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MULCAHY CO.

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MULCAHY MINUTE

ENGINEERED FLUID HANDLING AND HVAC SOLUTIONS

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WHY CHOOSE OIL???

Time after time fuel oil seems to be the preferred choice for a back-up fuel. Why is that? Is it because it is what we used on the last job? Is it because it is what the customer already has on site? Or is it just because everybody assumes oil is the back up fuel that is supposed to be used? There are other fuels such as LP gas that offer huge dividends to owners over the course of a heating season.

When a building is curtailed from natural gas it normally consumes it must switch to its back-up fuel. If this fuel choice is oil there are several maintenance items that must be done to ensure a proper and successful switch over. You need to first make sure that your oil is in good condition. If oil is not used on a regular basis you may experience breakdowns of the oil which leads to poor combustion and potential sooting in the boiler. If you use your oil regularly you still have to contend with water in the oil tank. To ensure this is not an issue you must make sure that you have the proper additives in the oil to eliminate the potential for moisture in the tank. You must also make sure that your fuel lines are free of debris and that the strainers are clean. Finally, the fuel pump must be inspected for proper operation. Assuming all this has been done and a successful switch over has taken place there is now the clean up to contend with. The burner or boiler manufacturer will provide an extended list of maintenance items that must be completed once oil has been fired. Typically the burner head must be removed and cleaned of debris and fuel oil by products that build up around the nozzles. The boiler will need an additional cleaning as well. All these items can lead to several hours, or more typically, days of maintenance each year that could be avoided if a gas was chosen for a back up fuel.

LP gas for example is a very clean burning fuel that has very little maintenance requirements to ensure its proper combustion. Because it is in the gaseous state when it leaves the storage tank it fires very similarly to the natural gas that the boiler fires. Typically when LP is used as a secondary fuel the only difference between the LP fuel line and the natural gas line is the supply pressure and an orifice size making the switch over very easy. The use of pumps is eliminated. In addition, the natural pressures of LP tend to be higher allowing the use of a smaller supply line in comparison to an oil line that would be needed to supply the same amount of BTU's.

Beyond the installation differences lets review the BIG difference. Efficiency! When specifying a high efficiency condensing boiler one would prefer to maintain that high efficiency throughout the heating season. Firing on oil doesn't allow a boiler to continue to condense. If a condensing boiler that typically fires on natural gas is switched to oil the boiler is no longer allowed to fire in low water temperature conditions. The return water temperature must be no less than 140 degrees F to ensure the boiler doesn't continue to condense while firing on oil therefore losing the whole purpose of high efficiency operation. And again, it must then be cleaned before it can be returned to natural gas condensing mode which usually requires one to wait until spring.

In the end there are several good reasons to start looking at LP as a back up fuel. It is cleaner, cheaper, more efficient and much easier to maintain.

SMALL BOOSTERS BY GOULDS

Have any of your residential or light commercial customers ever complained about low or inconsistent water pressure? If so we have the answer. Introducing the Goulds Aquavar ABII, a UL listed variable speed constant pressure pumping system that is designed for customers of municipal water districts with low water pressure. The system works by comparing the pressure in your pipes to the set pressure you want to maintain. When the pressure drops in your main line below your set pressure, the ABII controller turns on the pump and varies its speed in order to maintain the correct water pressure. The Aquavar ABII is a "Plumber's Dream." It is a factory wired UL listed system including the controller, pressure sensor, a stainless steel pump, and a tank*. The controller is wall mountable NEMA 3R controller with simple up and down buttons to set the pressure as well as signal lights to indicate "Power On", "Pump Running", and "Faults/Errors". A common question you may get from your customers is "Why do I need to boost my system pressure when I am on the municipal water grid?" The answer is as water flows to your house, it loses some of its pressure due to friction inside the supply pipes as well as elevation changes. The higher the flow, the more the friction reduces the water pressure you see at your meter. Also if the home is on a hill or at the end of a water line it is more susceptible to having lower water pressure, especially during peak usage times. The Aquavar ABII is available in a variety of sizes with capacities up to 100 gpm at 45 psi boost, for a full table of capacities and the model needed please see the selection chart below. **NOTE if your application exceeds the capabilities of the units listed below please contact us for sizing of different packaged systems with larger capacities.**

*5AB models do not include tank, Recommend at least 13 gallon volume bladder tank.

Bell & Gossett and Gould's have the widest variety of Pressure Booster product offerings. Contact Mulcahy Company and we will find the right Pre-Packaged, skid mounted or single component system that meets your needs and budget.

- B & G's new TechnoForce is ANSI/NSF 61 rated to meet your most rigorous requirements.
- Available in Variable and Constant Speed.

***1AB2 – Controller** (1151AB2 for 115V)
- 4.2 Amp, 208-230 V, single phase input
- 1 HP variable speed controller
- Wall mount set • Transducer • Pre-wired
- Pump and tank not included

2AB2 – Controller
- 6.9 Amp, 208-230 V, single phase input
- 2 HP variable speed controller
- Wall mount set • Transducer • Pre-wired
- Pump and tank not included

***1AB2LB1035**
- 1 HP controller • Wall mount set
- LB stainless steel jet pump
- Transducer • Discharge tee • V6P tank, pressure gauge
- Controller is pre-wired to the pump. Flows to 15 GPM.

2AB21MC1F2B2
- 2 HP controller • Wall mount set • 208-230 V input
- MCC cast iron / stainless steel pump
- Transducer • V6P (2 gallon) tank and pressure gauge
- Controller is pre-wired. Flows to 27 GPM.

2AB21MC1G2A2
- 2 HP controller • Wall mount kit • 208-230 V input
- MCC cast iron / stainless steel pump
- Transducer • V6P (2 gallon) tank and pressure gauge
- Controller is pre-wired. Flows to 32 GPM.

***1AB21HM1E2D0**
- 1 HP controller • Wall mount kit • 208-230 V input
- HMS stainless steel pump • Transducer
- V6P (2 gallon) tank and discharge pipe tee
- Controller is pre-wired. Flows to 20 GPM.

***1AB22HM1E2D0**
- 1 HP controller • Wall mount kit • 208-230 V input
- HMS stainless steel pump • Transducer
- V6P (2 gallon) tank, pressure gauge and discharge pipe tee
- Controller is pre-wired. Flows to 30 GPM.

2AB22HM1F2E0
- 2 HP controller • Wall mount kit • 208-230 V input
- HMS stainless steel pump • Transducer
- V6P (2 gallon) tank, pressure gauge and discharge pipe tee
- Controller is pre-wired. Flows to 30 GPM.

3AB2LCB1H2D0
- 3 HP controller • Wall mount kit • 208-230 V input
- LCB stainless steel pump • Transducer
- V6P (2 gallon) tank, pressure gauge and discharge pipe tee
- Controller is pre-wired. Flows to 50 GPM.

2AB22MC1G2D2
- 2 HP controller • Wall mount kit • 208-230 V input
- MCC cast iron/stainless steel impeller pump
- Pressure transducer
- V6P (2 gallon) tank, pressure gauge, 1¼" bronze discharge tank tee
- Controller and motor are pre-wired. Flows to 80 GPM.

****5AB22MC1J2K2**
- 5 HP controller • Wall mount • 208-230 V input
- MCC cast iron/stainless impeller pump
- Pressure transducer
- Pressure gauge, 1¼" bronze tank tee
- Controller and motor are pre-wired. Flows to 100 GPM.

****5AB2LCC1J2D0**
- 5 HP controller • Wall mount • 208-230 V input
- LCC stainless steel pump • Pressure transducer
- Pressure gauge, 1¼" bronze tank tee
- Controller and motor are pre-wired. Flows to 70 GPM.

*** 1 HP available in 115 input volt models, add a 115 prefix to order number; ex. 1151AB2LB1035.**

**** Tank not included.**

GLYCOL PART II—PRESSURE DROP CORRECTION

Pump curves are all based on pumping water. However, when we pump glycol things change in three different areas.

1. Heat transfer correction -Usually resulting in an increase in flow
2. Pressure drop correction -Both from the increase in flow and viscosity
3. Pump curve correction -Mainly correcting for the viscosity change

In this article we will cover #2, System Pressure drop correction. (#1 Heat Transfer correction was covered in Volume 12, Issue 1). However, our last article also effects this article. We discussed why we needed to increase the flow rate in glycol systems over water systems to get the same heat transfer. Therefore, we need to adjust our glycol system to the higher flow rate requirement with regards to our pressure drop calculation. Obviously flowing 90GPM through pipe has a different friction loss than 100GPM. In addition, glycol is typically more viscous than water at the same temperature. Warmer glycol is easier to pump than cold glycol. Therefore, corrections must be based on temperature and % concentration of glycol. So, lets figure out a new system pressure drop accounting for glycol. Use the factory provided pressure drop information for equipment and valves with regards to the use of Glycol. The piping & fittings pressure drop then needs to be calculated and adjusted for glycol. A tool that everyone should have is the electronic version of the B & G System Syzer. We can enter the fluid type and temperature and it will give us an accurate adjusted pressure drop. Figure A shows the pressure drop per 100' of pipe of 100 GPM through a 3" line with water. Figure B shows the adjusted press drop per 100' of pipe for Proplyene Glycol at 50% concentration at 45°F. This turns out to be a correction factor of 1.6. So, if we had calculated 15' of pressure drop in the pipe, valves and fittings with water, we could use the correction factor of 1.6 to get the new revised pressure drop.

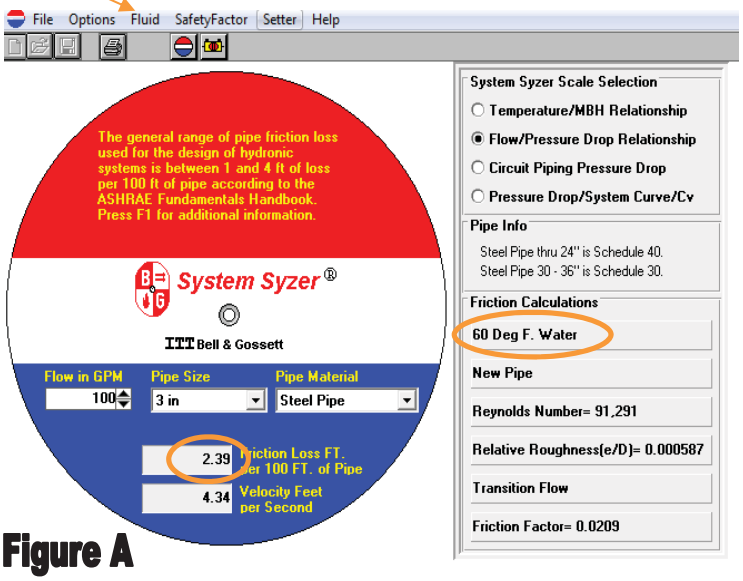

Figure A

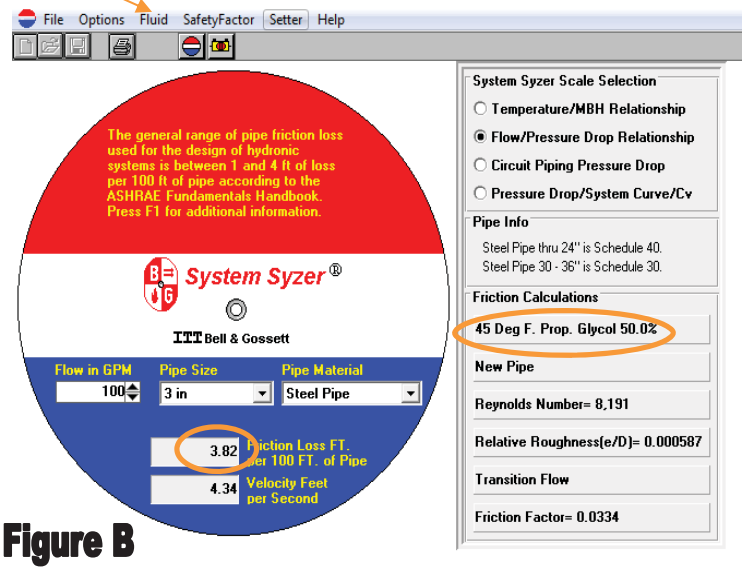

Figure B

In addtion we can use the following tables as well, Tables 1.1 and 1.2 are based on data from the ASHRAE Handbook.[1]. They show the pressure drop corrections for various concentrations and temperatures of ethylene and propylene glycol. For hot glycol systems (which normally operate at over 160°F) little if any correction is required.

Table: 1.1 Pipe, Valve and Fitting Pressure Drop Correction Factors for Ethylene Glycol Solutions

Temp °F	20%	30%	40%	50%
20°	1.15	1.25	1.37	1.60
40°	1.10	1.16	1.26	1.34
60°	1.06	1.10	1.17	1.24
80°	1.03	1.06	1.11	1.17
100°		1.03	1.07	1.13
120°			1.04	1.10
140°			1.01	1.08
160°				1.07

Table 1.2 Pipe, Valve and Fitting Pressure Drop Correction Factors for Propylene Glycol Solutions

Temp °F	20%	30%	40%	50%
20°	1.23	1.55	*	*
40°	1.15	1.26	1.42	1.60
60°	1.10	1.16	1.26	1.37
80°	1.05	1.10	1.16	1.24
100°	1.01	1.05	1.10	1.16
120°		1.01	1.05	1.10
140°			1.01	1.04
160°				

[1] 2000 ASHRAE Handbook, Systems and Equipment Volume,I-P Edition

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ENGINEERED FLUID HANDLING AND HVAC SOLUTIONS

B & G INTRODUCES I-ALERT

Lately some may have noticed something new on your B&G Series 1510 base mounted pump. That something is the newest industry leading standard feature is the i-ALERT Condition monitoring system. The The i-ALERT Condition Monitor is a compact, battery-operated monitoring device that continuously measures the vibration and temperature of the pump power end. The condition monitor uses blinking red

LEDs to alert the pump operator when the pump exceeds pre-set vibration and temperature limits. This allows the pump operator to make changes to the process or the pump before a catastrophic failure occurs. The condition monitor is also equipped with a single green LED to indicate when it is operational and has sufficient battery life.

The condition monitor enters alarm mode when either vibration or temperature limits are exceeded over two consecutive readings within a ten minute period. Alarm mode is indicated with two red flashing LED's within two second intervals.

Temperature and vibration alarm limits

Temperature 195°F (91°C)

Vibration 100% increase over the baseline level

Just about every pump installed is crucial to a buildings operation. Having an easy to interpret form of early warning (Flashing red light = Bad) before failure is very useful. Most importantly, the i-Alert is standard on all 1510 pumps.