TeatMix SYSTEMS

AUTOMATED CONTINUOUS PRESSURE TEAT SPRAY MIXING SYSTEMS

USER GUIDE

OCTOBER 2024

PRODUCT OVERVIEW

Flowcoach TeatMix Systems come in three configurations:

- **FC008 Standard Flask configuration** – combines sanitiser and skin conditioner with adjustable ratios of water, with a 1200ml calibration and mixing flask.
- **FC008L Large Flask configuration** – combines sanitiser and skin conditioner with adjustable ratios of water, with a 2L capacity calibration and mixing flask.
- **FC008R Remote Level Sensor** – combines sanitiser and skin conditioner with adjustable ratios of water, held in remote tanks with level sensor control.

Model FC008

Model FC008L

Model FC008R

Flowcoach Teat Mix Systems hold a flask of ready mixed teat spray in reserve, on top of that 1 litre mix is a 200ml buffer mix that triggers teat spray mixing when it has been used in the reservoir. The reservoir is also used 'once' on set up for mix calibration using the graduated scale on the side of the cylinder.

PRE-INSTALL SITE VISIT

Check the following

- Access to water for installation of the reservoir/header tank.
- Access to single phase power for 12V DC operation of the controller.
- Access to compressed air to operate the Inflex mixing pumps. Flowcoach air inlet has a 6mm quick connect air fitting for incoming compressed air.
- Closest practical access to chemical drums within approved guidelines.

Compressor Audit

Check air compressor condition for signs of water oily residue that indicates worn out compressor – contamination of solenoid valves from oil/voids warranty. Compressed air quality ensures long term trouble-free running – install a moisture trap next to the compressor when air is drawn from a warm air environment.

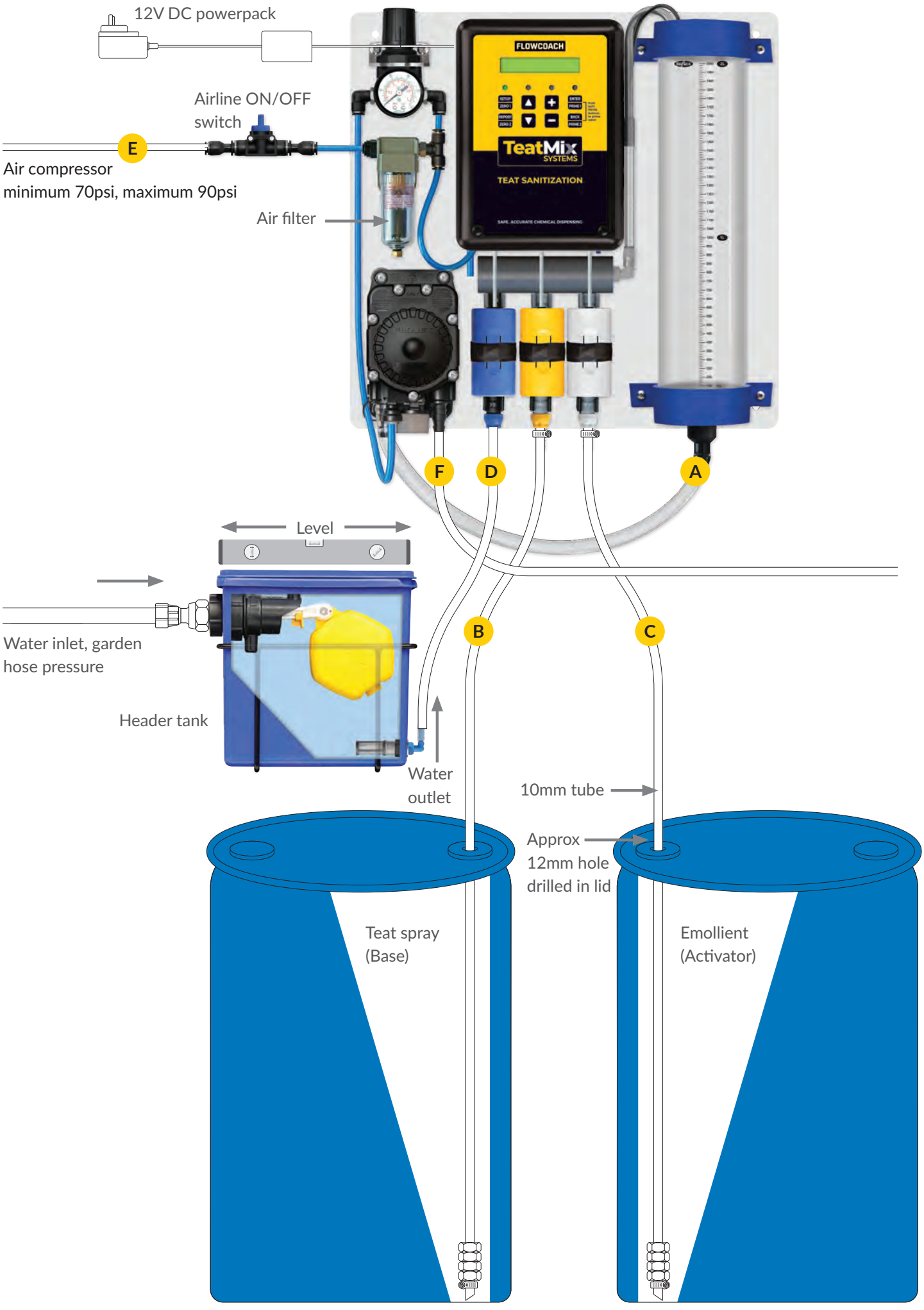
PARTS LIST

- 1 x Flowcoach TeatMix Systems mounted controller complete with air regulator, air filter, air driven pressure pump and calibration/chemical storage flask.
- Water Header Tank Assembly (containing cradle/wall mount fitting bracket, inlet pipe threaded external plastic washer/nut (if required), tube connecting water supply from header tank to Blue Water Pump inlet (cut to required length).
- 1 x 10 metre roll of 9.5 PVC Chemical Inlet tube (for teat spray and emollient).
- 1 x 10 metre roll of 6mm compressed air tube with 6mm/10mm equal tee fitting (for insertion into the existing compressed air line).
- 1 x 12 volt single phase power pack.

BEFORE OPERATION

- Connect tube onto Flojet Pump and Inflex Flask **A**
- Connect 10mm PVC teat spray chemical tube from bottom of teat spray drum, secure on barb fitting with tube clamp **B**
- Connect 10mm PVC emollient chemical tube from bottom of emollient drum **C**
- Connect the water line from reservoir tank onto the blue water pump **D**
- Connect the compressed air 6 mm blue tube from air supply to air inlet on filter **E**
- Connect a 10mm Outlet tube from Flojet pump to platform **F**.

Figure 1.


12V DC powerpack
Airline ON/OFF switch
E
Air compressor
minimum 70psi, maximum 90psi
Air filter
FLOWCOACH
TeatMix SYSTEMS
TEAT SANITIZATION
F
D
A
Level
Water inlet, garden hose pressure
Header tank
B
C
Water outlet
10mm tube
Approx 12mm hole drilled in lid
Teat spray (Base)
Emollient (Activator)

SYSTEM OPERATION (CONTROL BUTTONS)

SYSTEM CONTROLS

LED indicators

There are four coloured LED indicators in the Controller.

LED 1: **Green** – indicates that the unit is ON in active mode.

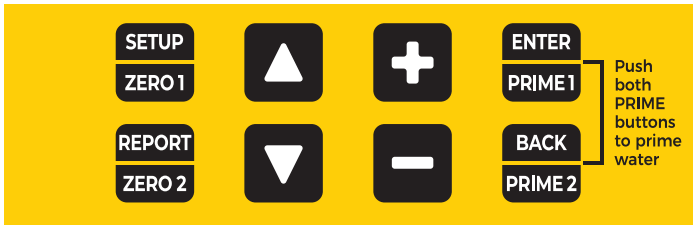
LED 2: **Blue** – indicates that the Chemical (Chem) dispensing pump is operating.

LED 3: **Blue** – indicates that the Emollient (Emol) pump is operating.

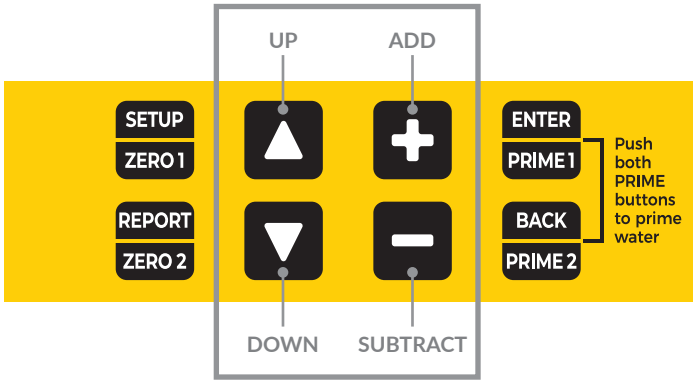
LED 4: **Static Red** – indicates that the processor is completing a duty cycle.

Button Functionality

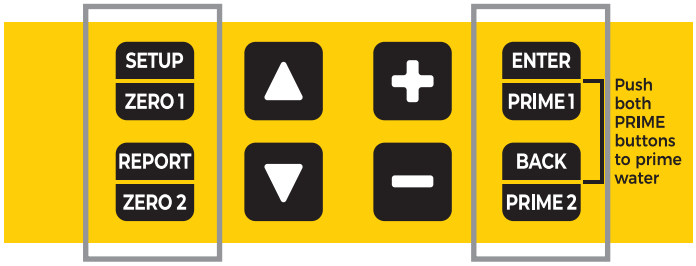
There are eight buttons on the TeatMix that control menu operations. Some buttons control more than one operation depending on the length of time they are pressed.



The four inner buttons allow the user to adjust the menu selections.



The four outer buttons are menu control functions.



Report Button

Pressing REPORT button gives the user a snapshot of comparisons of the amount of products used in sessions of continual use (up to five hours).

Reports can be viewed as both a 'Total Product used picture' and also as a 'Product applied per cow picture' broken down to:

- Last Session
- Sessions in the past 24 hours
- Sessions in the past 7 days
- Sessions in the past month
- Sessions in the past year

Data is displayed on both total mix volume (including water), total chemical used, total emollient used, and then also as an average amount of total teat spray mix applied per cow and chemical and emollient applied per cow. Using the UP and DOWN arrow allows users to view the full range of reports.

Priming Buttons

Prior to use both chemicals need to be primed. PRIMING OF CHEMICALS MUST BE DONE WITHOUT 'HEAD WATER PRESSURE'. CHEMICAL MUST BE PAST THE PUMP AND IN THE LINE BEFORE WATER IS CONNECTED.

Hold down for four seconds either of the PRIME buttons while on the home screen to activate pumps to prime.

Keep holding down the button until liquid is through the pump and in the product mix line.

NOTE: Raw Glycerine as an unmodified blend is not suitable for use in automated dispensing applications.

Back Button

This button is the 'Escape' button that takes the user out of a menu back to HOME SCREEN. Remember any adjustments made to ratios will be locked in for future use once the BACK button has been pressed.

Pressing the BACK button also kills the audible alarm.

SETUP
ZERO 1

Zero 1 Button

Once a TEAT SPRAY chemical drum has reached its low warning level a warning buzzer sound and screen message will display. To end the buzzer sound press the BACK button.

When a drum is replaced PRESS and HOLD the ZERO button for 4 seconds. This will take the user to a menu confirming the replacement drum size or varying the drum size using the range of container size options provided.

Once the new drum is confirmed the software will start to record information on the drum level and the alarm will cease.

NOTE: Once a drum is empty, users will be prompted to replace the drum every 24 hours by the alarm reactivating this will repeat until the drum is replaced and the new drum size is confirmed.

REPORT
ZERO 2

Zero 2 Button

Once the EMOLLIENT chemical drum has reached its low warning level a warning buzzer sound and screen message will display. To end the buzzer sound press the BACK button. When a drum is replaced, PRESS and HOLD the ZERO button for 4 seconds. This will take the user to confirming the replacement drum size or varying the drum size using the range of container size options provided. Once the new drum is confirmed the software will start to record information on the drum level and the audible alarm will cease.

NOTE: Once a drum is empty, users will be prompted to replace the drum every 24 hours by the alarm reactivating this will repeat until the drum is replaced and the new drum size is confirmed.

SETUP
ZERO 1

SETUP MENU (CONTROL FUNCTIONS)

Automatic Operation - Menu 1
Control (triggering) of the mixing operation is controlled by the level sensor in the top of the flask. This device is automatically activated when the fluid level in the flask drops down from 1200mL to 1000mL.

The level sensor should always be set at ON to automatically monitor fluid level in the flask. If it was turned OFF the unit will not work. To alter status press the + or – button (+ for ON, – for OFF).

Operation Mode:
Auto Operation ON

▼

Teat Spray Concentration - Menu 2
This menu controls and allows the user to modify the ratio percentage of teat spray and emollient in the final mix of teat spray.

The factory set up is 10% dilution on both the Teat Spray and Emollient. Once the calibration is completed each pump can be altered independently.

Variation in dilution of each ingredient is adjusted by the + or – button to increase or decrease ingredient dilution.

▼

Drum LEVEL Warning - Menu 3
Users can set a warning activation once low level liquid in the chemical drum is detected. That level can be adjusted using the + or - button to increase/decrease the % level of the drum when activation occurs.

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Zero Display Meter - Menu 4
System reset of chemical usage.

▼

Container Adjustment Select (Press Enter) - Menu 5
This menu allows users to match the amount of chemical in the drums to represent the actual volume in the drum.

When part drums of chemicals are used, an adjustment of the actual volume of chemical to match the amount of chemical in the screen values needs to be made up to make sense of low level warnings.

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Calibrate System - Menu 6 (see page 7)
This is a 'one off' process done at the completion of TeatMix installation and before the system is in daily use.

Each step is controlled by activating the + button.

Follow the screen prompts instructions to complete the calibration process.

Use the ENTER button to cycle through the menu tasks to be completed.

NOTE: Once calibration is completed and 'locked in' both chemical dilution settings for teat spray and emollient can be individually adjusted to the users or label recommendations.

Installation Menu - Menu 7
This menu must be completed before Calibration and prior to using the TeatMix.

There are two sets of controls and values for each chemical (System 1, teatspray; System 2, emollient).

These must be adjusted to represent the 'actual' physical attributes of your particular dairy and chemical/controller location:

Length of inlet tube
System 1 Setup: Adjust the length of inlet tube to represent the distance from the bottom of the chemical drum to the inlet of the teat spray pump (to the nearest 500mm).

System 1 Lift: Estimate the height from the ground to the controller pump.

System 1 Viscosity: Select a class of viscosity between 1 - 4 (1 = water and 4 = Emollient in very cold weather) to run pump speeds NOTE - This process is repeated again for System 2.

These same selections are repeated for System 2 (emollient pump) - length of inlet hose, lift, and Product viscosity. Typically Teat Spray is a viscosity 2 (may require 3 in cold weather. Emollient is viscosity 3, but will move to 4 in cold weather.

Advanced Options - Menu 8
This menu contains a number of useful settings and reset options.

Pump Calibrations
This lists the actual dispense volumes being displaced at each stroke of each pump.

Water Pump - Blue
This is a 5mL (black inner) pump typically its reading will be in the range of 5 - 6mL on water.

Teat Spray Pump - Grey
This is a 3mL pump (Grey inner core) typically its output will show as 2.5 - 3mL in advanced settings.

Emollient Pump - White
This is a 3mL pump (grey inner core) typically its output will be similar or less than the teat spray pump.

Run Time Limit
This feature limits the time the TeatMix will run for, if for some reason a pipe were to burst in the dairy and chemical is pressured to run to waste.

Factory settings for run time limit can be adjusted using the + or – button up to 180 minutes. From the factory run time is limited to 20 minutes of continuous running.

In large herds (1200 cows +) the run time limit may need to be adjusted to extend capacity as pumps may need to run for extended periods.

Container Filling Volume Run Time Limit
This setting determines the amount of chemical mixed at a filling interval into the flask. The factory setting for this function is 200mL. Usually no adjustment is required.

Low Air Pressure
Mixing of chemicals requires a minimum of 65psi air pressure at the controller. If that is reduced for any reason mixing may be compromised. In that case, a low air pressure signal may be triggered.

Control of this alarm function is in the advance setting menu.

1. **Complete installation (System Menu 7) first**
2. **Now calibrate System Menu 6**
3. **After calibration, set individual mix dilution percentage**

INITIAL CALIBRATION ROUTINE

Prime Pumps prior to calibration/use
Saflex pumps are self priming, 'O' rings and seals must be secure for pumps to work. Make sure all connections are hand tight, fully tighten tube clamps before using PRIMING. Set both pumps (teat spray and emollient) on chemical dispensing rates of 10%.

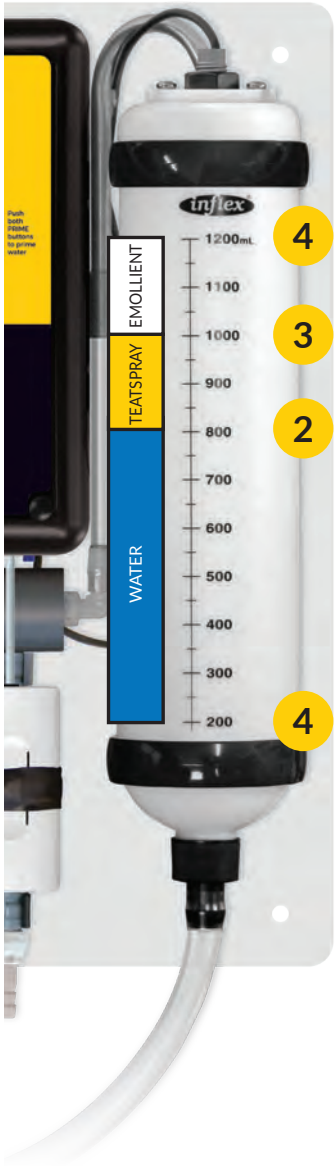
Unit should be off when calibrating and priming Flojet.

Set Up Menu - Calibrate Pumps - ENTER
The calibration menu uses only two buttons: the + button to add fluid and the ENTER button to confirm levels and move to the next step.

STAGE 1
Press + button to draw the water level in the flask until it is resting on the 200mL mark at the bottom of the flask.

Press ENTER button.

(NOTE: you can press + button in on/off motions to increase accuracy of fluid added to the flask)



STAGE 2
Press the + button, and draw up 600mL of water so that fluid level rests on the 800ml in the Flask.

Press ENTER button.

STAGE 3
Press the + button, and draw up 200mL of Teat Spray Concentrate to the Flask, this will change the colour of the water in the Flask.

Press ENTER button.

STAGE 4
Press the + button to add 200mL of emollient to the flask.

Press ENTER button.

NOTE: Screen prompt will now show the amount of water and chemical added by each pump stroke. The water will add 5-6mL of fluid per stroke, the Teat Spray and Emollient will add approximately 2-3mL per stroke. Follow screen instructions to save calibration values as the final calibration step.

Press ENTER button.

YOU ARE NOW READY TO SET THE ACTUAL PERCENTAGE THAT YOU REQUIRE.

KEYS TO CALIBRATION (see menu 2)

1. **Leave the Flojet off for calibration**
2. **Turn auto operation off**
3. **Prime unit**
4. **Calibrate**
5. **Set mix rates**
6. **Turn auto operation back on**
7. **Turn the Flojet on**

Now you are ready to go!

PREVENTATIVE MAINTENANCE

YOUR COMPRESSOR

(Read important message on page 14)

Installation check

Locate the unit where there is easy access to compressed air, water, power and where it will be convenient to deliver chemical drums with minimal effort.

Compressor operating air pressure

The air pressure entering the controller should ideally be 80-90psi in open flow.

Your compressor should have an auto-drain oil/air filter installed to reduce contamination.

If you are using an older compressor check for oil in the airline. Compressors need to cut back in to operation 65psi.

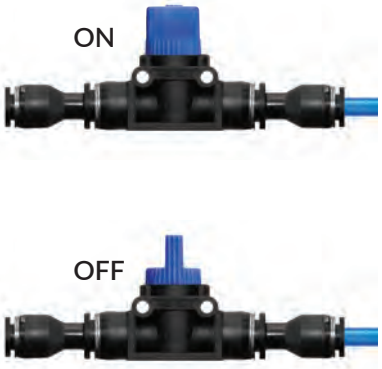
Compressors need to cut back in at 65psi.

The length of the compressor air tube should be as short as possible to minimise condensation.

Read important message on page 14.

Air filter

Turn OFF the air filter tap when water appears in the filter bowl to allow it to auto drain.



Signs of oily water

If the filter bowl is milky white the unit needs to be returned to Saflex for servicing.

CHEMICAL DRUMS

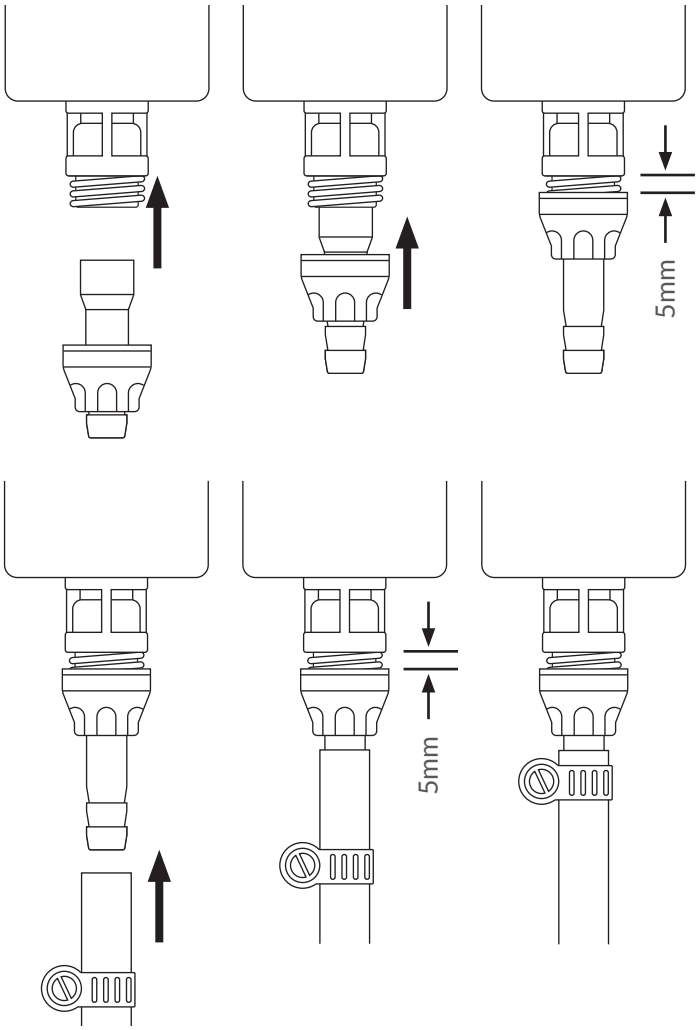
The drums need to be located as close as possible to the TeatMix unit.

Make sure the chemical inlet tubes inside the drums are cut to the correct length. To avoid blockages, the ends should not rest on the bottom of the drums.

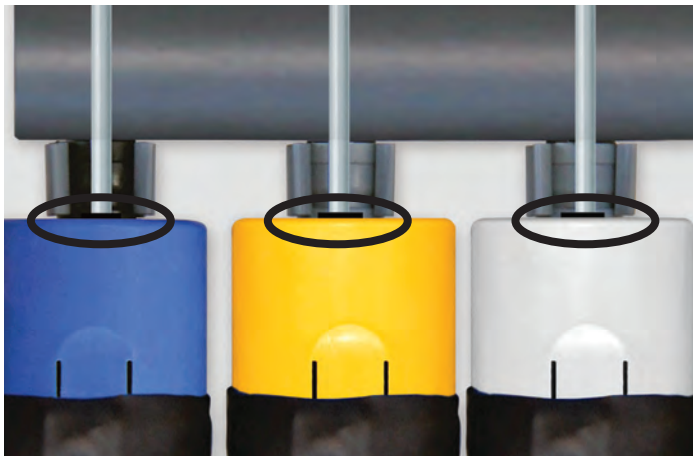
Angle cut the hose ends for constant uptake of chemical

CHEMICAL INLET TUBES

When fitting the tubes, do not over-tighten the nuts to avoid stripping the threads. Finger tight only, leaving approx 5mm of the thread showing above the nut.



Check pump air lines are locked into the clip on the top of the chemical pump. Air lines not locked in will prevent the pump operating.



Water line

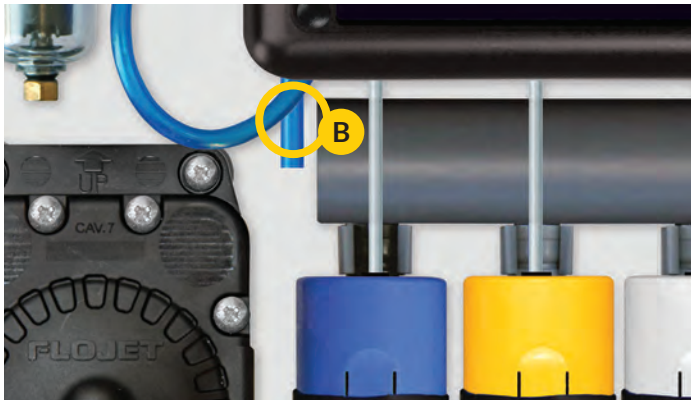
For adequate flow into the TeatMix reservoir, the water flow needs to be at a good consistent pressure.

THE WATER RESERVOIR

Check the water filter regularly for contaminants (A). Make sure the mesh filter on the pump inlet line is free of any water contaminants.

CONTINUAL AIR EXHAUSTING (B)

If air is continually exhausting from (B) this is a possible sign of solenoid valves being contamination by oil or water. This unit will need to be returned to base for servicing.



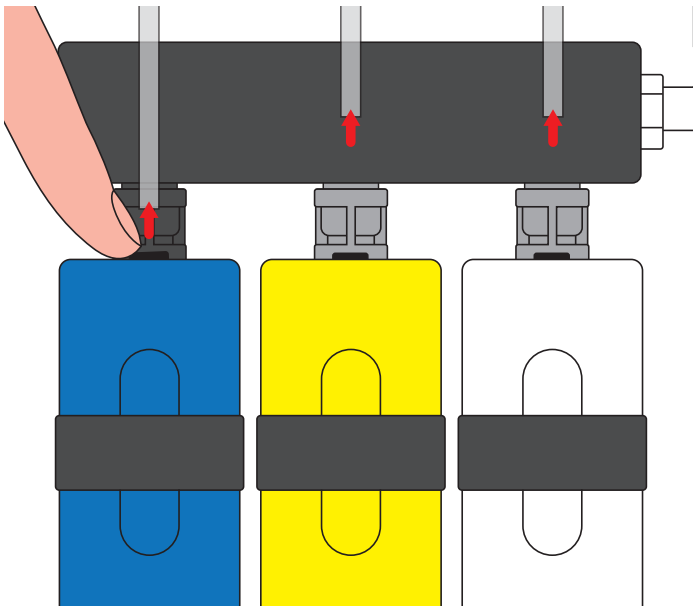
CARTRIDGE AIRLINE CONTAMINATION

If any liquid appears in the airlines (C), follow procedure on page 10 to replace the affected pump. Follow the pump removal instructions carefully to avoid damage.

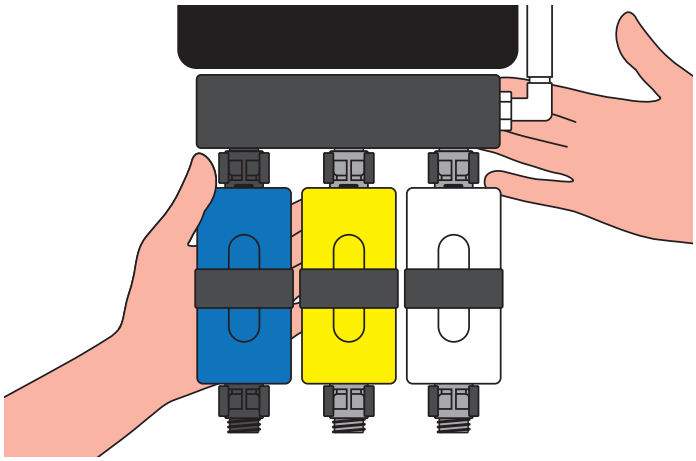
Use care when screwing in the pumps as Inflex pumps are made from a chemical-resistant plastic that could be cross-threaded or over-tightened.

REPLACING A WATER PUMP

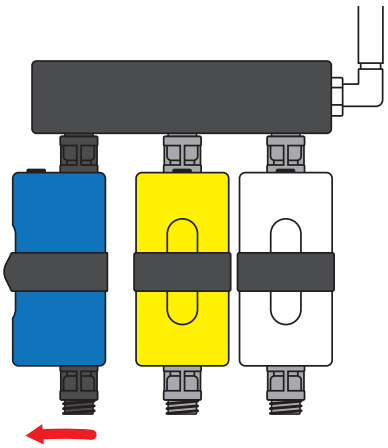
Push down on the black tube grips and pull tubes out of each of the three pumps, feeding them partway into the controller box.



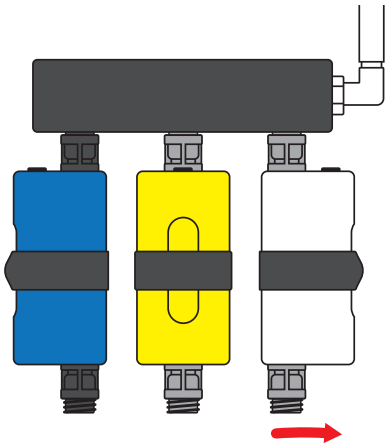
Supporting the grey manifold exit elbow with the right hand, and blue water pump with the left hand, pull upwards to unclip the three pumps from the retaining clips.



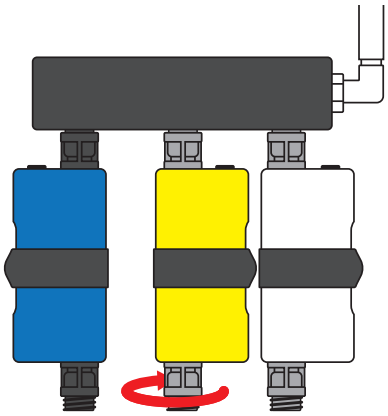
Rotate the blue water cartridge 90° to the left (anticlockwise).



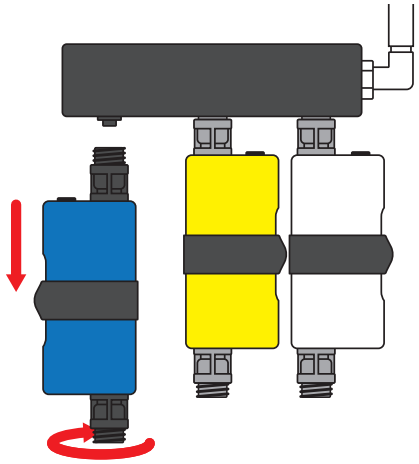
Rotate the white cartridge 90° to the right (clockwise).



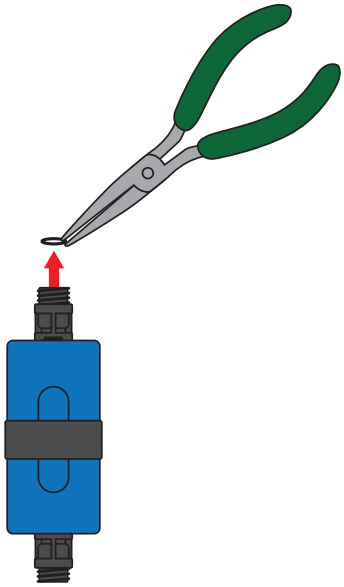
Rotate the yellow pump 270° (¾ turn) to the left (anticlockwise) so that it faces in the same direction as the white pump.



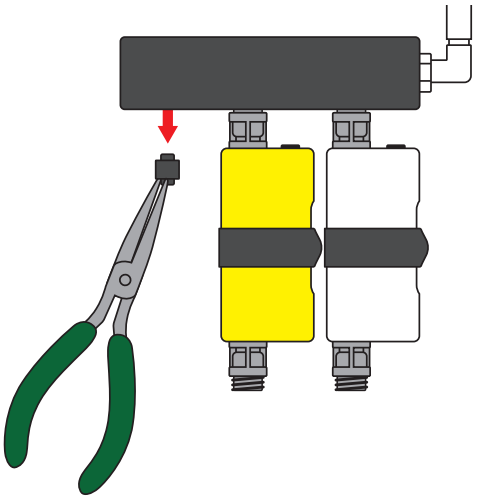
Rotate the blue pump to the left (anticlockwise) until it is fully removed from the manifold.



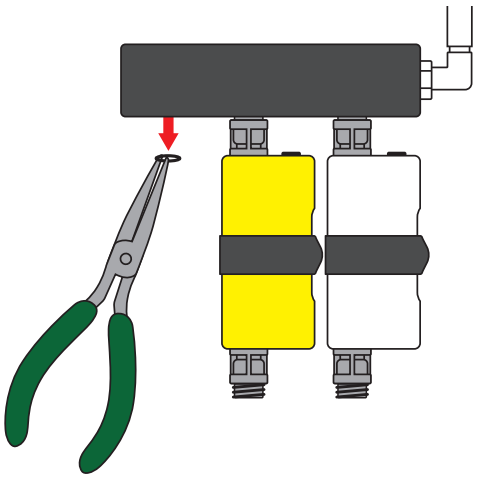
Remove the ‘O’ ring from the blue pump.



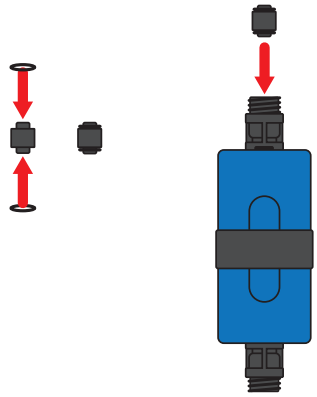
Remove the stub from the manifold.



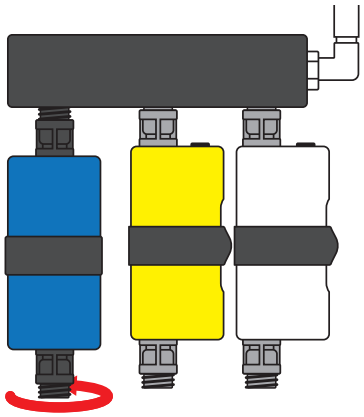
Remove the ‘O’ ring from the thread in the manifold where the blue pump had been.



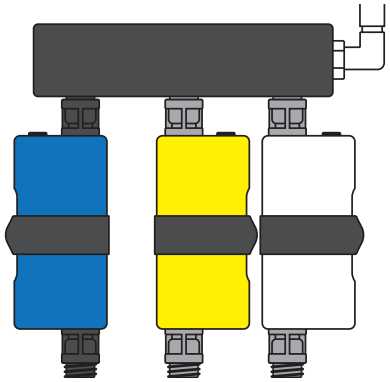
Reassemble the ‘O’ rings to both ends of the stub and insert into the top end of the blue water pump (the end with the black tube grip).



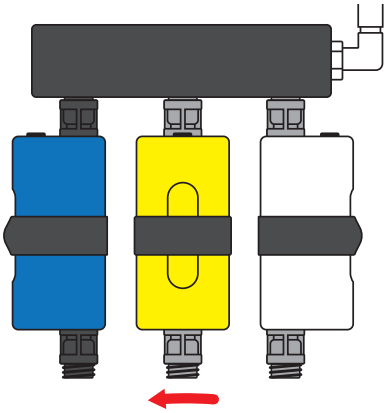
Carefully re-thread the new blue water pump clockwise into the manifold.



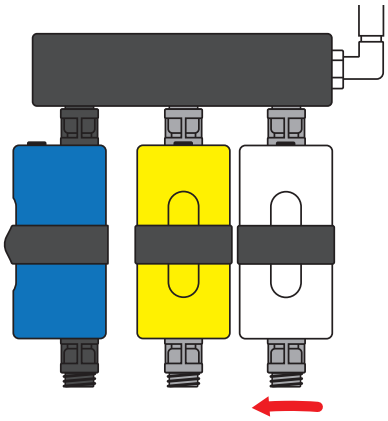
Pause re-threading when the pump is almost fully inserted but is still facing the left.



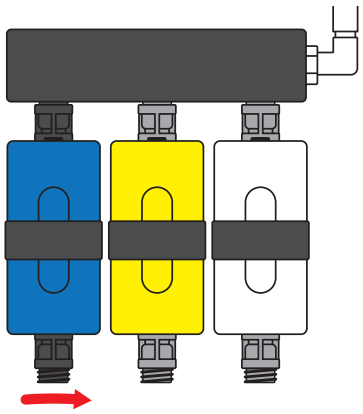
Rotate the yellow cartridge to the left (anticlockwise) 90° so the black tube grip faces forward, in its original position.



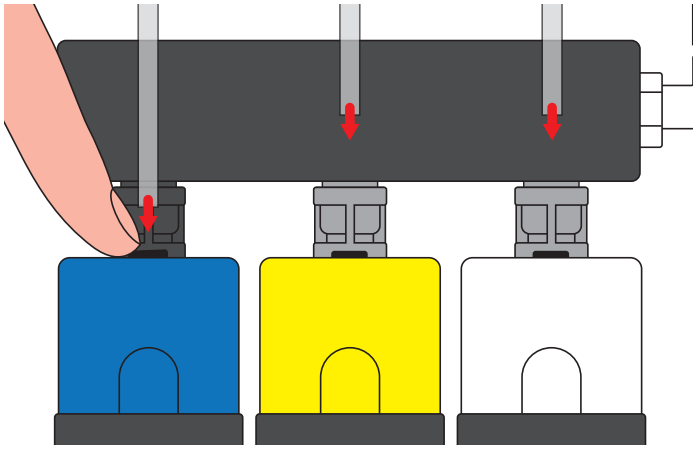
Rotate the white cartridge to the left (anticlockwise) 90° so the black tube grip faces forward, in its original position.



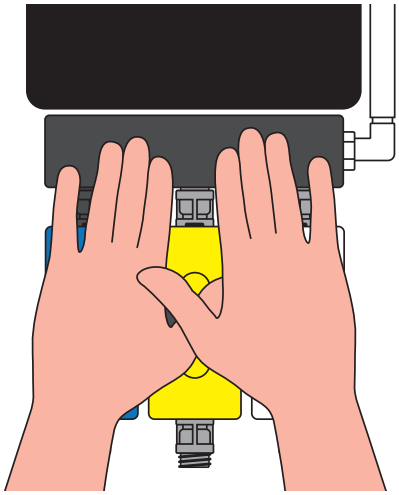
Rotate the blue cartridge 90° to the right (clockwise) so that now all three cartridges face forward.



Pushing down on the tube grips with one finger, insert all three tubes back into their pumps.



To refit the manifold and cartridges, place them on the six retaining clips and push down with both hands.

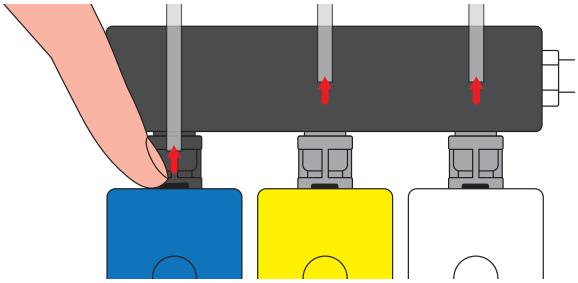


END-OF-SEASON MAINTENANCE

Check air filters and air lines to the TeatMix unit for signs of moisture and oil.

Turn the ON/OFF Valve (marked as E on Figure 1, page 3) to OFF, disconnect the airline from the filter. Turn the ON/OFF valve to ON to allow any moisture contaminant to be blown out of the airline from the compressor before reconnecting to the filter.

Remove the three airlines from the top of the pump cartridges.



Turn the controller to on and allow any contaminant to expel from the pump airlines.

Replace the three airlines into the top of the three pumps.

Run warm water through the unit before shutting down at the end of the season.

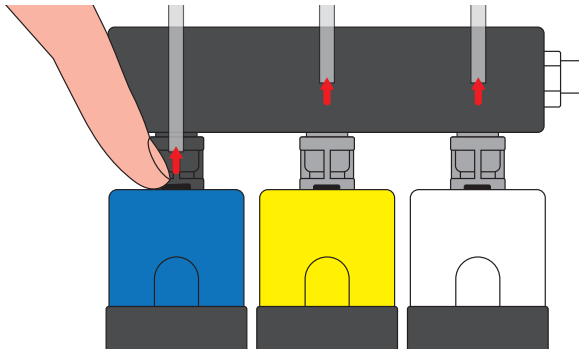
Do a routine check on the condition of the compressor, see page 14.

START-OF-SEASON MAINTENANCE

Check air filters and air lines to the TeatMix unit for signs of moisture and oil.

Turn the ON/OFF Valve (marked as E on Figure 1, page 3) to OFF, disconnect the airline from the filter. Turn the ON/OFF valve to ON to allow any moisture contaminant to be blown out of the airline from the compressor before reconnecting to the filter.

Remove the three airlines from the top of the pump cartridges.



Turn the controller to on and allow any contaminant to expel from the pump airlines.

Replace the three airlines into the top of the three pumps.

Run warm water through the unit before starting up at the start of the season.

Do a routine check on the condition of the compressor, see page 14.

Recalibrate unit if a change to the chemical formulation is made.

Check if servicing is required. Replace the water cartridge if it has done more than 5,000 litres.

USEFUL TIPS

Priming
If the inlet tube fluid level is not priming, check to see if the 'O' ring is missing.

Take a Pic!
When the unit setup is complete, use a camera or mobile phone to take photos of the chemical settings so that you can refer to them in the future, if necessary.

DON'T TOUCH WHAT YOU DON'T KNOW
Don't change the settings without referring to this user guide.

Foaming
If there are signs of foaming at the top of the flask, look for air coming in through the header tank, poorly fitted connections or the flojet.

WARRANTY

Flowcoach TeatMix Systems are covered by a parts and labour warranty up to 5,000 litres of mixed teat spray from the installation date, providing the following provisions have been maintained.

Air Compressor
Existing Air Compressors must be checked for signs of a need for servicing of the air Compressor PRIOR to the installation of the TeatMix. These signs include oil/water/sediment residue in the compressor filter. Contaminants must be removed and air delivery lines blown clear to ensure air delivery to the solenoids in the TeatMix are protected when installed. Failure of the TeatMix during warranty due to contamination of air supply will void the TeatMix warranty.

IMPORTANT MESSAGE ON AIR COMPRESSORS

BEST PERFORMANCE OF YOUR AIR COMPRESSOR

It is important that a compressor selected for compressed air supply into a dairy shed is rated for industrial use. A shed can work 3-4 hours per milking plus and often the compressor is left on 24/7 so an industrial compressor has to be selected for 6-8 hours daily service, 7 days per week.

Compressor selection/sizing guide. Always better to have reserve than to over demand.

Chemical dosing pumps only
Pressure 5.0 bar/70 PSI
Capacity 250 lpm/10CFM

Chemical dosing pumps and drafting gates
Pressure 6.0 bar/85 PSI
Capacity 350 lpm/12 CFM

Chemical dosing pumps, drafting gates and milk sweeping
Pressure 6-7.0 bar/85-90 PSI
Capacity 400 lpm/15 CFM

COMPRESSOR INSTALLATION NOTES

1. Place the compressor in a location that has plenty of fresh air movement for cooling and air intake to the compressor inlet filters. Air movement takes away heat and reduces moisture intake and resulting water condensate in the compressed air.
   a. Not in an area where chemicals are stored as it will draw in the chemical possibly damaging the compressor and downstream control equipment.
   b. Not in an area where high water/steam/humidity is present as this adds to water condensate in the compressed air.
   c. Easy access for daily checks and routine maintenance.

2. **Always** use compressor oil for the compressor, **motor oils are not suitable**. If you notice oily content in the airlines it is important to install oil removal coalescing filters immediately to protect all air control equipment from the “sticky” oil.
3. Direct power supply via 10/15amp plug for single phase units. **No** extension leads as these cause voltage drop/hard starting resulting in current overload and nuisance tripping and capacitor(s) failure.
4. If the compressor overload trips check for a fault. It is a protection device to prevent electric motor burnout so only reset once the fault has been identified and remedied
   a. Power supply voltage is low? Check voltage reading when starting so the load is reflected in the reading, the power shouldn’t drop below 210 volts at start up.
   b. Motor capacitor has failed, why?
      i. High start stop cycle rate. Increase receiver size or widen compressor Cut in-Cut out settings to reduce the number of starts per hour.
      ii. Low voltage on power supply. No extension leads or other devices from the same plug?
   c. Motor overheating
      i. Poor ventilation
      ii. Low voltage supply causing increased current draw
      iii. Duty cycle is over 70%? Reduce demand or increase capacity
5. Piston compressors are not rated for 100% duty. When selecting/sizing a compressor an allowance for a minimum 30% downtime is important. During peak demand does you compressor turn off between cycles?
6. Drain condensate from the air receiver daily, install an electric automatic drain valve kit if the receiver is not drained daily so condensate and oil is partially removed.

Routine servicing

The demand profile for the dairy shed means 6-8 hours per day, 7 days per week so the compressor should be serviced annually and checked at 6 monthly intervals by an experienced compressor service provider.

Auto drain water condensate

Flowcoach products include an air filter with an automatic drain to remove water condensate from incoming compressed air REMEMBER look for a suitable location when placing the air compressor where air movement is maximised to remove moisture build-up - avoid placing compressors in areas of heat/steam/humidity.

Regular compressor servicing over the life of use is essential for long term reliability of Flowcoach products.

Power Supply

In locations subject to electrical discharge from lightning or on sites where power is known to spike or surge. Surge protection must be installed on the electrical input plug prior to plugging in the power pack.

Tampering

Do not tamper with the unit as it may incur cost against the warranty.

FLOWCOACH

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