Pump Controller History – www.springltd.co

The advent of water fed pole (WFP) window cleaning radically changed the window cleaning industry by allowing people to work from ground level. Early WFP systems consisted of a water tank, battery, pump and pole. Whilst being safer and giving time savings, there were some issues.

It was common for pumps to fail after a short period of time as either the pump motor or pump pressure switch would burn out. To stop the pump and thus water flow, you had to either twist or kink the hose. Even with the flow stopped at the brush head the pump would continue to work against the restriction, building up the pressure in the system to a point where the pump pressure switch would activate. At this point maximum current would be passing through the pump. This, coupled with the fact that the pump is an inductive load, meant that as the switch broke, it would arc. This would cause pitting of the contacts that would eventually lead to failure. In addition the high pressure in the system meant that connections and hoses would wear out quickly, leading to lost working time whilst they were repaired or replaced. Water usage was also high.

In late 2004 we were approached by a cleaning company in the south east of England to address these problems. They had realised that if the speed of the pump could be controlled, there would be many benefits:

- Less wear and tear on the pump
- Extended life of the pump motor
- Less current drawn from the battery, meaning the charge lasts longer
- Reduced pump speed, meaning less water is used and therefore more jobs from the same tank

The first version was an analogue controller that simply turned the pump on or off and regulated the speed of the pump. Its main advantages were that the system now used less water, pump reliability was improved, and connectors and fittings lasted longer.

Further development resulted in a controller that did not rely on the pump pressure switch to stop the pump when the water flow stopped. Having the ability to detect pressure was building and to stop the pump gave many benefits. Referred to as Dead End (DE), the controller stopped the pump when the water flow stopped. With DE, the pump was no longer under full load when it stopped. One of the advantages of this was that less energy was drawn from the battery. Also, as the controller stopped the pump well before the pump pressure switch would have done, the strain on the pump motor was reduced as it was no longer working against a restriction.

The next step ushered in digital displays that provided the user with more information as to battery state, more accurate control of the pump, and some instant fault diagnosis. These innovations led to systems builders and distributors asking us for controllers that would be able to charge a battery, control the filling of a water tank, or control a hot water system, or even bespoke multifunction units.

The latest generation of controllers are a world away from the early analogues, as they not only control the pump speed but are in fact sophisticated tools to help manage the whole system. Please take a look at the full range of controllers contained on these pages.

What do I do if DE is displayed?

DE means the Dead End detection on the controller has shut off the pump. This happens when the controller detects the water flow has been stopped. In Normal operation this is likely deliberate due to turning off a pole tap of kinking the hose line as you move between windows.

We design the control to detect when water flow has stopped in turn the control will stop the pump well before a

pressure switch would. The advantage here is that the system is under less pressure reducing the risk of blown connectors or split hose lines.

We also design the control to know when flow has been restored: It does this by carrying out a dead end retest every 3 seconds. If flow gas been restored (tap open) the pump will be restarted, If not the pump is left off. We have engineered the V11 in a way that even if left in DE for prolonged periods Pressure will not build up in your system.

The longest delay between opening a tap and pump restart is three seconds.

DE is also used as an error message so in the event of the control unexpectedly displaying this message please check the following information.

1. Run the pump to bleed any trapped air from the system. Connect the pump direct to the Battery if there is no air in the system you should get a very powerful jet of water.

2. Check that the hose has not become disconnected, twisted or blocked.

3. Check that the water tank is not empty.

4. Set the auto calibration to a slightly higher value.

5. A blockage in the jets hose line or pump pre filter. To check for a blockage start by removing the brush, Does this clear the DE (no) next disconnect the pole hose and so on you may end up right back to the pump outlet.

6, Stuck non return valve on the reel

There are a number of factors that will affect DE and the length of time it takes the control to DE and stop the pump these are.....

1. Ambient air temperature. The temperature will effect the hose wall stiffness and expansion qualities of the hose. The change to hose wall expansion will effect how long the system takes to pressure up

2. The thickness and stiffness of the hose wall

3. The size of the hose or micro bore

4. Low Battery voltage

In our tests here we have found that a drop in voltage will slightly increase the dead end detection time but this change is minuscule. Certainly this tiny increase will not cause any extra wear on pump, battery or fittings. And remember that as the voltage drops the pump will run slower, dropping flow rates and pressures.

In most cases the controller is reporting a system fault. If having carried out the above checks the Control is still showing DE run the auto calibration as calibration may be to low.

THE WCA
Window Cleaners Association