

**ENERTECH**<sup>®</sup>  
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## Technical Bulletin

### Split System Filter Drier Changes

(Including Split System Charging)

12 September 2008

Bulletin #: TB08.004

#### **New Filter Drier Kit**

A new filter drier kit has been added to all split system compressor section units manufactured after September 1, 2008. Two different sizes of filter driers are utilized in the kits (1/2" P/N 20F012A and 5/8" P/N 20F020A). A 3" piece of 1/2" copper tubing and 1/2" filter drier (20F012A) match the line set requirements of the 1-1/2 ton to 4 ton compressor sections. A 3" piece of 5/8" copper tubing and 5/8" filter drier (20F020A) match the line set requirements of the 5 and 6 ton compressor sections. Included on page 5 are the instructions included in the kit for installing the filter drier.

#### **Split System Charging**

##### Location of Install:

Special care should be taken in locating the unit. All units should be placed on a vibration-absorbing pad (air pad) slightly bigger than the base of the unit. All units should be located in an indoor area where the ambient temperature will remain above 55°F. Piping of the unit should be installed in a configuration, which does not require piping to be removed during future service.

##### Installing the Line Set:

The line set consists of brazed copper piping between the compressor section and the air coil section (see Table 1 for recommended line set sizes). On installations with a long line set, copper adapters may be needed to connect the larger diameter tubing to the service studs. A reversible heat pump filter drier must be installed on the liquid line near the compressor section. Line sets over 50 feet are not recommended because of oil transfer and pressure drop. The line set, especially the suction line, must always be insulated. If the tubing is accidentally kinked, bent, or flattened, the bad portion should be replaced by utilizing a coupling or swaging one end of the tubing.

##### Connecting the Air Coil:

Braze the line set by using a low silver-phosphorus-copper brazing (Dynaflow<sup>®</sup> or comparable) alloy on all connections. Nitrogen should always be bled through the system at 2-3 psi to prevent oxidation inside the tubing. Units are shipped with enough refrigerant for the compressor section and the matched air coil (or other brands with comparable face area sq. ft.).

**Table 1**

<b>Recommended Liquid &amp; Suction Line Size</b>				
<b>Model No.</b>	<b>20 Feet</b>		<b>50 Feet</b>	
	<b>Liquid Line (OD)</b>	<b>Suction Line (OD)</b>	<b>Liquid Line (OD)</b>	<b>Suction Line (OD)</b>
<b>018</b>	3/8	5/8	3/8	3/4
<b>024 - 026</b>	3/8	5/8	3/8	3/4
<b>030</b>	3/8	3/4	1/2	7/8
<b>036 - 038</b>	3/8	3/4	1/2	7/8
<b>042</b>	1/2	7/8	1/2	1-1/8
<b>048 - 050</b>	1/2	7/8	1/2	1-1/8
<b>060 - 062</b>	1/2	7/8	1/2	1-1/8
<b>072</b>	1/2	7/8	1/2	1-1/8

40° F. Evaporating Temperature

Leak Testing:

The line set must be pressurized and leak checked before opening service valves on the compressor section. To check and pressure test the line, attach refrigerant gauges to both service ports, and add an inert gas (nitrogen or dry carbon dioxide) until pressure reaches 90-150 psig. Use a good quality bubble solution for the inert gas. If line set is tested and a leak is found, repair leak and repeat above steps.

Evacuating & Charging the System:

After purging the inert gas, the line set must be evacuated to at least 200 microns to remove air and moisture trapped in the line set and air coil. When the line set and air coil are purged and evacuated to 200 microns, and no leaks are found, the system is ready to be charged with refrigerant. Refrigerant can be added based on feet of liquid line. Refrigerant R-410A can be added as a liquid to the liquid line service port (Table 2 shows the weight of refrigerant per foot for typical liquid line sizes). Final charging of the unit should be checked by taking subcooling and superheat readings (see Table 3). The first subcooling reading can be done by opening the service valves and starting the unit in the **cooling mode**. If desired subcooling is not achieved, meter liquid refrigerant into the suction line in a manner, which allows the refrigerant to vaporize at the valve on the gauge set. *Never add liquid refrigerant to the suction line of the compressor.* After the system is charged properly, check performance and superheat. Superheat and subcooling should match Table 3. The unit must be checked in the **heating mode**, as well. Once the unit is started in the heating mode, superheat and subcool readings should match Table 3. If unit performs to specifications and superheat and subcooling is normal, the system is charged properly.

Performance Check:

Equipment should be in operation for a minimum of 10 minutes in either mode with the desuperheater pump turned off.

1. Determine flow rate in gallons per minute
  - a. Check entering water temperature
  - b. Check entering water pressure
  - c. Check leaving water pressure

2. Once this information is recorded, find corresponding entering water temperature column in Specification Manual for the model of the unit. Also locate pressure differential in PSI column. Then read the GPM column to determine flow in GPM.
3. Check leaving water temperature of unit.

Formula:

HE or HR (Heat of Extraction [Heating] or Heat of Rejection [Cooling]) = GPM X Water TD X 485(Antifreeze/water) or 500(fresh water)

A 10% variance from the Specification Manual is allowed. Water flow must be in range of the performance data. If system has too much or too little water flow, performance problems should be expected.

**Table 2**

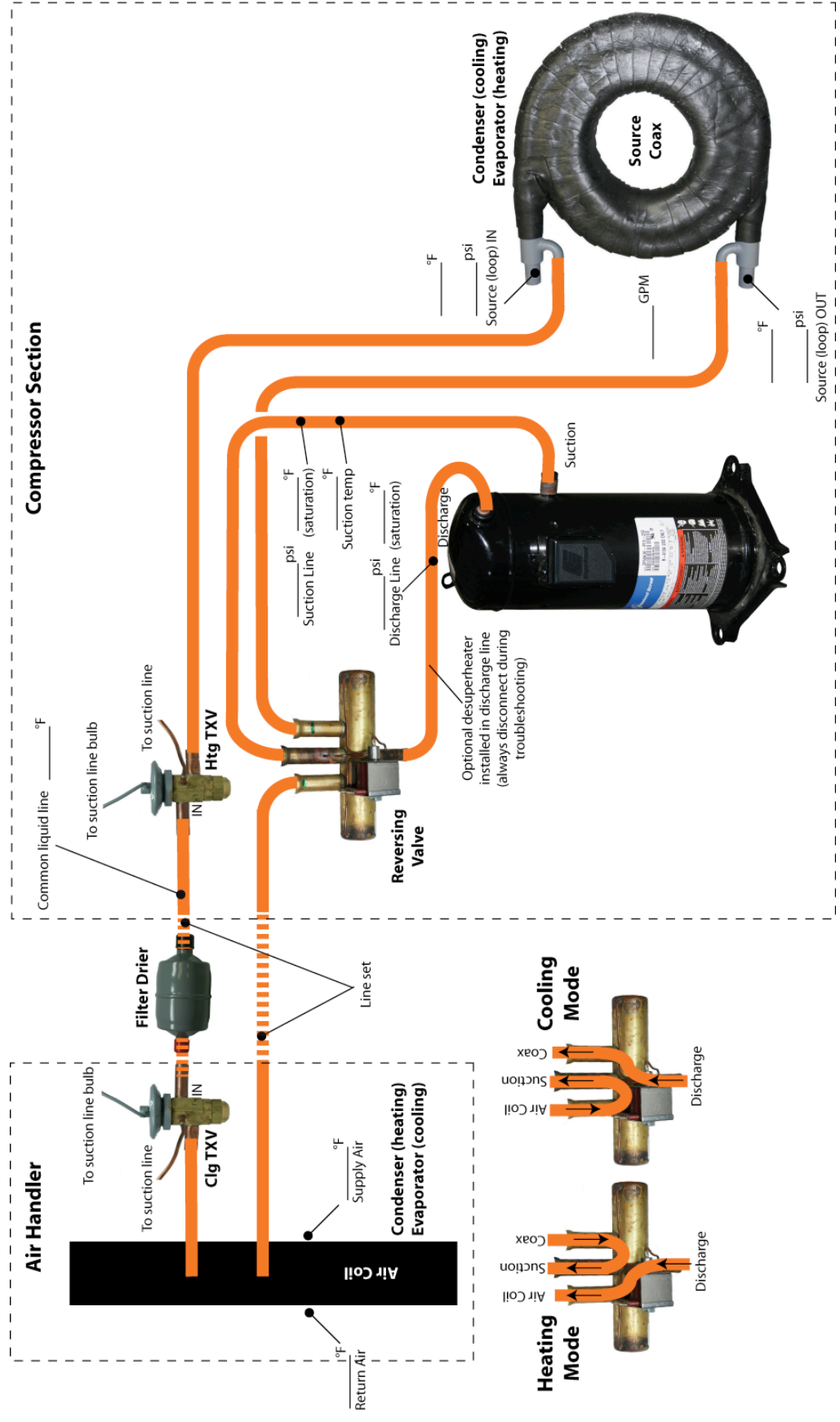
Weight of refrigerant in copper lines per foot	
Liquid Line Size (OD)	Oz. Per Foot
3/8"	.54
1/2"	1.04
5/8"	1.95

**Table 3**

Heating - Without Desuperheater							
EWT	GPM Per Ton	Discharge Pressure (PSIG)	Suction Pressure (PSIG)	Sub Cooling	Super Heat	Air Temperature Rise (°F-DB)	Water Temperature Drop (°F)
30	1.5	285-310	68-76	4-10	8-12	14-20	5-8
	3	290-315	70-80	4-10	8-12	16-22	3-6
50	1.5	315-345	100-110	6-12	9-14	22-28	7-10
	3	320-350	105-115	6-12	9-14	24-30	5-8
70	1.5	355-395	135-145	7-12	10-15	30-36	9-12
	3	360-390	140-150	7-12	10-15	32-38	7-10

Cooling - Without Desuperheater							
EWT	GPM Per Ton	Discharge Pressure (PSIG)	Suction Pressure (PSIG)	Sub Cooling	Super Heat	Air Temperature Drop (°F-DB)	Water Temperature Rise (°F)
50	1.5	220-235	120-130	10-16	12-20	20-26	19-23
	3	190-210	120-130	10-16	12-20	20-26	9-12
70	1.5	280-300	125-135	8-14	10-16	19-24	18-22
	3	250-270	125-135	8-14	10-16	19-24	9-12
90	1.5	360-380	130-145	8-14	10-14	18-22	17-21
	3	330-350	130-140	8-14	10-14	18-22	8-11

# Split System Refrig. Circuit Diagram





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# Split System Filter Drier/Line Set Installation Notes

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**Contents:**

- 2 - 3" pieces of copper tubing
- 1 - filter drier
- 1/2" ODF (018-050) or 5/8" ODF (060-072)

**Installation:**

A reversible heat pump filter drier must be installed on the liquid line near the cabinet of the compressor section. A filter drier is furnished with the unit. The filter drier kit includes a 3" piece of 1/2" or 5/8" copper tubing. This tubing will fit either inside or on the outside of the stub coming off the liquid line service valve. Braze it in place. Then braze the filter drier onto it. Make sure the arrow on the filter drier points in

the appropriate direction. A second piece of copper is attached between the filter drier and the liquid line (not needed for all applications, depending upon line set size -- consult line set sizing chart).

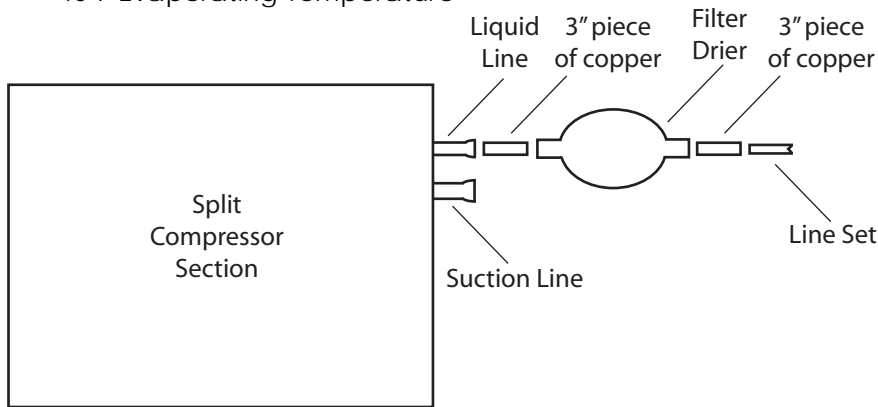
Refer to the split system I.O.M. (installation, operating, and maintenance) manual for details on line set and unit installation. Always use dry nitrogen when brazing.

**Guide Revision Table:**

Date	By	Page	Note
25JUL2008	JH	All	First published

Model No.	Unit Refrigerant Connections		Recommended Liquid & Suction Line Size			
	Liquid Line (OD)	Suction Line (OD)	20 Feet		50 Feet	
			Liquid Line (OD)	Suction Line (OD)	Liquid Line (OD)	Suction Line (OD)
018, 024, 026	1/2	5/8	3/8	3/4	3/8	3/4
030, 036, 038	1/2	3/4	3/8	3/4	1/2	7/8
042, 048, 050	1/2	3/4	1/2	7/8	1/2	1-1/8
060, 062, 072	5/8	7/8	1/2	7/8	5/8	1-1/8

40°F Evaporating Temperature



Weight of refrigerant in copper lines per 10 ft.	
Liquid Line Size (OD)	Oz. Per 10 Ft.
3/8"	5.4
1/2"	10.4
5/8"	15.8

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