



**Innovation In and
Out of Parlour**

Milk Pump Control Manual - 1 Phase Version

For MPC PCB (LLC208) Version 'J' onwards

Version 2.01

Date - March 2016



Manual Versions

Version 1.00 - June 2014

First Version of Manual (Software v1.00)

Version 2.00 - November 2015

Added support for the variable speed drive (Software v2.01)

Version 2.01 - March 2016

Updated manual for new software version (Software v2.20)

About the Milk Pump Control

The ATL Milk Pump Control comprises receiving vessel milk level detection using either probes or float switches, a plate cooler water valve delay to ensure that cold water flow is maintained through the cooler after the milk pump has stopped running and a plate cooler bypass valve delay to wash the plate cooler but then bypass it to maintain the wash fluid temperature. All the facilities have separate potentiometer controls to fine tune the timings. Probes or float switches are not supplied with the control.

Specifications

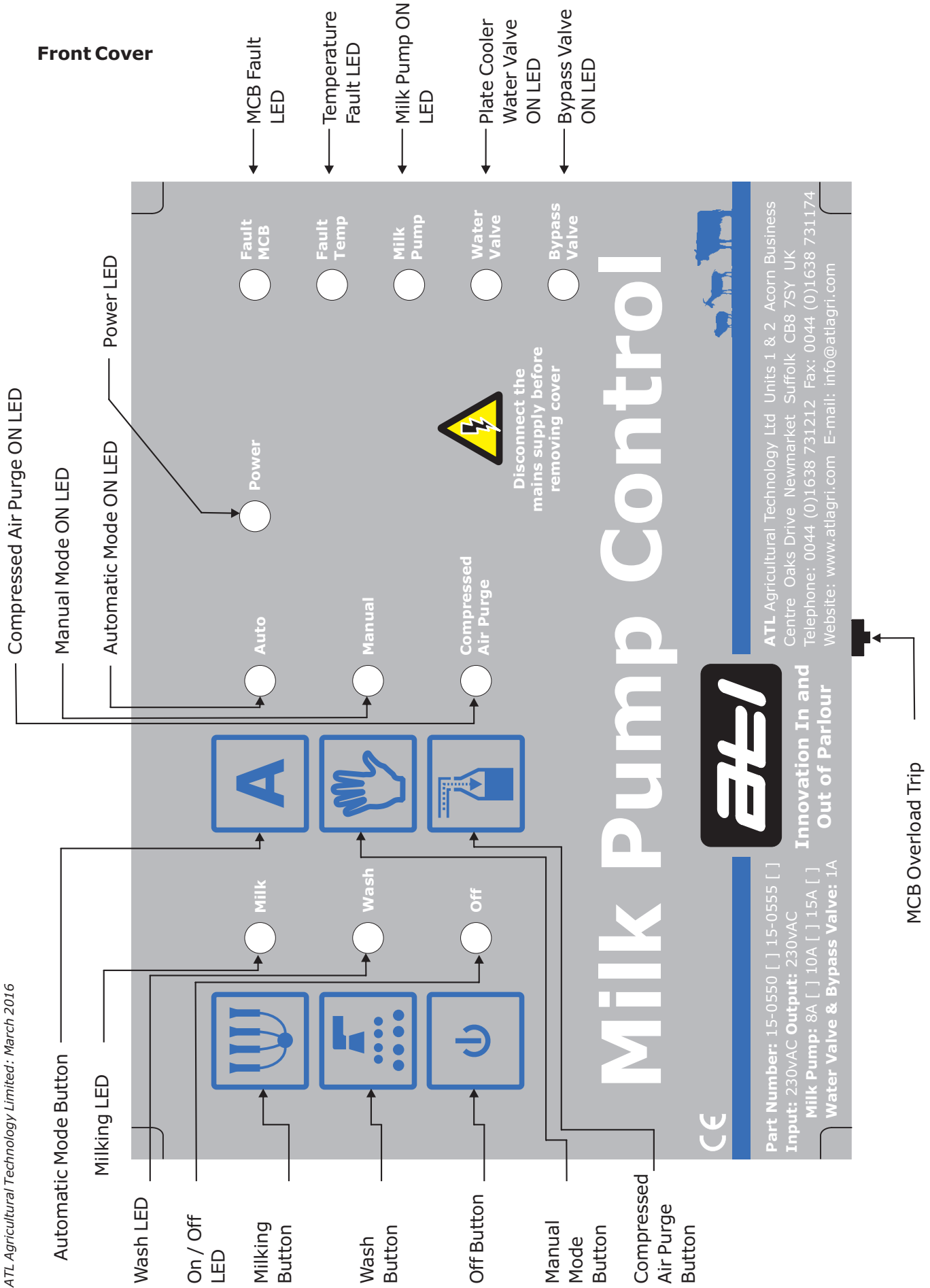
■ Input Voltage:	230volts AC, 50/60Hz 1 Phase
■ Output Voltage:	230volts AC, 50/60Hz 1 Phase
■ Milk Pump:	230volts AC, 1 Phase; Over temperature automatic shutdown and recovery at nominal 60°C
■ Milk Pump Options:	0.55kW with 8A overload 0.75kW with 8A overload 1.1kW with 10A overload 1.5kW with 15A overload
■ Sensor Options:	2 Wire or 3 Wire Probes 2 Wire or 3 Wire Float
■ Water Valve:	230volts AC 1 Phase: 0.25A, 50 watts maximum
■ Water Valve Protection:	1A Fuse on incoming mains supply to control
■ Bypass Valve:	230volts AC 1 Phase: 0.25A, 50 watts maximum
■ Bypass Valve Protection:	1A Fuse on incoming mains supply to control
■ Indicator LED's:	Power Mode: Off, Milk & Wash Milk Pump: Automatic & Manual Milk Pump On Water Valve On Bypass Valve On Compressed Air Purge On Mains Circuit Breaker (MCB) Fault Temperature Fault

What is different about the Milk Pump Control?

The ATL milk pump control uses solid state components as opposed to an electro mechanical relay or contactor. The solid state TRIAC provides many characteristics which are difficult to find in electro mechanical devices. They have a high degree of reliability, significantly reduced interference, fast response and high vibration resistance. They also have no moving parts to wear out or arcing contacts to deteriorate that are often the cause of failure with an electro mechanical device. When the TRIAC switches on, it waits until the mains voltage crosses the zero threshold, providing a much smoother switch on, reducing switch on noise spikes, and therefore should increase milk pump motor life.



Front Cover





Installing the Milk Pump Control

Firmly screw the enclosure to a vertical wall or onto the receiving vessel mounting plate with the cable glands facing downward. Avoid side cable entry and never use top entry. The Control requires a 230volt AC 50/60Hz mains electricity supply derived from an accessible, switched, fused outlet fitted with an appropriately rated anti-surge fuse. Do not use a 13amp plug and socket. The Control is internally fused with a 20mm 1amp anti-surge fuse.

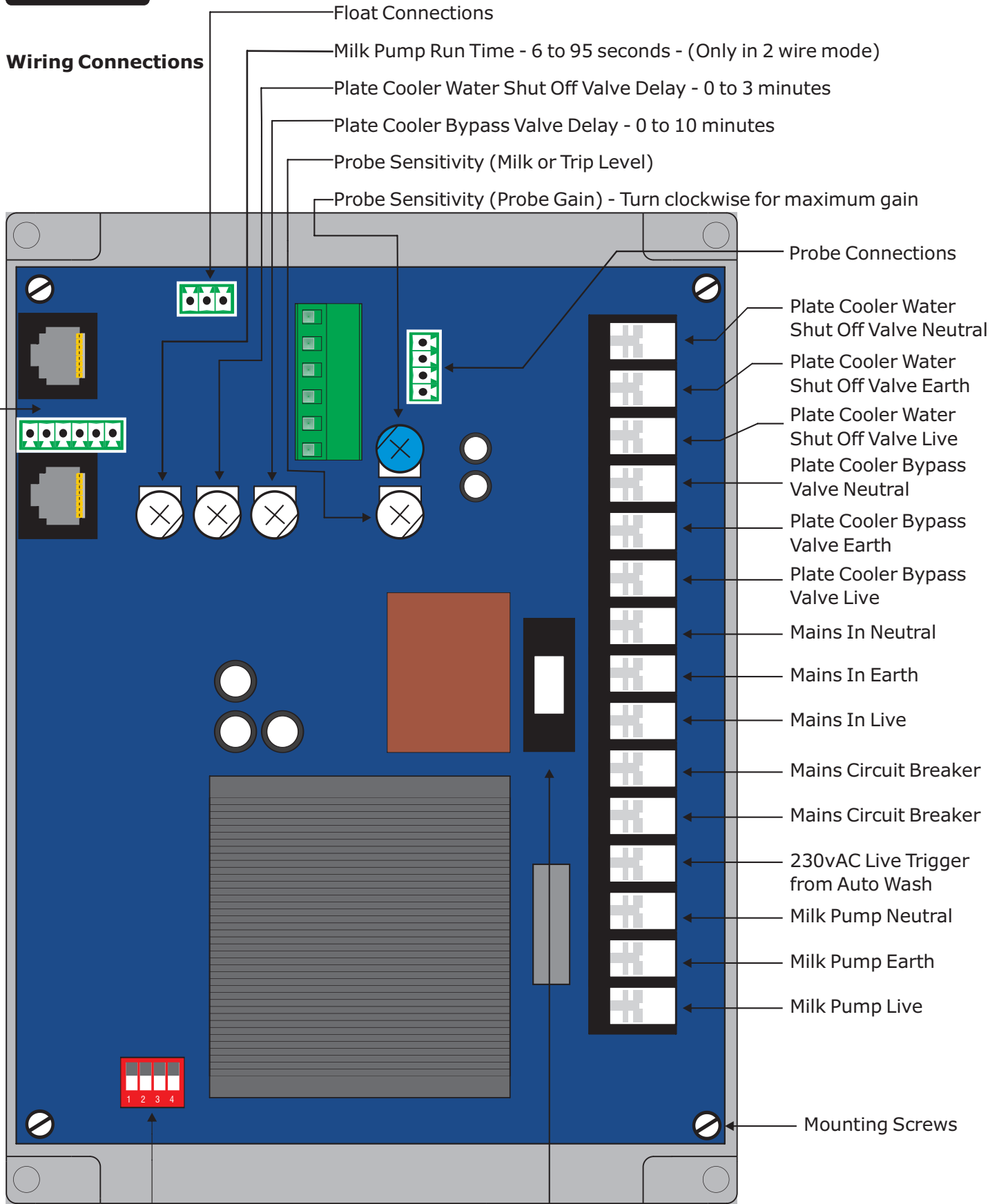
The control must be installed within easy reach of the operator because an overload switch is fitted and requires resetting manually if an overload occurs.

Good Installation Practice

- A separate mains supply and earth running directly from the consumer meter is essential.
- Avoid routing the mains cable to the milk pump control close to other supplies especially those providing intermittent current-motors that are starting and stopping continually or high power heaters with thermostatic control.

Wiring Connections

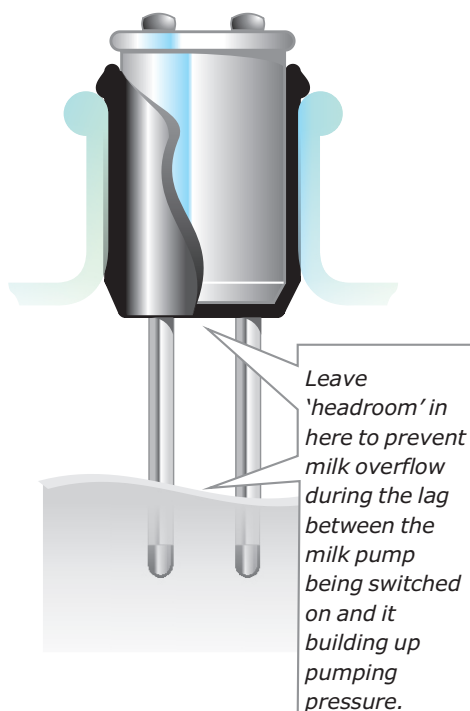
RS 485 / Meridian Connection



Notes

Mounting screws have plastic washers between printed circuit board (PCB) and lid mount. If not installed, the buttons will not function.

Setting up the Milk Pump Control for a 2 Wire Probe



Two Probe Sensor:

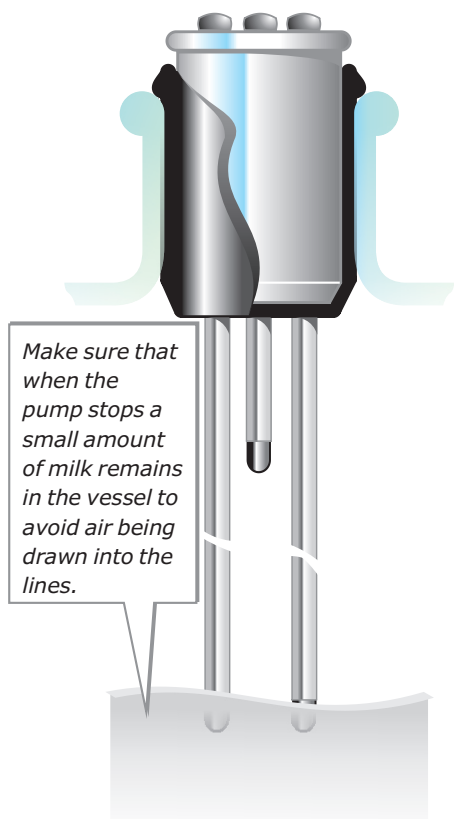
Connect the milk probes to the 'Probe Output' and 'Top' connectors.

- Set switch 1 on the Set-up Switch to off (2-Way), wire one of the probe connections to Probe Output and the other to Top Input.
- Turn the milk pump run time to the midway position.
- Turn the Probe Gain potentiometer to the half way position.
- Turn the Probe Milk or Trip Level potentiometer to the half way position.
- Turn on the control and press the Milk button.
- Manually fill the receiving vessel with washing fluid until the milk pump turns on. Allow it to pump out until it stops automatically.
- Check the fluid level in the receiving vessel. Make sure that when the milk pump switches off there is enough fluid in the vessel to cover the receiving vessel outlet to prevent any air being drawn into the lines.
- If there is too much or too little fluid remaining, turn off the mains supply, remove the cover and adjust the milk pump running time accordingly. Turn the potentiometer clockwise for too much fluid remaining and anti-clockwise for too little remaining.
- The milk pump run time adjustment range is 6 to 95 seconds.
- To run the milk pump manually, press the Manual button.

Adjusting the Sensitivity

- If the milk pump does not turn on at the correct level on the probes, turn off the mains supply, remove the cover and adjust the Milk or Trip Level potentiometer up if the milk pump is turning on too soon, or down if the milk pump is turning on too late.
- If the maximum or minimum setting is reached on the potentiometer, adjust the Probe Gain potentiometer towards maximum if a lower trip level is required, or towards minimum if a higher trip level is required.
- It should be noted that the more sensitive the setting, the more likely that condensation and froth between the probes will affect the operation.
- In areas where the water is very soft, it's conductivity may be much lower than milk. The sensitivity adjustment is specifically designed to get around this problem.

Setting up the Milk Pump Control for a 3 Wire Probe



Three Probe Sensor:

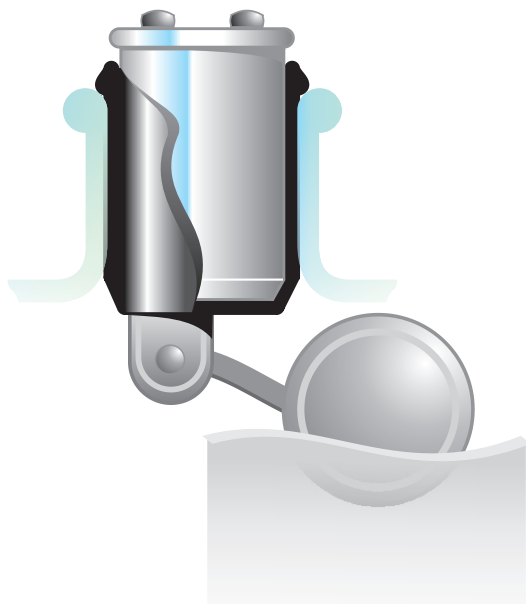
Connect the longest milk probe to 'Probe Output', second longest probe to 'Bottom' and the shortest probe to 'Top' connections on PCB.

- Set switch 1 on the Set-up Switch to on (3-way), wire the ground probe to the Probe Output and the bottom probe (the second longest probe) to the Bottom Input and the top probe (shortest probe) into the Top Input.
- Turn the Probe Gain potentiometer to the half way position.
- Turn the Probe Milk or Trip Level potentiometer to the half way position.
- Turn on the control and press the Milk button.
- Manually fill the receiving vessel with washing fluid until the milk pump turns on. Allow it to pump out until it stops automatically.
- Check the fluid level in the receiving vessel. Make sure that when the milk pump switches off there is enough fluid in the vessel to cover the receiving vessel outlet to prevent any air being drawn into the lines.
- If there is too much or too little fluid remaining, turn off the mains supply, remove the cover and adjust the sensitivity as described below.
- To run the milk pump manually, press the Manual button.

Adjusting the Sensitivity

- If the milk pump does not turn on or off at the correct level on the probes, turn off the mains supply, remove the cover and adjust the Milk or Trip Level potentiometer up if the milk pump is turning on too soon, or down if the milk pump is turning on too late.
- If the maximum or minimum setting is reached on the potentiometer, adjust the Probe Gain potentiometer towards maximum if a lower trip level is required, or towards minimum if a higher trip level is required.
- It should be noted that the more sensitive the setting, the more likely that condensation and froth between the probes will affect the operation.
- In areas where the water is very soft, it's conductivity may be much lower than milk. The sensitivity adjustment is specifically designed to get around this problem.

Setting up the Milk Pump Control for a 2 Wire Float



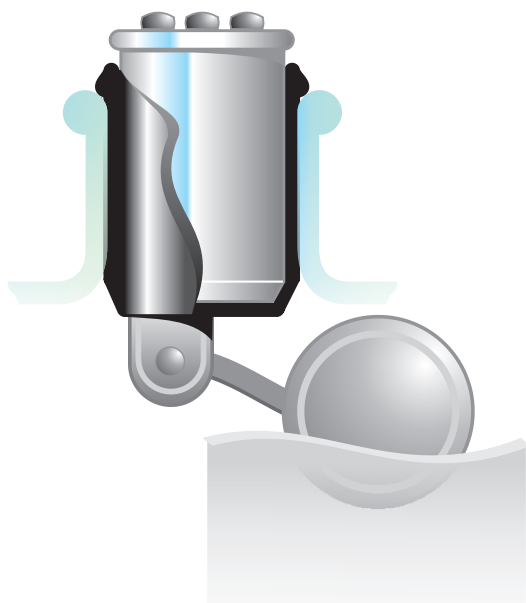
Float Sensors:

Various makes, but most comprise a simple micro-switch operated by a float. Refer to manufacturers instructions for connections. Usually Common (COM) and Normally Open (NO). Connect COM to 'Float Common' and NO to 'Top'.

- Set switch 1 of the Set-up Switch to off (2-way), set switch 3 on the Set-up Switch to Normally Open and Normally Closed (NO/NC) or Normally Open and Normally Open (NO/NO). Wire the ground common to the Float Common and the Normally Open connection into the Top Input.
- Turn the milk pump run time to the half way position.
- Turn on the control and press the Milk button.
- Manually fill the receiving vessel with washing fluid until the milk pump turns on. Allow it to pump out until it stops automatically.
- Check the fluid level in the receiving vessel. Make sure that when the milk pump switches off there is enough fluid in the vessel to cover the receiving vessel outlet to prevent any air being drawn into the lines.
- If there is too much or too little fluid remaining, turn off the mains supply, remove the cover and adjust the milk pump running time accordingly. Turn the potentiometer clockwise for too much fluid remaining and anti-clockwise for too little remaining.
- The milk pump run time adjustment range is 6 to 95 seconds.
- To run the milk pump manually, press the Manual button.

- As the Float Switch Input is simply On or Off, the sensitivity (Trip Level + Gain) controls are not used and therefore have no effect.

Setting up the Milk Pump Control for a 3 Wire Float



- Set switch 1 of the Set-up Switch to on (3-way), set switch 3 on the Set-up Switch to Normally Open and Normally Closed (NO/NC) or Normally Open and Normally Open (NO/NO). Wire the ground common to the Float Common, the Normally Closed connection to the Bottom Input and the Normally Open connection into the Top Input.
- Turn on the control and press the Milk button.
- Manually fill the receiving vessel with washing fluid until the milk pump turns on. Allow it to pump out until it stops automatically.
- Check the fluid level in the receiving vessel. Make sure that when the milk pump switches off there is enough fluid in the vessel to cover the receiving vessel outlet to prevent any air being drawn into the lines.
- To run the milk pump manually, press the Manual button.

Float Sensors:

Various makes but most comprise a simple micro-switch operated by a float. Refer to manufacturers instructions for connections. Usually Common (COM), Normally Open (NO and Normally Close (NC). Connect COM to 'Float Common', NO to 'Top' and NC to 'Bottom'.

- As the Float Switch Inputs are both simple On or Off levels, the sensitivity (Trip level + Gain) controls are not used and therefore have no effect.
- The majority of 3 Wire Floats have a top Normally Open (NO) and a bottom Normally Closed (NC) switch.
- A minority of 3 Wire Floats have 2 Normally Closed (NO) switches.
- Please check which type is being installed and adjust switch 3 on the Set-up Switch accordingly.

Setting up the Plate Cooler Water Valve Delay (optional)

- After the milk pump run time has been set, run the process again but this time check that the plate cooler water valve stays open after the milk pump has stopped. If the delay is too short, the milk remaining in the lines will not be cooled properly. If the delay is too long, the valve will stay open too long and waste water.
- If the delay is incorrect, turn off the mains supply, remove the cover and change the delay accordingly. Turning the potentiometer clockwise will increase the delay and turning anti-clockwise will reduce the delay.
- The plate cooler water valve delay adjustment range is 0 to 3 minutes.

Setting up the Plate Cooler Bypass Valve Delay (optional)

- After the plate cooler water valve delay has been set, run the process again but this time check that the plate cooler bypass valve opens after the milk pump has stopped during the washing process. This is designed to wash out the plate cooler and then, when the bypass valve opens, diverts the wash fluid around the plate cooler so the wash water is not cooled by the plate cooler. If the delay is too short, the plate cooler will not be washed out properly.
- If the delay is incorrect, turn off the mains supply, remove the cover and change the delay accordingly. Turning the potentiometer clockwise will increase the delay and turning anti-clockwise will reduce the delay.
- The plate cooler bypass valve delay adjustment range is 0 to 10 minutes. For correct operation, the bypass valve delay time should always be set to be longer than the milk pump run time.

Setting up the Manual Button

- Pressing the 'Manual' button turns the Milk Pump on and can be set to operate in two different formats. Either press and hold to turn the Milk Pump on or press once to turn the Milk Pump On and press again to turn the Milk Pump Off.
- To select Manual Mode 'Press and Hold', set switch 2 on the Set-up Switch to Off, to select Manual Mode 'On/Off', set switch 2 on the Set-up Switch to On.
- The Manual mode can be turned off by returning to automatic mode by pressing the 'Automatic' button or by pressing the 'Manual' button.

Operating the Milk Pump Control

- For milking, press the 'Milk' button before milking starts. This will turn on the automatic detection of the milk level in the receiving vessel. Press the 'Manual' button to select manual mode.
- For washing, press the 'Wash' button before washing starts. This will turn on the automatic detection of the wash fluid level in the receiving vessel. Press the 'Manual' button to select manual mode.
- The operation of the milk pump (i.e. when the milk pump is on), plate cooler water valve and plate cooler bypass valve are indicated by the LED's on the control front cover.
- The milk pump is protected by a thermal overload trip. This is fitted to the bottom of the enclosure. If a current surge occurs, the trip will disconnect the supply to the milk pump, the 'Fault MCB' LED will be lit and the small button at the centre of the trip will drop down.
- Before resetting the thermal overload trip, find and correct the cause of the fault, and press in and hold the button until it latches. As this is a thermal device, it may need some time to cool before it can be reset. If there is a temperature issue, the 'Fault Temp' LED will be lit on the front of the milk pump control.

Timings Chart (2 Wire Probe or Float)

Milk - Automatic	Milk Pump Run Time - 6 to 95 secs ^{*1}	Plate Cooler Water Valve Delay - 0 to 3 min ^{*2}
Wash - Automatic	Milk Pump Run Time - 6 to 95 secs ^{*1}	Plate Cooler Bypass Valve Delay - 0 to 10 mins ^{*3}

^{*1} Milk pump run time starts when milk touches probes or float passes micro switch;

^{*2} Water valve delay time starts when milk pump run time finishes;

^{*3} Bypass valve delay time starts from when wash key is pressed by user.

Timings Chart (3 Wire Probe or Float)

Milk - Automatic	Milk Pump Run Time ^{*1}	Plate Cooler Water Valve Delay - 0 to 10 mins ^{*2}
Wash - Automatic	Milk Pump Run Time ^{*1}	Plate Cooler Bypass Valve Delay - 0 to 10 mins ^{*3}

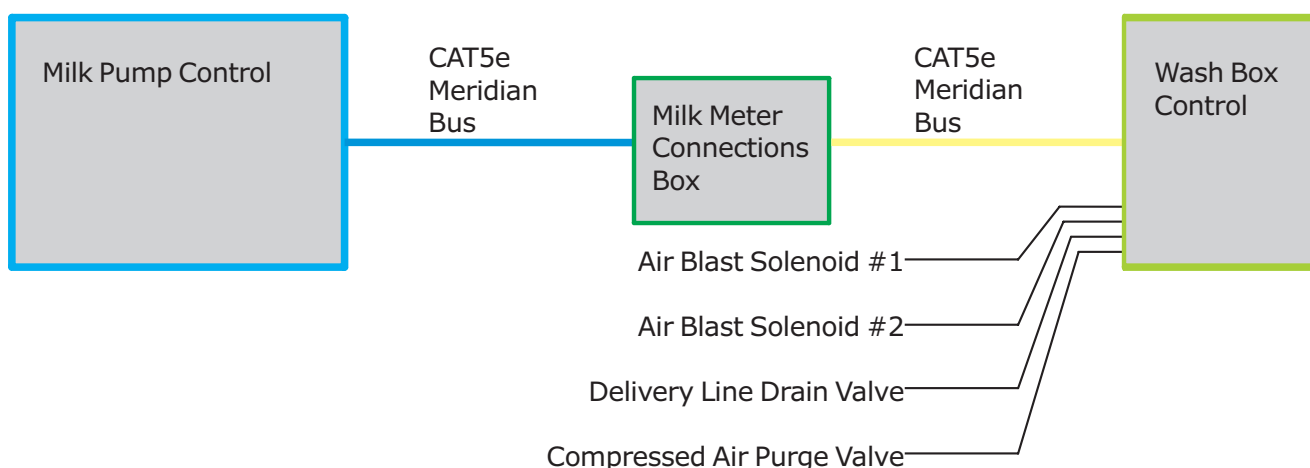
^{*1} Milk pump run time starts when milk touches top probe or float passes top micro switch and stops when milk loses contact with bottom probe or float passes bottom micro switch;

^{*2} Water valve delay time starts when milk pump run time finishes;

^{*3} Bypass valve delay time starts from when wash key is pressed by user.

Connecting the Milk Pump Control to a Stand Alone Wash Box

- Meridian bus connection requires product model 15-0550.
- Connect the CAT5e cable into the Meridian Bus connection socket.
- Check the communications on the Milk Meter Wash Box (Requires Wash Box firmware version 2.13, See below).
- The ATL Milk Meter system and Milk Pump Control will now enter wash, milking or idle modes from either the Wash Box Control or the Milk Pump Control.
- Changing Milk Pump Control mode to Wash will set the Wash Box into Wash mode, close the Delivery Line Drain Valve output (if enabled) on the Wash Box, and then start the AirBlast operation.
- Changing the Milk Pump Control mode to Milk will set the Wash Box into Milking mode, close the Delivery Line Drain Valve output (if enabled).
- Changing the Milk Pump Control mode to Off will set the Wash Box into Idle mode, open the Delivery Line Drain Valve (if enabled) after the delay.
- Pressing the Compressed Air Purge button on the Milk Pump Control will close the Delivery Line Drain Valve (if enabled) and then open the Compressed Air Valve for the time specified in the Wash Box settings.



Testing the Milk Pump Control Communications (IDS) on a Stand-Alone System

The communications between the Milk Pump Control and the Wash Box Control can be tested using this routine on the Wash Box Control. NB - This routine is only available on stand-alone systems.

Press and hold the IDLE, TICK, WASH and UP arrow keys to enter setup

Release the keys

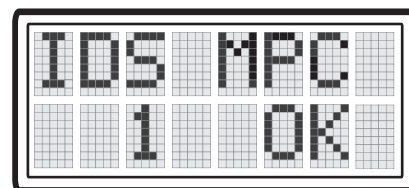
Press the WASH key to select the Milk Pump Control

Step through all the Milk Pump Controls using the UP and

DOWN arrow keys:

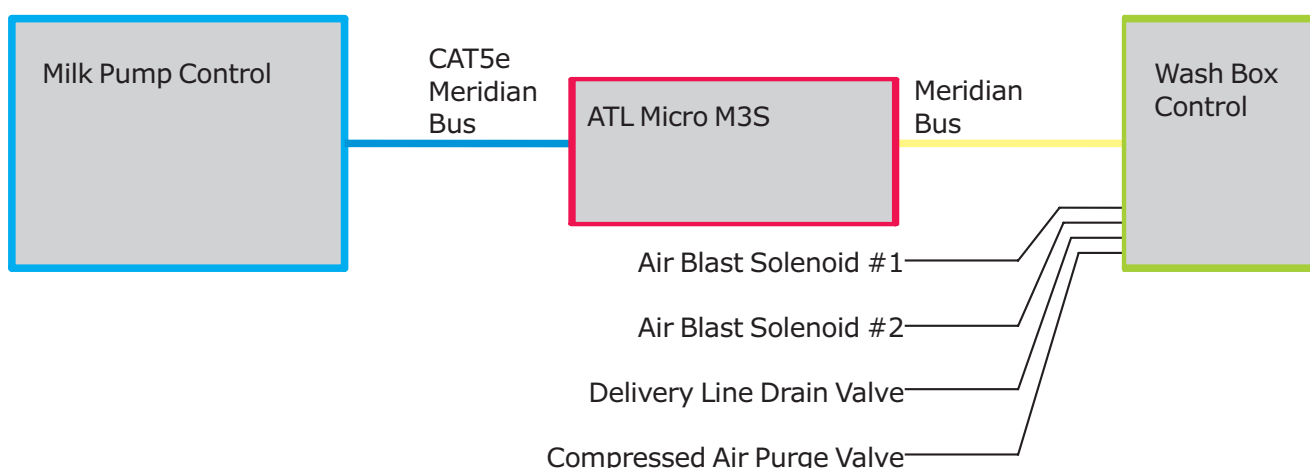
NB - The display will report OK if the communications are functioning correctly. ERR will be displayed if the communications are not functioning correctly.

Press the TICK key to exit the routine.



Connecting the Milk Pump Control to an ATL Micro M3S

- Meridian bus connection requires product model 15-0550.
- Connect the CAT5e cable into the Meridian Bus connection socket.
- Check the communications on the ATL Micro M3S control (Requires Micro software version 4.52 and Wash Box firmware 2.13, See below).
- The ATL Milk Meter system and Milk Pump Control will now enter wash, milking or idle modes from either the Wash Box Control or the Milk Pump Control.
- Changing Milk Pump Control mode to Wash will set the System into Wash mode, close the Delivery Line Drain Valve output (if enabled) on the Wash Box, and then start the AirBlast operation.
- Changing the Milk Pump Control mode to Milk will set the System into Milking mode, close the Delivery Line Drain Valve output (if enabled) on the Wash Box.
- Changing the Milk Pump Control mode to Off will set the System into Idle mode, open the Delivery Line Drain Valve (if enabled) on the Wash Box after the delay.
- Pressing the Compressed Air Purge button on the Milk Pump Control will close the Delivery Line Drain Valve (if enabled) and then open the Compressed Air Valve for the time specified in the Wash Box settings.



Enable the Milk Pump Control: Subroutine 420

This subroutine turns the link to the Milk Pump Control on or off.

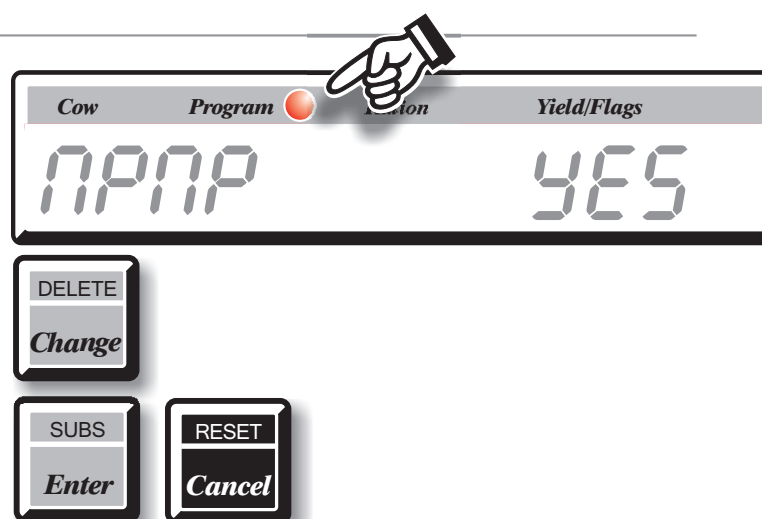
Check that Program Mode is selected.

Run the subroutine. The message 'nPNP' is displayed with 'yES' or 'no' in the Yield/Flags window.

Press Change to toggle between 'yES' and 'no'.

Press Enter to store the new setting.

Press Cancel to exit the subroutine.



Milk Pump Control TEST: Subroutine 609

The communications with the Milk Pump Control can be tested by running this subroutine.

Check that Program Mode is selected.

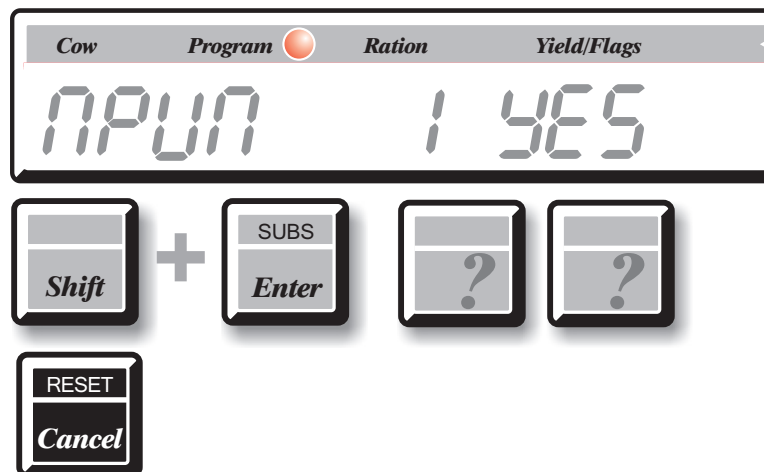
Run the subroutine 609. The message 'nPun' followed by '1 Yes' should be shown.

If a Milk Pump Control is not present, the message 'nPun' followed by '1 No'.

Press the 'STEP' key to step through additional Milk Pump Controls.

The software version of each Milk Pump Control present (i.e. '120') is displayed in the Cumulative Totals display.

Press Cancel to exit the subroutine.



Note: Please see the ATL Micro M3S operating manual for operating and instructions on running subroutines.

Connecting the Milk Pump Control to ATL AirBlast Controls

- RS485 bus connection requires product model 15-0555.
- Connect the CAT5e cable into the RS485 Bus connection socket.
- The AirBlast controls will now enter running and idle modes in accordance with the mode of the Milk Pump Control.
- Changing Milk Pump Control mode to Wash will close the Delivery Line Drain Valve on AirBlast #2, and start the AirBlast operation on AirBlast #1.
- Changing the Milk Pump Control mode to Milk will close the Delivery Line Drain Valve on AirBlast #2.
- Changing the Milk Pump Control mode to Off will open the Delivery Line Drain Valve after the delay on AirBlast #2.
- Pressing the Compressed Air Purge button on the Milk Pump Control will close the Delivery Line Drain Valve and then open the Compressed Air Valve for the time specified by the potentiometers on AirBlast #2.

