

March, 1999

Series 150S Product Update

There have been instances of problems in the field with controls in the 150S product family. Significant effort has gone into identifying the problems and taking appropriate corrective action. This memo and accompanying information are meant to update the field on the progress made since the last update in July 1998.

Switch Contact Overload

The symptom of this condition is a flooded boiler. We have discovered that the pump switch is being used to directly start/stop pumps rated at _ HP or greater. An additional discovery was the use of _ HP motors derated to 1/3 HP. In both instances, the switch is subjected to loads exceeding its design capacity. This causes the contacts to overheat and weld, not turning off the pump and flooding of the boiler system.

In September 1997, the switch contact material was upgraded to cad-oxide to give the unit a higher current carrying factor. The rating did not change, just the anticipated life and durability. When replacing a mercury switch unit, the rating of the pump needs to be checked and a starter or relay installed when necessary. ***The switch rating is 7.4 amps @ 120VAC and a starter or relay must be used in any application where this rating may be exceeded.***

Switch Set point Drift

The symptom of this condition is a "sticking" pump switch. While the symptom is the same as for overloaded contacts, the cause is completely different. In some instances, the switch settings loose their calibration when exposed to elevated temperatures. When this occurs, the set points drift beyond the upper limit of the float travel, thus failing to turn the pump off. The result is flooding of the boiler or system. It should be noted that drifting of the set points is diminished with use. As a result, once a unit is installed and operates properly for a period of time, the likelihood of failure due to switch set point drift is unlikely.

Effective May 1998, we began using thermally pre-conditioned snap switches (also with cad-oxide contacts). Pre-conditioning the switch at an elevated temperature has shown to stabilize the switch set points.

Float Rod Rubbing

The symptom is that the unit operates properly at no pressure, but when subjected to pressure and temperature, it reacts sluggishly. The bellows reaction to pressure and temperature can cause the float rod to rub on the guide-plate. This problem is associated with both 150S units and 150 units with mercury switches and usually occurs when the unit is first put into service.

Effective June 1999, we began affixing the bellows to the switch carriage to correct this issue. Connecting the bellows this way reduces the reaction of the bellows when subject to system pressure and temperature.

(over)

Manual Reset Switch

We have issued a recall of 150S manual reset models because there is a slight chance they may not operate correctly after exposure to temperature. This can change the force balance of the internal switch mechanism and external spring causing the switch to not open when the water level falls below the cut-off level of the control. ***This affects 150S-M and 157S-M snap switch manual reset models only manufactured prior to September 1998.*** All other models of the 150S and 157S models are unaffected and can be used with confidence.

Beginning September 1998, the burner switch in the manual reset models was changed. We strengthened the spring to ensure the switch will operate satisfactorily throughout its operating range.

Units manufactured between September 1997 and August 1998 can be field repaired with a kit that includes a higher force spring or can be exchanged for newer units. Units manufactured between September 1996 and August 1997 with white reset button on the side of the junction box must be replaced with a new head mechanism.

Additional information concerning the recall of manual reset units can be found in our website at www.mcdonnellmiller.com by clicking the 'Product Recall' button.

Low Pressure Application

We have received comments that the snap switch units cause rapid cycling of the burner or pump at low pressure. Keep in mind that the unit, whether it is a snap or mercury switch, is reacting to the water line and efforts should be made to stabilize the water level. A contributing factor to this rapid cycling is the dynamics of the switch operation.

Mercury switch units, by their design, are slightly more forgiving than snap switch units. Because of this, they have more tolerance and the set points are less likely to be affected by the system operating pressure and fluctuating water lines. This is related to the linkages that hold the mercury tubes and the rolling affect of the mercury itself. Snap switch units are more sensitive and when the water level rises or falls beyond the set points, the switch quickly changes state. There is no mercury or linkages to compensate for the subtle movements of the float. Because of this, differentials and set points appear to be less than they really are.

To compensate, we are promoting the use of 'MD' model units as replacements on lower pressure applications. 'MD' models have a lower burner off set point to compensate for the narrowing of differentials at lower pressures due to changes in system pressure and temperature.

Circuit Voltage

The snap switch units have contacts rated at 120/240VAC and 7.4/3.7FLA, which is the same rating as mercury switch units. While the snap switch operate satisfactorily in 24VAC applications, we have seen some instances where the switch did not conduct due to low loads across the contacts. The snap switch should work in most 24VAC circuit, however we recommend that 120VAC circuits be used when possible.

We hope this information has been useful in clarifying the issues. Please call if you any questions, comments or suggestions.

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