



Before using this guide, read and understand the unit instructions. Safety dictates that you use a hard hat, safety goggles for the protection of your eyes, and heavy leather gloves to protect your hands and arms. Boiling refrigerant at atmospheric pressure will freeze your eyes and exposed skin if it inadvertently leaks out of the system.

WARNING

Please note that the Environmental Protection Agency (EPA) requires that technicians be certified to handle refrigerants if they have the potential to release refrigerants into the atmosphere. See the EPA certification course offered at www.777educate.com or visit www.epa.gov for more information. Never, ever, ever, vent ANY refrigerant to the atmosphere.

When checking the charge on an air conditioning unit, **ALWAYS FOLLOW MANUFACTURER'S INSTRUCTIONS**. When manufacturers instructions are not available the following procedure for determining charge will be helpful.

Before Using The Superheat Charging Chart On The Next Page:

1. Be certain the unit is an R-22 unit with a fixed orifice metering device. Pistons and capillary tubes are fixed-orifice devices. The chart will not work on units using a thermostatic expansion valve (TXV) metering device. TXV metered units must use the sub-cooling method not superheat.
2. Measure the load on the condenser coil outdoors. This will be the **DRY BULB (db)** temperature of the air actually entering the condenser coil.
3. Measure the load on the evaporator coil indoors. This will be the **WET BULB (wb)** temperature of the air actually entering the evaporator coil. Obtain the wb temperature of the air entering the blower compartment. Your goal is to get a mixed return air temperature which is downstream of the bypass humidifier and fresh air intake, if used. Wet bulb temperature can be obtained with a sling psychrometer, electronic thermometer with a wet wick on the sensing area, or an electronic thermometer with wet bulb capability.
4. Determine the intersection point of the load on the condenser coil (db entering the condenser coil), and the load on the evaporator coil (wb entering the evaporator coil). If a number exists at this intersection point, the number represents the CORRECT superheat you should have, in the suction line near the compressor, when the unit is properly charged. If dashes are found at the point of intersection, attempting to alter charge may cause liquid slugging of the compressor. Go back to the job when correct superheat will not be indicated by dashes. When the db is less, or, the wb is greater you stand a better chance of getting "ON" the chart. Note: it is rare to be in the dashed areas in the mid-west.

Superheat charging chart follows on the next page.

Visit www.behler-young.com/dealertraining.htm for a current eastern and western Michigan seminar schedule. Visit www.777educate.com for a complete list of courses and a source of other information.

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Calculation Of Necessary Superheat

R22 Fixed Orifice Metering Devices Only

Source: Carrier/BDP

| Evap. Entering Wet (wb) Bulb Air Temp. | Condenser Air Entering Dry Bulb (db) Temperature | | | | | | | | | | | | |
|--|--|----|----|----|----|----|----|----|----|-----|-----|-----|-----|
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 |
| | Required Superheat Values Shown Below | | | | | | | | | | | | |
| 50 | 9 | 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 51 | 11 | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 52 | 12 | 10 | 6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 53 | 13 | 11 | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 54 | 14 | 12 | 10 | 7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 55 | 15 | 13 | 12 | 8 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 56 | 17 | 15 | 13 | 10 | 6 | -- | -- | -- | -- | -- | -- | -- | -- |
| 57 | 19 | 17 | 15 | 12 | 7 | -- | -- | -- | -- | -- | -- | -- | -- |
| 58 | 20 | 18 | 16 | 13 | 9 | 5 | -- | -- | -- | -- | -- | -- | -- |
| 59 | 21 | 19 | 17 | 14 | 10 | 6 | -- | -- | -- | -- | -- | -- | -- |
| 60 | 23 | 21 | 19 | 16 | 12 | 8 | -- | -- | -- | -- | -- | -- | -- |
| 61 | 25 | 23 | 20 | 17 | 13 | 10 | -- | -- | -- | -- | -- | -- | -- |
| 62 | 26 | 24 | 21 | 19 | 15 | 12 | 8 | 5 | -- | -- | -- | -- | -- |
| 63 | 27 | 25 | 23 | 20 | 16 | 13 | 9 | 7 | -- | -- | -- | -- | -- |
| 64 | 29 | 27 | 24 | 21 | 18 | 15 | 11 | 9 | 6 | -- | -- | -- | -- |
| 65 | 30 | 29 | 25 | 23 | 19 | 16 | 13 | 11 | 8 | -- | -- | -- | -- |
| 66 | 32 | 30 | 27 | 24 | 21 | 18 | 15 | 13 | 10 | 8 | 5 | -- | -- |
| 67 | 34 | 32 | 28 | 25 | 22 | 19 | 17 | 14 | 12 | 10 | 7 | -- | -- |
| 68 | 35 | 33 | 30 | 27 | 24 | 21 | 19 | 16 | 14 | 12 | 9 | 6 | -- |
| 69 | 36 | 34 | 31 | 28 | 26 | 23 | 20 | 18 | 16 | 13 | 11 | 8 | -- |
| 70 | 37 | 35 | 33 | 30 | 28 | 25 | 22 | 20 | 18 | 15 | 13 | 11 | 8 |
| 71 | 39 | 36 | 34 | 31 | 30 | 26 | 24 | 22 | 20 | 18 | 15 | 13 | 11 |
| 72 | 40 | 38 | 36 | 33 | 31 | 28 | 26 | 24 | 22 | 20 | 17 | 15 | 14 |
| 73 | 41 | 39 | 37 | 35 | 33 | 29 | 28 | 25 | 23 | 21 | 19 | 17 | 16 |
| 74 | 42 | 40 | 38 | 36 | 34 | 31 | 30 | 27 | 25 | 23 | 22 | 20 | 18 |
| 75 | 43 | 42 | 39 | 37 | 36 | 34 | 32 | 28 | 27 | 25 | 24 | 23 | 20 |
| 76 | 45 | 43 | 41 | 39 | 37 | 35 | 33 | 31 | 29 | 27 | 26 | 25 | 23 |

Important: to prevent the return of liquid refrigerant to the compressor and possible damage, DO NOT attempt to alter the charge in a system when the correct superheat is indicated by double dashes: --

This chart should be used only when the condenser and evaporator air flows are adequate, room temperature close to set point, and no air or moisture exists within the system.

WHEN CHARGE ADJUSTMENTS ARE REQUIRED:

- 1) If ACTUAL superheat is HIGHER than shown above, ADD CHARGE to lower it.
- 2) If ACTUAL superheat is LOWER than shown above, RECOVER CHARGE to increase it.

+ or - 5 degrees F

Always use manufacturer's instructions, instead of the above table, when available.

Remember: these systems should have superheat calculated at the condensing unit in the suction line.