



Gemini™ Select
38APS025-065, 38APD025-130
Air-Cooled Condensing Units
with Puron® Refrigerant (R-410A) 50/60 Hz

Installation Instructions

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SAFETY CONSIDERATIONS

Installation and servicing of air-conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair, or service air-conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air-conditioning equipment, observe precautions in the literature, tags and labels attached to the unit, and other safety precautions that may apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguisher available for all brazing operations.

It is important to recognize safety information. This is the safety-alert symbol . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words DANGER, WARNING, CAUTION, and NOTE. These words are used with the safety-alert symbol. DANGER identifies the most serious hazards which **will** result in severe personal injury or death. WARNING signifies hazards which **could** result in personal injury or death. CAUTION is used to identify unsafe practices, which **may** result in minor personal injury or product and property damage. NOTE is used to highlight suggestions which **will** result in enhanced installation, reliability, or operation.

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:

- Shut off electrical power to unit.
- Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- 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.
- 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 gauge for how much oil to add to the system.
- Carefully un-sweat 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.

WARNING

UNIT OPERATION AND SAFETY HAZARD

Failure to follow this warning could cause personal injury, death and/or equipment damage.

R-410A refrigerant systems operate at higher pressures than standard R-22 systems. Do not use R-22 service equipment or components on R-410A refrigerant equipment.

⚠ 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.

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 from any source. 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 that 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 and 2 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. 3 and 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 Table 3 and 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. 6-12 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 equalization between compressors.

Refer to Fig. 13 for outdoor fan and compressor layout.

Refer to Fig. 14 and 15 for unit piping installation. See Table 4 for refrigerant specialties part numbers.

38AP	D	025	6	4	A	1	0	0	2	0
38AP – Split System Condensing Unit Refrigeration Circuit Options* D – Dual Refrigeration Circuit S – Single Refrigeration Circuit Unit Size 025 060 100 027 065 115 030 070 130 040 080 050 090 Power Supply 1 – 575-3-60 2 – 380-3-60 5 – 280/230-3-60 6 – 460-3-60 9 – 380/415-3-50 Condenser Coil/Low Sound Options 0 – Aluminum Fin / Copper Tube, No Sound Treatment 1 – Copper Fin / Copper Tube, No Sound Treatment 2 – Aluminum Pre-Coat Fin / Copper Tube, No Sound Treatment 3 – Aluminum E-Coat Fin / Copper Tube, No Sound Treatment 4 – Micro Channel (MCHX), No Sound Treatment 5 – E-coat Micro Channel (MCHX), No Sound Treatment 6 – Copper E-Coat Fin / Copper Tube, No Sound Treatment 7 – Aluminum Fin / Copper Tube, Low Sound Fan(s) 8 – Copper Fin / Copper Tube, Low Sound Fan(s) 9 – Aluminum Pre-Coat Fin / Copper Tube, Low Sound Fan(s) B – Aluminum E-Coat Fin / Copper Tube, Low Sound Fan(s) C – Micro Channel (MCHX), Low Sound Fan(s) D – E-coat Micro Channel (MCHX), Low Sound Fan(s) F – Copper E-Coat Fin / Copper Tube, Low Sound Fan(s) G – Aluminum Fin / Copper Tube, Low Sound Fan(s), Compressor Blankets H – Micro Channel (MCHX), Low Sound Fan(s), Compressor Blankets J – E-coat Micro Channel (MCHX), Low Sound Fan(s), Compressor Blankets K – Copper Fin / Copper Tube, Low Sound Fan(s), Compressor Blankets L – Aluminum Pre-Coat Fin / Copper Tube, Low Sound Fan(s), Compressor Blankets M – Aluminum E-Coat Fin / Copper Tube, Low Sound Fan(s), Compressor Blankets N – Copper E-Coat Fin / Copper Tube, Low Sound Fan(s), Compressor Blankets					Packaging/Security Options 0 – Std Packaging 4 – Security Grilles/Hail Guards 8 – Std Packaging, Bottom Skid D – Bottom Skid, Security Grilles/Hail Guards J – Bottom Skid, Top Crate, Bag N – Bottom Skid, Top Crate, Bag, Security Grilles/Hail Guards Controls/Communications Options 2 – Standard, Scrolling Marquee 3 – EMM, Scrolling Marquee 8 – Scrolling Marquee, BACnet Communication 9 – Scrolling Marquee, EMM, BACnet Communication Electrical Options 0 – Single Point Power, XL, Terminal Block 1 – Single Point Power, XL, Non-Fused Disconnect 2 – Dual Point Power, XL, Terminal Block** Ambient/Capacity Control/High SCCR Options† 0 – Std Ambient, Std Compressor 2 – Std Ambient, Digital Compressor 3 – Std Ambient, Std Compressor, High SCCR 5 – Std Ambient, Digital Compressor, High SCCR D – GreenSpeed®, Std Compressor G – GreenSpeed®, Variable Compressor H – GreenSpeed®, Std Compressor, High Interrupt K – GreenSpeed®, Variable Compressor, High Interrupt Line Length Options 1 – Standard Line Length, MCHX 2 – Long Line Length Check valves, MCHX 3 – Standard Line Length, RTPF 4 – Long Line Length Check valves, RTPF Revision Level A B (Unit Sizes 065,115,130 Only)					

LEGEND

Cu/Al	—	Copper/Aluminum
Cu/Cu	—	Copper/Copper
EMM	—	Energy Management Module
MCHX	—	Microchannel Heat Exchanger
RTPF	—	Round Tube, Plate Fin (Condenser Coil)
SCCR	—	Short Circuit Current Rating
XL	—	Across-the-Line Start

* 38APS units available in sizes 025-050 and 065 only.

† Digital compressor not available on size 065.

** Only available on sizes 115 and 130.

Fig. 1 — Model Number Nomenclature

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

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 MCHX	1095	1077	1258	1240	1264	1246	2094	1968	2120	1977
MCHX, Low Sound Option	1131	1113	1294	1276	1300	1282	2148	2022	2174	2031
Cu-Al RTPF	1168	1150	1347	1329	1353	1335	2273	2147	2299	2156
Cu-Al RTPF, Low Sound Option	1204	1186	1383	1365	1389	1371	2327	2201	2353	2210
Cu-Cu RTPF	1308	1290	1523	1505	1529	1511	2625	2499	2651	2508
Cu-Cu RTPF, Low Sound Option	1344	1326	1559	1541	1565	1547	2679	2553	2705	2562
REFRIGERANT CHARGE (LB)										
Total MCHX ^b	25	24	27	26	28	29	38	39	48	48
Circuit A/Circuit B MCHX	12.5/12.5	24/—	13.5/13.5	26/—	14/14	29/—	21/17	39/—	22/26	48/—
Total RTPF ^b	43	42	49.6	48.5	51.6	51.5	83	83.9	93	92.9
Circuit A/Circuit B RTPF	21.5/21.5	42/—	24.8/24.8	48.5/—	25.3/25.3	51.5/—	43.5/39.5	83.9/—	44.5/48.5	92.9/—
NITROGEN SHIPPING CHARGE	15 psig									
COMPRESSOR hp (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
Total Airflow (60 Hz) (cfm)	18,500		20,500		20,500		33,300		33,300	
Total Airflow (50 Hz) (cfm)	15,448		17,124		17,124		27,804		27,804	
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
Total Airflow (60 Hz) (cfm)	17,500		19,400		19,400		30,501		30,501	
Total Airflow (50 Hz) (cfm)	14,614		16,205		16,205		25,467		25,467	
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 / 5/8	5/8	5/8 / 5/8	5/8	5/8 / 5/8	7/8	5/8 / 5/8	7/8	5/8 / 5/8	7/8
MAXIMUM HEIGHT FOR 3°F SUBCOOLING (ft)^c	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

NOTE(S):

- 38AP units with Greenspeed intelligence are available on unit sizes 38APS025-050 and 38APD025-060.
- 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.

LEGEND

cfm	—	Cubic Feet per Minute
CKT	—	Circuit
MCHX	—	Microchannel Heat Exchanger
ODF	—	Outside Diameter, Female
RTPF	—	Round Tube Plate Fin

Table 1 — 38AP060-130 Unit Physical Data — English^a (cont)

38AP UNIT SIZE	060	065	070	080	090	100	115	130
NOMINAL CAPACITY, 50/60 Hz (tons)	50/60	54/65	56/70	67/80	75/90	83/100	96/115	108/130
CIRCUIT	Dual	Single	Dual	Dual	Dual	Dual	Dual	Dual
OPERATING WEIGHTS (lb)								
Standard MCHX	2227	2505	2450	2610	2835	2844	3211	3353
MCHX with Low Sound Option	2299	2577	2522	2700	2943	2952	3337	3461
Cu/Al RTPF	2405	2975	2920	3290	3530	3539	3966	4492
Cu/Al RTPF with Low Sound Option	2477	3047	2992	3380	3638	3647	4092	4600
Cu/Cu RTPF	2757	3362	3435	3934	4303	4312	4868	5523
Cu/Cu RTPF with Low Sound Option	2829	3434	3507	4024	4411	4420	4994	5631
REFRIGERANT CHARGE (lb)								
Total MCHX ^b	56	55	62	75	85	92	101	117
Circuit A/Circuit B MCHX	27/29	—/55	29/33	29/46	39/46	46/46	46/55	46/71
Total RTPF ^b	101	105	128	157.5	184	191	216.5	249
Circuit A/Circuit B RTPF	49.5/51.5	105/—	62/66	62.0/95.5	88.5/95.5	95.5/95.5	95.5/121.0	95.5/153.5
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								
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	5/8 / 5/8	7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 1-1/8
MAXIMUM HEIGHT FOR 3°F SUBCOOLING (ft) ^c	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

NOTE(S):

- 38AP condensing units with Greenspeed intelligence are not available on unit sizes 065-130.
- 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.

LEGEND

cfm	—	Cubic Feet per Minute
CKT	—	Circuit
MCHX	—	Microchannel Heat Exchanger
ODF	—	Outside Diameter, Female
RTPF	—	Round Tube, Plate Fin

Table 2 — 38AP025-050 Unit Physical Data — SI^a

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 MCHX	497	489	571	562	573	565	950	893	961	897
MCHX with Low Sound Option	513	505	587	579	590	582	974	917	986	921
Cu/Al RTPF	531	522	611	603	613	605	1031	974	1042	978
Cu/Al RTPF with Low Sound Option	547	538	627	620	630	622	1055	998	1067	1002
Cu/Cu RTPF	594	585	691	683	693	685	1191	1134	1202	1138
Cu/Cu RTPF with Low Sound Option	610	601	707	699	710	702	1215	1158	1227	1162
REFRIGERANT CHARGE (kg)										
Total MCHX ^b	11.5	11	12.5	12	14	13	18	18	22	22
Circuit A/Circuit B MCHX	6/6	11/—	6.5/6.5	12/—	7/7	13/—	10/8	18/—	10/12	22/—
Total RTPF ^b	19.5	19	22.5	22	22.9	23.4	37.6	38	42.1	42.1
Circuit A/Circuit B RTPF	10/10	19/—	11.5/11.5	22/—	11.5/11.5	23.4/—	19.7/17.9	38/—	20.0/22	42.1/—
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										
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	15/8	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 / 5/8	5/8	5/8 / 5/8	5/8	5/8 / 5/8	7/8	5/8 / 5/8	7/8	5/8 / 5/8	7/8
MAXIMUM HEIGHT FOR 3°F SUBCOOLING (m) ^c	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

NOTE(S):

- 38AP units with Greenspeed intelligence are available on unit sizes 38APS025-050 and 38APD025-060.
- 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.

LEGEND

CKT	—	Circuit
L/s	—	Liters per Second
MCHX	—	Microchannel Heat Exchanger
ODF	—	Outside Diameter, Female
RTPF	—	Round Tube, Plate Fin

Table 2 — 38AP060-130 Unit Physical Data — SI^a (cont)

38AP UNIT SIZES	060	065	070	080	090	100	115	130
NOMINAL CAPACITY 50/60 Hz (kW)	176/211	190/228	196/246	234/281	264/316	293/351	337/404	381/457
CIRCUIT	Dual	Single	Dual	Dual	Dual	Dual	Dual	Dual
OPERATING WEIGHTS (kg)								
Standard MCHX	1010	1136	1111	1184	1286	1290	1456	1521
MCHX with Low Sound Option	1043	1169	1144	1225	1335	1339	1514	1570
Cu/Al RTPF	1090	1350	1324	1492	1601	1605	1799	2038
Cu/Al RTPF with Low Sound Option	1123	1382	1357	1533	1650	1654	1856	2087
Cu/Cu RTPF	1250	1525	1558	1784	1952	1956	2208	2505
Cu/Cu RTPF with Low Sound Option	1283	1557	1591	1825	2001	2005	2265	2554
REFRIGERANT CHARGE (kg)								
Total MCHX ^b	25	25	28	34	39	42	46	53
Circuit A/Circuit B MCHX	12/13	—/25	13/15	13/21	18/21	21/21	21/25	21/32
Total RTPF ^b	45.8	47.6	58	71.4	83.4	86.6	98.2	113
Circuit A/Circuit B RTPF	22.4/23.4	47.6/—	28.1/29.9	28.1/43.3	40.1/43.3	43.3/43.3	43.3/54.9	43.3/69.6
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	Propeller Type, Axial, Vertical Discharge							
Quantity	4	4	4	5	6	6	7	8
r/s	19 (60 Hz), 16 (50 Hz)							
Diameter (mm)	762							
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)							
Diameter (mm)	762							
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								
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 / 5/8	7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 7/8	7/8 / 11/8
MAXIMUM HEIGHT FOR 3°F SUBCOOLING (m) ^c	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

NOTE(S):

- 38AP condensing units with Greenspeed intelligence are not available on unit sizes 065-130.
- 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.

LEGEND

CKT	—	Circuit
L/s	—	Liters per Second
MCHX	—	Microchannel Heat Exchanger
ODF	—	Outside Diameter, Female
RTPF	—	Round Tube, Plate Fin

Table 3 — Maximum Operational Corner Weights**38APS MCHX Unit^{a,b}**

38APS UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)				TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)			
		A	B	C	D		A	B	C	D
025	1113	375	257	196	285	505	170	117	89	129
027	1276	413	295	236	331	579	188	134	107	150
030	1282	416	297	237	332	582	189	135	107	151
040	2022	639	621	376	387	917	290	282	171	175
050	2031	643	625	377	387	921	291	283	171	176
065	2577	858	848	433	438	1169	389	385	196	199

38APD MCHX Unit^{a,b}

38APD UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)						TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)					
		A	B	C	D	E	F		A	B	C	D	E	F
025	1131	379	262	200	290	—	—	513	172	119	91	131	—	—
027	1294	418	300	241	335	—	—	587	190	136	109	152	—	—
030	1300	421	301	241	337	—	—	590	191	137	109	153	—	—
040	2148	692	676	385	395	—	—	974	314	307	175	179	—	—
050	2174	703	688	388	396	—	—	986	319	312	176	179	—	—
060	2299	741	713	414	431	—	—	1043	336	323	188	195	—	—
070	2522	747	627	524	624	—	—	1144	339	284	238	283	—	—
080	2700	819	686	545	650	—	—	1225	371	311	247	295	—	—
090	2943	791	760	682	710	—	—	1335	359	345	309	322	—	—
100	2952	791	760	686	714	—	—	1339	359	345	311	324	—	—
115	3337	612	601	499	494	565	566	1514	278	273	226	224	256	257
130	3461	620	612	528	522	589	590	1570	281	278	239	237	267	268

38APS Cu-AI RTPF Unit^{a,b}

38APS UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)				TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)			
		A	B	C	D		A	B	C	D
025	1186	416	257	196	317	538	189	117	89	144
027	1365	413	301	275	376	619	187	137	125	171
030	1371	416	303	275	378	622	189	137	125	171
040	2201	683	666	420	432	998	310	302	191	196
050	2210	687	670	421	432	1002	312	304	191	196
065	3047	1045	915	507	580	1169	389	385	196	199

38APD Cu-AI RTPF Unit^{a,b}

38APD UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)						TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)					
		A	B	C	D	E	F		A	B	C	D	E	F
025	1204	379	267	231	327	—	—	546	172	121	105	148	—	—
027	1383	417	306	279	381	—	—	627	189	139	127	173	—	—
030	1389	420	307	280	382	—	—	630	191	139	127	173	—	—
040	2327	737	721	430	439	—	—	1056	334	327	195	199	—	—
050	2353	747	733	432	441	—	—	1067	339	332	196	200	—	—
060	2477	785	758	459	476	—	—	1124	356	344	208	216	—	—
070	2992	969	667	553	803	—	—	1357	440	303	251	364	—	—
080	3378	1115	738	608	917	—	—	1532	506	335	276	416	—	—
090	3638	1127	820	712	979	—	—	1650	511	372	323	444	—	—
100	3647	1128	820	716	983	—	—	1654	512	372	325	446	—	—
115	4092	853	815	730	747	464	483	1856	387	370	331	339	210	219
130	4600	943	906	781	798	575	597	2087	428	411	354	362	261	271

NOTE(S):

- a. Weights include refrigerant charge.
b. For operational corner weights, see Fig. 2.

Table 3 — Maximum Operational Corner Weights (cont)

38APS Cu-Cu RTPF Unit^{a,b}

38APS UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)				TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)			
		A	B	C	D		A	B	C	D
025	1326	494	256	197	379	601	224	116	89	172
027	1541	412	312	352	465	699	187	142	160	211
030	1547	415	313	352	467	702	188	142	160	212
040	2553	772	754	508	520	1158	350	342	230	236
050	2562	775	758	508	520	1162	352	344	230	236
065	3434	1215	853	564	802	1558	551	387	256	364

38APD Cu-Cu RTPF Unit^{a,b}

38APD UNIT SIZE	TOTAL WEIGHT (lb)	OPERATIONAL CORNER WEIGHT (lb)						TOTAL WEIGHT (kg)	OPERATIONAL CORNER WEIGHT (kg)					
		A	B	C	D	E	F		A	B	C	D	E	F
025	1344	378	276	291	398	—	—	610	171	125	132	181	—	—
027	1559	417	316	357	470	—	—	707	189	143	162	213	—	—
030	1565	420	318	357	471	—	—	710	191	144	162	214	—	—
040	2679	825	809	517	528	—	—	1215	374	367	235	239	—	—
050	2705	836	821	519	529	—	—	1227	379	372	235	240	—	—
060	2829	873	846	546	564	—	—	1283	396	384	248	256	—	—
070	3507	1223	654	568	1062	—	—	1591	555	297	258	482	—	—
080	4024	1388	694	648	1294	—	—	1825	630	289	294	587	—	—
090	4411	1504	802	732	1373	—	—	2001	682	364	332	623	—	—
100	4420	1503	803	736	1378	—	—	2005	682	364	334	625	—	—
115	4994	966	930	843	859	687	709	2265	438	422	382	390	312	322
130	5631	1073	1037	912	926	830	853	2554	487	470	414	420	376	387

NOTE(S):

a. Weights include refrigerant charge.

b. For operational corner weights, see Fig. 2.

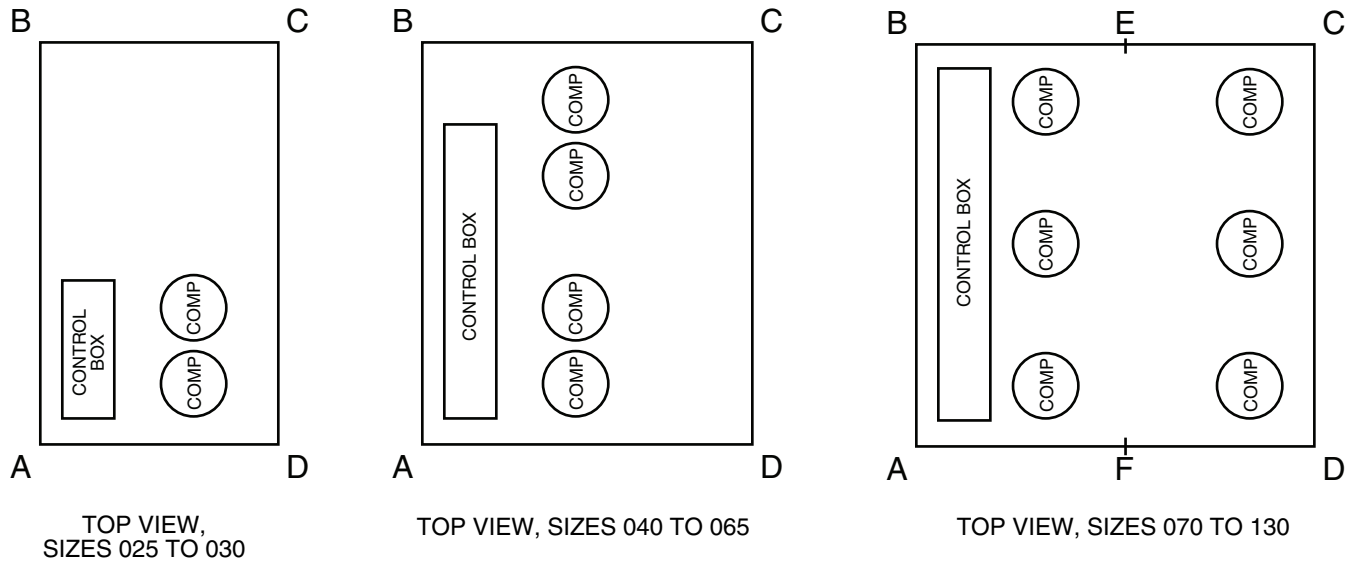


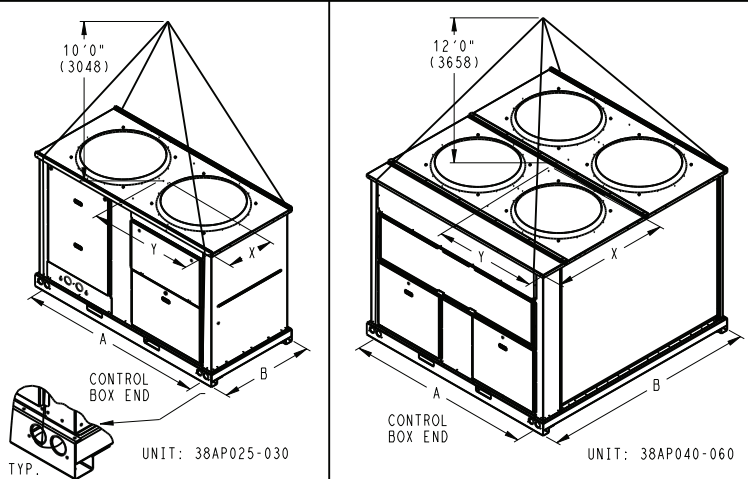
Fig. 2 — Maximum Operational Corner Weights

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	MCHX				RTPF(CU/CU)				LIFTING HOLES				CENTER OF GRAVITY			
	MAX. SHIP. WT. W/O PACKAGING		MAX. SHIP. WT. W/PACKAGING		MAX. SHIP. WT. W/O PACKAGING		MAX. SHIP. WT. W/PACKAGING		A		B		X		Y	
	LBS	KGS	LBS	KGS	LBS	KGS	LBS	KGS	IN	MM	IN	MM	IN	MM	IN	MM
38APS025	1113	505	1163	528	1326	601	1376	624	79.4	2017	40.3	1022	19.3	490	37.8	958
38APD025	1131	513	1184	536	1344	610	1394	632	79.4	2017	40.3	1022	19.3	490	37.8	961
38APS027	1276	579	1326	601	1541	699	1591	722	79.4	2017	40.3	1022	19.8	502	38.4	975
38APD027	1294	587	1344	610	1559	707	1609	730	79.4	2017	40.3	1022	19.8	502	38.5	977
38APS030	1282	582	1332	604	1547	702	1597	725	79.4	2017	40.3	1022	19.7	501	38.3	974
38APD030	1300	590	1350	612	1565	710	1615	733	79.4	2017	40.3	1022	19.7	501	38.4	975
38APS040	2022	917	2097	951	2553	1158	2628	1192	79.4	2017	92.1	2340	36.6	930	44.6	1134
38APD040	2148	974	2223	1008	2679	1215	2754	1249	79.4	2017	92.1	2340	35.3	897	44.7	1134
38APS050	2031	921	2106	955	2562	1162	2637	1196	79.4	2017	92.1	2340	36.5	927	44.6	1133
38APD050	2174	986	2249	1020	2705	1227	2780	1261	79.4	2017	92.1	2340	35.1	891	44.7	1135
38APD060	2299	1043	2374	1077	2829	1283	2904	1317	79.4	2017	92.1	2340	36.0	915	44.6	1133

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LEGEND

- MCHX** — Microchannel Heat Exchanger
RTPF — Round Tube, Plate Fin (Condenser Coil)

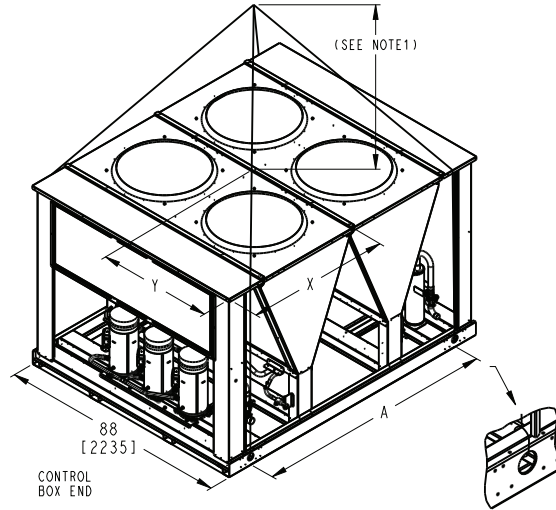
Fig. 3 — Rigging Label, 38AP025-060

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.

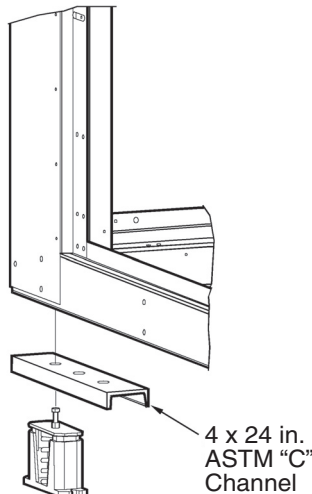


MODEL NUMBER	MCHX				RTPF (CU/CU)				LIFTING HOLE		CENTER OF GRAVITY			
	MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. WITH PACKAGING		MAX. SHIP WT. W/O PACKAGING		MAX. SHIP WT. WITH PACKAGING		A		X		Y	
	LBS	KGS	LBS	KGS	LBS	KGS	LBS	KGS	IN	MM	IN	MM	IN	MM
38APS065	2577	1169	2677	1214	3434	1557	3534	1603	91.4	2321	40.9	1039	43.6	1107
38APD070	2522	1144	2622	1189	3507	1591	3607	1636	91.4	2321	52.3	1328	42.9	1089
38APD080	2700	1225	2800	1270	4024	1825	4124	1871	131.6	3343	68.7	1745	42.5	1078
38APD090	2943	1335	3043	1380	4411	2001	4511	2046	131.6	3343	74.4	1889	44.2	1123
38APD100	2952	1339	3052	1384	4420	2005	4520	2050	131.6	3343	74.5	1893	44.2	1123
38APD115	3461	1514	3437	1559	4994	2265	5094	2311	171.7	4362	83.7	2125	44.2	1123
38APD130	3337	1570	3561	1615	5631	2554	5731	2599	171.7	4362	80.1	2035	44.3	1125

LEGEND

- MCHX** — Microchannel Heat Exchanger
RTPF — Round Tube, Plate Fin (Condenser Coil)

Fig. 4 — Rigging Label, 38AP065-130



LEGEND

- ASTM** — American Society for Testing and Materials

Fig. 5 — Perimeter Support Channel

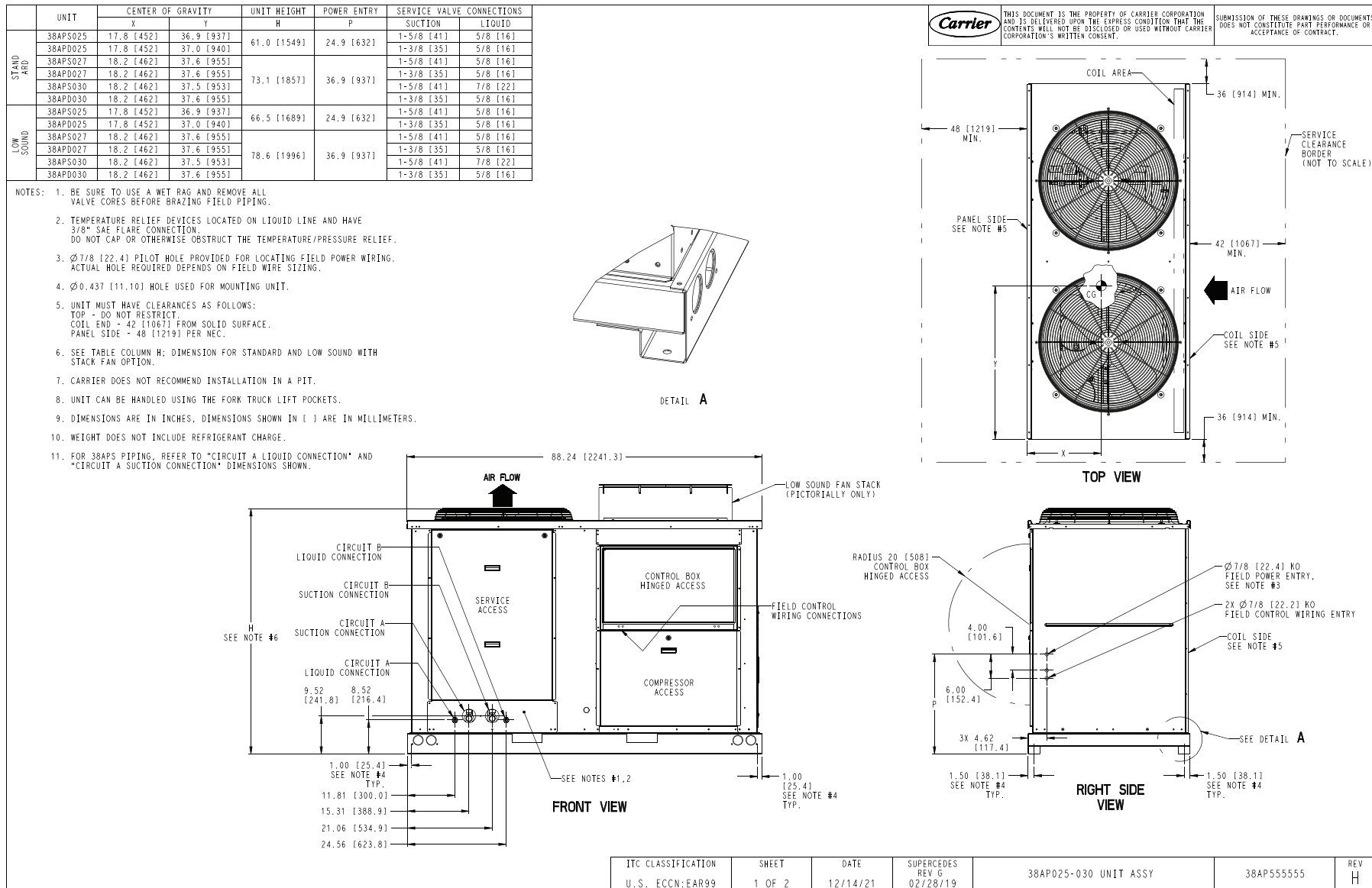


Fig. 6 — 38AP Unit Dimensions, Sizes 025-030, Standard and Low Sound

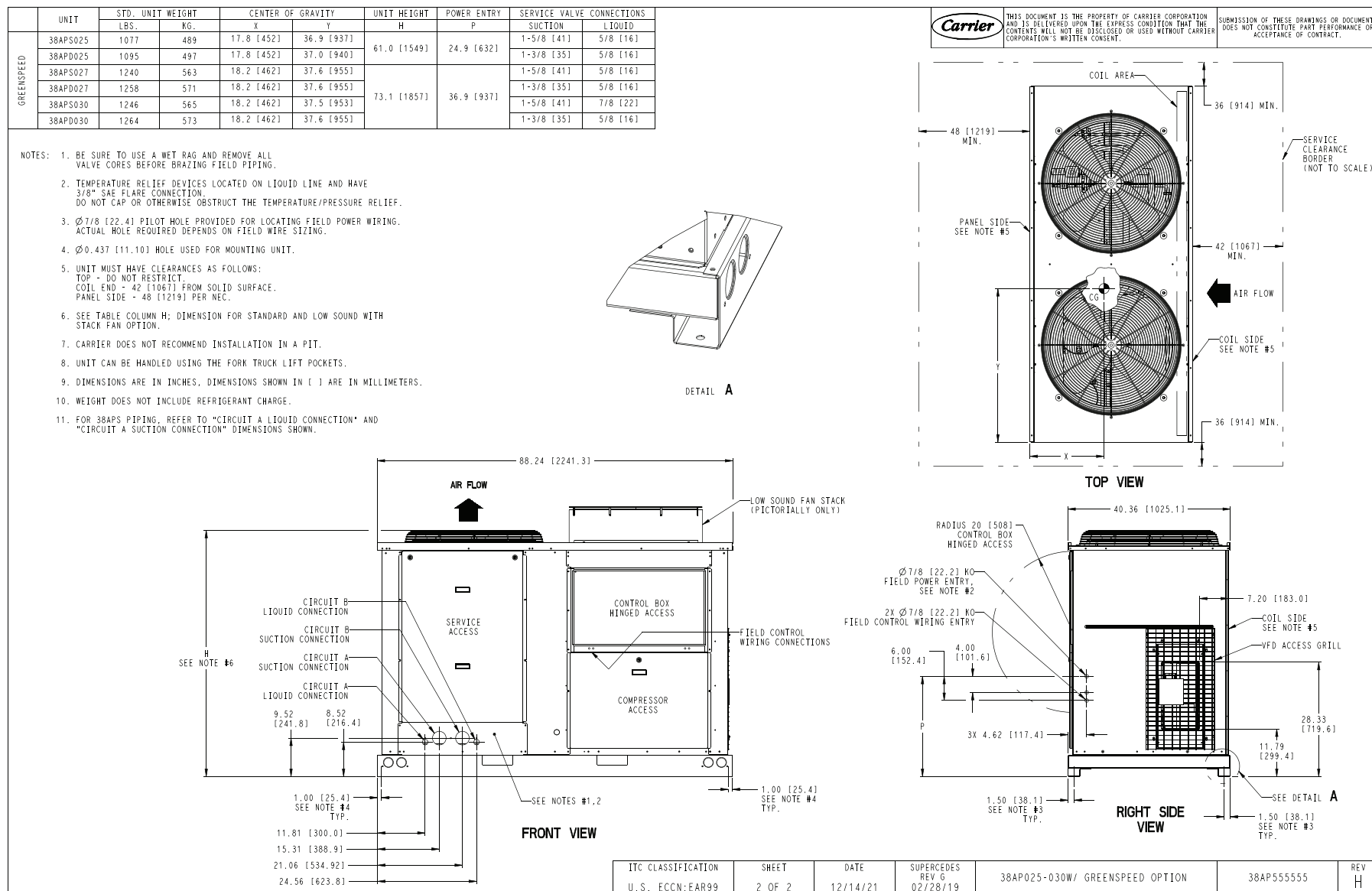


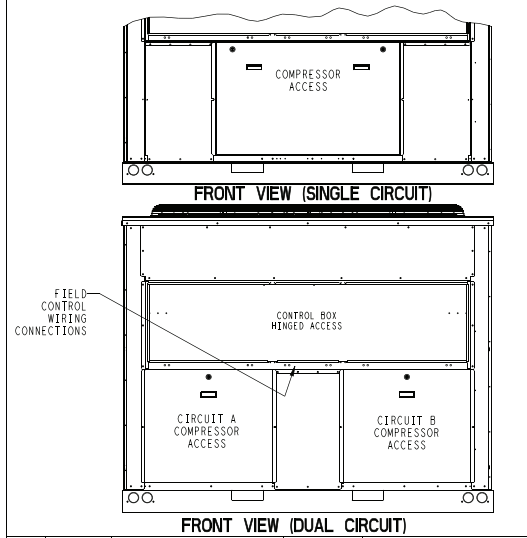
Fig. 7 — 38AP Unit Dimensions, Sizes 025-030, with Greenspeed Intelligence

- NOTES:
1. BE SURE TO USE A WET RAG AND REMOVE ALL VALVE CORES BEFORE BRAZING FIELD PIPING.
 2. TEMPERATURE RELIEF DEVICES LOCATED ON LIQUID LINE AND HAVE A 3/8" SAE FLARE CONNECTION. DO NOT CAP OR OTHERWISE OBSTRUCT THE TEMPERATURE/PRESSURE RELIEF.
 3. Ø7/8 [22.4] PILOT HOLE PROVIDED FOR LOCATING FIELD POWER WIRING. ACTUAL HOLE REQUIRED DEPENDS ON FIELD WIRE SIZING.
 4. Ø0.437 [11.10] HOLE USED FOR MOUNTING UNIT.
 5. UNIT MUST HAVE CLEARANCES AS FOLLOWS:
TOP - DO NOT RESTRICT.
COIL END - 42 [1067] FROM SOLID SURFACE.
PANEL SIDE - 48 [1219] PER NEC.
 6. SEE TABLE COLUMN H; DIMENSION FOR STANDARD AND LOW SOUND WITH STACK FAN OPTION.
 7. CARRIER DOES NOT RECOMMEND INSTALLATION IN A PIT.
 8. UNIT CAN BE HANDLED USING THE FORK TRUCK LIFT POCKETS.
 9. DIMENSIONS ARE IN INCHES, DIMENSIONS SHOWN IN [] ARE IN MILLIMETERS.
 10. SIZES 040 AND 050 UNITS HAVE 3 CONDENSER FANS, SIZE 060 UNITS HAVE 4 CONDENSER FANS.
 11. WEIGHT DOES NOT INCLUDE REFRIGERANT CHARGE.
 12. FOR 38APS PIPING, REFER TO 'CIRCUIT A LIQUID CONNECTION' AND 'CIRCUIT A SUCTION CONNECTION' DIMENSIONS SHOWN.

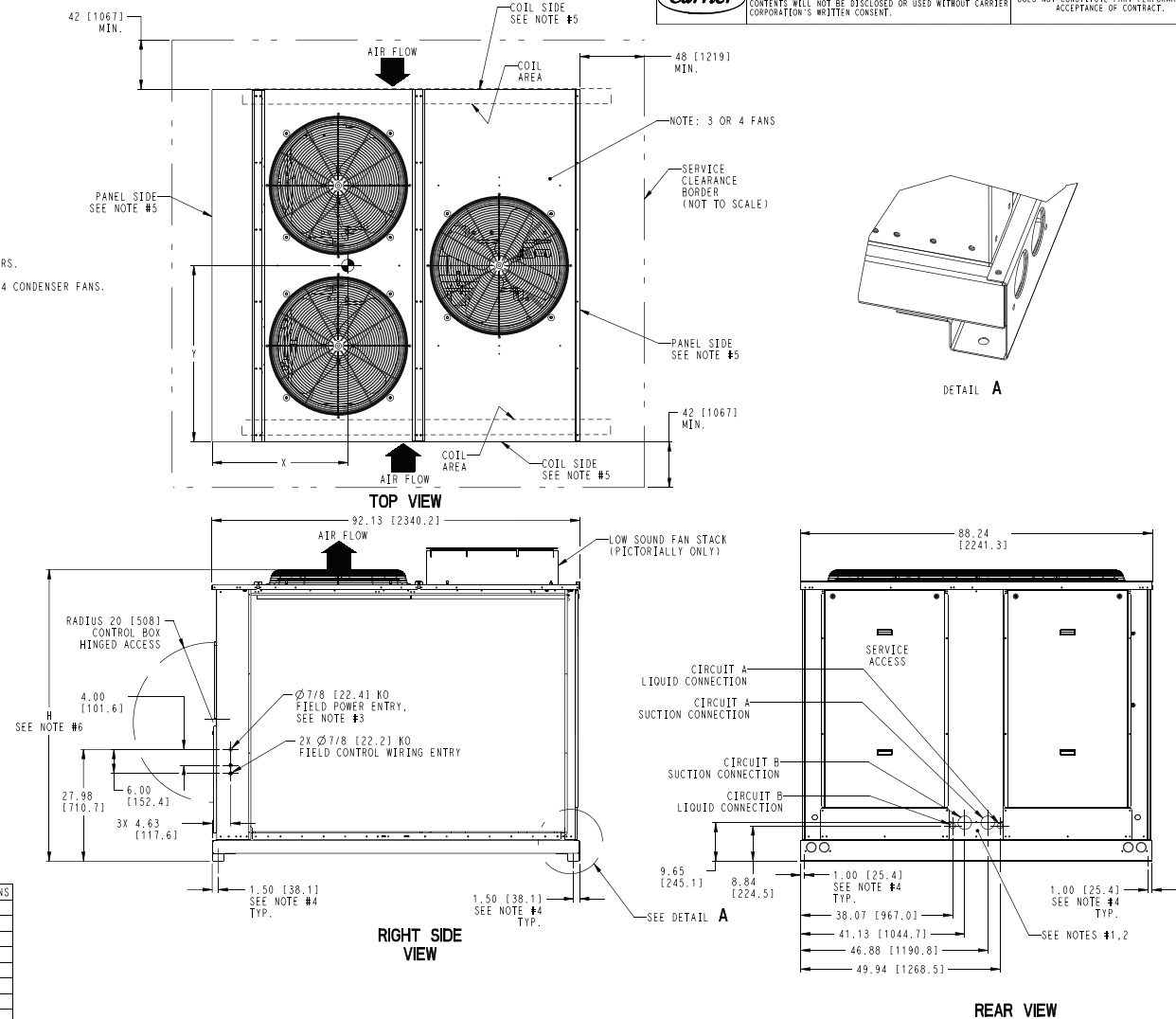


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	UNIT	CENTER OF GRAVITY		UNIT HEIGHT	SERVICE VALVE CONNECTIONS	
		X	Y		SUCTION	LIQUID
STANDARD	38APS040	35.0 [889]	44.0 [1118]	73.0 [1854]	2-1/8 [54]	7/8 [22]
	38APD040	33.7 [856]	44.1 [1120]		1-5/8 [41]	5/8 [16]
	38APS050	34.9 [886]	44.0 [1118]		2-1/8 [54]	7/8 [22]
	38APD050	33.4 [848]	44.1 [1120]		1-5/8 [41]	5/8 [16]
	38APD060	34.4 [874]	44.1 [1120]		1-5/8 [41]	5/8 [16]
LOW SOUND	38APS040	35.0 [889]	44.0 [1118]	78.5 [1994]	2-1/8 [54]	7/8 [22]
	38APD040	33.7 [856]	44.1 [1120]		1-5/8 [41]	5/8 [16]
	38APS050	34.9 [886]	44.0 [1118]		2-1/8 [54]	7/8 [22]
	38APD050	33.4 [848]	44.1 [1120]		1-5/8 [41]	5/8 [16]
	38APD060	34.4 [874]	44.1 [1120]		1-5/8 [41]	5/8 [16]



ITC CLASSIFICATION U.S. ECCN:EAR99	SHEET 1 OF 2	DATE 12/14/21	SUPERCEDES REV I 02/28/19	38AP040-060 UNIT ASSY	38AP555556	REV J
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Fig. 8 — 38AP Unit Dimensions, Sizes 040-060, Standard and Low Sound

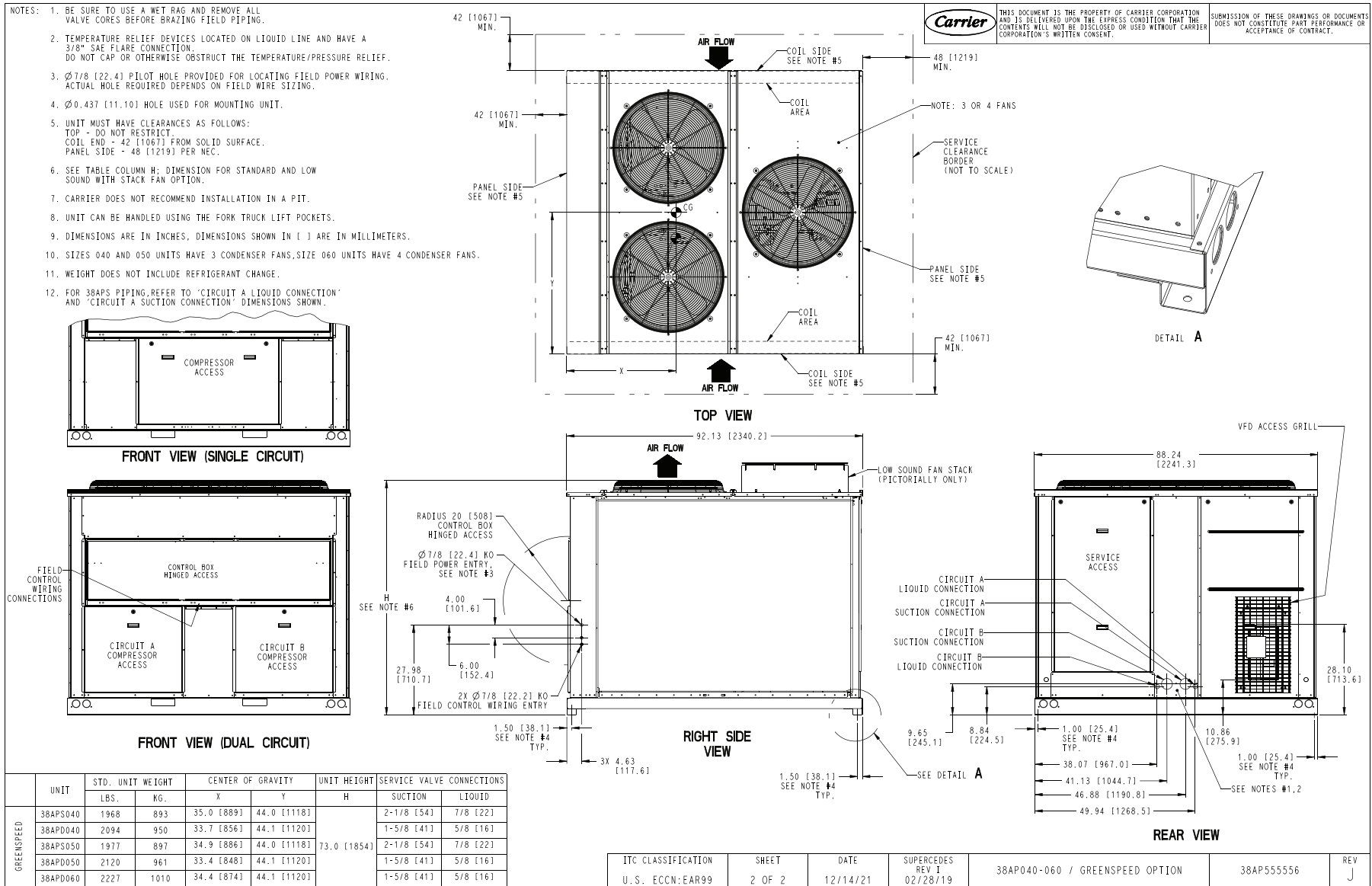


Fig. 9 — 38AP Unit Dimensions, Sizes 040-060, with Greenspeed Intelligence

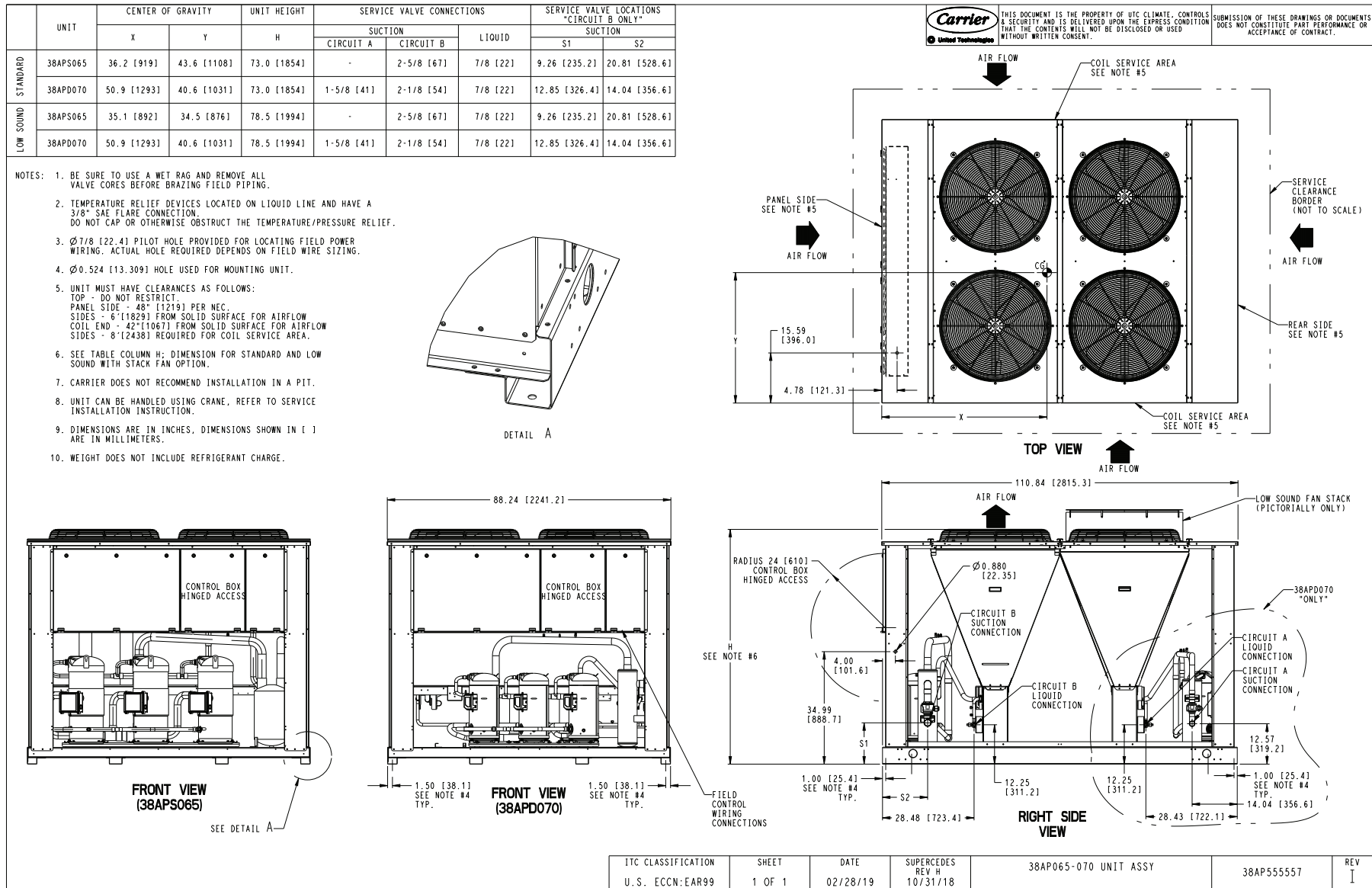


Fig. 10 — 38AP Unit Dimensions, Sizes 065 and 070

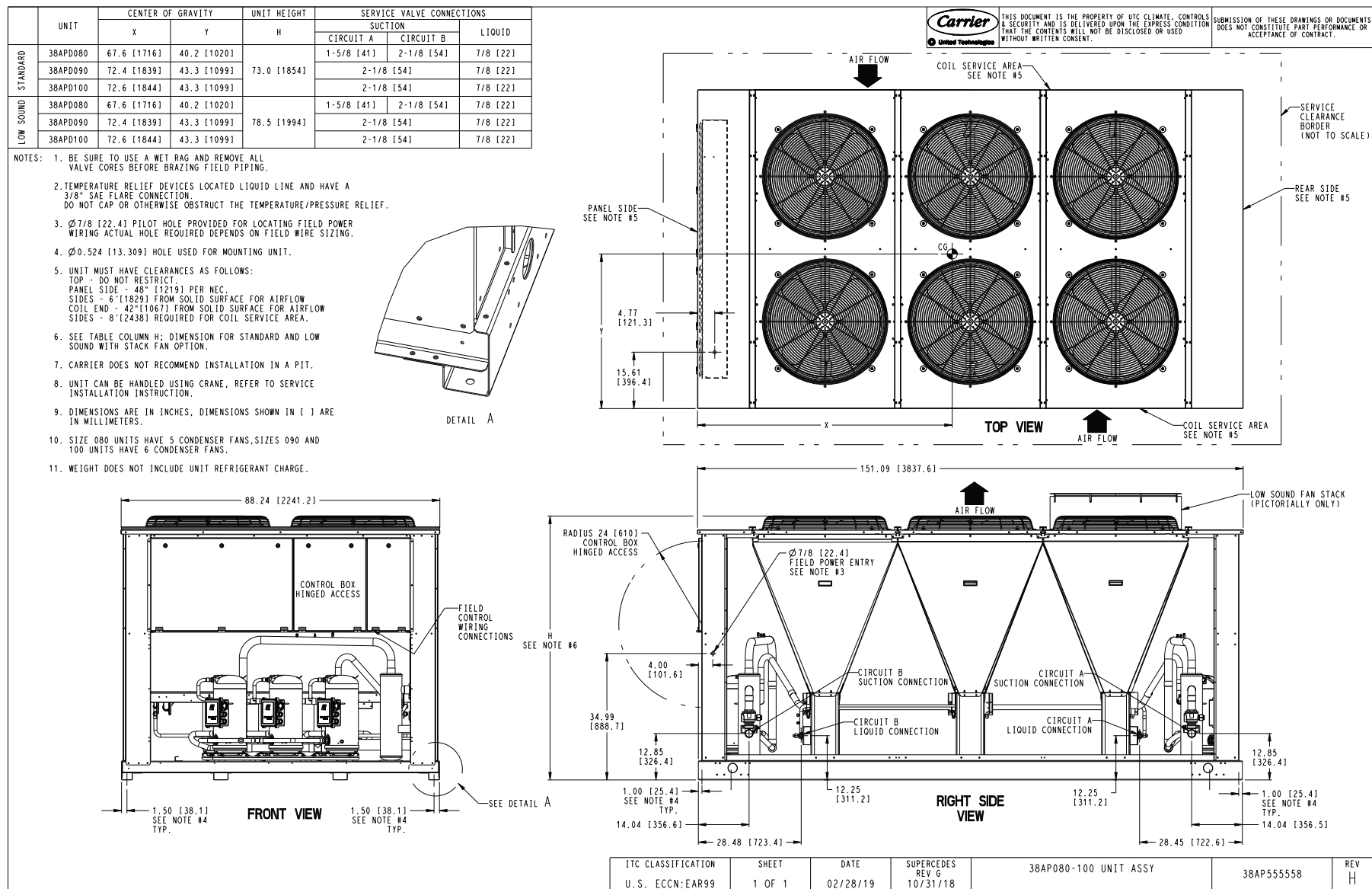


Fig. 11 — 38AP Unit Dimensions, Sizes 080-100

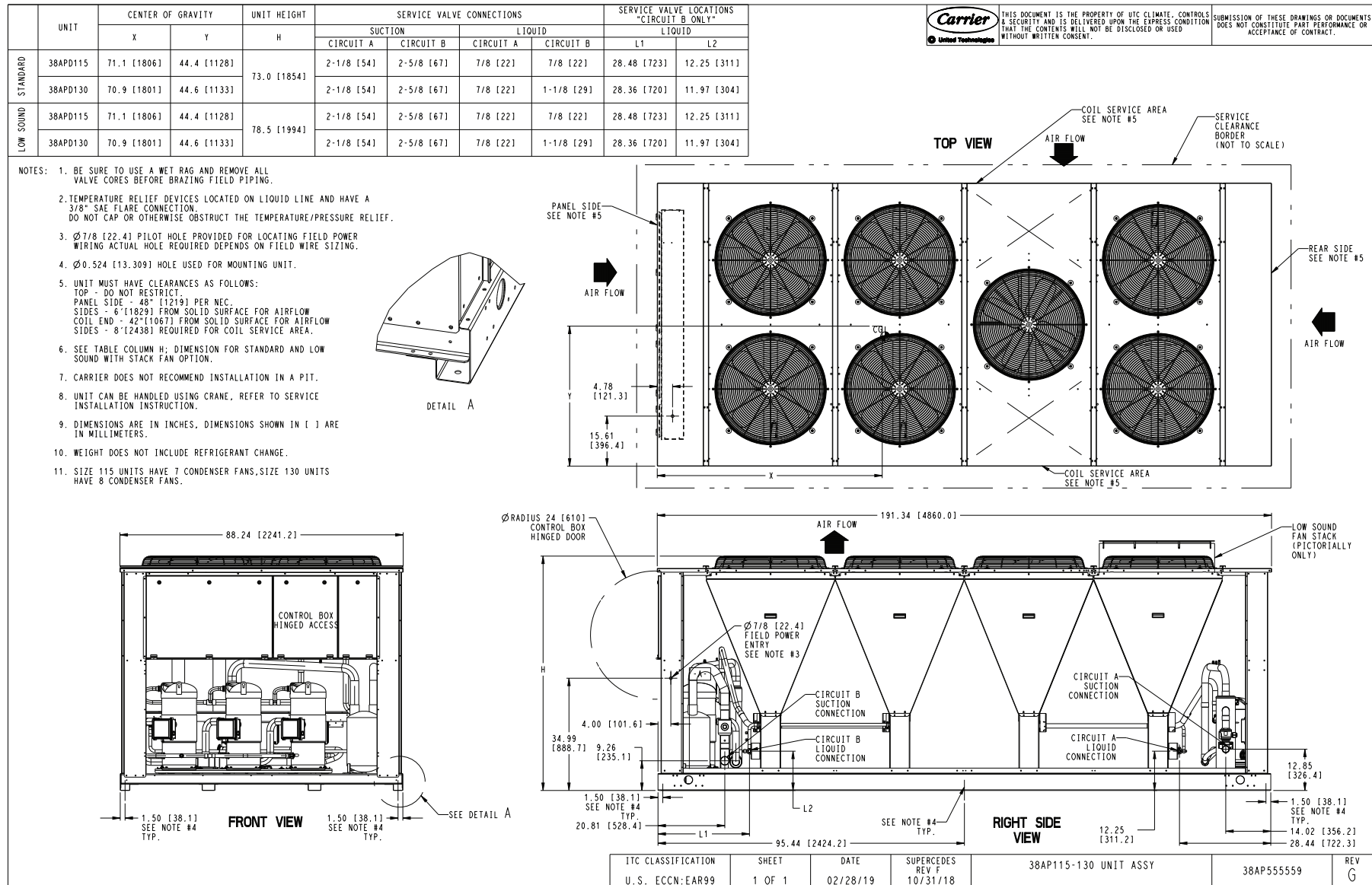
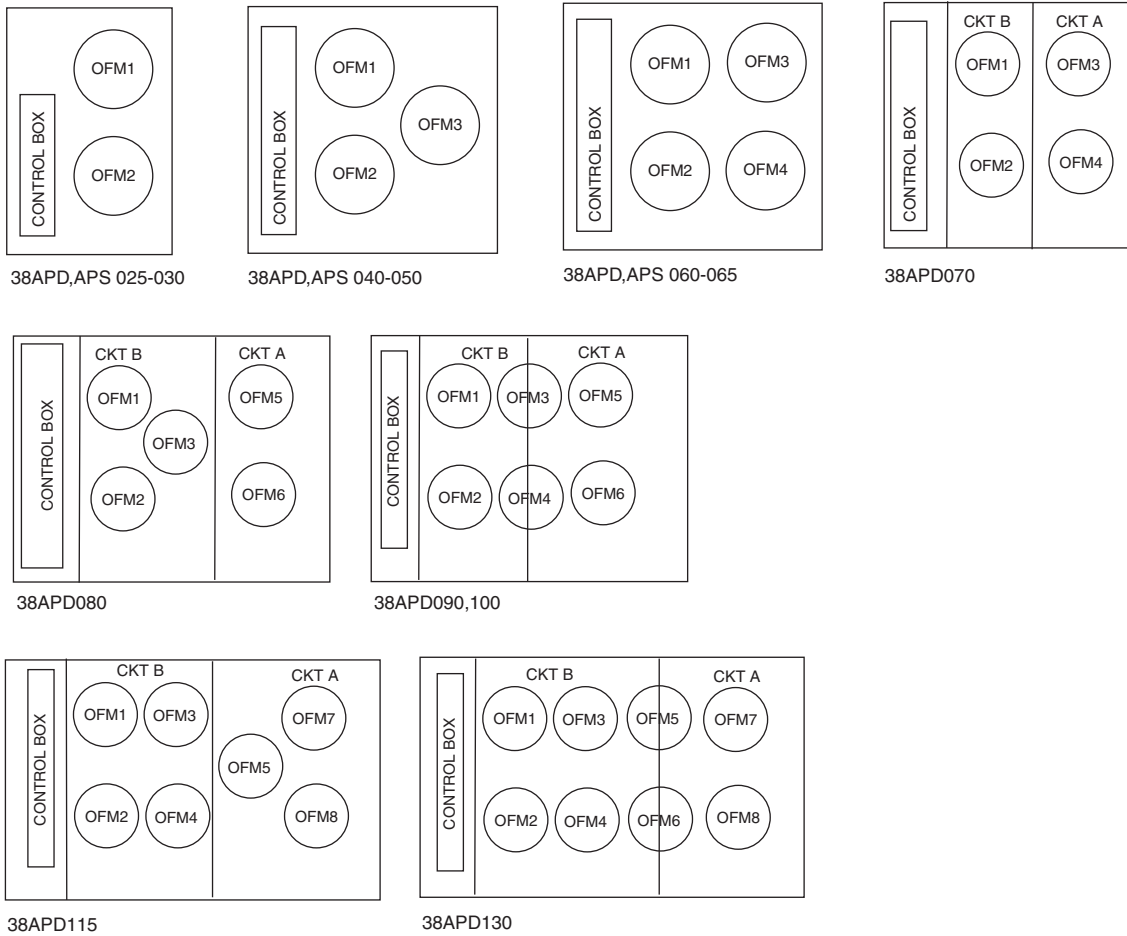
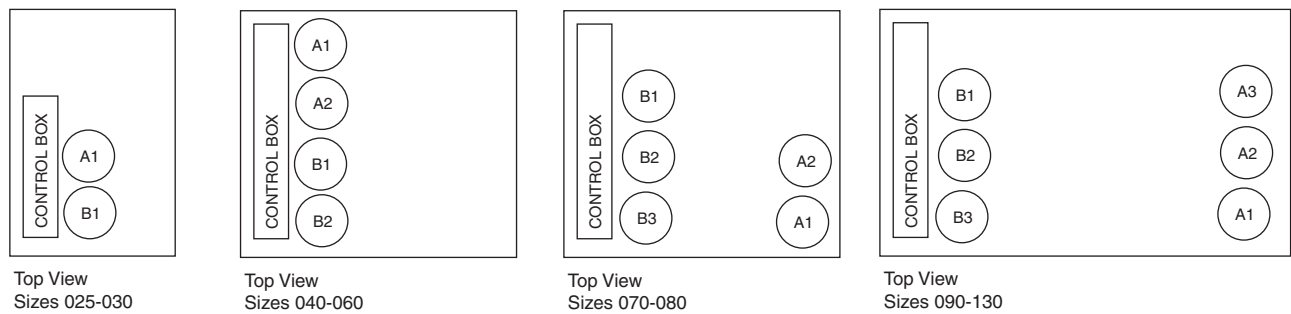


Fig. 12 — 38AP Unit Dimensions, Sizes 115, 130

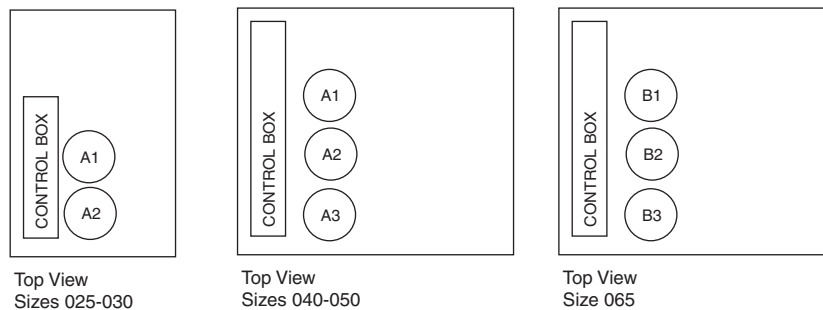
Outdoor Fan Layout (Top View)



Compressor Layout Dual Circuit, 38APD



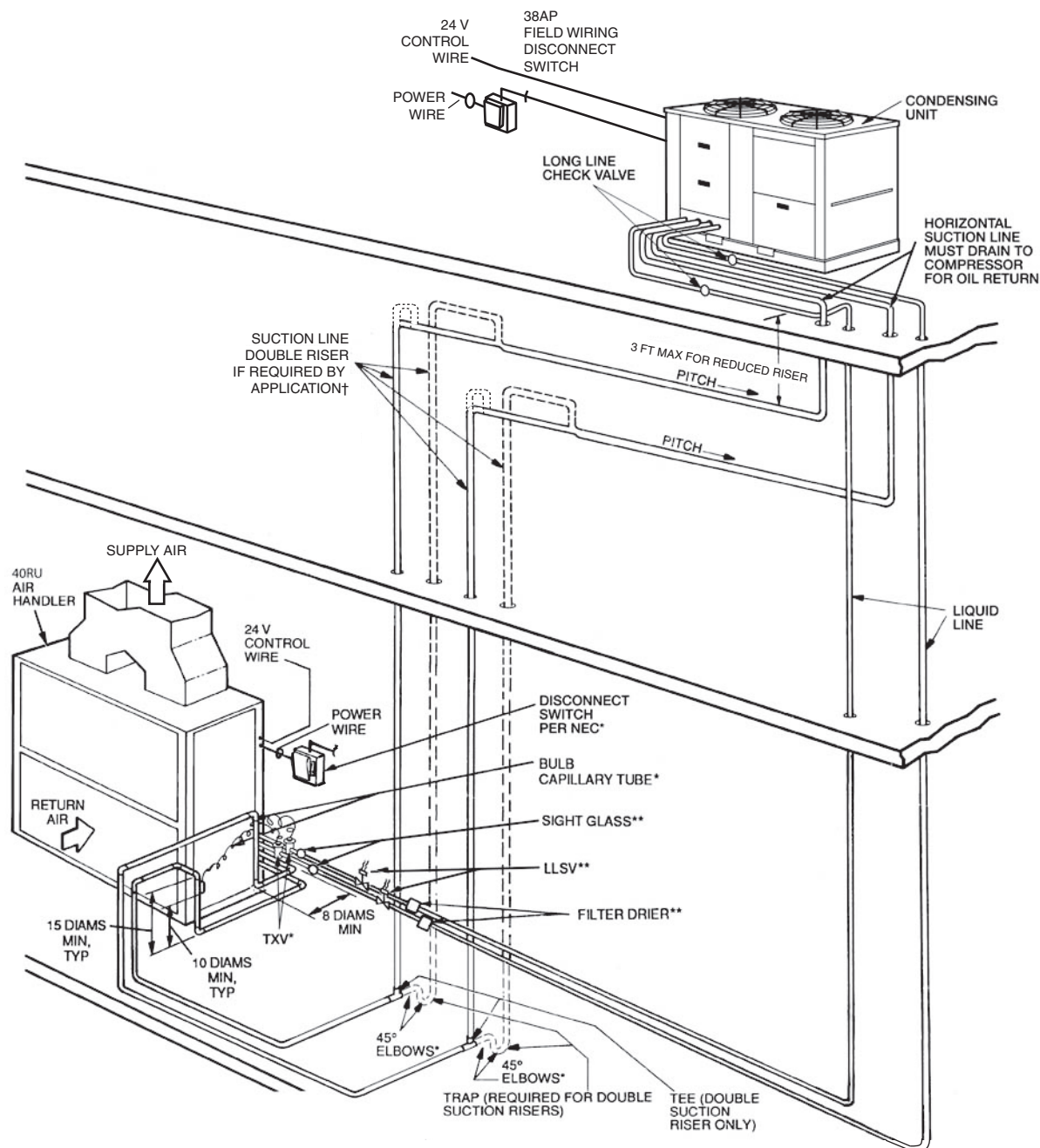
Compressor Layout Single Circuit, 38APS



LEGEND

- A** — Circuit 1 Compressor
- B** — Circuit 2 Compressor
- OFM** — Outdoor Fan

Fig. 13 — 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.

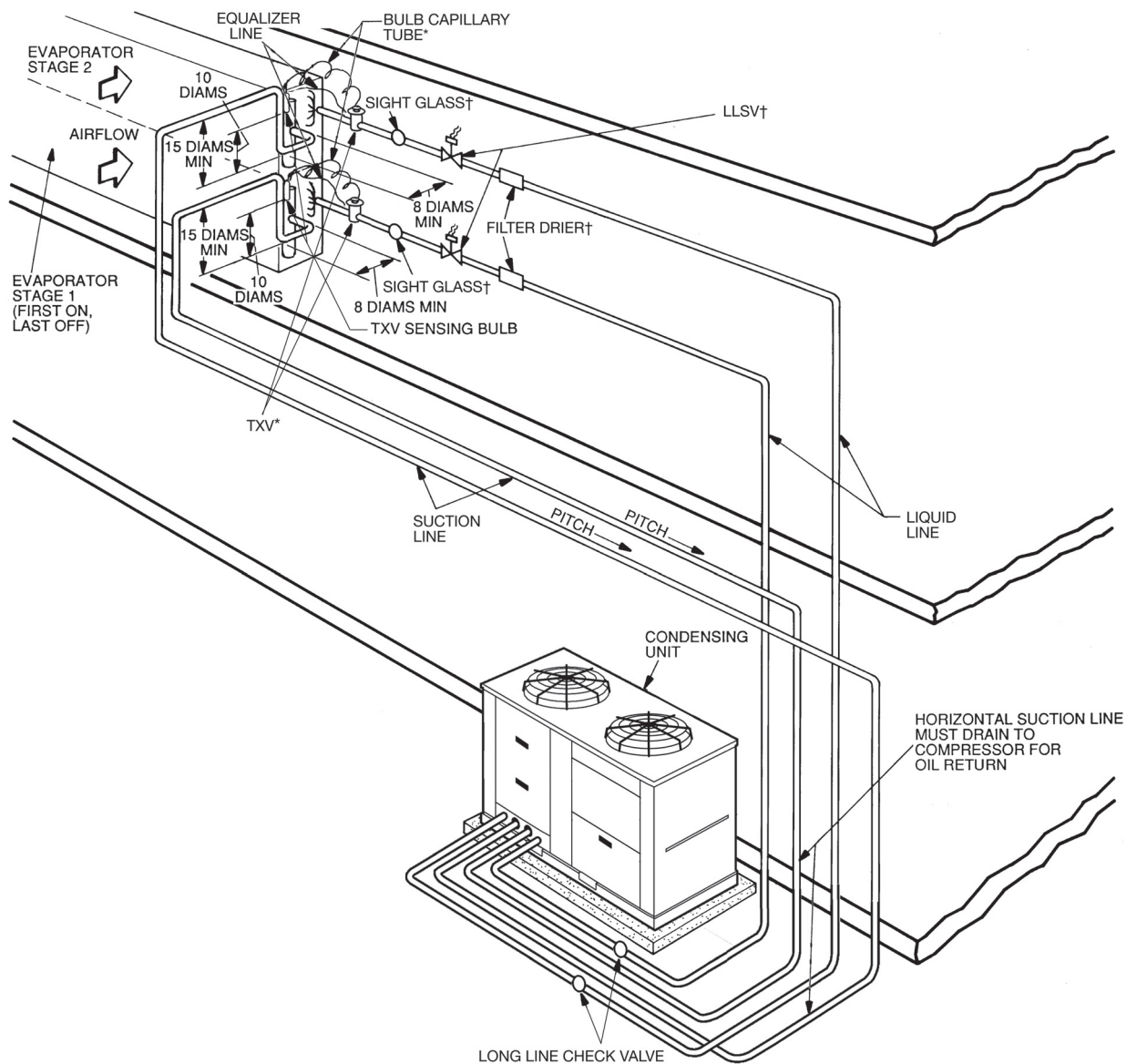
† If double suction riser is required for piping system, size reduced riser (3 ft [0.9 m] maximum) according to Fig. 16.

** Field supplied. See Table 4 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. 14 — 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 4 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. 15 — 38AP Dual-Circuit Unit Ground Level Installation

Table 4 — Refrigerant Specialties Part Numbers

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

38APD UNIT SIZE ^a	CIRCUIT A							CIRCUIT B						
	Tons	LL Size (in.) ^b	LLSV	LLSV Coil 24-v, 50/60 Hz	Sight Glass	Filter Drier ^c	Filter Drier Core	Tons	LL Size (in.)	LLSV	LLSV Coil 24-v, 50/60 Hz	Sight Glass	Filter Drier ^c	Filter Drier Core
025	12.0	1/2	EF680031	EF680032	KM680004	KH680001	—	12.0	1/2	EF680031	EF680032	KM680004	KH680001	—
		5/8	EF680028	EF680032	KM680005	KH680002	KH680008		5/8	EF680028	EF680032	KM680005	KH680002	KH680008
027	13.3	1/2	EF680031	EF680032	KM680004	KH680001	—	13.3	1/2	EF680031	EF680032	KM680004	KH680001	—
		5/8	EF680028	EF680032	KM680005	KH680002	KH680008		5/8	EF680028	EF680032	KM680005	KH680002	KH680008
030	15.6	1/2	EF680031	EF680032	KM680004	KH680001	—	15.6	1/2	EF680031	EF680032	KM680004	KH680001	—
		5/8	EF680028	EF680032	KM680005	KH680002	KH680008		5/8	EF680028	EF680032	KM680005	KH680002	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
040	21.0	—	—	—	—	—	—	18.2	1/2	EF680028	EF680032	KM680004	KH680001	—
		5/8	EF680028	EF680032	KM680005	KH680002	KH680008		5/8	EF680029	EF680032	KM680005	KH680002	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
050	23.8	5/8	EF680028	EF680032	KM680005	KH680002	KH680008	26.3	5/8	EF680028	EF680032	KM680005	KH680002	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
060	26.8	5/8	EF680028	EF680032	KM680005	KH680002	KH680008	31.5	5/8	EF680028	EF680032	KM680005	KH680002	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		—	—	—	—	—	—		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
070	31.8	5/8	EF680028	EF680032	KM680005	KH680002	KH680008	35.5	5/8	EF680028	EF680032	KM680005	KH680002	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
080	31.3	5/8	EF680028	EF680032	KM680005	KH680002	KH680008	46.7	5/8	EF680028	EF680032	KM680005	KH680003 ^d	KH680008
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
090	40.3	5/8	EF680028	EF680032	KM680005	KH680003 ^d	KH680008	47.1	—	—	—	—	—	—
		7/8	EF680029	EF680032	KM680006	KH680003	KH680008		7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
100	48.0	7/8	EF680029	EF680032	KM680006	KH680003	KH680008	48.0	7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
115	48.0	7/8	EF680029	EF680032	KM680006	KH680003	KH680008	62.4	7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
		—	—	—	—	—	—		1-3/8	EF680038	EF680032	KM680007 ^d	KH680012	KH680008
130	48.0	7/8	EF680029	EF680032	KM680006	KH680003	KH680008	77.1	7/8	EF680029	EF680032	KM680006	KH680003	KH680008
		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008		1-1/8	EF680030	EF680032	KM680007	KH680004	KH680008
		—	—	—	—	—	—		1-3/8	EF680038	EF680032	KM680007 ^d	KH680012	KH680008

NOTE(S):

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

b. 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

c. 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.

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

LEGEND

LL — Liquid Line

LLSV — Liquid Line Solenoid Valve

Step 3 — Make Refrigerant Piping Connections

⚠ CAUTION

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

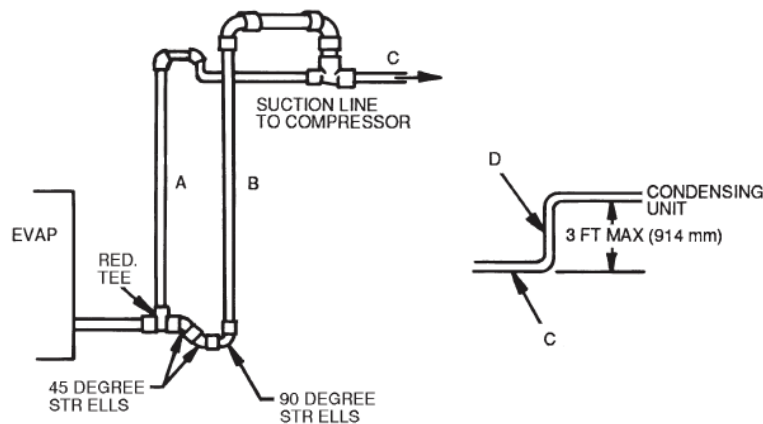
The units have large suction lines to minimize friction losses. The units also have the ability to operate at low capacity. Because of these capabilities, use special care with suction piping and suction risers to ensure proper compressor oil return under all operating conditions. If the evaporator is 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 5 (60 Hz) or Table 6 (50 Hz), and Fig. 16.

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 5 (60 Hz) or Table 6 (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. 16. 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 7 and 8. See Fig. 17 (for 38APD025-130 dual-circuit units), or Fig. 18 (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 5 and 6 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. 16 — Double Suction Riser Construction

Table 5 — 60 Hz Refrigerant Piping Requirements

38APS025-065 Single-Circuit Units (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)		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
			025	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
027	1-5/8, 5/8	5/8	1-3/8	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	7/8	2-1/8	
030	1-5/8, 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	1-1/8	2-1/8	
040	2-1/8, 7/8	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	1-1/8	2-1/8	1-1/8	2-5/8	1-1/8	2-5/8	
050	2-1/8, 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	2-5/8	1-1/8	2-5/8	1-1/8	2-5/8	1-1/8	2-5/8	
065	2-5/8, 7/8	7/8	1-5/8	1-1/8	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	1-3/8	2-5/8	

38APD025-130 Dual-Circuit Units (60 Hz)

60 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
025	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	1-3/8	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	1-3/8	5/8	1-5/8	
027	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	
030	Ckt A	1-3/8, 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	
	Ckt B	1-3/8, 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	
040	Ckt A	1-5/8, 5/8	5/8	1-1/8	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	1-1/8	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	7/8	1-5/8	7/8	2-1/8	
050	Ckt A	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	
	Ckt B	1-5/8, 5/8	5/8	1-3/8	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	7/8	2-1/8	
060	Ckt A	1-5/8, 5/8	5/8	1-3/8	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	7/8	2-1/8	
	Ckt B	1-5/8, 5/8	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	1-1/8	2-1/8	
070	Ckt A	1-5/8, 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	1-1/8	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	7/8	2-1/8	1-1/8	2-1/8	1-1/8	2-5/8	
080	Ckt A	1-5/8, 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	1-1/8	2-1/8	
	Ckt B	2-1/8, 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	2-5/8	1-1/8	2-5/8	1-1/8	2-5/8	1-1/8	2-5/8	
090	Ckt A	2-1/8, 7/8	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	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	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	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	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	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	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	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	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	1-1/8	2-5/8	1-1/8	2-5/8	
	Ckt B	2-5/8, 7/8	7/8	1-5/8	1-1/8	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	1-3/8	2-5/8	
130	Ckt A	2-1/8, 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	2-5/8	1-1/8	2-5/8	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	1-3/8	2-5/8	1-3/8	3-1/8	1-3/8	3-1/8	

LEGEND

L — Liquid Line
S — Suction Line

* 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:

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

- 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

Table 5 — 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)			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 (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		
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		
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		

38APD025-130 Dual-Circuit Units Double Suction Riser (60 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 (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	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	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1-3/8	1-5/8	2-1/8	
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	1-5/8	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	
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	1-5/8	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	1-5/8	2-1/8	2-5/8	

Legend and notes on page 26.

LEGEND

— — Not Required

Pipe A — Suction Riser without Trap

Pipe B — Suction Riser with Trap

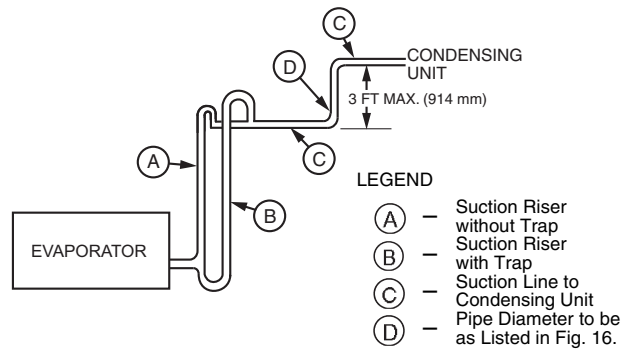
Pipe C — Suction Line to Condensing Unit

* 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 6 — 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
	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
025	Ckt A	1-3/8, 5/8	5/8	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	5/8	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	5/8	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	5/8	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	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	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

* 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:

- Shading indicates double suction riser or reduced riser is required on circuit where suction gas flow is up.
- 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

Table 6 — 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)			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 (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		
	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)

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 (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	
50 Hz	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	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	
	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	
		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	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	1-3/8	1-5/8	2-1/8	
	080	Ckt A	1-5/8, 7/8	—	—	—	—	—	—	—	—	—	—	—	1-3/8	1-5/8	2-1/8	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	
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	2-5/8	1-3/8	1-5/8	2-5/8		
	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	1-5/8	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	1-3/8	1-5/8	2-1/8	1-3/8	1-5/8	2-5/8	1-3/8	1-5/8	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	2-5/8	3-1/8	1-5/8	2-5/8	3-1/8		

Legend and notes on page 29.

LEGEND

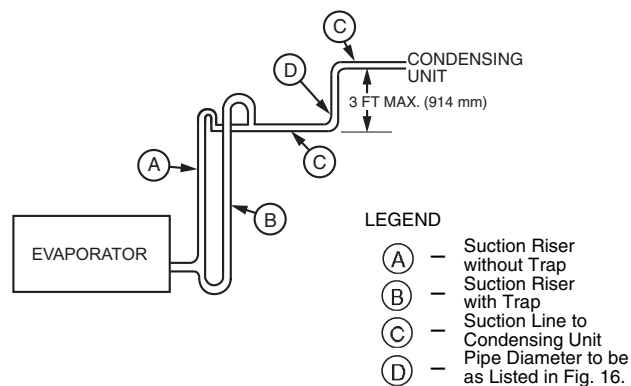
- — Not Required
- Pipe A** — Suction Riser without Trap
- Pipe B** — Suction Riser with Trap
- Pipe C** — Suction Line to Condensing Unit

* 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



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 7 and 8 or 38AP condensers are equipped with RTPF coils. 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. 17 (for 38APD025-130 dual-circuit units), or Fig. 18 (for 38APS025-065 single-circuit units). Refer to Table 4.

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. 17 for dual-circuit units and Fig. 18 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. 19 for dual-circuit units with face split coils, Fig. 20 for single-circuit units with face split coils, Fig. 21 for dual circuit units with row split coils, or Fig. 22 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 17 (for dual-circuit units) or Fig. 18 (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 4.

⚠ 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. 23.

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. 23 for orientation and Fig. 14 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. 6-12 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 pumpdown 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.

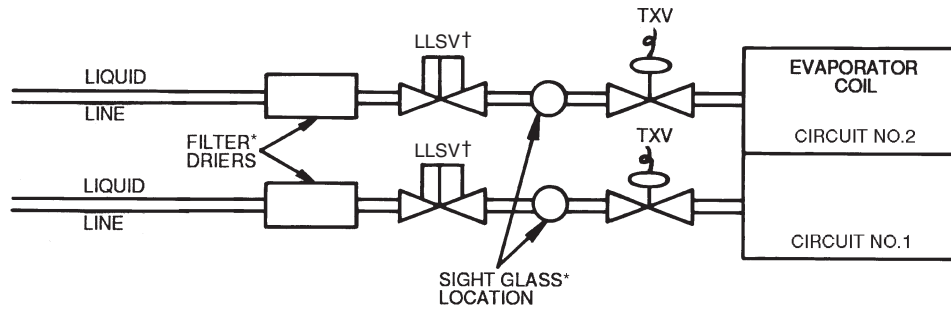
EVACUATION AND DEHYDRATION

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.



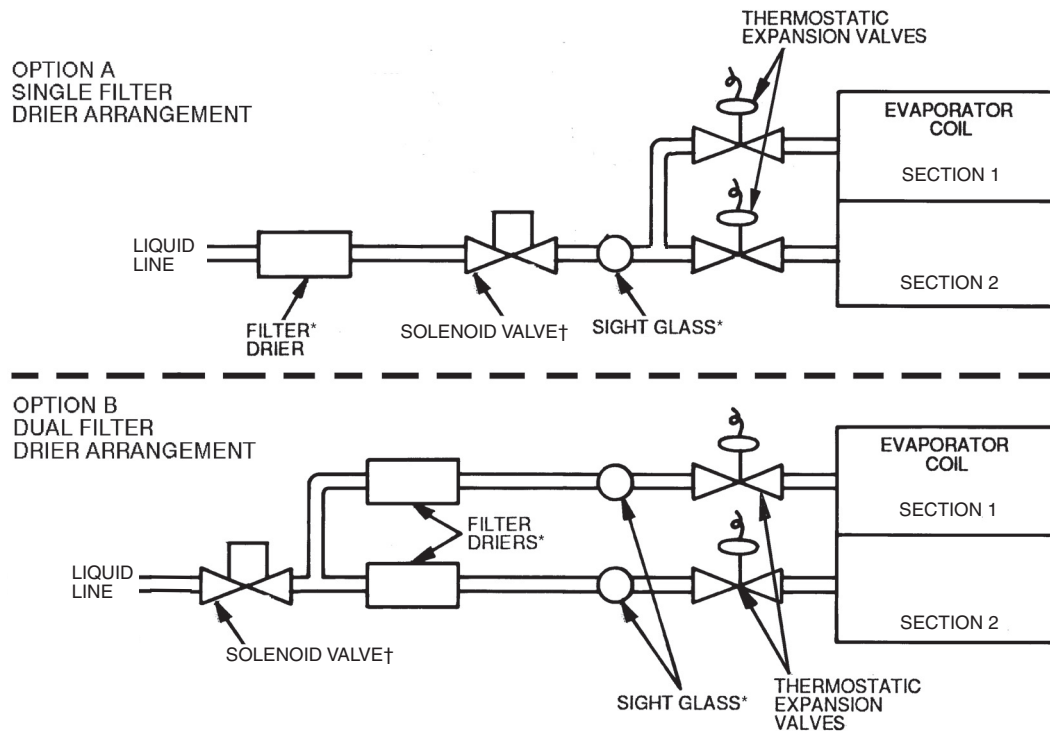
LEGEND

LLSV — Liquid Line Solenoid Valve
TXV — Thermostatic Expansion Valve

*Field-supplied.

†Field-supplied when required. See Tables 7 and 8.

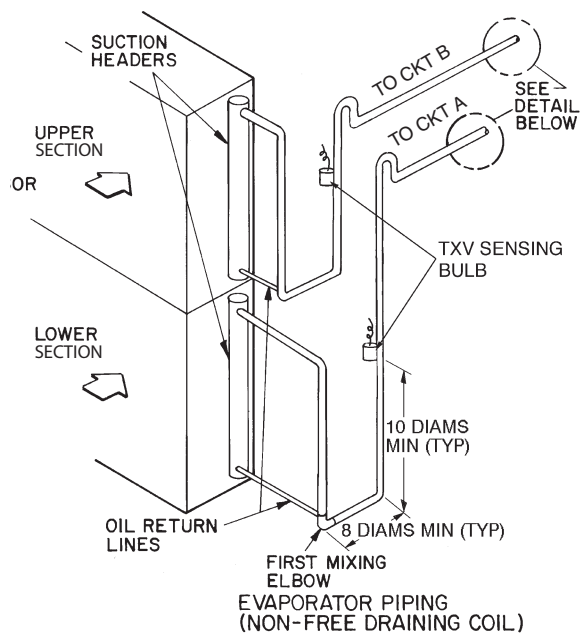
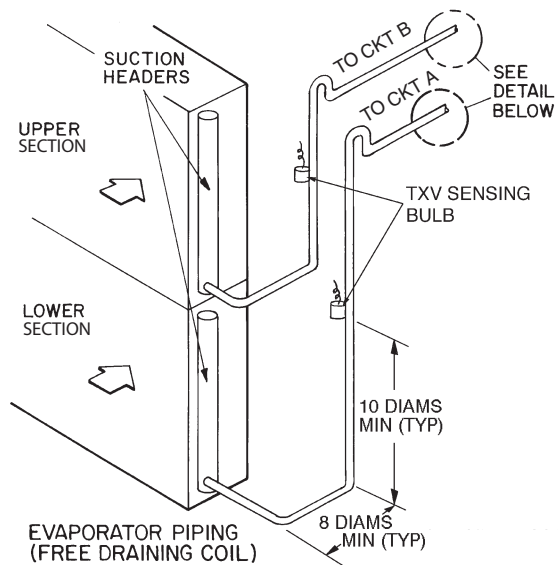
Fig. 17 — Required Location of Solenoid Valves and Recommended Filter Drier and Sight Glass Locations for 38APD025-130 Dual-Circuit Units



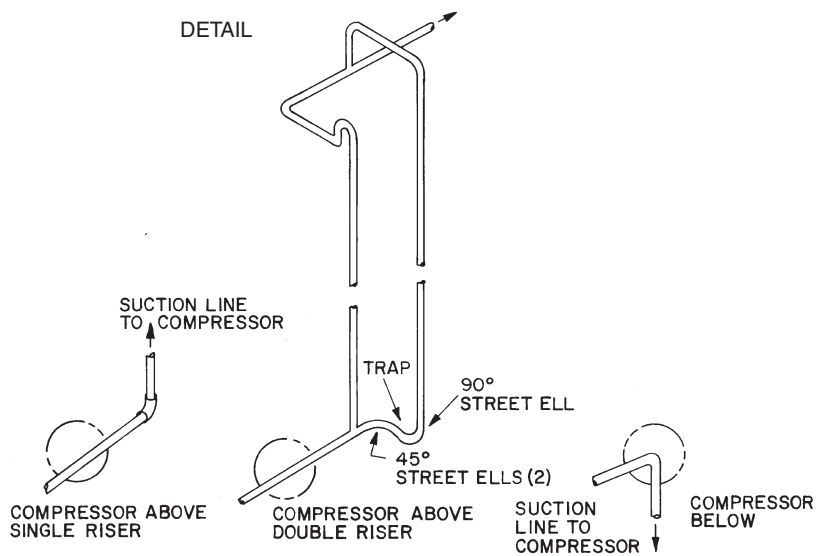
*Field-supplied.

†Field-supplied when required. See Tables 7 and 8.

Fig. 18 — Required Location of Solenoid Valves and Recommended Filter Drier and Sight Glass Locations for 38APS025-065 Single-Circuit Units



AIRFLOW



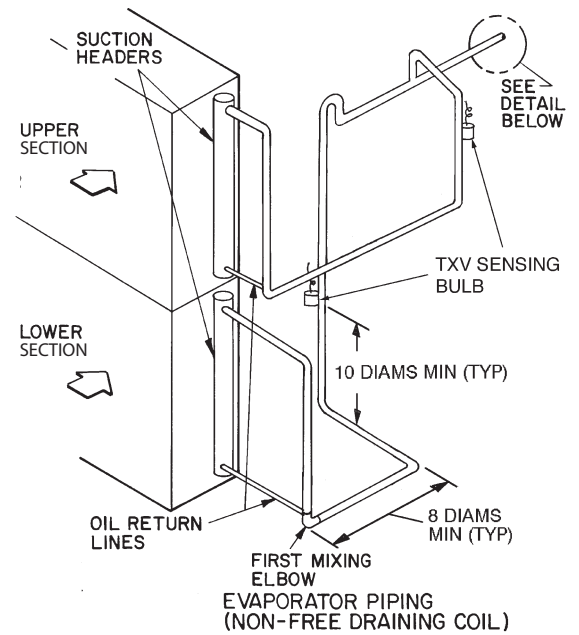
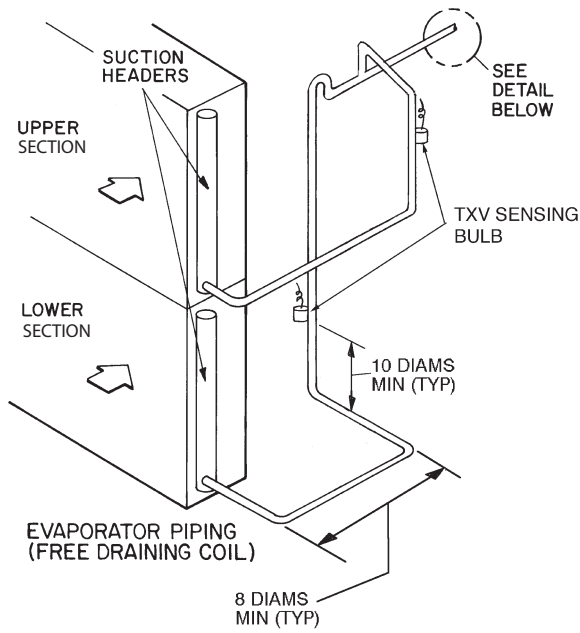
LEGEND

TXV — Thermostatic Expansion Valve
TYP — Typical

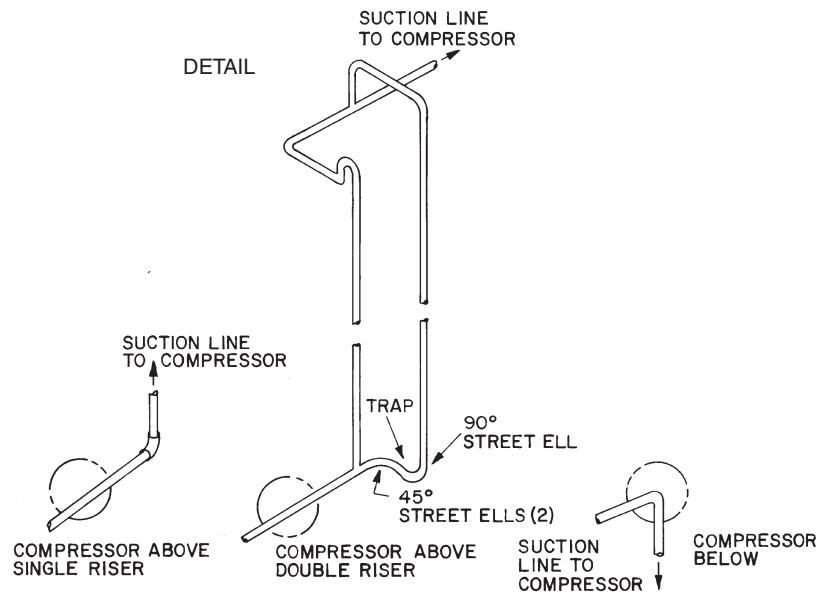
NOTES:

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



➡ AIRFLOW



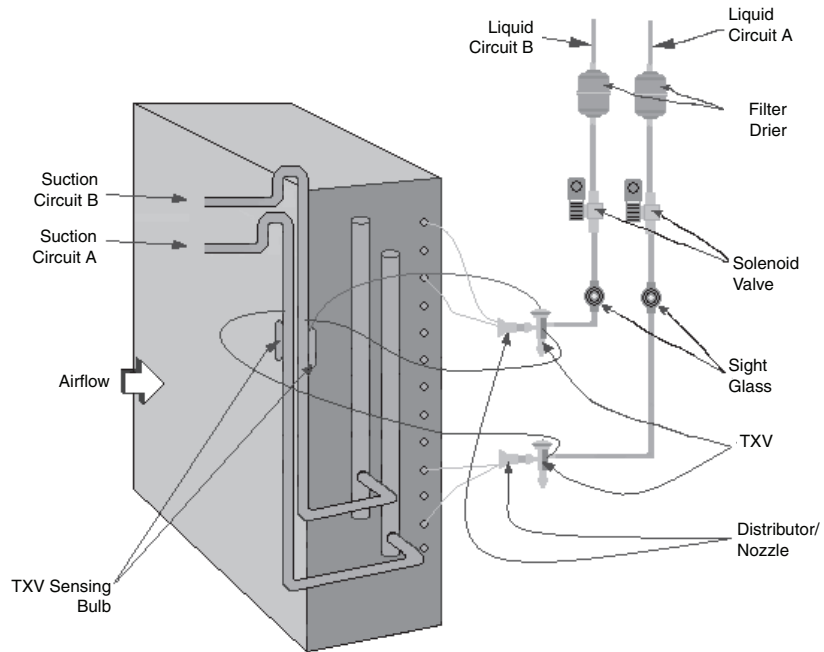
LEGEND

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

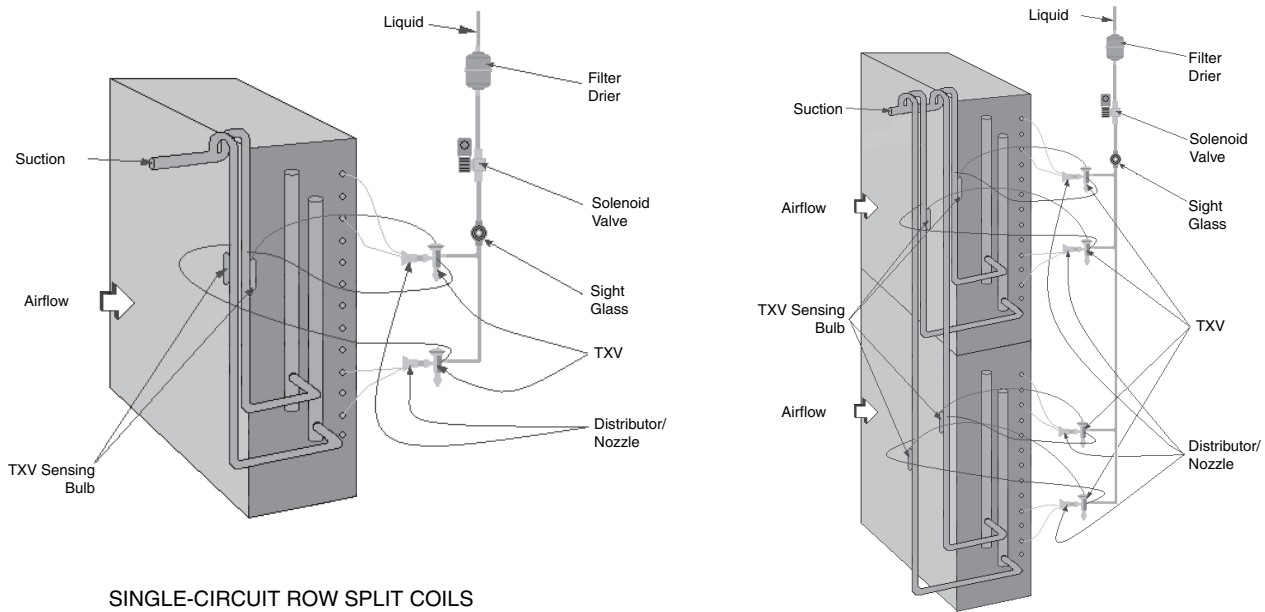


LEGEND

TXV — Thermostatic Expansion Valve

NOTE: Not all feeder tubes connected for clarity.

Fig. 21 — 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

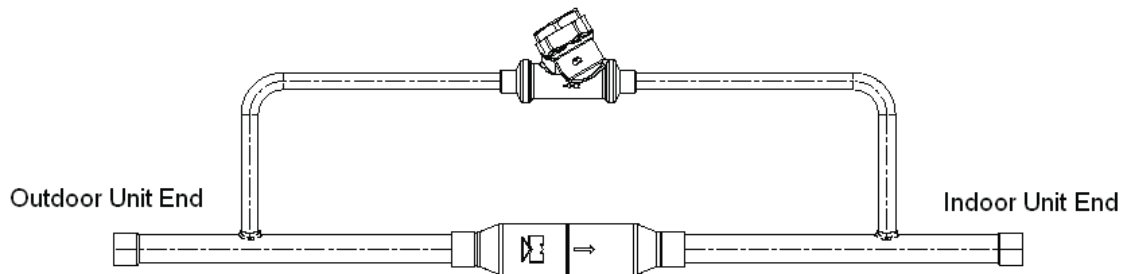
TXV — Thermostatic Expansion Valve

NOTE: Not all feeder tubes connected for clarity.

Fig. 22 — Typical Piping Connections for Row Split Coils for 38APS025-050 and 065 Single-Circuit Units

Table 7 — 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. 23 — Long Line Option Kit Installation

Table 8 — 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 9-14. See Table 15 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. 24 for field power wiring details. Refer to Fig. 6-12 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 13 and 14.

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. 25 for MAT/RAT (mixed air temperature/return air temperature sensor) and SAT (supply air temperature sensor) layout. Figures 26-32 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 Gauge), 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. 26.

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. 27.

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. 28.

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. 29.

Percent Capacity (C.TYP=7)

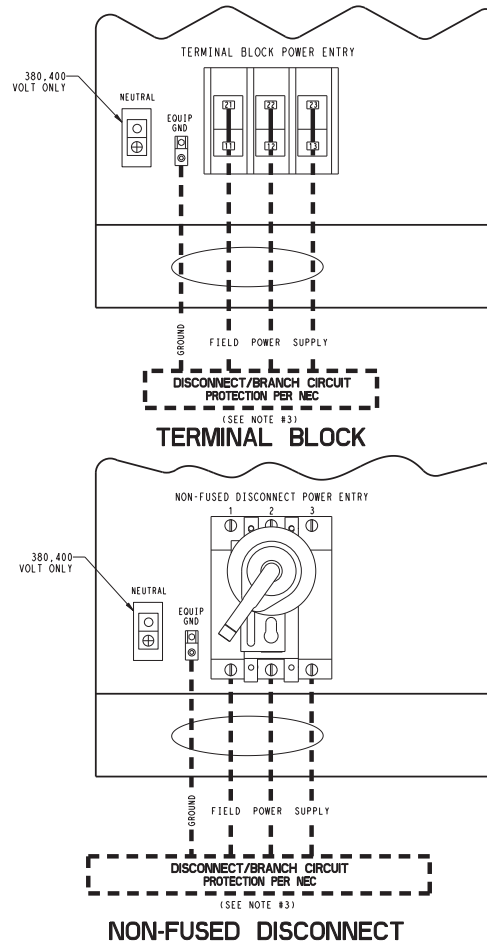
This configuration allows the MBB to monitor the 4 to 20 mA cooling demand signal input to the energy management module and translate this into desired percent capacity for the unit. It is compatible with both standard and digital compressors, and is intended for direct capacity control by a third-party control system. An energy management module and 4 to 20 mA generator are required. See Fig. 30.

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. 31.

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. 32.



LEGEND

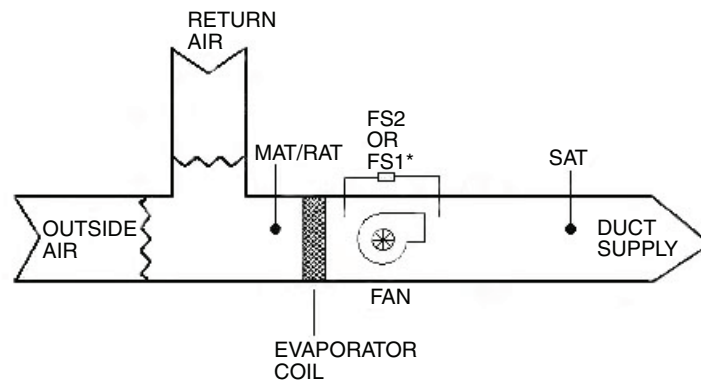
EQUIP GND — Equipment Ground
NEC — National Electrical Code

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. 24 — Field Power Wiring

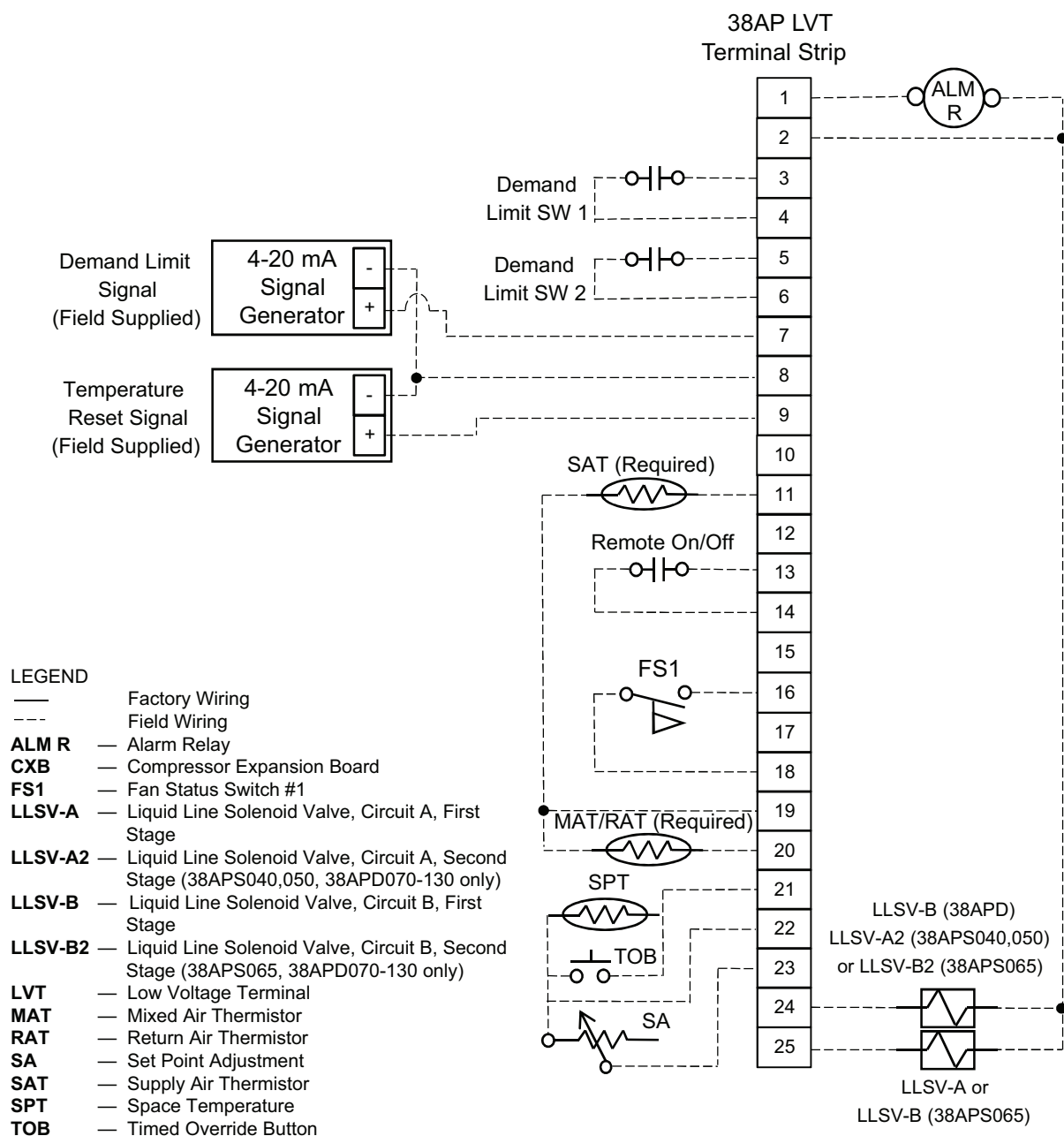


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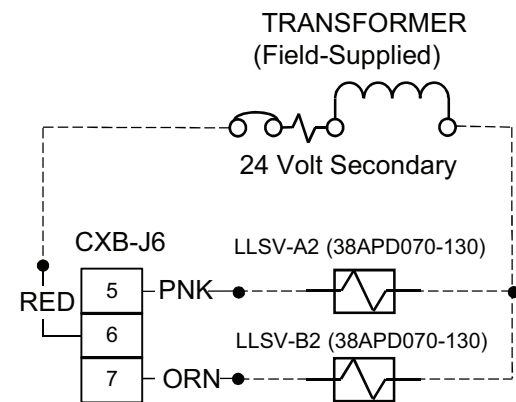
FS1 — Fan Status Switch (24-v)
MAT — Mixed Air Temperature Sensor
RAT — Return Air Temperature Sensor
SAT — Supply Air Temperature Sensor

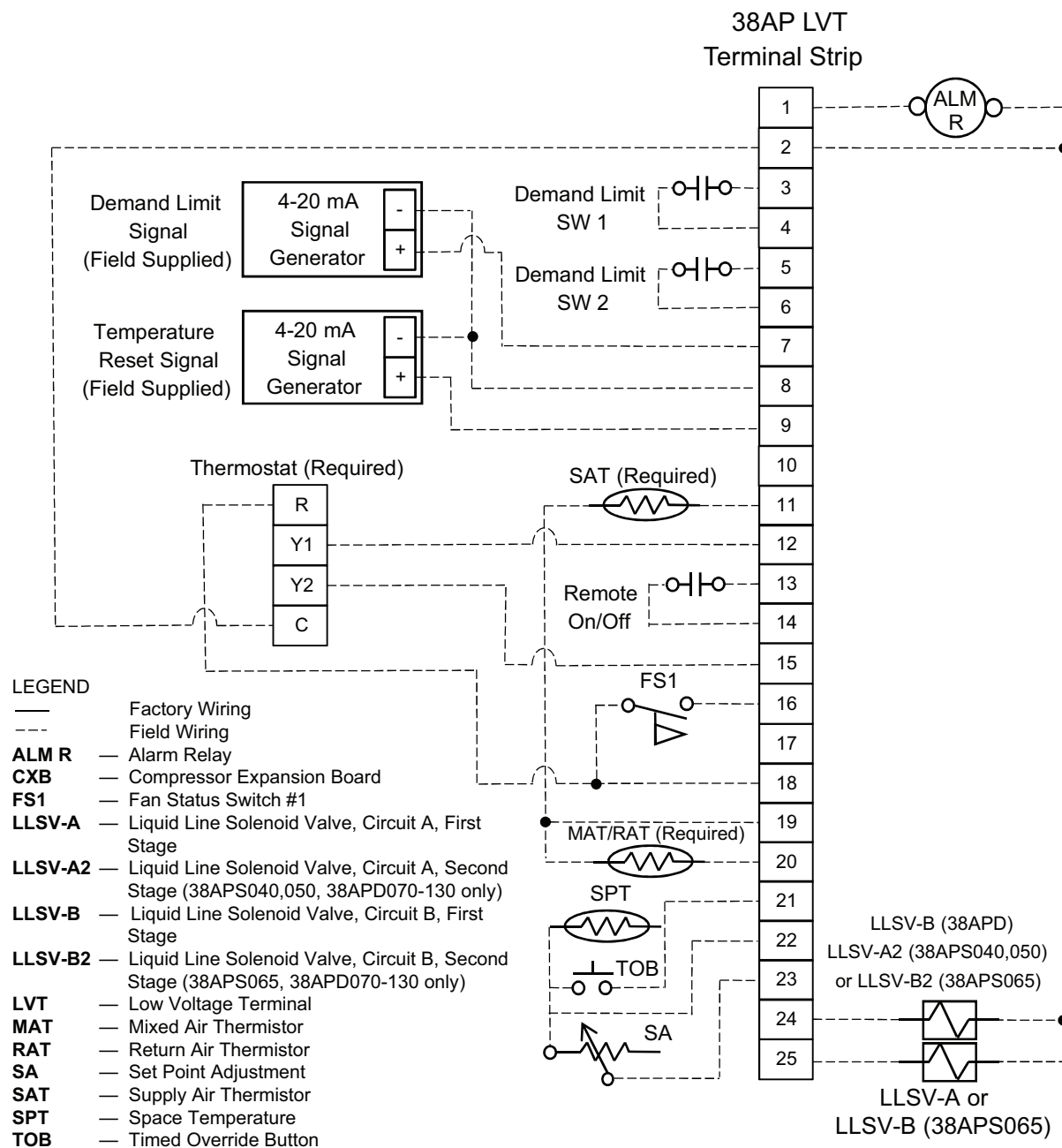
*FS1 can be pressure differential switch (shown), motor current detection, or sail switch.

Fig. 25 — Sensor Layout

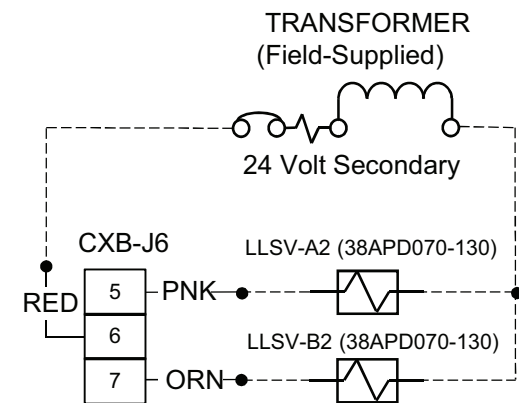
**NOTES:**

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF, Fan Status Switch (FS1), and Demand Limit Switch 1 and 2 must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switch (FS1) is required.
7. Energy Management Module (EMM) is required for 4-20 mA Demand Limit, Single or Two-Step Demand Limit, or 4-20 mA Temperature Reset.
8. Mixed Air/Return Air, Supply Air and Space Temperature Thermistor inputs are preferred method.

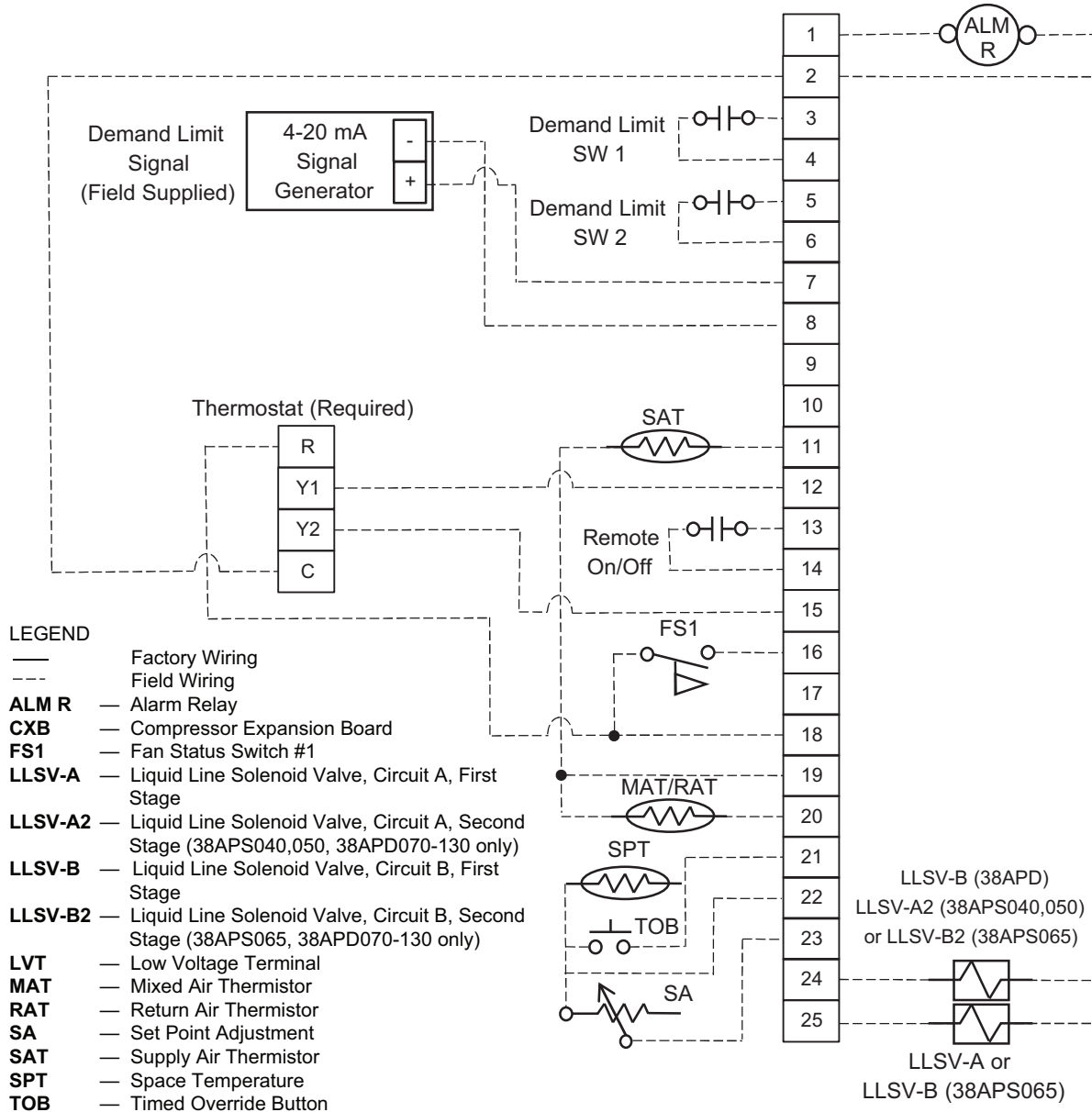
**Fig. 26 — C.TYP=1 (VAV) Wiring**

**NOTES:**

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF, Fan Status Switch (FS1), and Demand Limit Switch 1 and 2 must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switch (FS1) is required.
7. Energy Management Module (EMM) is required for 4-20 mA Demand Limit, Single or Two-Step Demand Limit, or 4-20 mA Temperature Reset.
8. Mixed Air/Return Air, Supply Air and Space Temperature inputs can be communicated to the unit controls. Thermistor inputs are preferred method.

**Fig. 27 — C.TYP=3 (TSTAT MULTI) Wiring**

38AP LVT Terminal Strip



NOTES:

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF, Fan Status Switch (FS1), and Demand Limit Switch 1 and 2 must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switch (FS1) is required.
7. Energy Management Module (EMM) is required for 4-20 mA Demand Limit, Single or Two-Step Demand Limit.
8. This control scheme does not support digital compressor or minimum load control operation.
9. This control scheme is not recommended for 38APD040-130 and 38APS040-065 units since there are more than 2 stages of capacity available.
10. Mixed Air/Return Air, Supply Air and Space Temperature are not required for this control scheme. Although not required Mixed Air/Return Air, Supply Air and Space Temperature inputs can be communicated to the unit controls. Thermistor inputs are preferred over communication.

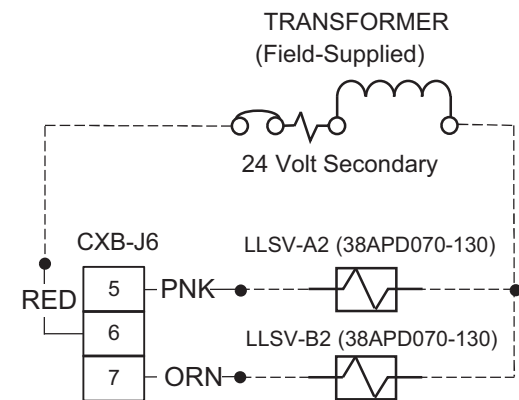
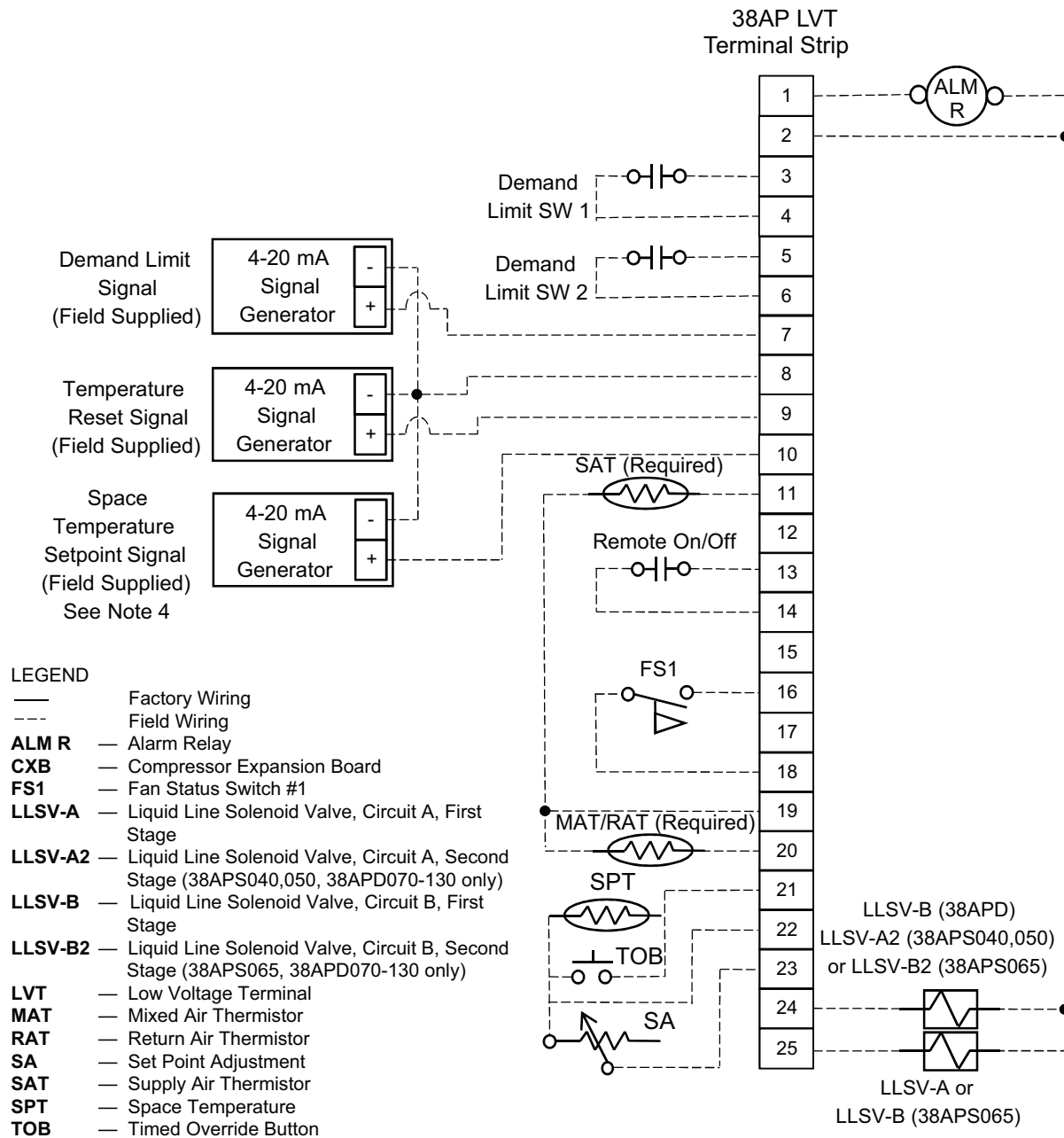
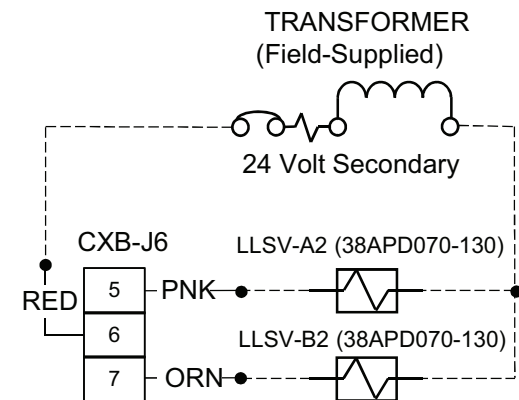


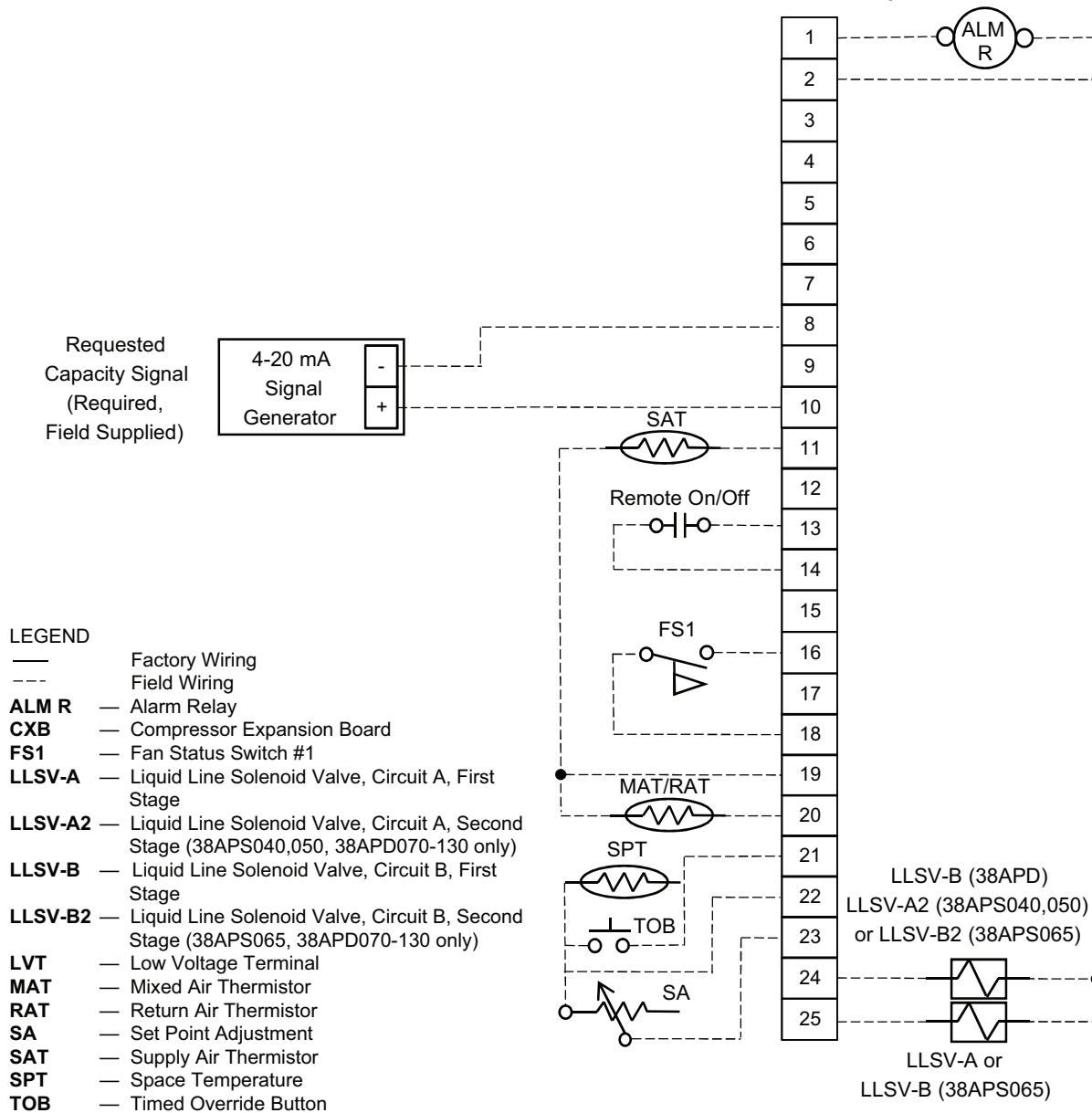
Fig. 28 — C.TYP=4 (TSTAT 2STG) Wiring

**NOTES:**

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. In order to use 4-20 mA Space Temperature Setpoint, unit Main Base Board (MBB) software must be Version 7.0 or higher. The use of 4-20 mA Space Temperature Setpoint with 4-20 mA Temperature Reset is not recommended.
5. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
6. All discrete inputs, Remote ON-OFF, Fan Status Switch (FS1), and Demand Limit Switch 1 and 2 must be rated for dry circuit applications, 24 VAC load up to 50 mA.
7. Installation of Fan Status Switch (FS1) is required.
8. Energy Management Module (EMM) is required for 4-20 mA Space Temperature Setpoint, 4-20 mA Demand Limit, Single or Two-Step Demand Limit, 4-20 mA Temperature Reset, or 4-20 mA Space Temperature Setpoint.
9. Mixed Air/Return Air, Supply Air and Space Temperature inputs can be communicated to the unit controls. Thermistor inputs are preferred method.

**Fig. 29 — C.TYP=5 (SPT MULTI) Wiring**

38AP LVT Terminal Strip



NOTES:

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF and Fan Status Switch (FS1) must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switch (FS1) is required.
7. Energy Management Module (EMM) is required for this Control Type.
8. Mixed Air/Return Air, Supply Air and Space Temperature inputs can be communicated to the unit controls. Thermistor inputs are preferred method.

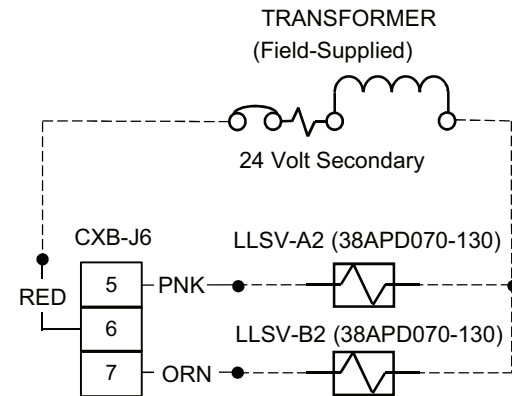
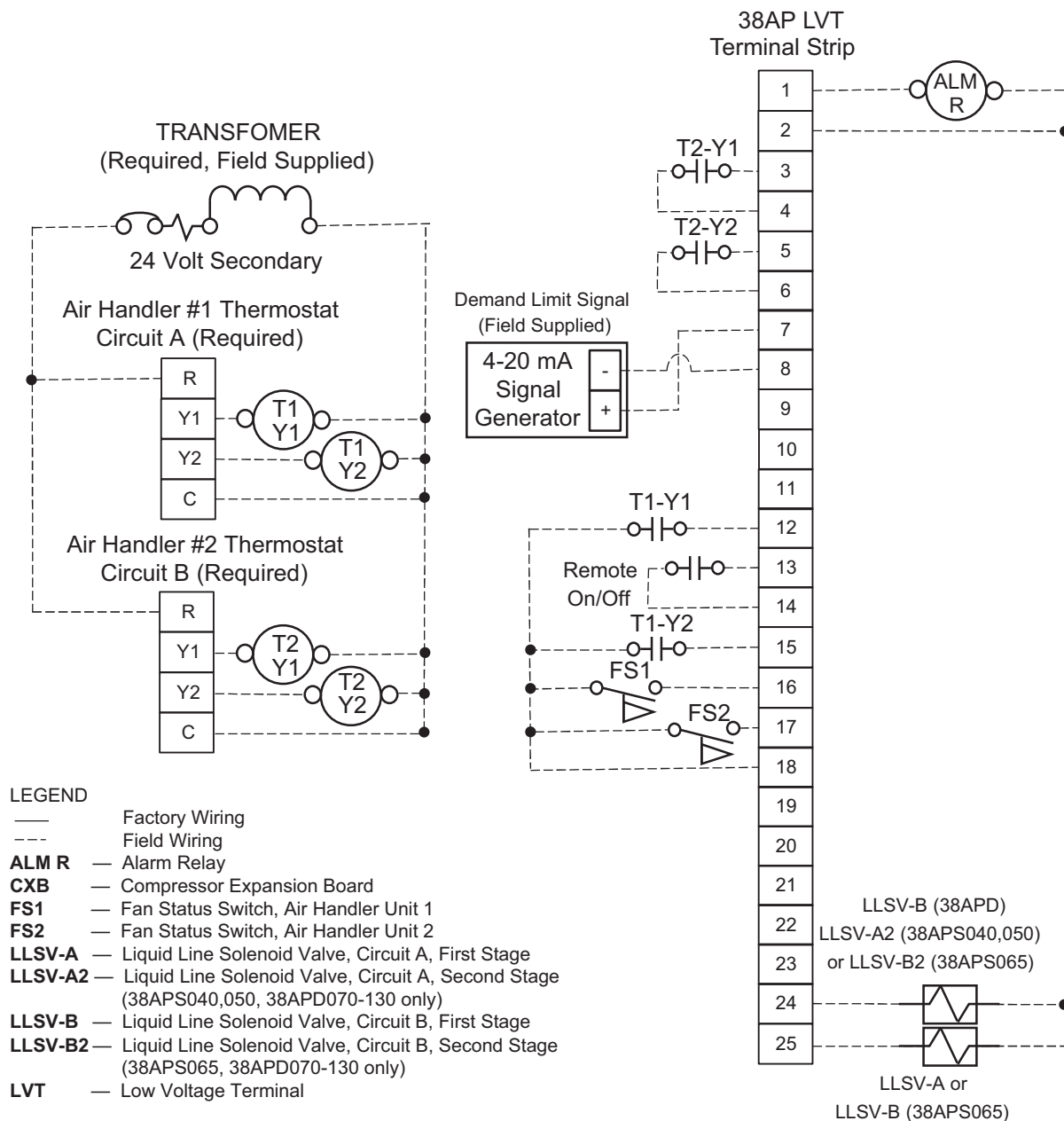


Fig. 30 — C.TYP=7 (Pct Cap) Wiring



NOTES:

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF, Fan Status Switches (FS1 and FS2), and Thermostat Relays (T1 and T2) must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switches (FS1 and FS2) are required.
7. Energy Management Module (EMM) is required for the Control Type, as well as 4-20 mA Demand Limit.
8. Single or Two-Step Demand Limit is not allowed for this Control Type.
9. This control scheme does not support digital compressor or minimum load control operation.
10. This control scheme is not recommended for units with more than 4 stages of capacity, 38APD070-130.
11. This control scheme is not allowed for single circuit units, 38APS025-065.

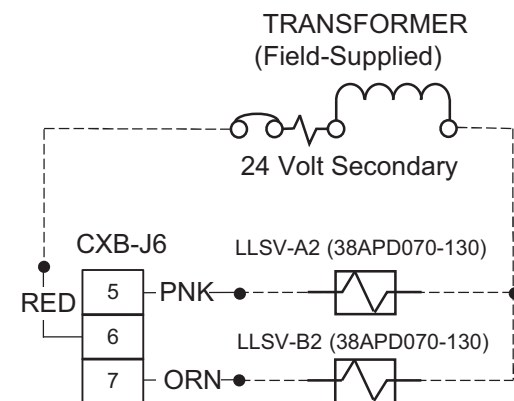
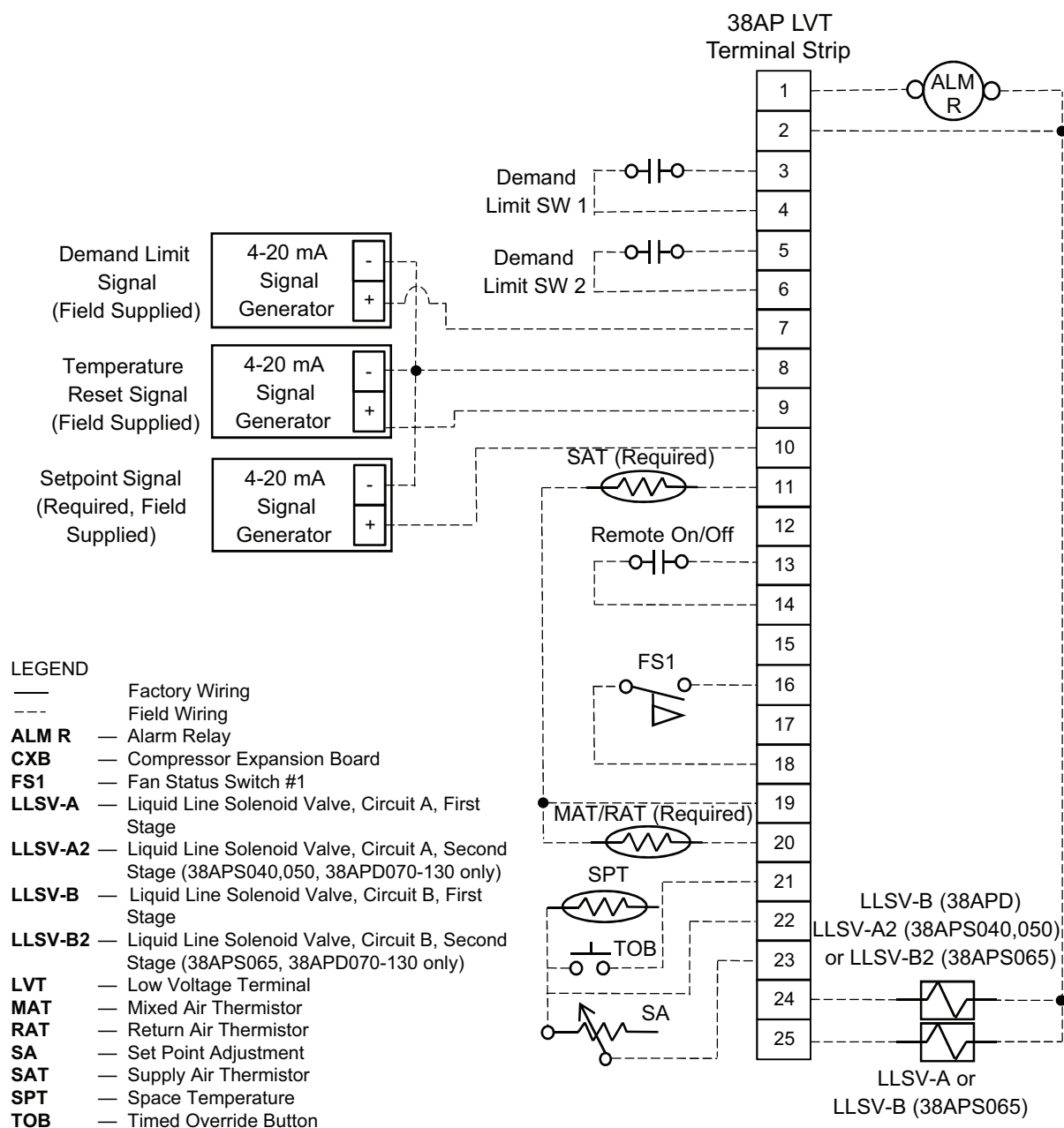


Fig. 31 — C.TYP=8 (Dual Tstat) Wiring



NOTES:

1. Field Wiring must be in accordance with local codes.
2. LVT-1 and LVT-2 are for an Alarm Relay. The maximum load allowed for the Alarm Relay is 5 VA sealed, 10 VA inrush at 24 VAC. Field Supplied power is not required.
3. LVT-24, -25 and -2 are for control of field-supplied Liquid Line Solenoid Valves (LLSV). The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. Field Supplied power is not required.
4. For 38APD070-130 units, additional LLSV can be connected to CXB-J6-5, -6 and -7. The contacts are rated for 15 VA sealed, 30 VA inrush at 24 VAC. A field-supplied control transformer is required, not to exceed 75 VA.
5. All discrete inputs, Remote ON-OFF, Fan Status Switch (FS1), and Demand Limit Switch 1 and 2 must be rated for dry circuit applications, 24 VAC load up to 50 mA.
6. Installation of Fan Status Switch (FS1) is required.
7. Energy Management Module (EMM) is required for 4-20 mA Setpoint, 4-20 mA Demand Limit, Single or Two-Step Demand Limit, or 4-20 mA Temperature Reset.
8. Mixed Air/Return Air, Supply Air and Space Temperature Thermistor inputs are preferred method.

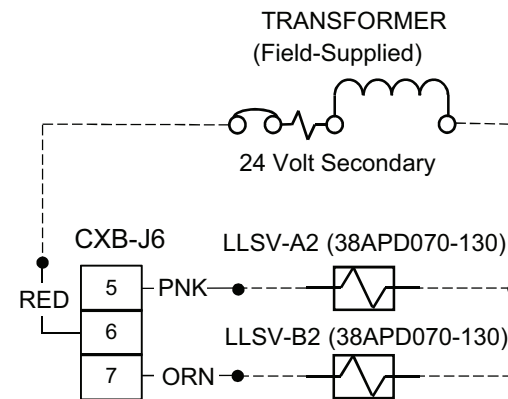


Fig. 32 — C.TYP=9 (VAV Setpoint) Wiring

ADDITIONAL NOTES FOR FIG. 26-32

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 9 — 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 10 — 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:

- 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%.
- All units or modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
- 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.
- Wiring for main field supply must be rated 75°C. Use copper conductors only.
 - Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gauge) to 2/0.
 - Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - Incoming wire size range for non-fused disconnect with MCA from 200.1 amps to 450 amps is 3/0 to 500 kcmil.



Table 11 — 38APD Single 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						
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:

- 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%.
- All units or modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
- 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.
- Wiring for main field supply must be rated 75°C. Use copper conductors only.
 - Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gauge) to 2/0.
 - Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - 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 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	1	48.1	245	1	48.1	245	2	6.0	120.2	150	150	305.1
	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		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
027	208/230-3-60	187	254	1	51.3	300	1	51.3	300	2	6.0	127.4	175	150	363.3
	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		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
030	208/230-3-60	187	254	1	55.8	340	1	55.8	340	2	6.0	137.6	175	175	407.8
	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		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
040	208/230-3-60	187	254	2	35.8	239	2	33.4	225	3	6.0	165.4	200	175	359.6
	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		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
050	208/230-3-60	187	254	2	48.1	245	2	51.3	300	3	6.0	229.6	250	250	465.5
	380-3-60	342	418		23.7	145		26.9	139		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
060	208/230-3-60	187	254	2	51.3	300	2	55.8	340	4	6.0	252.2	300	300	522.4
	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		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
070	208/230-3-60	187	254	2	55.8	340	3	46.1	245	4	6.0	293.9	300	300	564.1
	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		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
080	208/230-3-60	187	254	2	55.8	340	3	55.8	340	5	6.0	323.0	350	350	587.2
	380-3-60	342	418		34.0	196		34.0	196		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
090	208/230-3-60	187	254	3	51.3	300	3	55.8	340	6	6.0	371.3	400	400	641.5
	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		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
100	208/230-3-60	187	254	3	55.8	340	3	55.8	340	6	6.0	384.8	400	400	655.0
	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		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
115	208/230-3-60	187	254	3	55.8	340	3	72.4	538	7	6.0	444.7	500	500	892.2
	380-3-60	342	418		34.0	196		35.3	290		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
130	208/230-3-60	187	254	3	55.8	340	3	85.3	605	8	6.0	492.6	500	500	991.0
	380-3-60	342	418		34.0	196		51.9	380		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

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:

- 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%.
- All units or modules have single point primary power connection. Main power must be supplied from a field-supplied disconnect.
- 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.
- Wiring for main field supply must be rated 75°C. Use copper conductors only.
 - Incoming wire size range for terminal block with MCA up to 175 amps is 14 AWG (American Wire Gauge) to 2/0.
 - Incoming wire size range for terminal block with MCA from 175.1 amps to 420 amps is 2 AWG to 600 kcmil.
 - Incoming wire size range for non-fused disconnect with MCA up to 100 amps is 14 AWG to 1/0.
 - Incoming wire size range for non-fused disconnect with MCA from 100.1 amps to 200 amps is 6 AWG to 350 kcmil.
 - 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 — 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 14 — 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:

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

Table 15 — 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 16 are expected, Motormaster® V fan motor control is recommended.

Table 16 — 38AP Unit Low Ambient Limitations
Single Circuit

38APS UNIT SIZE	MINIMUM LOW AMBIENT ^{a,b} (Standard Unit)	MINIMUM LOW AMBIENT MOTORMASTER CONTROL (Factory-Installed Option)
025-065	45°F (7.2°C)	-20°F (-28.9°C)

NOTE(S):

- 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.

Dual Circuit

38APD UNIT SIZE	MINIMUM LOW AMBIENT ^{a,b} (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)

NOTE(S):

- 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, BACnet¹ 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

1. BACnet is a trademark of ASHRAE.

(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. 33-35.

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

- Pull the screw terminal connector from the controller's BAS Port.
- Check the communications wiring for shorts and grounds.
- 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.

- Insert the power screw terminal connector into the UPC Open controller's power terminals if they are not currently connected.
- 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 17 and 18. The wire jacket and UL temperature rating specifications list two acceptable alternatives. The Halar² specification has a higher temperature rating and a tougher outer jacket than the SmokeGard³ 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.

- Halar is a registered trademark of Solvay Plastics.
- SmokeGard is a trademark of AlphaGary-Mexichem Corp.

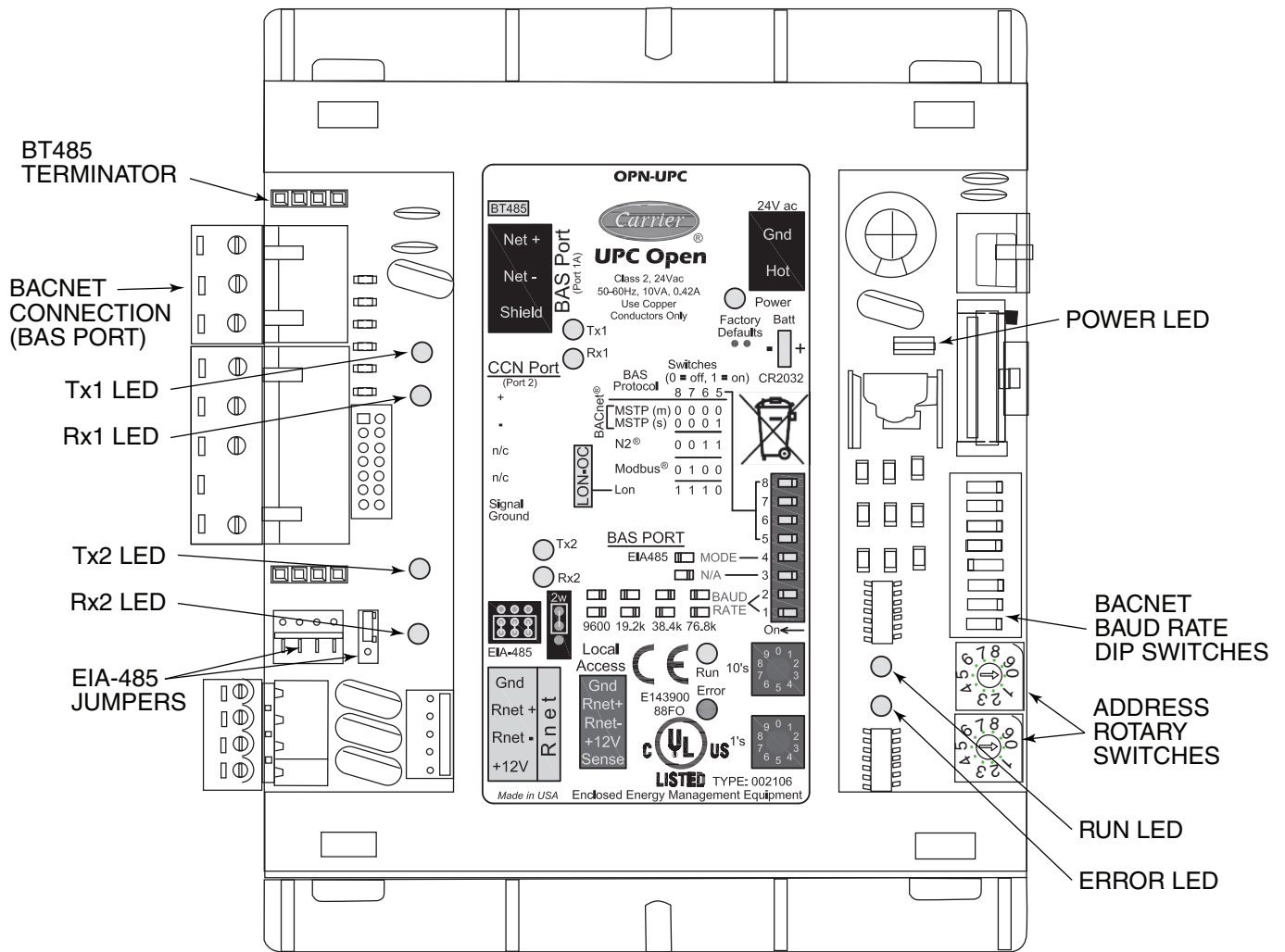


Fig. 33 — UPC Open Controller

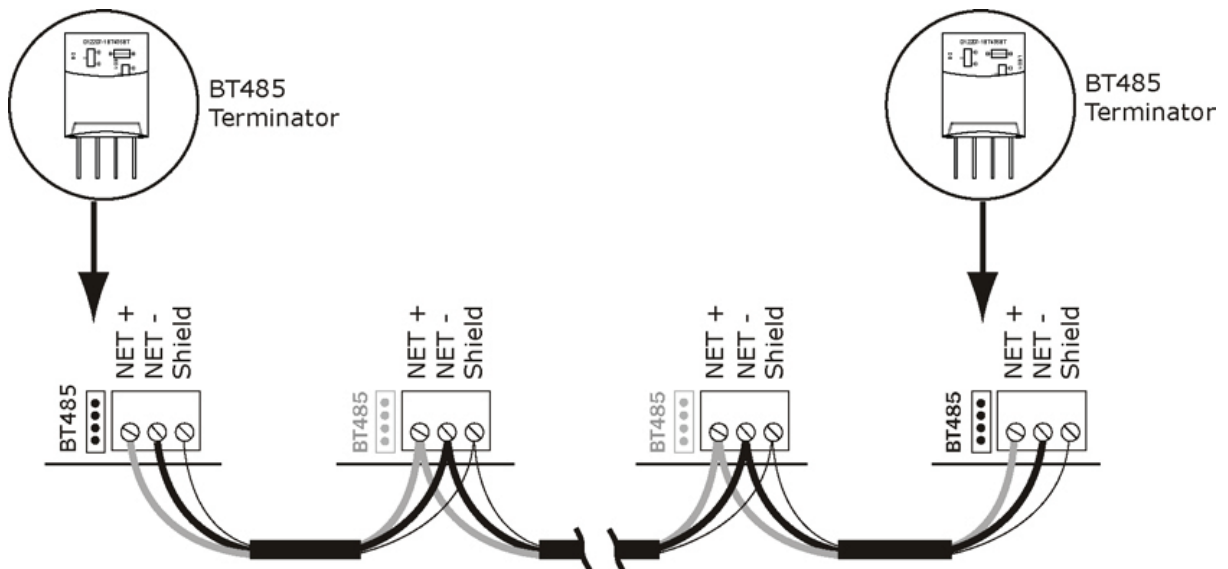


Fig. 34 — Network Wiring

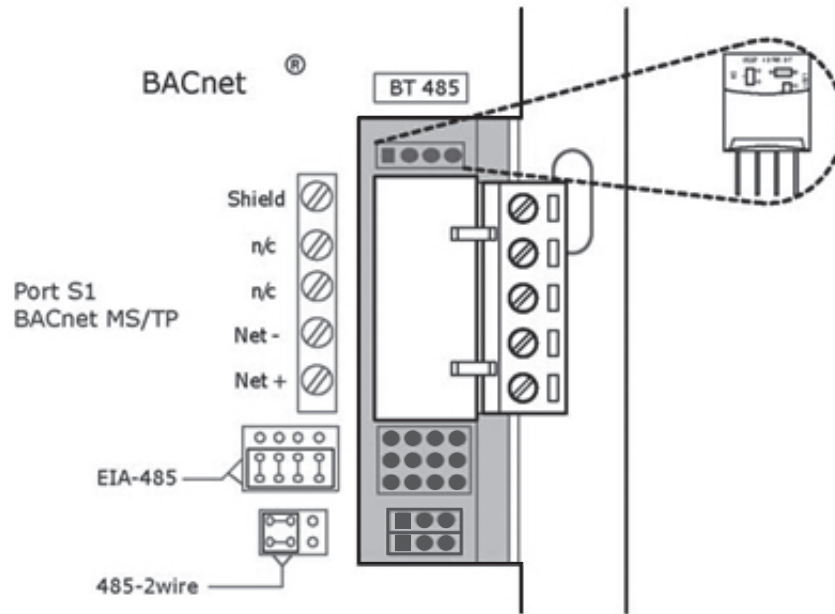


Fig. 35 — BT485 Terminator Installation

Table 17 — 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 18 — 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	

