CHARGE REFRIGERANT LINES (W2GC3—A-1 MODELS ONLY)

NOTE: Refrigerant lines must be charged by a licensed, EPA certified refrigeration technician in accordance with established procedures.

The outdoor condensing unit should be charged during warm weather. However, applications arise in which charging must occur in the colder months. The method of charging is determined by the system's refrigerant expansion device and the outdoor ambient temperature. Choose one of the following charge methods based on the system's refrigerant expansion device and the outdoor ambient temperature.

Measure the Liquid Line Temperature and the Outdoor Ambient Temperature

1. Connect the manifold gauge set to the service valve ports as follows:
   - Low pressure gauge to suction line service valve
   - High pressure gauge to liquid line service valve
2. Close manifold gauge set valves.
3. Connect the center manifold hose to an upright cylinder of refrigerant (R-22).
4. If room temperature is below 70°F (21°C), set the room thermostat to call for heat. This will create the necessary load for properly charging the system in the cooling cycle.
5. When the heating demand has been satisfied, switch the thermostat to cooling mode with a set point of 68°F.
6. When pressures have stabilized, use a digital thermometer to record the liquid and suction line temperatures.
7. Use a digital thermometer to record the outdoor ambient temperature.

NOTE: The outdoor temperature will determine which charging method to use.

Charge Using Weigh-In Method (Fixed Orifice/Thermal Expansion Valve Systems)

Use this method if the system is void of refrigerant, or if the outdoor ambient temperature is cool.

1. Locate and repair any leaks.
2. If necessary, recover the refrigerant from the condensing unit.
3. Conduct a leak check, then evacuate as previously outlined.
4. Weigh in the charge according to the total amount shown on the condensing unit nameplate.

NOTE: If weighing facilities are not available or if the condensing unit is being charged during warm weather, follow one of the other charging methods.

IMPORTANT:

- Refrigerant charge adjustment will be required for line set lengths greater than 15 ft (4.6 m) and for non system-matched evaporator coils.
- The condensing unit is factory-charged with the proper refrigerant charge amount for a matching evaporator and 15 ft (4.6 m) of refrigerant line. Refer to the condensing unit rating plate for the exact amount of this factory charge.
- Adjustment of the refrigerant charge will be necessary based on the system combination and line length. To adjust the refrigerant size for increased line lengths, add the following amount of refrigerant.

  For line set lengths greater than 15 ft (4.6 m), add refrigerant by weighing in 0.60 oz per ft of ⅜" (1 cm) O.D. liquid line.
- If necessary, adjust the refrigerant charge for compatibility with the evaporator coil.

Charge Using Sub-cooling Method (Fixed Orifice/Thermal Expansion Valve Systems)—Outdoor Temperatures 65°F (18ºC) or Above

Use this method if charging a fixed orifice or Thermal Expansion Valve system when the outdoor ambient temperature is 65°F (18ºC) or above.

1. Attach the manifold gauge hose to the liquid service port.
2. If the condensing unit pressures are stable, use a digital thermometer to record the liquid line temperature.
3. Record the liquid line pressure reading.
4. Use a temperature/pressure chart for refrigerant (R-22) to determine the saturation temperature for the liquid line pressure reading.
5. Subtract the liquid line temperature from the saturation temperature to determine sub-cooling. See Sub-cooling Values for Fixed Orifice or Thermal Expansion Valve Systems chart.

   _____ ° (Saturation Temperature °F) - _____ ° (Liquid Line Temperature °F) = _____ ° (Sub-cooling Value °F)
6. Compare the sub-cooling value with those shown in Sub-cooling Values for Fixed Orifice or Thermal Expansion Valve Systems chart.
   - If sub-cooling is greater than shown, recover some refrigerant.
   - If sub-cooling is less than shown, add some refrigerant.

Sub-cooling Values for Fixed Orifice or Thermal Expansion Valve Systems

	Liquid Sub-cooling—ΔºF						
Outdoor Temperature ºF (ºC)	**W2GC318A-1**	**W2GC324A-1**	**W2GC330A-1**	**W2GC336A-1**	**W2GC342A-1**	**W2GC348A-1**	**W2GC360A-1**
65 (18)	13	13	7	14	15	9	13
75 (23.9)	10	11	5	13	13	9	12
85 (29.4)	8	10	5	11	11	9	11
95 (35)	7	10	4	9	9	9	10
105 (40.6)	6	9	3	8	7	9	9
115 (46.1)	3	6	2	6	5	8	8

Charge Using Superheat Method (Fixed Orifice Systems)—Outdoor Temperatures 65°F (18ºC) or Above

Use this method if charging a fixed orifice system when the outdoor ambient temperature is 65ºF (18ºC) or above.

1. Attach the manifold gauge hose to the suction service port.
2. If the condensing unit pressures are stable, use a digital thermometer to record the suction line temperature.
3. Record the suction line pressure reading.
4. Use a temperature/pressure chart for refrigerant (R-22) to determine the saturation temperature for the suction line pressure reading.
5. Subtract the saturation temperature from the suction line temperature to determine the superheat. See Superheat Values for Fixed Orifice Systems chart.

   _____ ° (Suction Line Temperature °F) - _____ ° (Saturation Temperature °F) = _____ ° (Superheat Value °F)
6. Compare the superheat value with those shown in Superheat Values for Fixed Orifice Systems chart.
   - If superheat is greater than shown, add some refrigerant.
   - If superheat is less than shown, recover some refrigerant.

Superheat Values for Fixed Orifice Systems

(80° DB/67° WB Return Air)

Outdoor Ambient Temperature ºF (ºC)	Superheat ºF
60 (15.6)	38
65 (18.3)	35
70 (21.1)	30
75 (23.9)	26
80 (26.7)	22
85 (29.4)	18
90 (32.2)	12
95 (35)	8
100 (37.8)	5
105 (40.6)	0

Charge Using Approach Method (Thermal Expansion Valve Systems)—Outdoor Temperatures 65°F (18ºC) or Above

Use this method if charging a Thermal Expansion Valve system when the outdoor ambient temperature is 65ºF (18ºC) or above.

NOTES:

- The following procedure is intended as a general guide.
- Use on expansion valve systems only.
- For best results, indoor temperature should 70°F (21ºC) to 80°F (27ºC).
- Monitor system pressures while charging.

1. Record outdoor ambient temperature using a digital thermometer.
2. Attach high pressure gauge set.
3. Operate condensing unit for several minutes to allow system pressures to stabilize.
4. Compare stabilized pressures with those provided in the Normal Operating Pressures chart.

   NOTES:

   - Minor variations in these pressures may be expected due to differences in installations.
   - Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system.
   - Pressures higher than those listed indicate that the system is overcharged.
   - Pressures lower than those listed indicate that the system is undercharged.
   - Verify adjusted charge using the approach method.
5. Use the same digital thermometer to check liquid line temperature.
6. Subtract the outdoor ambient temperature from the liquid line temperature to determine the approach temperature.

   _____ ° (Liquid Line Temperature °F) - _____ ° (Outdoor Ambient Temperature °F) = _____ ° (Approach Temperature °F)
7. Compare the approach value with those shown in the Approach Values for Thermal Expansion Valve Systems chart.
   - If the approach values are too high, add refrigerant to lower the approach temperature
   - If the approach values are too low, recover refrigerant from the system to increase the approach temperature.

Approach Values for Thermal Expansion Valve Systems

Model	W2GC318A-1	W2GC324A-1	W2GC330A-1	W2GC336A-1	W2GC342A-1	W2GC348A-1	W2GC360A-1
Temperature ºF	6	10	11	9	5	5	8

- Approach value is the liquid line temperature minus the outdoor ambient temperature (Δ°F).

NOTE: For best results, use the same digital thermometer to check both outdoor ambient and liquid temperatures.

Check Charge Using Normal Operating Pressures

Use the Normal Operating Pressures chart to perform maintenance checks.

NOTES:

- This chart is not a procedure for charging the system.
- Minor variations in these pressures may be due to differences in installations.
- Significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Normal Operating Pressures (-18 to -36)

Air Temperature Entering Outdoor Coil ºF (ºC)	W2GC318A-1		W2GC324A-1		W2GC330A-1		W2GC336A-1	
	Liquid	Suction	Liquid	Suction	Liquid	Suction	Liquid	Suction
Thermal Expansion Valve								
65 (18)	141	80	147	79	141	76	145	74
75 (23.9)	166	81	173	80	167	77	170	76
85 (29.4)	195	82	218	82	195	78	201	77
95 (35)	222	83	234	82	227	80	234	78
105 (40.6)	258	85	267	84	260	81	268	79
115 (46.1)	294	86	307	85	299	83	309	81

Air Temperature Entering Outdoor Coil ºF (ºC)	W2GC318A-1		W2GC324A-1		W2GC330A-1		W2GC336A-1	
	Liquid	Suction	Liquid	Suction	Liquid	Suction	Liquid	Suction
Fixed Orifice								
65 (18)	144	73	147	68	140	66	150	67
75 (23.9)	167	78	173	74	166	71	176	72
85 (29.4)	196	82	203	79	196	76	205	76
95 (35)	225	84	238	83	227	80	237	79
105 (40.6)	256	86	272	86	262	83	273	81
115 (46.1)	293	88	317	88	302	86	314	84

NOTE: Values provided are typical pressures. Indoor unit match-up, indoor air quality and indoor load will cause pressures to vary.

Normal Operating Pressures (-42 to -60)

Air Temperature Entering Outdoor Coil ºF (ºC)	W2GC342A-1		W2GC348A-1		W2GC360A-1	
	Liquid	Suction	Liquid	Suction	Liquid	Suction
Thermal Expansion Valve						
65 (18)	143	78	145	80	151	76
75 (23.9)	167	80	170	81	177	78
85 (29.4)	198	81	198	82	207	79
95 (35)	231	82	230	84	240	80
105 (40.6)	268	84	265	85	277	81
115 (46.1)	308	85	303	86	318	83
Fixed Orifice						
65 (18)	147	70	145	70	150	67
75 (23.9)	171	75	170	75	177	72
85 (29.4)	198	78	198	80	207	77
95 (35)	228	81	230	84	239	80
105 (40.6)	262	84	264	86	274	83
115 (46.1)	300	85	301	88	315	85

NOTE: Values provided are typical pressures. Indoor unit match-up, indoor air quality and indoor load will cause pressures to vary.

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