



VSD OPERATED WATER PUMPS

Installation guidelines for Installing Horizontal Dry-mounted Variable Speed Drive Water Pumps (MPEP-6000, MPEP-7000, MPEP-9000, SQ2-DRL10-6M)

***This is a quick basic Installation guidelines only for VSD dry mounted water pumps.
Refer detailed Dooch VSD Operation and Maintenance Instructions supplied with the pump for VSD use.***

Please read and follow all these instructions carefully before proceeding with the installation, this will ensure many years of trouble free pump performance, and protect your warranty.

WARNING

- 1) This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- 2) Children should be supervised to ensure that they do not play with the appliance.
- 3) If the pump is not intended to be used for cleaning and other maintenance of swimming pools
- 4) The electrical installation must be in accordance with national wiring rules and regulations.
- 5) Where pumps are to be used in outdoor fountains, garden ponds and similar places the pump is to be supplied through a residual current device (RCD) having a rated residual operating current not exceeding 30 mA
- 6). If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- 7) Maximum fluid temperature should not exceed 35 °C.
- 8) Maximum of 15 starts per hour.



Application Parameters:

A Wallace automatic pressure system can supply clean water to houses or commercial units. MPEP-6000, MPEP-7000, MPEP-9000 & SQ2-DRL10-6M provide a constant pressure feed. MPEP-6000, MPEP-7000, MPEP-9000 & SQ2-DRL10-6M pumps operate from above or below ground rain water tanks, spear points or any other clean water source. These units can operate with a pressurised water supply as long as total pressure does not exceed the following limits: MPEP pumps - 80 m or DRL pumps - 100 m. Operation of above pumps with suction lifts of greater than 3m will significantly reduce pump performance. The max water temperature allowable is 35°C. Maximum ambient air temperature is 40°C. Maximum of 15 starts per hour. There is a built in delivery non-return valve in the controller of the pump, but it is recommended a non-return valve also be installed in the suction piping.

Caution Notes:-

1):- Air pressure in the pressure tank MUST be checked every 6 months or earlier & replenished to correct pressure. Pressure tank having No or less than recommended air pressure may keep pump running on and subsequently may damage pump or pipes etc. which is NOT COVERED UNDER WARRANTY. Refer procedure on page 6 for how to check and replenish air pressure in pressure tank.

2):- A small flow of between 0.05-0.7 L/min or repeated small volume usage (e.g. bottle filling) the pump will switch on and off more than 15 times per hour. To prevent this we recommend having a larger pressure vessel (DT18 or bigger) T-ee'd off from the discharge line. This increases the pressure storage volume which increases the time between pump starts.

INSTALLATION GUIDE

We advise suction pipe ID should not normally be less than the pump suction port size. (Use of smaller pipe size may invalidate warranty.)

Suction pipe length should be minimized wherever possible. If suction pipe length (not the suction lift which is restricted to max 3m) exceeds 6 m we recommend the pipe diameter be increased. If suction pipe length exceeds 15 m, please contact Wallace Pumps.



A) Items to be arranged by Owner / Installer:

1) For Flooded Suction conditions, use a best Quality AIRTIGHT Isolating valve Full Bore type of minimum same size or bigger to match the **Suction port** size (32 mm for MPEP & 40mm for DRL). Please **ensure that the Isolating valve used on suction pipe is suitable for full vacuum conditions & will not allow air to enter the suction pipe.**

2) For Suction Lift conditions a best Quality FOOT valve of suitable size with minimum head loss and to open fully for desired flow rate via pump, **Must be installed at the end of Suction pipe.**

3) On delivery side of the pump, use a best Quality AIRTIGHT Isolating valve Full Bore type of minimum same size or bigger to match the **Delivery pipe** size. This to be installed immediately after pump delivery port and before any tap or take off point.

4) On Suction side, use a best quality AIRTIGHT Quick Connect Union Full Bore type of minimum same size or bigger to match the **Suction port** size. Please **ensure that the Quick Connect union used on suction pipe is suitable for full vacuum conditions & will not allow air to enter the suction pipe.**

5) On delivery side, use a best Quality AIRTIGHT Quick Connect Union Full Bore type of minimum same size or bigger to match the **Delivery pipe** size. This Union to be installed Before the delivery side Isolating valve for ease of pump removal for repairs and maintenance.

6) For Flooded Suction conditions a best Quality Non-Return valve of suitable size with minimum head loss and to open fully for desired flow rate via pump, **to be installed in Suction pipe between pump and suction side Isolating valve for ease of repairs and maintenance.**

7) A covered housing for installing pump. This must protect pump from heat, rain, flooding, freezing, humidity & condensation etc. The housing should be weather and vermin proof, have a solid, dry base and be well vented so that motor heat can escape. In the event of a leak the water must be able to drain away from the pump and any property without causing damage. **Damaged to Pump, &/or motor &/or Controller &/or any property &/or person due to NON-PROVISION or INADEQUATE housing for pump is NOT COVERED UNDER WARRANTY.**

8) A dedicated, fused, switched, 230V, 1Ph, 50HZ suitably earthed power supply point **rated for correct FLC of pump** to be made available within **2 m from the pump with suitable circuit breaker & power surge protection**, to protect pump from overload & power surge.

Never use long undersized extension leads from a distantly located power supply point to supply power to pump.

Pump and / or motor damage due to inadequate &/or wrong &/or unprotected power supply is **not covered under warranty.**

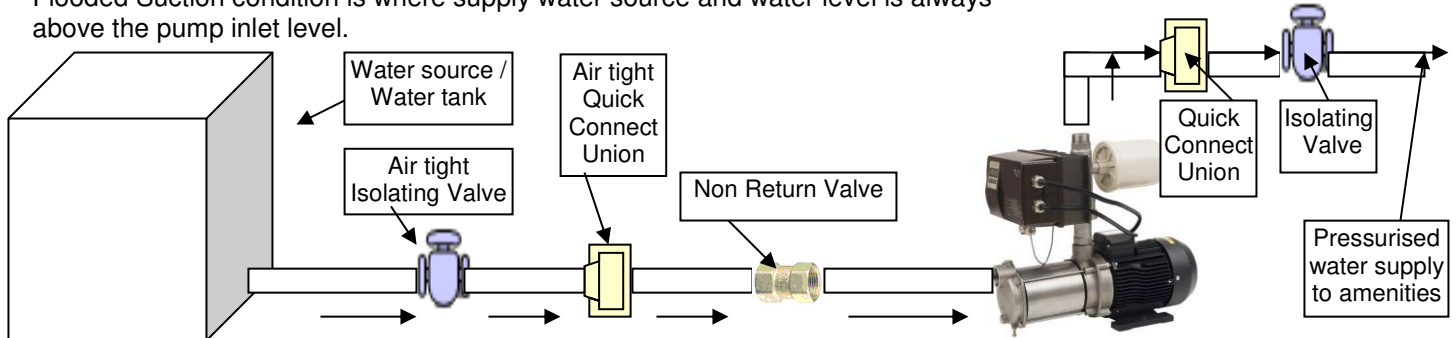
9) All other items that may require to install & operate the pump as per detailed instructions &/or as per local authority's rules & regulation.

10) WARNING – the VSD controller will retain charge for several seconds after the power supply is switched off or unplugged. During this time the VSD display will continue to operate. Do not access VSD power terminals or touch power plug prongs whilst the VSD display is lit.



B) Typical layout details for “Flooded Suction” condition with one tank:

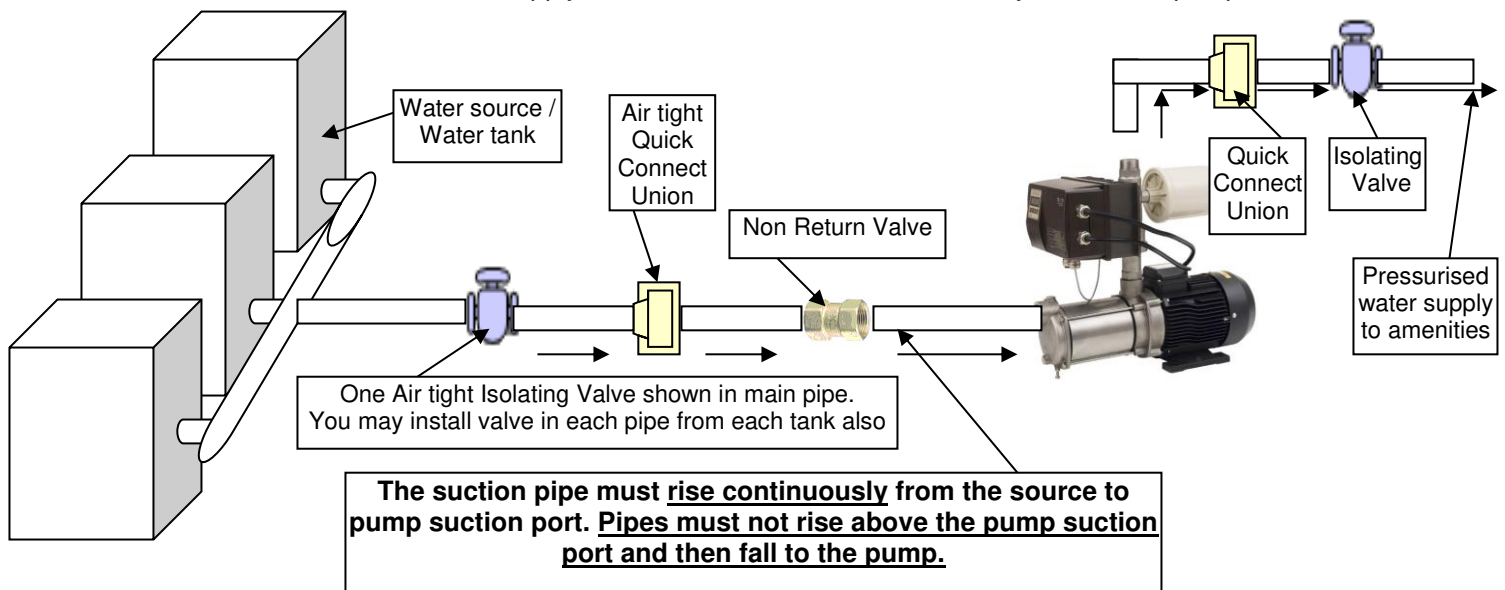
Flooded Suction condition is where supply water source and water level is always above the pump inlet level.



The suction pipe must rise continuously from the source to pump suction port. Pipes must not rise above the pump suction port and then fall to the pump. Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.

C) Typical layout details for “Flooded Suction” condition with multiple tanks:

Flooded Suction condition is where supply water source and water level is always above the pump inlet level.



Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.



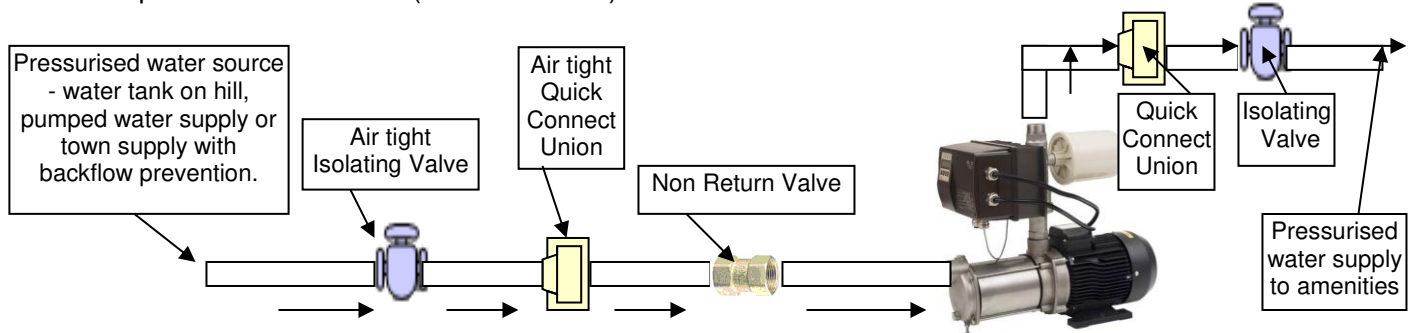
D) Typical layout details for Pressurised Suction condition:

Pressurised suction conditions can be challenging to operate, please contact Wallace Pumps with any concerns.

Care must be taken so total pressure does not exceed the following limits: **MPEP pumps - 80 m or DRL pumps - 100 m.**

A pressurised supply may require changing of VSD settings – see Wallace Pumps:

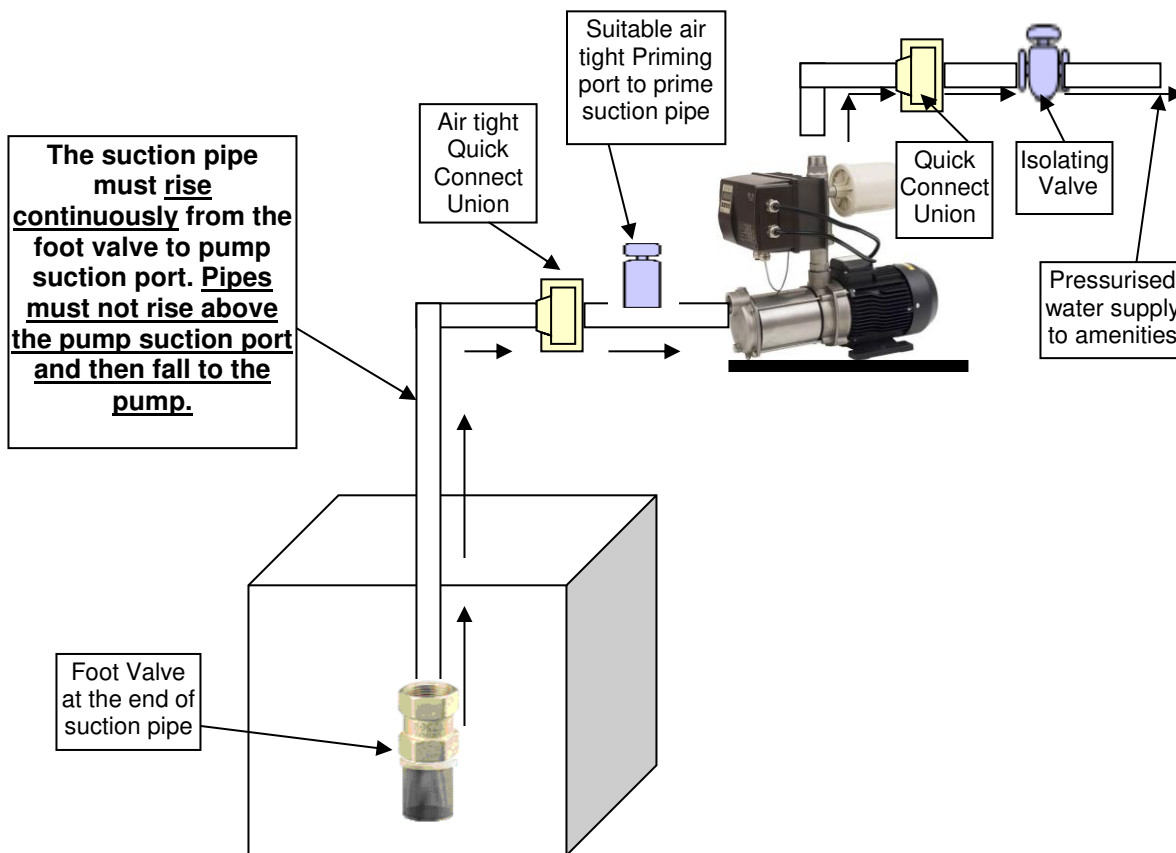
- pressure setting (S) – see H) General Instructions/VSD Changing Operating Pressure
- drive acceleration/deceleration periods to allow for inertia build up in pipework (G3-19 / G3-20)
- low pressure alarm level (G2-52 / G2-56)



Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.

E) Typical layout details for “Suction Lift” condition with one underground or lower level tank:

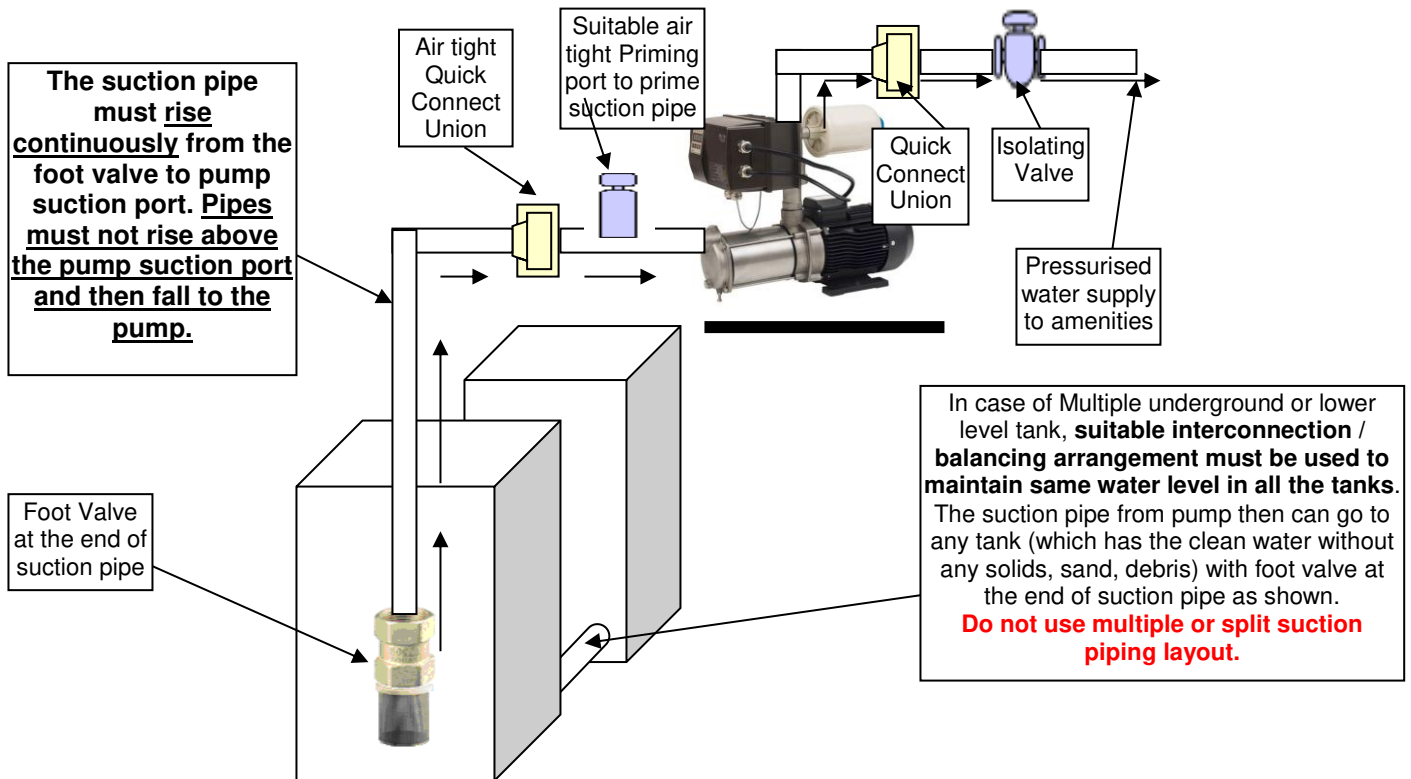
Suction Lift condition is where supply water source and water level is always below the pump inlet level.



Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.

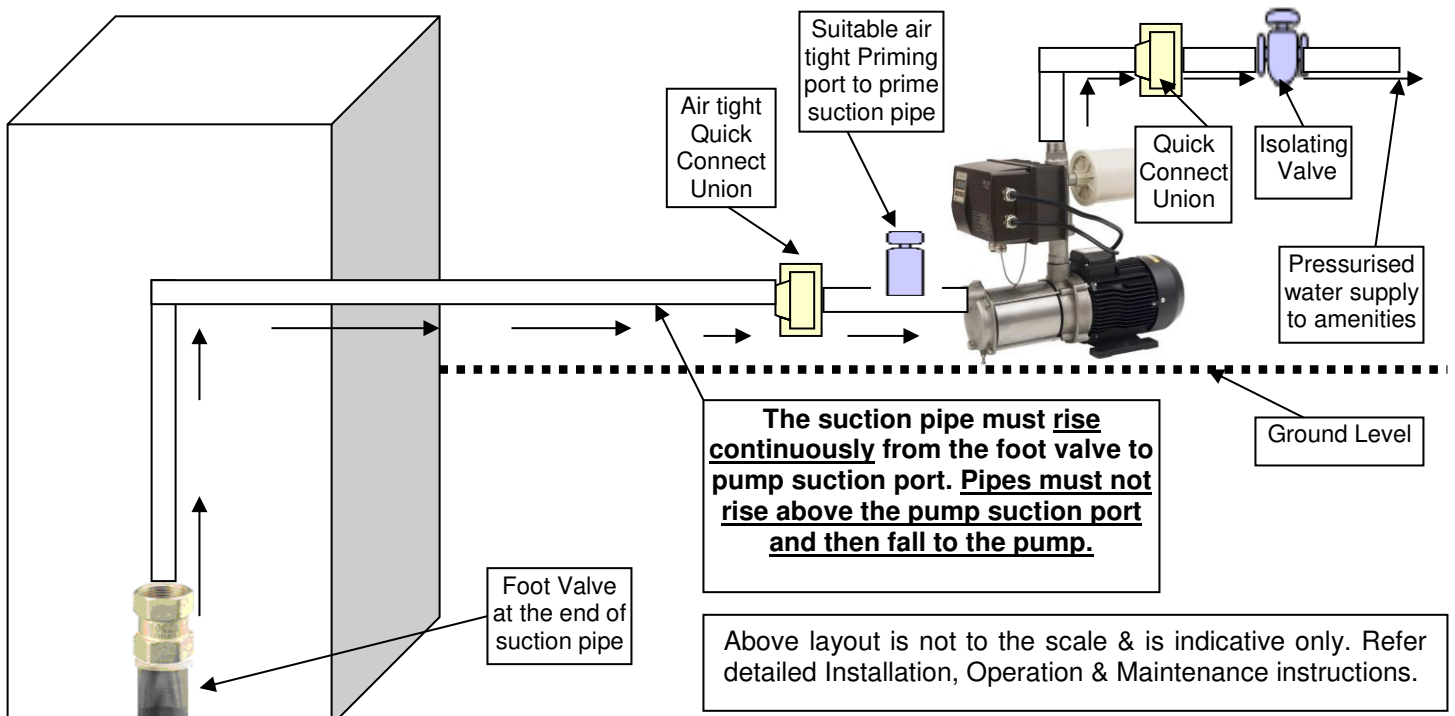
F) Typical layout details for “Suction Lift” condition with Multiple underground or lower level tanks:

Suction Lift condition is where supply water source and water level is always below the pump inlet level.



Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.

G) Typical layout details for “Suction Lift” condition with half buried tank:



Above layout is not to the scale & is indicative only. Refer detailed Installation, Operation & Maintenance instructions.



H) General Instructions:

Discharge Piping: should be sized appropriately to the pressure and flow requirements of the application. We strongly advise fitting pipe size of equal to, or greater than, the discharge size of the pump. For those wanting best pressure consistency we recommend fitting a ring main.

Priming: Ensure power is off to the pump before starting priming procedure.

Part I - Flooded suction Install the suction pipework. Open the tank isolating valve until water comes out and the pipe is flushed clean, close valve. Fit pump and delivery pipework to pump, open valve and release hexagonal priming / vent plug next to the suction pipe connection until all the air has been purged out of the pump and water is flowing freely, replace plug.

Part I - Suction lift Install the suction pipework. Fill the pump with water through suction pipe connection. Fill the suction pipe with water and connect to the pump. Fit delivery pipework. Remove the hexagonal priming / vent plug next to the pump delivery, pour water into the pump via the priming hole until full, wait for one minute and ensure the water level does not drop which would indicate a leak that needs to be rectified. Then replace priming / vent plug.

Part II - Flooded and Suction lift Turn pump on and allow pump to operate till primed and all air is flushed out of suction pipe and pump. This is achieved by starting the pump with all outlets closed, gradually open one outlet until fully open and a good flow is observed. Never control flow with the suction valve, leave it fully open. Do not run the pump with all outlets closed for more than five minutes. If priming a long or difficult suction pipe the pump may stop and indicate a fault, re-prime with water, then press the reset button to restart.

Pressure Tanks:

Required – The pumps require a pressure vessel to operate and one is supplied with each pump. Additional larger pressure vessels can be installed, T-ed off from the pump discharge line, installing larger vessels will delay the start of the pump and reduce the number of pump starts. The air pressure inside the pressure vessel(s) should be set at 65% of the pump operating pressure (S value), **air pressure in the pressure tank MUST be checked every 6 months or earlier and replenish to correct pressure. Pressure tank having No or less than recommended air pressure may keep pump running on and subsequently may damage pump or pipes etc. which is NOT COVERED UNDER WARRANTY. Refer procedure below to check and replenish air pressure in pressure tank.**

Checking and replenishing the tank air charge. Procedure:-

Every 6 months or earlier the pressure vessel air charge must be checked, and if necessary replenished as follows:-

1. Release all water pressure from the system by switching off the power to the pump, and turn on any tap to release water pressure from the system. In flooded suction situations close the supply tank isolating valve.
2. Apply a car tyre or similar type pressure gauge to the air valve on the pressure vessel to check the pressure.
3. If necessary; drain, or replenish vessel air charge pressure using a suitable car tyre pump or compressor to the correct pressure. DO NOT over pressurise the vessel.
4. Close the outlet tap, open the supply tank isolating valve, and switch the pump on.

Factory Settings (please note these may be adjusted to site conditions)

Pump Type	Water Set Pressure (S)	Recommended Tank Air Pressure
MPEP-6000	4.0 bar	2.6 bar (37 psi)
MPEP-7000	4.5 bar	2.9 bar (41 psi)
MPEP-9000 + SQ2-DRL10-6M	5.0 bar	3.2 bar (45 psi)

VSD Controller: The VSD controllers are factory set to a pressure setting that provides reliable operation in common applications. This factory set start pressure is adjustable and can be altered if needed. If altering the pressure setting take care not to exceed the total pressure capability of the pump and its supply conditons, as doing so will cause the pump to run on and damage itself. **OPENING THE CONTROLLER WILL INVALIDATE YOUR WARRANTY.** The controller starts and stops the pump in response to the changes of water pressure at the pump discharge. In the event of a power cut the controller will automatically reset and re-start the pump when the power is restored.



VSD Controller Basic Information: All pumps are supplied ready to operate and in most cases altering controller setting is not required. Each pump is fitted with a different Dooch VSD type:

- SQ2-0110SW – MPEP-6000
- SQ2-0220SW – MPEP-7000; MPEP-9000 & SQ2-DRL10-6M

These all have the same operating principles and general display layout, but offering increasing levels of programmability.

Each controller has four LED lights (“RUN”, “STOP”, “ALARM1”, “ALARM2”); four operating buttons (“PRE.SET”, “RUN/STOP”, ▲ ▼) and a display screen.

SQ2 controller units will display the following values:

- P = present pressure (bar)
- S = set pressure (bar)
- H = output frequency (Hz)
- U = Voltage of DC link (V)
- A = current (A)

Special SQ2 units will also display input & output pressure ONLY if set to differential pressure mode (refer to Wallace Pumps):

- O = discharge pressure (bar)
- I = inlet pressure (bar)

For a full set of instructions on the controller refer to the Dooch booklet included with pump.

VSD - Changing Operating Pressure: This is seldom required as factory settings are the best for ensuring reliability of operation in most operating conditions.

1. Stop the pump by pushing RUN/STOP button so that the STOP LED is lit.
2. Use the arrow keys to scroll to “P” value.
3. Open a tap to let pump pressure drain out of system, observe “P” value – this is the supply pressure. Close tap.
4. The highest permissible pump setting is 85% of its shut off pressure (see relevant pump performance graph).
5. Use the arrow keys to scroll to “S” value.
6. Push “PRE.SET” button, display will flash and now the set pressure can be adjusted using the arrow keys. After selecting preferred pressure, push “PRE.SET” button again to lock in the new the pressure.

WARNING: Set pressure must not exceed the combination of pump capability and supply pressure. Exceeding this figure will cause the pump to run continually & damage it. **Such damage is not covered under warranty.**

VSD Reverse Rotation: A Dooch VSD can cause the pump to operate in a reverse direction. Please check direction of fan rotation on first operation to ensure the pump is spinning in correct direction (an arrow is shown on fan cowling). This problem is mostly an issue in off-grid locations as the controllers are preset to the correct direction with the NZ grid in factory. If direction is incorrect please contact Wallace Pumps and info will be provided on how to alter base programming to correct setting G3-17 (5 minute fix procedure).

Anti-freeze Protection: When the ambient temperature falls to freezing the Dooch VSD will periodically run the pump for short time periods to warm the water inside the pump. This will stop water freezing in the pump, but will not stop water freezing in other parts of the piping. In view all water pipes Must be lagged in area where freezing can happen.

Start Pressure Variation: When the pressure on the discharge side of the pump falls the pump will start and the amount of fall below set pressure is called start pressure variation. Start pressure variation can be set between 0.3 bar and 2.0 bar and we currently factory set to 0.5 bar.



Larger Pressure Vessel (optional recommended): The recommended maximum starts per hour is 15. If there is a persistent small flow or repeated small usages it is possible to exceed 15 starts. **A small flow of between 0.05-0.7 L/min or repeated small volume usage (e.g. bottle filling) the pump will switch on and off more than 15 times per hour. To prevent this we recommend having a larger pressure vessel (DT18 or bigger) T-ee'd off from the discharge line. This increases the pressure storage volume which increases the time between pump starts.**

Filters (optional): Do not install any other filter in the pipework between the water source and pump. Only install filters on the pump delivery, be aware that filters can reduce pump delivery flow and pressure, and need frequent servicing. When choosing a filter please select the one matching their pressure and flow capability to the pump system. If the pump is to be used as a rural fire-sprinkler pump the sprinkler flow requirements will be much higher than filter can handle. In such case it is advisable to divert water for sprinklers prior to filters.

Town/Pump Water Auto-Change Over (optional):

Wallace Pumps offer the RAINMAIN or RM20 systems to auto-change between tank supply and town supply. Please Note: If your house is connected to both your water tank and pump, and the town water supply the NZ building code requires appropriate backflow prevention measures must be taken. Always check with your Territorial Authority for their requirements before connecting the pump.

I) Commissioning

Pre-start check list:

- 1) The operation requirements must be within the Application Parameters of the pump.
- 2) Pump has a weather protected position, section A-7.
- 3) Power supply is provided in accordance with section A-8.
- 4) Electrical installation complies with applicable NZ electrical standards.
- 5) Suction piping is in a compliance to whichever of sections B-G applies.
- 6) The supply tank has water inside.
- 7) Pump and suction piping is primed.
- 8) The pressure vessel is inflated to 60-70% of the Set Pressure. Refer section H

Check list to begin operation:

- 1) Ensure discharge isolating valve is closed.
- 2) Open a single tap on pump discharge.
- 3) Provide power to pump and observe motor fan to see if pump spins in correct direction.
- 4) Stop pump using RUN/STOP button and adjust display to show Set Pressure, S value. Ensure Set Pressure is a desired value.
- 5) (If required adjust S-value.)
- 6) Adjust display to Present Pressure, P-value.
- 7) Start pump using RUN/STOP button and observe P-value which should climb to or just above S-value. Then after this is reached the pump should stop within 30 seconds. If pump fails to make pressure, repeat priming procedures.
- 8) Once pump is primed, has come up to pressure and has switched off against closed discharge valve, check that P-value is stable. If the P-value is declining this will indicate a leak prior at pump or in suction piping.
- 9) Open discharge isolating valve, pump should start when P-value falls to 0.5 bar less than S-value and then run up to a constant speed at the set pressure.
- 10) Close the opened tap on discharge side, leaving isolating valve open. Check that pump switches off at or above set pressure.
- 11) If this is a new installation sequentially open and close other taps on discharge side to purge air from system.
- 12) Check that P-value is stable when all discharge taps are shut. If pressure not stable & drops slowly, this indicates leak in the delivery pipe, toilet cistern or any other appliance or unprimed air pocket in line.



J) Fault Finding:

The Dooch Variable Speed Drive controllers have a set of Error indicators that will display in a response to a problem. After fixing problem turn pump off and on to restart pump. If problems persist please contact Wallace Pumps.

Fault Finding – alarm coded:

Error Code	Description	Recommended Response
Er-01	Pressure Sensor Error	Check pressure sensor connection; check pressure sensor for foreign matter build up; replace sensor; replace drive.
Er-02	High Pressure Alarm	Check system pressure; check set pressure; check air pressure in pressure vessel; check alarm pressure.
Er-03	Low Pressure Alarm	Check if water in supply tank; check if air in suction line; check direction of rotation; check for blockage in suction line.
Er-04	Low Level Alarm	Check if water in supply tank; check if air in suction line; check direction of rotation; check for blockage in suction line.
Er-05	Drive Arm Short Trip	Check G3-19; check motor for sign of fire and insulation fault; disconnect drive from motor – if error remains could be internal drive short circuit.
Er-06	Drive H/W Over Current Trip	Check if drive capacity is suitable for motor; Adjust motor acceleration/deceleration time (G3-19 / G3-20); Start pump after motor has stopped; Check wiring, load and motor.
Er-07	Drive H/W Over Current Restriction Trip	Check if drive capacity is suitable for motor; Adjust motor acceleration/deceleration time (G3-19 / G3-20); Start pump after motor has stopped; Check wiring, load and motor. If load is large adjust torque boost amount (G3-35)
Er-08	Motor Overheat (TMOH)	Check if load capacity is larger than rated drive capacity; check that pump is not start/stopping excessively (more than 15 starts per hour); check that pump is not operating for long periods at low motor speeds.
Er-09	Drive Overheat Trip	Check drive cooling fan operation; check that ambient temperature is less than 40°C.
Er-10	DC-Link Low Voltage Trip	Check power supply input voltage; check power capacity.
Er-11	DC-Link High Voltage Trip	Increase deceleration time (G3-20); check DC link voltage on FND display part; check driver power supply voltage.
Er-12	Overload Operation Trip	Check the rated full load current of the motor and the rated current setting (G3-12); check DC link voltage on FND display part.
Er-13	Drive Overload Operation Trip	Drive is too small and needs to be upsized,
Er-14	Ground Trip	Check the drive output wiring; or replace motor.
Er-15	Communication ID Duplication Trip	Only occurs on multi-pump sets: check drive ID listings for duplication (G5-2)
Er-16	Communication Error	Check communication line connection; or replace drive.
Er-21	Allowable Time Elapsed	Contact Wallace Pumps



Fault Finding – non-alarm pump problems.

Fault	Symptoms	Recommended Response
Tank Air Pressure Set Incorrectly or no air pressure	Pump switches on/off rapidly/ Pump runs continuously/ output pressure varies during operation.	Set air pressure to 65% of pump operating pressure. Operate pump. Then recheck air pressure, replace pressure vessel if air pressure cannot be maintained.
Pump Running Backwards	Pump unable to generate normal pressure, runs continuously, sounds noisy.	Check direction of rotation by observing motor fan compared to arrow on fan cowling. If motor is running in reverse, then alter setting G3-17.
Suction Conditions Too Difficult and/or Air in Suction	Pump unable to generate normal pressure especially at higher flows or runs continuously, sounds noisy.	Examine suction pipe arrangements and compare with instructions above, if suction correctly installed reattempt priming of pump.
Pressure Set Too High	Pump runs continuously.	Check pump operating pressure compared to pump curve and supply pressure. Lower pump operating pressure.
Air in Discharge Piping	Intermittent starts occur when no water is being used, starts gradually become less common. Pump starting is delayed	In new builds it is not uncommon for a section of piping to be unused and retain air. Either open any previously unopened taps and allow air to be pushed out of system..
Small Water Leak	Intermittent starts occur when no water is being used, starts at repeating interval.	Shut off isolating valve at discharge of pump, if this stops pump switching on then there is a leak after the isolating valve, but if the pump continues to switch on then the leak is prior to the isolating valve. Find and fix leak.
Variable Pressurised Suction	Pressure surges whilst pump operates.	Increase suction piping diameter, including any valves or meters. Extend acceleration and/or deceleration times. Install an optional larger pressure vessel.
Small Water Usage	Pump switches on and off frequently when a small flow is being used.	These pumps are not suitable for continuous operation at flows less than 1 L/min. If a small water usage flow requirement exists, fit a larger than standard pressure vessel to ensure pump does not start more than 15x per hour.
Blocked Filter	Delayed pump start. Reduced flow capability.	Check filter, maintain regular filter servicing.

Regular Servicing

For this product to meet its expected lifetime please ensure it is installed by a qualified technician and following maintenance schedule must be followed. A record of by whom and when the maintenance was completed to be kept and that need to be provided to us when asked for.

- The pump must be serviced at regular intervals by Wallace Pump's authorised Service Agent or a qualified technician who understands the product operation and maintenance.
- The maximum interval between services should be 6 months or less.
- All Alarm activation occurred to be noted as to when (date & time) and how and who rectified it and what was the reason (record the alarm code).

Following (minimum but not limited to) servicing / maintenance work to be done by technician during every service call and records must be kept with signature of the servicing person, date of servicing and actual work done and observations.

- **Observation of pump operating and start pressure.**
- Check water supply tank (if applicable) for solids contamination that may foul pump suction.
- Check weathertight-ness of pump enclosure.
- **Check air pressure in pressure vessel**
- Record if any part was changed / replaced and why.

Modifications or Repairs: Wallace Pumps does not warrant for any damage to the unit or any other property caused by any un-authorised modifications/repairs in contravention with the Company's instructions or by use of materials or fittings not supplied by Wallace Pumps. Where a claim arises, we suggest you contact the installer for rectification.

Finally: Please keep these instructions in case of need to reset the pump. If you would like further assistance please contact Wallace Pumps – Auckland: 09 622 9100; Wellington: 0275438634; Christchurch: 0275329754.