

Proper System Charging:

The method used to charge a system depends on the metering device. To properly charge a system with an expansion valve (TXV) you must charge by Subcooling. To charge a fixed metering device system (Piston) you must use Superheat.

Subcooling Charging Method - TXV (Expansion Valve) R410A & R22

Subcooling is defined as: The temperature of a liquid refrigerant when it is cooled below its condensing temperature. Subcooling takes place in the condenser and is determined by subtracting the liquid line temperature (as read on a digital thermometer strapped on the liquid line) from saturation temperature (gauge temperature - the temperature that corresponds to the pressure read on the high-side gauge).

Step 1 – Locate unit required subcooling

From unit nameplate or literature

Typical 8-12° F.

Step 2 – Measure liquid pressure – convert to temperature.

Step 3 – subtract required subcooling (Step 1) from converted temperature (Step2) – This is the required liquid line temperature.

Step 4 – Measure liquid line temperature. If the measured liquid line temperature does not equal the required liquid line temperature:

Add refrigerant to lower temperature

Remove refrigerant to raise temperature

Allow a tolerance of +/- 3°F.

Superheat Charging Chart - Cooling - non-TXV - R410A & R22

Superheat is defined as: The temperature of vapor refrigerant above its saturation change of state (evaporation) temperature. Superheat takes place in the evaporator and is determined by subtracting the saturation temperature (gauge temperature - the temperature that corresponds to the pressure read on the low-side gauge) from the suction line temperature (as read on a digital thermometer strapped on the suction line, at the condenser service valve).

Required Superheat

		Condenser Entering Air - Dry Bulb										
		55	60	65	70	75	80	85	90	95	100	105
Indoor Entering Wet Bulb	50	9	7	X	X	X	X	X	X	X	X	X
	52	12	10	6	X	X	X	X	X	X	X	X
	54	14	12	10	7	X	X	X	X	X	X	X
	56	17	15	13	10	6	X	X	X	X	X	X
	58	20	18	16	13	9	5	X	X	X	X	X
	60	23	21	19	16	12	8	X	X	X	X	X
	62	26	24	21	19	15	12	8	5	X	X	X
	64	29	27	24	21	18	15	11	9	6	X	X
	66	32	30	27	24	21	18	15	13	10	8	5
	68	35	33	30	27	24	21	19	16	14	12	9
	70	37	35	33	30	28	25	22	20	18	15	13
	72	40	38	36	33	31	28	26	24	22	20	17
	74	42	40	38	36	34	31	30	27	25	23	22
	76	45	43	41	39	37	35	33	31	29	27	26

Step 1. Measure outdoor air (dry bulb) temperature, and indoor wet bulb temperature (Humidity - Moisture content of the air measured with a sling or digital psychrometer).

Step 2. Find required superheat from chart

Step 3. Measure suction pressure - convert pressure to temperature

Step 4. Add required superheat (Step 2) to converted temperature (Step 3)

This is the required suction line temperature.

Step 5. Measure the suction line temperature. If the suction line temperature does not equal the required suction line temperature (Step 4):

Add refrigerant to **lower** the line temperature

Remove refrigerant to **raise** line temperature

*Allow a tolerance of +/-5°

*R22 - charge with vapor refrigerant to suction side

***R410a - charge with liquid refrigerant to the suction side using "liquid charger" - failure to use this device may result in compressor damage! (Liquid Charger YellowJacket part# 41123 - approx \$10)**