

Pressure Switch and Vessel set up.

The following notes are a guide to assist in the setup and adjustment of a Telemechanique type pressure switch and pressure vessel. Please note that this is a guide only and you should always refer to the manufacturer's specific instructions.

All mains electrical work should be undertaken by a qualified and competent electrician.

Installation

The pressure vessel and pump should be secured with foundation bolts and if necessary shims should be used to ensure that the base is level and properly supported.

When the pump is to draw water from a level lower than the pump inlet port (suction lift), a foot valve must also be fitted to the end of the suction pipe, below the lowest possible water level.

If there is a positive head on the pump from an adjacent storage tank (suction head) a non return valve must be fitted in the suction pipe as close to the pump as possible. This non return valve will retain the pressure in the tank once the pump has stopped.

Ensure that the pump and manifold is positioned to allow access for examination, adjustment and maintenance, and that there are adequate drain facilities and protection from water damage in the immediate vicinity of the pump. In particular the pressure gauge and pressure switch should be easily accessible. To aid set up, an isolation valve should be fitted on the discharge side of the pump, after the vessel, pressure switch and gauge.

Important – Old & Existing systems

You are likely to find that the pressure switch is wired 'live' with mains voltage and the numbered terminals connected as follows. If possible we would recommend an upgrade as below.

Terminals 1 & 3 – 230v Power in from mains supply
Terminals 2 & 4 – To pump motor

Important – New & Upgrade systems

For new and replacement installations it is preferable to install a pump control panel (such as the LWS CONMANAMD1022) so that the wiring to the pressure switch is low or zero voltage and the pump has added protection.

In this situation it is not necessary to take mains power to the pressure switch. All that is required is a low/zero voltage link from the appropriate terminals on your pump control panel to terminal 1 & 2 or 3 & 4 on the pressure switch. The motor cable from the pump is also taken to the pump control panel and not the pressure switch.

The CONMANAMD1022 also enables you to have dry run protection and low water alarm via a rollerball floatswitch or probes. Please contact LWS for clarification before installation.

Adjustment of the Vessel Pre-charge Pressure

Firstly, decide the cut in and cut out pressure you require for the pressure switch.
(as a guide the difference between cut in and cut out is generally about 1.5 bar, this amount of differential provides a good operating range for smaller single phase pumps)

The vessel is normally supplied with a pre-charge pressure of 1.5 bar, but under normal operating conditions, this must be adjusted to a value of 90% of the cut in pressure for the pump.

eg.

Required cut-in pressure	2 bar
Required cut-out pressure	3.5 bar

Therefore tank pressure	=	(0.9 x 2)
	=	1.8 bar

To adjust the pre-charge pressure of the tank, remove the black cap at the end or on top to reveal a Schrader valve. A small compressor or heavy duty foot pump can be used to make any adjustment, check the setting with a standard pressure gauge.

Before checking the pressure setting or adding air to the vessel there should be no water or back pressure in the pipe work or system.

Starting and Adjusting

Before starting the pump ensure it has been FULLY PRIMED, filled with water and vented. Also follow all manufacturers installation instructions for the pump.

Isolate the supply and remove the cover on the pressure switch.

Before starting the pump loosen both the differential and range nuts completely, then tighten the range nut to approximately $\frac{3}{4}$ of maximum spring tension. **(the range nut is the metal cross headed nut, the differential is the plastic nut on the smaller spring).**

Switch on the electrical supply to the pump.

The pump will start and then the discharge valve should be slowly closed until the pump cuts out. Slowly reopen the discharge valve and observe the pressure gauge until the pump cuts in. This is the cut in pressure.

Isolate the electrical supply.

If the cut in pressure is too low tighten the range nut, if the cut in pressure is too high loosen the range nut. Switch on the supply and repeat the procedure until the right cut in pressure is obtained.

Once the cut in pressure is obtained switch on the pump and close the discharge valve, observe the pressure gauge until the pump cuts out. This is the cut out pressure.

Isolate the electrical supply.

If the pressure is too low, tighten the differential nut, if the pressure is too high loosen the differential nut. Switch on the pump and repeat the procedure until the right cut out pressure is obtained.

Isolate the supply and replace the cover on the pressure switch.

The widest differential will give the greatest storage capacity and thus reduce the number of stop/starts on the pump to a minimum.

Finally, check the system for correct operation and ensure that the pump does not stop or start more than 20 times per hour.

Maintenance

At regular intervals the following checks should be carried out.

1. Check the pump is giving the correct quantity of water and that it is operating smoothly and quietly.
2. Check there are no leaks around the pump, manifold and vessel
3. Check that the motor is not overheating
4. Remove and clean any filters on the system
5. Check that all controls are working including any probes or float switches
6. Check that the pump is not starting more than 20 times per hour
7. Check the pressure of the vessel every 6 months
8. Unusually long period of inactivity before or after installation are considered more detrimental than the same period of constant running. The unit should still be maintained and in addition the pump should be switched on for a short period at monthly intervals.

Fault Finding Chart

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|---|---|---|
| 1 | Motor does not start when the motor starter is operated. | a) Supply failure.
b) Main or sectional fuses blow. If new fuse blows at once, either cable or motor is faulty.
c) Control circuit fuses, if fitted, are defective.
d) Push button contacts or maintaining contacts on the starter are faulty. |
| 2 | Starter overload unit trips out immediately when supply is switched on. | a) One fuse is blown
b) Contacts in overload are faulty
c) Bad contact in fuse or fuse holder
d) Supply cable or connections are faulty, or the motor is defective.
e) Pumps stiff and not free to turn. |
| 3 | Motor starter overload trips out occasionally. | a) Overload setting too low.
b) Periodic supply failure. See (1) d, (2) d and e
c) Low voltage at peak times |
| 4 | Pump does not run when starter is operated. | a) Check (1) d and e
b) Check (5) e. |

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|----|---|---|
| 5 | Pump runs constantly (applies only to pumps with automatic stop/start). | <ul style="list-style-type: none"> a) The stop pressure has been set too high b) The water consumption is larger than anticipated. c) Leaks in discharge pipe d) The direction of rotation of the pump is incorrect. e) Pressure switch failure. f). See (6) b. |
| 6 | Period of operation is too long | <ul style="list-style-type: none"> a) Discharge pressure is too high in relation to the quantity of water. b) Pipes, valves or strainer blocked. c) Pump partly blocked. d) See (5) b and c. |
| 7 | Pumps starts and stops too frequently | <ul style="list-style-type: none"> a) Start/Stop differential on pressure switch is set too low. b) Pressure tank size too small for capacity of pump. c) Volume of air in pressure tank too small. The normal air volume is 2/3rds of total tank volume at pump start pressure. d) Check diaphragm has not been punctured. |
| 8 | Pump stops and starts without any water being drawn off. | <ul style="list-style-type: none"> a) Leakage in suction or discharge pipe. b) Faulty foot or non return valve. |
| 9 | Pump capacity not constant, trips out occasionally. | <ul style="list-style-type: none"> a) Suction pipe is too small. b) Insufficient water available at pump inlet c) Suction head is too high. d) Suction lift too great e) Suction pipe and strainer partly blocked. f) See (5) and (6). |
| 10 | Pump runs but gives no water. | <ul style="list-style-type: none"> a) Foot or non return valve blocked. b) Air in suction pipe or pump c) Leakage in suction pipe. d) See (9) b, c and d. |
| 11 | Pump/water runs backwards when switched off. | <ul style="list-style-type: none"> a) Leakage in suction pipe or faulty foot/non return valve. b) Air pockets in suction pipe. |

