	Left Side Select Input -Ve	Minimum 0.5mm² 0.5A cable
25	Start Input +Ve	Minimum 0.5mm² 0.5A cable
26	Start Input -Ve	Minimum 0.5mm² 0.5A cable
27	-Ve Common for Inputs	Minimum 0.5mm² 0.5A cable
28	Kick Input +Ve	Minimum 0.5mm² 0.5A cable
29	Kick Input -Ve	Minimum 0.5mm² 0.5A cable

IMPORTANT - DO NOT INSTALL TWO CABLES THROUGH 1 CABLE HOLE IN THE 4 PORT GLAND. THIS WILL INVALID THE WARRANTY.

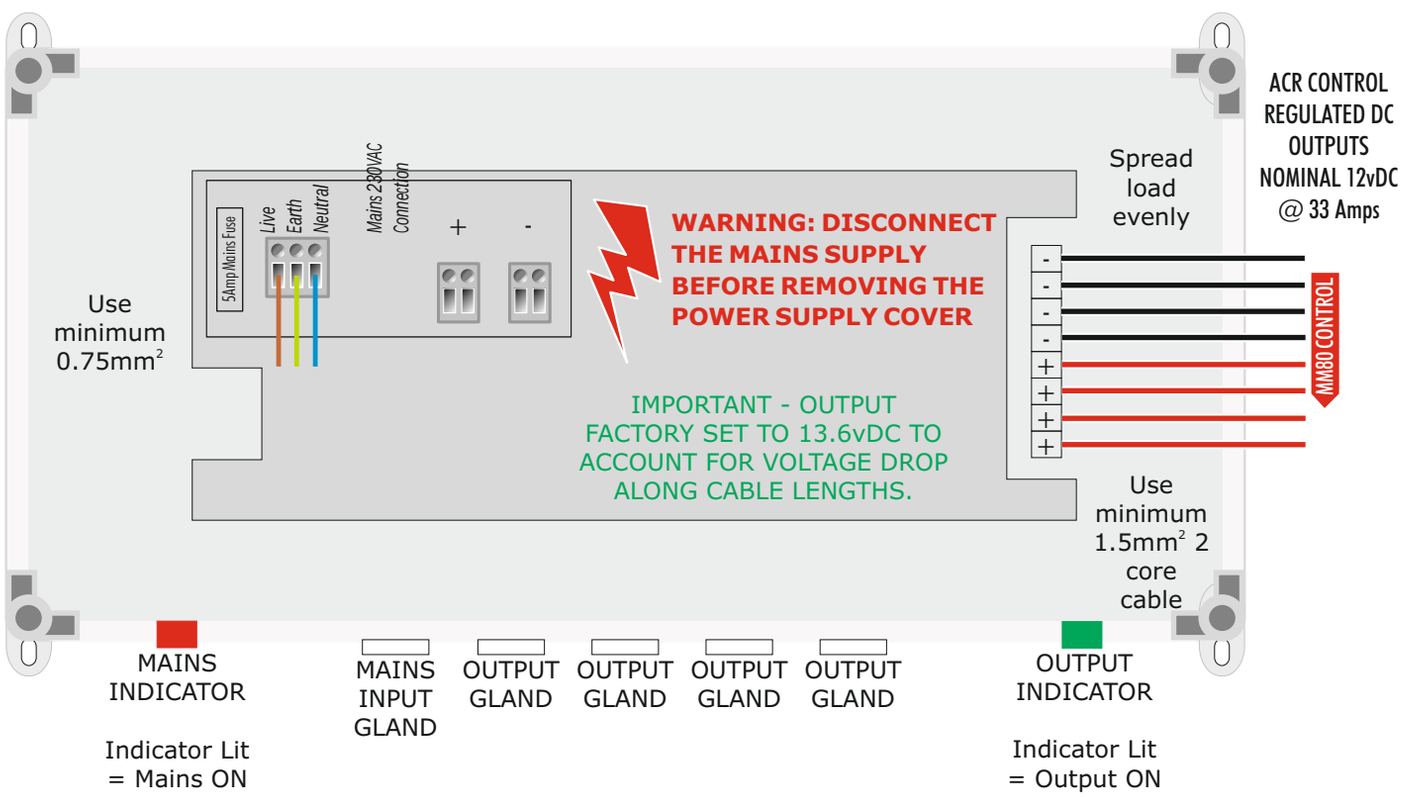
12vDC 396 Watt Power Supply Wiring Connections

- Mains Voltage: 100-240volt AC
- Output Voltage: Nominal 13.6volt DC
- Mains Fuse: 5 Amp
- Automatic Over Current Protection
- Maximum Number Of Milking Point Controls With ATL Control Valves: 24

  Maximum Number Of Milking Point Controls With ATL Control Valves & Pulsation: 15

  NB - Maximum number of MM80 controls will depend upon MM80 control valve solenoid specifications - if unsure please contact ATL.

- Ensure the loading on each power supply is as even as possible.
- Recommended ACR Solenoid Spec: 12volt DC Continuous Operation Normally Closed with power rating up to 3 watts.
- Recommend system is powered on all of the time to prevent condensation build up on electronic components.



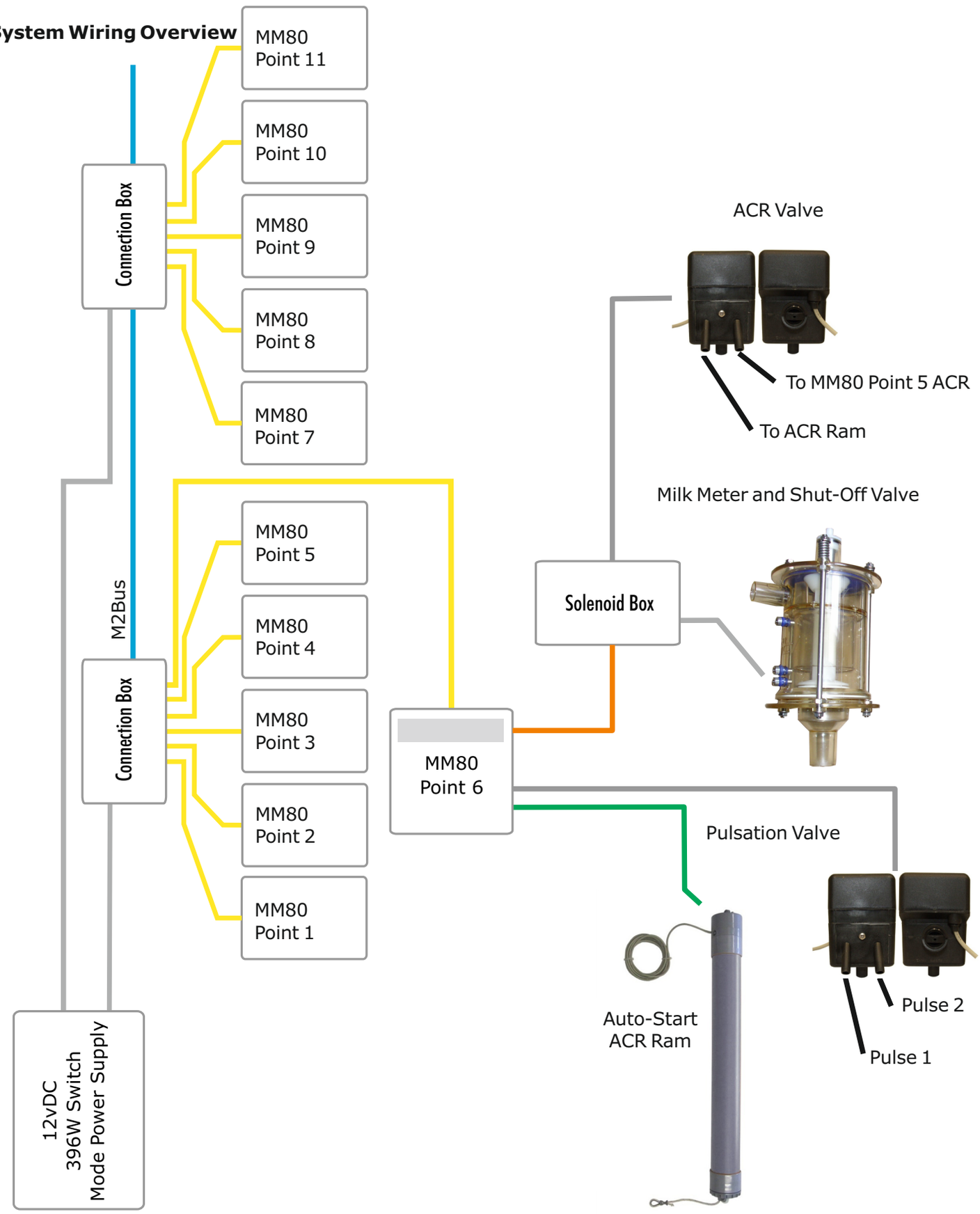
MM80 CONTROL Connect to MM80 Connection Boxes.

Output Specification: Nominal 12vDC @ 33 Amps

IMPORTANT - Use different cable for each group of 6 MM80 controls to provide for current requirements of system. This is based upon using CV20 control valve with nominal 3 watts per solenoid coil. If using existing control valve, please check wattage and reduce numbers accordingly.

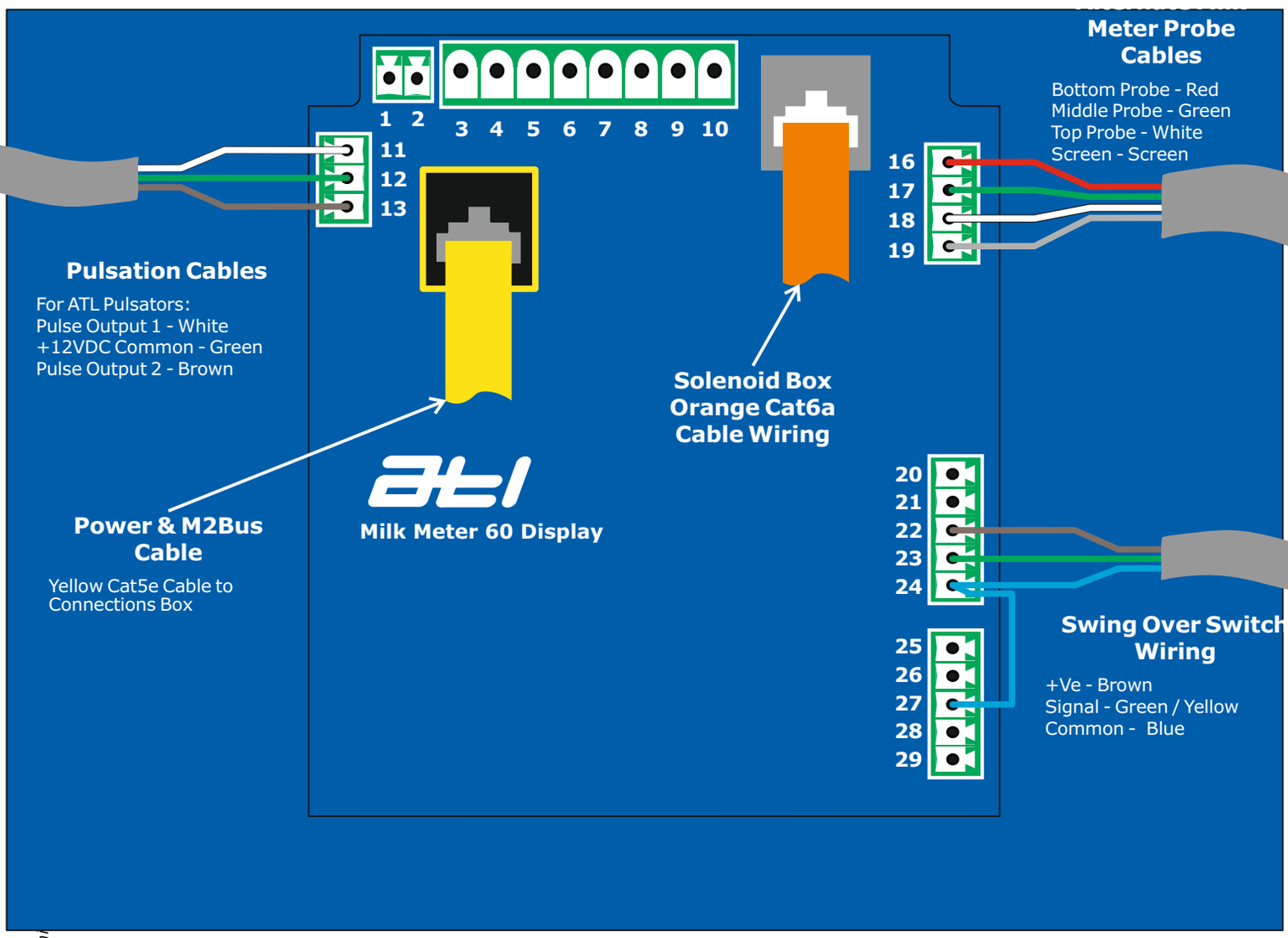
A 24vDC power supply can also be used. Please make sure all solenoids are 24vDC.

System Wiring Overview



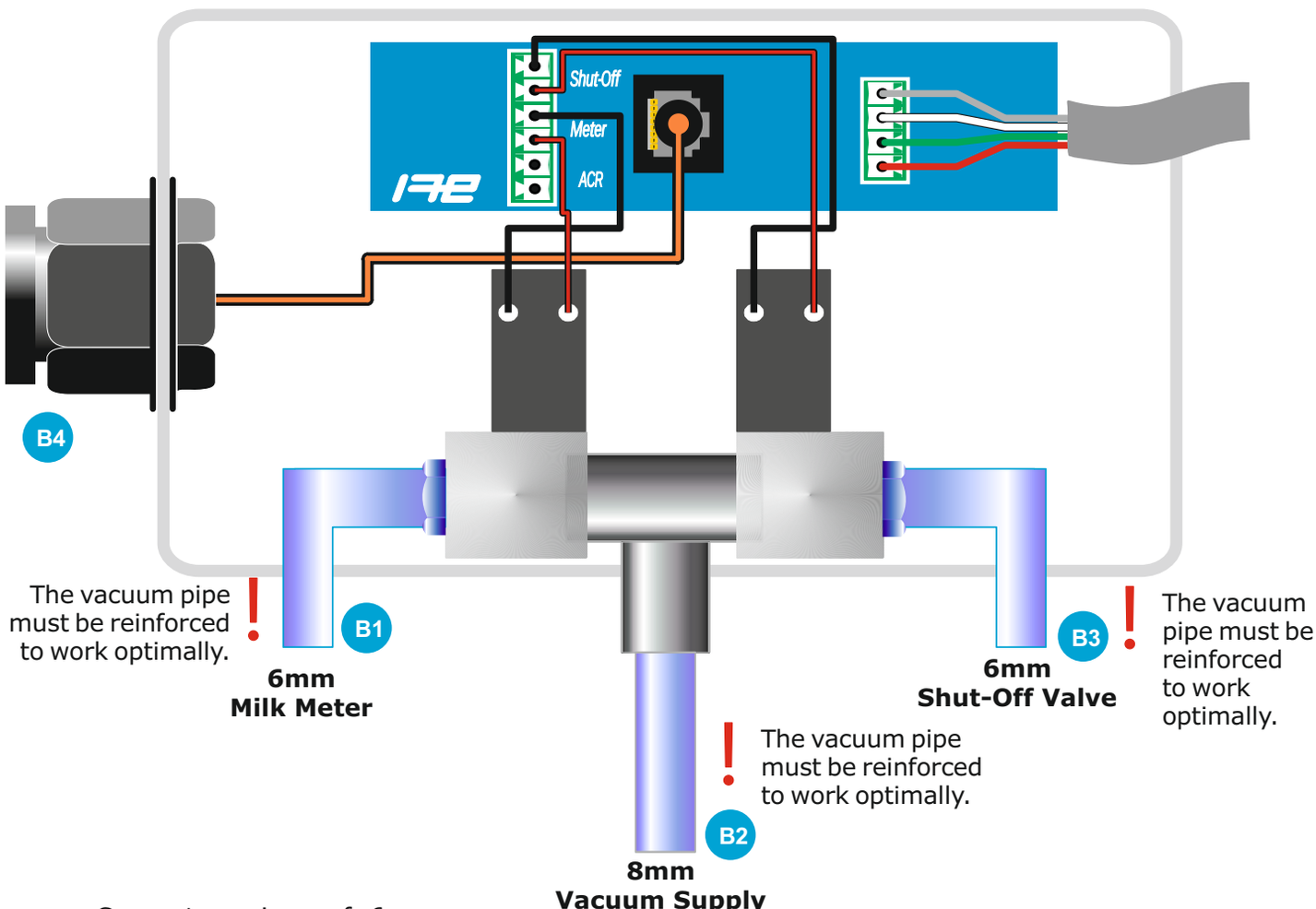
System Wiring Overview - Wire Colours

The individual wiring colours for each output / input wire are detailed below, please note, some wires are omitted as they will have different colours.



Solenoid Box Installation - For Solenoid Boxes with a PCB

The solenoid box contains two solenoids, one is used to operate the milk meter plunger, the other the shut-off valve. The box is fitted with two spring clips to enable easy installation to a 1.25 inch (nominal bore) tube. The solenoid box is delivered pre-wired.



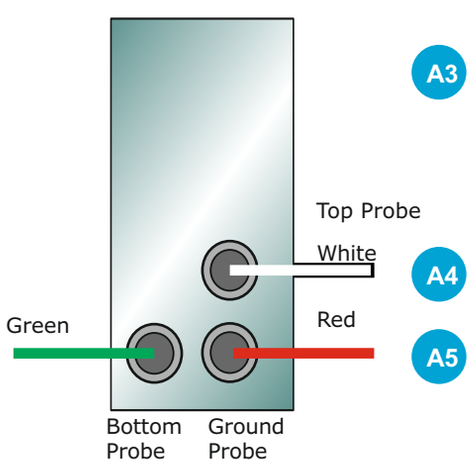
B1 Connect a piece of 6mm vacuum pipe to the milk meter (A1).

B2 Connect a piece of 8mm vacuum pipe to the vacuum source.

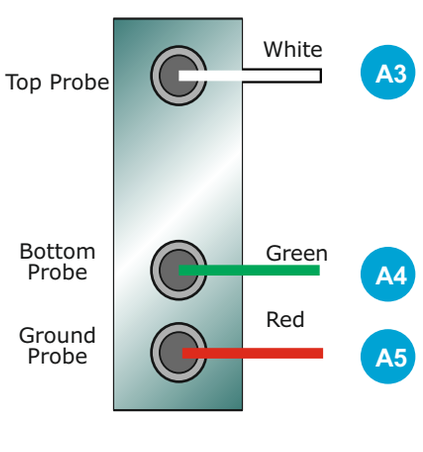
B3 Connect a piece of 6mm vacuum pipe to the shut-off valve.

B4 Connect into the milk meter display; see diagrams on page 14.

Sheep and Goats Milk Meter Sensor Connection Diagram

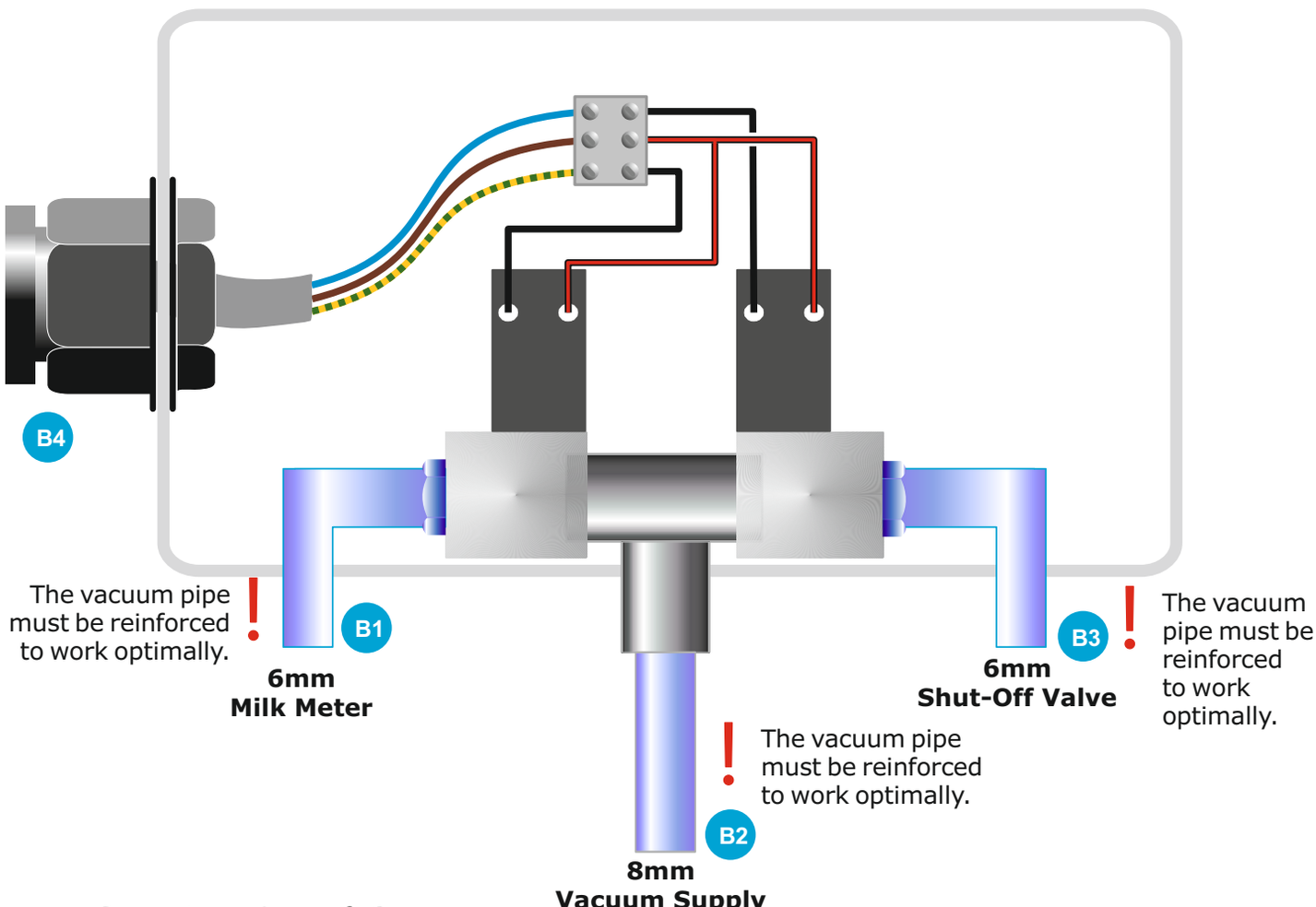


Cows Milk Meter Sensor Connection Diagram



Solenoid Box Installation - For Solenoid Boxes without a PCB

The solenoid box contains two solenoids, one is used to operate the milk meter plunger, the other the shut-off valve. The box is fitted with two spring clips to enable easy installation to a 1.25 inch (nominal bore) tube. The solenoid box is delivered pre-wired.



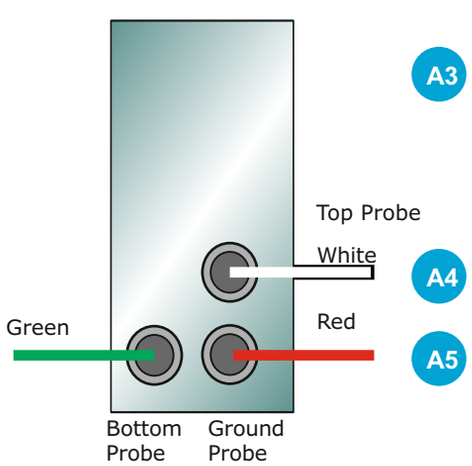
B1 Connect a piece of 6mm vacuum pipe to the milk meter (A1).

B2 Connect a piece of 8mm vacuum pipe to the vacuum source.

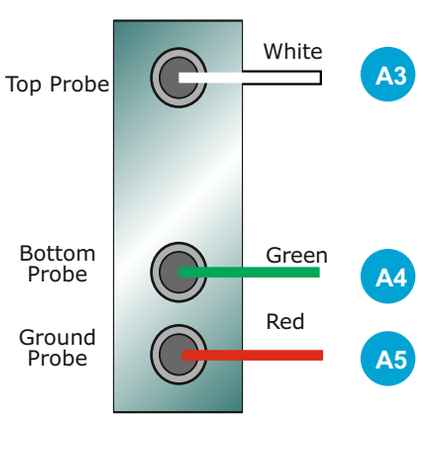
B3 Connect a piece of 6mm vacuum pipe to the shut-off valve.

B4 Connect into the milk meter display; see diagrams on page 13.

Sheep and Goats Milk Meter Sensor Connection Diagram



Cows Milk Meter Sensor Connection Diagram



Setting up the MM80 Milking Point Control

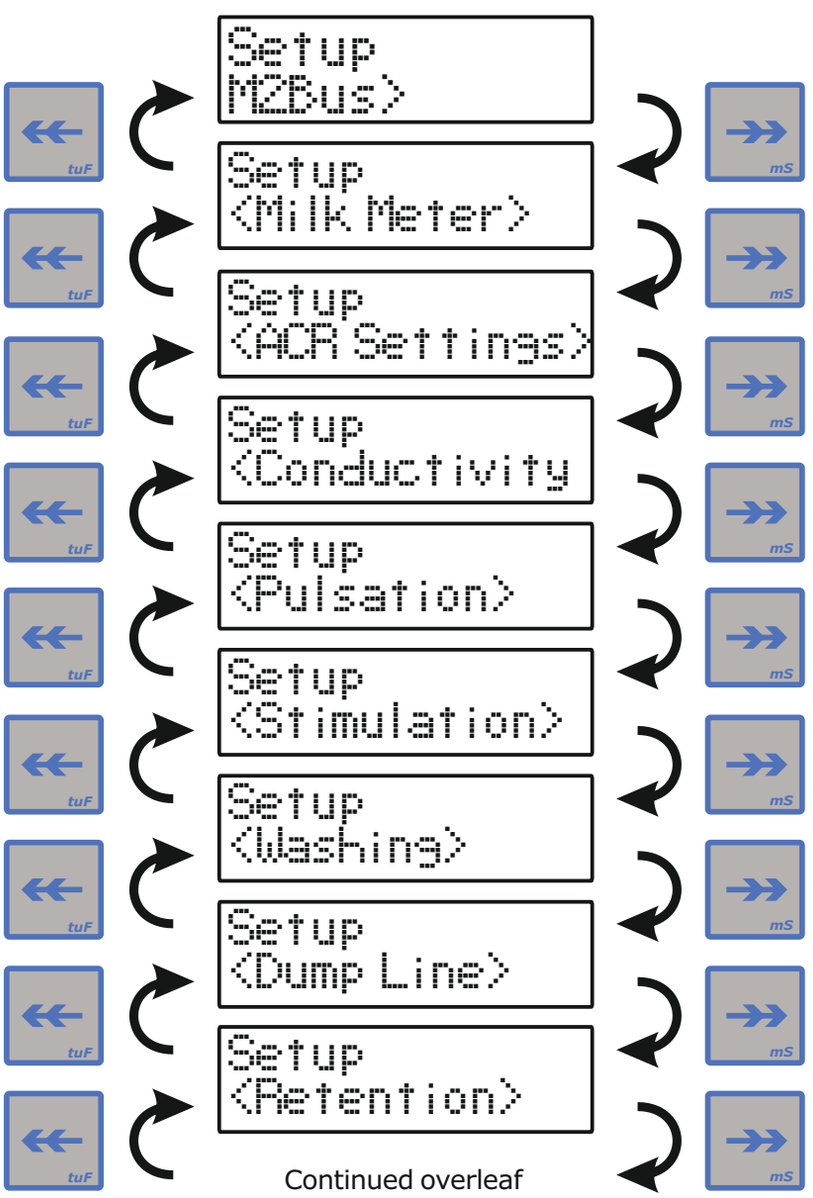
Before it can be used, the milking point control system must be setup. This is outlined in the following pages:

Accessing the Settings

Press and hold the Shift and Enter keys together.

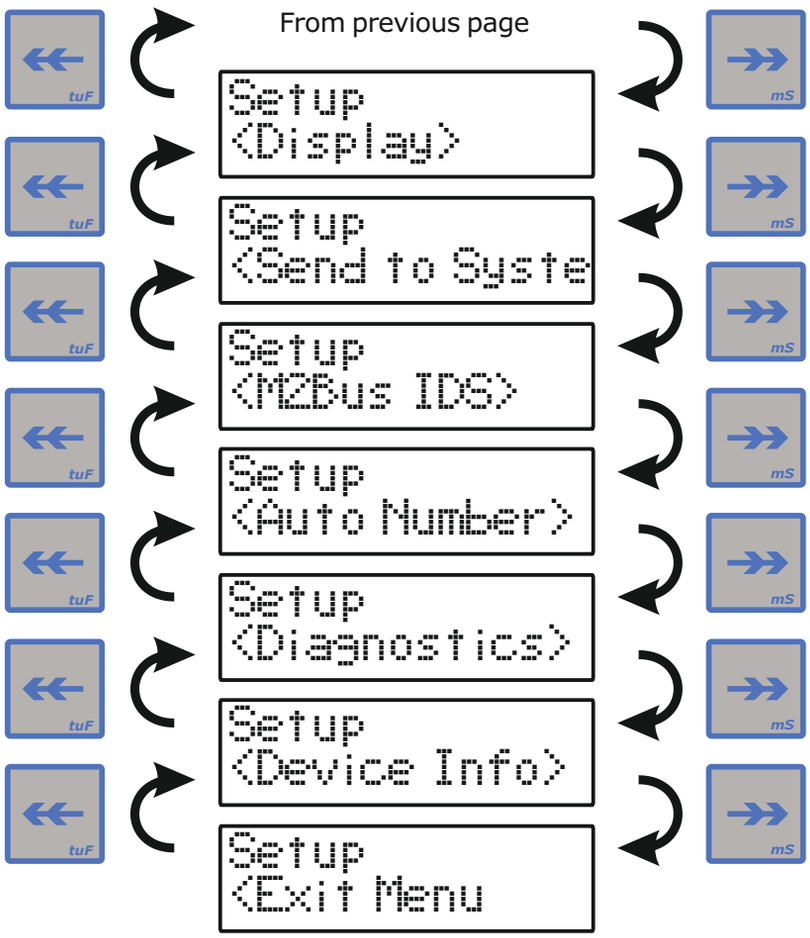
The Setup Menu

The setup menu is divided into sections, each section deals with a specific part of the control. The sections can be stepped through using the Left and Right keys, and accessed using the Wash key.



Continued overleaf

The Setup Menu Continued



Setup
Enter

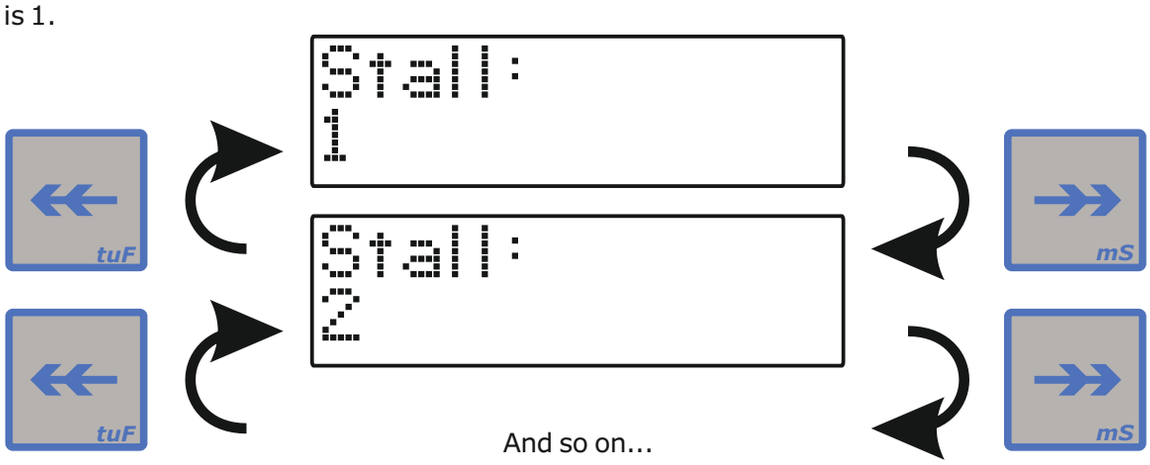
Pressing the Enter key when on a menu item will allow the user to enter the menu item.

The M2Bus Menu

The M2Bus menu contains the settings controlling the meridian 2 communications bus. There are a number of settings, each listed in the following pages.

The Stall Number Setting

The Stall number setting is the unique control address. Each control must have a different number for the communications bus to function and data to be transferred correctly. The range is 1 to 255. The factory default is 1.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

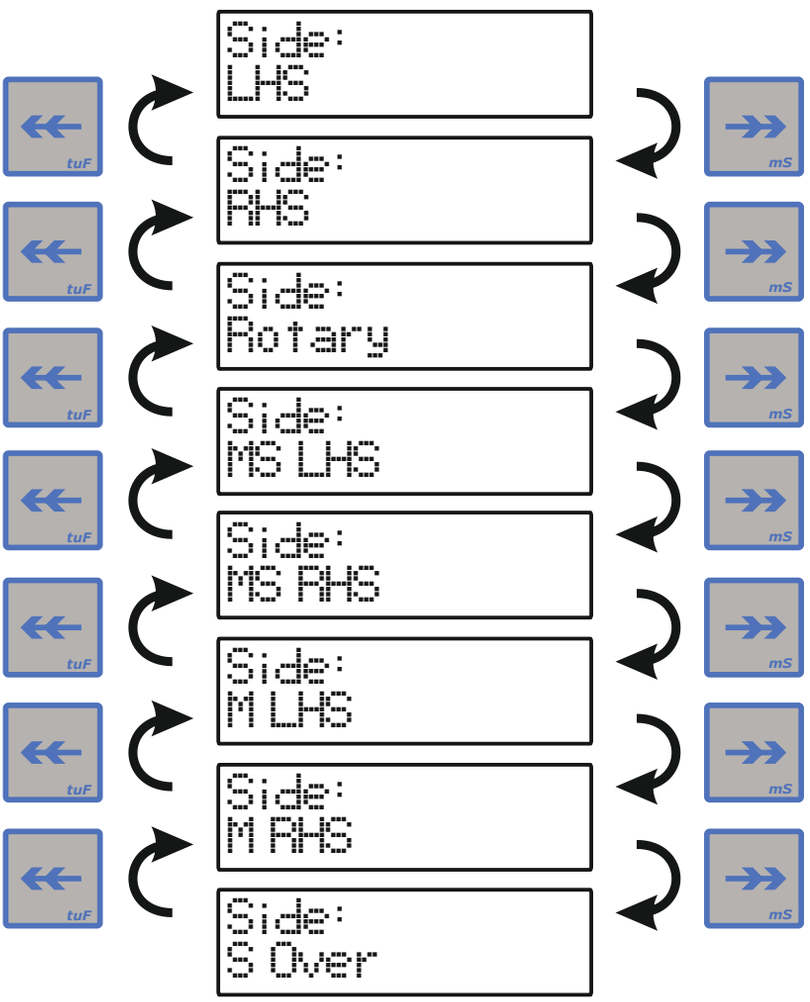
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The next menu item is now displayed.

The Parlour Type Setting

This setting selects the type of parlour the milk meter control is being installed on - doubled up, rotary, multi-stall single sided, multi-stall double sided and swingover parlours. Multi-stall allows for parlours where one milking unit is shared between 2 or 3 animal standings - this is especially popular on goat and sheep parlours. The factory default is Side LHS.



LHS: This setting is for doubled up parlours, where the control is on the Left.

RHS: This setting is for doubled up parlours, where the control is on the Right.

Rotary: This setting is for rotary parlours.

Multi-Stall Single Sided LHS: This setting is for single sided multi stall parlours, where the control is on the

Multi-Stall Single Sided RHS: This setting is for single sided multi stall parlours, where the control is on the

Multi-Stall LHS: This setting is for doubled up multi stall parlours, where the control is on the Left.

Multi-Stall RHS: This setting is for doubled up multi stall parlours, where the control is on the Right.

Swing Over: This setting is for swing over parlours, where the control changes sides.

Pressing the Enter key will save the current setting. If the setting chosen is a multi stall one, the menu will display the width setting, otherwise it will move on the the animal data enable setting.

The Stall Width Setting (Visible only when the Side setting is one of the multi stall options)

The side width setting allows the user to input the number of stalls the control will milk, the default is 2, the maximum is 3.

Press the Right key to increase the time

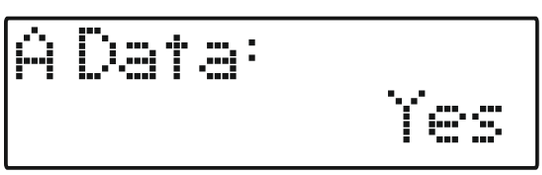
Press the Left key to decrease the time

When the correct setting is selected, press the Enter key to store the data.

The control will move on to the Animal Data setting.

The Animal Data Enable Setting

This setting allows the user to disable animal data, allowing for the control to ignore displaying animal information when none is expected.



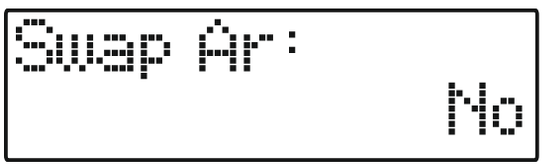
Press the Right key to enable the setting.

Press the Left key to disable the setting.

Press the Enter key to move to the swap arrows setting.

The Swap Arrows Setting

The Swap Arrows setting allows the user to swap the side the arrows display on, allowing for the MM80 display to be mounted facing backwards.



Press the Right key to enable the setting

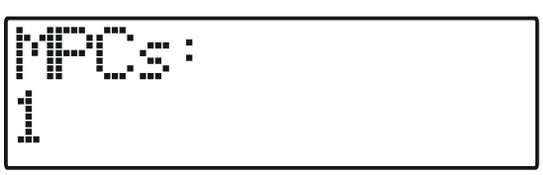
Press the Left key to disable the setting

When the correct setting is selected, press the Enter key to store the data.

The control will move on to the MPC Count setting.

The MPC Count Setting

This setting allows the control to know how many other MM80 controls are connected to the system, to allow data to be sent to other controls.



Press the Right key to increase the setting.

Press the Left key to decreasethe setting.

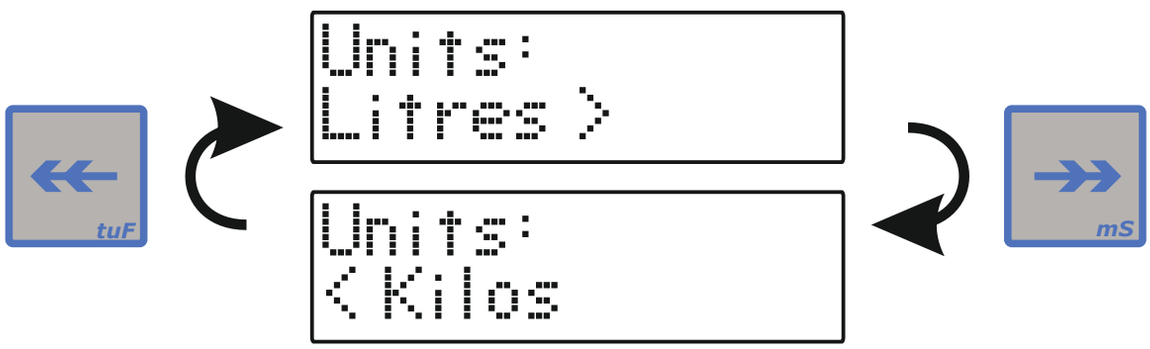
Press the Enter key to return to the main menu.

The Milk Meter Menu

The Milk Meter menu contains the settings controlling the operation of the milk meter. There are a number of settings, each listed in the following pages.

The Units Setting

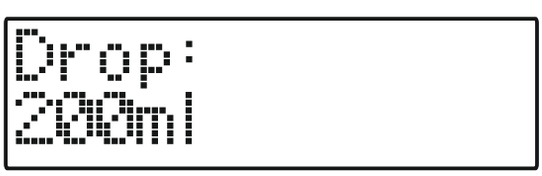
The Units setting allows the operator to choose whether the milk yield is displayed in litres or kilograms. The factory default is litres.



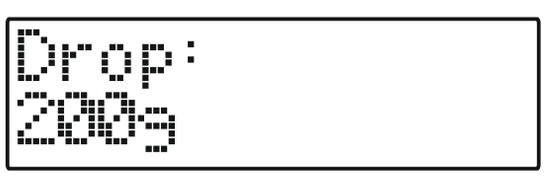
Pressing the Enter key will save the current setting and move onto the next menu item.

The Drop Setting

The drop value is the calibration setting for the milk meter 'dump' value. It is the milk meter flask chamber volume in millilitres or grams (depends upon the units setting). The range is 10ml/g to 500 ml/g. The factory default is 200ml which is for cows . For goats and sheep it should be changed to 55ml/g.



or



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

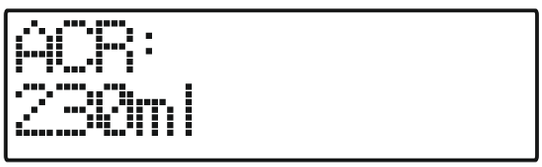
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The next menu item is now displayed.

The ACR Setting

The ACR setting controls when the ACR is activated. The ACR is only activated when the flow rate reaches or drops below this value. When this happens the end of milking procedure is initiated. It is measured in millilitres or grams per minute of milk flow (depends upon the units setting). If an animal is being over-milked, this value should be increased, and if the animal is being under-milked, it should be decreased. The range is 10ml/g per minute to 500ml/g per minute. The factory default is 230ml/g per minute = cows - change to 180ml/g per minute for goats and sheep.



or

Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

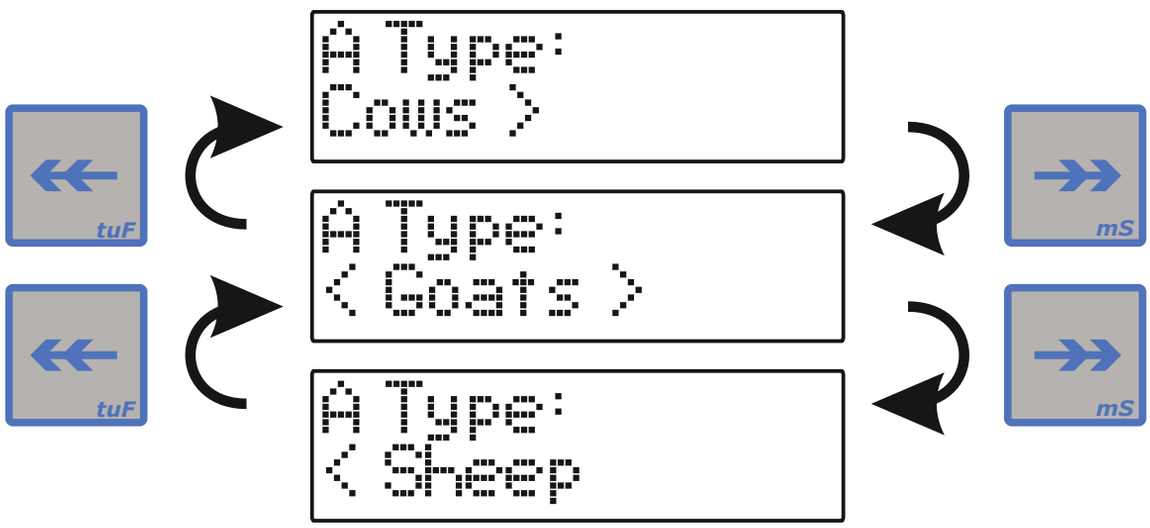
The main setup menu is now displayed.

The ACR Settings Menu

The ACR settings menu contains the settings for how the control will function as an ACR. There are a number of settings, each listed in the following pages;

The Animal Type Setting

The Animal Type setting selects the type of animal being milked using the control and changes the nomenclature displayed accordingly. Pressing the Right key will step through the available animal types, pressing the Left key will step back. Pressing the Milk key will save the animal type and move onto the next setting. The factory default is cows.



Pressing the Enter key will save the current setting and move onto the next menu item.

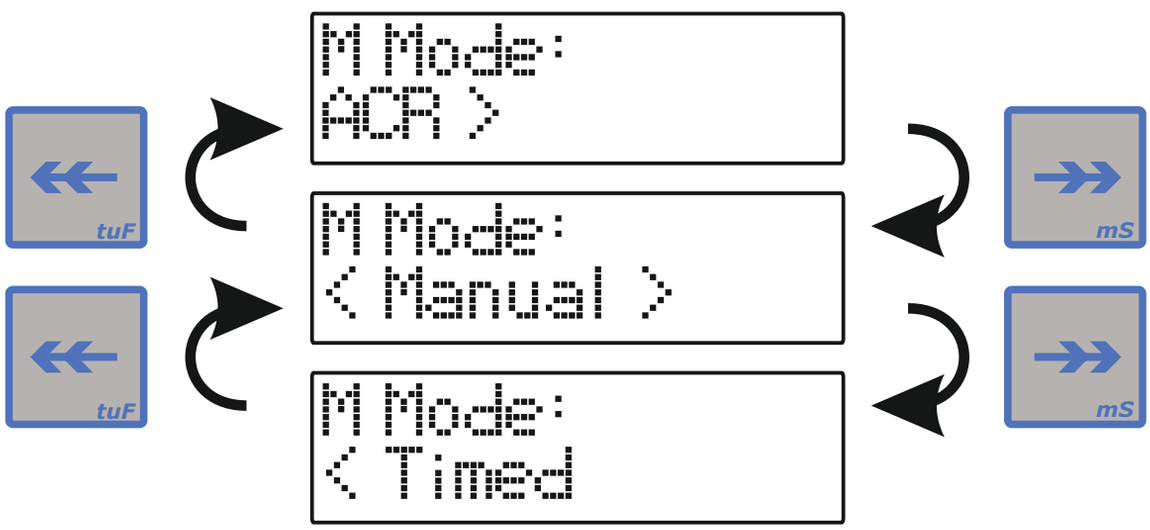
The ACR Mode Setting

The ACR Mode setting controls how the milking point control will function when milking an animal. There are three modes available, these are; ACR, Manual and Timed. Pressing the Right key will step through the available configurations, pressing the Left key will step back. Pressing the Milk key will save the setting and move onto the next setting.

ACR Mode - Uses the milk flow and automatically removes the milking unit when the flow rate drops below a certain flow (ml/minute or g/minute - milk meter - or resistance - cluster remover).

Manual Mode - Operator starts and stops the milking via pressing keys on the control unit. Milk flow rate is ignored throughout.

Timed Mode - Milking for preset length of time. Units can then be allowed to drop off (sheep/goats) or automatically removed using ACR cylinder. Flow rate is ignored throughout.



Pressing the Enter key will save the current setting and move onto the next menu item.

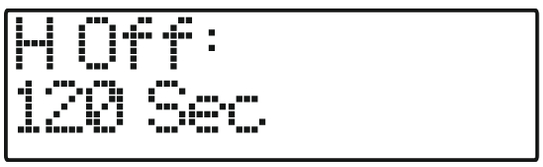
If the milking mode selected is ACR, the ACR hold off setting will be shown next.

If the milking mode selected is Manual, the vacuum delay setting will be shown next.

If the milking mode selected is Timed, the milking time setting will be shown next.

The ACR Hold Off Delay Setting (Visible only when the Milking Mode is ACR)

The ACR hold off setting lets the user specify the length of time before the ACR becomes active after the start of milking. The range is from 10 seconds to 240 seconds. The factory default is 120 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The kick off delay setting is now displayed.

The Kick Off Delay Setting (Visible only when the Milking Mode is ACR)

The kick off delay setting lets the user specify the length of time after the ACR hold off delay has passed, that if an ACR take off occurs, the control will give a kick off alert. The range is from 0 seconds to 999 seconds.

The factory default is 0 seconds.

Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Wash key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The ACR pull off resistance setting is now displayed.

The Milk Sensing Resistance Setting

The Milking Sensing Resistance setting lets the user specify the resistance the milk has to be before a 'dump' of the milk meter is triggered. This enables exact trigger point to be set and can be helpful if milk is very frothy. The range is from 25 ohms to 999 ohms. The factory default is 750 ohms.

Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

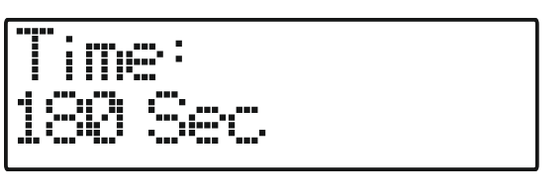
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The vacuum delay function is now displayed.

The Milking Time Setting (Visible only when the Milking Mode is Timed)

The milking time setting lets the user specify the length of time the animal will be milking for in timed mode. The range is 10 seconds to 900 seconds. The factory default is 180 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

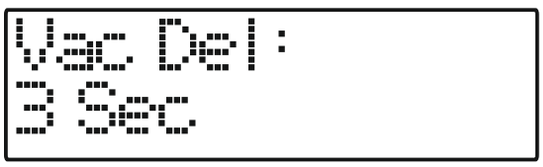
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The vacuum delay setting is now displayed.

The Vacuum Delay Setting

The vacuum delay setting allows the user to set a delay between the operation of the shut-off valve closing to shut off the vacuum and the ACR ram operating. It should be set to a value that ensures that as the shut-off valve operates at the end of milking, the vacuum delays to a point where the cluster is just about to fall before the ACR ram operates. The range is from 1 second to 10 seconds. The factory default is 3 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The purge function is now displayed.

The Purge Setting

The purge setting is a YES / NO setting. When the ACR ram operates, setting the purge to YES makes the shut-off valve momentarily open to purge any milk residues into the milk line. The factory default is YES.

Press the Right key to enable the setting.

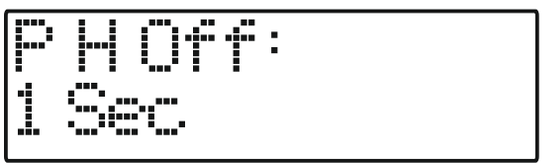
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

If the purge setting is enabled, the purge hold off function is now displayed, otherwise, the ACR settings main menu is displayed.

The Purge Hold Off Setting (Visible only when the Purge is Yes)

It allows a delay to be set between the ACR operating and the purge activating. It is for installations with flushing systems. The range is from 1 seconds to 60 seconds. The factory default is 1 second.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

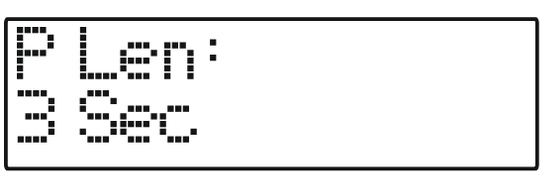
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The purge length setting is now displayed.

The Purge Length Setting (Visible only when the Purge is Yes)

This setting controls the length of the purge. Default is 3 Seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

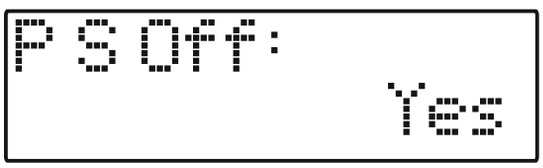
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The purge shut off setting is now displayed.

The Purge ShutOff Setting (Visible only when the Purge is Yes)

This setting allows the user to disable the opening of the shut off valve when purging to stop opening the cluster to atmosphere.



Press the Right key to enable the setting.

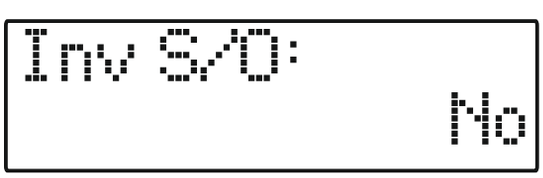
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The Invert Shut Off Output setting is now displayed.

The Invert Shut Off Output Setting

This setting allows the user to invert the output of the shut off valve.



Press the Right key to enable the setting.

Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The purge shut off setting is now displayed.

The Start Input Is Edge Setting

The start input is edge setting is a YES / NO setting. This setting selects between the start input being a pulse (low to high - YES) or an edge trigger (NO). The factory default is NO .

Press the Right key to enable the setting.

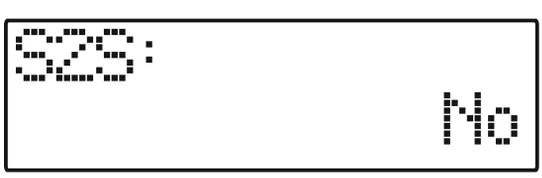
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The ACR Swing to Start menu is now displayed.

The ACR Swing to Start Setting (Visible only when the Side setting is Swing Over)

This setting enables to meter to start automatically when the swingarm is swung to change sides. It requires a swingover switch to function and can be used on both stand-alone and systems connected to a Micro. The factory default is NO.



Press the Right key to enable the setting.

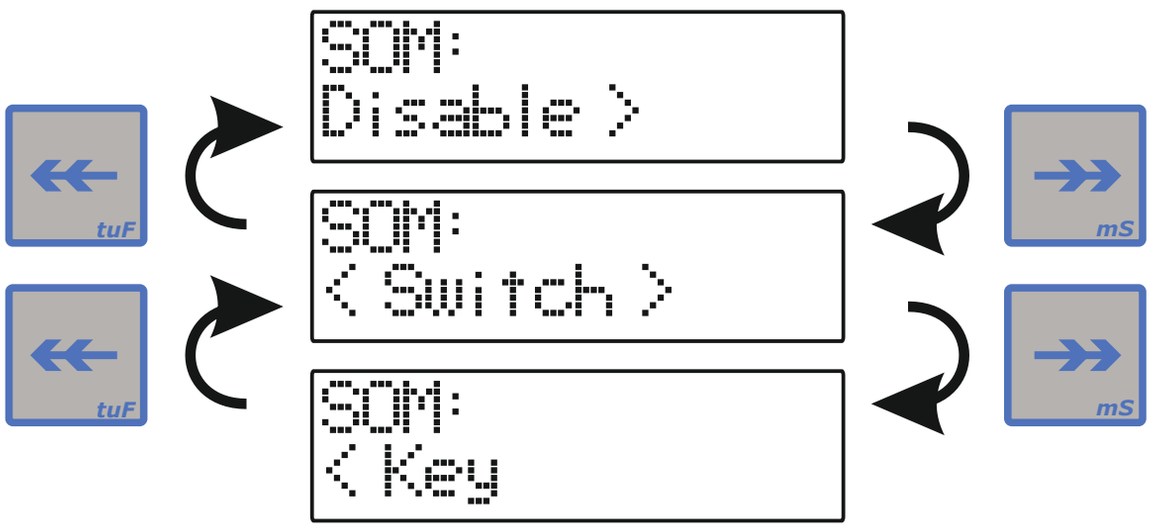
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The Swing Over Mode setting is now display.

The Swing Over Mode Setting

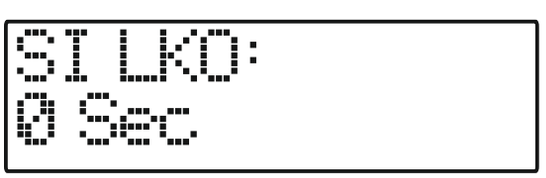
This setting allows the user to select the control of the swing over function, the function can be controlled by the switch input, keys or disabled entirely. The default setting is Switch.



When the correct setting is selected, press the Enter key to store the data. The Start Input Lockout setting is now displayed.

The Start Input Lockout Setting

This setting controls the length of the lockout of the start input after the ACR is activated, the setting allows the control to ignore start triggers from systems with very light weight clusters. Default is 0 Seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The ACR Setting main menu item is now displayed.

The Conductivity Settings Menu

The Conductivity settings menu contains the settings for how the conductivity functions on the control will function. There are 3 settings, each listed in the following pages;

The Conductivity Global Enable Setting

The conductivity global enable setting is a YES / NO setting, this setting enables or disables the conductivity features of the control. The factory default is YES.

Press the Right key to enable the setting.

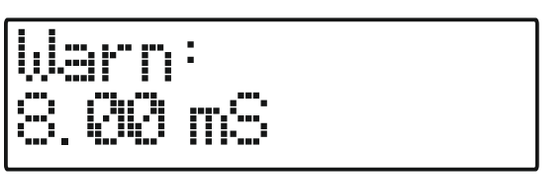
Press the Left key to diable the setting.

When the correct setting is selected, press the Enter key to store the data.

If conductivity is enabled the conductivity warning level function is now displayed, otherwise the conductivity main menu item is displayed.

The Conductivity Warning Level Setting (Visible only when the Conductivity is Yes)

The conductivity warning level setting is the conductivity level whereby the conductivity warning scale LEDs will flash . The range is from 2 millisiemens to 20 millisiemens. The factory default is 8.0 millisiemens.



Press the Right key to increase the value in tenths

Hold the Right key to increase in whole units.

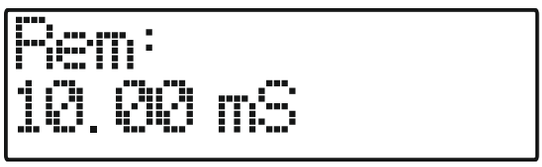
Press the Left key to decrease the value in tenths

Hold the Left key to decrease in whole units.

When the correct setting is selected, press the Enter key to store the data.
The conductivity pull off function is now displayed.

The Conductivity Pull Off Level Setting (Visible only when the Conductivity is Yes)

The conductivity pull off level setting allows the user to set the conductivity level at which the ACR activates and the cluster is removed from the animal. The range is from 2 millisiemens to 20 millisiemens. The factory default is 10 millisiemens.



Press the Right key to increase the value in tenths 

Hold the Right key to increase in whole units.

Press the Left key to decrease the value in tenths 

Hold the Left key to decrease in whole units.

When the correct setting is selected, press the Enter key to store the data.

The conductivity main menu item is now displayed.

The Pulsation Settings Menu

The Pulsation settings menu contains the settings for how the pulsation outputs function on the control. There are a number of settings, each listed in the following pages.

The Pulsation Global Enable Setting

The pulsation global enable setting is a YES / NO setting, this setting enables or disables the pulsation features of the control. The factory default is YES.

Press the Right key to enable the setting.

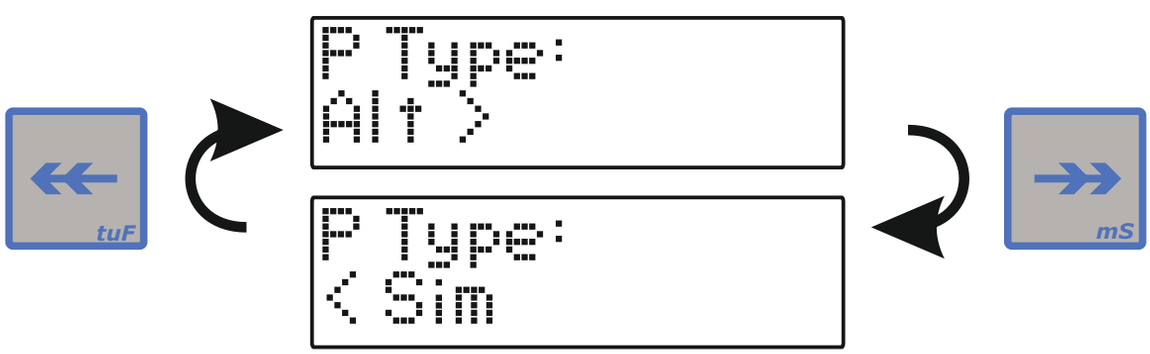
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

If pulsation is enabled, the pulsation type function is now displayed, otherwise the pulsation main menu item is displayed.

The Pulsation Type Setting (Visible only when Pulsation is Yes)

The pulsation type setting allows the control to be set to alternate or simultaneous pulsation. The factory default is alternate. Press either the Right or Left keys to toggle between the two modes.



When the correct setting is selected, press the Enter key to store the data.

The pulsation output invert function is now displayed.

The Pulsation Output Invert Setting (Visible only when Pulsation is Yes)

The pulsation output invert setting is a YES / NO setting. This setting will invert the outputs for pulsators which function in reverse. The factory default is NO.

Press the Right key to enable the setting.

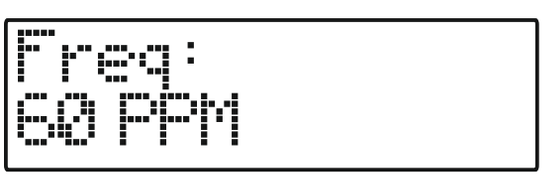
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The pulsation frequency function is now displayed.

The Pulsation Frequency Setting (Visible only when Pulsation is Yes)

The pulsation frequency setting controls the frequency of the pulsation during milking. The range is 30 to 180 pulses per minute. The factory default is 60 pulses per minute.



Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The pulsation ratio fo channel 1 is now displayed.

The Pulsation Ratio 1 Setting (Visible only when Pulsation is Yes)

The pulsation ratio 1 setting controls the ratio of channel 1's on time as a percentage of the total time. The factory default is 60 percent on.

Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

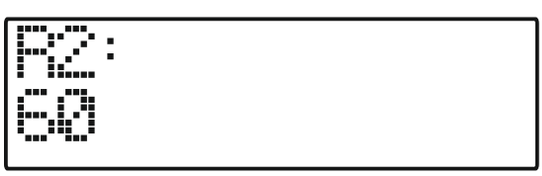
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The pulsation ratio for channel 2 is now displayed.

The Pulsation Ratio 2 Setting (Visible only when Pulsation is Yes)

The pulsation ratio 2 setting controls the ratio of channel 2's on time as a percentage of the total time. The factory default is 60 percent on.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash pulsation frequency is now displayed.

The Wash Pulsation Enable Setting (Visible only when Pulsation is Yes)

This setting enables or disabled the pulsation during the wash routine.

Press the Right key to enable the setting.

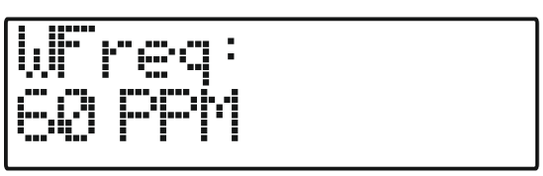
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The wash pulsation frequency is now displayed.

The Wash Pulsation Frequency Setting (Visible only when Wash Pulsation is Yes)

The wash pulsation frequency setting controls the frequency of the pulsation when washing. The factory default is 60 pulses per minute.



Press the Right key to increase the frequency

Hold the Right key to increase in 10s

Press the Left key to decrease the frequency

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash pulsation channel 1 ratio is now displayed.

The Wash Pulsation Ratio 1 Setting (Visible only when Wash Pulsation is Yes)

The wash pulsation ratio 1 setting controls the ratio of channel 1's on time as a percentage of the total time during washing. The factory default is 60 percent on.

Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

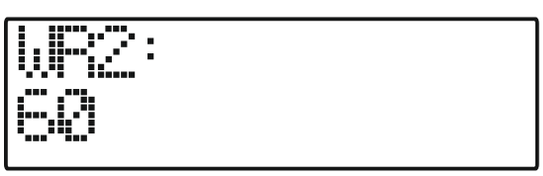
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash pulsation ration 2 setting is now displayed.

The Wash Pulsation Ratio 2 Setting (Visible only when Wash Pulsation is Yes)

The wash pulsation ratio 2 setting controls the ratio of channel 2's on time as a percentage of the total time during washing. The factory default is 60 percent on.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The pulsation main menu item is now displayed.

The Stimulation Settings Menu

The Stimulation settings menu contains the settings for the stimulation function on the control. There are a number of settings, each listed in the following pages.

The Stimulation Global Enable Setting

The stimulation global enable setting is a YES / NO setting, this setting enables or disables the stimulation features of the control. The factory default is NO.

Press the Right key to enable the setting.

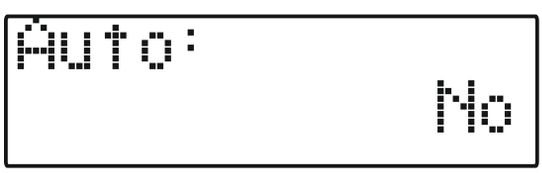
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

If stimulation is enabled, the automatic stimulation setting is now displayed, otherwise, the stimulation main menu item is displayed.

The Automatic Stimulation Enable Setting (Visible only when Stimulation is Yes)

The automatic stimulation enable setting is a YES / NO setting, this setting enables or disables the automatic stimulation function of the control. The factory default is NO.



Press the Right key to enable the setting.

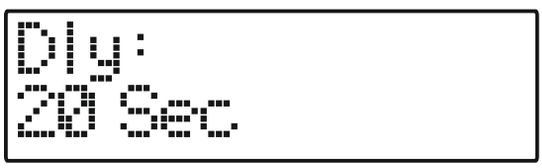
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The automatic stimulation initial delay function is now displayed.

The Automatic Stimulation Initial Delay Setting (Visible only when Stimulation is Yes)

The automatic stimulation initial delay setting controls the delay before stimulating the animal to produce milk. The factory default is 20 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

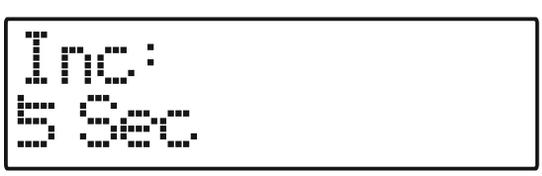
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The stimulation increment interval is now displayed.

The Stimulation Increment Interval Setting (Visible only when Stimulation is Yes)

The stimulation increment interval setting controls the time taken to increase the normal milking pulsation frequency and ratios to the stimulation frequency and ratios. The factory default is 5 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

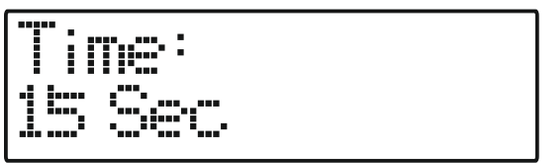
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The stimulation time setting is now displayed.

The Stimulation Time Setting (Visible only when Stimulation is Yes)

The stimulation time setting controls the length of stimulation for the animal. The factory default is 15 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10

Press the Left key to decrease the time

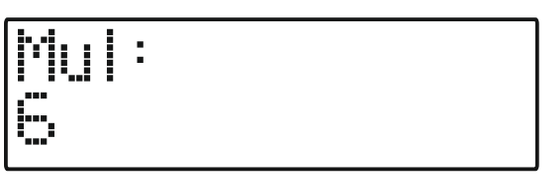
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The stimulation maximum multiplier is now displayed.

The Stimulation Maximum Multiplier Setting (Visible only when Stimulation is Yes)

The stimulation maximum mulitipler setting controls maximum length of stimulation when the user lengthens the stimulation manually by holding the milk key when stimulation is enabled, for example if this is 6, the maximum time stimulation can occur for is 6 times the stimulation time. The factory default is 6 .



Press the Right key to increase the time

Hold the Right key to increase in 10

Press the Left key to decrease the time

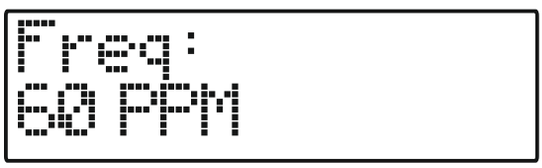
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The stimulation frequency is now displayed.

The Stimulation Pulsation Frequency Setting (Visible only when Stimulation is Yes)

The stimulation pulsation frequency setting controls the frequency of the pulsation during the stimulation of the animal. The factory default is 60 pulses per minute. This cannot be lower than the pulsation frequency.



Press the Right key to increase the value 

Hold the Right key to increase in 10s

Press the Left key to decrease the value 

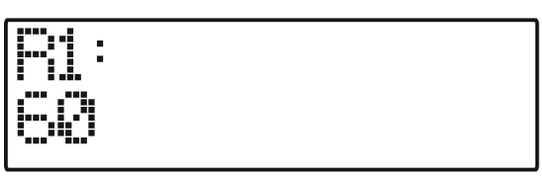
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data. 

The stimulation pulsation ratio 1 is now displayed.

The Stimulation Pulsation Ratio 1 Setting (Visible only when Stimulation is Yes)

The stimulation pulsation ratio 1 setting controls the ratio of channel 1's on time as a percentage of the total time when stimulating. The factory default is 60 percent on.



Press the Right key to increase the time 

Hold the Right key to increase in 10s

Press the Left key to decrease the time 

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data. 

The stimulation pulsation ratio 2 is now displayed.

The Stimulation Pulsation Ratio 2 Setting (Visible only when Stimulation is Yes)

The stimulation pulsation ratio 2 setting controls the ratio of channel 2's on time as a percentage of the total time during stimulation. The factory default is 60 percent on.

Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

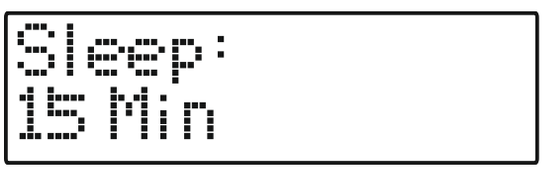
The stimulation main menu item is now displayed.

The Wash Settings Menu

The Wash settings menu contains the settings for the wash function on the control. There are 3 settings, each listed in the following pages;

The Automatic Sleep Time Setting

The automatic sleep time setting controls how long the milking point control will hold outputs on after no input is received from the user, this allows the system to turn off unwanted outputs when the parlour is not running, thus saving energy. The range is 5 to 360 minutes. The factory default is 15 minutes.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

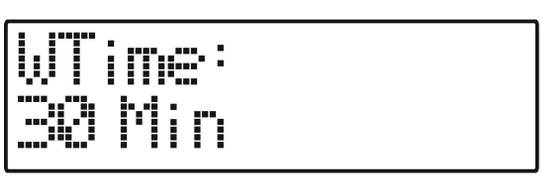
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash time setting is now displayed.

The Wash Time Setting

The wash time setting controls how long the milking point control will run its wash routine before switching to idle. The range is 1 to 720 minutes. The factory default is 30 minutes.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash water resistance setting is now displayed.

The Wash Water Resistance Setting

The Wash Water Resistance setting lets the user specify the resistance the wash water has to be before a 'dump' of the meter is triggered. This enables a different resistance to be used for the wash water, as often the milk trigger is too low for clean water to register. The range is from 25 ohms to 3000 ohms. The factory default is 750 ohms.

Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

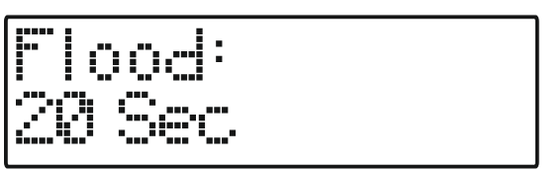
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The flood time setting is now displayed.

The Wash Flood Time Setting

The wash flood time setting lets the user specify the length of time the meter will flood the flask, to ensure the meter is correctly washed. The range is 10 seconds to 120 seconds. The factory default is 20 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10s

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The start in wash setting is now displayed.

The Start In Wash Setting

The start in wash setting is a YES / NO setting, this setting enables or disables the control to start in wash when the control first power's up, this allows automatic plant washers to wash the system automatically, the user is then able to take the system out of wash to milk. The factory default is NO.

Press the Right key to enable the setting.

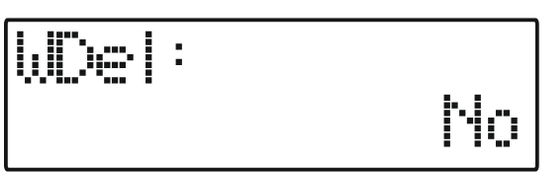
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The wash delay setting is now displayed.

The Wash Delay Setting

The wash delay setting allows the user to enable switching the wash into a group based system, whereby only some milk meter's will wash at the same time based on the settings. The factory default is No.



Press the Right key to enable the delay.

Press the Left key to disable the delay.

When the correct setting is selected, press the Enter key to store the data.

The wash delay time setting is now displayed.

The Wash Delay Time Setting (Visible only when Wash Delay is Yes)

The Wash Delay Time setting specifies how long a group of milk meter's will wash for. The factory default is 30 Seconds. this delay will be staggered across the number of groups.

Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

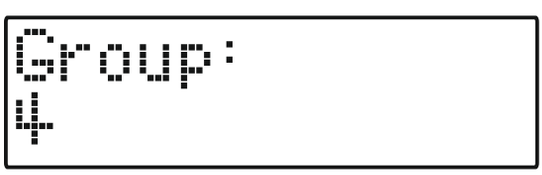
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash delay setting is now displayed.

The Wash Delay Groups Setting (Visible only when Wash Delay is Yes)

The wash delay groups setting controls how many groups the system will be split into for washing. The factory default is 4.



Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The wash main menu item is now displayed.

The Dump Line Settings Menu

The Dump Line settings menu contains the settings for the dump line function on the control. There are a number of settings, each listed in the following pages.

The Dump Line Enable Setting

The dump line enable setting is a YES / NO setting, this setting enables or disables the dump line features of the control. The factory default is No.

Press the Right key to enable the setting.

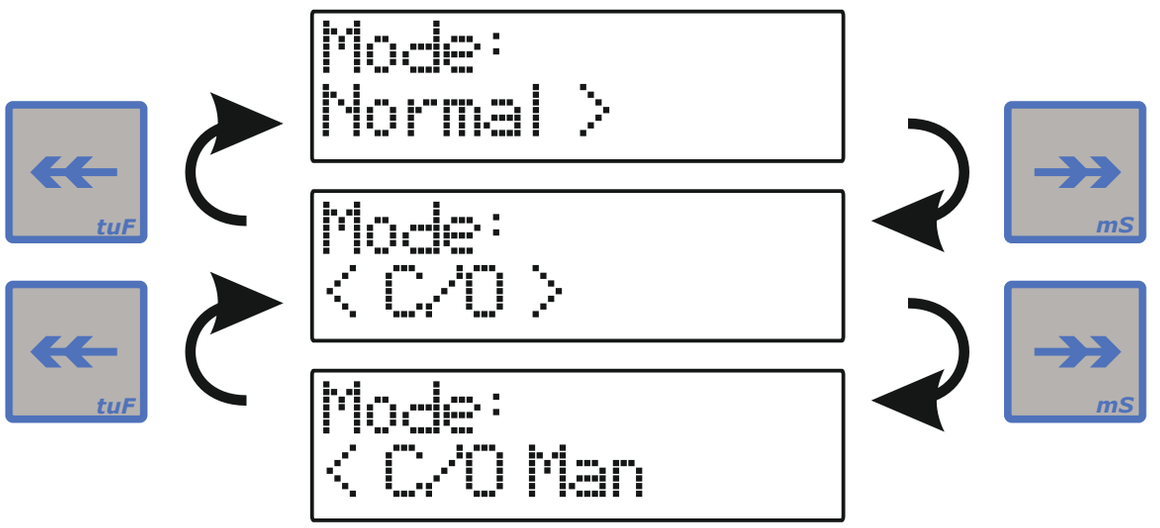
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

If dump line is enabled, the mode setting is now displayed, otherwise, the dump line main menu item is displayed.

The Dump Line Mode Setting (Visible only when Dump Line is Yes)

The dump line mode setting controls how the dump line is switched over, there are 3 settings, Normal, the output is switched on as well as the shut off staying on. Change Over (C/O), whereby the shut off output is turned off when the dump line is enabled and Change Over with Manual (C/O Man) where the meter is switched into manual milking mode as well. The factory default is Normal.



When the correct setting is selected, press the Enter key to store the data.

The auto divert setting is now displayed.

The Dump Line Auto Divert Setting (Visible only when Dump Line is Yes)

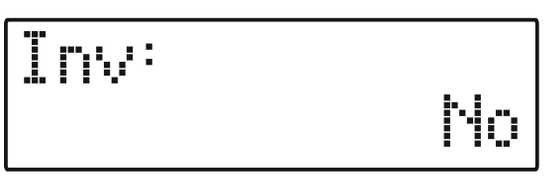
The dump line auto divert setting controls if the dump line is automatically switched over. The function uses the conductivity of the milk, and the warning levels to switch the meter automatically to dump high conductivity milk. The 3 settings are; None, no automatic divert. Warn; Milk with a conductivity level higher than the warning level will trigger the divert. Pull; Milk with a conductivity level higher than the pull off level will trigger the divert.

When the correct setting is selected, press the Enter key to store the data.

The dump line invert setting is now displayed.

The Dump Line Invert Setting (Visible only when Dump Line is Yes)

The dump line invert setting is a YES / NO setting, this setting inverts the output of the dump line. The factory default is No.



Press the Right key to enable the setting.

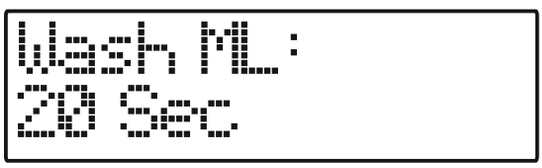
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The milk line wash time is displayed.

The Milk Line Wash Time Setting (Visible only when Dump Line is Yes)

The milk line wash time setting controls how long the milk meter is connected to the milk line in seconds during the wash cycle. The range is 5 to 120 seconds. The factory default is 20 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10.

Press the Left key to decrease the time

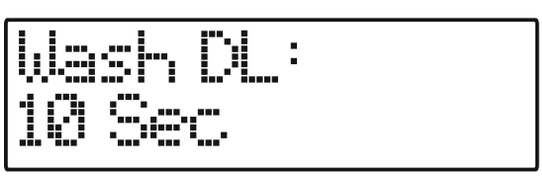
Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The dump line wash time is now displayed.

The Dump Line Wash Time Setting (Visible only when Dump Line is Yes)

The milk line wash time setting controls how long the milk meter is connected to the dump line in seconds during the wash cycle. The range is 5 to 120 seconds. The factory default is 10 seconds.



Press the Right key to increase the time

Hold the Right key to increase in 10

Press the Left key to decrease the time

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The Retention Bar Settings Menu

The Retention Bar settings menu contains the settings for the retention bar functionality on rotary parlours. There are a number of settings, each listed in the following pages.

The Retention Bar Enable Setting (Visible only when Parlour Type is Rotary)

The Retention Bar enable setting is a YES / NO setting, this setting enables or disables the dump line features of the control. The factory default is No.

Press the Right key to enable the setting.

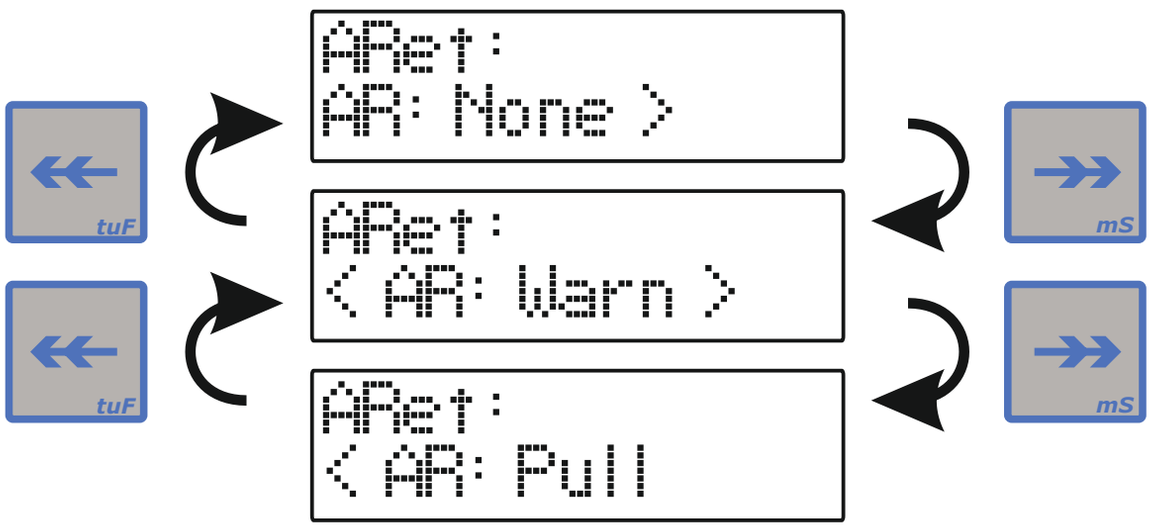
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

If retention bar is enabled, the mode setting is now displayed, otherwise, the retention bar main menu item is displayed.

The Retention Bar Auto Retain Mode Setting (Visible only when Retention Bar is Yes)

The auto retain mode setting controls how the retention bar functions with high conductivity animals, there are 3 settings; None, no automatic retention. Warn; Milk with a conductivity level higher than the warning level will trigger retention. Pull; Milk with a conductivity level higher than the pull off level will trigger retention. The factory default is None.



When the correct setting is selected, press the Enter key to store the data.

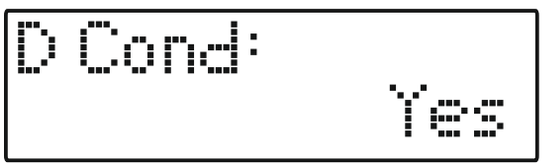
The retention bar main menu item is now displayed.

The Display Settings Menu

The Display settings menu contains the settings for the display on the control. There are 3 settings, each listed in the following pages;

The Display Conductivity Setting

The display conductivity setting enabled and disabled the display of the numeric conductivity on the MM80 during milking. The factory default is Yes.



Press the Right key to enable the setting.

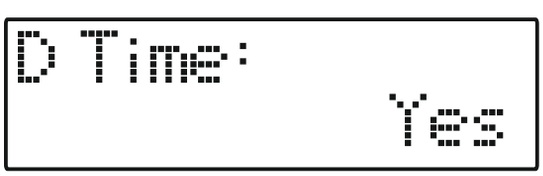
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The display milking time setting is now displayed.

The Display Milking Time Setting

The display milking time setting weather the milking length is displayed during milking. The factory default is Yes.



Press the Right key to enable the setting.

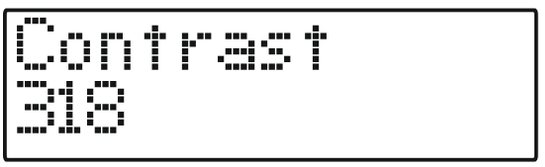
Press the Left key to disable the setting.

When the correct setting is selected, press the Enter key to store the data.

The display contrast setting is now displayed.

The Display Contrast Setting (Only adjust when instructed by ATL)

The Display contrast setting allows the user to control the contrast of the LCD display, this setting should only be adjusted when instructed to do so by ATL. The factory default is 318.



Press the Right key to increase the value

Hold the Right key to increase in 10s

Press the Left key to decrease the value

Hold the Left key to decrease in 10s

When the correct setting is selected, press the Enter key to store the data.

The display main menu item is now displayed.

The Send to System Setting

The Send to System settings menu allows the settings entered into one control to be sent to all the milking point controls on the system via the communications bus. Select the number of controls on the system. The range is 1 to 255. The factory default is 1.

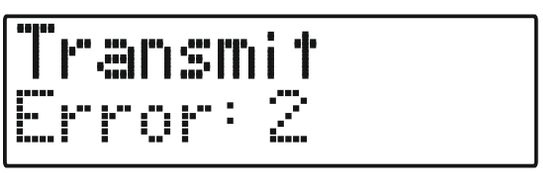
Press the Right key to increase

Hold the Right key to increase in 10

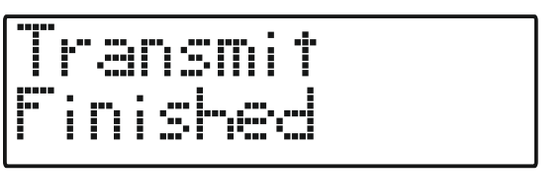
Press the Left key to decrease

Hold the Left key to decrease in 10s

When the correct number of controls has been selected, press the Enter key to send the settings to the controls.



If the settings cannot be sent to a control, an error will be reported as shown above.

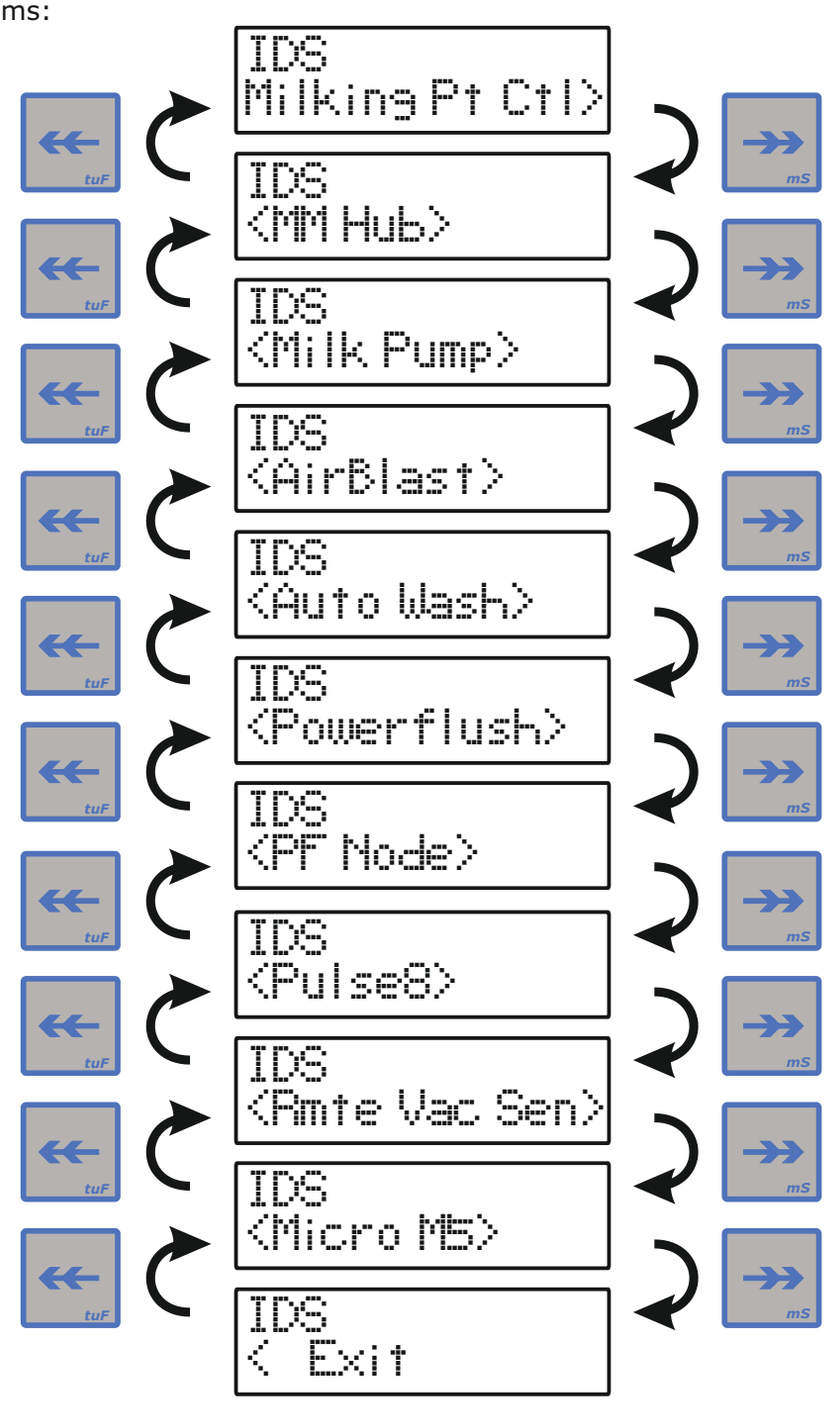


If sending the settings is successful, the screen will show 'Transmit Finished'.

Press the Enter key to return to the main menu.

The M2Bus IDS Menu

The M2Bus IDS menu allows the user to check the communications bus is working correctly, there are a number of menu items:

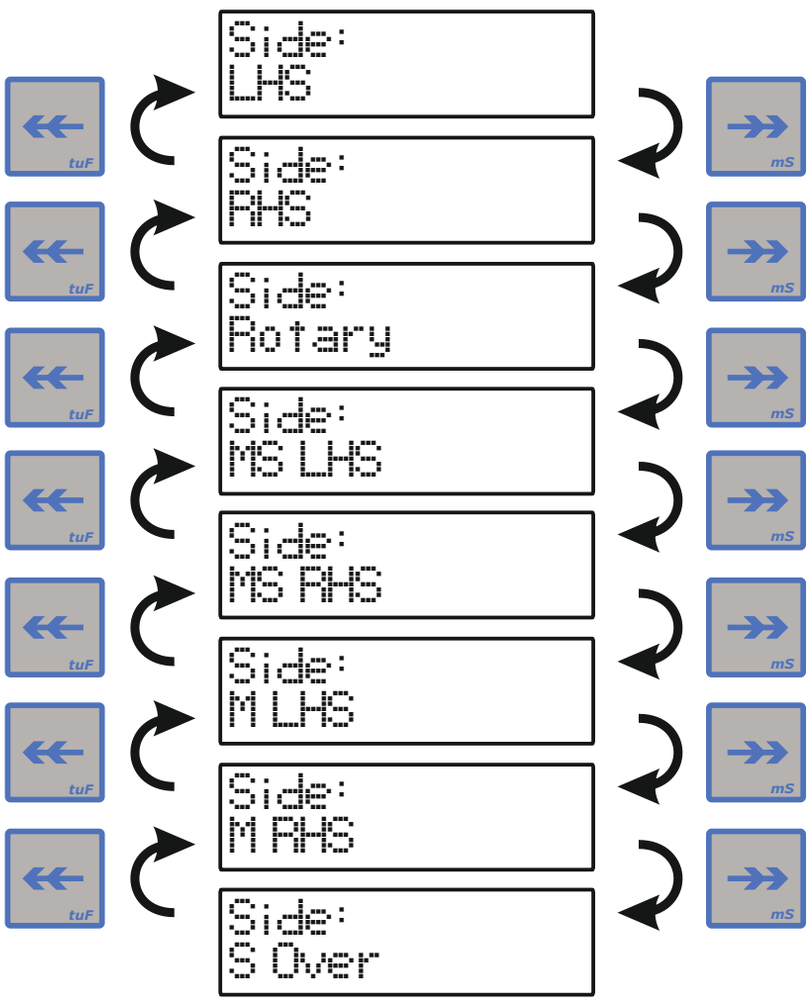


Setup
Enter

Pressing the Enter key when on a menu item will allow the user to check the communications to that item and to exit back to the main menu.

The Auto Number Setting

This setting allows milking point controls that are on the communications bus to be simply allocated their stall numbers, saving setup time. First select the type of parlour the milk meter control is being installed on - doubled up, rotary, multi-stall single sided, multi-stall double sided, swingover parlours and width if selecting a multi-stall configuration. This routine is only active for the first 5 minutes after the control is switched on, after that it is blocked.



LHS: This setting is for doubled up parlours, where the control is on the Left.

RHS: This setting is for doubled up parlours, where the control is on the Right.

Rotary: This setting is for rotary parlours.

Multi-Stall Single Sided LHS: This setting is for single sided multi stall parlours, where the control is on the

Multi-Stall Single Sided RHS: This setting is for single sided multi stall parlours, where the control is on the

Multi-Stall LHS: This setting is for doubled up multi stall parlours, where the control is on the Left.

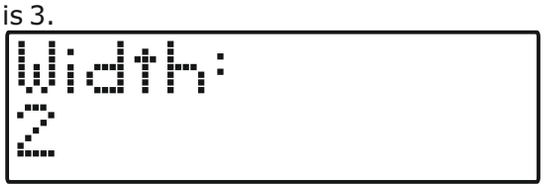
Multi-Stall RHS: This setting is for doubled up multi stall parlours, where the control is on the Right.

Swing Over: This setting is for swing over parlours, where the control changes sides.

Pressing the Enter key will place all controls on the communications bus into Auto Number mode, or, if selecting a multi-stall configuration the width setting will show.

The Stall Width Setting (Visible only when the Side setting is one of the multi stall options)

The side width setting allows the user to input the number of stalls the control will milk, the default is 2, the maximum is 3.

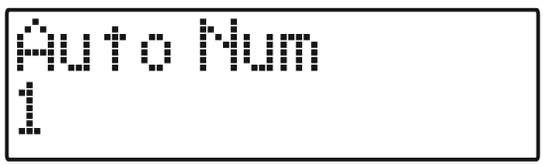


When the correct setting is selected, press the Wash key to start the auto numbering routine.

The Auto Number Routine

The basic method of operation of this routine is to allow the user to press a single key to identify a device as a stall number, allowing for the fast numbering of a parlour to occur simply by walking past all meters a pressing one key on each.

When the auto numbering mode is activated the screen will show 'Auto Num' and flash the stall number i.e. 1L for stall 1 on the left hand side, for rotary, swing over and multi stall single sided parlours the side letter is not shown.



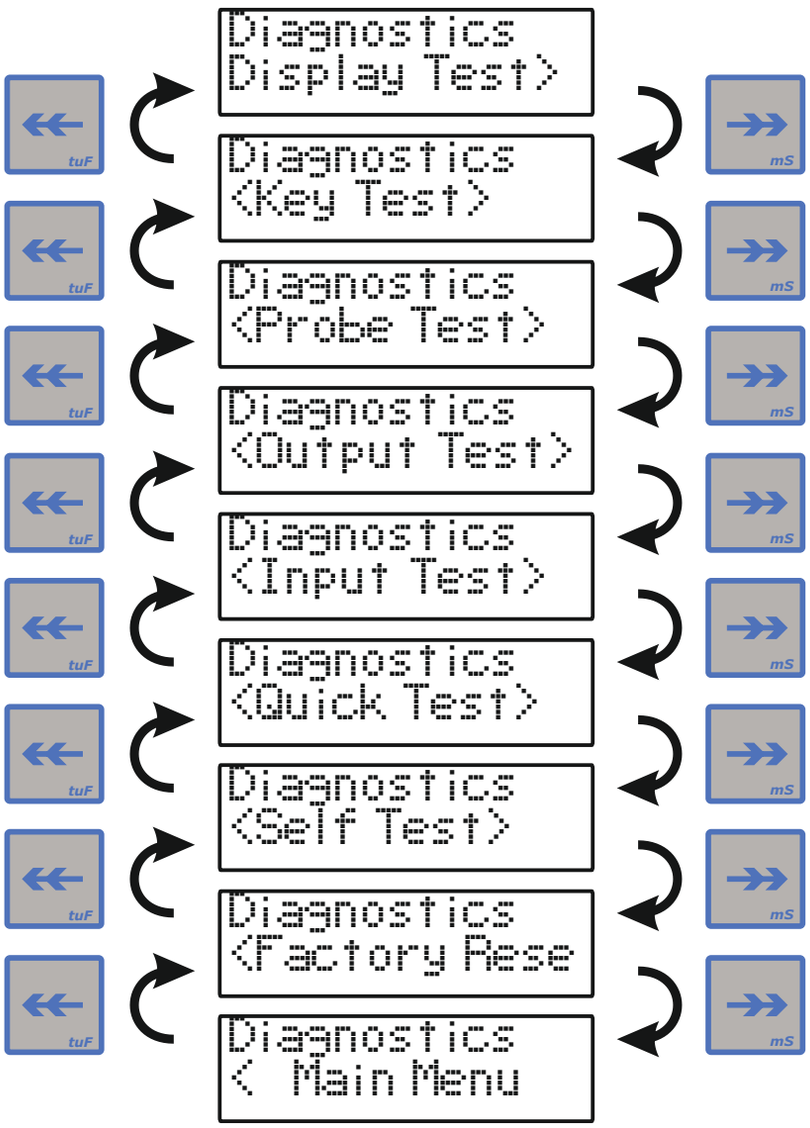
Pressing the right arrow will store the current stall number on the device and begin searching for the next stall number.

Pressing the left arrow will allow the user to undo an incorrect stall number identification and redo it with the correct one.

Press the Enter key to exit the routine.

The Diagnostics Menu

The diagnostics menu allows the user to diagnose issues with the control, there are a number of menu items:



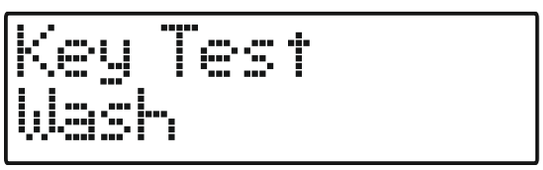
Pressing the Enter key when on a menu item will allow the user to access that item.

The Display Test Diagnostics Menu Item

The Display Test will turn on all pixels on the display, pressing the Milk key will return to the diagnostics menu.

The Key Test Diagnostics Menu Item

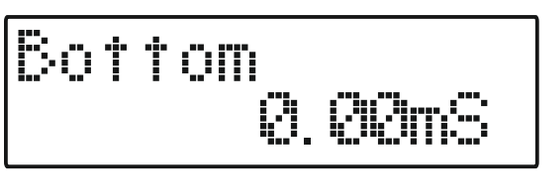
The Key Test menu item allows the testing of the keys, it will show the name of the key which has been pressed, pressing the Wash key will return to the diagnostics menu.



NB - The manual key is labelled ACR.

The Probe Test Diagnostics Menu Item

The Probe Test menu item will show the current value in milli-siemens of the probe, this allows the user to check the probe input is working correctly.



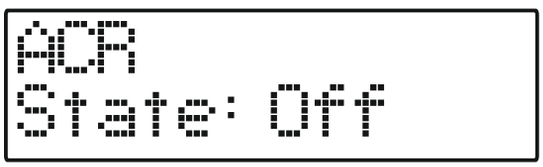
Press the Right key to select the top probe.

Press the Left key to select the bottom probe.

Press the Enter key to return to the diagnostics menu.

The Output Test Diagnostics Menu Item

The output test menu item allows the user to turn on and off all outputs on the control for testing.



Press the Right key to step to the next output.

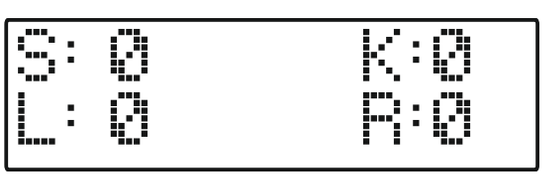
Press the Left key to step to the previous output.

Press the Enter key to toggle the output.

To exit the output test routine, scroll to the end using the Conductivity key and press the Milk key when on the Main Menu item.

The Input Test Diagnostics Menu Item

The Input Test menu item shows the state of the start input on the control. The 4 inputs are represented by letters, S: Start input, K: Kick input, L: Left input and R: Right input.



Press the Enter key to return to the diagnostics menu.

The Quick Test Diagnostics Menu Item

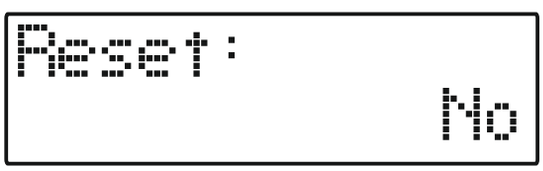
The quick test menu item is used by ATL to test the unit before shipping for installation, it will cycle through the inputs and outputs, also testing the M2Bus data link.

The Self Test Diagnostics Menu Item

The self test menu item is used by ATL to test the unit before shipping for installation, it will connect to ATL test kit to test the inputs and outputs, also testing the M2Bus data link. This will not function correctly in the field without the test equipment.

The Factory Reset Diagnostics Menu Item

The factory reset menu item will retset all settings within the control to factory default. To reset settings change the setting to Yes, and press the wash key.

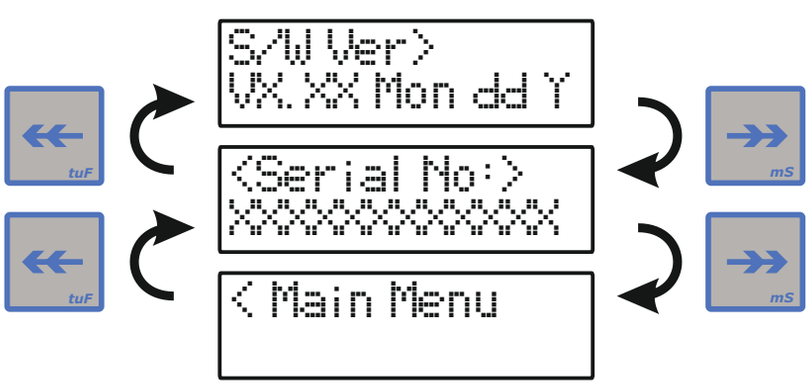


Press the Right key to set to yes, or left key to set to No.

Press the Enter key to factory reset.

The Device Info Menu

The device info menu allows the user to view information about the software in the control;



The software version menu item will show the version of the software as well as the build date.

The serial number will show the serial number of this control.

Press the Enter key

when < Main Menu displayed to exit.

Using the MM80 Control

The ACR control has 6 main milking modes - these are:

1. Automatic ACR removal and conductivity enabled;
2. Automatic ACR removal and conductivity disabled;
3. Manual ACR removal and conductivity enabled;
4. Manual ACR removal and conductivity disabled;
5. Timed Milking and conductivity enabled;
6. Timed Milking and conductivity disabled;

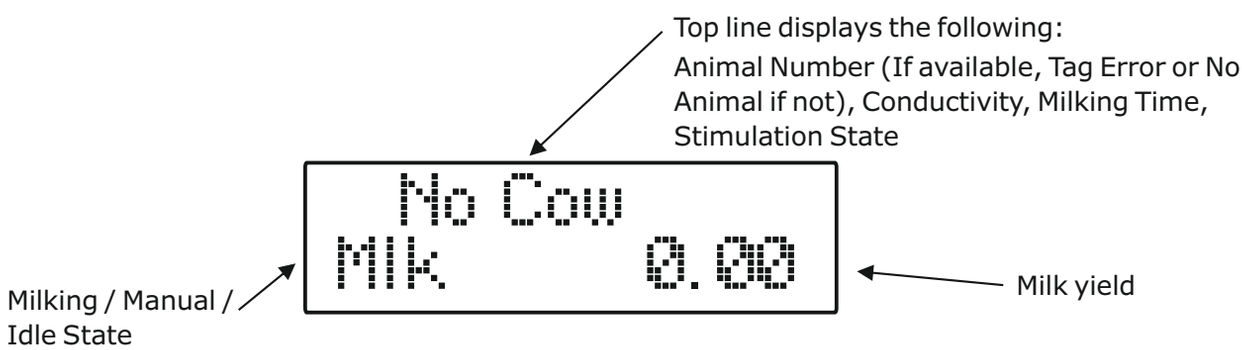
Automatic ACR removal allows the user to start the milking process and the ACR control completes it (i.e. the ACR ram removes the clusters from the animal and the milking is finished without user intervention).

Manual ACR removal allows the user to control the whole milking process from cluster attachment to removal.

Timed Milking allows the user to milk an animal for a specific time, then have the ACR remove the clusters from the animal.

The Milking Procedure

- Press the milking key to start milking in automatic mode or if in swing over mode, swing the arm, or if lift-to-start is connected, lift the cluster;
- The LCD display will show the milk yield on the right hand side and the milking mode on the top left. The animal number, milking time and conductivity value alternate in the bottom left of the LCD display;
- The status LEDs will show the respective states (milking will be green, pulsation will be running, ACR will be red, milk flow will indicate when milk is detected and conductivity will be green);
- The milking will continue until the ACR removes the cluster in ACR Mode, the time has elapsed in Timed mode or the Milk button is pressed in Manual mode, EXCEPT if the conductivity of the milk exceeds the conductivity pull off level whereby the cluster will be removed from the animal;
- If the animal is a slow milker or the cluster is removed early, press the milk key to restart milking.

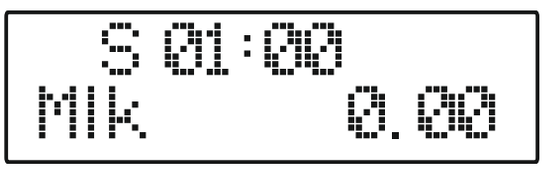


Method of Stimulation

The MM80 Milking Point Control can provide the animal with stimulation when milk flow is not detected, or when the user decides to apply stimulation.

When automatically stimulating the control will wait the stimulation delay, if milk is not detected within this time, the control will start to ramp up the pulsation frequency until it matches the stimulation pulation frequency, it will also alter the pulsation ratios.

When stimulating the control will show "S XX:XX" on the display in the bottom left hand side where the milking status information is shown, where XX:XX will show the stimulation time left.



The pulsation frequency and ratios will be ramped up to their stimulation settings using the interval delay to delay between changes.

Once milk is detected on the bottom probe of the milk meter, the control will begin to ramp down the pulsation frequency and ratios.

The user may start manually stimulating the animal at any time by pressing and holding the milking button.

The max multiplier setting is used when the user presses the stimulate button, this allows a maximum stimulation time to be set, and allows the user to cancel the stimulation by pressing the stimulation button until the control returns to normal milking mode.

Information about Milk Conductivity Measurement

The electrical conductivity of milk is an indication that there might be an infection within the animal (i.e. mastitis). Scientific research suggests that a healthy cow will have a conductivity measurement in the range of 4.0 to 5.5 millisiemens at 25°C. Therefore, an infection can be assumed at values above 5.5 millisiemens. However, this should be backed up by further testing such as the California Milk Test (CMT) to determine whether there is an infection that needs addressing.

It should be noted that the conductivity measurement provided on the milking point control is a guide and should be treated as such.

NB - The conductivity warning level and pull off level are user settable and therefore can be altered to suit individual farm requirements.

Conductivity Warning Level Indicators and Pull Off

The conductivity level is shown in two ways:

1. The highest conductivity level in millisiemens recorded during the animals milking can be shown on the LCD display, this is controlled by the display conductivity setting in the display menu;
2. The conductivity level warning scale LEDs give a visual indication of the conductivity of the milk of the animal.

The conductivity level show on the LED bar is different depending weather the MM80 milk meter is connected to an ATL Micro M5 parlour control or not. If the MM80 milk meter is not connected to an ATL Micro M5 control the conductivity bar graph functions in the following manor;

- If the conductivity level is less than or equal to the conductivity warning level, 10 combinations of LEDs display dependent upon the conductivity level. Each LED represents 1/10th of the conductivity warning level.
- If the conductivity level is above the conductivity warning level but below the conductivity pull off level, all the LEDs flash on the conductivity level warning scale LEDs. Further investigation of the animal is required to ascertain whether there is mastitis or another infection.
- If the conductivity level is above the conductivity pull off level, in addition to all the LEDs flashing, the ACR ram removes the cluster from the animal. Further investigation of the animal is required to ascertain whether there is mastitis or another infection.
- If you are milking a mastitic animal, the conductivity warning level indicators can be turned off by pressing and holding the Right / Conductivity key. The conductivity LED will change to red to indicate this.

- If the user would like the conductivity warning level indicator, but not the cluster removed from the animal, set the conductivity pull off level to the maximum setting of 20.0 millisiemens.

When connected to an ATL Micro M5 control, the LEDs are controlled in a different manor;

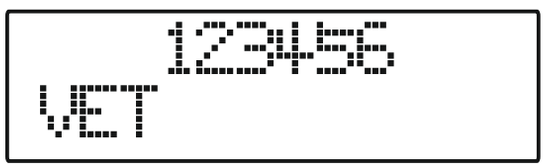
- The average conductivity of the animal is calculate in the Micro M5 control and sent to the MM80 milk meter, 0.25 millisiemens is then added to the average and then each green LED represents 1/3 of this calculated level.
- Above the calculated average level each LED represents a 0.25 millisiemens increase, up to 2.00 millisiemens.
- The settings for the warning level and pull off level are still active and will remove the cluster if the conductivity is greater than the pull of level.

Animal Data

The MM80 Milking Point Control can display warnings and allow the user to edit flags against animals.

Animal Warnings

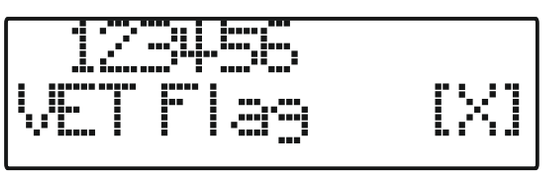
When the MM80 is linked to the ATL Micro M5 control, animal warnings can be displayed against an animal, the control will flash red led's along the side of the box and display animal number and the warning text, the user is required to press the Flag key to acknowledge the warning before being allowed to milk the animal.



Press the Flag key to scroll through the list of warning lockups until they are all acknowledged.

Animal Flags

When the MM80 is linked to the ATL Micro M5 control, animal flags can be edited by pressing the Flag key, the user can then scroll through the available flags (Please note, the displayed flags are controlled from the ATL Micro M5 control) using the Flag key and toggle the displaying flag using the Milk key, pressing any other key will exit the flags display.



Press the Flag key to scroll through the list of available flags.

Press the Enter key to toggle the flag.

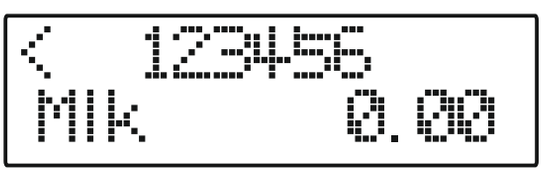
Stall selection in Multi-Stall mode

In Multi-stall mode the stall can be selected using the arrow keys, when the animal's number is shown the control will show which stall is selected with the use of an arrow.

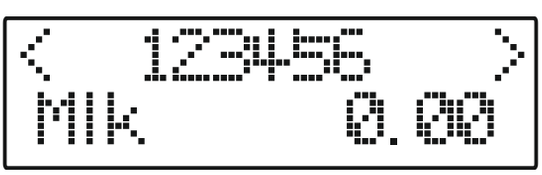
Press the left arrow to move to the left in the group of stalls which the control is responsible for milking.

Press the right arrow to move to the right in the group of stalls which the control is responsible for milking.

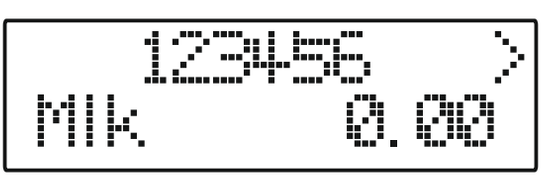
When milking the left hand stall, after the user selects the stall the animals number will appear with an arrow showing it is the left hand stall.



In Multi-Stlal configurations with 3 stalls the centre stall is shown using two arrows at each end.

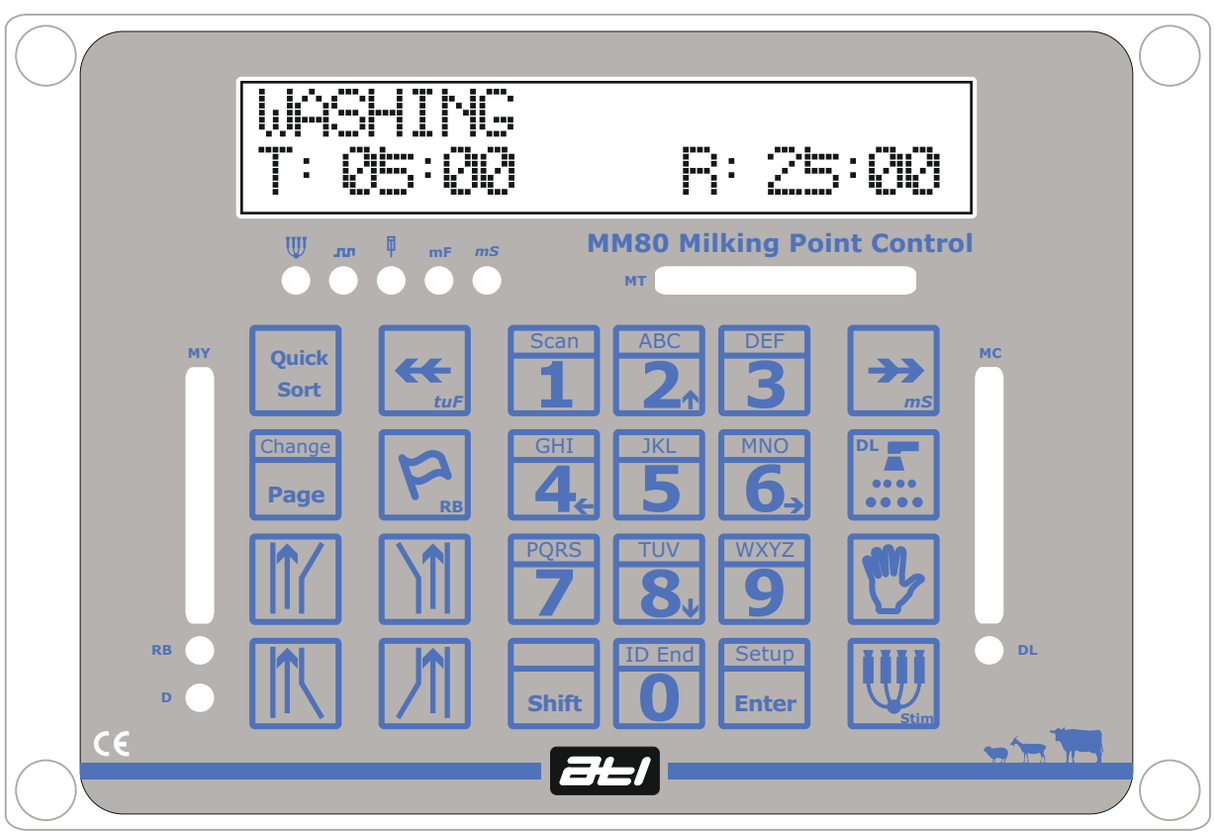


When milking the right hand stall, the display an arrow on the right.



The Washing Procedure

- If the clusters are raised, press the manual key on all milking points to lower them, and then place them into the jetters.
- Press the System Wash command is accessed from the MM Hub.
- The LCD display will show WASH, the elapsed wash time and the remaining wash time;
- The milking point control will remain in wash mode for the user set wash time period;
- At any point, the user can press the wash button to cancel the washing process;
- At the end of wash mode, the control will idle with all outputs off;
- We recommend that the parlour is cleaned by the circulation of milk stone remover at prevention strength on a weekly basis.



Monthly Routine Maintenance

- Visually inspect the control boxes for damage. Any damage will admit water causing the premature failure of the electronics and should be fixed as soon as possible;
- Inspect the vacuum lines from the control valve for contamination. Any contamination could indicate the Milk Meter flask diaphragm has failed;
- Check the milk meter flask is clean and there is no milk stone build up on the sensors.

Six Monthly Routine Maintenance

- In addition to the above monthly checks, check the ACR ram and make sure it operates smoothly.

Yearly Routine Maintenance

- In addition to the above monthly and six monthly checks, we recommend replacement of the milk meter flask diaphragm, plunger seal, bottom seal, probe grommets, top nipple o-ring and shut-off valve diaphragm.
- Thoroughly inspect the control valve, making sure it is clean and operates correctly. Service as required.

Parlour Wash Down

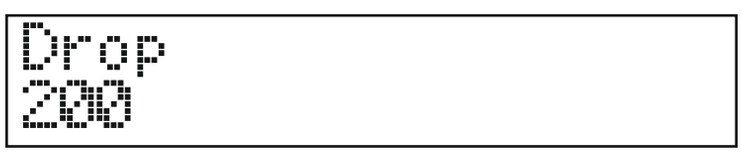
- The MM80 control enclosure is IP65 rated. However, no indirect or direct pressure washing should be used to wash the MM80 control unit, as this will cause the seals to fail and water to ingress and damage the electronic components. Please note that water damage is not covered under warranty.

Calibrating the Milk Meter System - Method 1

To ensure accurate performance each Milk Meter requires calibrating before use. This procedure may be carried out between milkings using milk or a hypochlorite solution. The calibration equipment required is as follows:

- 15 litres of milk or 3% Hypochlorite solution
- 1 metre length of 16mm stainless steel pipe with 1mm hole in the end
- Milking/dump bucket
- Bucket for milk or Hypochlorite solution
- Weighing scales accurate to within 50 grams

Before undertaking the calibration procedure, the drop value for each milk meter must be checked. For all new installations this value will have been factory set to 200, but for systems that have already been calibrated, the settings may be determined using the following procedure.



To access the drop value press the shift and enter keys:

Then access the Milk Meter menu using the right arrow key.

Use the Wash key to enter the milk meter menu.

Use the Right key to step to the Drop setting.

Calibrating the Milk Meter System Continued

Press the Enter 

key to confirm drop value and press it further times to step to the end of the setup routine.

Note the drop value from the milk meter control onto the calibration chart (NB factory default figure is 200) (photocopy chart on next page).

Set the receiving dump bucket with all the hoses connected on the scales and weigh. This weight is the tare weight.

Connect a 1 metre length of 16mm stainless steel pipe with a 1mm hole in the end furthest from the liquid and connect this to the long milk tube.

Put approximately 15 litres of milk or 3% hypo solution into a bucket (NB milk is more accurate).

Place the long milk tube into the calibration liquid, start the milk meter in manual mode and suck the calibration liquid through the milk meter into the dump bucket.

When approximately 10 litres of liquid is recorded on the milk meter control, stop the milk meter.

Note the weight of the dump bucket and then deduct the tare weight; this is the WEIGHT of liquid that has gone through the milk meter.

To convert to litres divide the weight by 1.04 (NB 12.5 kilograms divided by 1.04 = 12 litres).

Enter these figures onto the calibration chart along with the milk meter control displayed milk yield figures and repeat procedure twice more.

Add the 3 weighed literages together.

Add the 3 milk meter control figures together.

For example, weighed totals added together equals 35.8 litres; milk meter control totals added together equals 33.4 litres.

Divide the 35.8 by 33.4 equals 1.07; this equates to a 7% error.

To find the new calibration value multiply the milk meter control drop value by 1.07.

For example, 200 multiplied by 1.07 equals 214. This is the new drop value to be entered into the control.

Entering The New Drop Value

To enter the new drop value follow the procedure outlined on page 10.

The new drop value can be entered by pressing the LEFT 

or RIGHT 

arrow keys.

Holding down the LEFT 

or RIGHT 

arrow keys allows the values to be changed in tens.

Press the Enter 

key to confirm drop value and press it further times to step through the setup routines.

Milk Meter Calibration Check Form - SAMPLE

Milk Meter No.			Original Drop Value	
Reading No.	Scales - Kilogram	Scales - Litres*	Control - Litres	____
1	12.5	12.0	11.2	____
2	12.3	11.8	11.0	____
3	12.5	12.0	11.2	____
Total	37.3	35.8	33.4	____

A = Total Weighing Scale Readings (litres)

B = Total Control Readings (litres)

C = Ratio of A to B

D = Milk Meter Drop Value During Test

E = New Calculated Drop Value

A	B	C
35.8 divided by	33.4 equals	1.07
C	D	E
1.07 multiplied by	200 equals	214

* To convert the kilogram reading on the scales into litres please use the following formula:
Litres = Kilogram / 1.04

Milk Meter Calibration Form - PLEASE COPY AND USE

Milk Meter No.			Original Drop Value	
Reading No.	Scales - Kilogram	Scales - Litres*	Control - Litres	____
1				____
2				____
3				____
Total				____

A = Total Weighing Scale Readings (litres)

B = Total Control Readings (litres)

C = Ratio of A to B

D = Milk Meter Drop Value During Test

E = New Calculated Drop Value

A	B	C
divided by	equals	
C	D	E
times by	equals	

* To convert the kilogram reading on the scales into litres please use the following formula:
Litres = Kilogram / 1.04

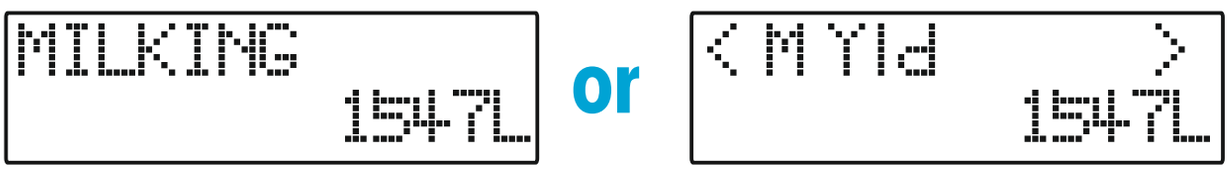
Calibrating the Milk Meter System - Method 2

Another method for calibrating the Milk Meter system is by comparing the milk yield total in the MM Hub to the bulk tank total.

Set the drop value to 200 (this is the factory default). It is best to milk the cows for a few days through the milk meters before calibrating as this allows the meters to settle down and the diaphragm to stretch etc.

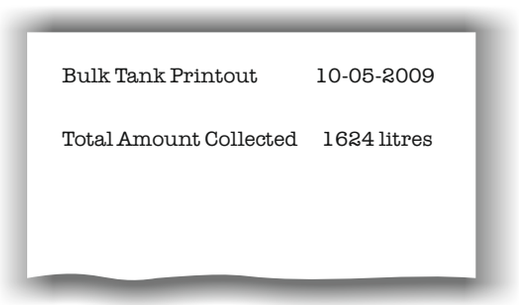
Stand-Alone Milk Meter Systems

After a few days make a note of the Total Yield on the Micro Wash Control.



When the MM80 System is in milking mode, the total number of litres that the cows have yielded in displayed (i.e. 1500L equals 1500 litres). If the Micro Wash Control is not in milking mode, press the Tick key to display the menu and the use the Up key to move to the Milk Yield Total.

Compare the Total Yield to the bulk tank printout.



Therefore, to calibrate the milk meters, do the following calculation:

Drop Value ÷ Measured Total x Actual Total = New Drop Value

This in this example equals:

200 ÷ 1547 x 1624 = 209.48

Therefore, if drop value is set at 200, the drop value should be changed to: 209

NB - Ensure that the drop value is changed on all MM80 milk meter controls, either by entering individually or by performing a send to system.

Re-check this again after a few more days and change if required.

Checking the Calibration of the Milk Meter System

It is recommended that a Calibration Check is carried out on each Milk Meter annually.

To check the calibration follow the instructions on calibrating the milk meter on page 33.

The resulting relative error should be not more than +/-5%; if the error is more than this it will be necessary to re-calibrate the Milk Meter.

Milk Meter Calibration Check Form - SAMPLE

Milk Meter No.			Original Drop Value	
Reading No.	Scales - Kilogram	Scales - Litres*	Control - Litres	____
1	12.5	12.0	11.2	____
2	12.3	11.8	11.0	____
3	12.5	12.0	11.2	____
Total	37.3	35.8	33.4	____

A = Total Weighing Scale Readings (litres)

B = Total Control Readings (litres)

C = Ratio of A to B

D = Milk Meter Drop Value During Test

E = New Calculated Drop Value

A	B	C
35.8 divided by	33.4 equals	1.07
C	D	E
1.07 multiplied by	200 equals	214

* To convert the kilogram reading on the scales into litres please use the following formula:
Litres = Kilogram / 1.04

Milk Meter Calibration Form - PLEASE COPY AND USE

Milk Meter No.			Original Drop Value	
Reading No.	Scales - Kilogram	Scales - Litres*	Control - Litres	____
1				____
2				____
3				____
Total				____

A = Total Weighing Scale Readings (litres)

B = Total Control Readings (litres)

C = Ratio of A to B

D = Milk Meter Drop Value During Test

E = New Calculated Drop Value

A	B	C
divided by	equals	
C	D	E
times by	equals	

* To convert the kilogram reading on the scales into litres please use the following formula:
Litres = Kilogram / 1.04

Additional Items Required to Install a Milk Meter System

- 8mm ID PVC signal pipe (10mm OD nipple) to connect from auxiliary vacuum line to solenoid box. Length required installation dependent.
- 4mm ID PVC signal pipe (5mm OD nipple) to connect from solenoid box to shut-off valve.
- 4mm ID PVC signal pipe (5mm OD nipple) to connect from solenoid box to Milk Meter flask top nipple.
- 19mm ID milk tube for connection to the Milk Meter outlet.
- 15.5mm ID milk tube for connection to the Milk Meter inlet.
- Fixings to fix the Milk Meter flask to the parlour frame.
- Milk line inlets suitable for 19mm milk tube, if not already available.
- Conduit, mounting and cable for wiring to bringing power to the Milk Meter controls.
- If using an existing ACR ram and solenoid, the solenoid must be 12vDC (Consult ATL for other voltages).