ALLIED™ Air Enterprises

SERVICE MANUAL

4SCU13LE/B

This is a safety alert symbol and should never be ignored. When you see this symbol on labels or in manuals, be alert to the potential for personal injury or death.

Table of Contents

WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer (or equivalent), service agency or the gas supplier.

CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

WARNING

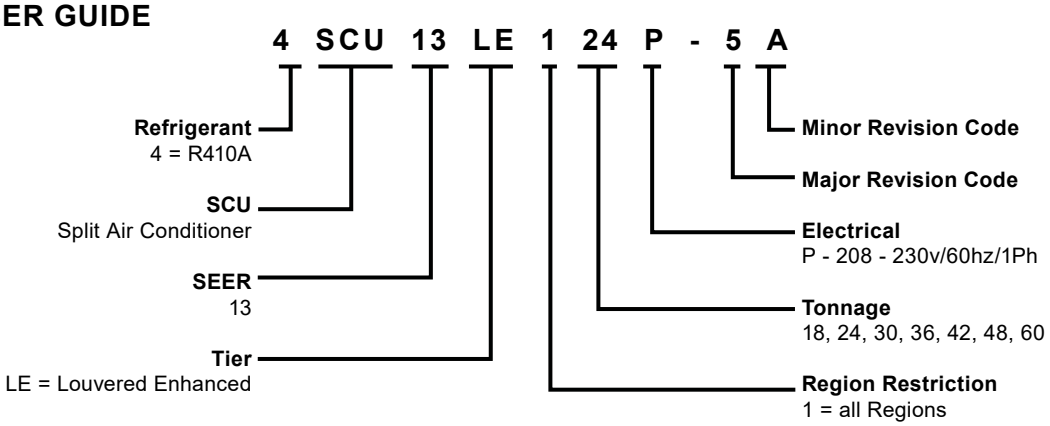
Electric shock hazard.

Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

(P) 508216-01

Technical Specifications - 4SCU13LE

MODEL NUMBER GUIDE

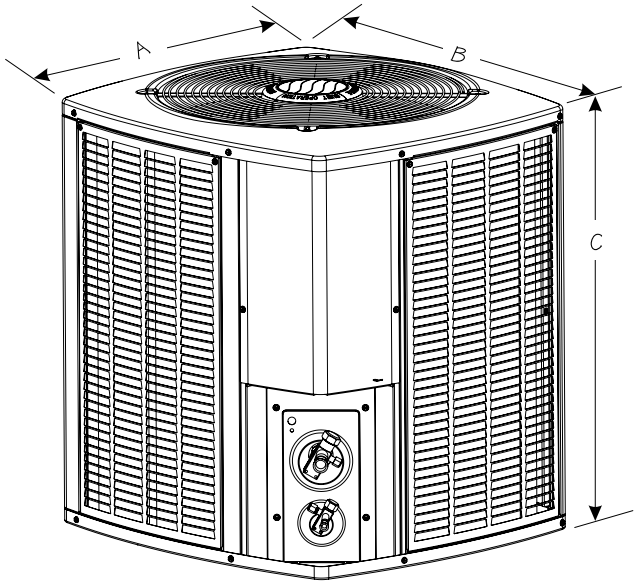


PHYSICAL AND ELECTRICAL DATA

Model	Voltage/Hz/ Phase	Voltage Range	Min. Circuit Amp.	Max. Over Current Device (amps)	Compressor		Fan Motor		
					Rated Load (amps)	Locked Rotor (amps)	Rated Load (amps)	Rated HP	Nom. RPM
4SCU13LE118P-5	208-230/60/1	197-253	10.9	15	8.1	39	0.7	1/10	1010
4SCU13LE124P-5	208-230/60/1	197-253	14.1	20	10.7	53	0.7	1/10	1010
4SCU13LE124P-6	208-230/60/1	197-253	14.7	25	11.2	61	0.7	1/10	1010
4SCU13LE130P-5	208-230/60/1	197-253	15.6	25	11.6	59	1.1	1/5	1090
4SCU13LE130P-6	208-230/60/1	197-253	17.1	25	12.8	68	1.1	1/5	1090
4SCU13LE136P-5	208-230/60/1	197-253	20.1	35	15.2	70	1.1	1/5	1090
4SCU13LE136P-6	208-230/60/1	197-253	20.4	35	15.4	84	1.1	1/5	1090
4SCU13LE142P-5	208-230/60/1	197-253	28.1	45	21.1	90	1.7	1/4	825
4SCU13LE142P-6	208-230/60/1	197-253	25.7	40	19.2	124	1.7	1/4	825
4SCU13LE148P-5	208-230/60/1	197-253	31.9	50	24.1	100	1.7	1/4	825
4SCU13LE160P-5	208-230/60/1	197-253	29.4	50	22.1	125	1.7	1/4	825

UNIT DIMENSIONS (IN.)

Model No.	Dimensions			Shipping Weight (lbs.)
	A - width	B - depth	C - Height	
4SCU13LE118P-5	24.75	26.75	25.75	140
4SCU13LE124P-5/6	24.75	26.75	25.75	137
4SCU13LE130P-5/6	24.75	26.75	29.75	149
4SCU13LE136P-5/6	24.75	26.75	29.75	157
4SCU13LE142P-5/6	29.38	31.25	29.75	201
4SCU13LE148P-5	29.38	31.25	33.75	204
4SCU13LE160P-5	29.38	31.25	29.75	231



Note:
Weights listed are unit weights with packaging
Dimensions listed are unit sizes w/o packaging

SOUND RATINGS

Model	Sound Power[1]	Estimated Sound Pressure (dBA)[2]		
		Approximate Distance[3]		
		3.3 Feet (1 Meter)	6.6 Feet (2 Meters)	9.8 Feet (3 Meters)
4SCU13LE118P-5	72	64	58	54
4SCU13LE124P-5/6	72	64	58	54
4SCU13LE130P-5/6	74	66	60	56
4SCU13LE136P-5/6	74	66	60	56
4SCU13LE142P-5/6	76	68	62	58
4SCU13LE148P-5	77	69	63	59
4SCU13LE160P-5	78	70	64	60

1 Rated in accordance with AHRI standard 270 (2015). AHRI Standard 270 establishes a method of rating outdoor unitary equipment in terms of Sound Power.
2 Rated in accordance with AHRI standard 275 (2010). AHRI Standard 275 provides the calculations for estimating the A-Weighted Sound Pressure at a given distance from the equipment. That is a more useful number because that is what humans will hear.
3 Based only on distance factor; other factors may change this value such as:
- Unit location (reflective surfaces adjacent to the unit)
- Barrier shielding sources
- Sound path/elevation
- Outside noise sources

ACCESSORIES

System Accessory	Where Used	Kit Number	Purpose
Liquid Line solenoid	All models	60M52	Prevents liquid migration to the compressor especially for high liquid riser applications
Low ambient (cooling operation)	All models	34M72	Enables cooling demand down to 30 °F. Will require freeze stat, CC heater and TXV
Compressor Short Cycle Protector	All models	47J27	Delays compressor start 5-7 minutes to prevent short cycling
Hard Start	18	10J42	Scroll compressors usually do not require hard start; maybe needed for utility brown-out or low voltage areas
Hard Start	24 thru 60	88M91	
Crankcase Heater	18, 24, 30, 36	93M04	Prevents liquid migration to compressor in cold weather
Crankcase Heater	42, 48, 60	93M05	
Sound Cover	Factory Installed		Lowers compressor sound level
Loss of Charge Kit	Factory Installed		Protects the compressor if refrigerant charge is too low
Additional System Accessories (indoor section)			
TXV Kit	18, 24, 30	H4TXV01	TXVs provide superior refrigerant flow control, comfort and efficiency compared to pistons
	36, 42, 48	H4TXV02	
	60	H4TXV03	
Outdoor Thermostat - electric heat	All models	10Z23	Prevents electric heat operation above specific ambient conditions
Outdoor Thermostat - Mounting box	All models	31461	Mounting box for outdoor thermostat
Freezestat	All models	93G35	Protects the compressor at low suction pressure conditions
Overflow switch	All models	11U75	Turn the system off, if condensate water overflows due to clogged drain pipes
Blower time delay	All models	58M81	Improves system efficiency and comfort
Single point power supply	All models	21H39	Provide single power source in one junction box
Auxiliary blower relay	All models	85W66	Maybe required to select multiple indoor blower speeds

REFRIGERATION DATA

Outdoor Model	Charge (oz) [6]	Refrigerant Connection				Refrigerant Line Size		Indoor Expansion Device	
		Outdoor		Indoor (DTC) [7]					
		Suction	Liquid	Suction	Liquid	Suction	Liquid	Piston	TXV [1]
4SCU13LE118P-5	62	5/8	3/8	3/4	3/8	5/8 or 3/4 [3]	3/8 or 1/4 [2]	0.053	H4TXV01
4SCU13LE124P-5/6	70	5/8	3/8	3/4	3/8	5/8 or 3/4 [3]	3/8 or 1/4 [2]	0.057	H4TXV01
4SCU13LE130P-5	82	3/4	3/8	3/4	3/8	3/4	3/8	0.063	H4TXV01
4SCU13LE130P-6	82	3/4	3/8	3/4	3/8	3/4	3/8	0.059	H4TXV01
4SCU13LE136P-5/6	84	3/4	3/8	7/8	3/8	3/4	3/8	0.072	H4TXV02
4SCU13LE142P-5/6	104	3/4	3/8	7/8	3/8	3/4 [5]	3/8	0.074	H4TXV02
4SCU13LE148P-5	124	7/8	3/8	7/8	3/8	7/8	3/8	0.082	H4TXV02
4SCU13LE160P-5	144	7/8	3/8	7/8	3/8	7/8 or 1-1/8 [4]	3/8	0.090	H4TXV02

Note:
1 Required to achieve AHRI rating. If NA (Not Applicable) is in the piston column, then TXV is required.
2 Use 3/8 if over 24 feet of line set
3 Use 3/4 if over 24 feet of line set
4 Use 1-1/8 if over 24 feet of line set. Adapter provided with OD unit
5 Use 7/8 if over 24 feet of line set
6 Charged for 15 ft of line set
7 DTC = Designated Tested Combination

COOLING PERFORMANCE WITH DTC[1]

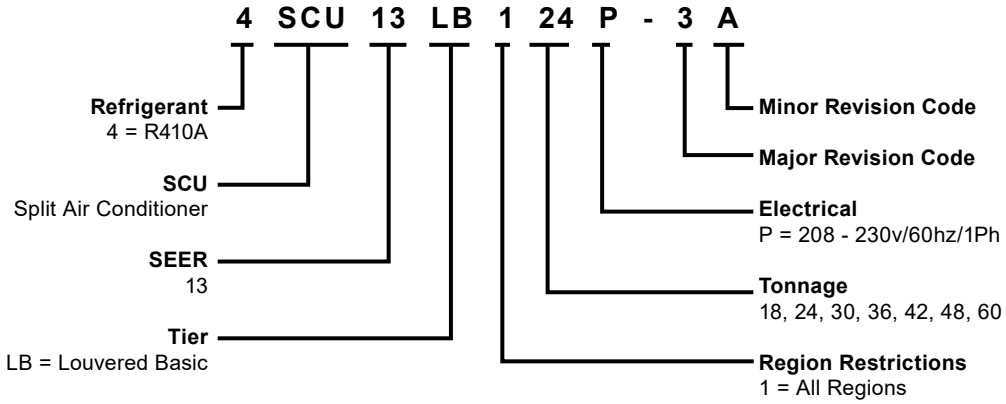
Outdoor Model	Indoor Model	Capacity (BTUH)	EER	SEER
4SCU13LE118P-5	E*1P24(A,B)+TDR	17600	11.0	13
4SCU13LE124P-5/6	E*1P24(A,B)+TDR	22800	11.0	13
4SCU13LE130P-5/6	E*1P24(A,B)+TDR	28000	10.5	13
4SCU13LE136P-5/6	E*1P36(B,C)+TDR	34000	10.5	13
4SCU13LE142P-5/6	E*1P43C+TDR	40000	10.5	13
4SCU13LE148P-5	E*1P49C+TDR	47000	11.0	13
4SCU13LE160P-5	E*1P49C+TDR	57000	10.5	13

[1] DTC = Designated Tested Combination

NOTE:
For the latest ratings, please see
www.alliedratings.com or www.AHRIdirectory.org

Technical Specifications - 4SCU13LB

MODEL NUMBER GUIDE



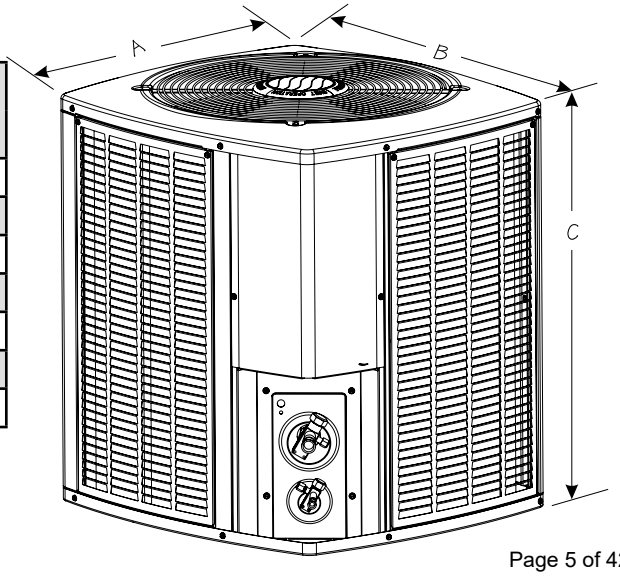
PHYSICAL AND ELECTRICAL DATA

Model	Voltage/Hz/ Phase	Voltage Range	Min. Circuit Amp.	Max. Over Current Device (amps)	Compressor		Outdoor Fan Motor		
					Rated Load (amps)	Locked Rotor (amps)	Rated Load (amps)	Rated HP	Nom. RPM
4SCU13LB118P-3	208-230/60/1	197-253	10.9	15	8.1	39	0.7	1/10	1010
4SCU13LB124P-3	208-230/60/1	197-253	14.1	20	10.7	53	0.7	1/10	1010
4SCU13LB124P-6	208-230/60/1	197-253	14.7	25	11.2	61	0.7	1/10	1010
4SCU13LB130P-3	208-230/60/1	197-253	15.6	25	11.6	59	1.1	1/5	1090
4SCU13LB130P-6	208-230/60/1	197-253	17.1	25	12.8	68	1.1	1/5	1090
4SCU13LB136P-3	208-230/60/1	197-253	20.1	35	15.2	70	1.1	1/5	1090
4SCU13LB136P-6	208-230/60/1	197-253	20.4	35	15.4	84	1.1	1/5	1090
4SCU13LB142P-3	208-230/60/1	197-253	28.1	45	21.1	90	1.7	1/4	825
4SCU13LB142P-6	208-230/60/1	197-253	25.7	40	19.2	124	1.7	1/4	825
4SCU13LB148P-3	208-230/60/1	197-253	31.9	50	24.1	100	1.7	1/4	825
4SCU13LB160P-3	208-230/60/1	197-253	29.4	50	22.1	125	1.7	1/4	825

UNIT DIMENSIONS (IN.)

Model	Dimensions (inch)			Shipping Weight (lbs.)
	A - Width	B - Depth	C - Height	
4SCU13LB118P-3	24.75	26.75	25.75	157
4SCU13LB124P-3/6	24.75	26.75	25.75	157
4SCU13LB130P-3/6	24.75	26.75	29.75	179
4SCU13LB136P-3/6	24.75	26.75	29.75	188
4SCU13LB142P-3/6	29.38	31.25	29.75	205
4SCU13LB148P-3	29.38	31.25	33.75	198
4SCU13LB160P-3	29.38	31.25	29.75	211

Note:
Dimensions listed are unit sizes w/o packaging
Weights listed are units weights with packaging.



SOUND RATINGS

Model	Sound Power[1]	Estimated Sound Pressure (dBA)[2]		
		Approximate Distance[3]		
		3.3 Feet (1 Meter)	6.6 Feet (2 Meters)	9.8 Feet (3 Meters)
4SCU13LB118P-3	74	66	60	56
4SCU13LB124P-3/6	74	66	60	56
4SCU13LB130P-3/6	74	66	60	56
4SCU13LB136P-3/6	74	66	60	56
4SCU13LB142P-3/6	79	71	65	61
4SCU13LB148P-3	79	71	65	61
4SCU13LB160P-3	80	72	66	62

1 Rated in accordance with AHRI standard 270 (2015). AHRI Standard 270 establishes a method of rating outdoor unitary equipment in terms of Sound Power.
2 Rated in accordance with AHRI standard 275 (2010). AHRI Standard 275 provides the calculations for estimating the A-Weighted Sound Pressure at a given distance from the equipment. That is a more useful number because that is what humans will hear.
3 Based only on distance factor; other factors may change this value such as:
- Unit location (reflective surfaces adjacent to the unit)
- Barrier shielding sources
- Sound path/elevation
- Outside noise sources

ACCESSORIES

System Accessory	Where Used	Kit Number	Purpose
Liquid Line solenoid	All models	60M52	Prevents liquid migration to the compressor especially for high liquid riser applications
Low ambient (cooling operation)	All models	34M72	Enables cooling demand down to 30 °F. Will require freeze stat, CC heater and TXV
Compressor Short Cycle protector	All models	47J27	Delays compressor start 5-7 minutes to prevent short cycling
Hard Start	18	10J42	Scroll compressors usually do not require hard start; maybe needed for utility brown-out or low voltage areas
Hard Start	24 thru 60	88M91	
Crankcase Heater	18, 24, 30, 36	93M04	Prevents liquid migration to compressor in cold weather
Crankcase Heater	42, 48, 60	93M05	
Sound Cover	18, 24, 30, 36	14W00	Lowers compressor sound level
Sound Cover	42, 48, 60	14W01	
Loss of Charge Kit	All models	84M23	Protects the compressor if refrigerant charge is too low
Additional System Accessories (indoor section)			
TXV Kit	18, 24, 30	H4TXV01	TXVs provide superior refrigerant flow control, comfort and efficiency compared to pistons
	36, 42, 48	H4TXV02	
	60	H4TXV03	
Outdoor Thermostat - electric heat	All models	10Z23	Prevents electric heat operation above specific ambient conditions
Outdoor Thermostat - mounting box	All models	31461	Mounting box for outdoor thermostat
Freezestat	All models	93G35	Protects the compressor at low suction pressure conditions
Overflow switch	All models	11U75	Turn the system off, if condensate water overflows due to clogged drain pipes
Blower time delay	All models	58M81	Improves system efficiency and comfort
Single point power supply	All models	21H39	Provide single power source in one junction box
Auxiliary blower relay	All models	85W66	Maybe required to select multiple indoor blower speeds

REFRIGERATION DATA

Outdoor Model	Charge (oz) [6]	Refrigerant Connection				Refrigerant Line Size		Indoor Expansion Device	
		Outdoor		Indoor (DTC) [7]					
		Suction	Liquid	Suction	Liquid	Suction	Liquid	Piston	TXV [1]
4SCU13LB118P-3	62	5/8	3/8	3/4	3/8	5/8 or 3/4 [3]	3/8 or 1/4 [2]	0.053	H4TXV01
4SCU13LB124P-3/6	70	5/8	3/8	3/4	3/8	5/8 or 3/4 [3]	3/8 or 1/4 [2]	0.057	H4TXV01
4SCU13LB130P-3	82	3/4	3/8	3/4	3/8	3/4	3/8	0.063	H4TXV01
4SCU13LB130P-6	82	3/4	3/8	3/4	3/8	3/4	3/8	0.059	H4TXV01
4SCU13LB136P-3/6	84	3/4	3/8	7/8	3/8	3/4	3/8	0.072	H4TXV02
4SCU13LB142P-3/6	104	3/4	3/8	7/8	3/8	3/4 [5]	3/8	0.074	H4TXV02
4SCU13LB148P-3	124	7/8	3/8	7/8	3/8	7/8	3/8	0.082	H4TXV02
4SCU13LB160P-3	144	7/8	3/8	7/8	3/8	7/8 or 1-1/8 [4]	3/8	0.090	H4TXV02

Note:
1 Required to achieve AHRI rating. If NA (Not Applicable) is in the piston column, then TXV is required.
2 Use 3/8 if over 24 feet of line set
3 Use 3/4 if over 24 feet of line set
4 Use 1-1/8 if over 24 feet of line set. Adapter provided with OD unit
5 Use 7/8 if over 24 feet of line set
6 Charged for 15 ft of line set
7 DTC = Designated Tested Combination

COOLING PERFORMANCE WITH DTC[1]

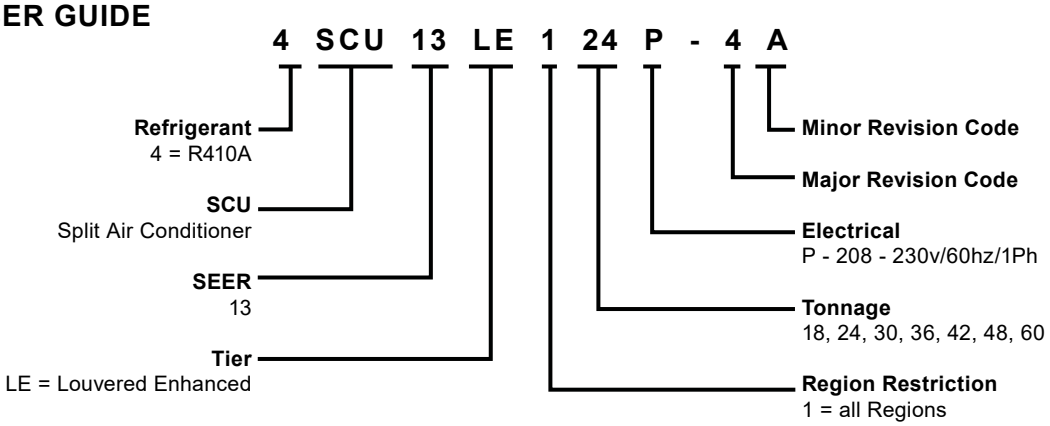
Outdoor Model	Indoor Model	Capacity (BTUH)	EER	SEER
4SCU13LB118P-3	E*1P24(A,B)+TDR	17600	11.0	13
4SCU13LB124P-3/6	E*1P24(A,B)+TDR	22800	11.0	13
4SCU13LB130P-3/6	E*1P24(A,B)+TDR	28000	10.5	13
4SCU13LB136P-3/6	E*1P36(B,C)+TDR	34000	10.5	13
4SCU13LB142P-3/6	E*1P43C+TDR	40000	10.5	13
4SCU13LB148P-3	E*1P49C+TDR	47000	11.0	13
4SCU13LB160P-3	E*1P49C+TDR	57000	10.5	13

1 DTC = Designated Tested Combination

NOTE:
For the latest ratings, please see
www.alliedratings.com or www.AHRIdirectory.org

Technical Specifications - 4SCU13LE*P-4

MODEL NUMBER GUIDE



PHYSICAL AND ELECTRICAL DATA

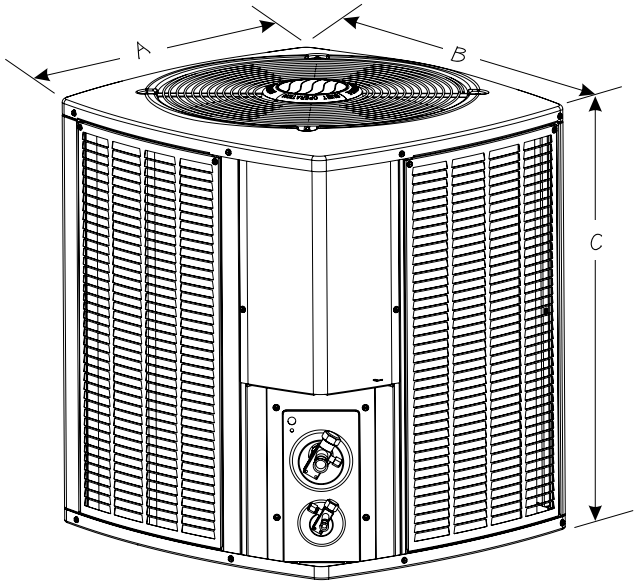
Model	Voltage/Hz/ Phase	Voltage Range	Min. Circuit Amp.	Max. Over Current Device (amps)	Compressor		Fan Motor			Refrig. Charge+ (oz.)	Shipping Weight (lbs.)
					Rated Load (amps)	Locked Rotor (amps)	Rated Load (amps)	Rated HP	Nom. RPM		
4SCU13LE118P-4	208-230/60/1	197-253	10.9	15	8.1	39	0.7	1/10	1010	62	157
4SCU13LE124P-4	208-230/60/1	197-253	14.1	20	10.7	53	0.7	1/10	1010	70	157
4SCU13LE130P-4	208-230/60/1	197-253	15.6	25	11.6	59	1.1	1/5	1090	82	179
4SCU13LE136P-4	208-230/60/1	197-253	20.1	35	15.2	70	1.1	1/5	1090	84	188
4SCU13LE142P-4	208-230/60/1	197-253	28.1	45	21.1	90	1.7	1/4	825	104	205
4SCU13LE148P-4	208-230/60/1	197-253	31.9	50	24.1	100	1.7	1/4	825	124	198
4SCU13LE160P-4	208-230/60/1	197-253	29.4	50	22.1	125	1.7	1/4	830	144	211

Note:
Weights listed are unit weights with packaging
+ Factory charged for 15 feet offline set. Adjust per installation instructions.

UNIT DIMENSIONS (IN.)

Model No.	Dimensions			Sound Rating (dBA)
	A - Width	B - Depth	C - Height	
4SCU13LE118P-4	24.75	26.75	25.75	74
4SCU13LE124P-4	24.75	26.75	25.75	74
4SCU13LE130P-4	24.75	26.75	29.75	74
4SCU13LE136P-4	24.75	26.75	29.75	74
4SCU13LE142P-4	29.38	31.25	29.75	79
4SCU13LE148P-4	29.38	31.25	33.75	79
4SCU13LE160P-4	29.38	31.25	29.75	80

Note:
Dimensions listed are unit sizes w/o packaging

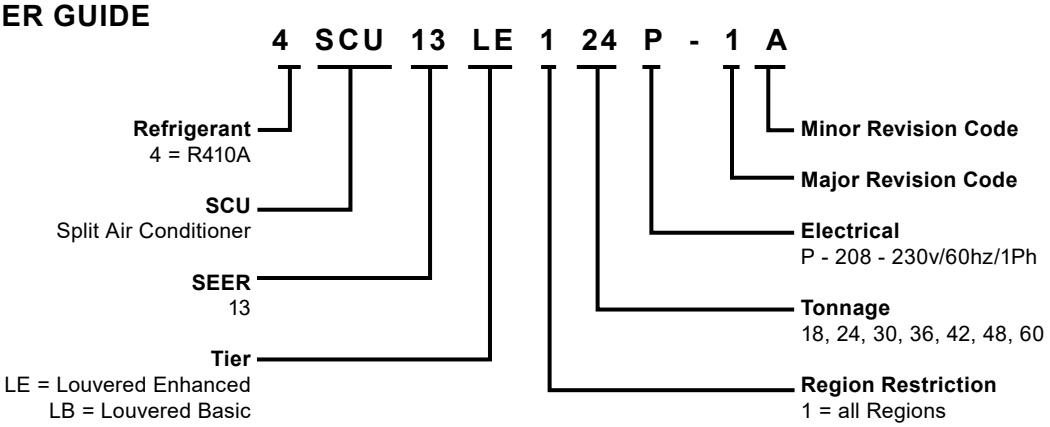


ACCESSORIES

Description	Where Used	Kit Number
Crankcase Heater	18, 24, 30, 36	93M04
	42, 48, 60	93M05
Hard Start	18	10J42
	24, 30, 36, 42, 48, 60	88M91
Compressor Low Ambient	All	45F08
Short Cycle Protector	All	47J27
Freezestat	3/8 tubing	93G35
	5/8 tubing	50A93
Time Delay Relay	All	58M81
Loss of Charge Kit	All	84M23

Technical Specifications - 4SCU13LE*-1 through 3 / 4SCU13LB*-1 through 2

MODEL NUMBER GUIDE



PHYSICAL AND ELECTRICAL DATA

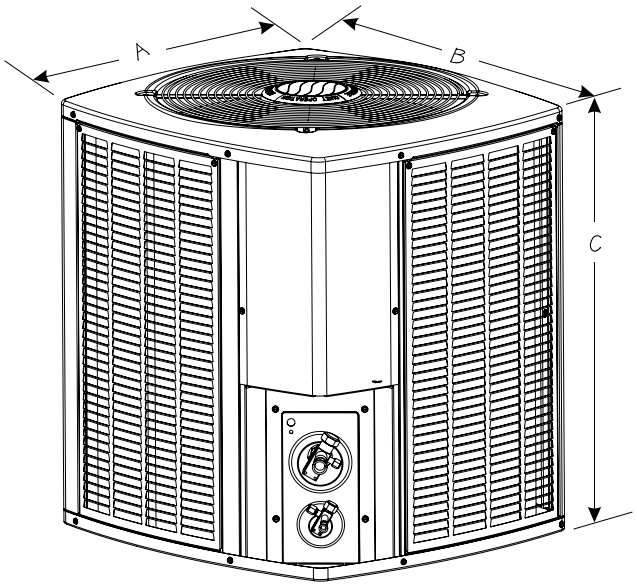
Model	Voltage/Hz/ Phase	Voltage Range	Min. Circuit Amp.	Max. Over Current Device (amps)	Compressor		Fan Motor			Refrig. Charge+ (oz.)	Shipping Weight (lbs.)
					Rated Load (amps)	Locked Rotor (amps)	Rated Load (amps)	Rated HP	Nom. RPM		
4SCU13LE118P	230/60/1	197-253	11.9	20	9.0	48.0	0.7	1/10	1075	75	155
4SCU13LE124P	230/60/1	197-253	17.5	30	13.5	58.3	0.7	1/10	1075	70	162
4SCU13LE130P	230/60/1	197-253	18.7	30	14.1	73.0	1.1	1/5	1075	87	178
4SCU13LE136P	230/60/1	197-253	21.9	35	16.7	79.0	1.1	1/5	825	89	202
4SCU13LE142P	230/60/1	197-253	23.2	40	17.9	107.0	1.1	1/6	825	115	216
4SCU13LE148P	230/60/1	197-253	28.3	50	21.8	117.0	1.1	1/6	825	127	220
4SCU13LE160P	230/60/1	197-253	34.6	60	26.3	134.0	1.7	1/4	825	160	282

Note:
Weights listed are unit weights with packaging
+ Factory charged for 15 feet offline set. Adjust per installation instructions.

UNIT DIMENSIONS (IN.)

Model No.	Dimensions			Sound Rating (dBA)
	A - Width	B - Depth	C - Height	
4SCU13LE118P	24.75	26.75	25.75	74
4SCU13LE124P	24.75	26.75	25.75	74
4SCU13LE130P	24.75	26.75	29.75	76
4SCU13LE136P	24.75	26.75	29.75	76
4SCU13LE142P	29.38	31.25	29.75	76
4SCU13LE148P	29.38	31.25	37.75	76
4SCU13LE160P	29.38	31.25	33.75	76

Note:
Dimensions listed are unit sizes w/o packaging



FAN BLADE SPECS

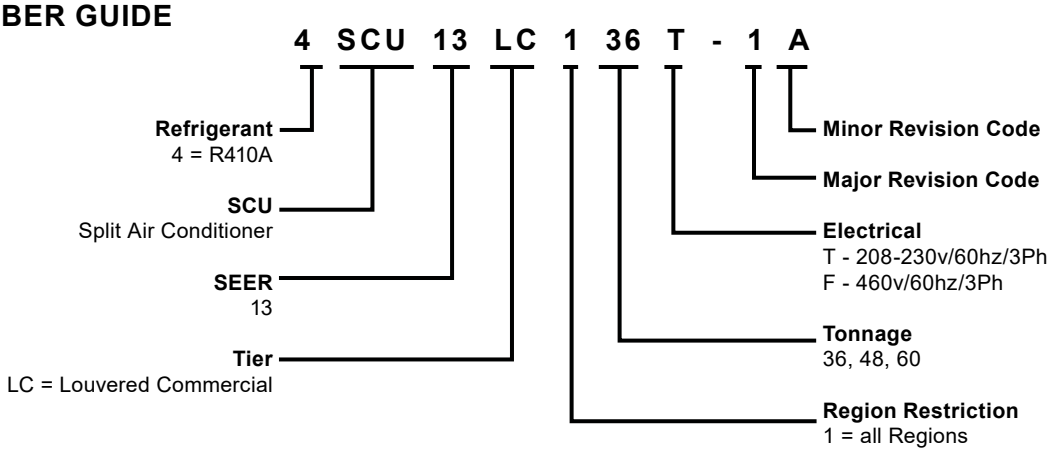
4SCU13L**-1,2,3,4,5	Fan Blade			
	Dia.	#of Blades	Pitch	Part #
-18	18	3	27	98M18
-24	18	3	27	98M18
-30	18	4	27	98M19
-36-1	22	4	24	10W78
-36-2,3,4,5	18	4	27	98M19
-42-1,2	22	4	24	10W78
-42-3,4,5	22	4	32	30W24
-48-1,2	22	4	24	10W78
-48-3,4,5	22	4	32	30W24
-60-1	22	4	32	98M21
-60-2,3,4,5	22	4	32	30W24

ACCESSORIES

Description	Where Used	Kit Number
Blower Off Delay Kit	All	40K58
Compressor Sound Covers	All	69J03
Compressor Low Ambient Cutoff	All	45F08
Freezestats (3/8” tubing)	All	93G35
Freezestats (5/8” tubing)	All	50A93
Time Off Control (A/C only)	All	47J27
Crankcase Heater - CCH	18, 24, 30, 36	93M04
	42, 48, 60	93M05
Hard Start Kit 1.5 - 3.5 ton	18	10J42
Hard Start KIt 4 - 5 ton	24, 30, 36, 42, 48, 60	88M91
Low Ambient	All	34M72
TXV Kit	18, 24, 30	A4TXV01
	18, 24, 30, 36	A4TXV02
	60	H4TXV03

Technical Specifications - 4SCU13LC 3-Phase

MODEL NUMBER GUIDE



PHYSICAL AND ELECTRICAL DATA

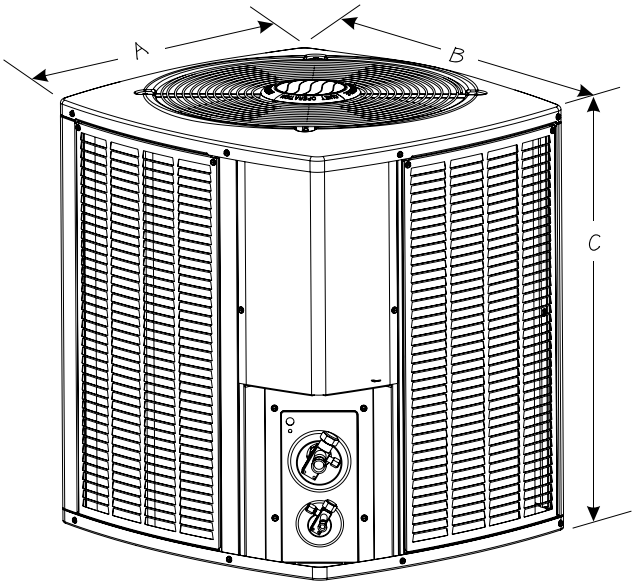
Model	Voltage/Hz/ Phase	Voltage Range	Min. Circuit Amp.	Max. Over Current Device (amps)	Compressor		Fan Motor			Refrig. Charge+ (oz.)	Shipping Weight (lbs.)
					Rated Load (amps)	Locked Rotor (amps)	Rated Load (amps)	Rated HP	Nom. RPM		
4SCU13LC136T	208-230/60/1	197-253	14.2	20	10.4	73.0	1.10	1/5	1075	89	202
4SCU13LC148T	208-230/60/1	197-253	18.8	30	13.7	83.1	1.70	1/4	825	122	220
4SCU13LC160T	208-230/60/1	197-253	21.3	35	15.6	110.0	1.70	1/4	825	160	228
4SCU13LC136F	460/3/60	414-506	7.8	15	5.8	38.0	0.55	1/5	1075	89	202
4SCU13LC148F	460/3/60	414-506	8.8	15	6.2	41.0	1.00	1/4	825	122	220
4SCU13LC160F	460/3/60	414-506	10.7	15	7.8	52.0	1.00	1/4	825	160	228

Note:
Weights listed are unit weights with packaging

UNIT DIMENSIONS (IN.)

Model No.	Dimensions			Sound Rating (dBA)
	A - Width	B - Depth	C - Height	
4SCU13LC136	24.75	26.75	29.75	76
4SCU13LC148	29.38	31-.25	37.75	78
4SCU13LC160	29.38	31-.25	33.75	78

Note:
Dimensions listed are unit sizes w/o packaging



ACCESSORIES

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Freezestats (3/8” tubing)	All	93G35
Freezestats (5/8” tubing)	All	50A93
Time Off Control (A/C only)	All	47J27
Crankcase Heater - CCH (230 volts)	36	93M04
	48, 60	93M05
Low Ambient	All	34M72
TXV Kit	All	A4TXV02
	60	H4TXV03

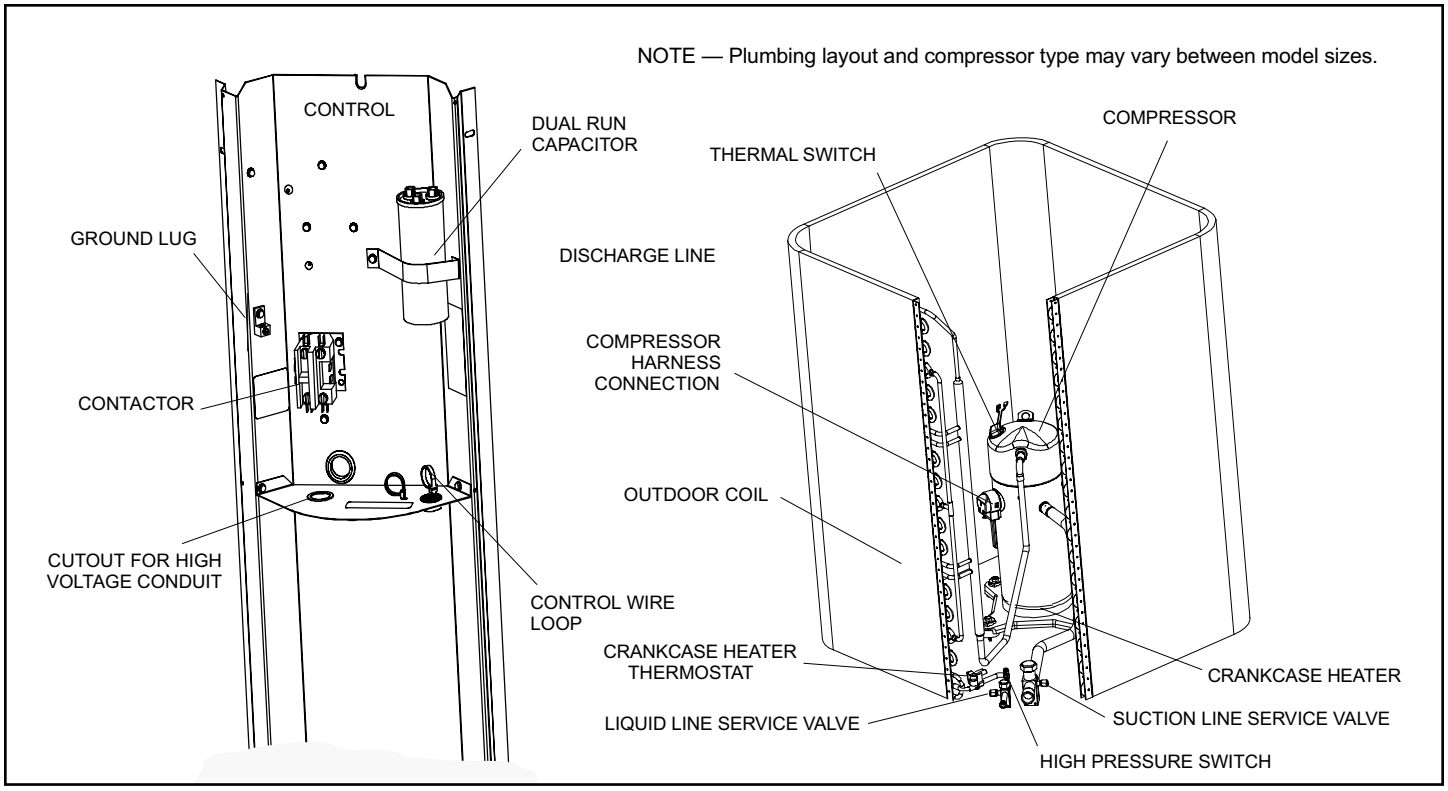


Figure 1. Typical Parts Arranegment

Refrigerant Metering Device - Indoor Coil

For correct metering device, refer to chart below.

Outdoor Model	Orifice Size	Indoor Expansion Device	Outdoor Model	Orifice Size	Indoor Expansion Device	Outdoor Model	Orifice Size	Indoor Expansion Device
4SCU13LE118P-1,4,5	0.053	A4TXV01	4SCU13LB118P-2	0.051	A4TXV01	4SCU13LC136T	0.073	A4TXV02
4SCU13LE118P-2,3	0.051	A4TXV01	4SCU13LB118P-3	0.053	A4TXV01	4SCU13LC148T	0.081	A4TXV02
4SCU13LE124P-1,2,3,4,5	0.057	A4TXV01	4SCU13LB124P-2,3	0.057	A4TXV01	4SCU13LC160T	0.090	A4TXV03
4SCU13LE130P-1,4,5	0.063	A4TXV01	4SCU13LB130P-2	0.065	A4TXV01	4SCU13LC136F	0.073	A4TXV02
4SCU13LE130P-2,3	0.065	A4TXV01	4SCU13LB130P-3	0.063	A4TXV01	4SCU13LC148F	0.081	A4TXV02
4SCU13LE136P-1	0.074	A4TXV01	4SCU13LB136P-2	0.069	A4TXV01	4SCU13LC160F	0.090	A4TXV03
4SCU13LE136P-2,3	0.073	A4TXV01	4SCU13LB136P-3	0.072	A4TXV01			
4SCU13LE136P-4,5	0.072	A4TXV01	4SCU13LB142P-2	0.076	A4TXV02			
4SCU13LE142P-1,2,3	0.076	A4TXV02	4SCU13LB148P-2	0.081	A4TXV02			
4SCU13LE142P-4,5	0.074	A4TXV02	4SCU13LB148P-3	0.082	A4TXV02			
4SCU13LE148P-1,2,3	0.081	A4TXV02	4SCU13LB160P-2	0.092	A4TXV03			
4SCU13LE148P-4,5	0.082	A4TXV02	4SCU13LB160P-3	0.090	A4TXV02			
4SCU13LE160P-1	0.092	A4TXV03						
4SCU13LE160P-2,3,4,5	0.090	A4TXV02						

Table 1.

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities who have jurisdiction before installation.

Installation

NOTE: *In some cases, noise in the living area has been traced to gas pulsations from improper installation of equipment.*

- Locate unit away from windows, patios, decks, etc. where unit operation sounds may disturb customer.
- Leave some slack between structure and unit to absorb vibration.
- Place a sound-absorbing material, such as Isomode, under the unit if it will be installed in a location or position that will transmit sound or vibration to the living area or adjacent buildings.
- In heavy snow areas, do not locate the unit where drifting snow will occur. The unit base should be elevated above the depth of average snows.

  NOTE: *Elevation of the unit may be accomplished by constructing a frame using suitable materials. If a support frame is constructed, it must not block drain holes in unit base.*
- When installed in areas where low ambient temperatures exist, locate unit so winter prevailing winds do not blow directly into outdoor coil.
- Locate unit away from overhanging roof lines which would allow water or ice to drop on, or in front of, coil or into unit.

When outdoor unit is connected to factory-approved indoor unit, outdoor unit contains system refrigerant charge for operation with matching indoor unit when connected by 15 ft. of field-supplied tubing. For proper unit operation, check refrigerant charge using charging information located on control box cover.

Outdoor Section

Zoning ordinances may govern the minimum distance the condensing unit can be installed from the property line.

Install on a Solid, Level Mounting Pad

The outdoor section is to be installed on a solid foundation. This foundation should extend a minimum of 2” (inches) beyond the sides of the outdoor section. To reduce the possibility of noise transmission, the foundation slab should NOT be in contact with or be an integral part of the building foundation. See Figure 2.

If conditions or local codes require the unit be attached to pad or mounting frame, tie down bolts should be used and secured to unit base pan.

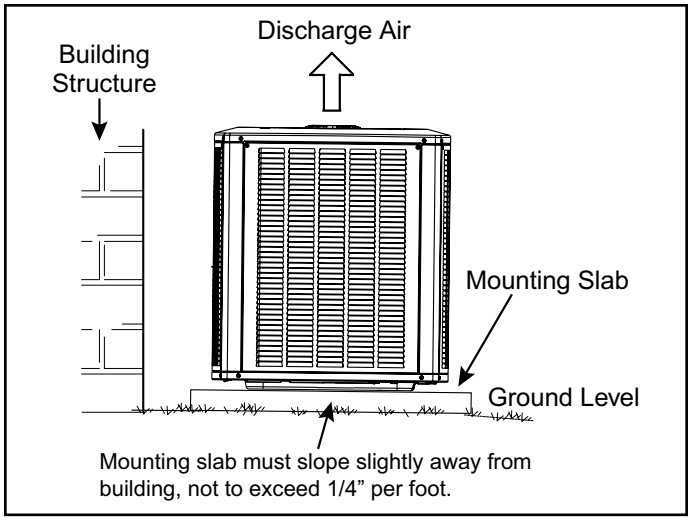


Figure 2. Slab Mounting

Elevate Unit

⚠ CAUTION

Accumulation of water and ice in base pan may cause equipment damage.

Elevate unit per local climate and code requirements to provide clearance above estimated snowfall level and ensure adequate drainage of unit. Use snow stand in areas where prolonged freezing temperatures are encountered.

If conditions or local codes require the unit be attached to pad or mounting frame, tie down bolts should be used and fastened through knockouts provided in unit base pan.

Clearance Requirements

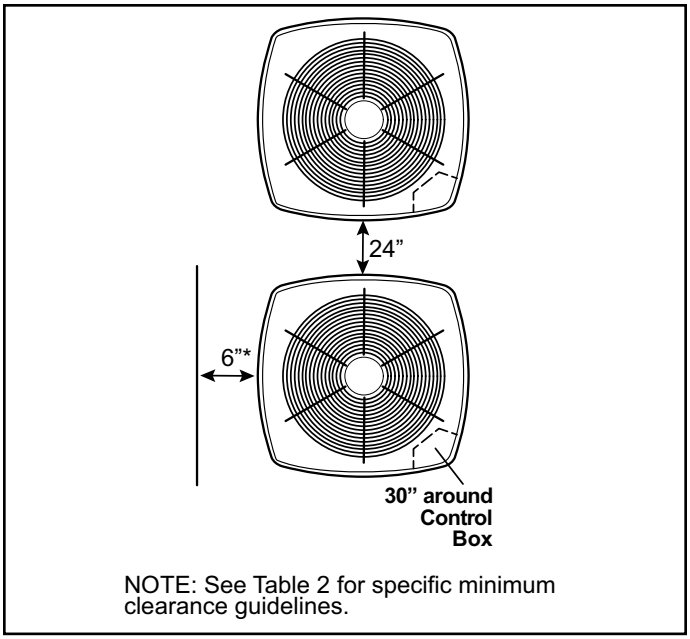
When installing, allow sufficient space for airflow clearance, wiring, refrigerant piping, and service. For proper airflow, quiet operation and maximum efficiency. Position so water, snow, or ice from roof or eaves cannot fall directly on unit. Refer to Table 2 for installation clearances.

Location	Minimum Clearance
Service box	30"
Top of unit*	48"
Between units	24"
Against wall	6"

* Maximum soffit overhang is 36".

NOTE: At least one side should be unobstructed by a wall or other barrier.

Table 2. Clearances



NOTE: See Table 2 for specific minimum clearance guidelines.

Figure 3.

DO LOCATE THE UNIT:

- With proper clearances on sides and top of unit
- On a solid, level foundation or pad (unit must be level to within ± 1/4 in./ft. per compressor manufacturer specifications)
- To minimize refrigerant line lengths

DO NOT LOCATE THE UNIT:

- On brick, concrete blocks or unstable surfaces
- Near clothes dryer exhaust vents where debris accumulates
- Near sleeping area or near windows
- Under eaves where water, snow or ice can fall directly on the unit
- With clearance less than 2 ft. from a second unit
- With clearance less than 4 ft. on top of unit

Rooftop Installations

Install unit at a minimum of 6" above surface of the roof to avoid ice buildup around the unit. Locate the unit above a load bearing wall or area of the roof that can adequately support the unit. Consult local codes for rooftop applications.

If unit cannot be mounted away from prevailing winds, a wind barrier should be constructed. Due to variation in installation applications, size and locate barrier according to the best judgment of the installer.

Torque Requirements

When servicing or repairing heating, ventilating, and air conditioning components, ensure the fasteners are appropriately tightened. Table 3 lists torque values for fasteners.

⚠ IMPORTANT

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

When servicing or repairing HVAC components, ensure the fasteners are appropriately tightened. Table 3 provides torque values for fasteners.

⚠ IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued (from 9 ft-lbs for small valves, to 25 ft-lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

Parts	Recommended Torque	
Service valve cap	8 ft.-lb.	11 NM
Sheet metal screws	16 in.-lb.	2 NM
Machine screws #10	28 in.-lb.	3 NM
Compressor bolts	90 in.-lb.	10 NM
Gauge port seal cap	8 ft.-lb.	11 NM

Table 3. Torque Requirements

Using Manifold Gauge Set

When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings. Manifold gauge set used with HFC-410A refrigerant systems must be capable of handling the higher system operating pressures.

The gauges should be rated for use with pressures of 0 - 800 psig on the high side and a low side of 30” vacuum to 250 psig with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psig of pressure with a 4000 psig burst rating.

Operating Service Valves

The liquid and vapor line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging. Each valve is equipped with a service port which has a factory-installed valve stem.

Liquid and Suction Line Service Valves

The liquid line and suction line service valves (see Figure 4) and service ports are used for leak testing, evacuation, charging, and checking charge.

Each valve is equipped with a service port which has a factory-installed Schrader valve. A service port cap protects the Schrader valve from contamination and serves as the primary leak seal.

To Access the Schrader Port:

1. Remove the service port cap with an adjustable wrench.
2. Connect gauge to the service port.
3. When testing is completed, replace service port cap. Tighten finger tight, then an additional 1/6 turn.

To Open Liquid or Suction Line Service Valve:

1. Remove stem cap with an adjustable wrench.
2. Use service wrench with a hex-head extension to back the stem out counterclockwise as far as it will go. Use a 3/16” hex head extension for liquid line service valves and a 5/16” extension for suction line service valves.
3. Replace the stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

To Close Liquid or Suction Line Service Valve:

1. Remove the stem cap with an adjustable wrench.
2. Use a service wrench with a hex-head extension to turn the stem clockwise to seat the valve. Tighten firmly.
3. Replace the stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

Suction Line (Ball Type) Service Valve

Suction line (ball type) service valves function the same way as the other valves; the difference is in the construction (see Figure 5).

The ball valve is equipped with a service port with a factory-installed Schrader valve. A service port cap protects the Schrader valve from contamination and serves as the primary seal.

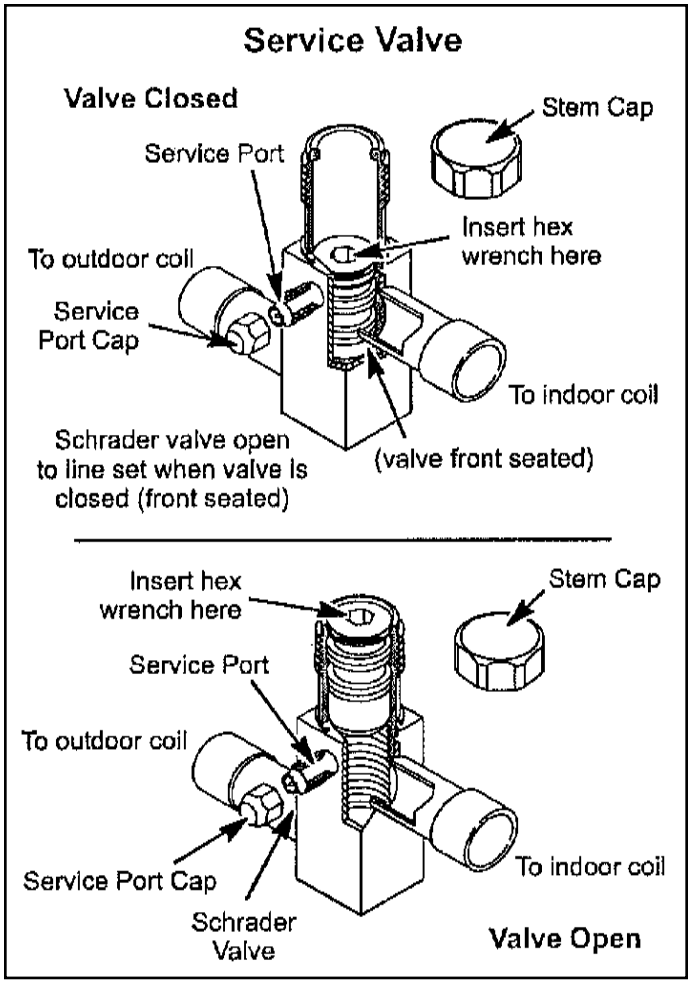


Figure 4.

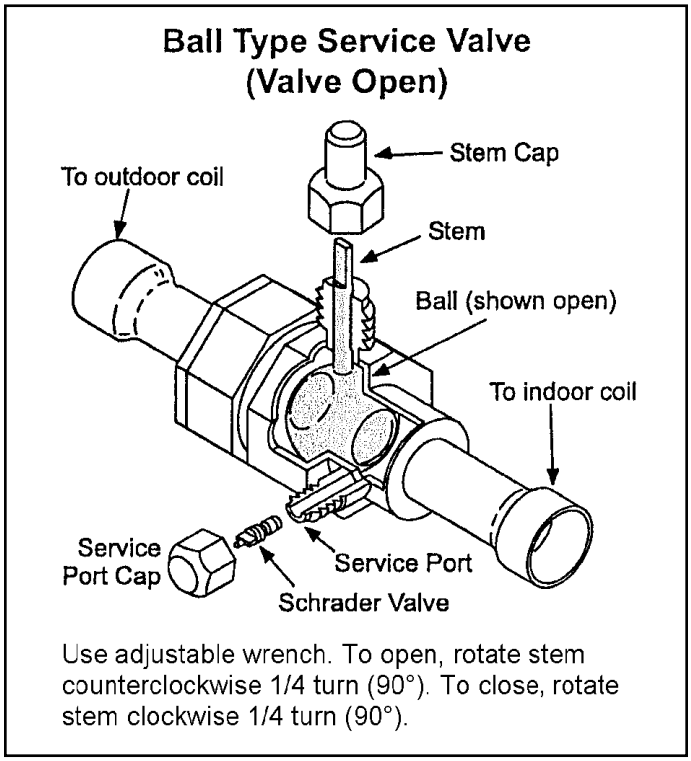


Figure 5.

Refrigeration Piping

- Use only refrigerant grade copper tubes.
- Split systems may be installed with up to 50 feet of line set (no more than 20 feet vertical) without special consideration (see long line set guidelines).
- Ensure that vapor and liquid tube diameters are appropriate to capacity of unit.
- Run refrigerant tubes as directly as possible by avoiding unnecessary turns and bends.
- When passing refrigerant tubes through the wall, seal opening with RTV or other silicon-based caulk.
- Avoid direct tubing contact with water pipes, duct work, floor joists, wall studs, floors, walls, and any structure.
- Do not suspend refrigerant tubing from joists and studs with a rigid wire or strap that comes in direct contact with tubing.
- Ensure that tubing insulation is pliable and completely surrounds vapor tube.

It is important that no tubing be cut or seals broken until you are ready to actually make connections to the evaporator and to the condenser section. DO NOT remove rubber plugs or copper caps from the tube ends until ready to make connections at evaporator and condenser. Under no circumstances leave the lines open to the atmosphere for any period of time, if so unit requires additional evacuation to remove moisture.

Model	13 SEER	
	Liquid Line	Suction Line
18	3/8 OR 1/4 1	3/4 OR 5/8 2
24	3/8 OR 1/4 1	3/4 OR 5/8 2
30	3/8	3/4
36	3/8	3/4
42	3/8	7/8 OR 3/4 [3]
48	3/8	7/8
60	3/8	1-1/8 OR 7/8 [4]

* Fittings should be supplied by the installer.
1: Use 3/8 if over 24 feet of line set
2: Use 3/4 if over 24 feet of line set
3: Use 7/8 if over 24 feet of line set
4: Use 1-1/8 if over 24 feet of line set

Table 4.

Be extra careful with sharp bends. Tubing can “kink” very easily, and if this occurs, the entire tube length will have to be replaced. Extra care at this time will eliminate future service problems.

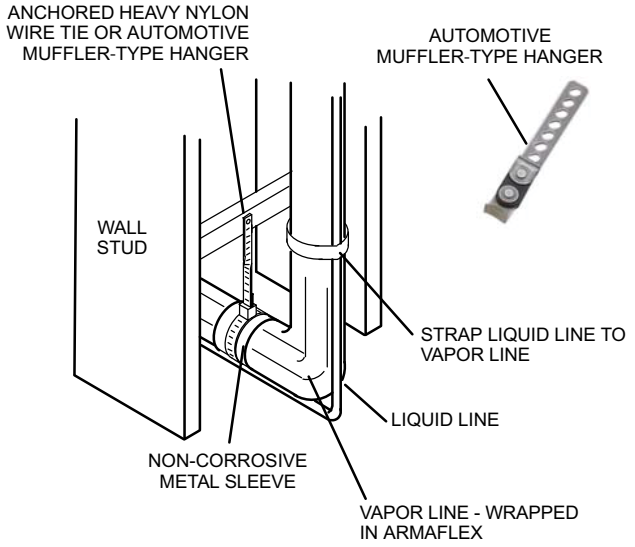
LINE SET

IMPORTANT — Refrigerant lines must not contact structure.

INSTALLATION

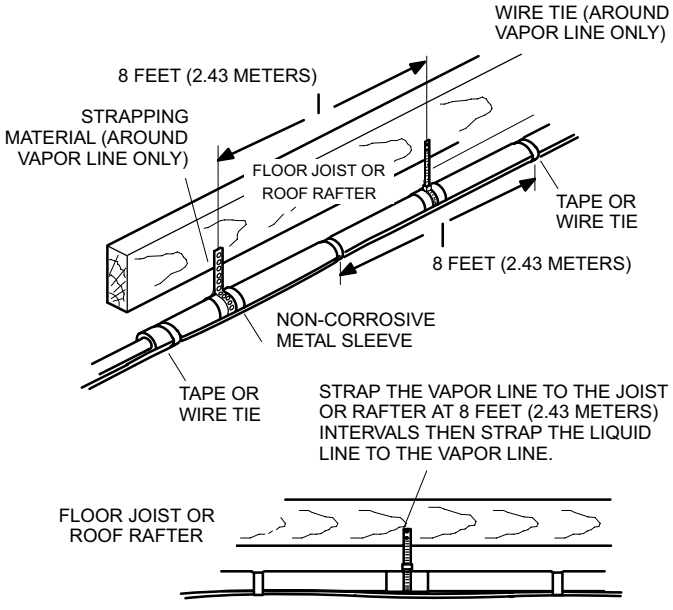
Line Set Isolation — The following illustrations are examples of proper refrigerant line set isolation:

REFRIGERANT LINE SET — TRANSITION FROM VERTICAL TO HORIZONTAL



REFRIGERANT LINE SET — INSTALLING HORIZONTAL RUNS

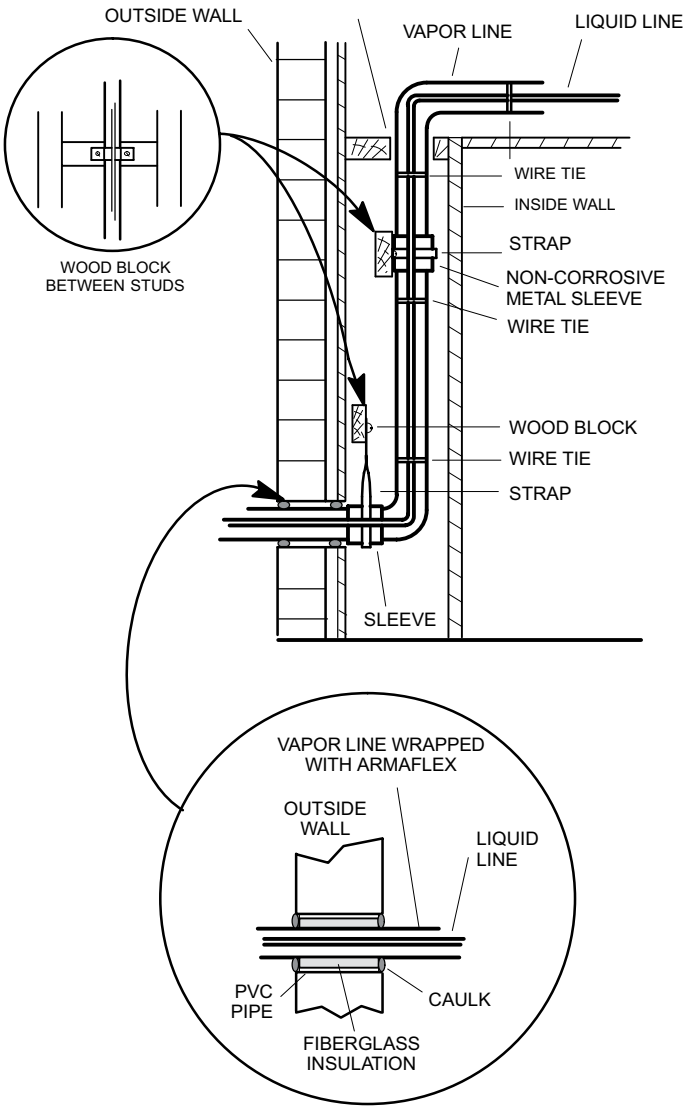
To hang line set from joist or rafter, use either metal strapping material or anchored heavy nylon wire ties.



REFRIGERANT LINE SET — INSTALLING VERTICAL RUNS (NEW CONSTRUCTION SHOWN)

NOTE — Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

IMPORTANT — Refrigerant lines must not contact wall



***NOTE** — Similar installation practices should be used if line set is to be installed on exterior of outside wall.*

It is recommended that vertical suction risers not be up-sized. Proper oil return to the compressor should be maintained with suction gas velocity.

Filter Drier

The filter drier is very important for proper system operation and reliability. If the drier is shipped loose, it must be installed by the installer in the field. Unit warranty will be void, if the drier is not installed.

Installation of Line Sets

DO NOT fasten liquid or suction lines in direct contact with the floor or ceiling joist. Use an insulated or suspension type of hanger. Keep both lines separate, and always insulate the suction line. Liquid line runs (30 feet or more) in an attic will require insulation. Route refrigeration line sets to minimize length.

DO NOT let refrigerant lines come in direct contact with foundation. When running refrigerant lines through the foundation or wall, openings should allow for a sound and vibration absorbing material to be placed or installed between tubing and foundation. Any gap between foundation or wall and refrigerant lines should be filled with a vibration damping material.

⚠ CAUTION

If ANY refrigerant tubing is required to be buried by state or local codes, provide a 6 inch vertical rise at service valve.

Installation into an Existing R-22 System

If the unit will be installed in an existing system that uses an indoor unit or line sets charged with R-22 refrigerant, installer must perform the following procedures to convert the system to an R-410A system.

Remove Existing Expansion Valve

1. On fully cased coils, remove the coil access and plumbing panels.
2. Remove any shipping clamps from the liquid line and distributor assembly.
3. Disconnect the equalizer line from the check expansion valve equalizer line fitting on the vapor line.
4. Remove the vapor line sensing bulb.
5. Disconnect the liquid line from the check expansion valve at the liquid line assembly.
6. Disconnect the check expansion valve from the liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.
7. Remove and discard check expansion valve and the two Teflon® rings (see Figure 6).
8. Use a field-provided fitting to temporarily reconnect the liquid line to the indoor unit's liquid line orifice housing.

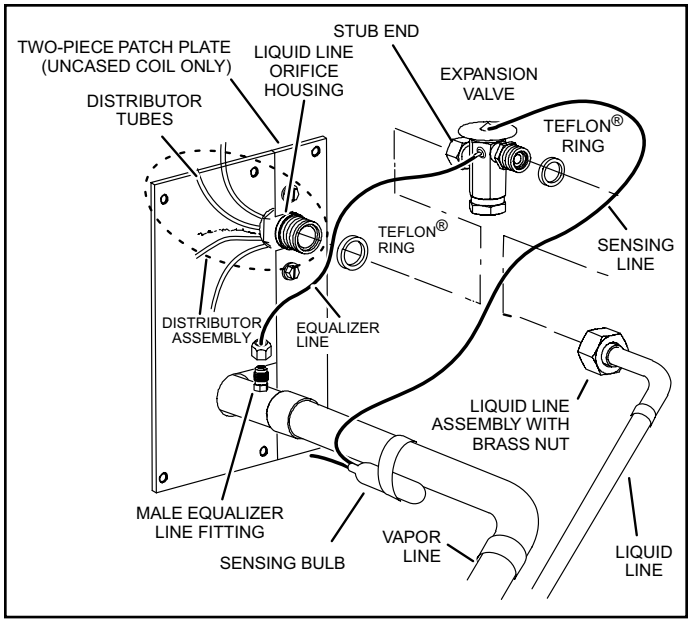


Figure 6. Remove Existing Expansion Valve (uncased coil shown)

Flushing Line Sets

If the unit will be installed in an existing system that uses an indoor unit or line sets charged with R-22 refrigerant, installer must perform the following flushing procedure.

NOTE: *Existing system components (including line set and indoor coil) must be an AHRI match with the unit in order to fulfill unit warranty requirements.*

⚠ WARNING

Refrigerant must be reclaimed in accordance with national and local codes.

⚠ CAUTION

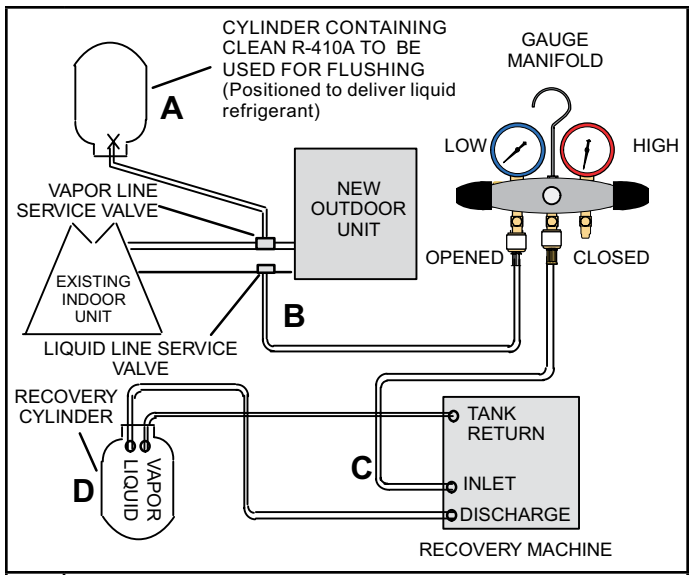
Do **NOT** attempt to flush and re-use existing line sets or indoor coil when the system contains contaminants (i.e., compressor burn out).

NOTE

"Clean refrigerant" is any refrigerant in a system that has not had compressor burnout. If the system has experienced burnout, it is recommended that the existing line set and indoor coil be replaced.

NOTE

In lieu of R-410A, an industry-standard flushing agent may also be used.



A	Cylinder with clean R-410A (positioned to deliver liquid refrigerant) to the vapor service valve.
B	Refrigerant gauge set (low side) to the liquid line valve.
C	Refrigerant gauge set center port to inlet on the recovery machine with an empty recovery tank connected to the gauge set.
D	Connect recovery tank to recovery machine per machine instructions.

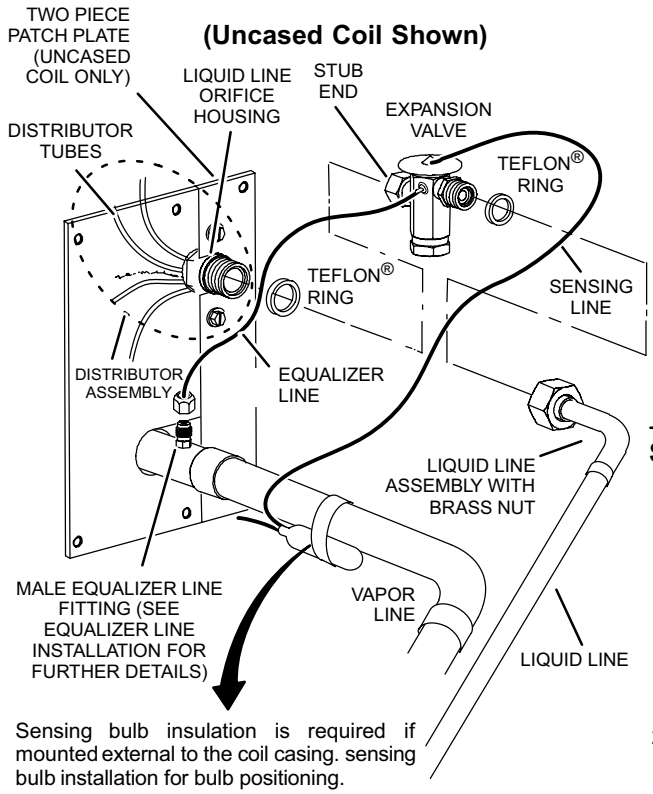
Figure 7.

1. Connect gauges and equipment as shown in Figure 7.
2. Set the recovery machine for liquid recovery and start the recovery machine. Open the gauge set valves to allow the recovery machine to pull a vacuum on the existing system line set and indoor unit coil.
3. Position the cylinder of clean R-410A for delivery of liquid refrigerant and open its valve to allow liquid refrigerant to flow into the system through the vapor line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor unit coil before it enters the recovery machine.
4. After all of the liquid refrigerant has been recovered, switch the recovery machine to vapor recovery so that all of the R-410A vapor is recovered. Allow the recovery machine to pull the system down to 0.
5. Close the valve on the inverted R-410A drum and the gauge set valves. Pump the remaining refrigerant out of the recovery machine and turn the machine off.

Refrigerant Piping - Install Indoor Expansion Valve

This outdoor unit is designed for use in systems that include an expansion valve metering device (purchased separately) at the indoor coil. See the Product Specifications for approved expansion valve kit match-ups and application information. The check expansion valve unit can be installed internal or external to the indoor coil. In applications where an uncased coil is being installed in a field-provided plenum, install the check/expansion valve in a manner that will provide access for future field service of the expansion valve. Refer to below illustration for reference during installation of expansion valve unit.

INDOOR EXPANSION VALVE INSTALLATION

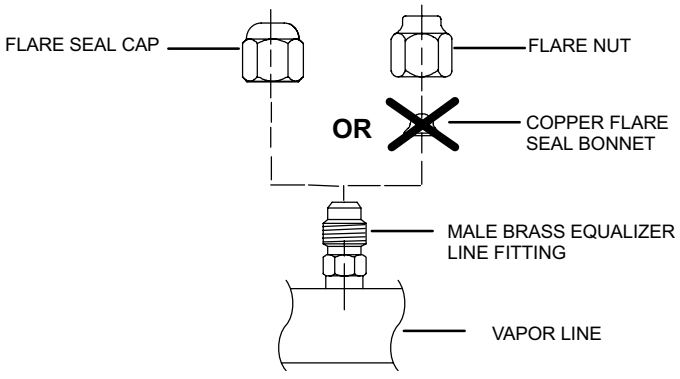


Sensing bulb insulation is required if mounted external to the coil casing. sensing bulb installation for bulb positioning.

EQUALIZER LINE INSTALLATION

1 - Remove and discard either the flare seal cap or flare nut with copper flare seal bonnet from the equalizer line port on the vapor line as illustrated in the figure below.

2 - Remove the field-provided fitting that temporarily reconnected the liquid line to the indoor unit's distributor assembly.

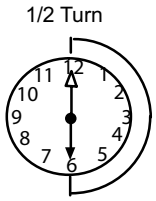


3 - Install one of the provided Teflon® rings around the stubbed end of the check expansion valve and lightly lubricate the connector threads and expose surface of the Teflon® ring with refrigerant oil.

4 - Attach the stubbed end of the check expansion valve to the liquid line orifice housing. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above, or tighten to 20 ft-lb.

5 - Place the remaining Teflon® washer around the other end of the check expansion valve. Lightly lubricate connector threads and expose surface of the Teflon® ring with refrigerant oil.

6 - Attach the liquid line assembly to the check expansion valve. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above or tighten to 20 ft-lb.

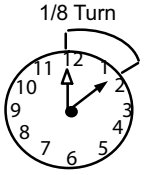


SENSING BULB INSTALLATION

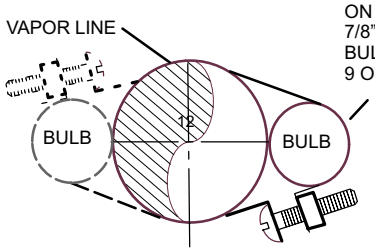
1 - Attach the vapor line sensing bulb in the proper orientation as illustrated to the right using the clamp and screws provided.

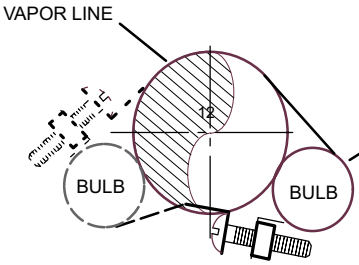
NOTE *- Though it is preferred to have the sensing bulb installed on a horizontal run of the vapor line, installation on a vertical run of piping is acceptable if necessary.*

NOTE *- Confirm proper thermal contact between vapor line and check/expansion bulb before insulating the sensing bulb once installed.*



2 - Connect the equalizer line from the check expansion valve to the equalizer vapor port on the vapor line. Finger tighten the flare nut plus 1/8 turn (7 ft-lbs) as illustrated below.

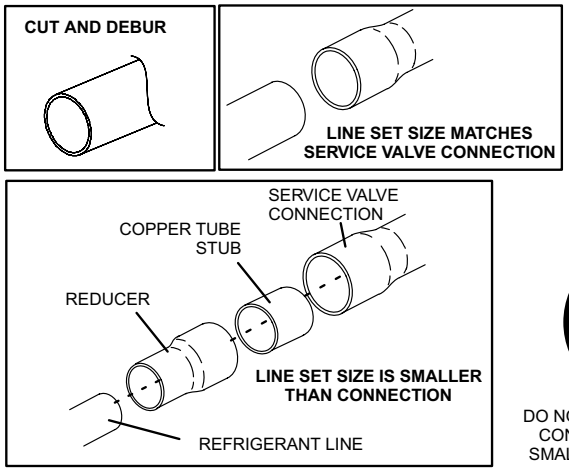




NOTE - *NEVER MOUNT THE SENSING BULB ON BOTTOM OF LINE.*

1 CUT AND DEBUR

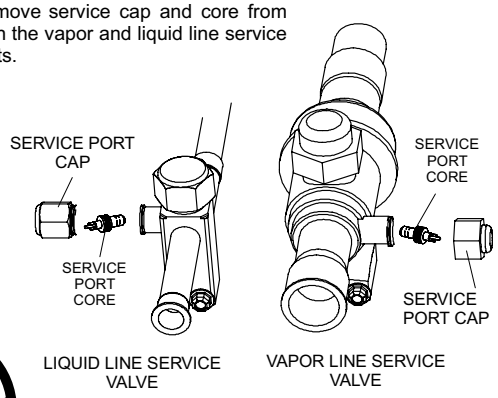
Cut ends of the refrigerant lines square (free from nicks or dents) and debur the ends. The pipe must remain round. Do not crimp end of the line.



DO NOT CRIMP SERVICE VALVE CONNECTOR WHEN PIPE IS SMALLER THAN CONNECTION

2 CAP AND CORE REMOVAL

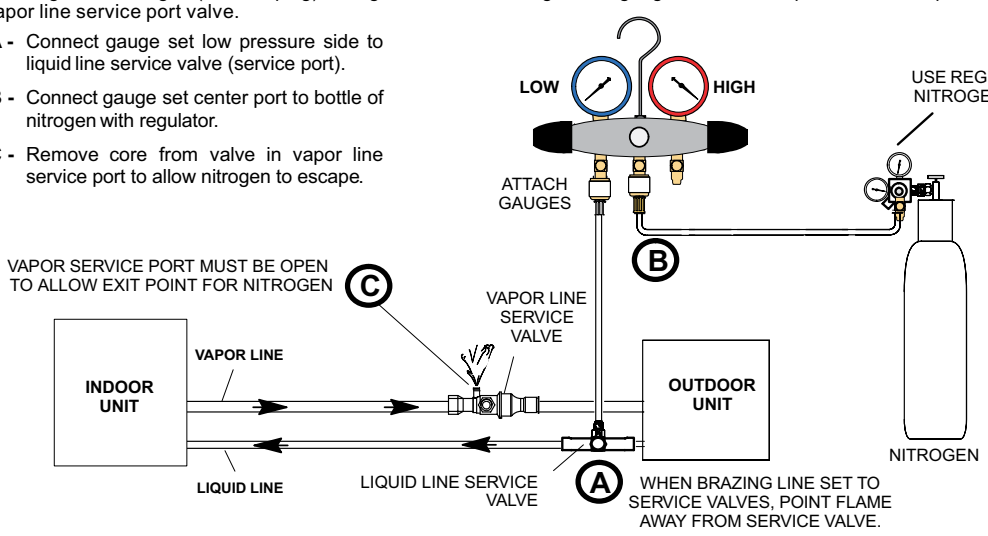
Remove service cap and core from both the vapor and liquid line service ports.



3 ATTACH THE MANIFOLD GAUGE SET FOR BRAZING LIQUID AND VAPOR LINE SERVICE VALVES

Flow regulated nitrogen (at 1 to 2 psig) through the low-side refrigeration gauge set into the liquid line service port valve, and out of the vapor line service port valve.

- **A -** Connect gauge set low pressure side to liquid line service valve (service port).
- **B -** Connect gauge set center port to bottle of nitrogen with regulator.
- **C -** Remove core from valve in vapor line service port to allow nitrogen to escape.



NOTE

Use a manifold gauge set designed for use on R-410A refrigerant systems.

⚠ WARNING

Before brazing, ensure the system is fully recovered of all refrigerant. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

⚠ WARNING

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

4 WRAP SERVICE VALVES

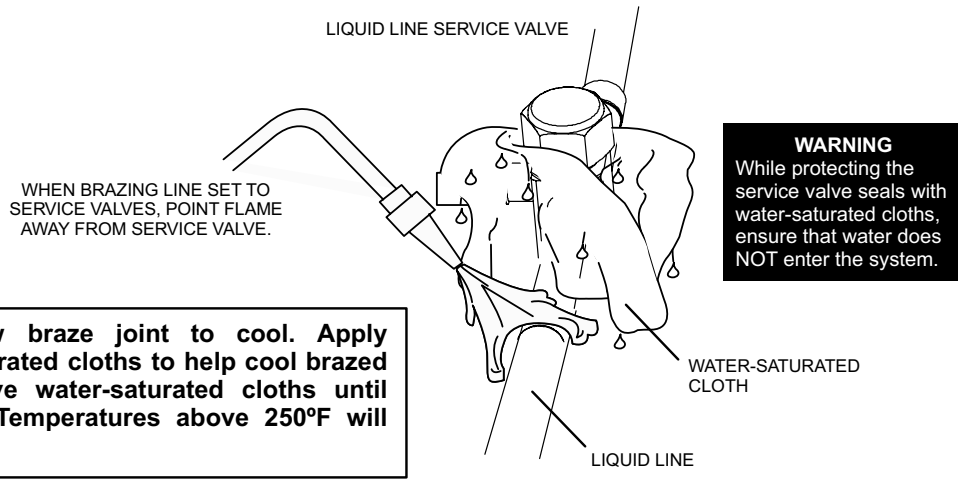
To help protect service valve seals during brazing, wrap water-saturated cloths around service valve bodies and copper tube stubs. Use additional water-saturated cloths underneath the valve body to protect the base paint.

5 FLOW NITROGEN

Flow regulated nitrogen (at 1 to 2 psig) through the refrigeration gauge set into the valve stem port connection on the liquid service valve and out of the vapor valve stem port. See steps **3A, 3B** and **3C** on manifold gauge set connections.

6 BRAZE LINE SET

Wrap both service valves with water-saturated cloths as illustrated here and as mentioned in step 4, before brazing to line set. Cloths must remain water-saturated throughout the brazing and cool-down process.



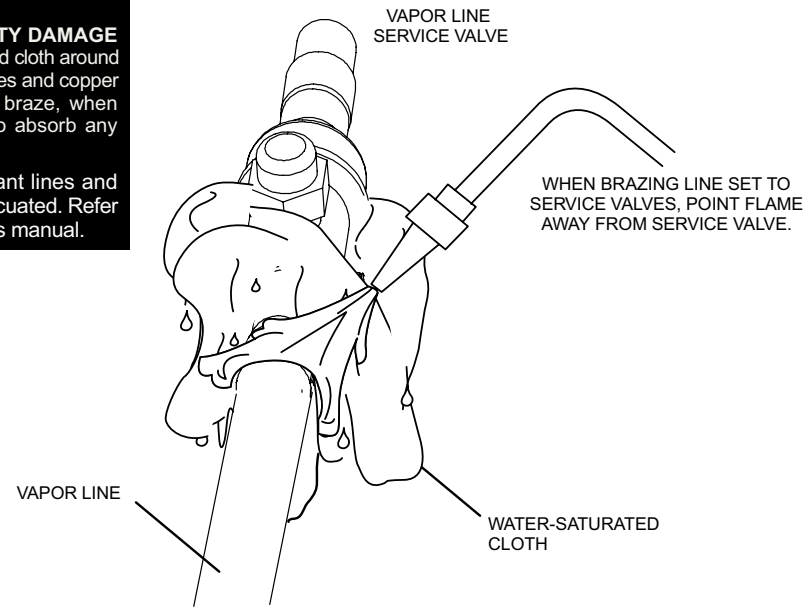
WARNING
While protecting the service valve seals with water-saturated cloths, ensure that water does NOT enter the system.

IMPORTANT — Allow braze joint to cool. Apply additional water-saturated cloths to help cool brazed joint. Do not remove water-saturated cloths until piping has cooled. Temperatures above 250ºF will damage valve seals.

WARNING

FIRE, PERSONAL INJURY, OR PROPERTY DAMAGE may result if you do not wrap a water-saturated cloth around both liquid and suction line service valve bodies and copper tube stub while brazing the line set! The braze, when complete, must be quenched with water to absorb any residual heat.

Do not open service valves until refrigerant lines and indoor coil have been leak-tested and evacuated. Refer to Leak Test and Evacuation section of this manual.

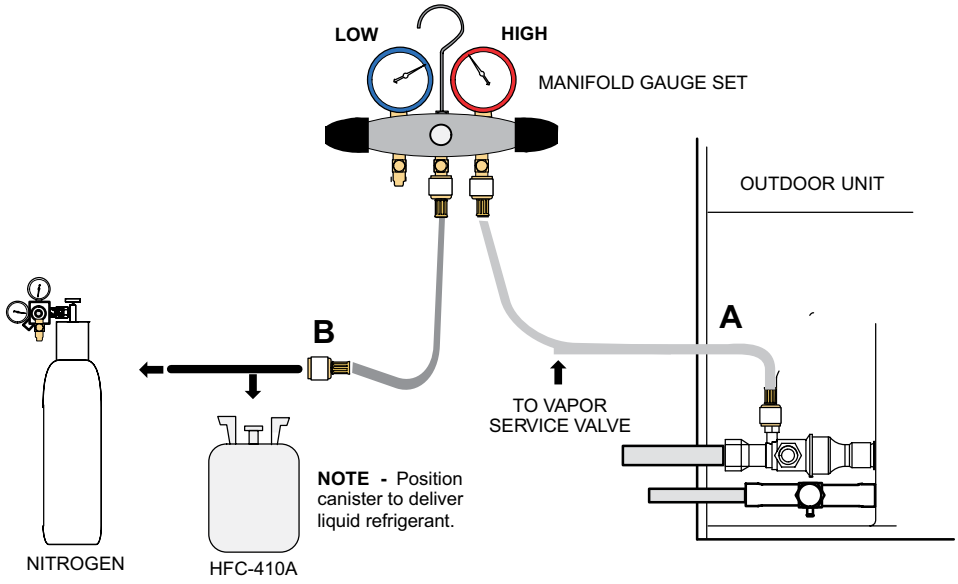


7 PREPARATION FOR NEXT STEP

After all connections have been brazed, disconnect manifold gauge set from service ports. Apply additional water-saturated cloths to both services valves to cool piping. Once piping is cool, remove all water-saturated cloths.

Leak Test and Evacuation

LEAK TEST



1 CONNECT GAUGE SET

A - Connect the high pressure hose of an HFC-410A manifold gauge set to the vapor valve service port.
NOTE *- Normally, the high pressure hose is connected to the liquid line port. However, connecting it to the vapor port better protects the manifold gauge set from high pressure damage.*

B - With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set.
NOTE *- Later in the procedure, the HFC-410A container will be replaced by the nitrogen container.*

2 TEST FOR LEAKS

After the line set has been connected to the indoor and outdoor units, check the line set connections and indoor unit for leaks. Use the following procedure to test for leaks:

A - With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set. Open the valve on the HFC-410A cylinder (vapor only).

B - Open the high pressure side of the manifold to allow HFC-410A into the line set and indoor unit. Weigh in a trace amount of HFC-410A. *[A trace amount is a maximum of two ounces (57 g) refrigerant or three pounds (31 kPa) pressure.]* Close the valve on the HFC-410A cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the HFC-410A cylinder.

C - Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set.

D - Adjust nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set in order to pressurize the line set and the indoor unit.

E - After a few minutes, open one of the service valve ports and verify that the refrigerant added to the system earlier is measurable with a leak detector.

F - After leak testing, disconnect gauges from service ports.
NOTE *- Service valve cores remain removed for the following evacuation procedure.*

3 CONNECT GAUGE SET

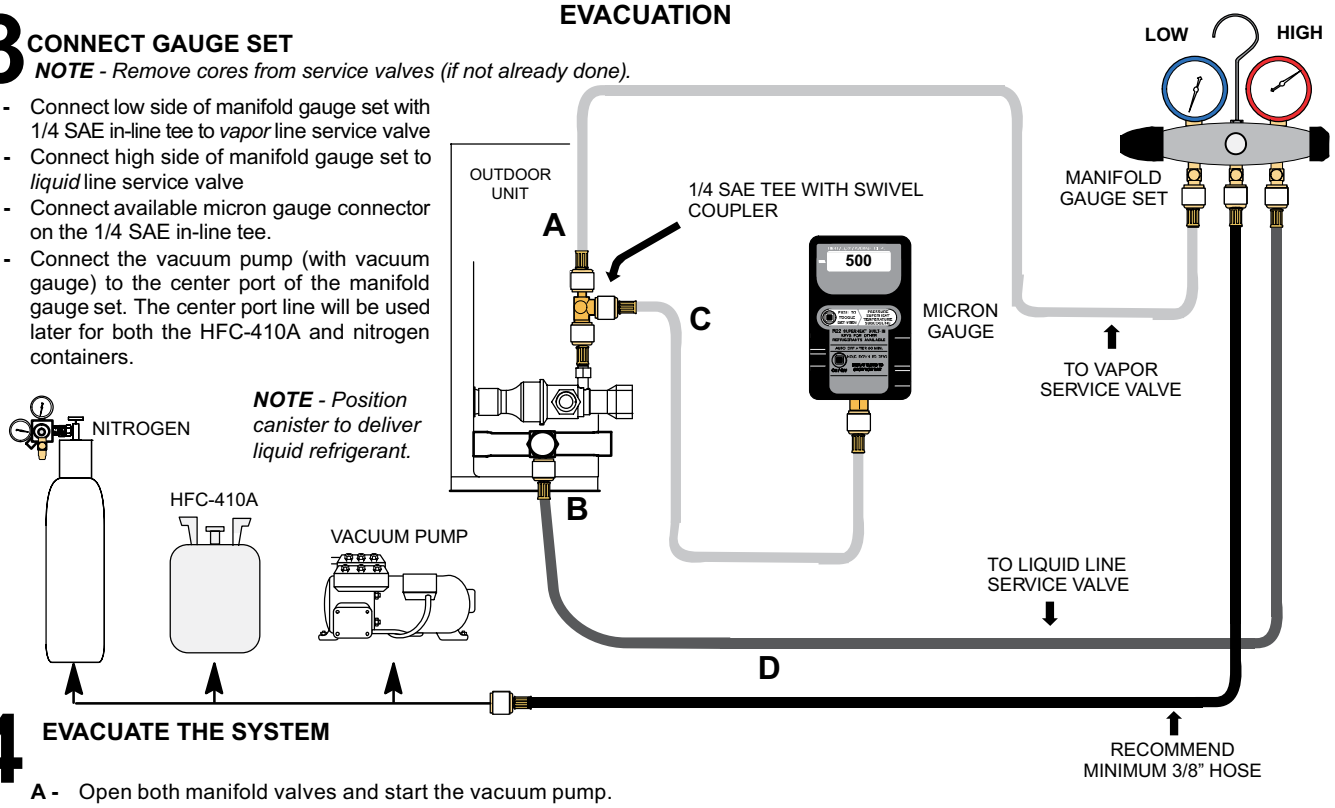
***NOTE** - Remove cores from service valves (if not already done).*

A - Connect low side of manifold gauge set with 1/4 SAE in-line tee to *vapor* line service valve

B - Connect high side of manifold gauge set to *liquid* line service valve

C - Connect available micron gauge connector on the 1/4 SAE in-line tee.

D - Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set. The center port line will be used later for both the HFC-410A and nitrogen containers.



4 EVACUATE THE SYSTEM

A - Open both manifold valves and start the vacuum pump.

B - Evacuate the line set and indoor unit until a slight vacuum is indicated on the micron gauge (approximately 23,000 microns or 29.01 inches of mercury).

***NOTE** - During the early stages of evacuation, it is desirable to close the manifold gauge valve at least once. A rapid rise in pressure indicates a relatively large leak. If this occurs, **repeat the leak testing procedure**.*

***NOTE** - The term **absolute pressure** means the total actual pressure above absolute zero within a given volume or system. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.*

C - When the absolute pressure reaches 23,000 microns (29.01 inches of mercury), perform the following:

- Close manifold gauge valves.
- Close valve on vacuum pump.
- Turn off vacuum pump.
- Disconnect manifold gauge center port hose from vacuum pump.
- Attach manifold center port hose to a nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) and purge the hose.
- Open manifold gauge valves to break the vacuum in the line set and indoor unit.
- Close manifold gauge valves.

WARNING !

Possible equipment damage.

Avoid deep vacuum operation. Do not use compressors to evacuate a system. Extremely low vacuum can cause internal arcing and compressor failure. Damage caused by deep vacuum operation will void warranty.

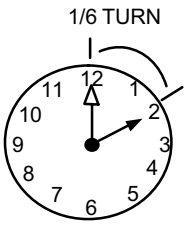
D - Shut off the nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the nitrogen from the line set and indoor unit.

E - Reconnect the manifold gauge to the vacuum pump, turn the pump on, and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above 500 microns (29.9 inches of mercury) within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.

F - When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to a cylinder of HFC-410A positioned to deliver liquid refrigerant. Open the manifold gauge valve 1 to 2 psig in order to release the vacuum in the line set and indoor unit.

G - Perform the following:

- Close manifold gauge valves.
- Shut off HFC-410A cylinder.
- Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.
- Replace stem caps and finger tighten them, then tighten an additional one-sixth (1/6) of a turn as illustrated.



H - Open suction service valve first before liquid valve to release the unit charge into the system. Replace valve caps and tighten (8 ft. lb.). Caps are the primary seal.

Electrical Wiring

All field wiring must be done in accordance with the National Electrical Code (NEC) recommendations, Canadian Electrical Code (CEC) and CSA Standards, or local codes, where applicable.

⚠ WARNING

Electrical Shock Hazard!

Turn OFF electric power before connecting unit, performing any maintenance or removing panels or doors. More than one disconnect may be required to turn off all power.

FAILURE TO DO SO COULD RESULT IN BODILY INJURY OR DEATH.

⚠ WARNING

Unit must be grounded in accordance with national and local codes. Failure to ground unit properly can result in personal injury or death.

⚠ WARNING

Line voltage is present at all components when unit is not in operation on units with single pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies. Failure to disconnect all power supplies could result in personal injury or death.

Refer to the furnace or blower coil Installation Instructions for additional wiring application diagrams and refer to unit rating plate for minimum circuit ampacity and maximum overcurrent protection size.

1. Install line voltage power supply to unit from a properly sized disconnect switch. Any excess high voltage field wiring should be trimmed or secured away from the low voltage field wiring.
2. High voltage power connections to 3-phase models is made to “Pig Tail” leads with field supplied splice connectors.
3. Ground unit at unit disconnect switch or to an earth ground. To facilitate conduit, a hole is in the bottom of the control box. Connect conduit to the control box using a proper conduit fitting. Units are approved for use only with copper conductors. 24V Class II circuit connections are made in the low voltage junction box. A complete unit wiring diagram is located inside the unit control box cover.
4. Install room thermostat according to thermostat installation instruction and on an inside wall that is not subject to drafts, direct sunshine, or other heat sources.
5. Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit (see Figure 8).
6. Do not bundle any excess 24V control wire inside control box. Run control wire through installed wire tie and tighten wire tie to provide low voltage strain relief and to maintain separation of field-installed low and high voltage circuits.

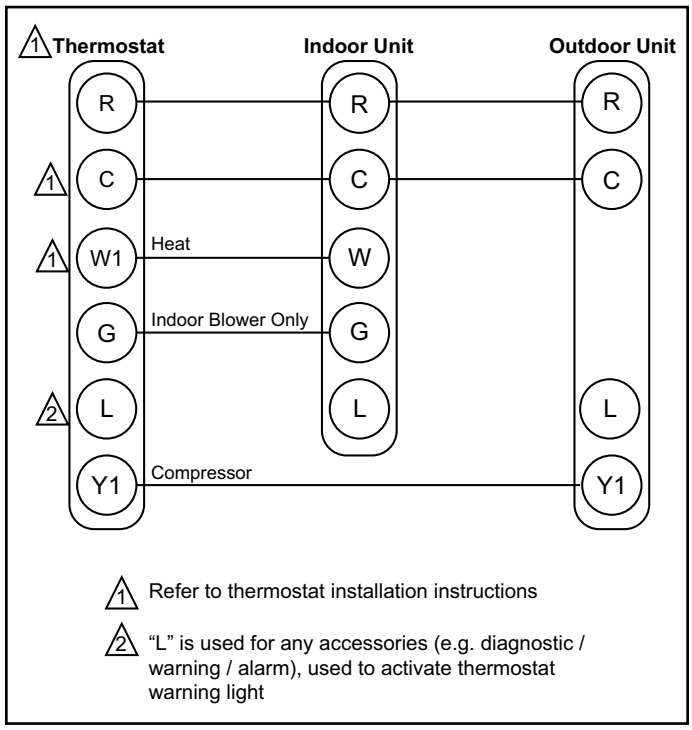


Figure 8. Thermostat Designations - Non-Communicating

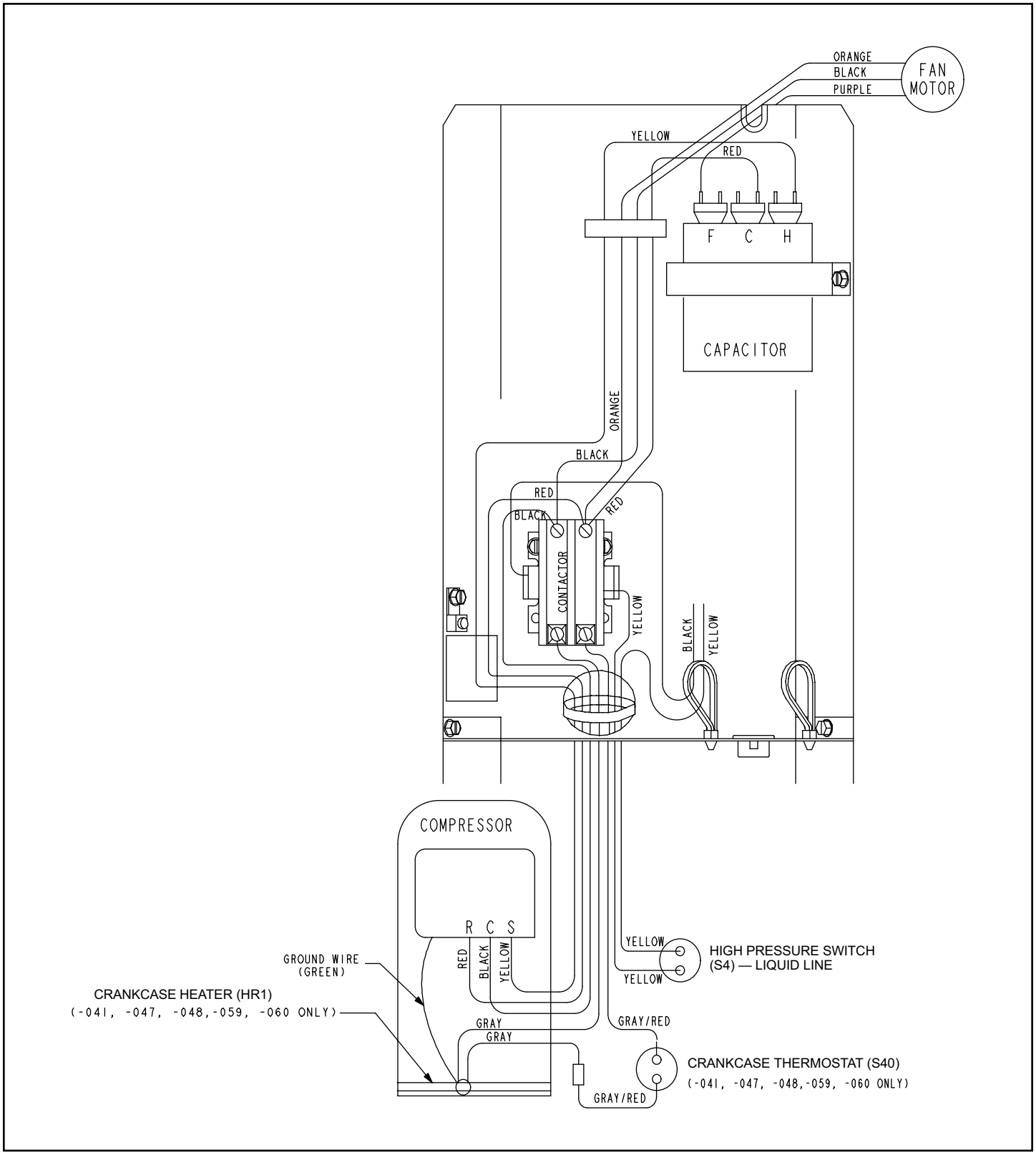


Figure 9. Typical Factory Wiring Diagram (Copeland Compressor)

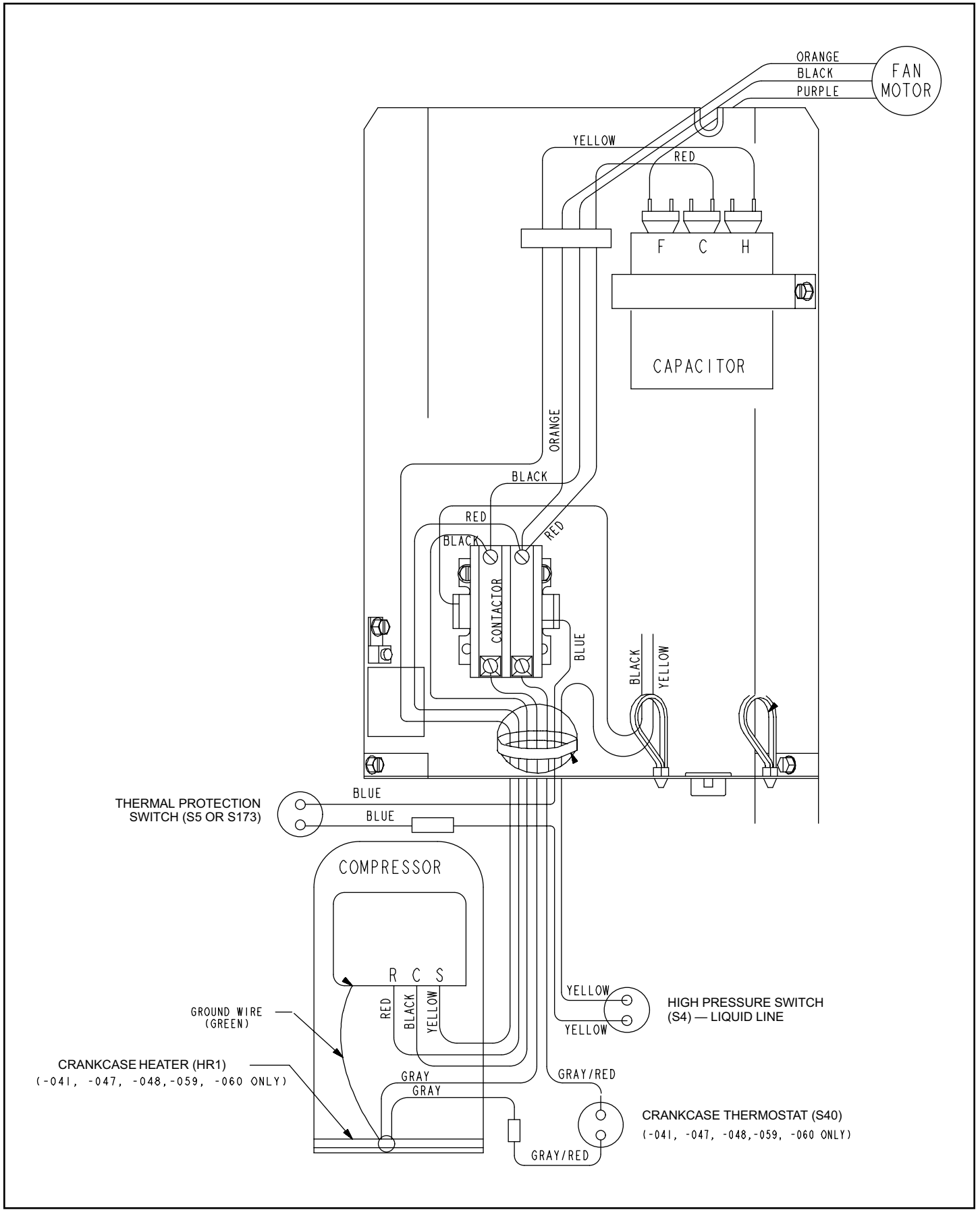


Figure 10. Typical Factory Wiring Diagram (Interlink Compressor)

Sequence of Operation

NOTE: *The thermostat used may be electromechanical or electronic.*

NOTE: *Transformer in indoor unit supplies power (24 VAC) to the thermostat and outdoor unit controls.*

Cooling:

1. Cooling demand initiates at Y1 in the thermostat.
2. 24VAC from indoor unit (Y1) energizes the TOC timed off control (if used) which energizes contactor K1 (provided S4 high pressure switch is closed).
3. K1-1 N.O. closes, energizing compressor (B1) and outdoor fan motor (B4).
4. Compressor (B1) and outdoor fan motor (B4) begin immediate operation..

End of Cooling Demand:

5. Cooling demand is satisfied. Terminal Y1 is de-energized.
6. Compressor contactor K1 is de-energized.
7. K1-1 opens and compressor (B1) and outdoor fan motor (B4) are de-energized and stop immediately.

Start-Up

⚠ CAUTION

If unit is equipped with a crankcase heater, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

1. Rotate fan to check for frozen bearings or binding.
2. Inspect all factory and field-installed wiring for loose connections.
3. After evacuation is complete, open liquid line and suction line service valves to release refrigerant charge (contained in outdoor unit) into system.
4. Replace the stem caps and secure finger tight, then tighten an additional 1/6 of a turn.
5. Check voltage supply at the disconnect switch. The voltage must be within the range listed on the unit nameplate. If not, do not start equipment until the power company has been consulted and the voltage condition corrected.
6. Set thermostat for cooling demand, turn on power to indoor blower, and close the outdoor unit disconnect switch to start the unit.
7. Recheck unit voltage with unit running. Power must be within range shown on unit nameplate.

Refrigerant Charging

⚠ CAUTION

Excessive amounts of liquid refrigerant entering the suction line can damage the compressor. When adding refrigerant, precautions must be taken to control the flow of liquid into the system. This can be done by using a liquid vaporizing adapter or manual control using a sight glass as indicator.

Units are factory charged with the amount of R-410A refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with 15' line set. For varying lengths of line set, refer to Table 5 for refrigerant charge adjustment. A blank space is provided on the unit rating plate to list the actual field charge.

Liquid Line Set Diameter	Oz. Per 5 ft. adjust from 15 ft. line set*
3/8 in.	3 oz. per 5 ft. or 0.6 oz. per 1 ft.
* If line length is greater than 15 ft., add this amount. If line length is less than 15 ft., remove this amount.	

Table 5. Refrigerant Charge Adjustment

⚠ IMPORTANT

Mineral oils are not compatible with R-410A. If oil must be added, it must be a polyolester oil.

NOTE: *Both airflow and refrigerant charge must be monitored for proper system set-up. It may be necessary to alternately check and adjust the airflow and the refrigerant charge.*

If the system is void of refrigerant, or if the outdoor ambient temperature is cool, use the weigh-in method to charge the unit. Do this after any leaks have been repaired.

1. Recover the refrigerant from the unit.
2. Conduct a leak check, then evacuate as previously outlined.
3. Weigh in the charge according to the total amount shown on the unit nameplate.

If weighing facilities are not available or if unit is being charged during warm weather, use one of the following procedures.

- **For systems using a fixed orifice on the indoor evaporator and outdoor temperatures above 65°F** – charge using the superheat method and table provided on the unit access panel.
- **For systems using a TXV on the indoor evaporator and outdoor temperature above 60°F** – charge in

cooling mode using the subcooling method and table provided on the unit access panel.

- **For systems below 60°F** – charge in heating mode using the subcooling method and table provided on the unit access panel. Attach low pressure gauge hose to auxiliary service port to access suction side in heating mode.

NOTE: *All unit table values are based on 70 to 80°F indoor return air temperature for cooling mode, and 65°F to 75°F return air temperature for heat mode.*

Maintenance

Regular Maintenance Requirements

Your system should be regularly inspected by a qualified service technician. These regular visits may include (among other things) checks for:

- Motor operation
- Ductwork air leaks
- Coil & drain pan cleanliness (indoor & outdoor)
- Electrical component operation & wiring check
- Proper refrigerant level & refrigerant leaks
- Proper airflow
- Drainage of condensate
- Air filter(s) performance
- Blower wheel alignment, balance & cleaning
- Primary & secondary drain line cleanliness

Air Filter

Inspect air filters at least monthly and replace or clean as required. Disposable filters should be replaced. Washable filters may be cleaned by soaking in mild detergent and rinsing with cold water. Allow filter to dry before reinstalling. Replace filters with the arrows pointing in the direction of airflow. Dirty filters are the most common cause of poor heating / cooling performance and compressor failures.

Indoor Coil

If the system has been operated with a clean filter in place, it should require minimal cleaning. If cleaning is needed, call your dealer for service.

Condensate Drain

During cooling season check at least monthly for free flow of drainage and clean if necessary.

Condenser Coils

Grass cuttings, leaves, dirt, dust, lint from clothes dryers, and foliage from trees can be drawn into coils by movement of the air. Clogged condenser coils will lower the efficiency of your unit and could cause damage to the condenser.

Periodically, debris should be brushed from the condenser coils. Use a soft bristle brush with light pressure only. DO NOT damage or bend condenser coil fins. Damaged or bent fins may affect unit operation.

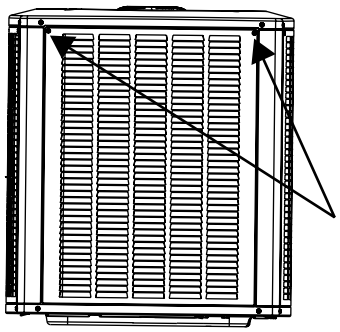


Figure 11. Removing Louvers

⚠ WARNING

SHARP OBJECT HAZARD!

Condenser coils have sharp edges. Wear adequate body protection on body extremities (e.g. gloves).

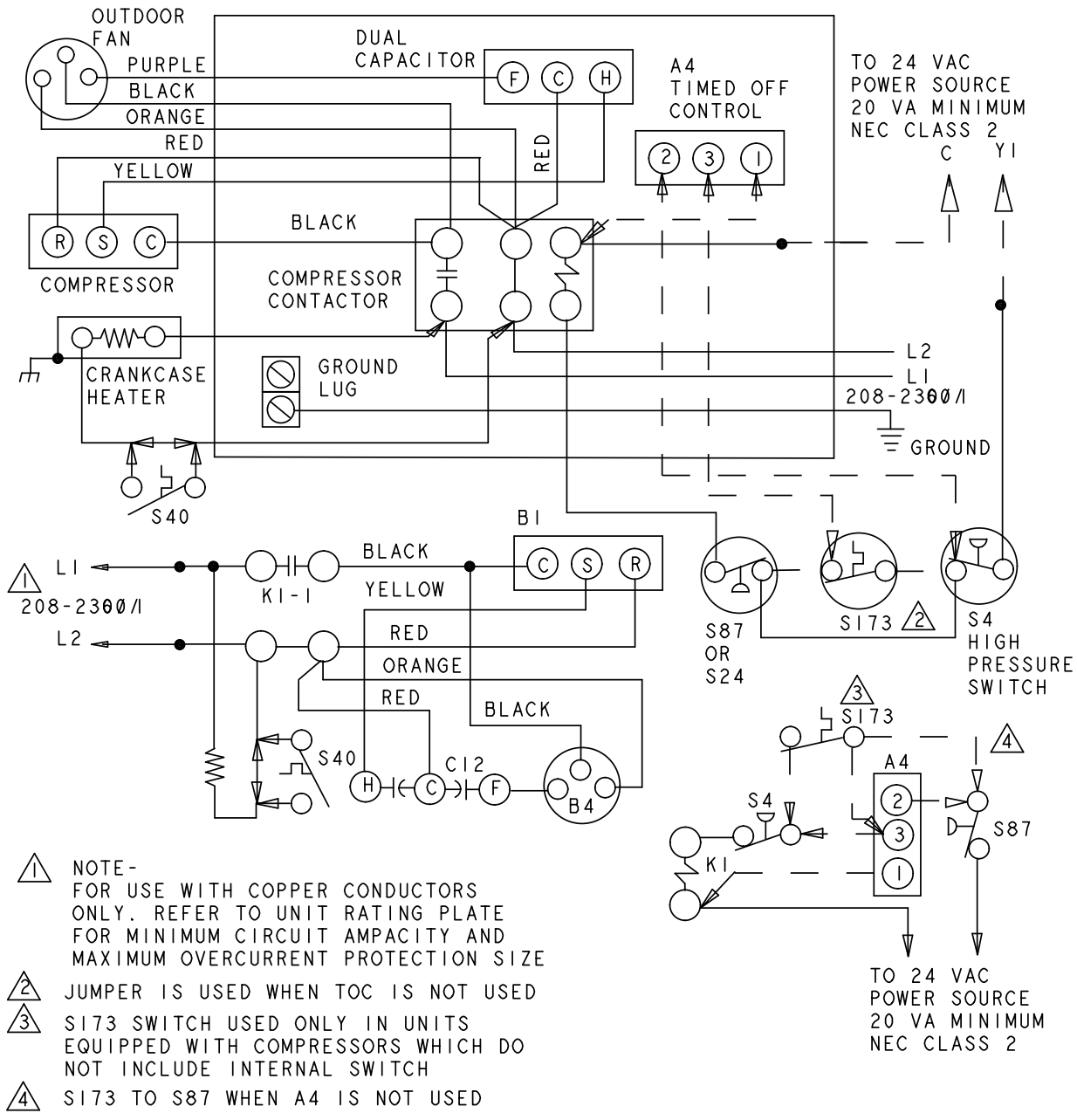
FAILURE TO FOLLOW THIS WARNING COULD RESULT IN BODILY INJURY.

Painted Surfaces

For maximum protection of the unit's finish, a good grade of automobile wax should be applied every year. In geographical areas where water has a high concentration of minerals (calcium, iron, sulfur, etc.), it is recommended that lawn sprinklers not be allowed to spray the unit. In such applications, the sprinklers should be directed away from the unit. Failure to follow this precaution may result in premature deterioration of the unit finish and metal components.

In sea coast areas, special maintenance is required due to the corrosive atmosphere provided by the high salt concentration in ocean mists and the air. Periodic washing of all exposed surfaces and coil will add additional life to your unit. Please consult your installing dealer for proper procedures in your geographic area.

Wiring Diagram



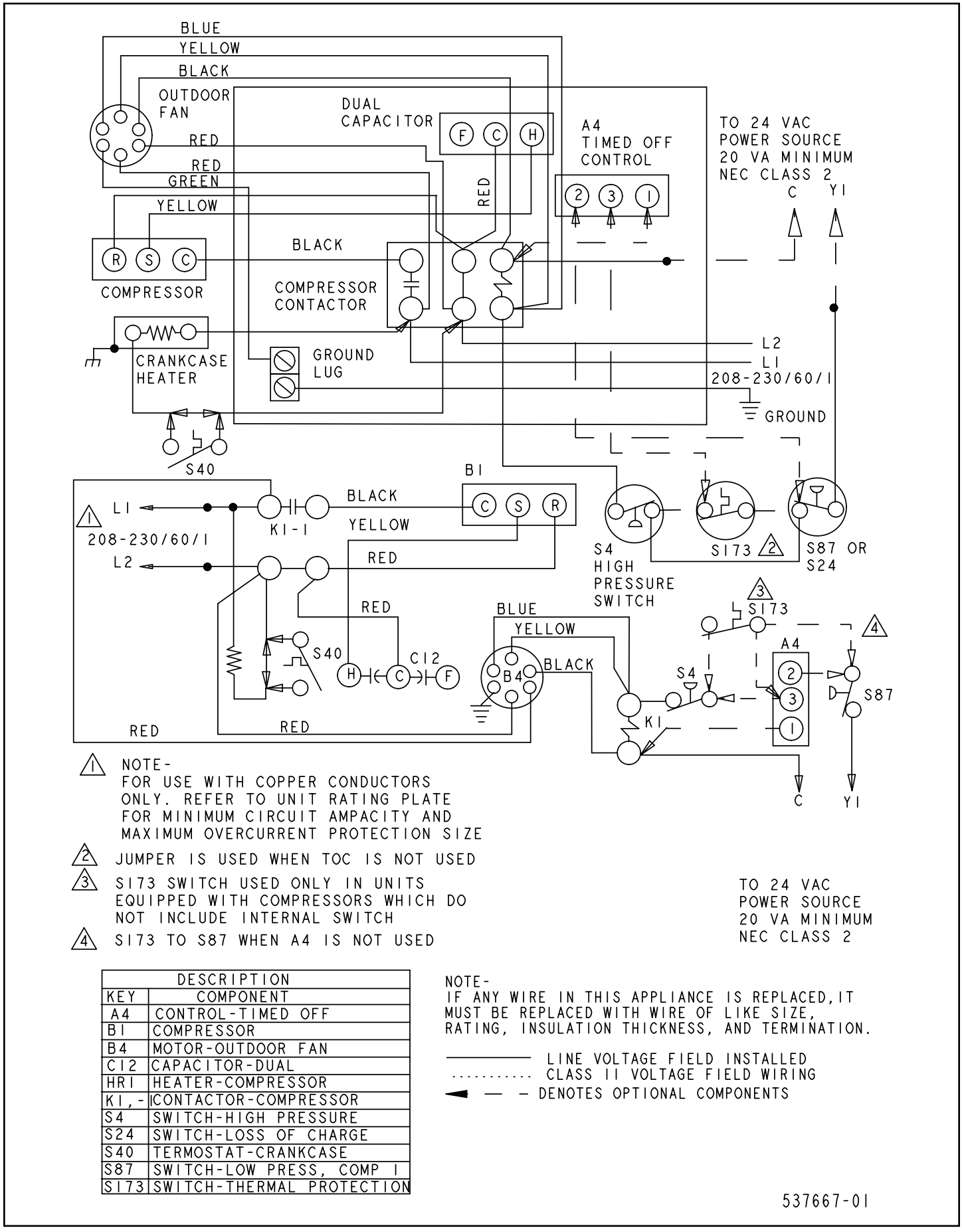
DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C12	CAPACITOR-DUAL
HR1	HEATER-COMPRESSOR
K1,-1	CONTACTOR-COMPRESSOR
S4	SWITCH-HIGH PRESSURE
S24	SWITCH-LOSS OF CHARGE
S40	TERMOSTAT-CRANKCASE
S87	SWITCH-LOW PRESS, COMP 1
S173	SWITCH-THERMAL PROTECTION

NOTE-
IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING, INSULATION THICKNESS, AND TERMINATION.

——— LINE VOLTAGE FIELD INSTALLED
..... CLASS II VOLTAGE FIELD WIRING
◄——— DENOTES OPTIONAL COMPONENTS

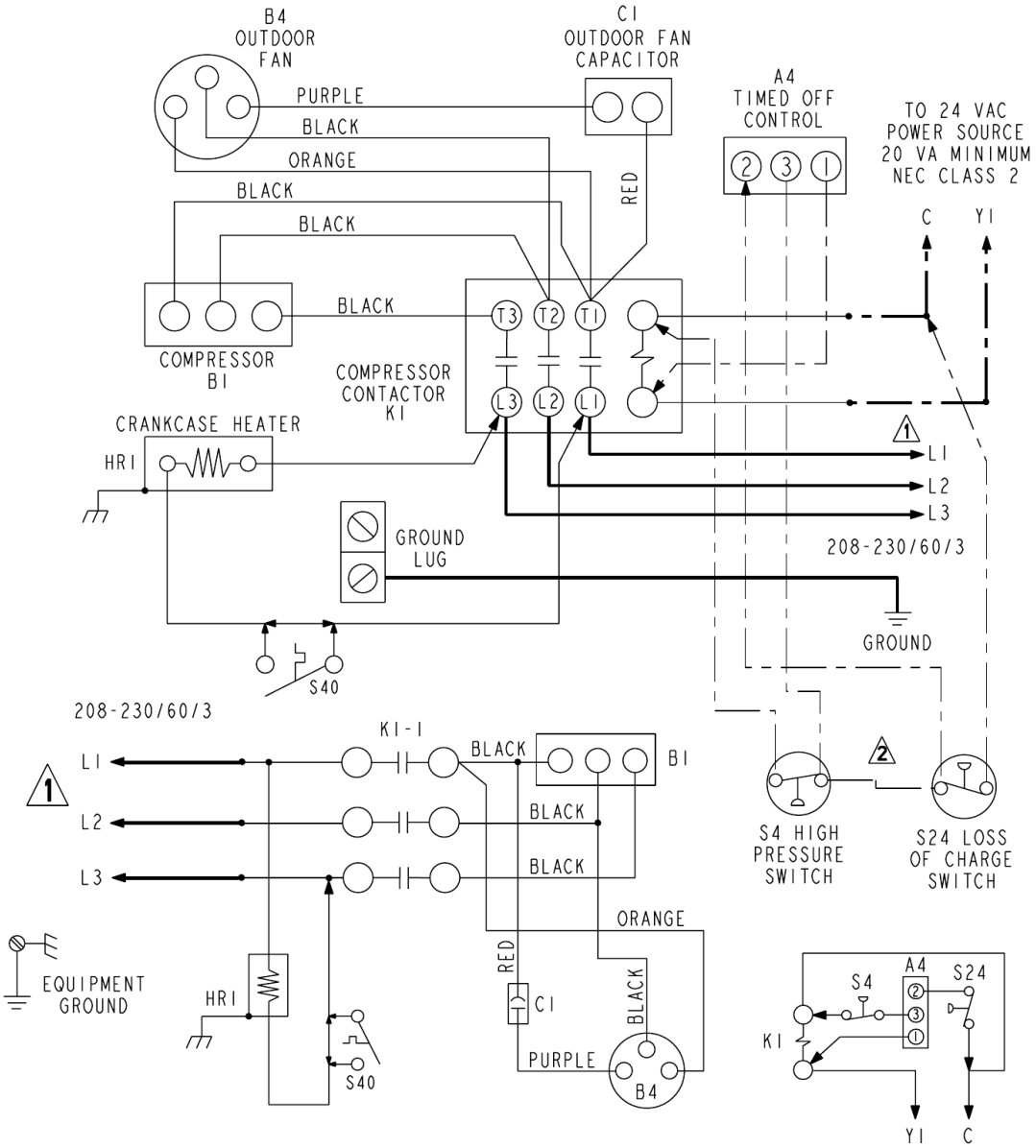
537316-02

Figure 12. A/C Single Phase Wiring Diagram



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF
BI	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
CI2	CAPACITOR-DUAL
HRI	HEATER-COMPRESSOR
KI,-1	CONTACTOR-COMPRESSOR
S4	SWITCH-HIGH PRESSURE
S24	SWITCH-LOSS OF CHARGE
S40	TERMOSTAT-CRANKCASE
S87	SWITCH-LOW PRESS, COMP 1
S173	SWITCH-THERMAL PROTECTION

Figure 13. A/C Single Phase Wiring Diagram (59 model only)



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL - TIMED OFF
B1	COMPRESSOR
B4	MOTOR - OUTDOOR FAN
C1	CAPACITOR - OUTDOOR FAN
HR1	HEATER - COMPRESSOR
K1-1	CONTACTOR - COMPRESSOR
S4	SWITCH - HIGH PRESSURE
S24	SWITCH - LOSS OF CHARGE
S40	THERMOSTAT - CRANKCASE

1 FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

2 JUMPER IS USED WHEN TOC IS NOT USED.

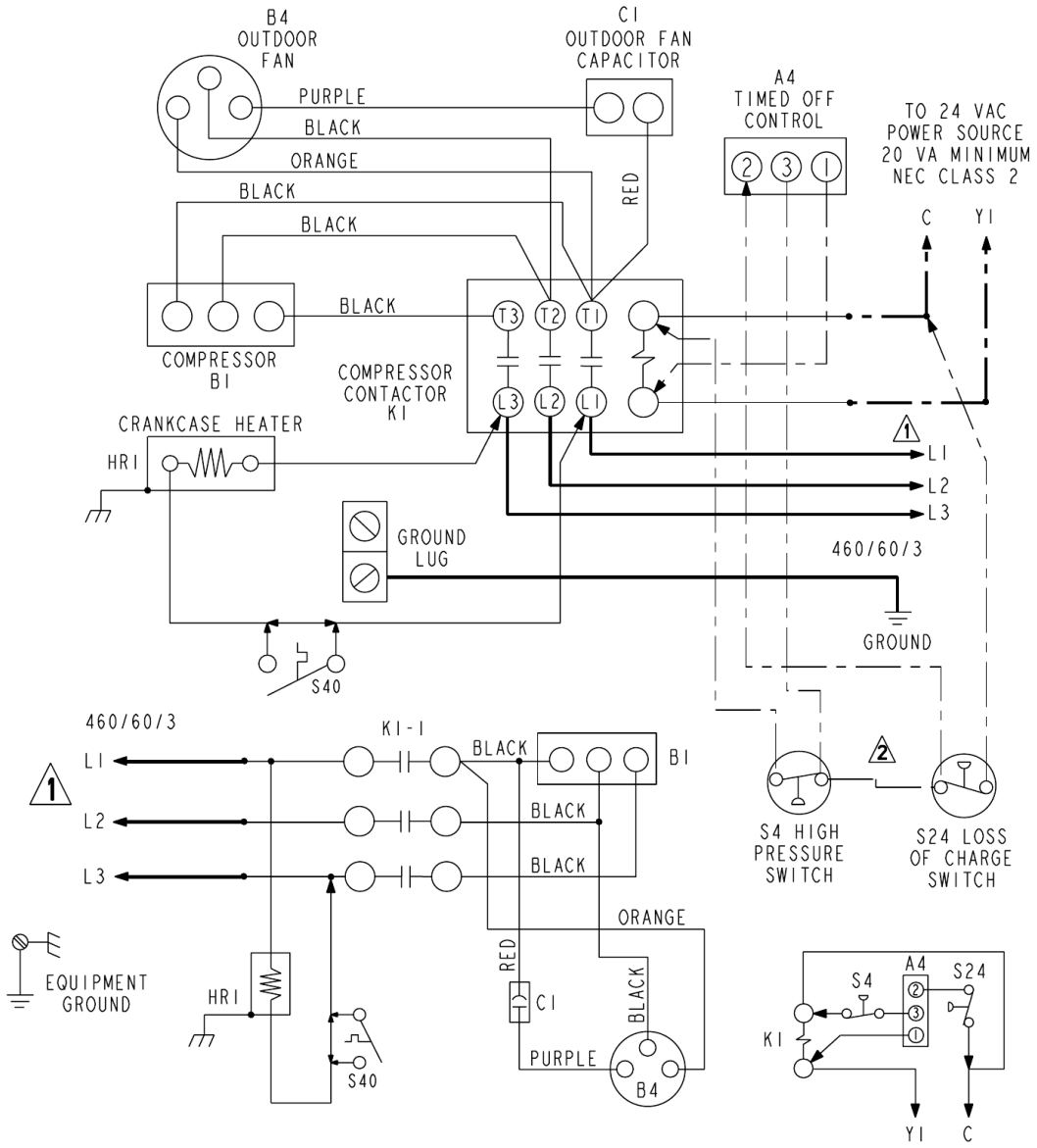
WARNING--
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

DENOTES OPTIONAL COMPONENTS

LINE VOLTAGE FIELD INSTALLED
CLASS II VOLTAGE FIELD INSTALLED
24 VOLT FACTORY INSTALLED

48436-001

Figure 14. 3 Phase (208-230 Volt)



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL - TIMED OFF
B1	COMPRESSOR
B4	MOTOR - OUTDOOR FAN
C1	CAPACITOR - OUTDOOR FAN
HR1	HEATER - COMPRESSOR
K1-1	CONTACTOR - COMPRESSOR
S4	SWITCH - HIGH PRESSURE
S24	SWITCH - LOSS OF CHARGE
S40	THERMOSTAT - CRANKCASE

1 FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMPACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE.

2 JUMPER IS USED WHEN TOC IS NOT USED.

WARNING--
ELECTRIC SHOCK HAZARD, CAN CAUSE INJURY OR DEATH. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

DENOTES OPTIONAL COMPONENTS

LINE VOLTAGE FIELD INSTALLED

CLASS II VOLTAGE FIELD INSTALLED

24 VOLT FACTORY INSTALLED

537217-01

Figure 15. 3 Phase (460 Volt)

Servicing Units Void of Charge

If the outdoor unit is void of refrigerant, clean the system using the procedure described below.

1. Leak check system using procedure outlined on Page 25.
2. Evacuate the system using procedure outlined on Page 25.
3. Use nitrogen to break the vacuum and install a new filter drier in the system.
4. Evacuate the system again using procedure outlined on Page 25.
5. Weigh in refrigerant. Refer to data plate and line set length for proper charge.

System Refrigerant

This section outlines procedures for:

1. Connecting gauge set for testing and charging;
2. Checking and adjusting indoor airflow;
3. Adding or removing refrigerant.

GAUGE SET

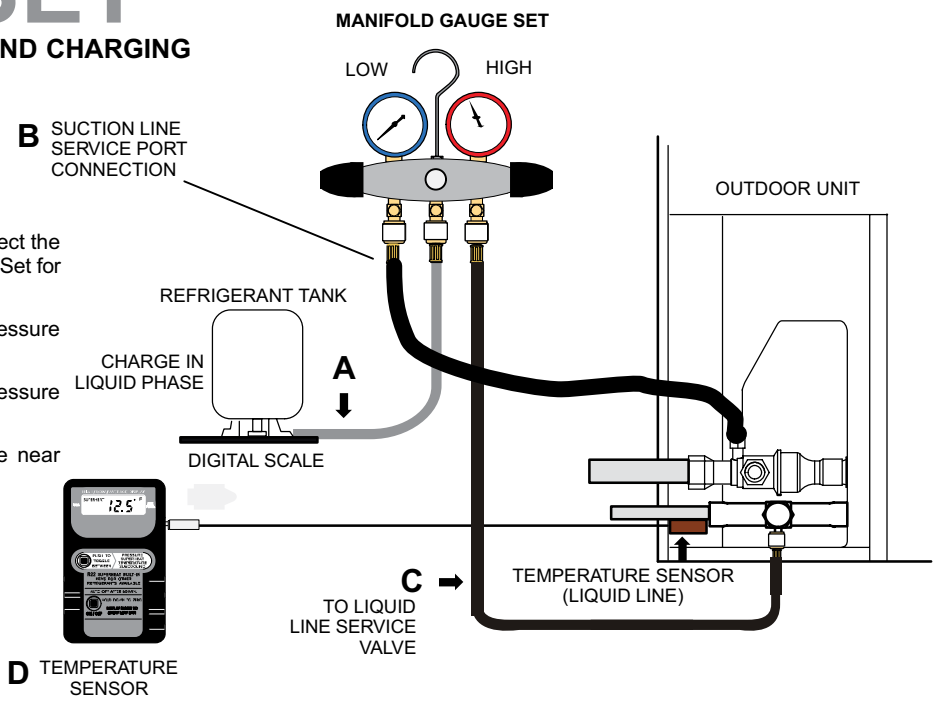
CONNECTIONS FOR TESTING AND CHARGING

A Close manifold gauge set valves and connect the center hose to a cylinder of HFC-410A. Set for liquid phase charging.

B Connect the manifold gauge set's low pressure side to the suction line service port.

C Connect the manifold gauge set's high pressure side to the liquid line service port.

D Position temperature sensor on liquid line near liquid line service port.

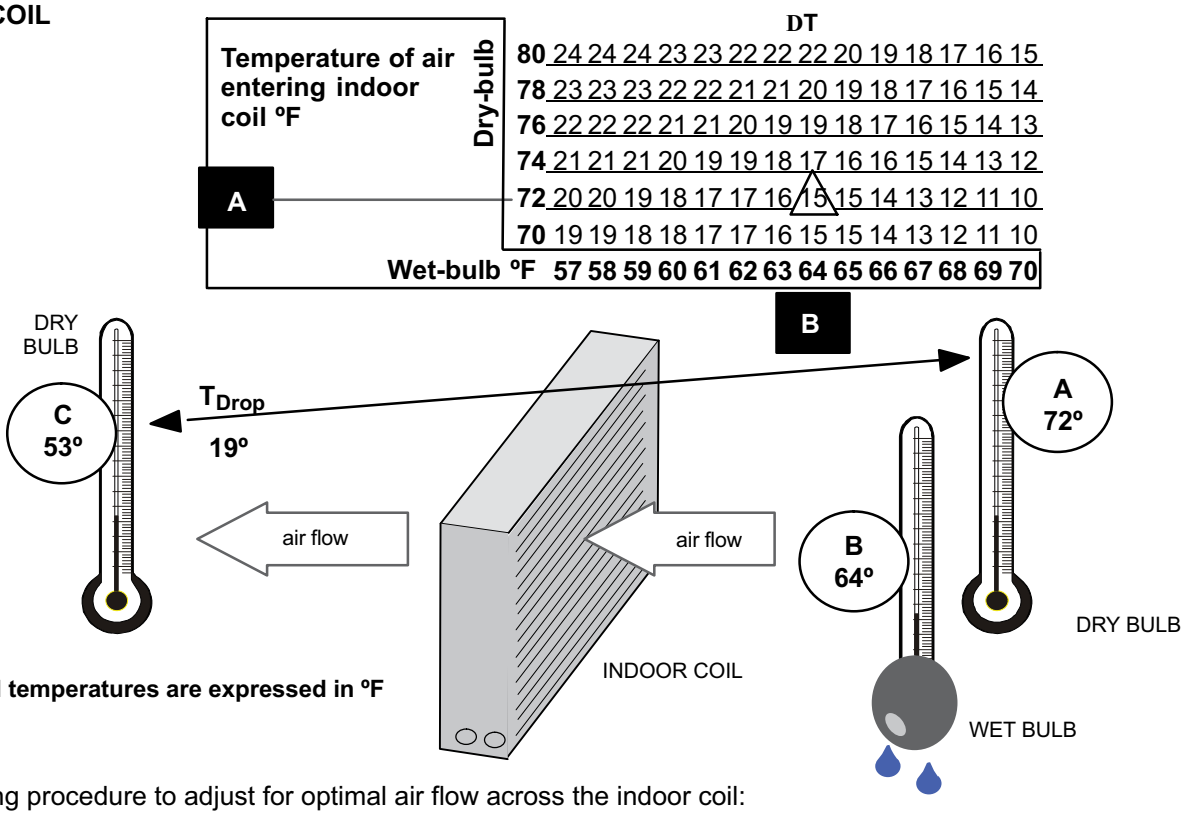


Adding or Removing Refrigerant

This system uses HFC-410A refrigerant which operates at much higher pressures than HCFC-22. The pre-installed liquid line filter drier is approved for use with HFC-410A only. Do not replace it with components designed for use with HCFC-22. This unit is NOT approved for use with coils which use capillary tubes or fixed orifices as a refrigerant metering device. Check airflow using the Delta-T (DT) process shown below..

AIRFLOW

INDOOR COIL



Use the following procedure to adjust for optimal air flow across the indoor coil:

1. **Determine the desired DT** — Measure entering air temperature using dry bulb (**A**) and wet bulb (**B**). **DT** is the intersecting value of **A** and **B** in the table (see triangle).
2. **Find temperature drop across coil** — Measure the coil's dry bulb entering and leaving air temperatures (**A** and **C**). Temperature Drop Formula: (T_{Drop}) = **A** minus **C**.
3. **Determine if fan needs adjustment** — If the difference between the measured T_{Drop} and the desired **DT** (T_{Drop}–**DT**) is within ±3º, no adjustment is needed. See example below:

Assume **DT** = 15 and **A** temp. = 72º, these **C** temperatures would necessitate stated actions:

Cº	T_{Drop}	–	DT	=	ºF	*ACTION*
53º	19	–	15	=	4	*Increase the airflow*
58º	14	–	15	=	-1	*(within ±3º range) no change*
62º	10	–	15	=	-5	*Decrease the airflow*

Changing air flow affects all temperatures; recheck temperatures to confirm that the temperature drop and DT are within ±3º.

4. **Adjust the fan speed** — See indoor unit instructions to increase/decrease fan speed.

°F	°C	Psig	°F	°C	Psig
-40	-40.0	11.6	60	15.6	170.0
-35	-37.2	14.9	65	18.3	185.0
-30	-34.4	18.5	70	21.1	201.0
-25	-31.7	22.5	75	23.9	217.0
-20	-28.9	26.9	80	26.7	235.0
-15	-26.1	31.7	85	29.4	254.0
-10	-23.3	36.8	90	32.2	274.0
-5	-20.6	42.5	95	35.0	295.0
0	-17.8	48.6	100	37.8	317.0
5	-15.0	55.2	105	40.6	340.0
10	-12.2	62.3	110	43.3	365.0
15	-9.4	70.0	115	46.1	391.0
20	-6.7	78.3	120	48.9	418.0
25	-3.9	87.3	125	51.7	446.0
30	-1.1	96.8	130	54.4	476.0
35	1.7	107.0	135	57.2	507.0
40	4.4	118.0	140	60.0	539.0
45	7.2	130.0	145	62.8	573.0
50	10.0	142.0	150	65.6	608.0
55	12.8	155.0			

Table 6. HFC-410A Temperature - Pressure (Psig)

13 SEER AIR CONDITIONING CHARGING PROCEDURE

1. CHARGE THE SYSTEM BY WEIGHT, IF OUTDOOR TEMPERATURE IS BELOW 65°F:

   OUTDOOR UNITS ARE FACTORY CHARGED WITH R410A FOR 15 FT. OF LINE SET. ADD OR REMOVE 0.6 OZ. FOR EVERY FOOT OF LINE SET DIFFERENT THAN 15 FT. FINAL CHARGE ADJUSTMENT MUST BE MADE PER ITEM (2) BELOW, ONCE THE OUTDOOR TEMPERATURE RISE ABOVE 65 °F.

2. IF OUTDOOR TEMPERATURE IS ABOVE 65°F, ADJUST CHARGE AS FOLLOWS:

   A. CHECK FOR PROPER AIR FLOW AND RUN THE SYSTEM FOR 20 MINUTES FOR STABILIZATION
   B. USE SUPERHEAT FOR ORIFICE COILS (SEE TABLE BELOW)
   C. USE SUBCOOLING FOR TXV COILS (SEE TABLE BELOW), PROVIDED THAT SUPERHEAT IS WITHIN 8-16 °F AT OUTDOOR UNIT AND THE REFERENCED PRESSURES BELOW ARE WITHIN ± 3 PSI FOR LOW SIDE AND ± 10 PSI FOR HIGH SIDE
   D. CONTACT TECHNICAL SERVICE, IF MEASURED VALUES ARE OUTSIDE THE RANGE OF THE LISTED DATA

MODELS	18	24	30	36	42	48	60
TABLE 1 - SUBCOOLING METHOD (TXV SYSTEM) ± 1 °F							
OUTDOOR TEMP (°F)	*LIQUID LINE SATURATION TEMPERATURE MINUS LIQUID LINE TEMPERATURE*						
65	5	8	5	3	8	6	4
75	5	8	6	3	9	7	4
85	5	8	6	4	9	7	5
95	6	9	8	4	10	8	5
105	7	9	8	5	11	9	5
115	9	10	9	5	11	9	4
TABLE 2 - APPROACH METHOD (TXV SYSTEM) ± 1 °F - FOR REFERENCE ONLY							
LIQUID LINE TEMPERATURE MINUS OUTDOOR AMBIENT TEMPERATURE							
TEMP (°F)	8	11	10	13	7	7	13
TABLE 3 - OPERATING PRESSURES (FOR REFERENCE)							
OUTDOOR TEMP (°F)	HIGH / LOW PRESSURES (PSI)						
65	238/132	256/134	254/129	263/132	251/128	260/130	258/128
75	278/137	298/138	296/133	309/137	294/132	300/134	300/133
85	318/142	341/141	338/137	354/139	338/135	340/139	342/137
95	358/147	383/145	380/141	400/141	381/139	380/143	384/142
105	411/150	437/149	439/145	458/150	434/142	430/148	435/144
115	464/153	490/152	498/148	515/153	487/145	492/153	485/146

TABLE 4 - SUPERHEAT METHOD (ORIFICE SYSTEM) ± 1 °F									
SUCTION LINE TEMPERATURE MINUS SUCTION LINE SATURATION TEMPERATURE									
OUTDOOR TEMP (°F)	65	70	75	80	85	90	95	100	105
SUPERHEAT (°F)	35	30	25	22	18	12	8	5	5

ALL MEASUREMENTS ARE AT THE SERVICE VALVES AND ARE BASED ON 80db/67wb INDOOR TEMPERATURE.

RFC SIZE	18	24	30	36	42	48	60
	0.053	0.057	0.063	0.072	0.074	0.082	0.090

580452-03

Figure 16. 4SCU13L*-3 through 5

13 SEER R-410A CONDENSOR CHARGING PROCEDURE

1. CHARGE THE SYSTEM BY WEIGHT, IF OUTDOOR TEMPERATURE IS BELOW 65°F:

   OUTDOOR UNITS ARE FACTORY CHARGED WITH R410A FOR 15 FT. OF LINE SET. ADD OR REMOVE 0.6 OZ. FOR EVERY FOOT OF LINE SET DIFFERENT THAN 15 FT. FINAL CHARGE ADJUSTMENT MUST BE MADE PER ITEM (2) BELOW, ONCE THE OUTDOOR TEMPERATURE RISE ABOVE 65 °F.

2. IF OUTDOOR TEMPERATURE IS ABOVE 65°F, ADJUST CHARGE AS FOLLOWS:

   A. CHECK FOR PROPER AIR FLOW AND RUN THE SYSTEM FOR 20 MINUTES FOR STABILIZATION
   B. USE SUPERHEAT FOR ORIFICE COILS (SEE TABLE BELOW)
   C. USE SUBCOOLING FOR TXV COILS (SEE TABLE BELOW), PROVIDED THAT SUPERHEAT IS WITHIN 8-16 °F AT OUTDOOR UNIT AND THE REFERENCED PRESSURES BELOW ARE WITHIN ± 3 PSI FOR LOW SIDE AND ± 10 PSI FOR HIGH SIDE
   D. CONTACT TECHNICAL SERVICE, IF MEASURED VALUES ARE OUTSIDE THE RANGE OF THE LISTED DATA

CHARGING TEMPERATURES AND PRESSURES							
MODELS	**-18**	**-24**	**-30**	**-36**	**-42**	**-48**	**-60**
TABLE 1 - SUBCOOLING VALUES							
OUTSIDE TEMP. °F (°C)	*SATURATION TEMPERATURE MINUS LIQUID LINE TEMPERATURE °F (°C) ± 1°F (0.5°C)*						
65 (18)	12 (6.7)	12 (6.7)	11 (6)	15 (8.3)	14 (7.7)	12 (6.7)	11 (6)
75 (24)	11 (6)	11 (6)	10 (5.5)	13 (7.2)	12 (6.7)	11 (6)	10 (5.5)
85 (29)	10 (5.5)	10 (5.5)	9 (5)	12 (6.7)	11 (6)	10 (5.5)	9 (5)
95 (35)	9 (5)	9 (5)	8 (4.4)	11 (6)	10 (5.5)	9 (5)	7 (4)
105 (41)	7 (4)	7 (4)	5 (2.7)	9 (5)	8 (4.4)	7 (4)	5 (2.7)
115 (45)	6 (3.3)	6 (3.3)	4 (2.2)	7 (4)	7 (4)	6 (3.3)	3 (1.7)
TABLE 2 - APPROACH VALUES - FOR REFERENCE ONLY *LIQUID LINE TEMPERATURE MINUS OUTDOOR AMBIEMT TEMPERATURE °F (°C) ± 1°F (0.5°C)*							
TEMP. °F (°C)	4 (2.2)	8 (4.4)	8 (4.4)	11 (6)	10 (5.5)	8 (4.4)	9 (5)
TABLE 3 - NORMAL OPERATING PRESSURES							
THE VALUES BELOW ARE TYPICAL PRESSURES; INDOOR EVAPORATOR MATCH UP, INDOOR AIR QUALITY, AND EVAPORATOR LOAD WILL CAUSE THE PRESSURES TO VARY.							
***TEMP. °F (°C)**	**LIQUID LINE PRESSURE / VAPOR LINE PRESSURE**						
EXPANSION VALVE (TXV) SYSTEMS							
65 (18)	233/132	244/137	248/127	263/135	250/135	240/130	242/130
75 (24)	265/133	285/139	284/132	302/140	288/138	278/132	286/132
85 (29)	314/136	329/141	330/135	349/142	332/140	323/134	332/134
95 (35)	362/138	379/143	380/137	404/144	381/141	369/136	381/136
105 (41)	415/141	438/145	434/139	462/147	432/143	418/139	433/138
115 (45)	475/143	495/148	497/142	527/150	490/145	477/141	488/141
FIXED ORIFICE (RFC) SYSTEMS							
65 (18)	233/121	246/126	245/123	261/134	250/135	248/127	255/126
75 (24)	270/128	286/132	286/129	301/138	288/138	284/132	294/131
85 (29)	313/134	330/137	331/135	346/142	332/140	325/137	339/136
95 (35)	359/138	378/142	380/140	396/146	381/141	371/141	386/140
105 (41)	409/142	428/145	431/144	448/150	432/143	418/144	435/144
115 (45)	464/147	486/149	487/148	506/153	490/145	472/147	490/148
***TEMPERATURE OF AIR ENTERING OUTSIDE COIL.**							

SUPERHEAT CHARGING METHOD FOR FIXED METERING DEVICES									
OUTDOOR AMBIENT	65	70	75	80	85	90	95	100	105
REQUIRED SUPERHEAT	35	30	25	22	18	12	8	5	5

ALL MEASUREMENTS ARE AT THE SERVICE VALVES AND ARE BASED ON 80db/67wb INDOOR TEMPERATURE.

48385-004

Figure 17. 4SCU13L*-2

13 SEER R-410A CONDENSOR CHARGING PROCEDURE

UNITS ARE FACTORY CHARGED WITH THE AMOUNT OF HFC R-410A REFRIGERANT INDICATED ON THE UNIT NAMEPLATE. THIS CHARGE IS BASED ON A MATCHING INDOOR COIL AND OUTDOOR COIL WITH A 15 FT. (4.6 M) LINE SET. THE METHOD OF CHARGING IS DETERMINED BY THE UNITS REFRIGERANT METERING DEVICE AND THE OUTDOOR AMBIENT TEMPERATURE.

CHARGE USING THE WEIGH IN METHOD:

FIXED ORIFICE OR EXPANSION VALVE SYSTEM WITH OUTDOOR TEMPERATURE < 65°F (18°C)
IF THE SYSTEM IS VOID OF REFRIGERANT, OR IF THE OUTDOOR AMBIENT TEMPERATURE IS COOL, THE REFRIGERANT CHARGE SHOULD BE WEIGHED INTO THE UNIT ACCORDING TO THE TOTAL AMOUNT SHOWN ON THE UNIT NAMEPLATE.

1. RECOVER THE REFRIGERANT FROM THE UNIT.
2. CONDUCT A LEAK CHECK, THEN EVACUATE THE SYSTEM AS OUTLINED IN THE INSTALLATION INSTRUCTIONS.
3. WEIGH IN THE UNIT NAMEPLATE CHARGE.

IF WEIGHING FACILITIES ARE NOT AVAILABLE OR IF UNIT IS BEING CHARGED DURING WARM WEATHER, FOLLOW ONE OF THE OTHER PROCEDURES OUTLINED BELOW.

CHARGE USING THE SUBCOOLING METHOD:

FIXED ORIFICE OR EXPANSION VALVE SYSTEM WITH OUTDOOR TEMPERATURE > 65°F (18°C)
IN A FIXED-ORIFICE OR EXPANSION VALVE SYSTEM WITH THE OUTDOOR AMBIENT TEMPERATURE ABOVE 65°F (18°C), USE THE SUBCOOLING METHOD TO CHARGE THE UNIT.

1. WITH THE MANIFOLD GUAGE HOSE STILL ON THE LIQUID SERVICE PORT AND THE UNIT OPERATING STABLY, USE A DIGITAL THERMOMETER TO RECORD THE LIQUID LINE TEMPERATURE.
2. AT THE SAME TIME, RECORD THE LIQUID LINE PRESSURE READING.
3. USE A TEMPERATURE/PRESSURE CHART FOR HFC R-410A TO DETERMINE THE SATURATION TEMPERATURE FOR THE LIQUID LINE PRESSURE READING.
4. SUBTRACT THE LIQUID LINE TEMPERATURE FROM THE SATURATION TEMPERATURE (ACCORDING TO THE CHART) TO DETERMINE SUBCOOLING (SATURATION TEMPERATURE MINUS LIQUID LINE TEMPERATURE = SUBCOOLING VALUE).
5. COMPARE THE SUBCOOLING VALUE WITH THOSE IN TABLE 1. IF SUBCOOLING IS GREATER THAN SHOWN, RECOVER SOME REFRIGERANT. IF SUBCOOLING IS LESS THAN SHOWN, ADD SOME REFRIGERANT.

CHARGE USING NORMAL OPERATING PRESSURES/APPROACH METHOD:

EXPANSION VALVE (TXV) SYSTEM WITH OUTDOOR TEMPERATURE > 65°F (18°C).
IN AN EXPANSION VALVE SYSTEM WITH THE OUTDOOR AMBIENT TEMPERATURE ABOVE 65°F (18°C), USE THE APPROACH METHOD TO CHARGE THE SYSTEM. FOR BEST RESULTS, INDOOR TEMPERATURE SHOULD BE 70°F (21°C) TO 80°F (26°C). MONITOR THE SYSTEM PRESSURE WHILE CHARGING.

1. RECORD OUTDOOR AMBIENT TEMPERATURE USING A DIGITAL THEMOMETER.
2. AT THE SAME TIME, RECORD THE LIQUID LINE TEMPERATURE READING.
3. SUBTRACT THE OUTDOOR AMBIENT TEMPERATURE FROM THE LIQUID LINE TEMPERATURE TO DETERMINE THE APPROACH TEMPERATURE: LIQUID LINE TEMPERATURE MINUS OUTDOOR AMBIENT TEMPERATURE = APPROACH TEMPERATURE.
4. THE RESULTING DIFFERENCE (APPROACH TEMPERATURE) SHOULD AGREE WITH THE VALUES GIVEN IN TABLE 2. IF NOT, ADD REFRIGERANT TO LOWER THE APPROACH TEMPERATURE OR RECOVER REFRIGERANT FROM THE SYSTEM TO INCREASE THE APPROACH TEMPERATURE.

USING THE NORMAL OPERATING PRESSURES TABLE:

TABLE 3 MAY BE USED TO HELP PERFORM MAINTANANCE CHECKS. THIS TABLE IS NOT A PROCEDURE FOR CHARGING THE SYSTEM AND ANY MINOR VARIATIONS IN THE PRESSURES MAY BE EXPECTED DUE TO DIFFERENCES IN INSTALLATIONS. HOWEVER, SIGNIFICANT DEVIATIONS COULD MEAN THAT THE SYSTEM IS NOT PROPERLY CHARGED OR THAT A PROBLEM EXISTS WITH SOME COMPONENT IN THE SYSTEM.

CHARGING TEMPERATURES AND PRESSURES

MODELS	-18	-24	-30	-36	-42	-48	-60
TABLE 1 - SUBCOOLING VALUES							
OUTSIDE TEMP. °F (°C)	*SATURATION TEMPERATURE MINUS LIQUID LINE TEMPERATURE °F (°C) ± 1°F (0.5°C)*						
65 (18)	10 (5.5)	14 (7.7)	10 (5.5)	10 (5.5)	13 (7.2)	15 (8.3)	11 (6)
75 (24)	7 (4)	12 (6.7)	8 (4.4)	7 (4)	11 (6)	13 (7.2)	10 (5.5)
85 (29)	6 (3.3)	11 (6)	6 (3.3)	6 (3.3)	10 (5.5)	11 (6)	9 (5)
95 (35)	4 (2.2)	9 (5)	4 (2.2)	4 (2.2)	8 (4.4)	9 (5)	8 (4.4)
105 (41)	3 (1.7)	6 (3.3)	3 (1.7)	3 (1.7)	7 (4)	8 (4.4)	7 (4)
115 (45)	2 (1)	5 (2.7)	2 (1)	2 (1)	5 (2.7)	6 (3.3)	6 (3.3)
TABLE 2 - APPROACH VALUES *LIQUID LINE TEMPERATURE MINUS OUTDOOR AMBIEMT TEMPERATURE °F (°C) ± 1°F (0.5°C)*							
TEMP. °F (°C)	12 (6.7)	12 (6.7)	7 (4)	10 (5.5)	7 (4)	7 (4)	9 (5)
TABLE 3 - NORMAL OPERATING PRESSURES							
THE VALUES BELOW ARE TYPICAL PRESSURES; INDOOR EVAPORATOR MATCH UP, INDOOR AIR QUALITY, AND EVAPORATOR LOAD WILL CAUSE THE PRESSURES TO VARY.							
*TEMP. °F (°C)	LIQUID LINE PRESSURE / VAPOR LINE PRESSURE						
EXPANSION VALVE (TXV) SYSTEMS							
65 (18)	237/135	244/136	243/131	238/133	231/129	247/130	250/125
75 (24)	275/137	283/138	281/132	278/135	269/131	281/134	291/127
85 (29)	317/139	326/141	325/134	324/137	314/134	325/137	334/130
95 (35)	363/142	376/142	372/136	374/139	362/135	386/139	383/133
105 (41)	413/144	428/144	422/139	429/142	409/139	428/141	434/136
115 (45)	471/147	486/146	478/141	500/144	463/142	485/144	489/139
FIXED ORIFICE (RFC) SYSTEMS							
65 (18)	238/130	249/126	239/124	251/129	240/120	249/123	243/117
75 (24)	273/134	288/133	277/129	291/135	280/128	286/129	285/123
85 (29)	316/141	331/138	320/135	334/139	323/133	328/133	329/129
95 (35)	363/147	379/143	365/140	383/143	368/137	372/137	376/134
105 (41)	411/151	425/147	414/143	435/147	471/141	419/141	427/137
115 (45)	467/155	481/150	468/147	490/150	468/144	475/145	485/141

*TEMPERATURE OF AIR ENTERING OUTSIDE COIL.

SUPERHEAT CHARGING METHOD FOR FIXED METERING DEVICES										
OUTDOOR AMBIENT	60	65	70	75	80	85	90	95	100	105
REQUIRED SUPERHEAT	38	35	30	26	22	18	12	8	5	0

NOTE: ALL MEASUREMENTS IN DEGREES FAHRENHEIT
CALCULATION: SUCTION LINE TEMP (MINUS) SUCTION SATURATION TEMP
SUCTION SATURATION TEMP: SUCTION PRESSURE CONVERTED TO TEMPERATURE
80°F DB 67°F WB RETURN AIR

48385-002

Figure 18. 4SCU13L*-1

Start-Up and Performance Checklist

Job Name _____ Job no. _____ Date _____

Job Location _____ City _____ State _____

Installer _____ City _____ State _____

Unit Model No. _____ Serial No. _____ Service Technician _____

Nameplate Voltage _____

Rated Load Ampacity _____ Compressor _____ Outdoor Fan _____

Maximum Fuse or Circuit Breaker _____

Electrical Connections Tight? ☐ Indoor Filter Clean? ☐ Supply Voltage (Unit Off) _____

Indoor Blower RPM _____ S.P. Drop Over Indoor (Dry) _____ Outdoor Coil Entering Air Temp. _____

Discharge Pressure _____ Vapor Pressure _____ Refrigerant Charge Checked? ☐

Refrigerant Lines: Leak Checked? ☐ Properly Insulated? ☐ Outdoor Fan Checked? ☐

Services Valve: Fully Opened? ☐ Caps Tight? ☐

Voltage with Compressor Operating _____

Thermostat

Calibrated? ☐ Properly Set? ☐ Level? ☐