

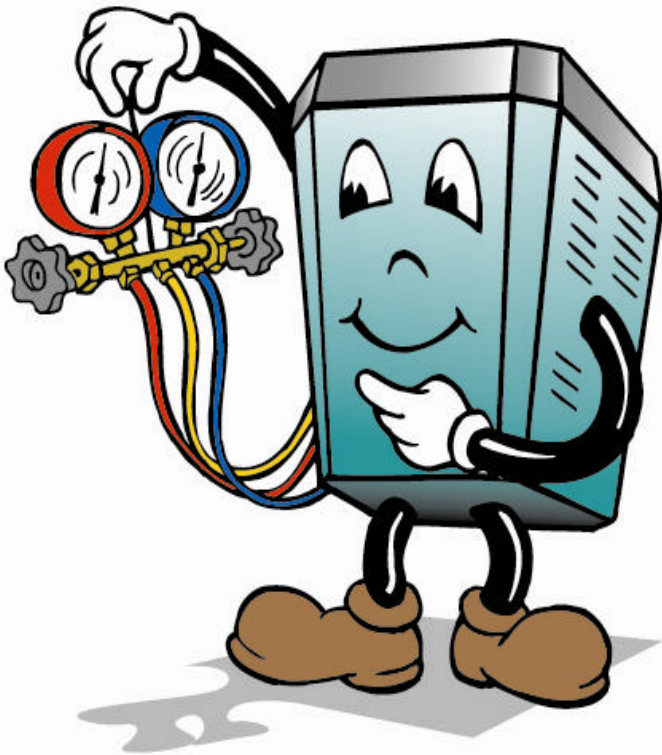
TRANE[®]

TRACKS
TECHNICAL NEWSLETTER

Spring 2009

**Proper Subcooling
Charging Techniques**

R-410A



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It's Hard To Stop A Trane.[®]

Proper Refrigerant Charging Techniques for TXV Systems:

Subcooling is the preferred method.

*Evaluate your conditions before using subcooling techniques:

- The indoor temperature should be between 70 & 80.
- The outdoor temperature should be between 55 & 120.
- Charging by subcooling should be performed in the cooling mode only.

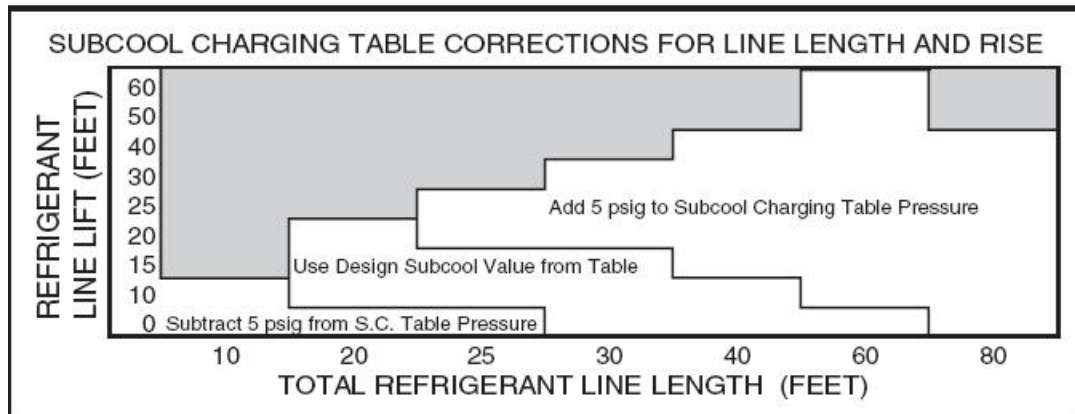
If you are outside these parameters, use a scale and weight in the refrigerant charge.

- The amount of refrigerant is printed on the data plate of each system.
- Additional refrigerant for the line sets is on the front page of the service facts.

TUBING INFORMATION			
Tubing Suction	Tubing Sizes Liquid	Tubing Length	Additional Refrigerant
3/4"	3/8"	20'	3 oz.
3/4"	3/8"	30'	9 oz.
3/4"	3/8"	40'	15 oz.
3/4"	3/8"	50'	21 oz.
3/4"	3/8"	60'	27 oz.
3/4"	3/8"	70'	32 oz.
3/4"	3/8"	80'	38 oz.

Return when conditions stabilize to confirm proper charge by using subcooling.

Many condensing units have a design subcooling listed on the data plate; 10 degrees is common. This 10 degrees ensures the refrigerant remains in a liquid state when it reaches the TXV on a "typical" line set. Longer line sets will require additional refrigerant & subcooling to maintain this liquid seal.



High efficient systems (such as the 16i, 19i & 20i's) typically require higher subcooling levels than standard systems. Always reference the subcooling table & chart for the unit you are working on. The following page shows charts for two R-410A systems: an XR14 & an XL20i.

Use a thermocouple (pipe clamp) to determine your liquid line temperature and ensure your liquid pressure matches the chart; or use Charge Assist on our Communicating Systems to make the calculations and charge the system for you.

5-ton XR14 system

R-410A REFRIGERANT CHARGING CHART							
LIQUID TEMP (°F)	DESIGN SUBCOOLING (°F)						
	8	9	10	11	12	13	14
	LIQUID GAGE PRESSURE (PSI)						
55	179	182	185	188	191	195	198
60	195	198	201	204	208	211	215
65	211	215	218	222	225	229	232
70	229	232	236	240	243	247	251
75	247	251	255	259	263	267	271
80	267	271	275	279	283	287	291
85	287	291	296	300	304	309	313
90	309	313	318	322	327	331	336
95	331	336	341	346	351	355	360
100	355	360	365	370	376	381	386
105	381	386	391	396	402	407	413
110	407	413	418	424	429	435	441
115	435	441	446	452	458	464	470
120	464	470	476	482	488	495	501
125	495	501	507	514	520	527	533

5-ton XL20i system

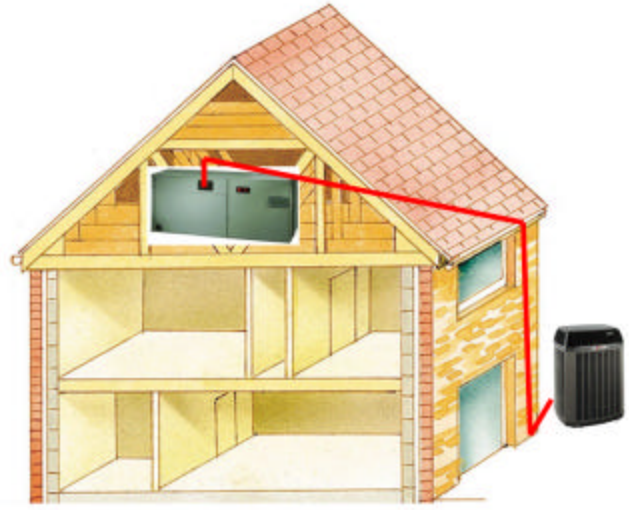
5 TON HP R410A REFRIGERANT CHARGING CHART			
Liquid Temp (°F)	LIQUID GAGE PRESSURE (PSIG)		
	ONLY DIPSWITCH 1 ON	ONLY DIPSWITCH 2 ON	ONLY DIPSWITCH 3 ON
	LOWER *	MIDDLE	UPPER & 4TEE3_10 DOWNFLOW & HORIZ. LEFT **
55	208	208	210
60	225	225	227
65	242	242	245
70	260	260	264
75	280	280	284
80	300	300	305
85	322	322	327
90	345	345	350
95	369	369	374
100	394	394	400
105	420	420	426
110	447	447	454
115	476	476	483
120	505	505	513
125	536	536	544

What to do with refrigerant lines when replacing an R-22 system with an R-410

While replacing the refrigerant line sets with a new system is ideal; it's not always practical, and often impossible.

Use the following clean up process if you are using existing refrigerant line sets:

- *Existing line sets must be properly sized for the new system.
- *Purge the line sets with nitrogen to remove and recover residual mineral oil.
- *Use a slight nitrogen flow when brazing to prevent oxidation.
- *Leak check welds with nitrogen pressure.
- *Pull a vacuum to 500 microns or below.
- *Ensure vacuum holds below 1000 microns before opening service valves.



Flush Kits Are Not Required or Recommended.

There are multiple HVAC flush agents available to our industry. Flush kits contain “solvents”. Solvents that are not completely removed can generate strong acids in the system—leading to premature compressor failures.

If you opt to use a flush kit on line sets after a compressor burn out; follow the flush with a strong flow of nitrogen and a deep vacuum -- 300 microns for 15 minutes. Please read and understand all directions printed by the manufacturer as there may be differences from one product to another.

Small amounts of mineral oil will not harm your new Trane R-410A system—moisture, acids & solvents are more of a concern.

For Additional Information & Advanced Troubleshooting Techniques, Check out our Upcoming Refrigerant Troubleshooting Classes

Tuesday, April 14th in Tucson
Thursday, April 16th in Phoenix