



2506 South Elm Street  
Greenville, IL 62246  
www.enertechmfg.com  
(618) 664-5860

## Technical Bulletin

Low Pressure Control Fault on Split Units

Date: February 26, 2009

Bulletin #: TB09.001

Split system geothermal heat pumps have become very popular in the past couple of years. Split systems have a lot of advantages, especially in retrofit applications. However, because split systems require part of the installation to be field-designed, it is important to remember that *the line set selection/installation can create start-up and installation issues* if not considered carefully. A low pressure fault is the most common symptom of a potential line set problem.

The three main causes of a low pressure fault are liquid migration, low oil return, and low initial charge. Each one of these potential issues are being addressed through changes in controls, components, and field piping. The first issue, liquid migration concerns units that require higher levels of liquid charge due to the diameter and length of liquid and vapor lines between the compressor section and air handler section. If the line set requires large amounts of refrigerant (length of 50 ft. or more), the installer should install a bi-flow liquid line solenoid (field supplied) in the liquid line just outside the compressor section. The solenoid will limit liquid bleeding through the heating (compressor section) thermostatic expansion valve during the off cycle to help eliminate liquid migration.

During startup, liquid refrigerant in the oil can allow the production of foam, which can be pumped out of the compressor, causing low oil return. Once this occurs, the pressure in the crankcase can begin to drop below the pressure switch setting of 50 psi. For minor cases, the addition of a crankcase heater (field supplied) can alleviate the foaming and the drastic pressure drop. In addition, our new control board in the B revision units will reduce low-pressure faults with the 90-second delay of the low pressure switch on start-up. In order to maintain the proper level of oil in the crankcase to help reduce foaming, the piping between the compressor section and the evaporator section must provide sufficient trapping for both modes of operation. The trapping diagrams for the many different applications can be found in our **Split System Line Set Installation and Application Manual**. This manual is on the secure website ([www.enertechmfg.com](http://www.enertechmfg.com)) under the Installation, Operation, Application, & Maintenance Manuals section.

We have also seen systems where the initial charge is less than the required charge for the line set. The weight of refrigerant per foot chart can be found in our **Split Unit IOM & Owner's Manual** (manual is shipped in each unit – also found on the secure website). Once the total feet of line set is calculated, the length of line set can be multiplied by the ounces per foot. This amount of refrigerant will be close enough to the final charge to start the unit. Once the unit is started, superheat and subcooling should be checked in both modes. The additional charge added per foot is not an exact charge for every unit, which is why it is important to check superheat and subcooling.

Please review the new materials on the website before your next split system installation. It could save a significant amount of time and a potentially unhappy customer.