



Installation Instructions

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

Untrained personnel can perform basic maintenance functions, such as cleaning coils. All other operations should be performed by trained service personnel.

When working on the equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment and any other safety precautions that may apply.

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling, rigging, and setting bulky equipment.

⚠ WARNING

Open all remote disconnects before servicing this equipment. Failure to do so could result in personal injury from electric shock.

⚠ WARNING

DO NOT USE TORCH to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

- a. Shut off electrical power to unit.
- b. Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
- d. Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system.
- e. Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

⚠ CAUTION

DO NOT re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. **DO NOT** leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

⚠ CAUTION

Puron refrigerant (R-410A) systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on Puron refrigerant equipment. If service equipment is not rated for Puron refrigerant, equipment damage or personal injury may result.

STORAGE RECOMMENDATIONS

The 38AP condensing units are designed for outdoor installations. At times, a delay in construction or other factors require that a unit be stored for a period of time prior to installation. The following guidelines should be used for unit storage.

Provide Machine Protection — Place and store the unit in an area that will protect it from vandalism, accidental contact with vehicles, falling debris or construction waste. Ideally, do not remove the shipping protection such as the coil protectors. This will provide additional protection for the unit. The unit can be stored outdoors.

Inspection During Storage — To ensure faster installation when the time comes, the following inspection schedule is recommended:

EVERY 3 MONTHS — The 38AP units are shipped with a nitrogen holding charge. Check each refrigerant circuit to be sure that there is positive pressure, at least 5 psig (34.5 kPa) in the circuit. If a circuit is found to be without pressure, contact a qualified refrigeration mechanic. The system should be pressurized to find the leak. It should be repaired, dehydrated and recharged with nitrogen. If a positive circuit pressure was not found, the compressor oil should be changed or at least sampled to determine if moisture is present. If moisture is found in the compressor oil, the oil should be changed.

EVERY 6 MONTHS — Check the unit for damage, both physical and from wildlife. Check the unit for nests from rodents, birds, or insects. Depending on location, these organisms can cause deterioration of components which may result in failure. Consider an exterminator if necessary. If damage is found and it will interfere with the installation, consider repairing the damage before installation.

Check the unit control box for signs of moisture. If moisture is found, determine the entry path and seal the leak.

INSTALLATION

Step 1 — Inspect Shipment — Inspect unit for damage upon arrival. If damage is found, immediately file a claim with the shipping company. Verify proper unit delivery by checking unit nameplate data and the model number nomenclature shown in Fig. 1. See Tables 1-4 for unit physical data.

Step 2 — Rig and Place Unit — All units are designed for overhead rigging, and it is *important that this method be used*. Lifting holes are provided in the frame base rails. It is recommended to use shackles in the lifting holes (see rigging label on the unit and Fig. 2-4 for rigging weights and center of gravity). All panels must be in place when rigging.

IMPORTANT: To maintain unit stability while lifting, use 4 cables, chains or straps of equal length. Attach one end of each cable to shackle attachment point and the other end of each cable to the overhead rigging point.

Use spreader bars or frame to keep the cables, chains, and straps clear of the unit sides. Leave standard coil protection packaging in place during rigging to provide protection to coils. Remove and discard all coil protection after rigging cables are detached.

⚠ CAUTION

All panels must be in place when rigging. Failure to comply could result in equipment damage.

⚠ CAUTION

For unit sizes 025 to 060 when handling with a forklift, handle only through fork pocket holes. Failure to follow this caution could result in equipment damage or personal injury.

⚠ CAUTION

For unit sizes 065 to 130, do not forklift the unit unless unit is attached to a skid designed for forklifting. Failure to follow this caution could result in equipment damage or personal injury.

DOMESTIC UNITS — Standard 38AP unit packaging consists of coil protection only. *Skids are not provided.* If overhead rigging is not available at the jobsite, place the unit on a skid or pad before dragging or rolling. When rolling, use a minimum of 3 rollers. When dragging, pull the pad or skid. *Do not apply force to the unit.* When in final position, raise from above to lift unit off the pad or skid.

EXPORT UNITS — All export units are mounted on skids with vertical coil protection. Leave the unit on the skid until it is in final position. *While on the skid, the unit can be rolled or skidded. Apply force to the skid, not to the unit.* Use a minimum of 3 rollers when rolling. When in final position, raise from above to remove the skid.

PLACING UNITS — When considering location of the unit, be sure to consult National Electrical Code (NEC, U.S.A.) and local code requirements. Allow sufficient space for airflow, wiring, piping, and service. The placement area must be level and strong enough to support the operating weight of the unit. (See Fig. 2.) When unit is in proper location, use of mounting holes in base rails is recommended for securing unit to supporting structure. For mounting unit on vibration isolators, 4 x 24 in. perimeter support ASTM “C” channels between unit and the isolators are recommended with a minimum of 4 channels per unit. Fasteners for mounting unit are field supplied. See Fig. 5.

Refer to Fig. 6-10 for airflow clearances. Recommended minimum clearances are 6 ft (1829 mm) for unrestricted airflow and service on sides of unit, 4 ft (1219 mm) on ends, and unrestricted clear air space above the unit. Provide ample space to connect liquid and suction lines to indoor unit. For multiple units, allow 10 ft (3048 mm) separation between airflow surfaces. If walls surround the unit, wall height should not exceed the top of the unit fan discharge. Installation in a pit is not recommended.

IMPORTANT: Be sure to mount unit level to within 1/8 in. per ft (10.4 mm per m) to ensure proper oil return to compressors.

Refer to Fig. 11 for outdoor fan and compressor layout.

Refer to Fig. 12 and 13 for unit piping installation. See Table 5 for refrigerant specialties part numbers.

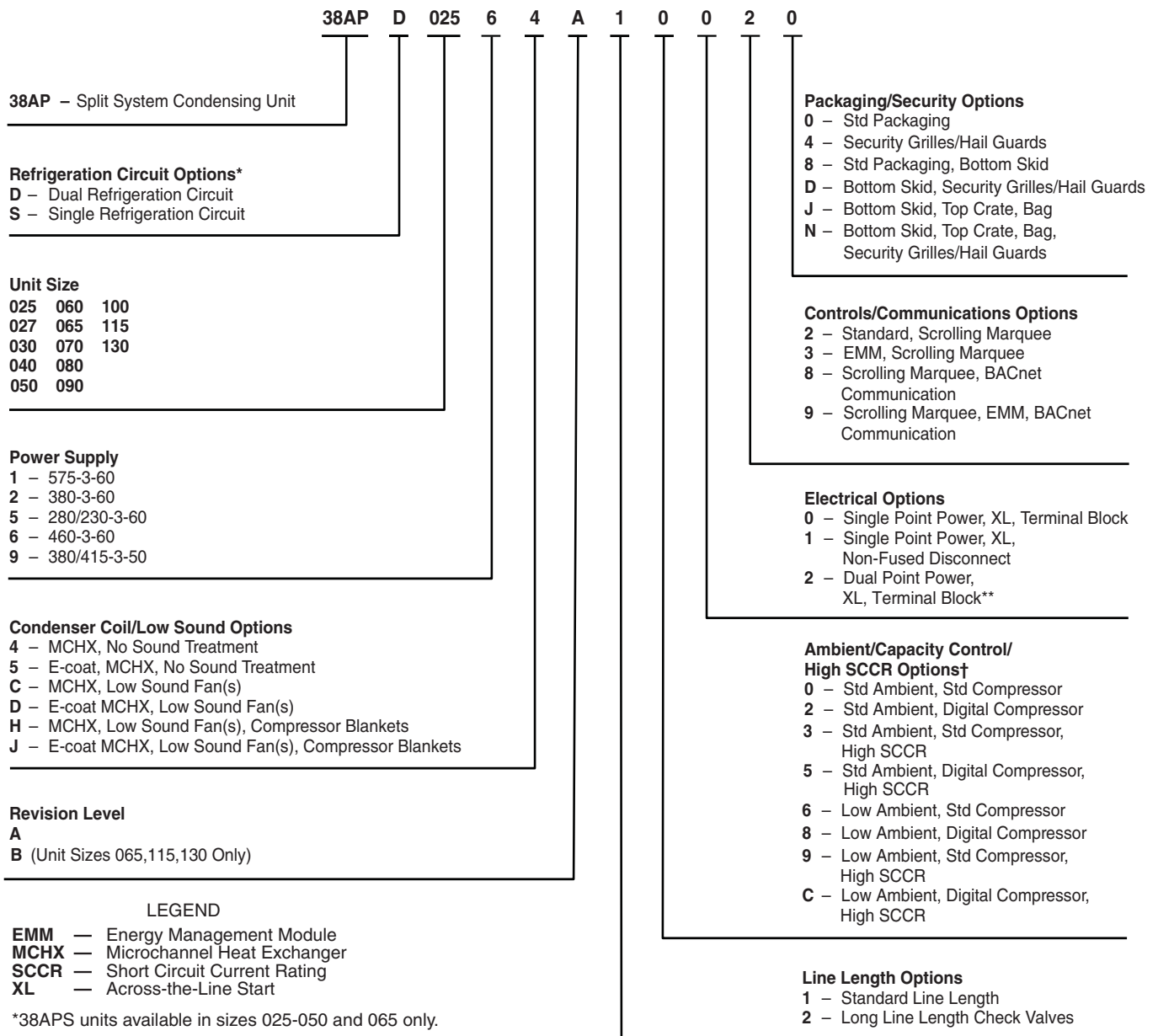


Fig. 1 — Model Number Nomenclature

Table 1 — 38AP025-050 Unit Physical Data — English

38AP UNIT SIZE	025		027		030		040		050	
NOMINAL CAPACITY, 50/60 Hz (tons)	21/25		23/27		25/30		33/40		42/50	
CIRCUIT	Dual	Single	Dual	Single	Dual	Single	Dual	Single	Dual	Single
OPERATING WEIGHTS (lb)										
Standard	1095	1077	1258	1240	1264	1246	2094	1968	2120	1977
With Low Sound Option	1131	1113	1294	1276	1300	1282	2148	2022	2174	2031
REFRIGERANT CHARGE (lb)										
Total*	24	24	26	26	28	29	38	39	48	48
Circuit A/Circuit B	12/12	24/—	13/13	26/—	14/14	29/—	21/17	39/—	22/26	48/—
NITROGEN SHIPPING CHARGE	15 psig									
COMPRESSOR										
tons (Qty) (CKT A/CKT B)	11 (1)/ 11 (1)	11 (2)	13 (1)/ 13 (1)	13 (2)	15 (1)/ 15 (1)	15 (2)	10 (2)/ 8.5 (2)	13 (3)	11 (2)/ 13 (2)	15 (3)
CAPACITY STEPS										
Standard	2	2	2	2	2	2	4	3	4	3
Digital Option	22	22	22	22	22	22	36	27	36	27
CRANKCASE HEATER (W) (each compressor)	90 (60/50 Hz)									
CONDENSER FANS										
Standard	Propeller Type, Axial, Vertical Discharge									
Quantity	2	2	2	2	2	2	3	3	3	3
Rpm	1140 (60 Hz), 950 (50 Hz)									
Diameter (in.)	30									
Total Watts (60 Hz)	3300	3300	3300	3300	3300	3300	4200	4200	4200	4200
Total Watts (50 Hz)	1997	1997	1997	1997	1997	1997	2541	2541	2541	2541
Low Noise	Plastic Type, Axial, Vertical Discharge									
Quantity	2	2	2	2	2	2	3	3	3	3
Rpm	850 (60 Hz), 700 (50 Hz)									
Diameter (in.)	30									
Total Watts (60 Hz)	2750	2750	2750	2750	2750	2750	3500	3500	3500	3500
Total Watts (50 Hz)	1664	1664	1664	1664	1664	1664	2118	2118	2118	2118
CONDENSER COIL	MCHX Type									
No. Coils per Circuit	1	1	1	1	1	1	1	2	1	2
sq ft	27.1	27.1	33.9	33.9	33.9	33.9	67.8	67.8	67.8	67.8
TEMPERATURE RELIEF	Fusible Plug on Liquid Lines of Each Circuit - 210 F									
CONNECTIONS (in.) ODF (CKT A/CKT B)										
Suction Line	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ¹ / ₈	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ¹ / ₈
Liquid Line	5 ⁸ / ₈ / 5 ⁸ / ₈	5 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	5 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈
MAXIMUM HEIGHT FOR 3° F SUBCOOLING (ft)†	75	75	75	75	75	75	75	75	75	75
CAPACITY PER CIRCUIT (%) (CKT A/CKT B)	50/50	100	50/50	100	50/50	100	54/46	100	48/52	100
MINIMUM UNIT CAPACITY (%)										
Standard Compressor	50	50	50	50	50	50	27	33	23	33
Digital Compressor	17	17	17	17	17	17	13	16	11	16

LEGEND

MCHX — Microchannel Heat Exchanger
ODF — Outside Diameter, Female

*Typical operating charge with 25 ft of interconnecting piping. Operating charge is approximate for maximum system capacity. Unit is factory supplied with nitrogen holding charge. Refrigerant charge for dual circuit units is the total for both circuits.

†Maximum vertical separation between evaporator coil and condensing unit if condensing unit is below the evaporator.

Table 2 — 38AP060-130 Unit Physical Data — English

38AP UNIT SIZE	060	065	070	080	090	100	115	130
NOMINAL CAPACITY, 50/60 Hz (tons)	50/60	54/65	58/70	67/80	75/90	83/100	96/115	108/130
CIRCUIT	Dual	Single	Dual	Dual	Dual	Dual	Dual	Dual
OPERATING WEIGHTS (lb)								
Standard	2227	2333	2450	2610	2835	2844	3211	3353
With Low Sound Option	2299	2387	2522	2700	2943	2952	3319	3461
REFRIGERANT CHARGE (lb)								
Total*	56	55	62	75	85	92	101	117
Circuit A/Circuit B	27/29	—/55	29/33	29/46	39/46	46/46	46/55	46/71
NITROGEN SHIPPING CHARGE	15 psig							
COMPRESSOR tons (Qty) (CKT A/CKT B)	13 (2)/15 (2)	20 (3)	15 (2)/11 (3)	15 (2)/15 (3)	13 (3)/15 (3)	15 (3)/15 (3)	15 (3)/20 (3)	15 (3)/25 (3)
CAPACITY STEPS								
Standard	4	3	5	5	6	6	6	6
Digital Option	36	—	45	45	54	54	54	54
CRANKCASE HEATER (W) (each compressor)	90 (60 /50 Hz)						90 CKT A, 120 CKT B (60/50 Hz)	
CONDENSER FANS								
Standard	Propeller Type, Axial, Vertical Discharge							
Quantity	4	4	4	5	6	6	7	8
Rpm	1140 (60 Hz), 950 (50 Hz)							
Diameter (in.)	30							
Total Watts (60 Hz)	6200	6000	6000	7500	9000	9000	10,500	12,000
Total Watts (50 Hz)	3751	3630	3630	4538	5445	5445	6353	7260
Low Noise	Plastic Type, Axial, Vertical Discharge							
Quantity	4	4	4	5	6	6	7	8
Rpm	850 (60 Hz), 700 (50 Hz)							
Diameter (in.)	30							
Total Watts (60 Hz)	5200	5000	5000	6250	7500	7500	8750	10,000
Total Watts (50 Hz)	3146	3025	3025	3781	4538	4538	5294	6050
CONDENSER COIL	MCHX Type							
No. Coils per Circuit	1	3	2	2 to 3	3	3	3 to 4	3 to 5
sq ft	67.8	99.6	99.6	124.5	149.4	149.4	174.3	199.2
TEMPERATURE RELIEF	Fusible Plug on Liquid Lines of Each Circuit - 210 F							
CONNECTIONS (in.) ODF (CKT A/CKT B)								
Suction Line	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ⁵ / ₈	1 ⁵ / ₈ / 2 ¹ / ₈	1 ⁵ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ⁵ / ₈	2 ¹ / ₈ / 2 ⁵ / ₈
Liquid Line	5 ¹ / ₈ / 5 ¹ / ₈	7 ¹ / ₈	7 ¹ / ₈ / 7 ¹ / ₈	7 ¹ / ₈ / 7 ¹ / ₈	7 ¹ / ₈ / 7 ¹ / ₈	7 ¹ / ₈ / 7 ¹ / ₈	7 ¹ / ₈ / 7 ¹ / ₈	7 ¹ / ₈ / 1 ¹ / ₈
MAXIMUM HEIGHT FOR 3° F SUBCOOLING (ft)†	75	75	75	75	75	75	75	75
CAPACITY PER CIRCUIT (%) (CKT A/CKT B)	46/54	100	47/53	40/60	46/54	50/50	44/56	38/62
MINIMUM UNIT CAPACITY (%)								
Standard Compressor	23	33	24	20	15	17	14	13
Digital Compressor	11	—	11	9	7	8	7	6

LEGEND

MCHX — Microchannel Heat Exchanger
ODF — Outside Diameter, Female

with nitrogen holding charge. Refrigerant charge for dual circuit units is the total for both circuits.

†Maximum vertical separation between evaporator coil and condensing unit if condensing unit is below the evaporator.

*Typical operating charge with 25 ft of interconnecting piping. Operating charge is approximate for maximum system capacity. Unit is factory supplied

Table 3 — 38AP025-050 Unit Physical Data — SI

38AP UNIT SIZES	025		027		030		040		050	
NOMINAL CAPACITY 50/60 Hz (kW)	73/88		79/95		88/105		117/141		146/176	
CIRCUIT	Dual	Single	Dual	Single	Dual	Single	Dual	Single	Dual	Single
OPERATING WEIGHTS (kg)										
Standard	497	489	571	562	573	565	950	893	961	897
With Low Sound Option	513	505	587	579	590	582	974	917	986	921
REFRIGERANT CHARGE (kg)										
Total*	12	11	12	12	14	13	18	18	22	22
Circuit A/Circuit B	6/6	11/—	6/6	12/—	7/7	13/—	10/8	18/—	10/12	22/—
NITROGEN SHIPPING CHARGE	1.03 bar									
COMPRESSOR kW (Qty) (CKT A/CKT B)	8.2 (1)/ 8.2 (1)	8.2 (2)	9.7 (1)/ 9.7 (1)	9.7 (2)	11.2 (1)/ 11.2 (1)	11.2 (2)	7.5 (2)/ 6.3 (2)	9.7 (3)	8.2 (2)/ 9.7 (2)	11.2 (3)
CAPACITY STEPS										
Standard	2	2	2	2	2	2	4	3	4	3
Digital Option	22	22	22	22	22	22	36	27	36	27
CRANKCASE HEATER (W) (each compressor)	90 (60/50 Hz)									
CONDENSER FANS										
Standard	Propeller Type, Axial, Vertical Discharge									
Quantity	2	2	2	2	2	2	3	3	3	3
r/s	19 (60 Hz), 16 (50 Hz)									
Diameter (mm)	762									
Total Watts (60 Hz)	3300	3300	3300	3300	3300	3300	4200	4200	4200	4200
Total Watts (50 Hz)	1997	1997	1997	1997	1997	1997	2541	2541	2541	2541
Low Noise	Plastic Type, Axial, Vertical Discharge									
Quantity	2	2	2	2	2	2	3	3	3	3
r/s	14 (60 Hz), 12 (50 Hz)									
Diameter (mm)	762									
Total Watts (60 Hz)	2750	2750	2750	2750	2750	2750	3500	3500	3500	3500
Total Watts (50 Hz)	1664	1664	1664	1664	1664	1664	2118	2118	2118	2118
CONDENSER COIL	MCHX Type									
No. Coils per Circuit	1	1	1	1	1	1	1	2	1	2
sq m	2.5	2.5	3.1	3.1	3.1	3.1	6.3	6.3	6.3	6.3
TEMPERATURE RELIEF	Fusible Plug on Liquid Lines of Each Circuit - 99 C									
CONNECTIONS (in.) ODF (CKT A/CKT B)										
Suction Line	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ³ / ₈ / 1 ³ / ₈	1 ⁵ / ₈	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ¹ / ₈	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ¹ / ₈
Liquid Line	5 ⁸ / ₈ / 5 ⁸ / ₈	5 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	5 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈
MAXIMUM HEIGHT FOR 1.7° C SUBCOOLING (m)†	23	23	23	23	23	23	23	23	23	23
CAPACITY PER CIRCUIT (%) (CKT A/CKT B)	50/50	100	50/50	100	50/50	100	54/46	100	48/52	100
MINIMUM UNIT CAPACITY (%)										
Standard Compressor	50	50	50	50	50	50	27	33	23	33
Digital Compressor	17	17	17	17	17	17	13	16	11	16

LEGEND

MCHX — Microchannel Heat Exchanger
 ODF — Outside Diameter, Female

*Typical operating charge with 7.62 m of interconnecting piping. Operating charge is approximate for maximum system capacity. Unit is factory supplied with nitrogen holding charge. Refrigerant charge for dual circuit units is the total for both circuits.

†Maximum vertical separation between evaporator coil and condensing unit if condensing unit is below the evaporator.

Table 4 — 38AP060-130 Unit Physical Data — SI

38AP UNIT SIZES	060	065	070	080	090	100	115	130
NOMINAL CAPACITY 50/60 Hz (kW)	176/211	190/228	205/246	234/281	264/316	293/351	337/404	381/457
CIRCUIT	Dual	Single	Dual	Dual	Dual	Dual	Dual	Dual
OPERATING WEIGHTS (kg)								
Standard	1010	1058	1111	1184	1286	1290	1456	1521
With Low Sound Option	1043	1083	1144	1225	1335	1339	1505	1570
REFRIGERANT CHARGE (kg)								
Total*	25	25	28	34	39	42	46	53
Circuit A/Circuit B	12/13	—/25	13/15	13/21	18/21	21/21	21/25	21/32
NITROGEN SHIPPING CHARGE	1.03 bar							
COMPRESSOR kW (Qty) (CKT A/CKT B)	9.7 (2)/ 11.2 (2)	15.0 (3)	11.2 (2)/ 8.2 (3)	11.2 (2)/ 11.2 (3)	9.7 (3)/ 11.2 (3)	11.2 (3)/ 11.2 (3)	11.2 (3)/ 15.0 (3)	11.2 (3)/ 18.6 (3)
CAPACITY STEPS								
Standard	4	3	5	5	6	6	6	6
Digital Option	36	—	45	45	54	54	54	54
CRANKCASE HEATER (W) (each compressor)	90 (60/50 Hz)						90 CKT A, 120 CKT B (60/50 Hz)	
CONDENSER FANS								
Standard	Propeller Type, Axial, Vertical Discharge							
Quantity	4	4	4	5	6	6	7	8
r/s	19 (60 Hz), 16 (50 Hz) 762							
Diameter (mm)								
Total Watts (60 Hz)	6200	6000	6000	7500	9000	9000	10,500	12,000
Total Watts (50 Hz)	3751	3630	3630	4538	5445	5445	6353	7260
Low Noise	Plastic Type, Axial, Vertical Discharge							
Quantity	4	4	4	5	6	6	7	8
r/s	14 (60 Hz), 12 (50 Hz) 762							
Diameter (mm)								
Total Watts (60 Hz)	5200	5000	5000	6250	7500	7500	8750	10,000
Total Watts (50 Hz)	3146	3025	3025	3781	4538	4538	5294	6050
CONDENSER COIL	MCHX Type							
No. Coils per Circuit	1	3	2	2 to 3	3	3	3 to 4	3 to 5
sq m	6.3	6.9	9.3	11.6	13.9	13.9	16.2	18.5
TEMPERATURE RELIEF	Fusible Plug on Liquid Lines of Each Circuit - 99 C							
CONNECTIONS (in.) ODF (CKT A/CKT B)								
Suction Line	1 ⁵ / ₈ / 1 ⁵ / ₈	2 ⁵ / ₈	1 ⁵ / ₈ / 2 ¹ / ₈	1 ⁵ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ¹ / ₈	2 ¹ / ₈ / 2 ⁵ / ₈	2 ¹ / ₈ / 2 ⁵ / ₈
Liquid Line	5 ⁸ / ₈ / 5 ⁸ / ₈	7 ⁸ / ₈	7 ⁸ / ₈ / 7 ⁸ / ₈	7 ⁸ / ₈ / 7 ⁸ / ₈	7 ⁸ / ₈ / 7 ⁸ / ₈	7 ⁸ / ₈ / 7 ⁸ / ₈	7 ⁸ / ₈ / 7 ⁸ / ₈	7 ⁸ / ₈ / 1 ¹ / ₈
MAXIMUM HEIGHT FOR 1.7° C SUBCOOLING (m)†	23	23	23	23	23	23	23	23
CAPACITY PER CIRCUIT (%) (CKT A/CKT B)	46/54	100	47/53	40/60	46/54	50/50	44/56	38/62
MINIMUM UNIT CAPACITY (%)								
Standard Compressor	23	33	24	20	15	17	14	13
Digital Compressor	11	—	11	9	7	8	7	6

LEGEND

MCHX — Microchannel Heat Exchanger
ODF — Outside Diameter, Female

*Typical operating charge with 7.62 m of interconnecting piping. Operating charge is approximate for maximum system capacity. Unit is factory supplied with nitrogen holding charge. Refrigerant charge for dual circuit units is the total for both circuits.

†Maximum vertical separation between evaporator coil and condensing unit if condensing unit is below the evaporator.

38APS Unit (lb)

38APS UNIT SIZE	TOTAL WEIGHT	OPERATIONAL CORNER WEIGHT			
		A	B	C	D
025	1113	375	257	196	285
027	1276	413	295	236	331
030	1282	416	297	237	332
040	2022	639	621	376	387
050	2031	643	625	377	387
065	2387	814	795	385	394

38APS Unit (kg)

38APS UNIT SIZE	TOTAL WEIGHT	OPERATIONAL CORNER WEIGHT			
		A	B	C	D
025	505	170	117	89	129
027	579	188	134	107	150
030	582	189	135	107	151
040	917	290	282	171	175
050	921	291	283	171	176
065	1083	368	361	175	179

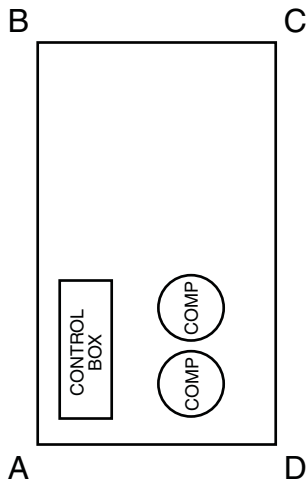
38APD Unit (lb)

38APD UNIT SIZE	TOTAL WEIGHT	OPERATIONAL CORNER WEIGHT					
		A	B	C	D	E	F
025	1131	379	262	200	290	—	—
027	1294	418	300	241	335	—	—
030	1300	421	301	241	337	—	—
040	2148	692	676	385	395	—	—
050	2174	703	688	388	396	—	—
060	2299	741	713	414	431	—	—
070	2522	747	627	524	624	—	—
080	2700	819	686	545	650	—	—
090	2943	791	760	682	710	—	—
100	2952	791	760	686	714	—	—
115	3319	608	599	496	491	562	563
130	3461	620	612	528	522	589	590

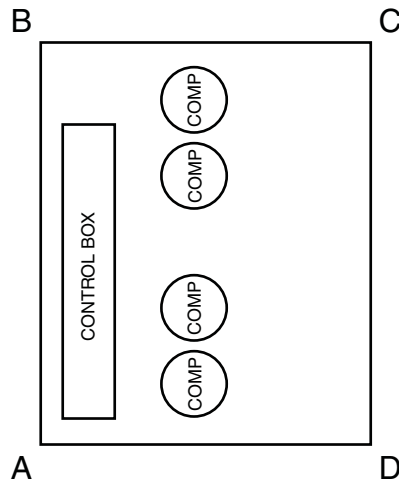
38APD Unit (kg)

38APD UNIT SIZE	TOTAL WEIGHT	OPERATIONAL CORNER WEIGHT					
		A	B	C	D	E	F
025	513	172	119	91	131	—	—
027	587	190	136	109	152	—	—
030	590	191	137	109	153	—	—
040	974	314	307	175	179	—	—
050	986	319	312	176	179	—	—
060	1043	336	323	188	195	—	—
070	1144	339	285	238	283	—	—
080	1225	371	311	247	295	—	—
090	1335	359	345	309	322	—	—
100	1339	359	345	311	324	—	—
115	1505	276	272	225	223	255	255
130	1570	281	278	239	237	267	268

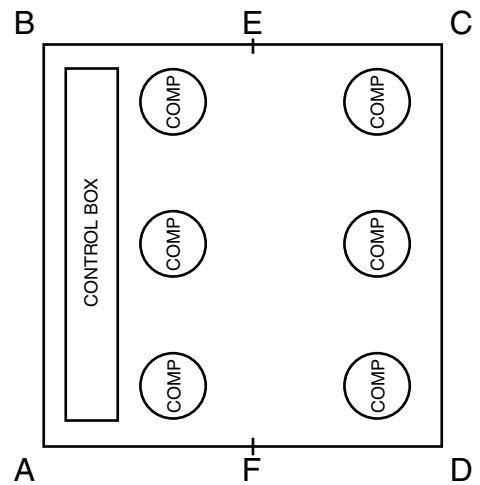
NOTE: Weights include refrigerant charge.



TOP VIEW,
SIZES 025 TO 030



TOP VIEW, SIZES 040 TO 065



TOP VIEW, SIZES 070 TO 130

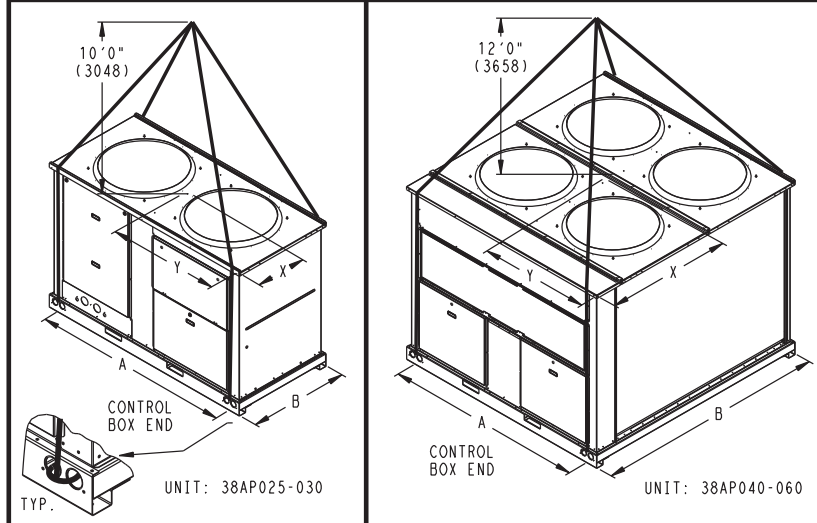
Fig. 2 — Maximum Operational Corner Weights

CAUTION - NOTICE TO RIGGERS:

ALL PANELS MUST BE IN PLACE WHEN RIGGING. FORK ONLY THROUGH BASE RAIL FORK OPENINGS.

NOTES:

1. RIG WITH FOUR CABLES USING A MINIMUM 20 FT. (6094mm) LENGTH FOR 025-030 SIZES AND 24 FT. (7315mm) LENGTH FOR 040-060 SIZES.
2. CENTRAL LIFTING POINT MUST BE A MINIMUM OF 10 FT. (3048mm) FOR 025-030 SIZES AND 12 FT. (3658mm) FOR 040-060 SIZES ABOVE THE TOP OF THE UNIT.
3. LIFTING HOLES PROVIDED ARE 2.25 IN. (57.2mm) DIAMETER.
4. CHECK BILL OF LADING FOR SHIPPING WEIGHT OF UNIT.



MODEL NUMBER	MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. W/PACKAGING		LIFTING HOLES				CENTER OF GRAVITY			
	LBS	KGS	LBS	KGS	A		B		X		Y	
					IN	MM	IN	MM	IN	MM	IN	MM
38APS025	1113	505	1163	528	79.39	2017	40.25	1022	17.78	452	36.87	937
38APD025	1131	513	1181	536	79.39	2017	40.25	1022	17.82	453	36.99	940
38APS027	1276	579	1326	601	79.39	2017	40.25	1022	18.21	463	37.60	955
38APD027	1294	587	1344	610	79.39	2017	40.25	1022	18.23	463	37.69	957
38APS030	1282	582	1332	604	79.39	2017	40.25	1022	18.18	462	37.52	953
38APD030	1300	590	1350	612	79.39	2017	40.25	1022	18.20	462	37.61	955
38APS040	2022	917	2097	951	79.39	2017	92.12	2340	35.00	889	44.00	1118
38APD040	2148	974	2223	1008	79.39	2017	92.12	2340	33.66	855	44.06	1119
38APS050	2031	921	2106	955	79.39	2017	92.12	2340	34.90	886	44.00	1118
38APD050	2174	986	2249	1020	79.39	2017	92.12	2340	33.39	848	44.12	1121
38APD060	2299	1043	2374	1077	79.39	2017	92.12	2340	34.35	873	44.06	1119

38AP501542

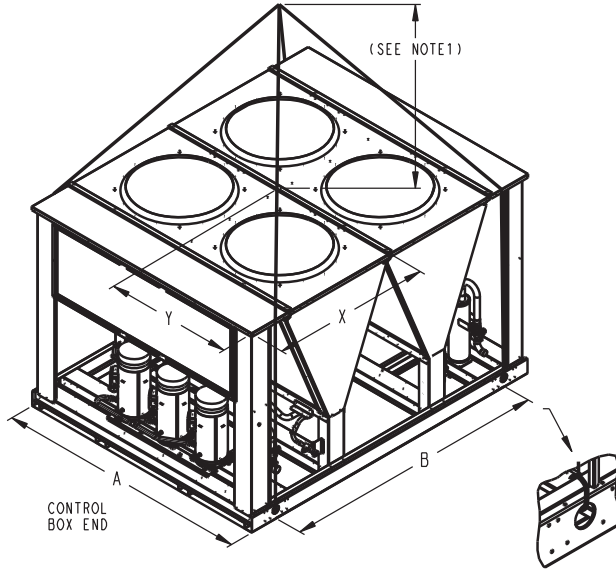
Fig. 3 — Rigging Label, 38AP025-060

CAUTION - NOTICE TO RIGGERS:

ALL PANELS MUST BE IN PLACE WHEN RIGGING. DO NOT FORK THIS UNIT WITHOUT SKID.

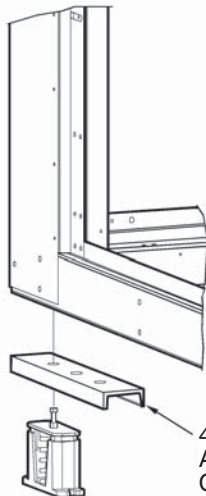
NOTES:

1. RIG WITH FOUR CABLES USING A MINIMUM 20 FT. (6094mm) LENGTH FOR 065,070 SIZES, 24 FT. (7315mm) LENGTH FOR 080-100 SIZES AND 30FT. (9144mm) LENGTH FOR 115,130 SIZES.
2. CENTRAL LIFTING POINT MUST BE A MINIMUM OF 10 FT. (3048mm) FOR 065,070 SIZES, 12 FT. (3658mm) FOR 080-100 SIZES AND 15 FT. (4572mm) FOR 115,130 SIZES ABOVE THE TOP OF THE UNIT.
3. LIFTING HOLES PROVIDED ARE 2.50 IN. (63.5mm) DIAMETER.
4. CHECK BILL OF LADING FOR SHIPPING WEIGHT OF UNIT.



MODEL NUMBER	MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. WITH PACKAGING		LIFTING HOLES				CENTER OF GRAVITY			
					A		B		X		Y	
	LBS	KGS	LBS	KGS	IN	MM	IN	MM	IN	MM	IN	MM
38APS065	2387	1083	2487	1128	88.00	2235	91.37	2321	36.21	919	43.61	1108
38APD070	2522	1144	2622	1189	88.00	2235	91.37	2321	50.92	1293	40.60	1031
38APD080	2700	1225	2830	1284	88.00	2235	131.62	3343	67.57	1716	40.15	1020
38APD090	2943	1335	3073	1394	88.00	2235	131.62	3343	72.40	1839	43.25	1099
38APD100	2952	1339	3082	1398	88.00	2235	131.62	3343	72.61	1844	43.25	1099
38APD115	3319	1505	3469	1573	88.00	2235	171.72	4362	71.10	1806	44.42	1128
38APD130	3461	1570	3611	1638	88.00	2235	171.72	4362	70.89	1801	44.57	1132

Fig. 4 — Rigging Label, 38AP065-130

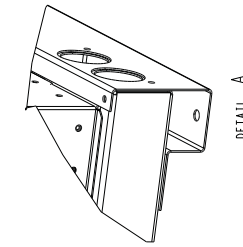


LEGEND
ASTM — American Society for Testing and Materials

4 x 24 in. ASTM "C" CHANNEL

Fig. 5 — Perimeter Support Channel

UNIT	STANDARD WEIGHT, LB (KG)	CENTER OF GRAVITY, IN. (MM)		HEIGHT, IN. (MM)		POWER ENTRY, IN. (MM)		SERVICE VALVE CONNECTIONS, IN. (MM)	
		X	Y	H	P	SUCTION	LIQUID		
STANDARD	38APS025	17.8 (452)	36.9 (937)	61.0 (1549)	24.9 (632)	1 5/8 (41)	5/8 (16)		
	38APD025	17.8 (452)	37.0 (940)			1 3/8 (35)	5/8 (16)		
	38APS027	18.2 (462)	37.6 (955)	73.1 (1857)	36.9 (937)	1 5/8 (41)	5/8 (16)		
	38APD027	18.2 (462)	37.6 (955)			1 5/8 (41)	7/8 (22)		
	38APS030	1246 (565)	18.2 (462)	37.5 (953)	1 3/8 (35)	5/8 (16)			
	38APD030	1264 (573)	18.2 (462)	37.6 (955)	1 3/8 (35)	5/8 (16)			
LOW SOUND	38APS025	1113 (505)	36.9 (937)	66.5 (1689)	24.9 (632)	1 5/8 (41)	5/8 (16)		
	38APD025	1131 (513)	37.0 (940)			1 3/8 (35)	5/8 (16)		
	38APS027	1276 (579)	37.6 (955)	78.6 (1996)	36.9 (937)	1 5/8 (41)	5/8 (16)		
	38APD027	1294 (587)	37.6 (955)			1 3/8 (35)	7/8 (22)		
	38APS030	1282 (582)	18.2 (462)	37.5 (953)	1 5/8 (41)	5/8 (16)			
	38APD030	1300 (590)	18.2 (462)	37.6 (955)	1 3/8 (35)	5/8 (16)			



- NOTES:**
1. Be sure to use a wet rag and remove all valve cores before brazing field piping.
 2. Do not cap or otherwise obstruct the liquid line temperature relief.
 3. A 7/8 in. (22.4 mm) diameter hole is provided for locating field power wiring. Actual hole size required depends on field wire sizing.
 4. A 0.437 in. (11.1 mm) diameter hole is used for mounting unit.
 5. Unit must have clearances as follows:
Top - Do not restrict.
Coil End - 42 in. (1067) from solid surface.
Panel Side - 48 in. (1219) per NEC (National Electrical Code).
 6. Unit height (dimension H) for the low sound fan option includes the fan stack.
 7. Installation in a pit is not recommended.
 8. Unit can be handled using the fork truck lift pockets.
 9. Dimensions shown in inches (mm).
 10. Weight does not include unit refrigerant charge.
 11. For 38APS piping locations, refer to Circuit A Liquid Connection and Circuit A Suction Connection shown below.

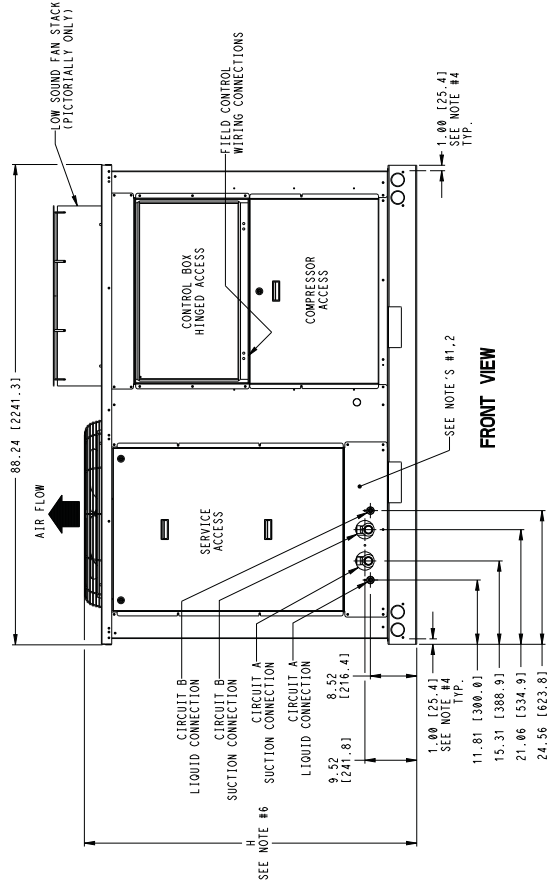
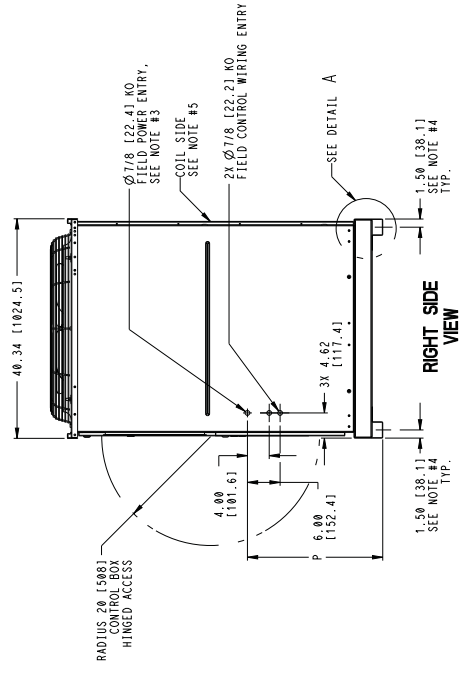
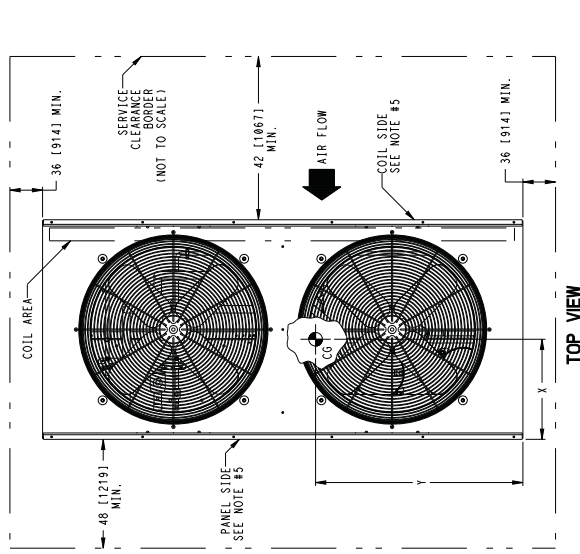


Fig. 6 — 38AP Unit Dimensions, Sizes 025-030

- NOTES:
1. Be sure to use a wet rag to remove all valve cores before brazing field piping.
 2. Do not cap or otherwise obstruct the liquid line temperature relief.
 3. A 7/8 in. (22.4 mm) diameter hole is provided for locating field power wiring. Actual hole size required depends on field wire sizing.
 4. A 0.437 in. (11.1 mm) diameter hole is used for mounting unit.
 5. Unit must have clearances as follows:
 - Top - Do not restrict.
 - Coil End - 42 in. (1067) from solid surface.
 - Panel Side - 48 in. (1219) per NEC (National Electrical Code).
 6. Unit height (dimension H) for the low sound fan option includes the fan stack.
 7. Installation in a pit is not recommended.
 8. Unit can be handled using the fork truck lift pockets.
 9. Dimensions shown in inches (mm).
 10. Sizes 040 and 050 units have 3 condenser fans. Size 060 units have 4 condenser fans.
 11. Weight does not include unit refrigerant charge.
 12. For 38APS piping locations, refer to Circuit A Liquid Connection and Circuit A Suction Connection shown below.

UNIT	STANDARD WEIGHT, LB (KG)	CENTER OF GRAVITY, IN. (MM)			HEIGHT, IN. (MM)	SERVICE VALVE CONNECTIONS, IN. (MM)	
		X	Y	H		SUCTION	LIQUID
38APS040	1968 (893)	35.0 (869)	44.0 (1118)	73.0 (1854)	2 1/8 (54)	7/8 (22)	
38APD040	2094 (950)	33.7 (856)	44.1 (1120)		1 5/8 (41)	5/8 (16)	
38APS050	1977 (897)	34.9 (886)	44.0 (1118)	78.5 (1994)	2 1/8 (54)	7/8 (22)	
38APD050	2120 (961)	33.4 (848)	44.1 (1120)		1 5/8 (41)	5/8 (16)	
38APD060	2227 (1010)	34.4 (874)	44.1 (1120)	1 5/8 (41)	5/8 (16)		
38APS040	2022 (917)	35.0 (869)	44.0 (1118)	2 1/8 (54)	7/8 (22)		
38APD040	2148 (974)	33.7 (856)	44.1 (1120)	1 5/8 (41)	5/8 (16)		
38APS050	2031 (921)	34.9 (886)	44.0 (1118)	2 1/8 (54)	7/8 (22)		
38APD050	2174 (986)	33.4 (848)	44.1 (1120)	1 5/8 (41)	5/8 (16)		
38APD060	2299 (1043)	34.4 (874)	44.1 (1120)	1 5/8 (41)	5/8 (16)		

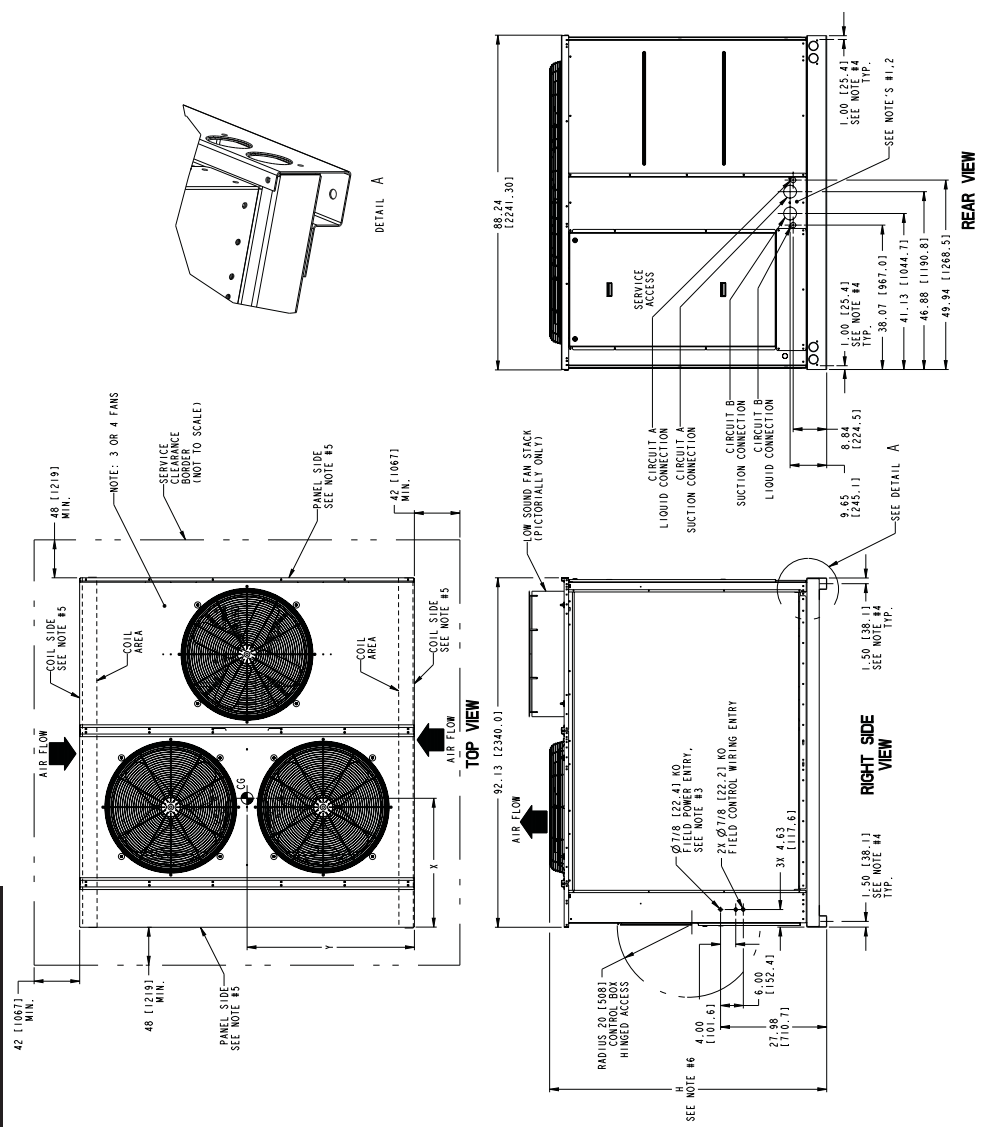


Fig. 7 — 38AP Unit Dimensions, Sizes 040-060

UNIT	STANDARD WEIGHT, LB (KG)	CENTER OF GRAVITY, IN. (MM)		HEIGHT, IN. (MM)		SERVICE VALVE CONNECTIONS, IN. (MM)			SERVICE VALVE LOCATIONS, CIRCUIT B ONLY, IN. (MM)		
		X	Y	H	SUCTION		LIQUID	SUCTION			
					CIRCUIT A	CIRCUIT B		S1	S2		
STANDARD											
38APS065	2333 (1058)	36.2 (919)	43.6 (1108)	73.0 (1854)	—	2 ⁵ / ₈ (67)	7/8 (22)	9.26 (235.2)	20.81 (528.6)		
38APD070	2450 (1111)	50.9 (1293)	40.6 (1031)	73.0 (1854)	1 ⁵ / ₈ (41)	2 ¹ / ₈ (54)	7/8 (22)	12.85 (326.4)	14.04 (356.6)		
LOW SOUND											
38APS065	2387 (1083)	36.2 (919)	43.6 (1108)	78.5 (1994)	—	2 ⁵ / ₈ (67)	7/8 (22)	9.26 (235.2)	20.81 (528.6)		
38APD070	2522 (1144)	50.9 (1293)	40.6 (1031)	78.5 (1994)	1 ⁵ / ₈ (41)	2 ¹ / ₈ (54)	7/8 (22)	12.85 (326.4)	14.04 (356.6)		

NOTES:

1. Be sure to use a wet rag to remove all valve cores before brazing field piping.
2. Do not cap or otherwise obstruct the liquid line temperature relief.
3. A 7/8 in. (22.4 mm) diameter hole is provided for locating field power wiring. Actual hole size required depends on field wire sizing.
4. A 0.524 in. (13.309 mm) diameter hole is used for mounting unit.
5. Unit must have clearances as follows:
Top - Do not restrict.
Panel Side - 48 in. (1219 mm) per NEC.
Sides and End - 6 ft. (1828.8 mm) from solid surface for airflow
Sides - 8 ft. (2438.4 mm) required for coil service area.
6. Unit height (dimension H) for the low sound fan option includes the fan stack.
7. Installation in a pit is not recommended.
8. Unit can be handled using crane. Refer to service installation instructions.
9. Dimensions shown in inches (mm).
10. Weight does not include unit refrigerant charge.

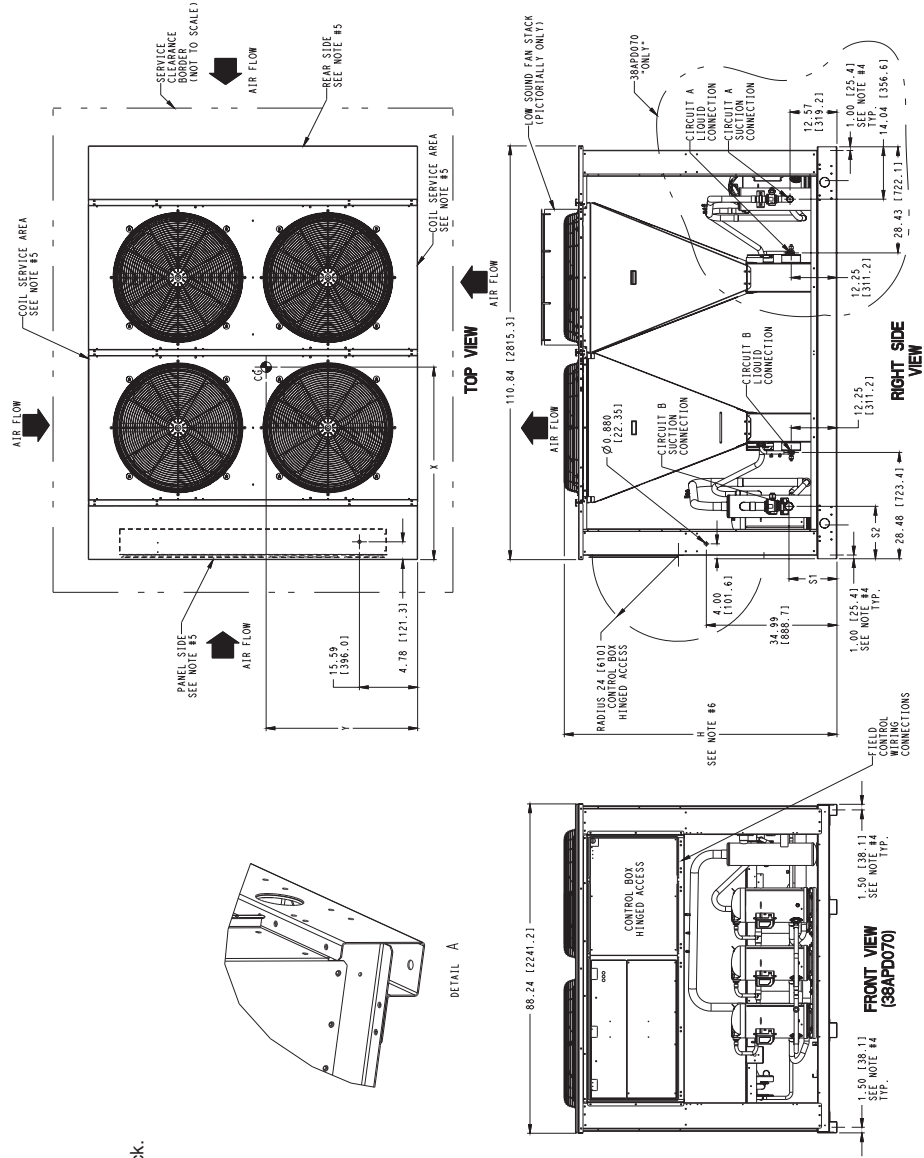
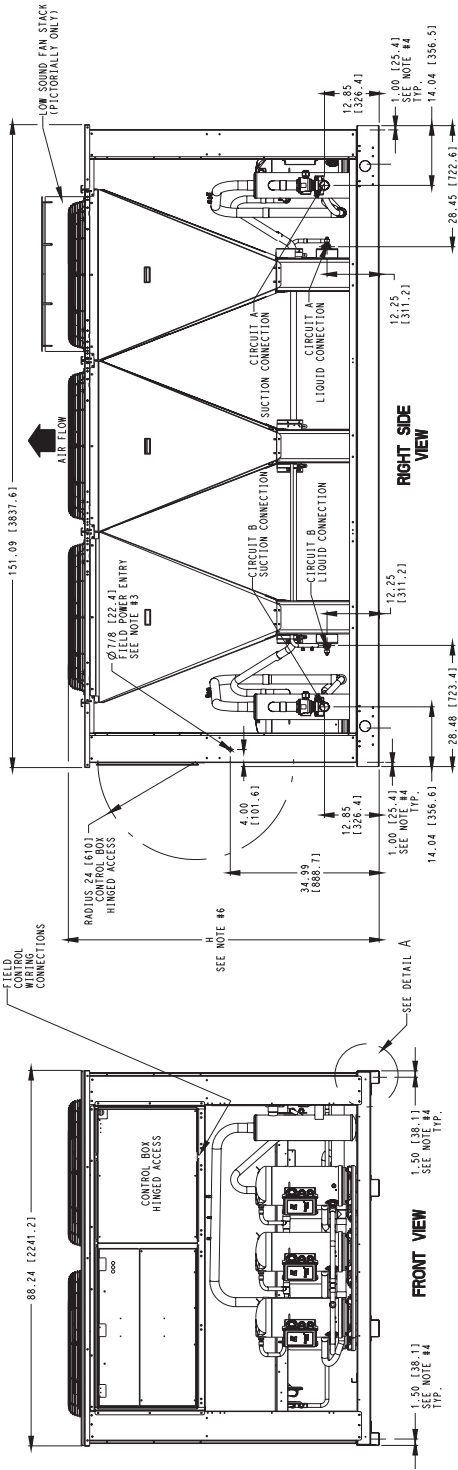
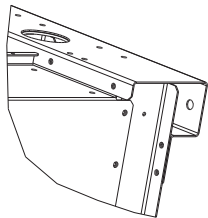
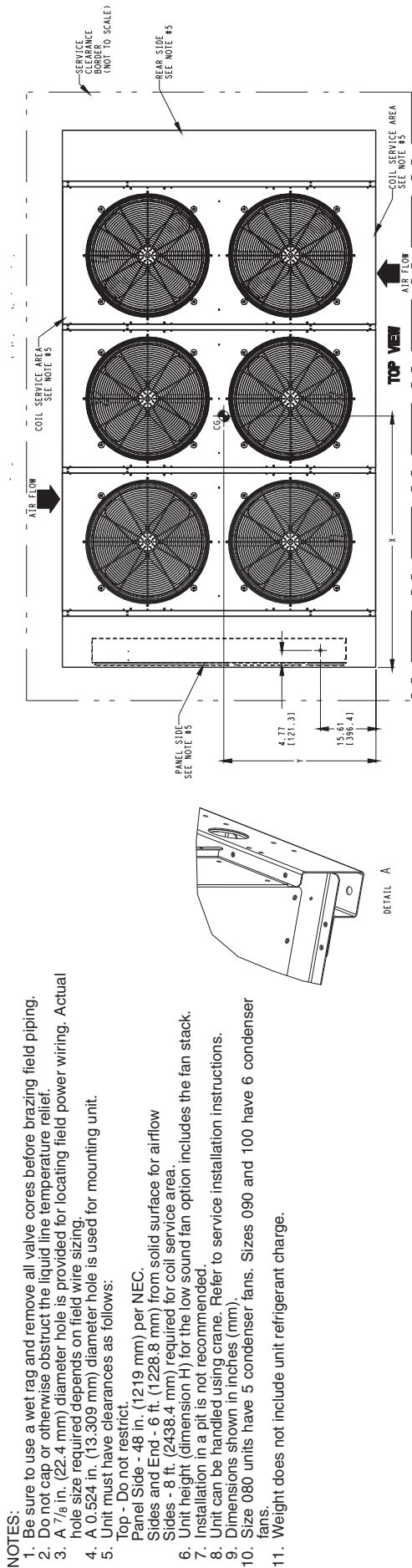


Fig. 8 — 38AP Unit Dimensions, Sizes 065 and 070

UNIT	STANDARD WEIGHT, LB (KG)	CENTER OF GRAVITY, IN. (MM)		HEIGHT, IN. (MM)	SERVICE VALVE CONNECTIONS, IN. (MM)		
		X	Y		SUCTION	CIRCUIT A	CIRCUIT B
38APD080	2610 (1184)	67.6 (1716)	40.2 (1020)	73.0 (1854)	1 5/8 (41)	2 1/8 (54)	7/8 (22)
38APD090	2835 (1286)	72.4 (1839)	43.3 (1099)	73.0 (1854)	2 1/8 (54)	2 1/8 (54)	7/8 (22)
38APD100	2844 (1290)	72.6 (1844)	43.3 (1099)	73.0 (1854)	2 1/8 (54)	2 1/8 (54)	7/8 (22)
38APD080	2700 (1225)	67.6 (1716)	40.2 (1020)	78.5 (1994)	1 5/8 (41)	2 1/8 (54)	7/8 (22)
38APD090	2943 (1335)	72.4 (1839)	43.3 (1099)	78.5 (1994)	2 1/8 (54)	2 1/8 (54)	7/8 (22)
38APD100	2952 (1339)	72.6 (1844)	43.3 (1099)	78.5 (1994)	2 1/8 (54)	2 1/8 (54)	7/8 (22)



- NOTES:**
1. Be sure to use a wet rag and remove all valve cores before brazing field piping.
 2. Do not cap or otherwise obstruct the liquid line temperature relief.
 3. A 7/8 in. (22.4 mm) diameter hole is provided for locating field power wiring. Actual hole size required depends on field wire sizing.
 4. A 0.524 in. (13.309 mm) diameter hole is used for mounting unit.
 5. Unit must have clearances as follows:
Top - Do not restrict.
Panel Side - 48 in. (1219 mm) per NEC.
Sides and End - 6 ft. (1228.8 mm) from solid surface for airflow.
Sides - 8 ft. (2438.4 mm) required for coil service area.
 6. Unit height (dimension H) for the low sound fan option includes the fan stack.
 7. Installation in a pit is not recommended.
 8. Unit can be handled using crane. Refer to service installation instructions.
 9. Dimensions shown in inches (mm).
 10. Size 080 units have 5 condenser fans. Sizes 090 and 100 have 6 condenser fans.
 11. Weight does not include unit refrigerant charge.

Fig. 9 — 38AP Unit Dimensions, Sizes 080-100

UNIT	STANDARD WEIGHT, LB (KG)	CENTER OF GRAVITY, IN. (MM)		HEIGHT, IN. (MM)	SERVICE VALVE CONNECTIONS, IN. (MM)				SERVICE VALVE LOCATIONS, CIRCUIT B ONLY, in. (mm)		
		X	Y		H	SUCTION		LIQUID		L1	L2
						CIRCUIT A	CIRCUIT B	CIRCUIT A	CIRCUIT B		
STANDARD											
38APD115	3211 (1457)	71.1 (1806)	44.4 (1128)	73.0 (1854)	2 1/8 (54)	2 5/8 (67)	7/8 (22)	7/8 (22)	28.48 (723)	12.25 (311)	
38APD130	3353 (1521)	70.9 (1801)	44.6 (1133)		2 1/8 (54)	2 5/8 (67)	7/8 (22)	1 1/8 (29)	28.36 (720)	11.97 (304)	
38APD115	3319 (1506)	71.1 (1806)	44.4 (1128)	78.5 (1994)	2 1/8 (54)	2 5/8 (67)	7/8 (22)	7/8 (22)	28.48 (723)	12.25 (311)	
38APD130	3461 (1570)	70.9 (1801)	44.6 (1133)		2 1/8 (54)	2 5/8 (67)	7/8 (22)	1 1/8 (29)	28.36 (720)	11.97 (304)	

NOTES:

1. Be sure to use a wet rag and remove all valve cores before brazing field piping.
2. Do not cap or otherwise obstruct the liquid line temperature relief.
3. A 7/8 in. (22.4 mm) diameter hole is provided for locating field power wiring. Actual hole size required depends on field wire sizing.
4. A 0.437 in. (11.1 mm) diameter hole is used for mounting unit.
5. Unit must have clearances as follows:
 Top - Do not restrict.
 Panel Side - 48 in. (1219 mm) per NEC.
 Sides and End - 6 ft. (1828.8 mm) from solid surface for airflow.
 Sides - 8 ft. (2438 mm) required for coil service area.
6. Unit height (dimension H) for the low sound fan option includes the fan stack.
7. Installation in a pit is not recommended.
8. Unit can be handled using crane. Refer to service installation instructions.
9. Dimensions shown in inches (mm).
10. Weight does not include unit refrigerant charge.
11. Size 115 units have 7 condenser fans. Size 130 units have 8 condenser fans.

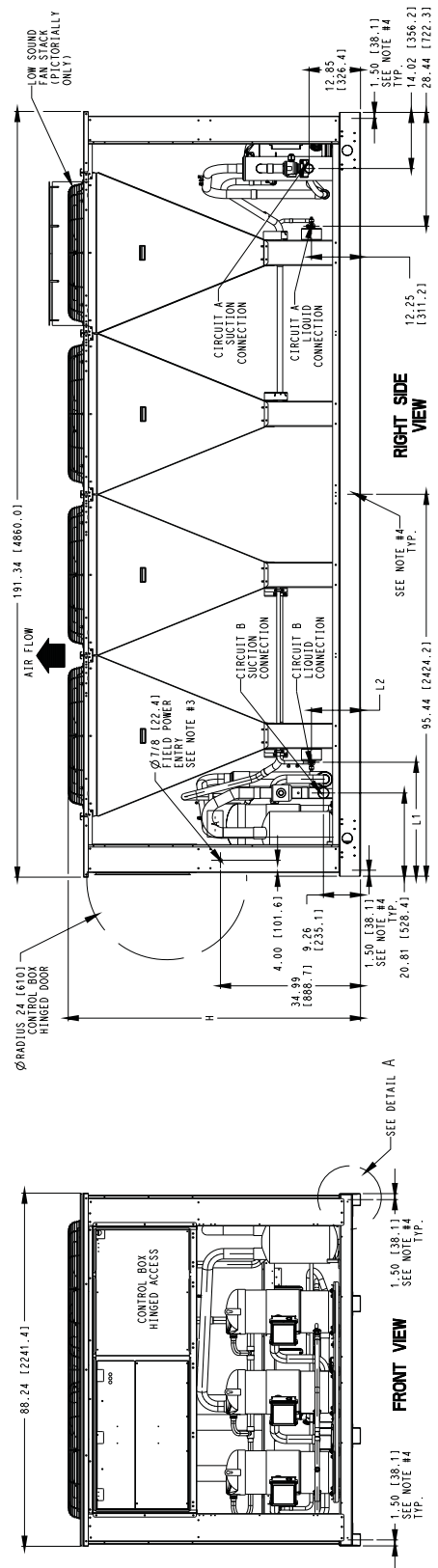
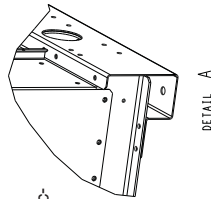
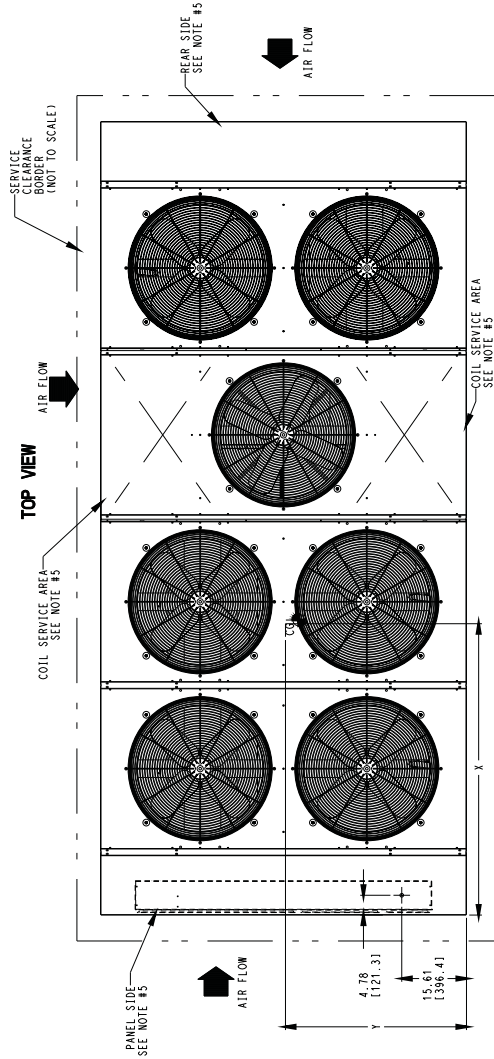
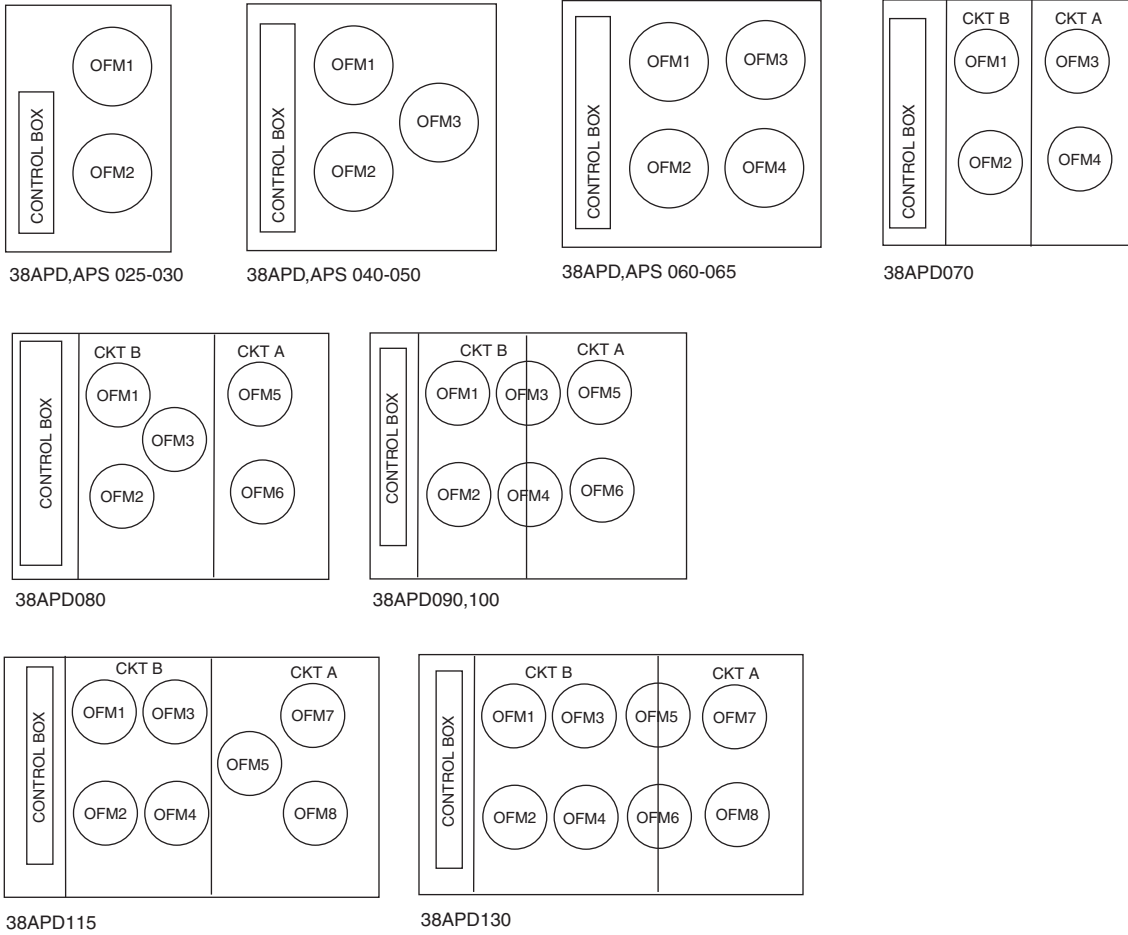
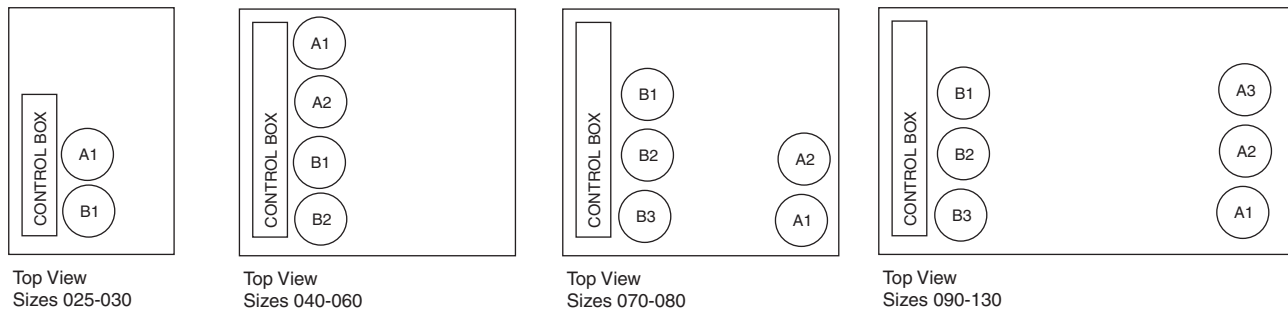


Fig. 10 — 38AP Unit Dimensions, Sizes 115, 130

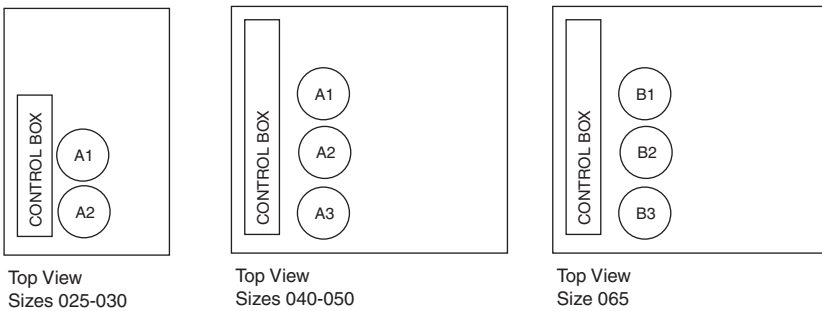
Outdoor Fan Layout (Top View)



Compressor Layout Dual Circuit, 38APD

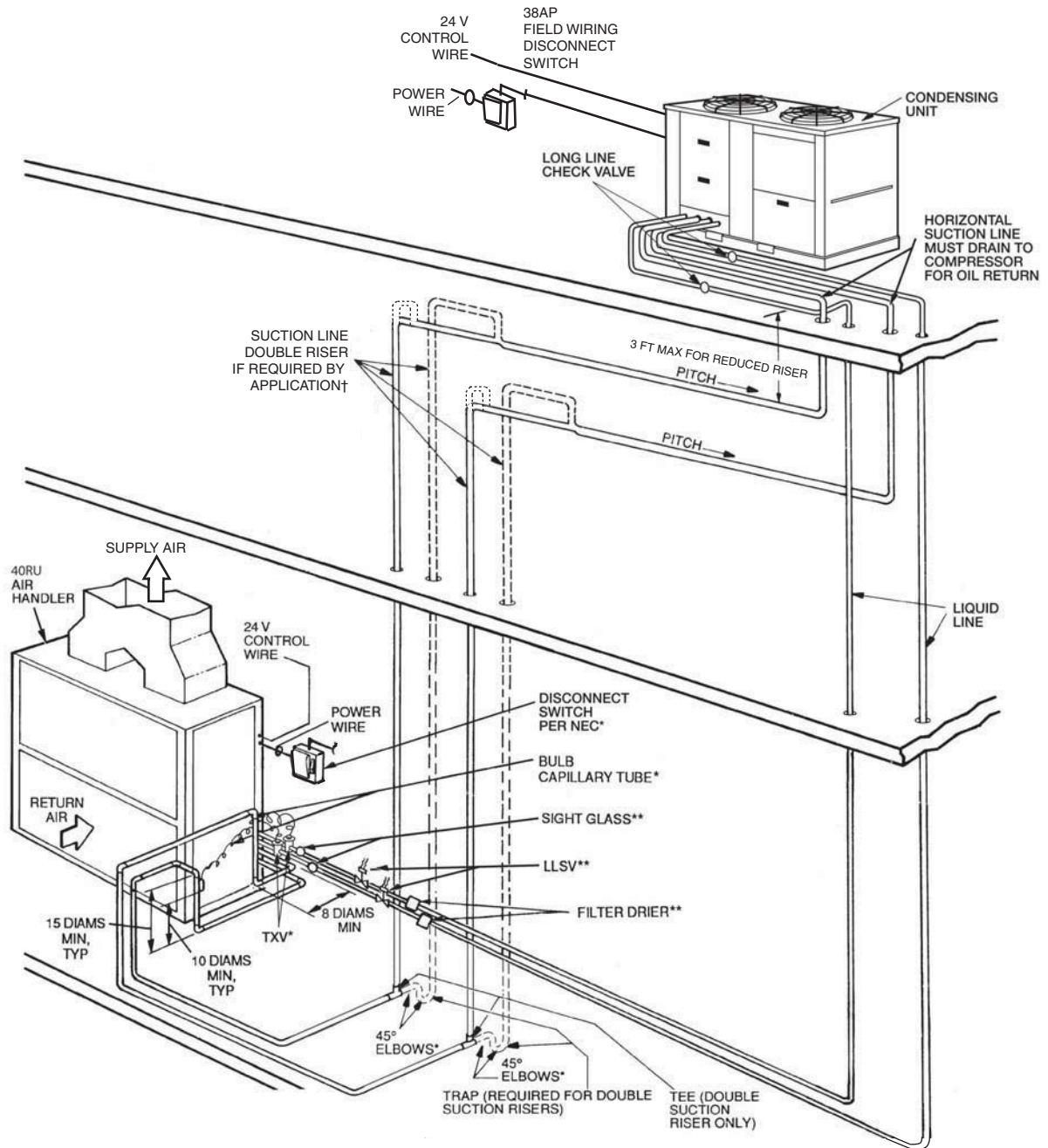


Compressor Layout Single Circuit, 38APS



LEGEND
A — Circuit 1 Compressor
B — Circuit 2 Compressor
OFM — Outdoor Fan

Fig. 11 — Outdoor Fan and Compressor Layout



LEGEND

- LLSV** — Liquid Line Solenoid Valve
- NEC** — National Electrical Code
- OAT** — Outside Air Temperature
- SST** — Saturated Suction Temperature
- TXV** — Thermostatic Expansion Valve
- Piping
- Double Riser Piping (if required)

*Field supplied.

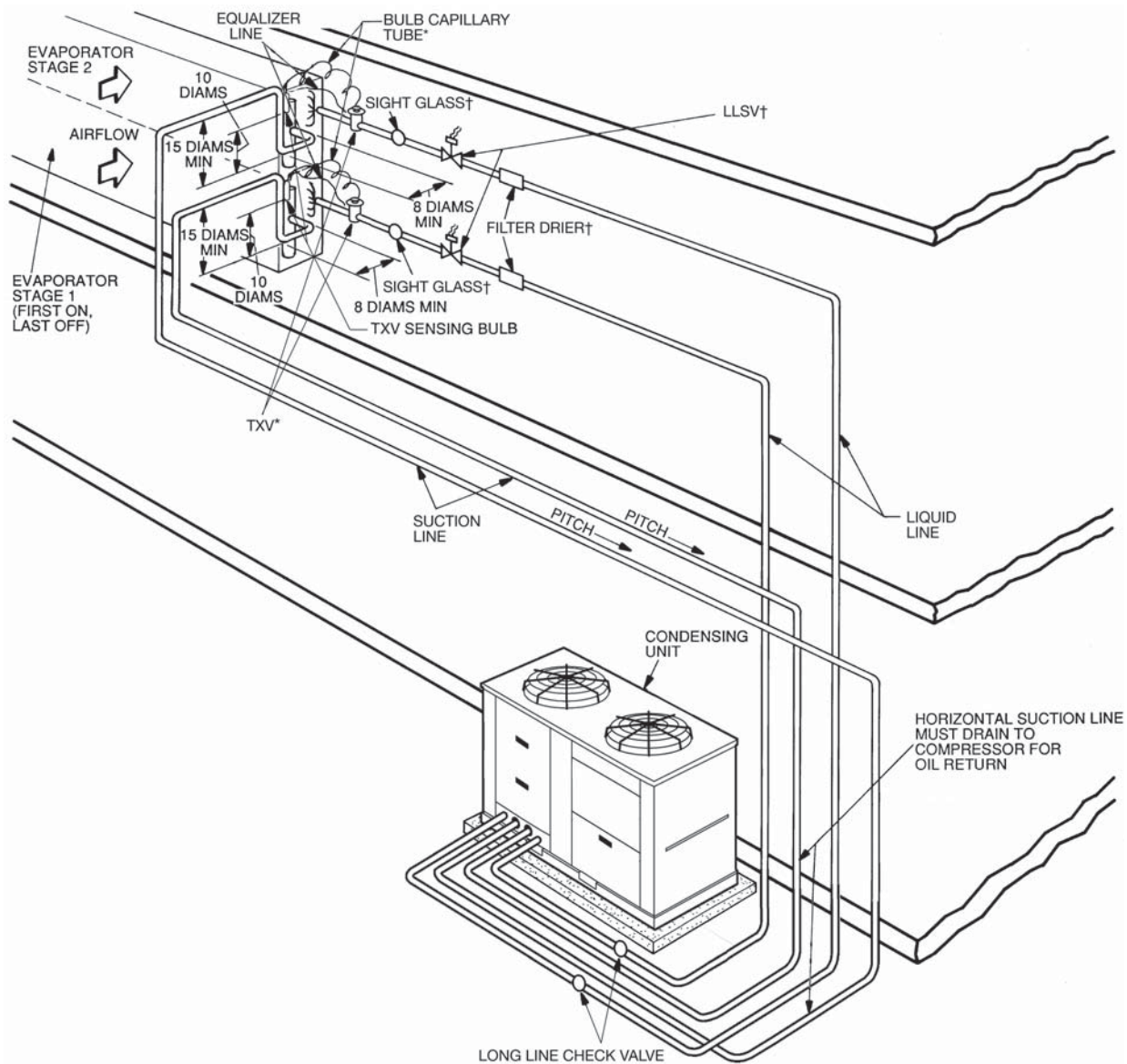
†If double suction riser is required for piping system, size reduced riser (3 ft [0.9 m] maximum) according to Fig. 14.

**Field supplied. See Table 5 for refrigerant specialties part numbers.

NOTES:

1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
2. All wiring must comply with the applicable local and national codes.
3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
4. Install field-supplied disconnect switch in accordance with all local and national electrical codes.
5. Liquid line solenoid valves may be required for charge management depending on unit size and evaporator size. Valves open with temperature differential, when OAT is less than SST.
6. Factory-supplied accumulator not shown.
7. Dual-circuit piping shown. Single-circuit piping is similar but would only have one suction line and one liquid line.
8. Inverted trap on single suction riser not required if suction line is pitched in direction of refrigerant flow. Inverted trap is required on all double suction risers.
9. A field-supplied (min. 5% up to 15%) bleed port TXV is required for every application.
10. Sight glass, LLSV, and filter drier are field supplied.
11. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m). For any 025-030 size dual-circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
12. Do not use soft solder.

Fig. 12 — 38AP Dual-Circuit Unit Rooftop Installation



LEGEND

- LLSV** — Liquid Line Solenoid Valve
- NEC** — National Electrical Code
- OAT** — Outside Air Temperature
- SST** — Saturated Suction Temperature
- TXV** — Thermostatic Expansion Valve
- Piping

*Field supplied.

†Field supplied. See Table 5 for refrigerant specialties part numbers.

NOTES:

1. All piping must follow standard refrigerant piping techniques. Refer to Carrier System Design Manual for details.
2. All wiring must comply with the applicable local and national codes.
3. Wiring and piping shown are general points-of-connection guides only and are not intended for, or to include all details for, a specific installation.
4. Install field-supplied disconnect switch in accordance with all local and national electrical codes.
5. Liquid line solenoid valves may be required for charge management depending on unit size and evaporator size. Valves open with temperature differential, when OAT is less than SST.
6. Factory-supplied accumulator not shown.
7. Dual-circuit piping shown. Single-circuit piping is similar but would only have one suction line and one liquid line.
8. A field-supplied (min. 5% up to 15%) bleed port TXV is required for every application.
9. Sight glass, LLSV, and filter drier are field supplied.
10. Long line length check valves are required for liquid line installation on all linear line length applications of more than 100 ft (30.5 m). For any 025-030 size dual-circuit unit application where evaporator is located higher than the condensing unit, check valves are required for linear line length above 55 ft (16.8 m).
11. Do not use soft solder.

Fig. 13 — 38AP Dual-Circuit Unit Ground Level Installation

Table 5 — Refrigerant Specialties Part Numbers

38APS UNIT SIZE	CIRCUIT A						
	TONS	LL SIZE (IN.)	LLSV	LLSV COIL 24-V, 50/60 HZ	SIGHT GLASS	FILTER DRIER	FILTER DRIER CORE
025	24.0	5/8 7/8	EF680028 EF680029	EF680032 EF680032	KM680005 KM680006	KH680002 KH680003	KH680008 KH680008
027	26.7	5/8 7/8	EF680028 EF680029	EF680032 EF680032	KM680005 KM680006	KH680002 KH680003	KH680008 KH680008
030	31.1	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680002 KH680003 KH680004	KH680008 KH680008 KH680008
040	39.8	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680003* KH680003 KH680004	KH680008 KH680008 KH680008
050	48.1	7/8 1 1/8	EF680029 EF680030	EF680032 EF680032	KM680006 KM680007	KH680003 KH680004	KH680008 KH680008
065	59.6	7/8 1 1/8 1 3/8	EF680029 EF680030 EF680038	EF680032 EF680032 EF680032	KM680006 KM680007 KM680007*	KH680003 KH680004 KH680012	KH680008 KH680008 KH680008

38APD UNIT SIZE	CIRCUIT A							CIRCUIT B						
	TONS	LL SIZE (IN.)	LLSV	LLSV COIL 24-V, 50/60 HZ	SIGHT GLASS	FILTER DRIER	FILTER DRIER CORE	TONS	LL SIZE (IN.)	LLSV	LLSV COIL 24-V, 50/60 HZ	SIGHT GLASS	FILTER DRIER	FILTER DRIER CORE
025	12.0	1/2 5/8	EF680031 EF680028	EF680032 EF680032	KM680004 KM680005	KH680001 KH680002	— KH680008	12.0	1/2 5/8	EF680031 EF680028	EF680032 EF680032	KM680004 KM680005	KH680001 KH680002	— KH680008
027	13.3	1/2 5/8	EF680031 EF680028	EF680032 EF680032	KM680004 KM680005	KH680001 KH680002	— KH680008	13.3	1/2 5/8	EF680031 EF680028	EF680032 EF680032	KM680004 KM680005	KH680001 KH680002	— KH680008
030	15.6	1/2 5/8 7/8	EF680031 EF680028 EF680029	EF680032 EF680032 EF680032	KM680004 KM680005 KM680006	KH680001 KH680002 KH680003	— KH680008 KH680008	15.6	1/2 5/8 7/8	EF680031 EF680028 EF680029	EF680032 EF680032 EF680032	KM680004 KM680005 KM680006	KH680001 KH680002 KH680003	— KH680008 KH680008
040	21.0	— 5/8 7/8	— EF680028 EF680029	— EF680032 EF680032	— KM680005 KM680006	— KH680002 KH680003	— KH680008 KH680008	18.2	1/2 5/8 7/8	— EF680028 EF680029 EF680029	— EF680032 EF680032 EF680032	— KM680004 KM680005 KM680006	— KH680001 KH680002 KH680003	— KH680008 KH680008
050	23.8	5/8 7/8	EF680028 EF680029	EF680032 EF680032	KM680005 KM680006	KH680002 KH680003	KH680008 KH680008	26.3	5/8 7/8	EF680028 EF680029	EF680032 EF680032	KM680005 KM680006	KH680002 KH680003	KH680008 KH680008
060	26.8	5/8 7/8	EF680028 —	EF680032 —	KM680005 —	KH680002 —	KH680008 —	31.5	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680002 KH680003 KH680004	KH680008 KH680008 KH680008
070	31.8	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680002 KH680003 KH680004	KH680008 KH680008 KH680008	35.5	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680002 KH680003 KH680004	KH680008 KH680008 KH680008
080	31.3	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680002 KH680003 KH680004	KH680008 KH680008 KH680008	46.7	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680003* KH680003 KH680004	KH680008 KH680008 KH680008
090	40.3	5/8 7/8 1 1/8	EF680028 EF680029 EF680030	EF680032 EF680032 EF680032	KM680005 KM680006 KM680007	KH680003* KH680003 KH680004	KH680008 KH680008 KH680008	47.1	— 7/8 1 1/8	— EF680029 EF680030	— EF680032 EF680032	— KM680006 KM680007	— KH680003 KH680004	— KH680008 KH680008
100	48.0	7/8 1 1/8	EF680029 EF680030	EF680032 EF680032	KM680006 KM680007	KH680003 KH680004	KH680008 KH680008	48.0	7/8 1 1/8	EF680029 EF680030	EF680032 EF680032	KM680006 KM680007	KH680003 KH680004	KH680008 KH680008
115	48.0	7/8 1 1/8	EF680029 EF680030	EF680032 EF680032	KM680006 KM680007	KH680003 KH680004	KH680008 KH680008	62.4	7/8 1 1/8 1 3/8	EF680029 EF680030 EF680038	EF680032 EF680032 EF680032	KM680006 KM680007 KM680007*	KH680003 KH680004 KH680012	KH680008 KH680008 KH680008
130	48.0	— 7/8 1 1/8	— EF680029 EF680030	— EF680032 EF680032	— KM680006 KM680007	— KH680003 KH680004	— KH680008 KH680008	77.1	— 7/8 1 1/8 1 3/8	— EF680029 EF680030 EF680038	— EF680032 EF680032 EF680032	— KM680006 KM680007 KM680007*	— KH680003 KH680004 KH680012	— KH680008 KH680008 KH680008

LEGEND

LL — Liquid Line
 LLSV — Liquid Line Solenoid Valve

*Bushing required to fit 5/8 in. line.

NOTES:

- Filter driers have been sized based upon 1 to 2 psig pressure drop in accordance with AHRI (Air-Conditioning, Heating and Refrigeration Institute) Standard 710.
- All pipe sizes are OD inches. Equivalent sizes in millimeters follow:

IN.	MM
-----	----

1/2	12.7
5/8	15.9
7/8	22.2
1 1/8	28.6
1 3/8	34.9

- Thermostatic expansion valve (TXV) is provided with all 40RU fan coil units. Contact your Carrier representative for appropriate TXV size.

Step 3 — Make Refrigerant Piping Connections

⚠ CAUTION

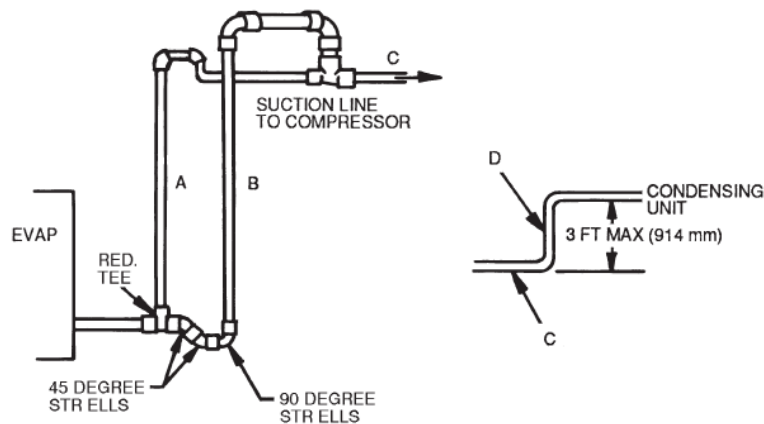
Do NOT bury refrigerant piping underground. Failure to comply could result in equipment damage.

The units have large suction lines to minimize friction losses. The units also have the ability to operate at low capacity. Because of these capabilities, use special care with suction piping and suction risers to ensure proper compressor oil return under all operating conditions. If the evaporator is above the condensing unit, the maximum allowable vertical separation between the condensing unit and the evaporator is 75 ft (22.9 m) for all units. Size suction lines in accordance with Table 6 (60 Hz) or Table 7 (50 Hz), and Fig. 14.

SIZE REFRIGERANT LINES — Consider the length of piping required between the condensing unit and indoor unit (evaporator), the amount of liquid lift, and compressor oil return. Suction and liquid lines should be sized in accordance with Table 6 (60 Hz) or Table 7 (50 Hz). *Double suction risers may be required* if condensing unit is located above the evaporator to assure proper oil return at minimum load operating conditions. See Fig. 14. Note the indoor unit installation instructions for additional information.

⚠ CAUTION

The field-supplied liquid line solenoid valve *must* be installed at the evaporator to avoid possible compressor damage during unit operation if the maximum allowable evaporator size is exceeded per Tables 8 and 9. See Fig. 15 (for 38APD025-130 dual-circuit units), or Fig. 16 (for 38APS025-065 single-circuit units).



LEGEND

- A** — Pipe A, Suction Riser, without Trap
- B** — Pipe B, Suction Riser with Trap
- C** — Suction Line to Condensing Unit
- D** — Pipe D, Suction Riser Short Lift
- RED.** — Reducer
- STR** — Street

NOTES:

1. Short riser, pipe D, is used when routing suction line to condensing unit connection. See table at right.
2. See Tables 6 and 7 for values of A, B, and C.

38AP UNIT SIZE	D PIPE DIAMETER					
	DUAL CIRCUIT				SINGLE CIRCUIT	
	CIRCUIT A		CIRCUIT B		IN.	MM
IN.	MM	IN.	MM			
025	1 ¹ / ₈	29	1 ¹ / ₈	29	1 ³ / ₈	35
027	1 ¹ / ₈	29	1 ¹ / ₈	29	1 ³ / ₈	35
030	1 ¹ / ₈	29	1 ¹ / ₈	29	1 ³ / ₈	35
040	1 ³ / ₈	35	1 ¹ / ₈	29	1 ⁵ / ₈	41
050	1 ³ / ₈	35	1 ³ / ₈	35	1 ⁵ / ₈	41
060	1 ³ / ₈	35	1 ⁵ / ₈	41	—	—
065	—	—	—	—	2 ¹ / ₈	54
070	1 ⁵ / ₈	41	1 ⁵ / ₈	41	—	—
080	1 ⁵ / ₈	41	1 ⁵ / ₈	41	—	—
090	1 ⁵ / ₈	41	1 ⁵ / ₈	41	—	—
100	1 ⁵ / ₈	41	1 ⁵ / ₈	41	—	—
115	1 ⁵ / ₈	41	2 ¹ / ₈	54	—	—
130	1 ⁵ / ₈	41	2 ¹ / ₈	54	—	—

Fig. 14 — Double Suction Riser Construction

Table 6 — 60 Hz Refrigerant Piping Requirements (cont)
38APS025-065 Single-Circuit Units Double Suction Riser (60 Hz)

60 Hz	38APS UNIT SIZE	CONN S,L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, ft (m)																							
			0-25 (0-7.6)			26-50 (7.9-15.2)			51-75 (15.5-22.9)			76-100 (23.1-30.5)			100-125 (30.8-38.1)			126-150 (38.4-45.7)			151-175 (46.0-53.3)			176-200 (53.6-61.0)		
			EQUIVALENT LENGTH, ft (m)*																							
			0-37 (0-11.3)			38-75 (11.6-22.8)			76-112 (22.2-34.1)			113-150 (34.4-45.7)			151-187 (46.0-57.0)			188-225 (57.3-68.6)			226-262 (68.9-79.9)			263-300 (80.1-91.5)		
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
025	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
027	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
030	1 5/8, 7/8	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
040	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	
050	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	
065	2 5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	—	—	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8

38APD025-130 Dual-Circuit Units Double Suction Riser (60 Hz)

60 Hz	38APD UNIT SIZE	CONN S,L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, ft (m)																							
			0-25 (0-7.6)			25-50 (7.6-15.2)			50-75 (15.2-22.9)			75-100 (22.9-30.5)			100-125 (30.5-38.1)			125-150 (38.1-45.7)			150-175 (45.7-53.3)			175-200 (53.3-61.0)		
			EQUIVALENT LENGTH, ft (m)*																							
			0-37.5 (0-11.4)			37.5-75 (11.4-22.8)			75-112.5 (22.8-34.3)			112.5-150 (34.3-45.7)			150-187.5 (45.7-57.1)			187.5-225 (57.1-68.5)			225-262.5 (68.5-79.9)			262.5-300 (68.5-91.5)		
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
025	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
027	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
030	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
040	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
050	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
060	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
070	Ckt A	1 5/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8
080	Ckt A	1 5/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
090	Ckt A	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
	Ckt B	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
100	Ckt A	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
	Ckt B	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
115	Ckt A	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
	Ckt B	2 5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	
130	Ckt A	2 1/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
	Ckt B	2 5/8, 1 1/8	—	—	—	—	—	—	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	3 1/8	1 5/8	2 5/8

LEGEND

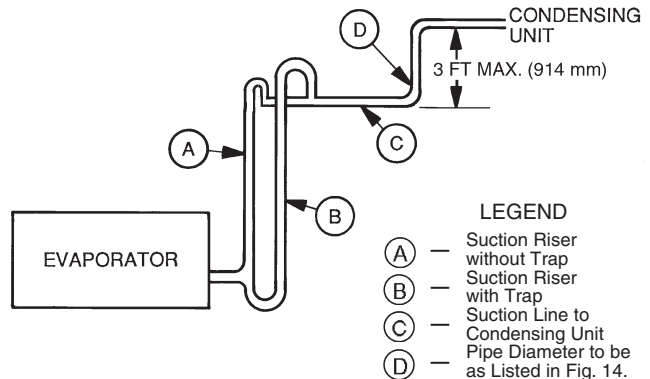
- Not Required
- Pipe A — Suction Riser without Trap
- Pipe B — Suction Riser with Trap
- Pipe C — Suction Line to Condensing Unit

*Equivalent Length shown is based on the Total Linear Length plus an additional 50% for fittings and valves. If application requires more than 50% additional losses for fittings and valves, calculate the equivalent length and find pipe size using the Equivalent Length columns.

NOTES:

1. Refer to the figure located to the right for suction line piping locations.
2. Suction and liquid line sizing is based on pressure drop equivalent to 2 F (1.1 C) at nominal rating conditions.
3. All pipe sizes are OD inches. Equivalent sizes in millimeters follow:

IN.	MM
1/2	12.7
5/8	15.9
7/8	22.2
1 1/8	28.6
1 3/8	34.9
1 5/8	41.3
2 1/8	54.0
2 5/8	66.7
3 1/8	79.4



DOUBLE SUCTION RISER AND REDUCED RISER LINE PIPING

Table 7 — 50 Hz Refrigerant Piping Requirements

38APS025-065 Single-Circuit Units (50 Hz)

50 Hz	38APS UNIT SIZE	CONN S,L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, FT (M)															
			0-25 (0-7.6)		26-50 (7.9-15.2)		51-75 (15.5-22.9)		76-100 (23.1-30.5)		101-125 (30.8-38.1)		126-150 (38.4-45.7)		151-175 (46.0-53.3)		176-200 (53.6-61.0)	
			EQUIVALENT LENGTH, FT (M)*															
			0-37 (0-11.3)		38-75 (11.6-22.8)		76-112 (23.2-34.1)		113-150 (34.4-45.7)		151-187 (46.0-57.0)		188-225 (57.3-68.6)		226-262 (68.9-79.9)		263-300 (80.1-91.5)	
L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	
	025	1 ⁵ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	027	1 ⁵ / ₈ , 5/8	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	030	1 ⁵ / ₈ , 7/8	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	040	2 ¹ / ₈ , 7/8	7/8	1 ³ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	050	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
	065	2 ⁵ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈

38APD025-130 Dual-Circuit Units (50 Hz)

50 Hz	38APD UNIT SIZE	CONN S,L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, FT (M)															
			0-25 (0-7.6)		26-50 (7.9-15.2)		51-75 (15.5-22.9)		76-100 (23.1-30.5)		101-125 (30.8-38.1)		126-150 (38.4-45.7)		151-175 (46.0-53.3)		176-200 (53.6-61.0)	
			EQUIVALENT LENGTH, FT (M)*															
			0-37 (0-11.3)		38-75 (11.6-22.8)		76-112 (23.2-34.1)		113-150 (34.4-45.7)		151-187 (46.0-57.0)		188-225 (57.3-68.6)		226-262 (68.9-79.9)		263-300 (80.1-91.5)	
L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	L	S	
025	Ckt A	1 ³ / ₈ , 5/8	1/2	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈
	Ckt B	1 ³ / ₈ , 5/8	1/2	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈
027	Ckt A	1 ³ / ₈ , 5/8	1/2	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈
	Ckt B	1 ³ / ₈ , 5/8	1/2	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈
030	Ckt A	1 ³ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈
	Ckt B	1 ³ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈
040	Ckt A	1 ⁵ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈
	Ckt B	1 ⁵ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈
050	Ckt A	1 ⁵ / ₈ , 5/8	5/8	1 ¹ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	Ckt B	1 ⁵ / ₈ , 5/8	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
060	Ckt A	1 ⁵ / ₈ , 5/8	5/8	1 ³ / ₈	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	Ckt B	1 ⁵ / ₈ , 5/8	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
070	Ckt A	1 ⁵ / ₈ , 7/8	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	Ckt B	2 ¹ / ₈ , 7/8	5/8	1 ³ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
080	Ckt A	1 ⁵ / ₈ , 7/8	5/8	1 ³ / ₈	5/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	Ckt B	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
090	Ckt A	2 ¹ / ₈ , 7/8	7/8	1 ³ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈
	Ckt B	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
100	Ckt A	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
	Ckt B	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
115	Ckt A	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
	Ckt B	2 ⁵ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
130	Ckt A	2 ¹ / ₈ , 7/8	7/8	1 ⁵ / ₈	7/8	1 ⁵ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈
	Ckt B	2 ⁵ / ₈ , 1 ¹ / ₈	7/8	2 ¹ / ₈	1 ¹ / ₈	2 ¹ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	2 ⁵ / ₈	1 ¹ / ₈	3 ¹ / ₈	1 ³ / ₈	3 ¹ / ₈

LEGEND

- L — Liquid Line
- S — Suction Line

3. All pipe sizes are OD inches. Equivalent sizes in millimeters follow:

IN.	MM
1/2	12.7
5/8	15.9
7/8	22.2
1 ¹ / ₈	28.6
1 ³ / ₈	34.9
1 ⁵ / ₈	41.3
2 ¹ / ₈	54.0
2 ⁵ / ₈	66.7
3 ¹ / ₈	79.4

*Equivalent Length shown is based on the Total Linear Length plus an additional 50% for fittings and valves. If application requires more than 50% additional losses for fittings and valves, calculate the equivalent length and find pipe size using the Equivalent Length columns.

NOTES:

1. Shading indicates double suction riser or reduced riser is required on circuit where suction gas flow is up.
2. Suction and liquid line sizing is based on pressure drop equivalent to 2 F (1.1 C) at nominal rating conditions.

Table 7 — 50 Hz Refrigerant Piping Requirements (cont)
38APS025-065 Single-Circuit Units Double Suction Riser (50 Hz)

50 Hz	38APS UNIT SIZE	CONN S.L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, ft (m)																							
			0-25 (0-7.6)			25-50 (7.6-15.2)			50-75 (15.2-22.9)			75-100 (22.9-30.5)			100-125 (30.5-38.1)			125-150 (38.1-45.7)			150-175 (45.7-53.3)			175-200 (53.3-61.0)		
			EQUIVALENT LENGTH, ft (m)*																							
			0-37.5 (0-11.4)			37.5-75 (11.4-22.8)			75-112.5 (22.8-34.3)			112.5-150 (34.3-45.7)			150-187.5 (45.7-57.1)			187.5-225 (57.1-68.5)			225-262.5 (68.5-79.9)			262.5-300 (68.5-91.5)		
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
025	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
027	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
030	1 5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
040	2 1/8, 7/8	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
050	2 1/8, 7/8	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
065	2 5/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	

38APD025-130 Dual-Circuit Units Double Suction Riser (50 Hz)

50 Hz	38APD UNIT SIZE	CONN S.L (IN.)	TOTAL LINEAR LENGTH OF INTERCONNECTING PIPE, ft (m)																							
			0-25 (0-7.6)			25-50 (7.6-15.2)			50-75 (15.2-22.9)			75-100 (22.9-30.5)			100-125 (30.5-38.1)			125-150 (38.1-45.7)			150-175 (45.7-53.3)			175-200 (53.3-61.0)		
			EQUIVALENT LENGTH, ft (m)*																							
			0-37.5 (0-11.4)			37.5-75 (11.4-22.8)			75-112.5 (22.8-34.3)			112.5-150 (34.3-45.7)			150-187.5 (45.7-57.1)			187.5-225 (57.1-68.5)			225-262.5 (68.5-79.9)			262.5-300 (68.5-91.5)		
A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C			
025	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
027	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
030	Ckt A	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Ckt B	1 3/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
040	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	7/8	1 3/8	1 5/8	7/8	1 3/8	1 5/8	7/8	1 3/8	1 5/8	7/8	1 3/8	1 5/8
050	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
060	Ckt A	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
	Ckt B	1 5/8, 5/8	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
070	Ckt A	1 5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
	Ckt B	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
080	Ckt A	1 5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8
	Ckt B	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
090	Ckt A	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
100	Ckt A	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
	Ckt B	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8
115	Ckt A	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	2 5/8, 7/8	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 5/8	2 1/8	2 5/8	1 3/8	1 5/8	2 5/8
130	Ckt A	2 1/8, 7/8	—	—	—	—	—	—	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8	1 3/8	1 5/8	2 1/8
	Ckt B	2 5/8, 1 1/8	—	—	—	—	—	—	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 1/8	2 5/8	1 5/8	2 5/8	3 1/8	1 5/8	2 5/8	3 1/8

LEGEND

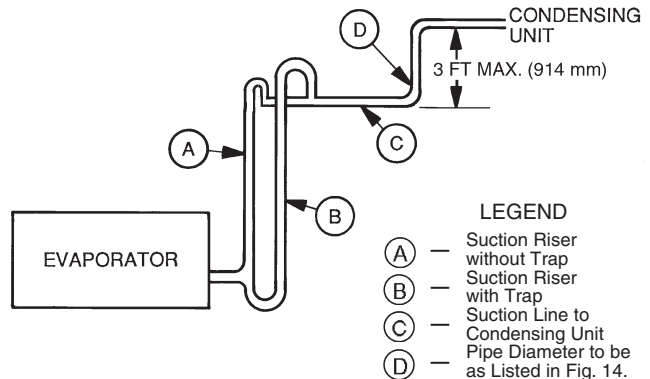
- Not Required
- Pipe A** — Suction Riser without Trap
- Pipe B** — Suction Riser with Trap
- Pipe C** — Suction Line to Condensing Unit

*Equivalent Length shown is based on the Total Linear Length plus an additional 50% for fittings and valves. If application requires more than 50% additional losses for fittings and valves, calculate the equivalent length and find pipe size using the Equivalent Length columns.

NOTES:

1. Refer to the figure located to the right for suction line piping locations.
2. Suction and liquid line sizing is based on pressure drop equivalent to 2 F (1.1 C) at nominal rating conditions.
3. All pipe sizes are OD inches. Equivalent sizes in millimeters follow:

IN.	MM
1/2	12.7
5/8	15.9
7/8	22.2
1 1/8	28.6
1 3/8	34.9
1 5/8	41.3
2 1/8	54.0
2 5/8	66.7
3 1/8	79.4



DOUBLE SUCTION RISER AND REDUCED RISER LINE PIPING

LIQUID LINE SOLENOID VALVE — Field-supplied liquid line solenoid valve(s) are used for refrigerant charge management and in some cases oil return. Generally, one solenoid valve for each refrigeration circuit is recommended and must be installed at the evaporator if coil surface area is exceeded per Tables 8 and 9. In some cases, evaporator coil tons/circuit is too low to properly entrain oil while the circuit is operating at less than full load. In these cases, additional solenoids may be required. Contact the evaporator coil manufacturer/supplier for information on circuit loading and the need for additional solenoids.

Install liquid line solenoid valve just ahead of the TXVs (thermostatic expansion valves) which will be mounted at the evaporator. See Fig. 15 (for 38APD025-130 dual-circuit units), or Fig. 16 (for 38APS025-065 single-circuit units). Refer to Table 5.

EVAPORATOR SUCTION HEADER PIPING — To ensure proper oil return, individual suction line connections at the evaporator coil must be sized properly. See manufacturer's recommendations.

THERMOSTATIC EXPANSION VALVES — All 38AP units must be installed with 5% up to 15% bleed port TXVs to ensure proper unit operation.

To achieve good mixing of the refrigerant leaving the evaporator suction header for proper sensing by the TXV bulb:

1. Install a minimum of two 90-degree elbows upstream of the TXV bulb location. See Fig. 16 for dual-circuit units and Fig. 17 for single-circuit units.
2. Locate the TXV bulb on a vertical riser, where possible. If a horizontal location is necessary, secure the bulb at approximately the 4 o'clock position.
3. Insulate TXV bulb to minimize external ambient effects.

If an oil return connection is located at the bottom of the evaporator suction header, tee-in this connection ahead of first mixing elbow. See Fig. 17 for dual-circuit units with face split coils, Fig. 18 for single-circuit units with face split coils, Fig. 19 for dual circuit units with row split split coils, or Fig. 20 for single circuit units with row split coils. When the compressor is below the evaporator, the riser at the evaporator should extend to the top of the evaporator section. After the riser is installed, the suction line can elbow down immediately. Refer to the evaporator product data for sizing information.

LIQUID LINE FILTER DRIER — *Installation of a field-supplied filter drier and sight glasses in each refrigerant circuit is required.* Select the filter drier for maximum unit capacity and minimum pressure drop. Figure 15 (for dual-circuit units) or Fig. 16 (for single-circuit units) shows required location of solenoid valves and recommended locations for the filter driers and sight glasses. Complete the refrigerant piping from the evaporator to the condenser before opening the liquid and suction lines at the condenser. Refer to Table 5.

⚠ CAUTION

For all units with liquid lines of 100 ft (30.5 m) or more or any 025-030 size dual-circuit unit application where evaporator is located higher than the condensing unit and liquid lines exceed 55 ft (16.8 m), a long line option kit must be installed to prevent compressor failure. The long line option kit must be mounted in the liquid line near the condensing unit. See Fig. 21.

LONG LINE APPLICATIONS — A long line option kit must be installed for:

1. Any 025-030 size dual-circuit unit where the evaporator is located higher than the condensing unit and the linear line length exceeds 55 ft (16.8 m).

2. Any size dual or single-circuit unit with linear line length of 100 ft (30.5 m) or more.

The kit consists of a liquid line check valve and a bypass check valve to prevent charge migration to compressor. The long line option kit must be mounted in the liquid line near the condensing unit. The kit may be mounted in any orientation, horizontally or vertically. See Fig. 21 for orientation and Fig. 12 for location. If a long line check valve assembly is used, a refrigerant access port downstream of the assembly must be provided to facilitate evacuation.

HOT GAS BYPASS — Hot gas bypass is not recommended. If hot gas bypass is used, it should be introduced before the evaporator.

FINAL CONNECTION AND LEAK TEST

⚠ CAUTION

The 38AP unit is shipped with a nitrogen holding charge. Use caution when relieving unit pressure to avoid possible equipment damage or personal injury.

Relieve the pressure caused by the nitrogen holding charge. Connect liquid line and suction line to field piping. Refer to Fig. 6-10 for circuit orientation.

IMPORTANT: Protect the liquid and suction service valves from the heat of brazing. Schrader valve cores must be removed from the liquid and suction service valves before brazing in field connection piping to avoid damage. Reinsert cores after brazing is completed.

The refrigerant system must not be opened and exposed to atmosphere for longer than 15 minutes. Connection and pump-down should be made as soon as possible to avoid acids forming in the compressor POE (polyolester) oils, which could damage the compressors.

Leak test the entire system by using soap bubbles and nitrogen or R-410A and an electronic leak detector.

Purge nitrogen or recover R-410A from system after completion of leak-checking procedure. Repair leak if one is found. When finished, evacuate and dehydrate system using the following method.

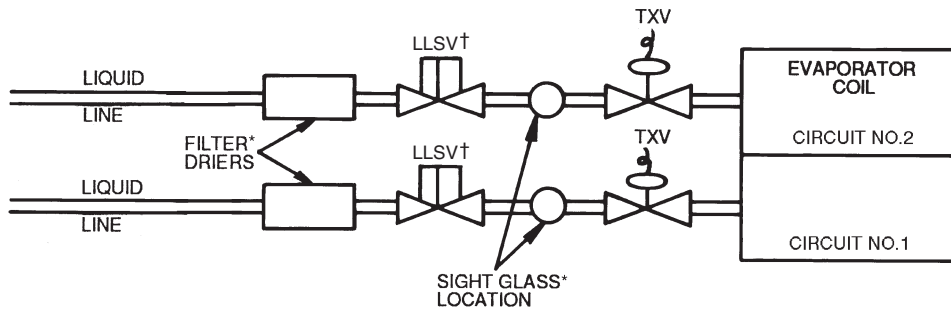
EVACUATION AND DEHYDRATION — Because the 38AP systems use polyolester oil, which can absorb moisture, it is important to minimize the amount of time that the system interior is left exposed to the atmosphere. Minimizing the exposure time of the oil to the atmosphere will minimize the amount of moisture that needs to be removed during evacuation.

Once all of the piping connections are complete, leak test the unit and then pull a deep dehydration vacuum. Connect the vacuum pump to the charging valve in the suction line and to the liquid line service valve. If a unit is installed with the long line check valve assembly, evacuation must be completed on both sides of the check valve to ensure proper evacuation. For best results, it is recommended that a vacuum of at least 500 microns (0.5 mm Hg) be obtained. Afterwards, to ensure that no moisture is present in the system, perform a standing vacuum-rise test.

With the unit in deep vacuum (500 microns or less), isolate the vacuum pump from the system. Observe the rate-of-rise of the vacuum in the system. If the vacuum rises by more than 50 microns in a 30-minute time period, then continue the dehydration process. Maintain a vacuum on the system until the standing vacuum requirement is met. This will ensure a dry system.

By following these evacuation and dehydration procedures, the amount of moisture present in the system will be minimized. It is required that liquid line filter driers be installed between the condenser(s) and the expansion devices to capture

any foreign debris and provide additional moisture removal capacity. Be sure to consider the pressure drop of the filter drier when determining piping requirements.

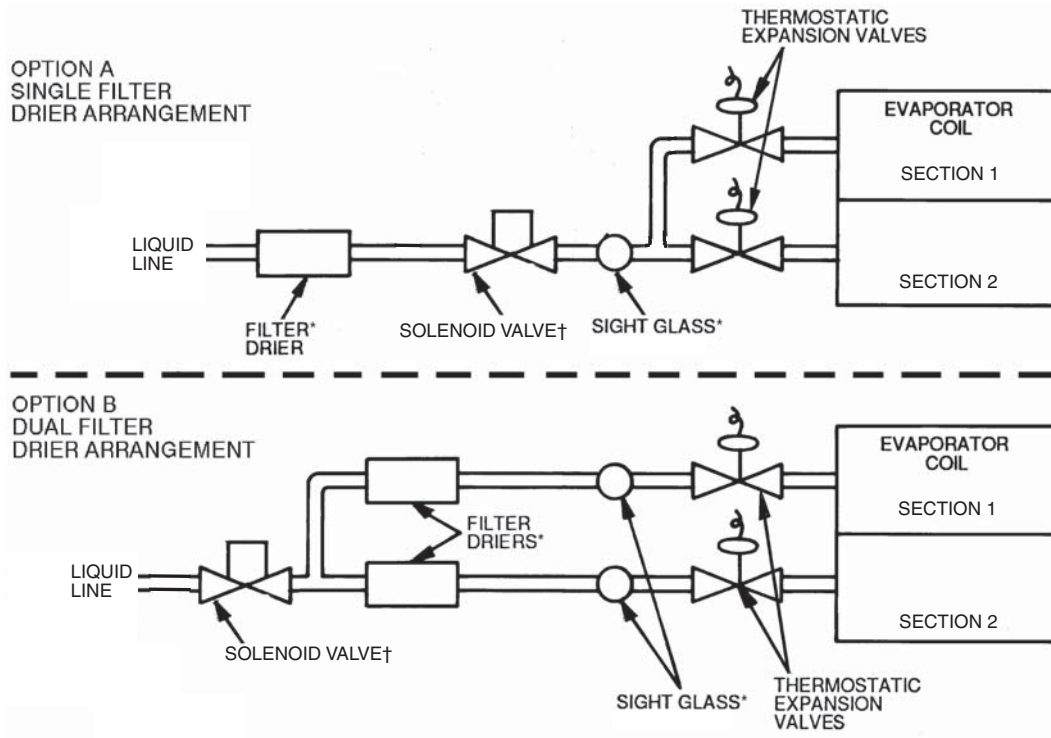


LEGEND

- LLSV** — Liquid Line Solenoid Valve
- TXV** — Thermostatic Expansion Valve

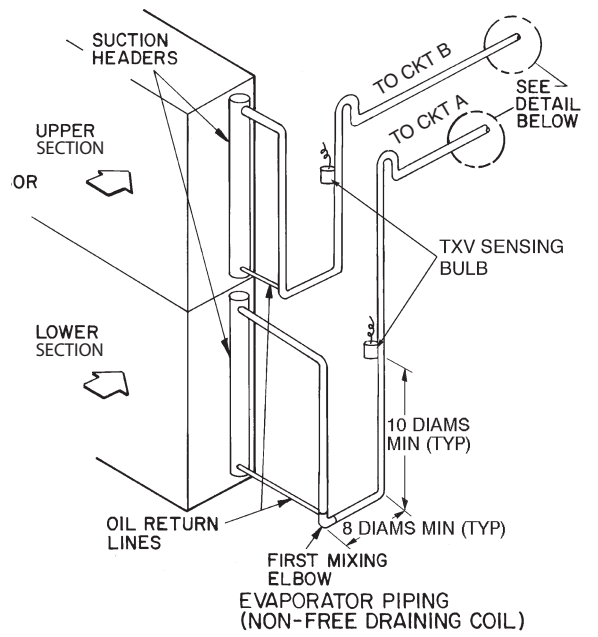
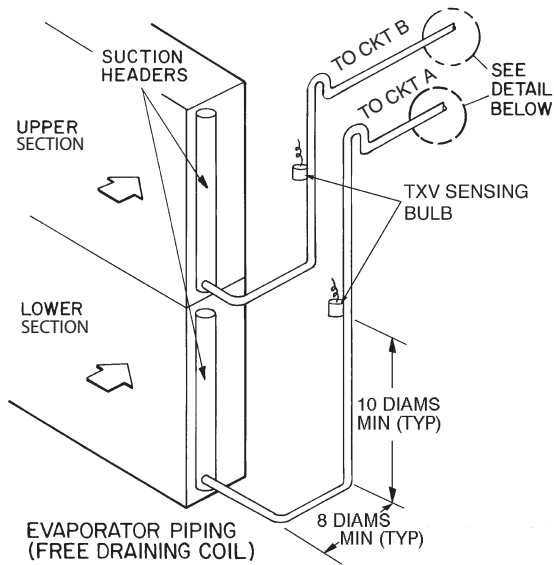
*Field-supplied.
†Field-supplied when required. See Tables 8 and 9.

Fig. 15 — Required Location of Solenoid Valves and Recommended Filter Drier and Sight Glass Locations for 38APD025-130 Dual-Circuit Units

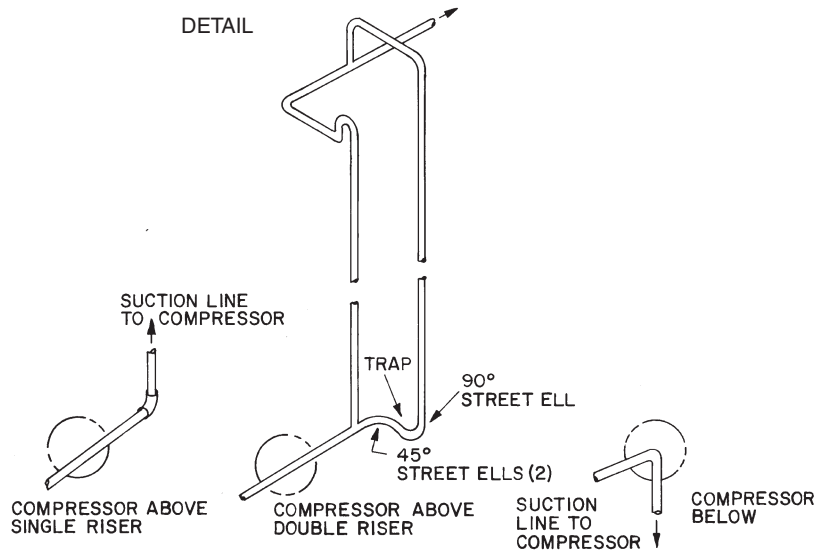


*Field-supplied.
†Field-supplied when required. See Tables 8 and 9.

Fig. 16 — Required Location of Solenoid Valves and Recommended Filter Drier and Sight Glass Locations for 38APS025-065 Single-Circuit Units



AIRFLOW



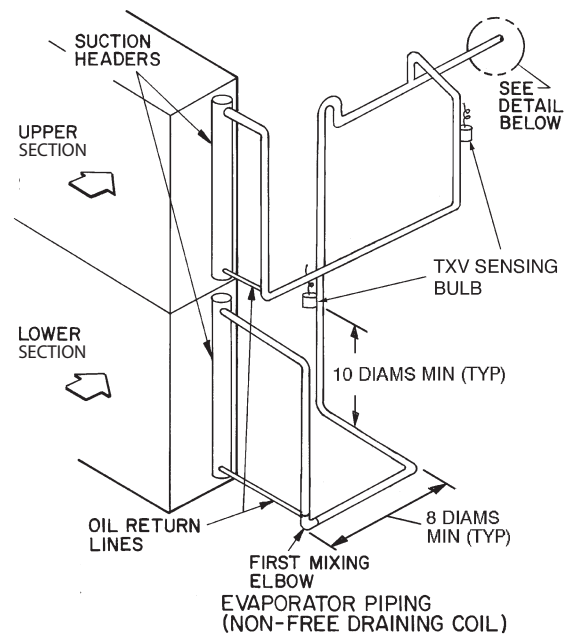
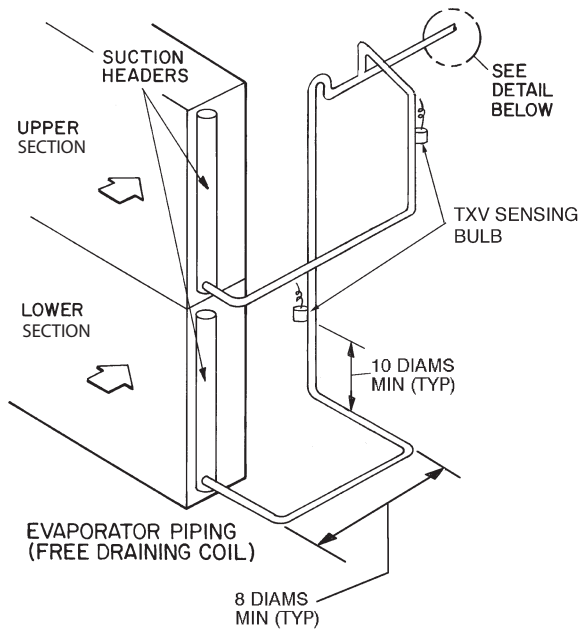
LEGEND

TXV — Thermostatic Expansion Valve
TYP — Typical

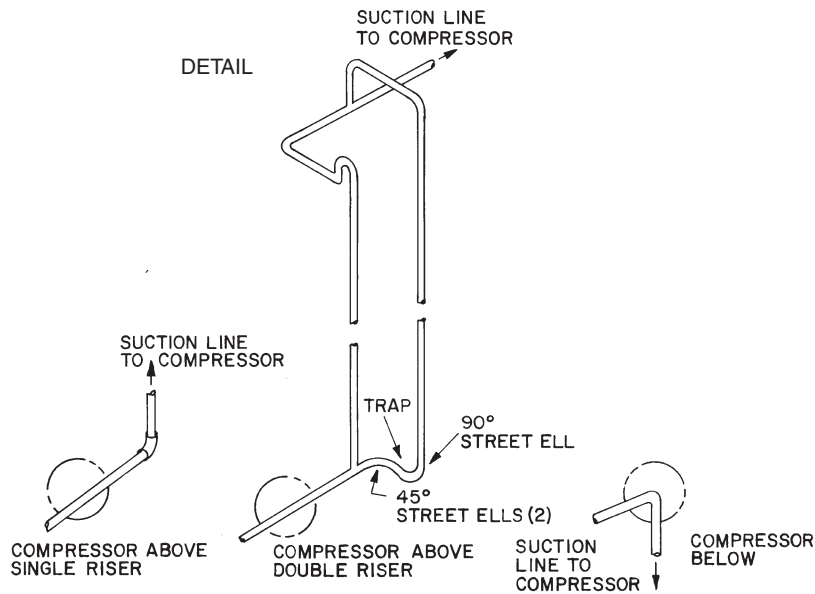
NOTES:

1. For units with single condensate pan, lower coil section is first on, last off.
2. To ensure oil return, individual suction line risers should be the same as the evaporator connection size, provided they do not exceed the 0-25 ft (0-7.5 m) piping recommendation.

Fig. 17 — Typical Piping Connections for Face Split Coils for 38APD025-130 Dual-Circuit Units



⇨ AIRFLOW



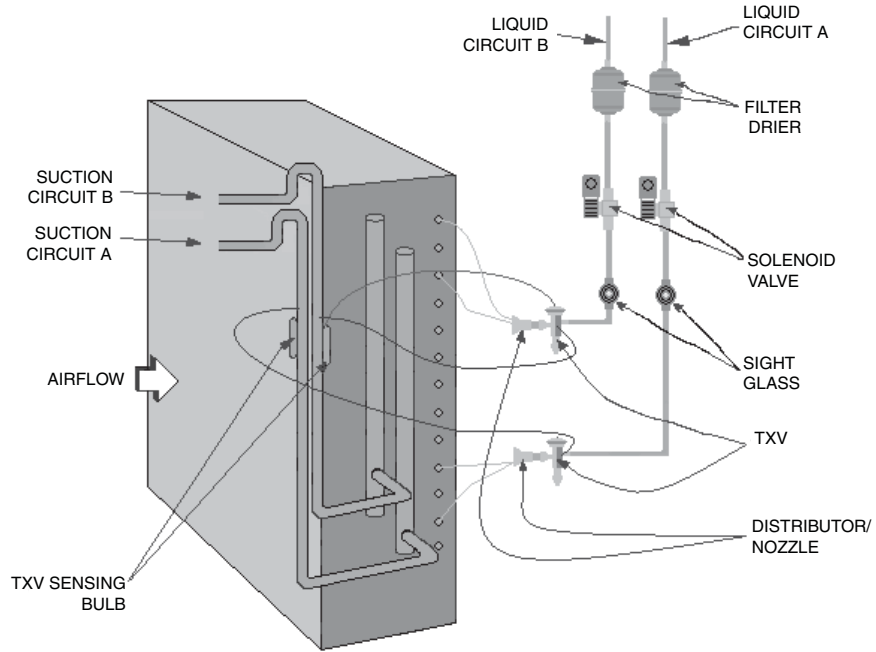
LEGEND

TXV — Thermostatic Expansion Valve
TYP — Typical

NOTES:

1. For units with single condensate pan, lower coil section is first on, last off.
2. To ensure oil return, individual suction line risers should be the same as the evaporator connection size, provided they do not exceed the 0-25 ft (0-7.5 m) piping recommendation.

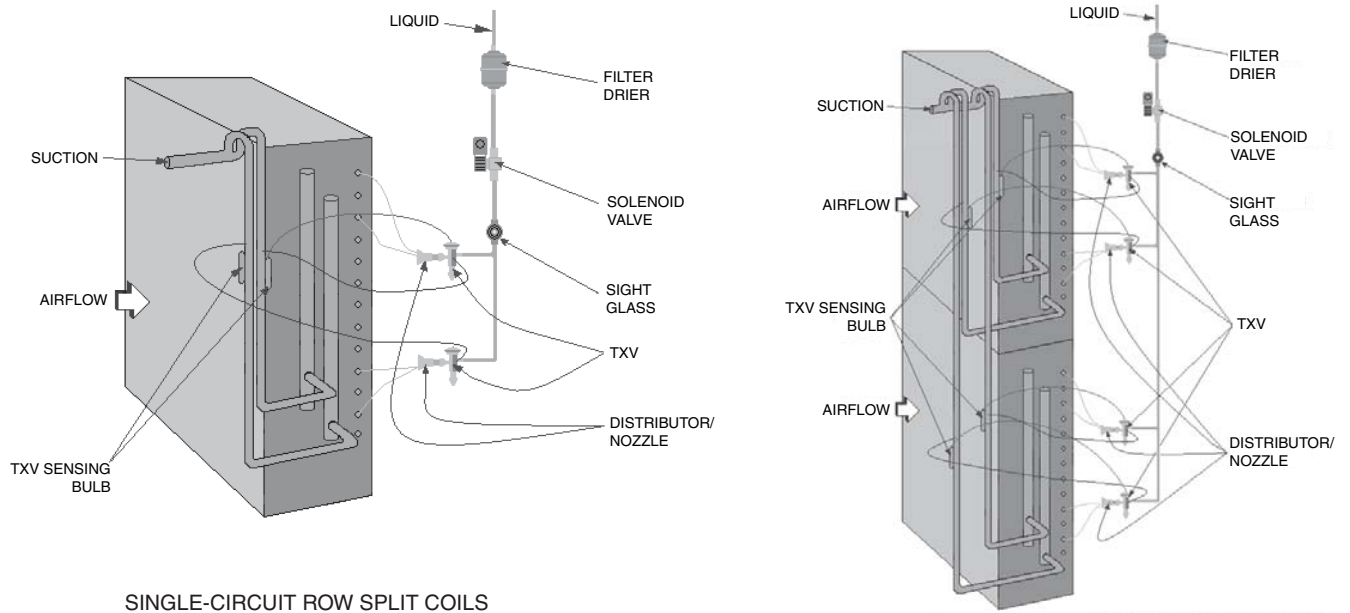
Fig. 18 — Typical Piping Connections for Face Split Coils for 38APS025-050 and 065 Single-Circuit Units



LEGEND
TXV — Thermostatic Expansion Valve

NOTE: Not all feeder tubes connected for clarity.

Fig. 19 — Typical Piping Connections for Row Split Coils for 38APD025-130 Dual-Circuit Units



SINGLE-CIRCUIT ROW SPLIT COILS

SINGLE-CIRCUIT ROW SPLIT COILS, 4 TXV

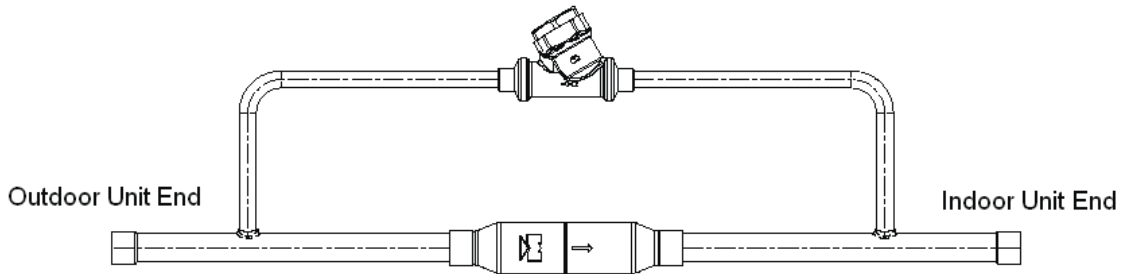
LEGEND
TXV — Thermostatic Expansion Valve

NOTE: Not all feeder tubes connected for clarity.

Fig. 20 — Typical Piping Connections for Row Split Coils for 38APS025-050 and 065 Single-Circuit Units

Table 8 — Requirements for Installation of Liquid Line Solenoid Valve (English)

38AP UNIT SIZE	CIRCUIT	MAXIMUM ALLOWABLE EVAPORATOR SURFACE AREA WITHOUT LIQUID LINE SOLENOID VALVE (sq ft)				
		4-Row, 1/2 in. Tube	6-Row, 1/2 in. Tube	8-Row, 1/2 in. Tube	3-Row, 3/8 in. Tube	4-Row, 3/8 in. Tube
025	Circuit A Dual Circuit	18.9	12.7	9.5	36.1	28.1
	Circuit B Dual Circuit	18.9	12.7	9.5	36.1	28.1
	Single Circuit	37.9	25.3	18.9	72.3	56.3
027	Circuit A Dual Circuit	21.7	14.5	10.9	41.4	32.3
	Circuit B Dual Circuit	25.6	17.1	12.8	48.9	38.1
	Single Circuit	47.3	31.6	23.7	90.3	70.4
030	Circuit A Dual Circuit	21.7	14.5	10.9	41.4	32.3
	Circuit B Dual Circuit	25.6	17.1	12.8	48.9	38.1
	Single Circuit	47.3	31.6	23.7	90.3	70.4
040	Circuit A Dual Circuit	47.3	31.6	23.7	—	—
	Circuit B Dual Circuit	47.3	31.6	23.7	—	—
	Single Circuit	94.7	63.3	47.3	—	—
050	Circuit A Dual Circuit	47.3	31.6	23.7	—	—
	Circuit B Dual Circuit	47.3	31.6	23.7	—	—
	Single Circuit	94.7	63.3	47.3	—	—
060	Circuit A Dual Circuit	47.3	31.6	23.7	—	—
	Circuit B Dual Circuit	47.3	31.6	23.7	—	—
065	Single Circuit	104.6	69.9	52.3	—	—
070	Circuit A Dual Circuit	69.7	46.6	34.9	—	—
	Circuit B Dual Circuit	69.7	46.6	34.9	—	—
080	Circuit A Dual Circuit	69.7	46.6	34.9	—	—
	Circuit B Dual Circuit	104.6	69.9	52.3	—	—
090	Circuit A Dual Circuit	104.6	69.9	52.3	—	—
	Circuit B Dual Circuit	104.6	69.9	52.3	—	—
100	Circuit A Dual Circuit	104.6	69.9	52.3	—	—
	Circuit B Dual Circuit	104.6	69.9	52.3	—	—
115	Circuit A Dual Circuit	104.6	69.9	52.3	—	—
	Circuit B Dual Circuit	139.5	93.2	69.7	—	—
130	Circuit A Dual Circuit	104.6	69.9	52.3	—	—
	Circuit B Dual Circuit	174.3	116.5	87.2	—	—



NOTE: Locate long line kit as close to the condensing unit as possible.

Fig. 21 — Long Line Option Kit Installation

Table 9 — Requirements for Installation of Liquid Line Solenoid Valve (SI)

38AP UNIT SIZE	CIRCUIT	MAXIMUM ALLOWABLE EVAPORATOR SURFACE AREA WITHOUT LIQUID LINE SOLENOID VALVE (sq m)				
		4-Row, 1/2 in. Tube	6-Row, 1/2 in. Tube	8-Row, 1/2 in. Tube	3-Row, 3/8 in. Tube	4-Row, 3/8 in. Tube
025	Circuit A Dual Circuit	1.8	1.2	0.9	3.4	2.6
	Circuit B Dual Circuit	1.8	1.2	0.9	3.4	2.6
	Single Circuit	3.5	2.4	1.8	6.7	5.2
027	Circuit A Dual Circuit	2.0	1.3	1.0	3.9	3.0
	Circuit B Dual Circuit	2.4	1.6	1.2	4.5	3.5
	Single Circuit	4.4	2.9	2.2	8.4	6.5
030	Circuit A Dual Circuit	2.0	1.3	1.0	3.9	3.0
	Circuit B Dual Circuit	2.4	1.6	1.2	4.5	3.5
	Single Circuit	4.4	2.9	2.2	8.4	6.5
040	Circuit A Dual Circuit	4.4	2.9	2.2	—	—
	Circuit B Dual Circuit	4.4	2.9	2.2	—	—
	Single Circuit	8.8	5.9	4.4	—	—
050	Circuit A Dual Circuit	4.4	2.9	2.2	—	—
	Circuit B Dual Circuit	4.4	2.9	2.2	—	—
	Single Circuit	8.8	5.9	4.4	—	—
060	Circuit A Dual Circuit	4.4	2.9	2.2	—	—
	Circuit B Dual Circuit	4.4	2.9	2.2	—	—
065	Single Circuit	9.7	6.5	4.9	—	—
070	Circuit A Dual Circuit	6.5	4.3	3.2	—	—
	Circuit B Dual Circuit	6.5	4.3	3.2	—	—
080	Circuit A Dual Circuit	6.5	4.3	3.2	—	—
	Circuit B Dual Circuit	9.7	6.5	4.9	—	—
090	Circuit A Dual Circuit	9.7	6.5	4.9	—	—
	Circuit B Dual Circuit	9.7	6.5	4.9	—	—
100	Circuit A Dual Circuit	9.7	6.5	4.9	—	—
	Circuit B Dual Circuit	9.7	6.5	4.9	—	—
115	Circuit A Dual Circuit	9.7	6.5	4.9	—	—
	Circuit B Dual Circuit	13.0	8.7	6.5	—	—
130	Circuit A Dual Circuit	9.7	6.5	4.9	—	—
	Circuit B Dual Circuit	16.2	10.8	8.1	—	—

Step 4 — Make Electrical Connections

⚠ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

IMPORTANT: When starting up this equipment for operation, be sure to check tightness of all electrical terminal connections, clamps, screws, etc., as they may have become loose during shipment. It is also advisable to re-tighten all electrical connections after equipment has been in operation and components have reacted to operating temperature.

POWER SUPPLY — The electrical characteristics of the available power supply must agree with the unit nameplate rating. Supply voltage must be within the limits shown in Tables 10-15. See Table 16 for incoming power options.

IMPORTANT: Operating unit on improper supply voltage or with excessive phase imbalance constitutes abuse and may adversely affect Carrier warranty.

⚠ CAUTION

Proper rotation of condenser fan(s) **MUST** be verified before compressors are started. Consult the Controls, Start-Up, Operation, Service and Troubleshooting guide provided with the 38AP units for correct procedure. Failure to comply could result in possible equipment damage.

POWER WIRING — All power wiring must comply with applicable local and national codes. Install field-supplied branch circuit fused disconnect per NEC (National Electrical Code, U.S.A) of a type that can be locked OFF or OPEN. Disconnect must be within sight and readily accessible from the unit in compliance with NEC Article 440-14.

General Wiring Notes:

1. The control circuit does NOT require a separate power source. Control circuit power is obtained by a step-down transformer from the main three-phase power supply. Be sure that the appropriate connection tap is connected on all transformers for the supply voltage.
2. A low-voltage terminal strip (LVT) is provided for field-wired control devices.

NOTE: The field-supplied disconnect should never be off except when unit is being serviced or is to be down for a prolonged period.

3. Power entry is at one end only.
4. All field power enters the unit through a hole located in the corner post of the unit or the bottom of the control box shelf. Refer to Fig. 22 for field power wiring details. Refer to Fig. 6-10 for exact location of field power entry. Be sure to seal entering power wire conduit per NEC requirements.
5. Terminals for field power supply are suitable only for copper conductors. Insulation must be rated 75 C minimum.
6. Units with high short circuit ratings and terminal block option require that specific fuses be applied to achieve this rating. Refer to Tables 14 and 15.

CONTROL POWER — Control power is obtained from the main power supply and does NOT require a separate source. A toggle switch (marked Emergency On-Off on the unit label diagram and by the switch) allows the control circuit to be manually disconnected when necessary. Crankcase heaters are in an operable state when this switch is in the Off position. All field control wiring must comply with applicable local and national codes.

IMPORTANT: For 208-v systems, the connection tap for all transformers must be changed. The factory default setting is for 230-v. Failure to connect to the proper tap may result in unreliable operation.

FIELD CONTROL WIRING — The standard unit control is microprocessor based, and supports multiple control configurations. See Fig. 23 for MAT/RAT (mixed air temperature/return air temperature sensor) and SAT (supply air temperature sensor) layout. Figures 24-30 show specific control field wiring schemes, depending on unit configuration and desired control requirements. See Controls, Start-Up, Operation, Service, and Troubleshooting guide for specific control method requirements.

If the installer is extending sensor cables, plenum-rated, 18 or 20 AWG (American Wire Gage), twisted pair cable should be used. For a space temperature sensor with set point adjustment, use plenum-rated, 20 AWG, three-conductor, twisted, shielded cable. The standard CCN (Carrier Comfort Network®) communication cable is acceptable for this purpose. The wire is suitable for distances of up to 500 ft.

IMPORTANT: Do not run sensor or relay wires in the same conduit or raceway with Class 1 AC service wiring.

Do not abrade, cut, or nick the outer jacket of the cable. Do not pull or draw cable with a force that may harm the physical or electrical properties. Avoid splices in any control wiring. Refer to Controls, Start-Up, Operation, Service, and Troubleshooting guide for additional information.

Control options include the following:

Variable Air Volume (VAV) (C.TYP = 1) — This configuration is the standard VAV option. With this control type, the MBB (Main Base Board) capacity control routine stages compressor capacity to attempt to meet the current Control Point. This option requires a supply air sensor and a mixed air/return air sensor (Part No. 33ZCSENSAT). See Fig. 24.

Two-Stage Thermostat, Multi-Step Control (C.TYP=3) — This configuration allows the MBB to monitor the thermostat inputs to make a determination of supply air temperature. Unlike traditional 2-stage thermostat control, the unit is allowed to perform VAV-style operation using multiple stages of

cooling capacity to attempt to meet the current Control Point. This control type also requires a supply air temperature sensor and return air temperature sensor (Part No. 33ZCSENSAT), as well as the 2-stage thermostat (Part No. 33CS2PP2S-01). See Fig. 25.

Two-Stage Thermostat (C.TYP = 4) — With this constant-volume option, the MBB monitors the thermostat inputs to make capacity stage decisions. If Y1 input is closed, no more than 50% of the circuit capacity will be energized. If Y2 is closed, 100% of the circuit capacity will be energized for that circuit and air handler. Y1 closure is not required for 100% capacity. This control scheme cannot be used with digital compressors. See Fig. 26.

Space Sensor Control (C.TYP=5) — This option will allow the MBB to monitor the space temperature sensor and compare it to the Space Temperature Set Point to make a capacity determination. The unit is allowed to use multiple stages of cooling control and perform VAV-style operation in an attempt to meet the current Control Point. The control requires installation of supply air temperature sensor and mixed air/return air temperature sensor (Part No. 33ZCSENSAT), and one of the following space temperature sensors:

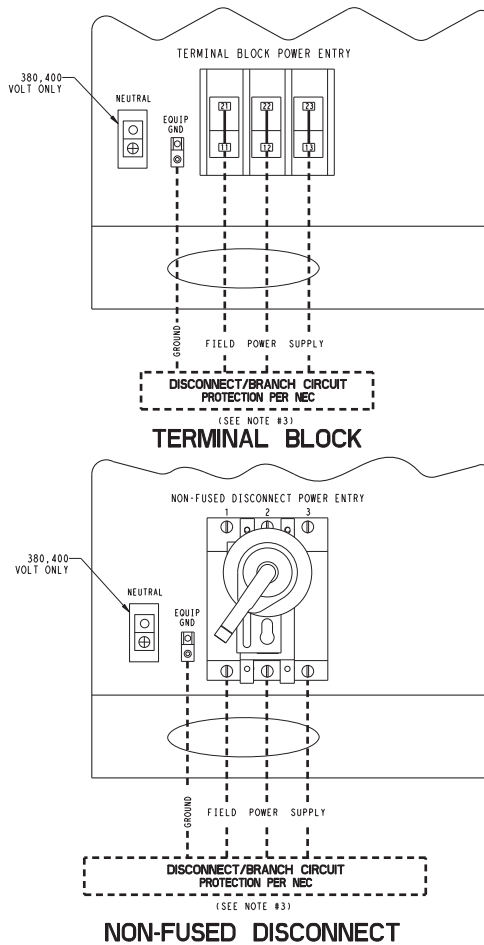
- Space temperature sensor with occupancy override button (Part No. 33ZCT55SPT)
- Space temperature sensor with occupancy override button and set point adjustment slidebar (Part No. 33ZCT56SPT)
- Space temperature sensor with occupancy override button, set point adjustment slidebar, and LCD (liquid crystal display) display (Part No. 33ZCT59SPT)

See Fig. 27.

Percent Capacity (C.TYP=7) — This configuration allows the MBB to monitor the 4 to 20 mA cooling demand signal input to the energy management module and translate this into desired percent capacity for the unit. It is compatible with both standard and digital compressors, and is intended for direct capacity control by a third-party control system. An energy management module and 4 to 20 mA generator are required. See Fig. 28.

Dual Thermostat (C.TYP=8) — This configuration allows for the connection and control of a single 38APD unit to two separate air handlers. The configuration allows the MBB to monitor the thermostat inputs from each of two separate thermostats to make a determination of mode and capacity for each circuit of the 38APD unit. With this control scheme, thermostat T1, Y1 and Y2 contacts operate circuit A. Thermostat T2, Y3 and Y4 contacts operate circuit B. This control option cannot be used with units with digital compressors or 38APS units. It requires an energy management module, two 2-stage thermostats (one for each air handler), and 4 SPST relays for thermostat input. See Fig. 29.

Variable Air Volume Setpoint (C.TYP=9) — With this configuration, the 38AP unit operates as a VAV unit and controls unit capacity in an attempt to meet a field-supplied 4 to 20 mA supply air temperature request, by staging compressors to attempt to meet the current Control Point. A field-supplied 4 to 20 mA signal determines the Active Setpoint. The Control Point is the Active Setpoint adjusted for any temperature reset that is applied. This control type requires the energy management module, a 4 to 20 mA generator, supply air sensor, and mixed air/return air sensor. It is compatible with both standard and digital compressors, and is used when variable supply air set points are required and determined by a third-party Building Management System. See Fig. 30.



LEGEND

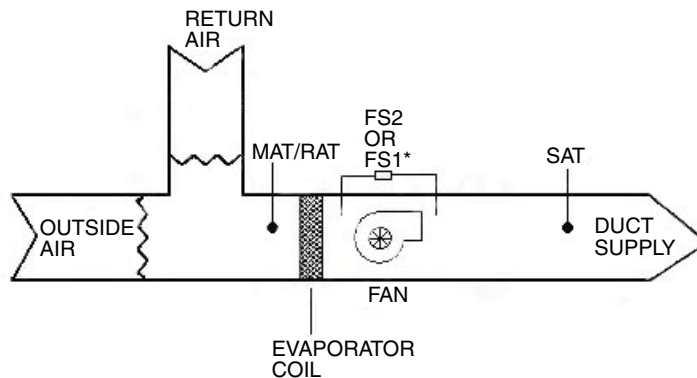
- EQUIP GND** — Equipment Ground
- NEC** — National Electrical Code

NOTES:

1. Factory wiring is in accordance with UL 1995 standards. Field modifications or additions must be in compliance with all applicable codes.
2. All units or modules except sizes 115,130 have single point primary power connection. Main power must be supplied from a field or factory-supplied disconnect. Unit sizes 115 and 130 have an option for dual point power.
3. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA (minimum circuit amps) up to 175 amps is 14 AWG (American Wire Gage) to 2/0.

- b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
- c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
- d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
- e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.
4. Refer to certified dimensional drawings for exact locations of the main power and control power entrance locations.
5. All discrete inputs are 24 vac.

Fig. 22 — Field Power Wiring

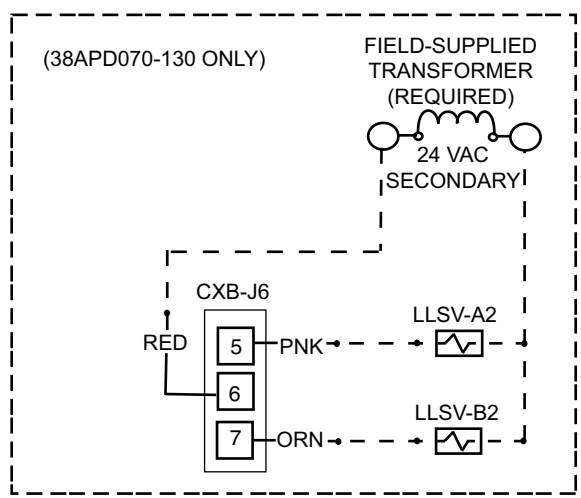
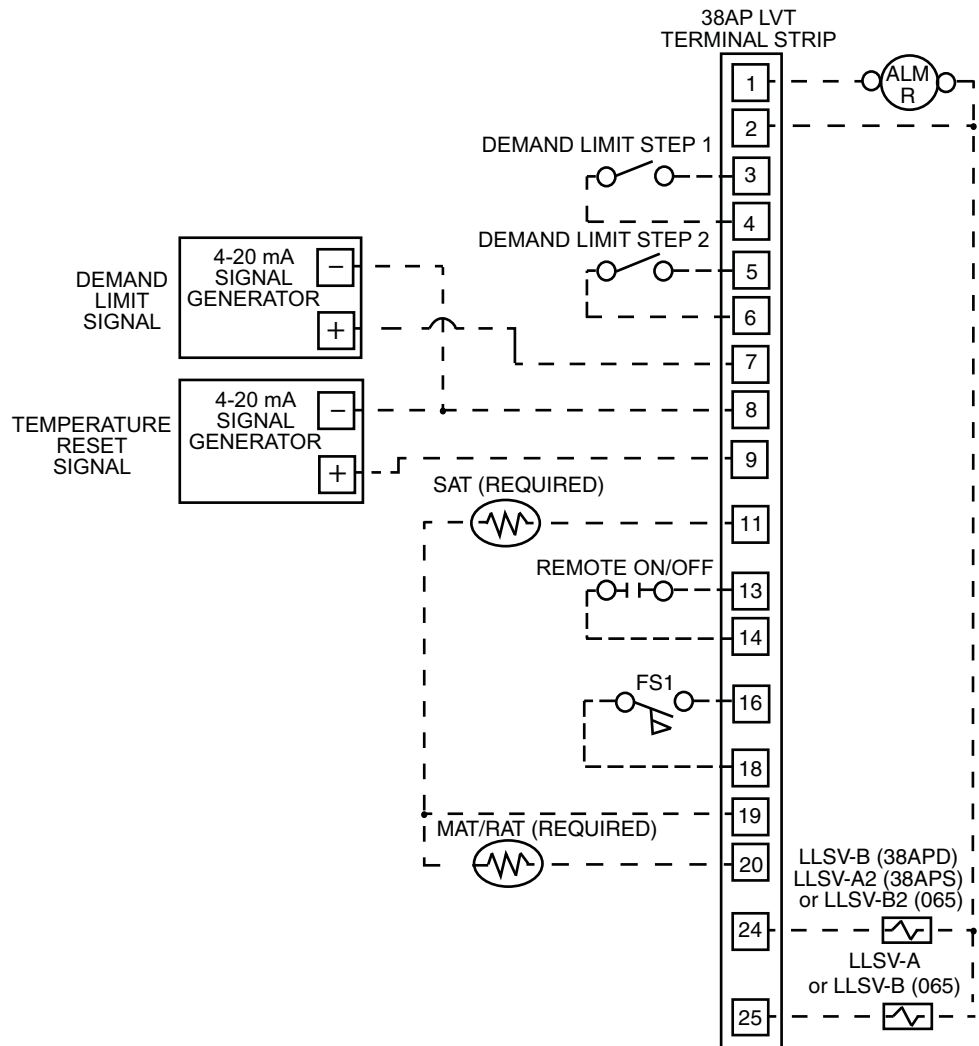


LEGEND

- FS1** — Fan Status Switch (24-v)
- MAT** — Mixed Air Temperature Sensor
- RAT** — Return Air Temperature Sensor
- SAT** — Supply Air Temperature Sensor

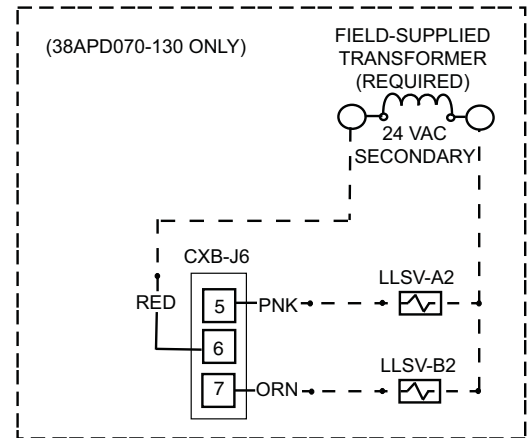
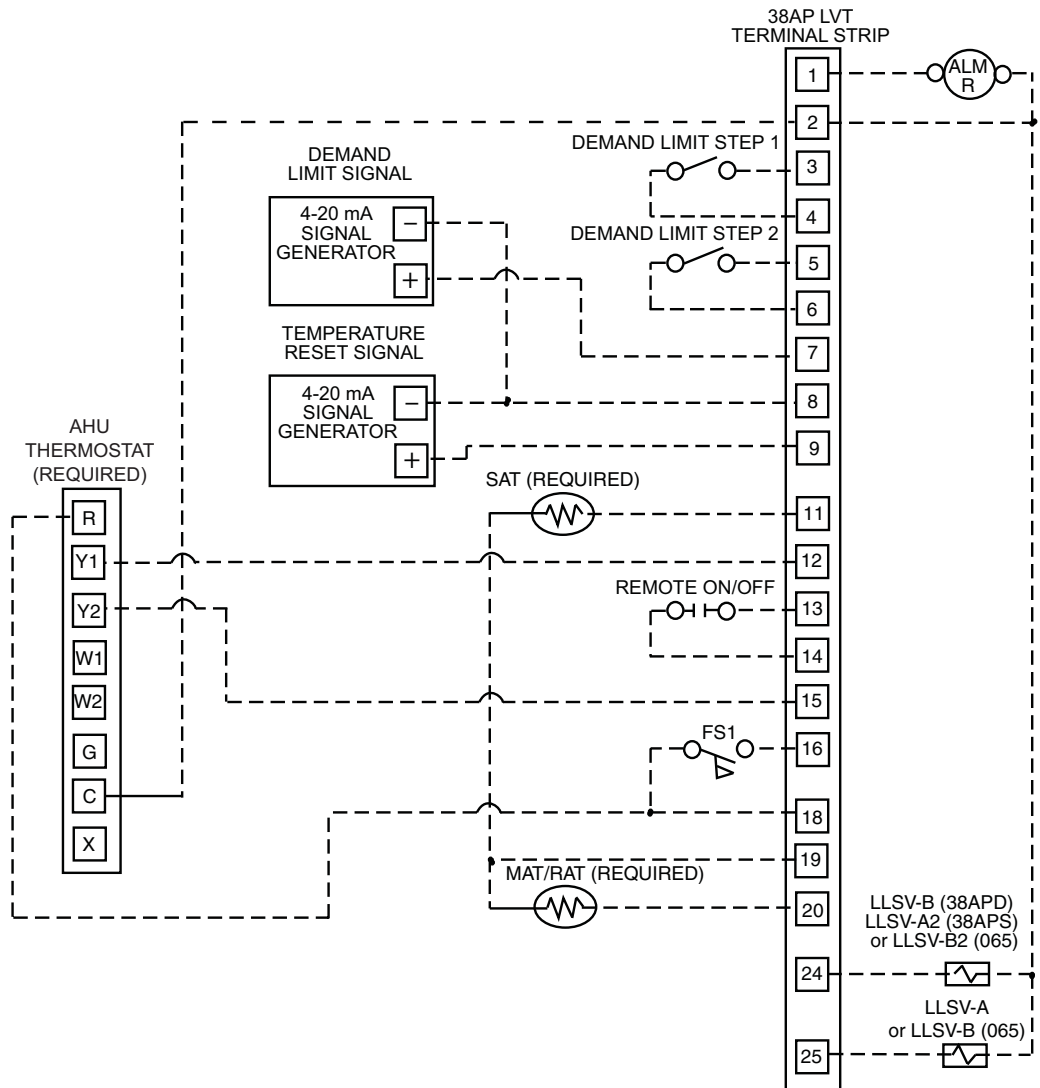
*FS1 can be pressure differential switch (shown), motor current detection, or sail switch.

Fig. 23 — Sensor Layout



- NOTES:
1. Field wiring must be in accordance with local codes.
 2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
 3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
 4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
 5. All discrete inputs are 24 VAC.
 6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
 7. Energy management module (EMM) is required for Demand Limit functions, 4 to 20 mA, Demand Limit Step 1 and 2, or 4 to 20 mA Temperature Reset.
 8. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.
 9. LLSV-A2 for 38APS040-065 single circuit units optional. Not recommended for 38APS025-030.
 10. See Fig. 23 for SAT and MAT/RAT location. Required for all units.

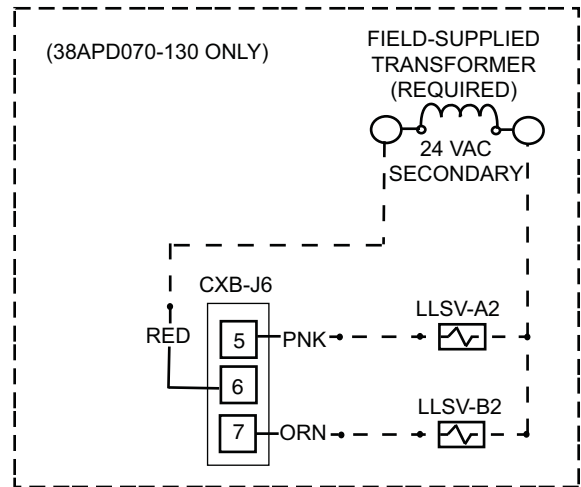
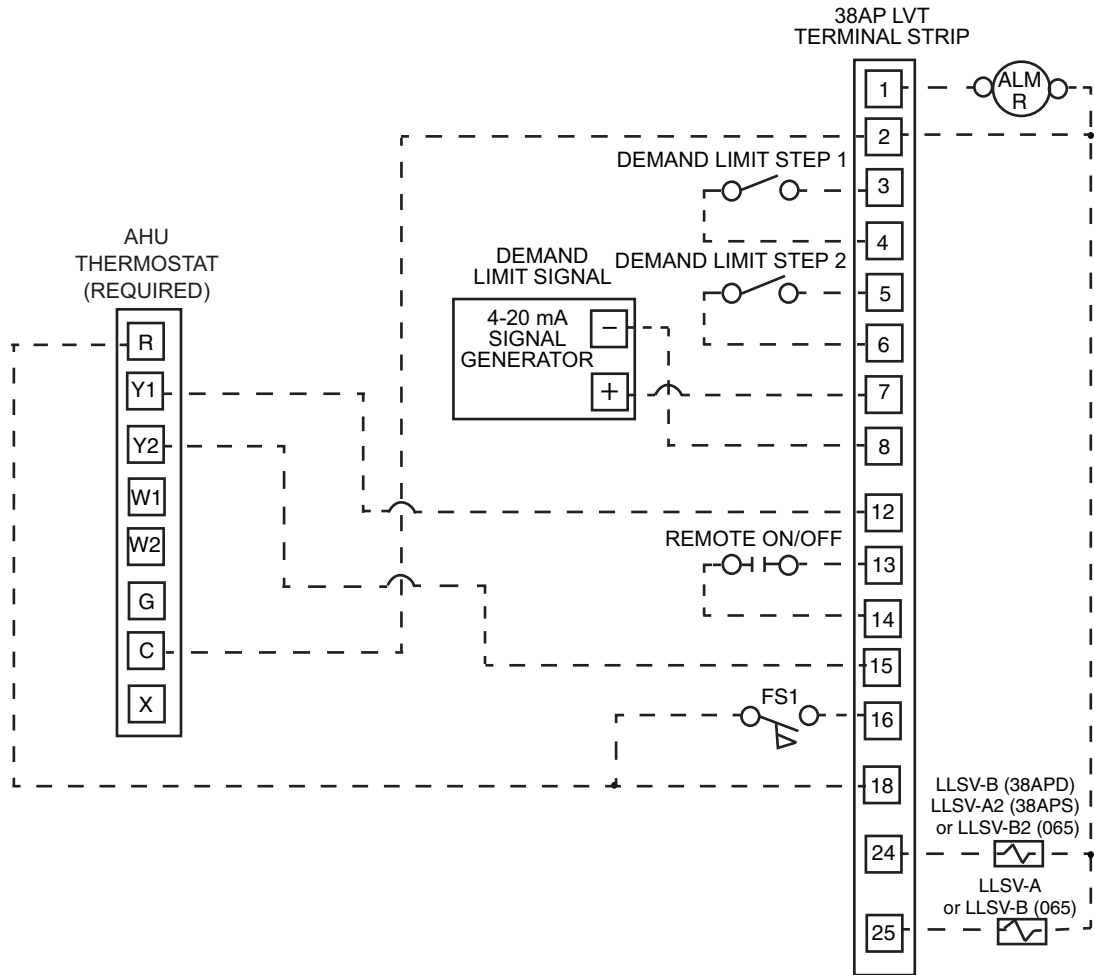
Fig. 24 — C.TYP=1 (VAV) Wiring



NOTES:

1. Field wiring must be in accordance with local codes.
2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs are 24 VAC.
6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
7. Energy management module (EMM) is required for Demand Limit functions, 4 to 20 mA, Demand Limit Step 1 and 2, or 4 to 20 mA Temperature Reset.
8. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.
9. LLSV-A2 for 38APS040-065 single circuit units optional. Not recommended for 38APS025-030.
10. See Fig. 23 for SAT and MAT/RAT location. Required for units with digital scroll option and all 38AP040-130 units.

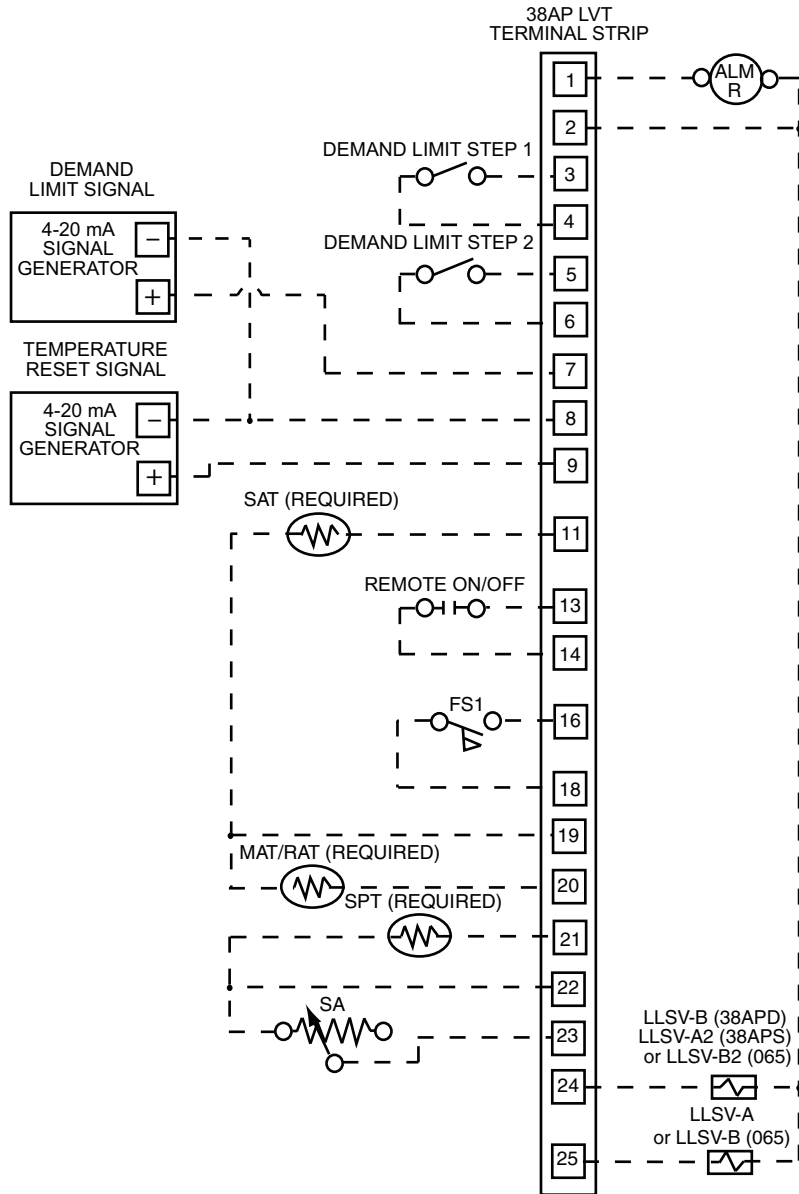
Fig. 25 — C.TYP=3 (TSTAT MULTI) Wiring



NOTES:

1. Field wiring must be in accordance with local codes.
2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs are 24 VAC.
6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
7. Energy management module (EMM) is required for Demand Limit functions, 4 to 20 mA, Demand Limit Step 1 and 2, or 4 to 20 mA Temperature Reset.
8. This control scheme is valid for 38APD, APS025, 027 and 030. It is not recommended for units with more than 2 compressors, 38APD040-130 and 38APS040-065.
9. This control scheme does not support digital compressor operation.
10. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.
11. LLSV-A2 for 38APS040-065 single-circuit units optional. Not recommended for 38APS025-030.

Fig. 26 — C.TYP=4 (TSTAT 2STG) Wiring



NOTES:

1. Field wiring must be in accordance with local codes.
2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs are 24 VAC.
6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
7. Energy management module (EMM) is required for Demand Limit functions, 4 to 20 mA, Demand Limit Step 1 and 2, or 4 to 20 mA Temperature Reset.
8. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.
9. See Fig. 23 for SAT and MAT/RAT location. Required for all units.
10. LLSV-A2 for 38APS040-065 single-circuit units optional. Not recommended for 38APS025-030.

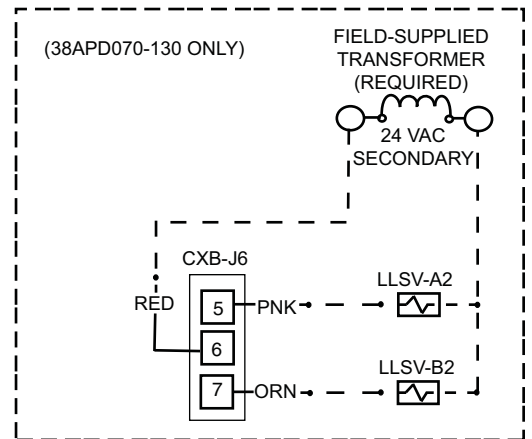
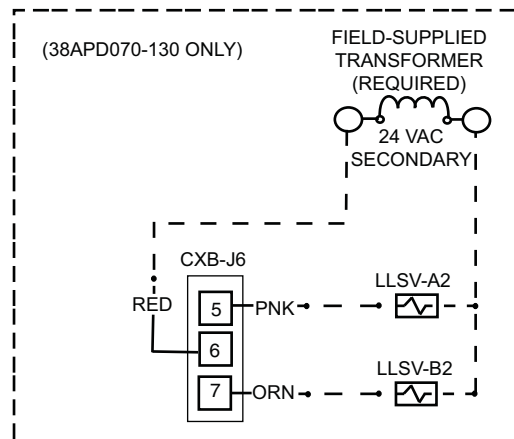
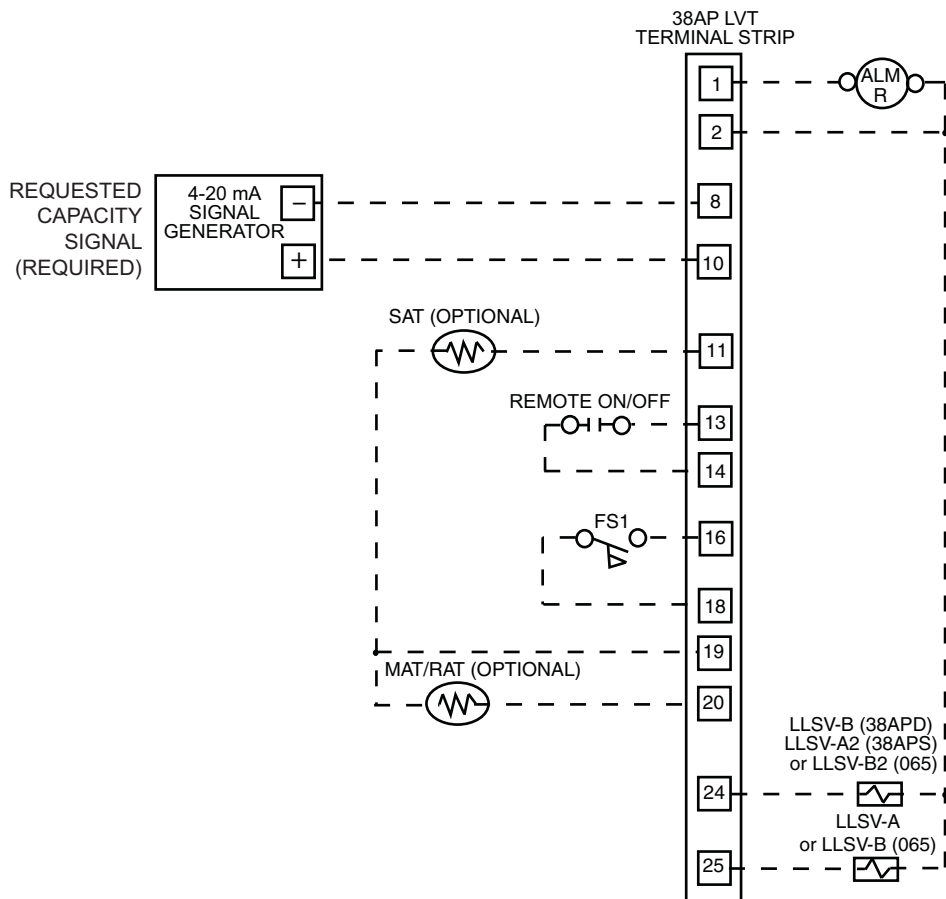


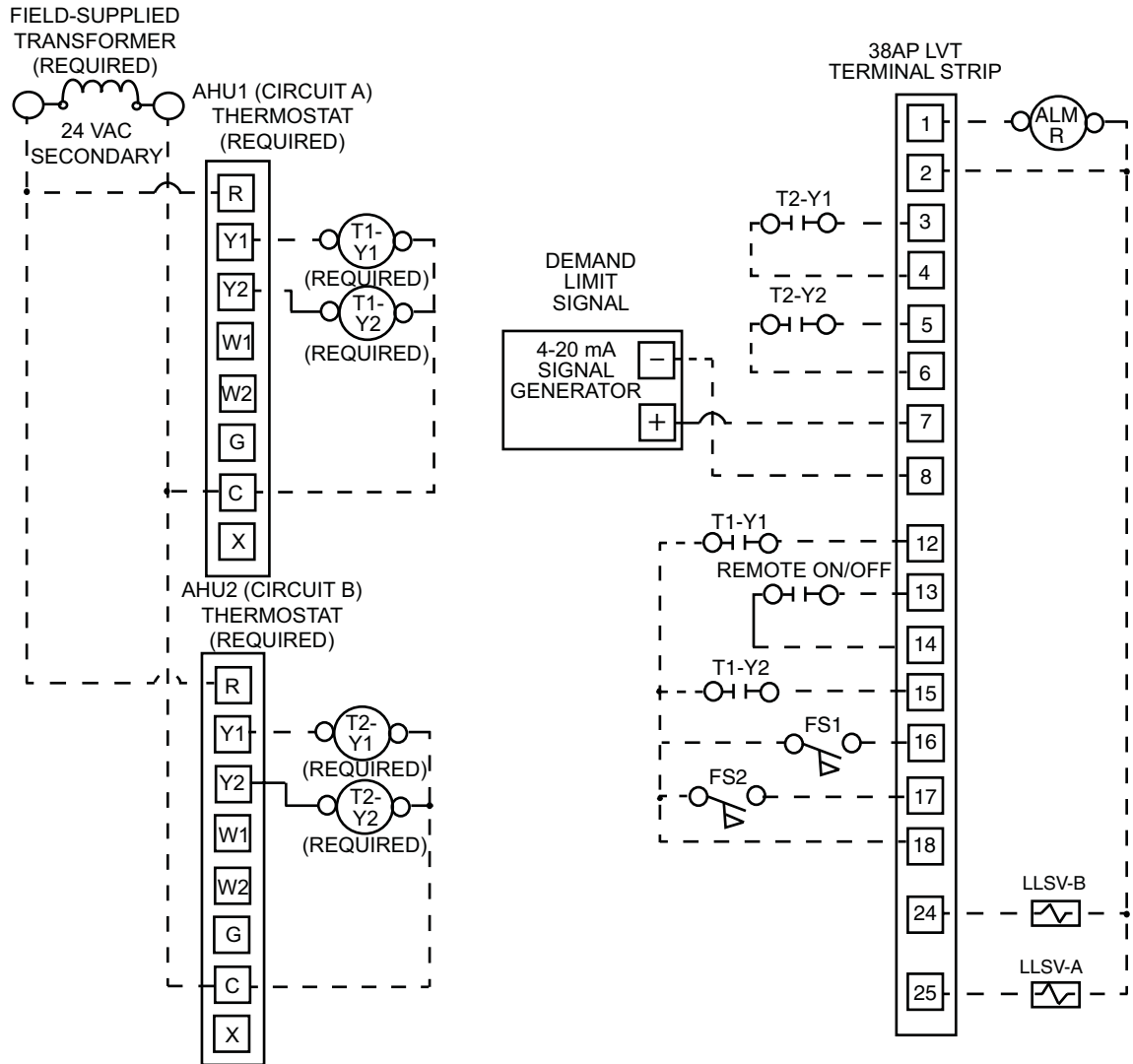
Fig. 27 — C.TYP=5 (SPT MULTI) Wiring



NOTES:

1. Field wiring must be in accordance with local codes.
2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs are 24 VAC.
6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
7. Energy management module (EMM) is required.
8. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.

Fig. 28 — C.TYP=7 (Pct Cap) Wiring



NOTES:

1. AHU1 is connected to 38APD — Circuit A.
AHU2 is connected to 38APD — Circuit B.
2. Field wiring must be in accordance with local codes.
3. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
4. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
5. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
6. All discrete inputs are 24 VAC.
7. Installation of fan status switches (FS1, FS2) is recommended. If not used, a jumper must be installed.
8. Energy management module (EMM) is required.
9. This control scheme does not support digital compressor operation.
10. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.
11. Single or 2-Step Demand Limit is not available with this control type.

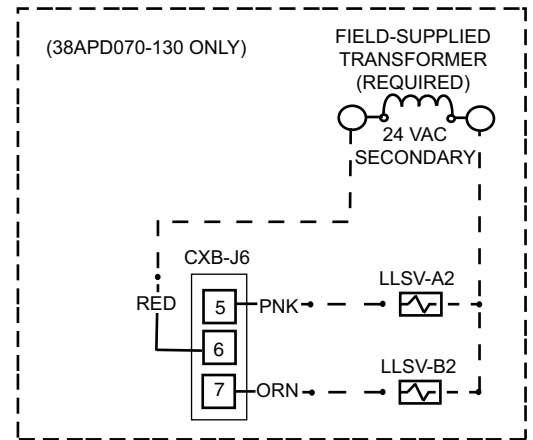
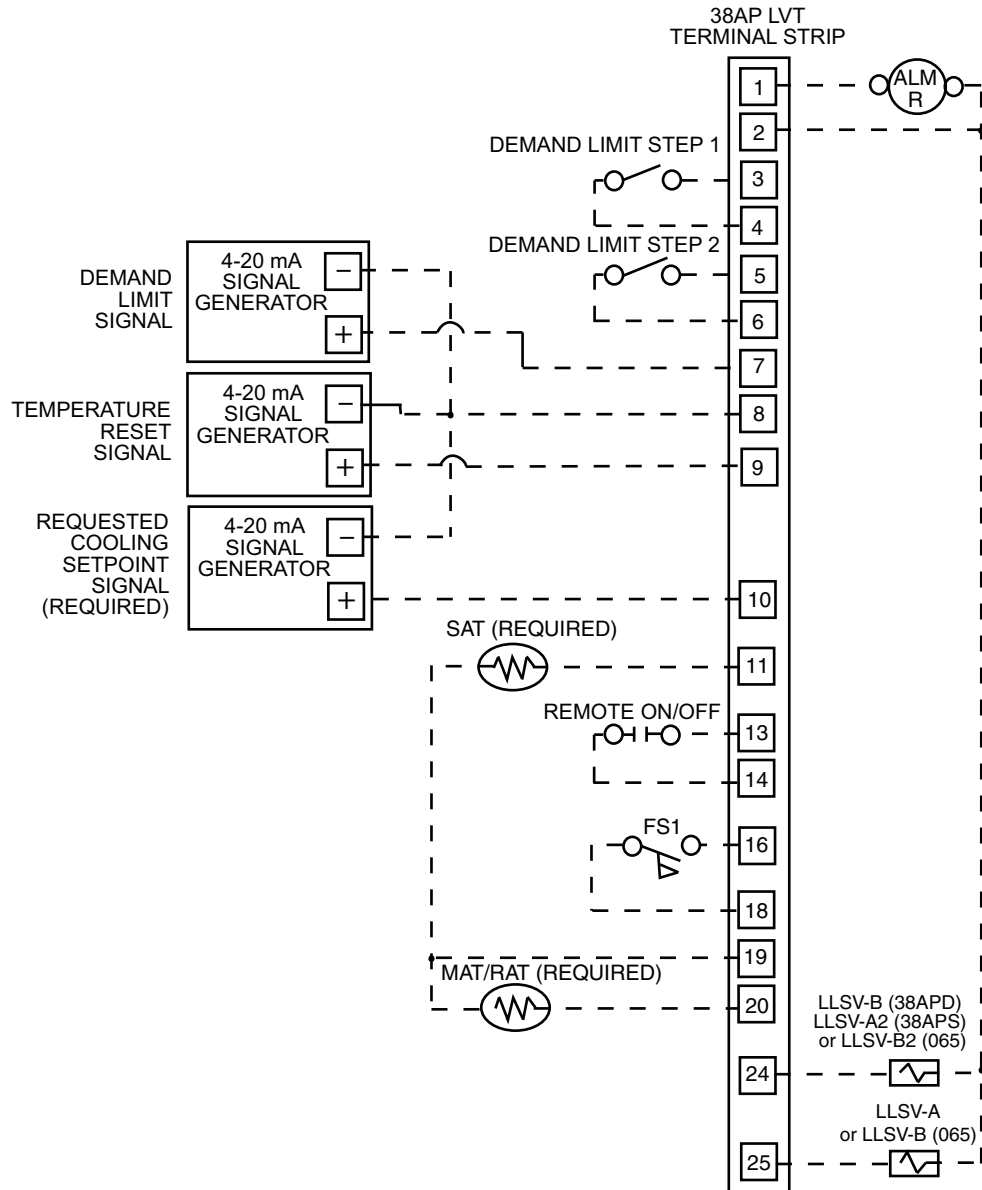


Fig. 29 — C.TYP=8 (Dual Tstat) Wiring



NOTES:

1. Field wiring must be in accordance with local codes.
2. LVT-1 and 2 are for the alarm relay. The maximum load allowed for the alarm relay is 5 VA sealed, 10 VA at 24 VAC. Field power supply is not required.
3. LVT-24, 25, and 2 are for control of field-supplied liquid line solenoid valve (LLSV) 15 VA sealed, 30 VA inrush at 24 VAC. Field power supply is not required.
4. For 38APD070-130 units, an additional LLSV, 15 VA sealed, 30 VA inrush at 24 VAC can be connected to CXB. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs are 24 VAC.
6. Installation of fan status switch (FS1) is recommended. If not used, a jumper must be installed.
7. Energy management module (EMM) is required.
8. The contacts for Remote On-Off, Fan Status Switch and Demand Limit must be rated for dry circuit applications capable of handling a 24 VAC load up to 50 mA.

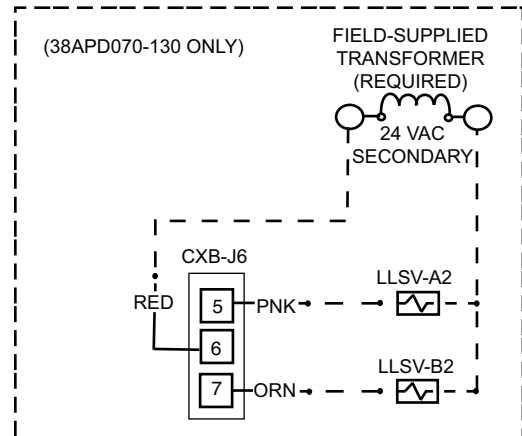


Fig. 30 — C.TYP=9 (VAV Setpoint) Wiring

Legend and Notes for Fig. 24-30

LEGEND

AHU	—	Air Handler Unit
ALM R	—	Alarm Relay (24-v), 5-va Maximum
CXB	—	Compressor Expansion Board
FS1	—	Fan Status Switch (24-v), AHU-1
FS2	—	Fan Status Switch (24-v), AHU-2
LLSV	—	Liquid Line Solenoid Valve
LLSV-A	—	Liquid Line Solenoid Valve, Circuit A, First Stage
LLSV-A2	—	Liquid Line Solenoid Valve, Circuit A, Second Stage
LLSV-B	—	Liquid Line Solenoid Valve, Circuit B, First Stage
LLSV-B2	—	Liquid Line Solenoid Valve, Circuit B, Second Stage
LVT	—	Low Voltage Terminal
MAT	—	Mixed Air Temperature Sensor
RAT	—	Return Air Temperature Sensor
SA	—	Set Point Adjustment (T-56, T-59)
SAT	—	Supply Air Temperature Sensor
SPT	—	Space Temperature Sensor (T-55, T-56, T-59)
T1	—	Thermostat, AHU-1
T2	—	Thermostat, AHU-2

————— Factory Wiring
 - - - - - Field Wiring

NOTES:

1. Factory wiring is in accordance with UL 1995 standards. Field modifications or additions must be in compliance with all applicable codes.
2. All units or modules except sizes 115 and 130 have single point primary power connection. Main power must be supplied from a

- field or factory-supplied disconnect. Unit sizes 115 and 130 have an option for dual point power.
3. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA (minimum circuit amps) up to 175 amps is 14 AWG (American Wire Gage) to 2/0.
 - b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.
 4. Terminals 1 and 2 of the LVT are for the alarm relay. The maximum load allowed for the alarm relay is 5 va sealed and 10 va inrush at 24 v. Field power supply is not required.
 5. Refer to certified dimensional drawings for exact locations of the main power and control power entrance locations.
 6. Terminals 24, 25, and 2 of the LVT are for control of the field-supplied LLSV. The maximum load allowed for each LLSV is 40 va at 24 v. Field power supply is not required.
 7. All discrete inputs are 24 vac.
 8. LLSV (24-v) should be 40 va maximum per valve as required.
 9. Installation of fan status switch (FS1) is recommended.
 10. The contacts for remote ON/OFF, fan status, and demand limit options must be rated for dry circuit application capable of handling a 24-vac load up to 50 mA.

Table 10 — 38APS Single Point Standard Condenser Fan Electrical Data

38APS UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR			CONDENSER FAN		MCA	MOCP	REC FUSE	ICF
		MIN	MAX	QTY	RLA	LRA	TOTAL QTY	FLA				
025	208/230-3-60	187	254	2	48.1	245	2	6.6	121.4	150	150	306.3
	380-3-60	342	418		23.7	145		3.9	61.1	80	70	176.5
	460-3-60	414	506		18.6	125		3.3	48.5	60	60	150.2
	575-3-60	518	632		14.7	100		2.6	38.3	50	45	119.9
	380/415-3-50	342	440		18.6	118		3.3	48.5	60	60	143.2
027	208/230-3-60	187	254	2	51.3	300	2	6.6	128.6	175	150	364.5
	380-3-60	342	418		26.9	139		3.9	68.3	90	80	173.7
	460-3-60	414	506		23.1	150		3.3	58.6	80	70	179.7
	575-3-60	518	632		19.9	109		2.6	50.0	60	60	134.1
	380/415-3-50	342	440		23.1	140		3.3	58.6	80	70	169.7
030	208/230-3-60	187	254	2	55.8	340	2	6.6	138.8	175	175	409.0
	380-3-60	342	418		34.0	196		3.9	84.3	110	100	237.8
	460-3-60	414	506		26.9	179		3.3	67.1	90	80	212.5
	575-3-60	518	632		23.7	132		2.6	58.5	80	70	160.9
	380/415-3-50	342	440		26.9	174		3.3	67.1	90	80	207.5
040	208/230-3-60	187	254	3	51.3	300	3	6.6	186.5	225	200	422.4
	380-3-60	342	418		26.9	139		3.9	99.1	125	110	204.5
	460-3-60	414	506		23.1	150		3.3	85.0	100	100	206.1
	575-3-60	518	632		19.9	109		2.6	72.5	90	80	156.6
	380/415-3-50	342	440		23.1	140		3.3	85.0	100	100	196.1
050	208/230-3-60	187	254	3	55.8	340	3	6.6	201.2	250	225	471.4
	380-3-60	342	418		34.0	196		3.9	122.2	150	150	275.7
	460-3-60	414	506		26.9	179		3.3	97.3	110	110	242.7
	575-3-60	518	632		23.7	132		2.6	84.8	100	100	187.2
	380/415-3-50	342	440		26.9	174		3.3	97.3	110	110	237.7
065	208/230-3-60	187	254	3	72.4	538	4	6.6	261.7	300	300	709.2
	380-3-60	342	418		35.3	290		3.9	130.3	150	150	376.2
	460-3-60	414	506		30.8	229		3.3	113.3	125	125	303.8
	575-3-60	518	632		25.0	180		2.6	91.7	110	100	240.4
	380/415-3-50	342	440		30.8	229		3.3	113.3	125	125	303.8

Table 11 — 38APS Single Point Low Sound Condenser Fan Electrical Data

38APS UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR			CONDENSER FAN		MCA	MOCP	REC FUSE	ICF
		MIN	MAX	QTY	RLA	LRA	TOTAL QTY	FLA				
025	208/230-3-60	187	254	2	48.1	245	2	6.0	120.2	150	150	305.1
	380-3-60	342	418		23.7	145		3.9	61.1	80	70	176.5
	460-3-60	414	506		18.6	125		2.9	47.7	60	60	149.4
	575-3-60	518	632		14.7	100		2.4	37.9	50	45	119.5
	380/415-3-50	342	440		18.6	118		2.9	47.7	60	60	142.4
027	208/230-3-60	187	254	2	51.3	300	2	6.0	127.4	175	150	363.3
	380-3-60	342	418		26.9	139		3.9	68.3	90	80	173.7
	460-3-60	414	506		23.1	150		2.9	57.8	80	70	178.9
	575-3-60	518	632		19.9	109		2.4	49.6	60	60	133.7
	380/415-3-50	342	440		23.1	140		2.9	57.8	80	70	168.9
030	208/230-3-60	187	254	2	55.8	340	2	6.0	137.6	175	175	407.8
	380-3-60	342	418		34.0	196		3.9	84.3	110	100	237.8
	460-3-60	414	506		26.9	179		2.9	66.3	90	80	211.7
	575-3-60	518	632		23.7	132		2.4	58.1	80	70	160.5
	380/415-3-50	342	440		26.9	174		2.9	66.3	90	80	206.7
040	208/230-3-60	187	254	3	51.3	300	3	6.0	184.7	225	200	420.6
	380-3-60	342	418		26.9	139		3.9	99.1	125	110	204.5
	460-3-60	414	506		23.1	150		2.9	83.8	100	100	204.9
	575-3-60	518	632		19.9	109		2.4	71.9	90	80	156.0
	380/415-3-50	342	440		23.1	140		2.9	83.8	100	100	194.9
050	208/230-3-60	187	254	3	55.8	340	3	6.0	199.4	250	225	469.6
	380-3-60	342	418		34.0	196		3.9	122.2	150	150	275.7
	460-3-60	414	506		26.9	179		2.9	96.1	110	110	241.5
	575-3-60	518	632		23.7	132		2.4	84.2	100	100	186.6
	380/415-3-50	342	440		26.9	174		2.9	96.1	110	110	236.5
065	208/230-3-60	187	254	3	72.4	538	4	6.0	259.3	300	300	706.8
	380-3-60	342	418		35.3	290		3.9	130.3	150	150	376.2
	460-3-60	414	506		30.8	229		2.9	111.7	125	125	302.2
	575-3-60	518	632		25.0	180		2.4	90.9	110	100	239.6
	380/415-3-50	342	440		30.8	229		2.9	111.7	125	125	302.2

LEGEND

- FLA** — Full Load Amps
- ICF** — Maximum Instantaneous Current Flow
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
2. All units or modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
3. For MCA that is less than or equal to 380 amps, 3 conductors are required.
For MCA between 381 and 760 amps, 6 conductors are required.
Calculation of conductors required is based on 75 C copper wire.

4. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gauge) to 2/0.
 - b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.



Table 12 — 38APD Single Point Standard Condenser Fan Electrical Data

38APD UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR						CONDENSER FAN		MCA	MOCP	REC FUSE	ICF
		MIN	MAX	CIRCUIT A			CIRCUIT B			TOTAL QTY	FLA				
				QTY	RLA	LRA	QTY	RLA	LRA						
025	208/230-3-60	187	254	1	48.1	245	1	48.1	245	2	6.6	121.4	150	150	306.3
	380-3-60	342	418		23.7	145		23.7	145		3.9	61.1	80	70	176.5
	460-3-60	414	506		18.6	125		18.6	125		3.3	48.5	60	60	150.2
	575-3-60	518	632		14.7	100		14.7	100		2.6	38.3	50	45	119.9
	380/415-3-50	342	440		18.6	118		18.6	118		3.3	48.5	60	60	143.2
027	208/230-3-60	187	254	1	51.3	300	1	51.3	300	2	6.6	128.6	175	150	364.5
	380-3-60	342	418		26.9	139		26.9	139		3.9	68.3	90	80	173.7
	460-3-60	414	506		23.1	150		23.1	150		3.3	58.6	80	70	179.7
	575-3-60	518	632		19.9	109		19.9	109		2.6	50.0	60	60	134.1
	380/415-3-50	342	440		23.1	140		23.1	140		3.3	58.6	80	70	169.7
030	208/230-3-60	187	254	1	55.8	340	1	55.8	340	2	6.6	138.8	175	175	409.0
	380-3-60	342	418		34.0	196		34.0	196		3.9	84.3	110	100	237.8
	460-3-60	414	506		26.9	179		26.9	179		3.3	67.1	90	80	212.5
	575-3-60	518	632		23.7	132		23.7	132		2.6	58.5	80	70	160.9
	380/415-3-50	342	440		26.9	174		26.9	174		3.3	67.1	90	80	207.5
040	208/230-3-60	187	254	2	35.8	239	2	33.4	225	3	6.6	167.2	200	175	361.4
	380-3-60	342	418		23.7	145		19.2	140		3.9	103.5	125	110	218.9
	460-3-60	414	506		17.9	125		16.7	114		3.3	83.6	100	90	186.2
	575-3-60	518	632		14.3	80		13.4	80		2.6	66.7	80	70	128.8
	380/415-3-50	342	440		17.9	118		16.7	111		3.3	83.6	100	90	179.2
050	208/230-3-60	187	254	2	51.3	300	2	51.3	300	3	6.6	231.4	250	250	467.3
	380-3-60	342	418		26.9	139		26.9	139		3.9	119.6	125	125	225.0
	460-3-60	414	506		23.1	150		23.1	150		3.3	99.1	110	110	220.2
	575-3-60	518	632		19.9	109		19.9	109		2.6	82.0	100	90	166.1
	380/415-3-50	342	440		23.1	140		23.1	140		3.3	99.1	110	110	210.2
060	208/230-3-60	187	254	2	51.3	300	2	55.8	340	4	6.6	254.6	300	300	524.8
	380-3-60	342	418		26.9	139		34.0	196		3.9	145.9	175	175	299.4
	460-3-60	414	506		23.1	150		26.9	179		3.3	119.9	125	125	265.3
	575-3-60	518	632		19.9	109		23.7	132		2.6	103.5	125	110	205.9
	380/415-3-50	342	440		23.1	140		26.9	174		3.3	119.9	125	125	260.3
070	208/230-3-60	187	254	2	55.8	340	3	46.1	245	4	6.6	296.3	300	300	566.5
	380-3-60	342	418		34.0	196		23.7	145		3.9	163.2	175	175	316.7
	460-3-60	414	506		26.9	179		18.6	125		3.3	129.5	150	150	274.9
	575-3-60	518	632		23.7	132		14.7	100		2.6	107.8	125	125	210.2
	380/415-3-50	342	440		26.9	174		18.6	118		3.3	129.5	150	150	269.9
080	208/230-3-60	187	254	2	55.8	340	3	55.8	340	5	6.6	326.0	350	350	596.2
	380-3-60	342	418		34.0	196		34.0	196		3.9	198.0	225	225	351.5
	460-3-60	414	506		26.9	179		26.9	179		3.3	157.7	175	175	303.1
	575-3-60	518	632		23.7	132		23.7	132		2.6	137.4	150	150	239.8
	380/415-3-50	342	440		26.9	174		26.9	174		3.3	157.7	175	175	298.1
090	208/230-3-60	187	254	3	51.3	300	3	55.8	340	6	6.6	374.9	400	400	645.1
	380-3-60	342	418		26.9	139		34.0	196		3.9	214.6	225	225	368.1
	460-3-60	414	506		23.1	150		26.9	179		3.3	176.5	200	200	321.9
	575-3-60	518	632		19.9	109		23.7	132		2.6	152.3	175	150	254.7
	380/415-3-50	342	440		23.1	140		26.9	174		3.3	176.5	200	200	311.9
100	208/230-3-60	187	254	3	55.8	340	3	55.8	340	6	6.6	388.4	400	400	658.6
	380-3-60	342	418		34.0	196		34.0	196		3.9	235.9	250	250	389.4
	460-3-60	414	506		26.9	179		26.9	179		3.3	187.9	200	200	333.3
	575-3-60	518	632		23.7	132		23.7	132		2.6	163.7	175	175	266.1
	380/415-3-50	342	440		26.9	174		26.9	174		3.3	187.9	200	200	328.3
115	208/230-3-60	187	254	3	55.8	340	3	72.4	538	7	6.6	448.9	500	500	896.4
	380-3-60	342	418		34.0	196		35.3	290		3.9	244.0	250	250	489.9
	460-3-60	414	506		26.9	179		30.8	229		3.3	203.9	225	225	394.4
	575-3-60	518	632		23.7	132		25.0	180		2.6	170.6	175	175	319.3
	380/415-3-50	342	440		26.9	174		30.8	229		3.3	203.9	225	225	394.4
130	208/230-3-60	187	254	3	55.8	340	3	85.3	605	8	6.6	497.4	500	500	995.8
	380-3-60	342	418		34.0	196		51.9	380		3.9	301.9	350	300	617.0
	460-3-60	414	506		26.9	179		37.8	320		3.3	230.0	250	250	502.7
	575-3-60	518	632		23.7	132		34.6	250		2.6	204.4	225	225	411.1
	380/415-3-50	342	440		26.9	174		37.8	320		3.3	230.0	250	250	502.7

LEGEND

- FLA** — Full Load Amps
- ICF** — Maximum Instantaneous Current Flow
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
2. All units/modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
3. For MCA that is less than or equal to 380 amps, 3 conductors are required. For MCA between 381 and 760 amps, 6 conductors are required. Calculation of conductors required is based on 75 C copper wire.

4. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gage) to 2/0.
 - b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.



Table 13 — 38APD Single Point Low Sound Condenser Fan Electrical Data

38APD UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR						CONDENSER FAN		MCA	MOCP	REC FUSE	ICF
				CIRCUIT A			CIRCUIT B			TOTAL QTY	FLA				
		MIN	MAX	QTY	RLA	LRA	QTY	RLA	LRA						
025	208/230-3-60	187	254		48.1	245		48.1	245		6.0	120.2	150	150	305.1
	380-3-60	342	418	1	23.7	145	1	23.7	145	2	3.9	61.1	80	70	176.5
	460-3-60	414	506		18.6	125		18.6	125		2.9	47.7	60	60	149.4
	575-3-60	518	632		14.7	100		14.7	100		2.4	37.9	50	45	119.5
	380/415-3-50	342	440		18.6	118		18.6	118		2.9	47.7	60	60	142.4
208/230-3-60	187	254			51.3	300			51.3		300		6.0	127.4	175
027	380-3-60	342	418	1	26.9	139	1	26.9	139	2	3.9	68.3	90	80	173.7
	460-3-60	414	506		23.1	150		23.1	150		2.9	57.8	80	70	178.9
	575-3-60	518	632		19.9	109		19.9	109		2.4	49.6	60	60	133.7
	380/415-3-50	342	440		23.1	140		23.1	140		2.9	57.8	80	70	168.9
	208/230-3-60	187	254			55.8		340			55.8	340		6.0	137.6
030	380-3-60	342	418	1	34.0	196	1	34.0	196	2	3.9	84.3	110	100	237.8
	460-3-60	414	506		26.9	179		26.9	179		2.9	66.3	90	80	211.7
	575-3-60	518	632		23.7	132		23.7	132		2.4	58.1	80	70	160.5
	380/415-3-50	342	440		26.9	174		26.9	174		2.9	66.3	90	80	206.7
	208/230-3-60	187	254			35.8		239			33.4	225		6.0	165.4
040	380-3-60	342	418	2	23.7	145	2	19.2	140	3	3.9	103.5	125	110	218.9
	460-3-60	414	506		17.9	125		16.7	114		2.9	82.4	100	90	185.0
	575-3-60	518	632		14.3	80		13.4	80		2.4	66.1	80	70	128.2
	380/415-3-50	342	440		17.9	118		16.7	111		2.9	82.4	100	90	178.0
	208/230-3-60	187	254			48.1		245			51.3	300		6.0	229.6
050	380-3-60	342	418	2	23.7	145	2	26.9	139	3	3.9	119.6	125	125	225.0
	460-3-60	414	506		18.6	125		23.1	150		2.9	97.9	110	110	219.0
	575-3-60	518	632		14.7	100		19.9	109		2.4	81.4	100	90	165.5
	380/415-3-50	342	440		18.6	118		23.1	140		2.9	97.9	110	110	212.0
	208/230-3-60	187	254			51.3		300			55.8	340		6.0	252.2
060	380-3-60	342	418	2	26.9	139	2	34.0	196	4	3.9	145.9	175	175	299.4
	460-3-60	414	506		23.1	150		26.9	179		2.9	118.3	125	125	263.7
	575-3-60	518	632		19.9	109		23.7	132		2.4	102.7	125	110	205.1
	380/415-3-50	342	440		23.1	140		26.9	174		2.9	118.3	125	125	253.7
	208/230-3-60	187	254			55.8		340			46.1	245		6.0	293.9
070	380-3-60	342	418	2	34.0	196	3	23.7	145	4	3.9	163.2	175	175	316.7
	460-3-60	414	506		26.9	179		18.6	125		2.9	127.9	150	150	273.3
	575-3-60	518	632		23.7	132		14.7	100		2.4	107.0	125	125	209.4
	380/415-3-50	342	440		26.9	174		18.6	118		2.9	127.9	150	150	268.3
	208/230-3-60	187	254			55.8		340			55.8	340		6.0	323.0
080	380-3-60	342	418	2	34.0	196	3	34.0	196	5	3.9	198.0	225	225	347.6
	460-3-60	414	506		26.9	179		26.9	179		2.9	155.7	175	175	298.2
	575-3-60	518	632		23.7	132		23.7	132		2.4	136.4	150	150	236.4
	380/415-3-50	342	440		26.9	174		26.9	174		2.9	155.7	175	175	293.2
	208/230-3-60	187	254			51.3		300			55.8	340		6.0	371.3
090	380-3-60	342	418	3	26.9	139	3	34.0	196	6	3.9	214.6	225	225	368.1
	460-3-60	414	506		23.1	150		26.9	179		2.9	174.1	200	200	319.5
	575-3-60	518	632		19.9	109		23.7	132		2.4	151.1	175	150	253.5
	380/415-3-50	342	440		23.1	140		26.9	174		2.9	174.1	200	200	309.5
	208/230-3-60	187	254			55.8		340			55.8	340		6.0	384.8
100	380-3-60	342	418	3	34.0	196	3	34.0	196	6	3.9	235.9	250	250	389.4
	460-3-60	414	506		26.9	179		26.9	179		2.9	185.5	200	200	330.9
	575-3-60	518	632		23.7	132		23.7	132		2.4	162.5	175	175	264.9
	380/415-3-50	342	440		26.9	174		26.9	174		2.9	185.5	200	200	325.9
	208/230-3-60	187	254			55.8		340			72.4	538		6.0	444.7
115	380-3-60	342	418	3	34.0	196	3	35.3	290	7	3.9	244.0	275	250	489.9
	460-3-60	414	506		26.9	179		30.8	229		2.9	201.1	225	225	391.6
	575-3-60	518	632		23.7	132		25.0	180		2.4	169.2	175	175	317.9
	380/415-3-50	342	440		26.9	174		30.8	229		2.9	201.1	225	225	391.6
	208/230-3-60	187	254			55.8		340			85.3	605		6.0	492.6
130	380-3-60	342	418	3	34.0	196	3	51.9	380	8	3.9	301.9	300	300	617.0
	460-3-60	414	506		26.9	179		37.8	320		2.9	226.8	250	250	499.5
	575-3-60	518	632		23.7	132		34.6	250		2.4	202.8	225	225	409.5
	380/415-3-50	342	440		26.9	174		37.8	320		2.9	226.8	250	250	499.5
	208/230-3-60	187	254			55.8		340			55.8	340		6.0	384.8

LEGEND

- FLA** — Full Load Amps
- ICF** — Maximum Instantaneous Current Flow
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
2. All units/modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
3. For MCA that is less than or equal to 380 amps, 3 conductors are required. For MCA between 381 and 760 amps, 6 conductors are required. Calculation of conductors required is based on 75 C copper wire.

4. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gage) to 2/0.
 - b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.



Table 14 — 38APD115,130 Dual Point Standard Condenser Fan Electrical Data

38APD UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR						CONDENSER FAN		MCA	MOCP	REC FUSE	ICF	
				CIRCUIT A			CIRCUIT B			TOTAL QTY	FLA					
		MIN	MAX	QTY	RLA	LRA	QTY	RLA	LRA							
115 CIRCUIT 1	208/230-3-60	187	254	3	55.8	340	—	—	—	7	6.6	227.6	250	250	497.8	
	380-3-60	342	418		34.0	196		—	—		—	3.9	137.8	150	150	291.3
	460-3-60	414	506		26.9	179		—	—		—	3.3	110.5	125	125	255.9
	575-3-60	518	632		23.7	132		—	—		—	2.6	95.2	110	110	197.6
	380/415-3-50	342	440		26.9	174		—	—		—	3.3	110.5	125	125	250.9
115 CIRCUIT 2	208/230-3-60	187	254	—	—	—	3	72.4	538	—	—	235.3	300	300	682.8	
	380-3-60	342	418		—	—		35.3	290		—	—	114.7	150	150	360.6
	460-3-60	414	506		—	—		30.8	229		—	—	100.1	125	110	290.6
	575-3-60	518	632		—	—		25.0	180		—	—	81.3	100	90	230.0
	380/415-3-50	342	440		—	—		30.8	229		—	—	100.1	125	110	290.6
130 CIRCUIT 1	208/230-3-60	187	254	3	55.8	340	—	—	—	8	6.6	234.2	250	250	504.4	
	380-3-60	342	418		34.0	196		—	—		—	3.9	141.7	175	175	295.2
	460-3-60	414	506		26.9	179		—	—		—	3.3	113.8	125	125	259.2
	575-3-60	518	632		23.7	132		—	—		—	2.6	97.8	110	110	200.2
	380/415-3-50	342	440		26.9	174		—	—		—	3.3	113.8	125	125	254.2
130 CIRCUIT 2	208/230-3-60	187	254	—	—	—	3	85.3	605	—	—	277.2	350	300	775.6	
	380-3-60	342	418		—	—		51.9	380		—	—	168.7	200	200	483.8
	460-3-60	414	506		—	—		37.8	320		—	—	122.9	150	150	395.6
	575-3-60	518	632		—	—		34.6	250		—	—	112.5	125	125	319.2
	380/415-3-50	342	440		—	—		37.8	320		—	—	122.9	150	150	395.6

Table 15 — 38APD115,130 Dual Point Low Sound Fan Electrical Data

38APD UNIT SIZE	V-PH-HZ	SUPPLY VOLTAGE		COMPRESSOR						CONDENSER FAN		MCA	MOCP	REC FUSE	ICF	
				CIRCUIT A			CIRCUIT B			TOTAL QTY	FLA					
		MIN	MAX	QTY	RLA	LRA	QTY	RLA	LRA							
115 CIRCUIT 1	208/230-3-60	187	254	3	55.8	340	—	—	—	7	6.6	227.6	250	250	497.8	
	380-3-60	342	418		34.0	196		—	—		—	3.9	137.8	150	150	291.3
	460-3-60	414	506		26.9	179		—	—		—	3.3	110.5	125	125	255.9
	575-3-60	518	632		23.7	132		—	—		—	2.6	95.2	110	110	197.6
	380/415-3-50	342	440		26.9	174		—	—		—	3.3	110.5	125	125	250.9
115 CIRCUIT 2	208/230-3-60	187	254	—	—	—	3	72.4	538	—	—	235.3	300	300	682.8	
	380-3-60	342	418		—	—		35.3	290		—	—	114.7	150	150	360.6
	460-3-60	414	506		—	—		30.8	229		—	—	100.1	125	110	290.6
	575-3-60	518	632		—	—		25.0	180		—	—	81.3	100	90	230.0
	380/415-3-50	342	440		—	—		30.8	229		—	—	100.1	125	110	290.6
130 CIRCUIT 1	208/230-3-60	187	254	3	55.8	340	—	—	—	8	6.6	234.2	250	250	504.4	
	380-3-60	342	418		34.0	196		—	—		—	3.9	141.7	175	175	295.2
	460-3-60	414	506		26.9	179		—	—		—	3.3	113.8	125	125	259.2
	575-3-60	518	632		23.7	132		—	—		—	2.6	97.8	110	110	200.2
	380/415-3-50	342	440		26.9	174		—	—		—	3.3	113.8	125	125	254.2
130 CIRCUIT 2	208/230-3-60	187	254	—	—	—	3	85.3	605	—	—	277.2	350	300	775.6	
	380-3-60	342	418		—	—		51.9	380		—	—	168.7	200	200	483.8
	460-3-60	414	506		—	—		37.8	320		—	—	122.9	150	150	395.6
	575-3-60	518	632		—	—		34.6	250		—	—	112.5	125	125	319.2
	380/415-3-50	342	440		—	—		37.8	320		—	—	122.9	150	150	395.6

LEGEND

- FLA** — Full Load Amps
- ICF** — Maximum Instantaneous Current Flow
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Amps
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps

NOTES:

1. Units are suitable for use on electrical systems where voltage supplied to the unit terminals is not below or above the listed minimum and maximum limits. Maximum allowable phase imbalance is: voltage 2%; amps 10%.
2. For MCA that is less than or equal to 380 amps, 3 conductors are required.
For MCA between 381 and 760 amps, 6 conductors are required.
Calculation of conductors required is based on 75 C copper wire.

3. Wiring for main field supply must be rated 75 C. Use copper conductors only.
 - a. Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gage) to 2/0.
 - b. Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - c. Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - d. Incoming wire size range for non-fused disconnect with MCA from 100.1 amp to 200 amps is 6 AWG to 350 kcmil.
 - e. Incoming wire size range for non-fused disconnect with MCA from 200.1 amp to 450 amps is 3/0 to 500 kcmil.



Table 16 — Unit Incoming Power Options

MOCP VALUE	UNIT INCOMING POWER OPTION						
	STANDARD TERMINAL BLOCK OPTION		HIGH SCCR TERMINAL BLOCK OPTION			STANDARD AND HIGH SCCR DISCONNECT OPTION	
	MAX WIRE SIZE	MIN WIRE SIZE	MAX WIRE SIZE	MIN WIRE SIZE	HIGH SCCR FUSE TYPE	MAX WIRE SIZE	MIN WIRE SIZE
100 A OR LESS	2/0	#14 AWG	2/0	#6 AWG	J, RK1, or RK5	1/0	#14 AWG
GREATER THAN 100 A AND LESS THAN OR EQUAL TO 200 A	2/0	#14 AWG	2/0	#6 AWG	J or RK1	350 kcmil	#6 AWG
GREATER THAN 200	600 kcmil	#2	600 kcmil	3/0	J or RK1	500 kcmil (1) 500 kcmil (2)	3/0

LEGEND

- AWG** — American Wire Gage
- kcmil** — Thousand Circular Mills
- MOCP** — Maximum Overcurrent Protection
- SCCR** — Short Circuit Current Rating

NOTES:

1. Terminal block high SCCR option units must use approved fuses to meet high SCCR rating.
2. High SCCR disconnect option units can use either approved fuse or circuit breaker for incoming power protection.
3. Time delay fuse type required.

Step 5 — Install Accessories

LOW-AMBIENT OPERATION — If operating temperatures below those found in Table 17 are expected, Motormaster® V fan motor control is recommended.

Table 17 — 38AP Unit Low Ambient Limitations

Single Circuit

38APS UNIT SIZE	MINIMUM LOW AMBIENT*† (Standard Unit)	MINIMUM LOW AMBIENT MOTORMASTER® CONTROL (Factory-Installed Option)
025-065	45 F (7.2 C)	-20 F (-28.9 C)

Dual Circuit

38APD UNIT SIZE	MINIMUM LOW AMBIENT*† (Standard Unit)	MINIMUM LOW AMBIENT MOTORMASTER CONTROL (Factory-Installed Option)
025-040	32 F (0 C)	-20 F (-28.9 C)
050-060	25 F (-3.9 C)	-20 F (-28.9 C)
070-130	32 F (0 C)	-20 F (-28.9 C)

* Temperatures calculated with the minimum number of fans operating per circuit.

† Minimum outdoor-air operating temperature is based on 32 C (90 F) saturated condensing temperature and 100% capacity.

MISCELLANEOUS ACCESSORIES — Energy management module, Navigator™ display, remote enhanced display, Touch Pilot™ display, BACnet* translator control, LON (local operating network) translator control, and long line accessory kit are available for special applications.

BACnet Communication Option Wiring — The BACnet communication option uses the UPC Open controller. The controller communicates using BACnet on an MS/TP network segment communications at 9600 bps, 19.2 kbps, 38.4 kbps, or 76.8 kbps.

Wire the controllers on an MS/TP network segment in a daisy-chain configuration. Wire specifications for the cable are 22 AWG (American Wire Gage) or 24 AWG, low-capacitance, twisted, stranded, shielded copper wire. The maximum length is 2000 ft (609.6 m).

Install a BT485 terminator on the first and last controller on a network segment to add bias and prevent signal distortions due to echoing. See Fig. 31-33.

To wire the UPC Open controller to the BAS (Building Automation System) network:

1. Pull the screw terminal connector from the controller's BAS Port.
2. Check the communications wiring for shorts and grounds.
3. Connect the communications wiring to the BAS port's screw terminals labeled Net +, Net -, and Shield.

NOTE: Use the same polarity throughout the network segment.

4. Insert the power screw terminal connector into the UPC Open controller's power terminals if they are not currently connected.
5. Verify communication with the network by viewing a module status report. To perform a module status report using the BACview keypad/display unit, press and hold the "FN" key then press the "." Key.

To install a BT485 terminator, push the BT485 terminator on to the BT485 connector located near the BACnet connector.

NOTE: The BT485 terminator has no polarity associated with it.

To order a BT485 terminator, consult Commercial Products i-Vu® Open Control System Master Prices.

MS/TP WIRING RECOMMENDATIONS — Recommendations are shown in Tables 18 and 19. The wire jacket and UL temperature rating specifications list two acceptable alternatives. The Halar† specification has a higher temperature rating and a tougher outer jacket than the SmokeGard** specification, and it is appropriate for use in applications where the user is concerned about abrasion. The Halar jacket is also less likely to crack in extremely low temperatures.

NOTE: Use the specified type of wire and cable for maximum signal integrity.

*Sponsored by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers).

†Registered trademark of Solvay Plastics.

**Trademark of AlphaGary-Mexichem Corp.

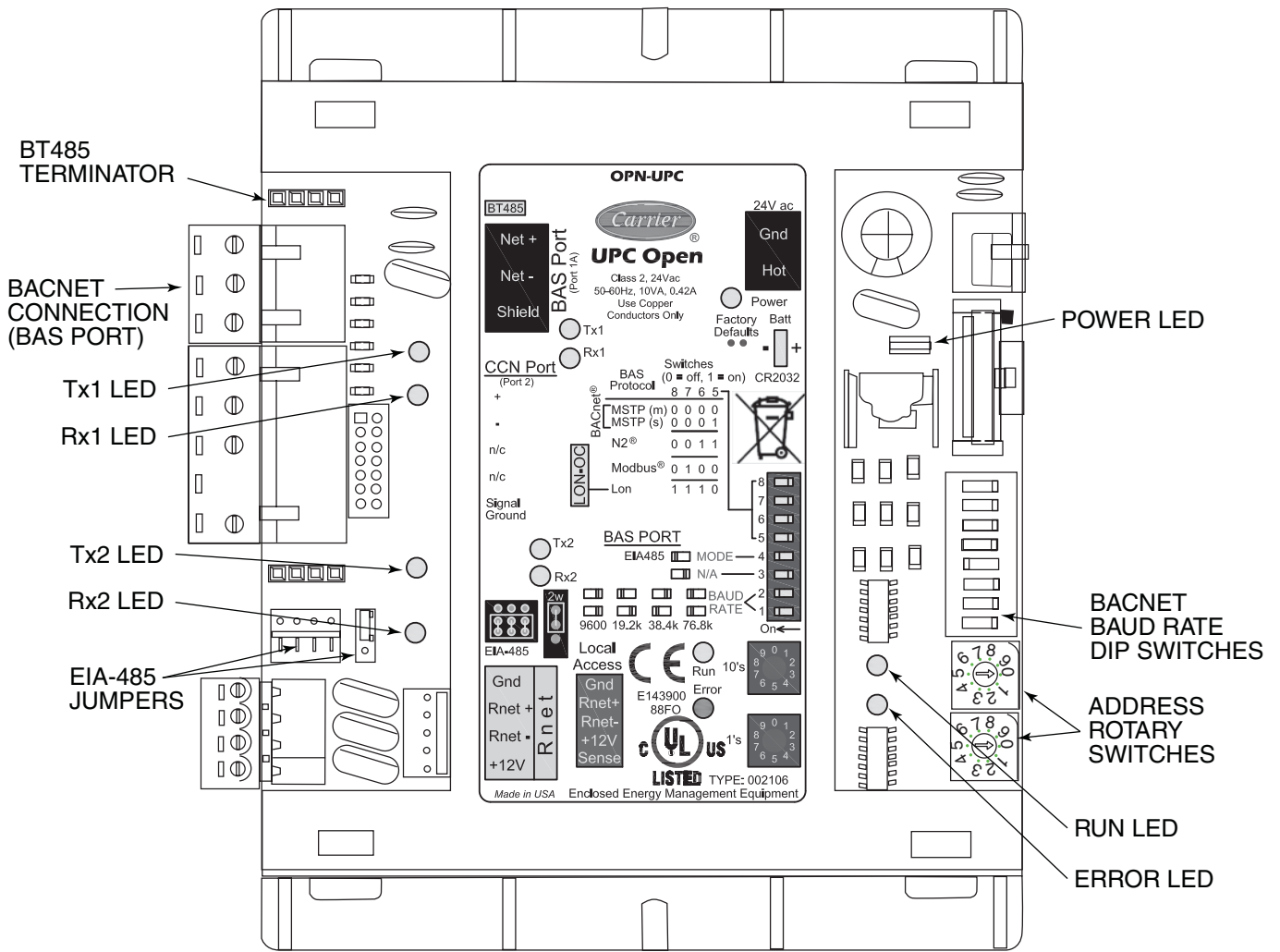


Fig. 31 — UPC Open Controller

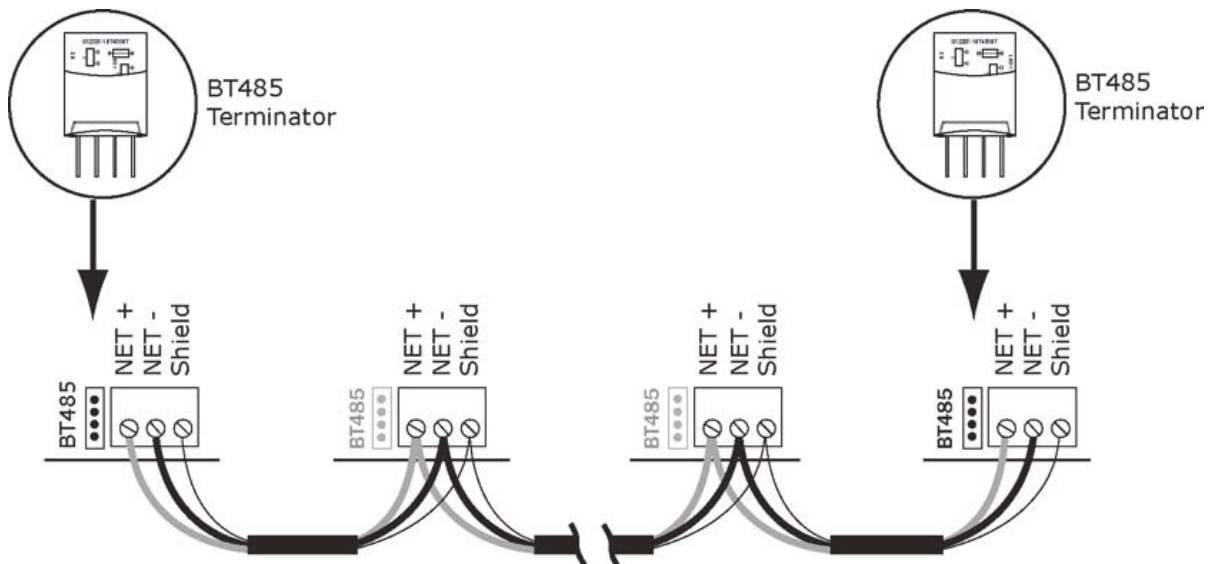


Fig. 32 — Network Wiring

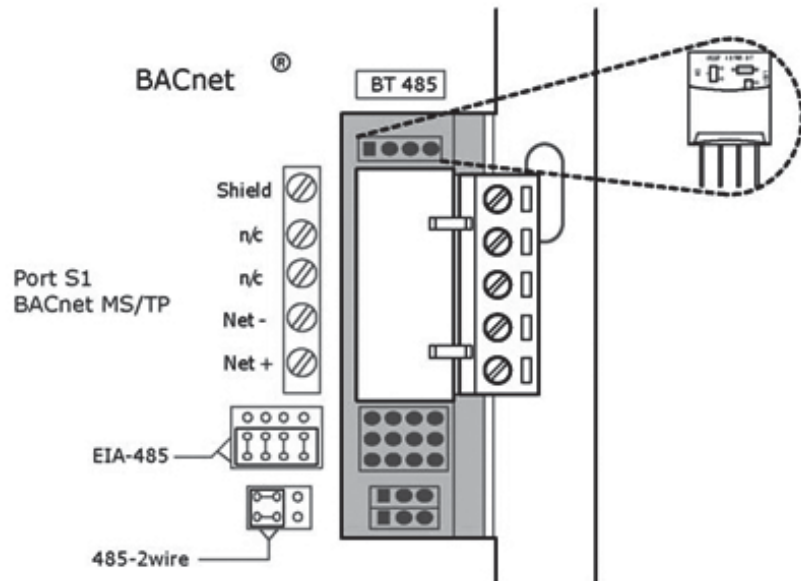


Fig. 33 — BT485 Terminator Installation

Table 18 — MS/TP Wiring Recommendations

SPECIFICATION	RECOMMENDATION
CABLE	Single twisted pair, low capacitance, CL2P, 22 AWG (7x30), TC foam FEP, plenum rated cable
CONDUCTOR	22 or 24 AWG stranded copper (tin plated)
INSULATION	Foamed FEP 0.015 in. (0.381 mm) wall 0.060 in. (1.524 mm) O.D.
COLOR CODE	Black/White
TWIST LAY	2 in. (50.8 mm) lay on pair 6 twists/foot (20 twists/meter) nominal
SHIELDING	Aluminum/Mylar shield with 24 AWG TC drain wire
JACKET	SmokeGard Jacket (SmokeGard PVC) 0.021 in. (0.5334 mm) wall 0.175 in. (4.445 mm) O.D. Halar Jacket (E-CTFE) 0.010 in. (0.254 mm) wall 0.144 in. (3.6576 mm) O.D.
DC RESISTANCE	15.2 Ohms/1000 feet (50 Ohms/km) nominal
CAPACITANCE	12.5 pF/ft (41 pF/meter) nominal conductor to conductor
CHARACTERISTIC IMPEDANCE	100 Ohms nominal
WEIGHT	12 lb/1000 feet (17.9 kg/km)
UL TEMPERATURE RATING	SmokeGard 167 F (75 C) Halar -40 to 302 F (-40 to 150 C)
VOLTAGE	300 Vac, power limited
LISTING	UL: NEC CL2P, or better

LEGEND

- | | |
|---|---------------------------------------|
| AWG — American Wire Gage | NEC — National Electrical Code |
| CL2P — Class 2 Plenum Cable | O.D. — Outside Diameter |
| DC — Direct Current | TC — Tinned Copper |
| FEP — Fluorinated Ethylene Polymer | UL — Underwriters Laboratories |

Table 19 — Open System Wiring Specifications and Recommended Vendors

WIRING SPECIFICATIONS		RECOMMENDED VENDORS AND PART NUMBERS			
WIRE TYPE	DESCRIPTION	CONNECT AIR INTERNATIONAL	BELDEN	RMCORP	CONTRACTORS WIRE AND CABLE
MS/TP NETWORK (RS-485)	22 AWG, single twisted shielded pair, low capacitance, CL2P, TC foam FEP, plenum rated. See MS/TP Installation Guide for specifications.	W221P-22227	—	25160PV	CLP0520LC
	24 AWG, single twisted shielded pair, low capacitance, CL2P, TC foam FEP, plenum rated. See MS/TP Installation Guide for specifications.	W241P-2000F	82841	25120-OR	—
RNET	4 conductor, unshielded, CMP, 18 AWG, plenum rated.	W184C-2099BLB	6302UE	21450	CLP0442

LEGEND

- | | |
|--|---|
| AWG — American Wire Gage | FEP — Fluorinated Ethylene Polymer |
| CL2P — Class 2 Plenum Cable | TC — Tinned Copper |
| CMP — Communications Plenum Rated | |