



20 December 2011

MILITARY DEPARTMENT
STATE of NEBRASKA
LINCOLN, NEBRASKA

**NEBRASKA ARMY NATIONAL GUARD
CATS 505-507 AIR QUALITY REMEDIATION**

at

**CAMP ASHLAND TRAINING SITE
220 County Road A
Ashland, Nebraska 68003**

PROJECT NO. 31050027

A D D E N D U M N O . 3

The original specifications and drawings on the STATE OF NEBRASKA REQUEST for PROPOSAL FORM for the project noted above are amended as noted in this Addendum No. 3.

Receipt of this Addendum shall be acknowledged by inserting its number and date in the space provided on the Bid Form.

ADDENDUM NO. 3

NOTE TO ALL PLANHOLDERS: Please insert this Addendum into your copy of the Contract Documents for the above named project.

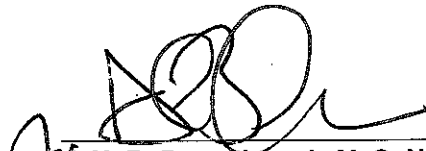
The following changes to the Contract Documents are issued by the CFMO-CMB and shall have the same force and affect as though a part of the original issue.

THE RECIEPT DATE, TIME and LOCATION of the BID PROPOSAL submission HAS NOT CHANGED.

ITEM NO.

ADD 3-1: General reference: See attached cutsheets titled "Existing FCU-1" and "Existing FCU-2" describing the dimensional and IOM data for the existing FCU-1 and FCU-2.

THIS ADDENDUM SHALL BE ATTACHED TO AND MADE A PART OF THE DRAWINGS AND SPECIFICATIONS AND SHALL BE ACKNOWLEDGED WITH THE BIDDER'S PROPOSAL.



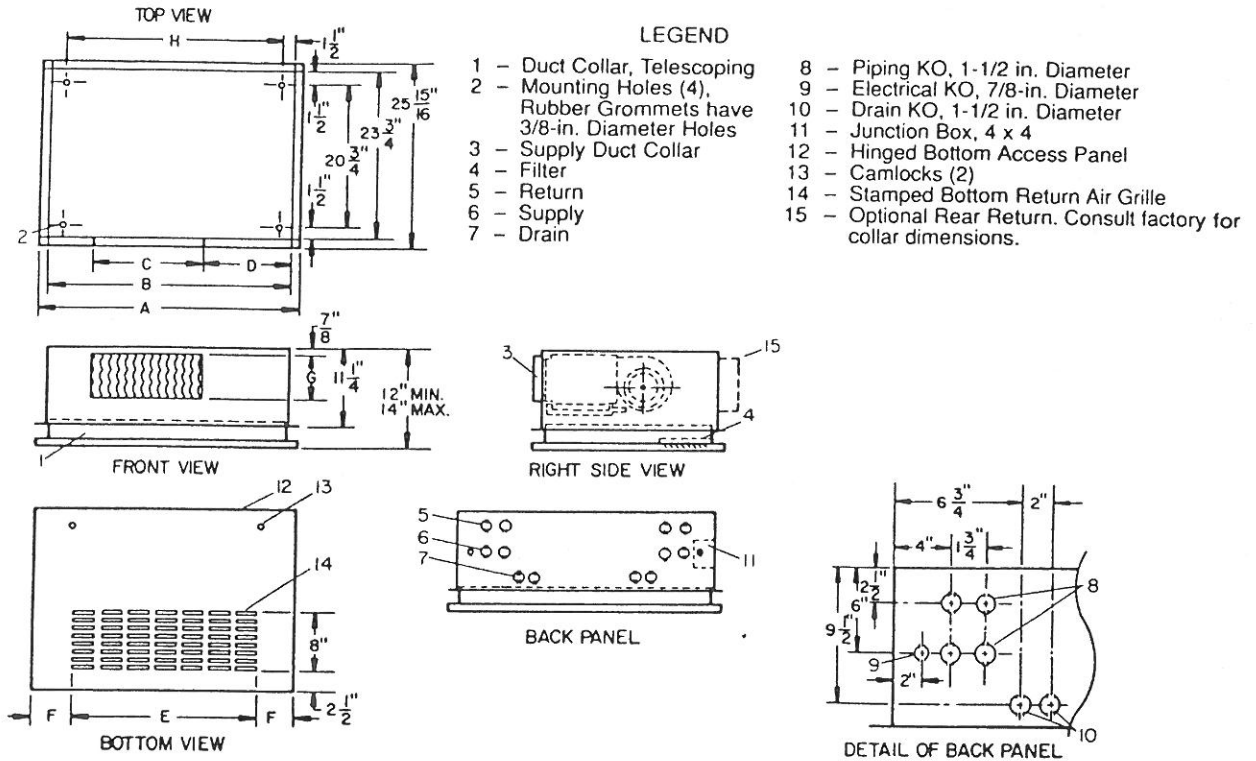
M U D D H . L Y O N S
Major General The Adjutant General

End of Addendum No. 3



EXISTING FCU-1

42CK HORIZONTAL CABINET UNIT WITH TELESCOPING ACCESS PANEL



- NOTES:**
1. Right hand unit shown; left hand unit opposite.
 2. Unit sizes 02 and 03 have one motor, one blower; sizes 04 through 08 have one motor, 2 blowers; sizes 10 and 12 have 2 motors, 4 blowers.
 3. Bottom access panel finish champagne beige recoatable baked finish.
 4. Refer to 42CA dimensions for coil stub-out locations.
 5. Not shown: optional drip lip, 3-speed fan switch, wall plate, 1/2-in. glass fiber insulation on inside of casing, 1/2-in. closed cell foam on main drain pan.

UNIT SIZE	NOM CFM	DIMENSIONS (in.)								FACE AREA (sq ft)
		A	B	C	D	E	F	G	H	
02	200	37	35	16	2-3/4	25-7/8	4-9/16	6	32	0.83
03	300	37	35	20	8-3/4	25-7/8	4-9/16	6	32	1.08
04	400	43	41	26	8-3/4	30-1/4	5-3/8	6	38	1.35
06	600	55	53	31	15-3/4	43-3/8	4-13/16	7	50	1.88
08	800	55	53	38	8-3/4	43-3/8	4-13/16	7	50	2.31
10	1000	77	75	52	16-3/4	60-7/8	7-1/16	7	72	3.16
12	1200	77	75	60	8-3/4	60-7/8	7-1/16	7	72	3.65

Physical data and dimensions (cont)

SHIPPING WEIGHTS (lb approx)

UNIT SIZE	NOM CFM	TYPE UNIT											
		CA	CE	CF	CG	CG W/ Ext. Cab.	CK	VA	VB	VF	VC	VE	VG
01	150	—	—	—	—	—	—	—	—	—	—	—	40
02	200	36	55	—	82	98	115	65	89	92	50	72	—
03	300	39	60	—	85	118	120	80	95	98	60	100	74
04	400	49	70	84	100	126	135	90	116	122	72	108	—
06	600	59	82	97	110	168	150	112	134	141	110	154	—
08	800	64	95	110	138	176	155	115	137	144	—	—	—
10	1000	95	135	163	180	215	227	140	169	178	—	—	—
12	1200	107	154	—	200	245	241	170	192	205	—	—	—

Ext. Cab. – Extended Cabinet

FILTER DATA

UNIT SIZE	NOM CFM	FILTER SIZE (in., 1-in. thick)*									
		CA†	CE**	CF**††	CG	CG/Ext. Cab.	CK	VA, VB, VF	VC, VE	VG	
01	150	—	—	—	—	—	—	—	—	—	10x14-1/2
02	200	10x24	10x18	—	10x28	10x33	10x28	7-3/4x21-3/4	6-3/4x21-3/4	—	—
03	300	10x28	10x22	—	10x28	10x40	10x28	7-3/4x25-3/4	6-3/4x26-3/4	—	—
04	400	10x32	10x28	12-3/4x28	10x33	10x45	10x33	7-3/4x31-3/4	6-3/4x34-3/4	—	10x28
06	600	10x42	10x33	12-3/4x33	10x40	10x54	10x45	7-3/4x41-3/4	6-3/4x48-3/4	—	—
08	800	10x42	10x40	12-3/4x40	10x45	10x54	10x45	7-3/4x43-3/4	—	—	—
10	1000	10x54	10x54	12-3/4x54	10x54	10x62	10x62	7-3/4x57-3/4	—	—	—
12	1200	10x64	10x62	—	10x62	10x62	10x62	7-3/4x65-3/4	—	—	—

Ext. Cab. – Extended Cabinet

* Sizes shown for Model 42CA are nominal sizes; all other sizes are actual sizes.

† Filter size for return air grille location.

** Filter size if located in return air plenum.

†† With electric heat and bottom return, the 42CF unit filter width increases from 12-3/4 to 16-3/4 inches.

Selection procedure (with examples)

Example 1: Ceiling Unit, Cooling

I Determine job requirements.

Given:

Room Sensible Cooling Load	10.4 MBtuh
Room Total Cooling Load	13.5 MBtuh
Entering Air Temperature	65 F wb, 76 F db
Entering Water Temperature	45 F
Water Temperature Rise	10 degrees F
External Static Pressure	0.10 in. wg
Unit Type Desired	horizontal, furred-in with plenum
Nominal Air Delivery	600 cfm

II Determine unit size and nominal cfm.

For an initial selection, choose a unit size that will provide the required cfm.

Select a 42CE06 unit (nominal 600 cfm) with a standard 3-row coil.

III Determine actual air delivery and cooling capacity.

Enter the Air Delivery table (page 26) for the selection at the given external static pressure.

At 0.10 in. wg, high speed, a 42CE size 06 unit with 3-row coil delivers 615 cfm at high fan speed.

IV Determine water temperature rise.

This step is used to determine the actual water temperature rise required to provide the specified cooling capacity.

(This can be done to meet either specified sensible or specified total capacity. For this example, we will determine water temperature rise required to meet the specified total capacity after it has been corrected to the rating curve capacity. The resulting rating curve sensible capacity will be determined in Step V and then corrected to actual capacity. If the sensible capacity were the critical requirement, the reverse procedure would be followed.)



Installation, Start-Up and Service Instructions

INSTALLATION

Unpack and Inspect Units — Remove shipping wraps from all units. Check the shipment against shipping order. *If shipment is damaged or incomplete, file claim with transportation company and advise Carrier immediately.*

Protect Units From Damage — To maintain warranty, protect units against adverse weather, theft or vandalism on jobsite.

Prepare Jobsite for Unit Installation — To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire and duct connection requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their part of the installation.

Identify and Prepare Units

1. Be sure power requirements match available power source. Refer to unit nameplate and wiring diagram.
2. Check all tags on unit to determine if shipping screws are to be removed. Remove screws as directed.

Place Unit in Position

1. Be sure unit is level or pitched towards drain to ensure proper drainage and operation. Pitch of suspended unit can change after coil is filled; recheck after filling coil.
2. When installing ceiling units, use factory-provided mounting holes. Units are not balanced on mounting holes. Select suitable vibration isolators at installation. If used, adjust isolators so unit is uniformly suspended and pitched.
3. Models 42CA and CF without plenums and Models 42CE and CF with bottom inlet may be installed in noncombustible areas only.
4. Protect units from damage caused by jobsite debris. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor or fan wheels.

Table 1 — Physical Data

DIMENSIONS (in.)	
COIL OUTLET, INLET	5/8 OD
DRAIN CONNECTION	
42C	7/8 OD
42V	3/4 MPT
SUPPLY DUCT	
Flange Connection	1

Make Piping Connections — Refer to Table 1 for piping connection physical dimensions.

DRAIN CONNECTIONS — Install drain line in accordance with all applicable codes. Slope drain away from unit. Insulate the drain line to prevent sweating.

WATER SUPPLY/RETURN CONNECTIONS — Install piping in accordance with all applicable codes. Position valves over the drain pan. Be sure valves are in proper operating position and are easily accessible for adjustment.

If coil and valve package connections will be made with a solder joint, care should be taken to ensure that components in the valve package are not subjected to high temperatures which may damage seals or other materials. Many 2-position electric control valves are provided with a manual operating lever. This lever should be in the OPEN position during all soldering operations.

If coil connection is made with a union, the coil side of the union must be prevented from turning (it must be backed up) during tightening. Do not overtighten! Overtightening will distort (egg shape) the union seal surface and destroy the union.

Steam Connections — On units with steam heating coils, the maximum steam pressure applied to the unit should never exceed 10 psig.

TEST AND INSULATE — When all joints are complete, perform hydrostatic test for leaks. Vent all coils at this time. Check interior unit piping for signs of leakage from shipping damage or mishandling. If leaks are found, notify a Carrier representative before initiating any repairs. Release trapped air from system (refer to Make Final Preparations section).

⚠ CAUTION

All water coils must be protected from freezing after initial filling with water. Even if system is drained, unit coils may still have enough water to cause damage when exposed to temperatures below freezing.

Following the hydrostatic test, insulate all piping to prevent sweating.

To ensure compliance with building codes, restore the structure's original fire resistance rating by sealing all holes with material carrying the same fire rating as the structure.

Make Electrical Connections — Refer to unit serial plate for required supply voltage, fan and heater amperage and required circuit ampacities. Refer to unit wiring diagram for unit and field wiring.

The fan motor(s) should never be controlled by any wiring or device other than the factory-supplied switch or thermostat/switch combination unless prior factory authorization is obtained. Fan motor(s) may be temporarily wired for use during construction only with prior factory approval and only in strict accordance with the instructions issued at that time.

SERVICE

Excessive Condensation on Unit — Excessive condensation can be caused by running chilled water through a fan coil unit with the unit fan off. If fan cycling is used, a water flow control valve should be installed to shut off the water when the fan stops.

Other methods of control which avoid condensation problems are as follows:

1. Continuous fan operation with motorized chilled water valve controlled by a thermostat.
2. Continuous fan operation with thermostat control to switch fan from high to low speed (instead of off).

To Clean Coil

1. Be sure electrical disconnect is open, locked and tagged while working on unit.
2. Remove return air grille access panel and brush between coil fins with stiff wire brush. Follow up by cleaning with vacuum cleaner. If coil is cleaned with air hose and nozzle, take care not to drive dirt and dust into other components.
3. Install clean filter as described in the section Clean or Replace Air Filters.

Check Drain — *Lock open and tag unit electrical disconnect.*

Check drain pan, drain line and trap at start of each cooling season. A standard type pipe cleaner for 3/4-in. ID pipe can be used to be sure pipe is clear of obstruction so that condensate is carried away. Check the drain line at filter cleaning time during the cooling season. Be sure that debris has not fallen into unit through supply air grille.

Fan Motor Bearings — Standard motors are permanently sealed and lubricated. No lubrication is required unless special motors have been supplied or unusual operating conditions exist.

Clean Fan Wheel — *Lock open and tag unit electrical disconnect.*

For access to fan assembly, remove front or bottom panel. Fan assembly may be removed from its tracks if unit has a long conduit lead. Use a stiff brush or vacuum to remove dirt and debris from scroll. Wipe all fan surfaces with a damp cloth.

Clean Electric Heater — *Lock open and tag heater and unit disconnects.*

Check that airflow through heater elements is unobstructed. Clean heater elements with soft brush or vacuum cleaner as necessary.

Clean or Replace Air Filters — *Lock open and tag unit electrical disconnect.*

At the start of each cooling season and after each month of operation (more or less depending on operating conditions) replace throwaway filter or clean permanent filter.

THROWAWAY FILTER — Replace filter with a good quality filter of the size shown in Table 2. Do not attempt to clean and reuse disposable filters.

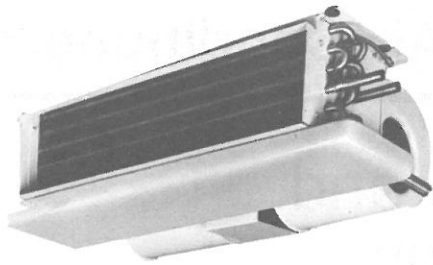
PERMANENT FILTER (FIBER TYPE)

1. Tap on solid surface to dislodge heavy particles.
2. Wash in hot water. If needed, use mild solution of commercial solvent such as sal soda or trisodium phosphate.
3. Set filter on end so that water drains out through slots in frame. Allow filter to dry thoroughly.
4. Recharge filter with Film-Cor or similar recharging oil. Three ounces is sufficient for medium size filter. Oil may be applied by insect spray gun. For easier spraying, the oil can be warmed.

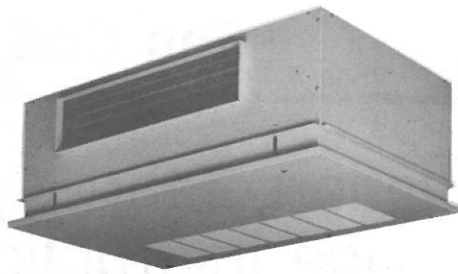
If the filter is dipped in the recharging oil, remove it immediately and allow to drain through slots in frame.

5. Replace filter in unit.

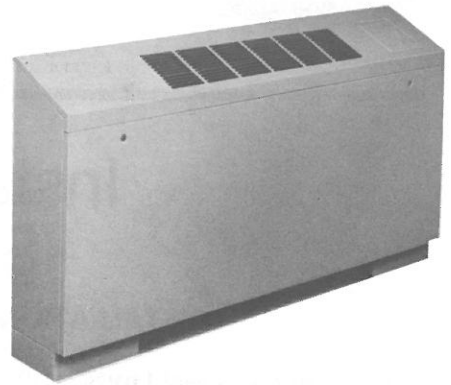
If another type of filter is used, follow the filter manufacturer's instructions.



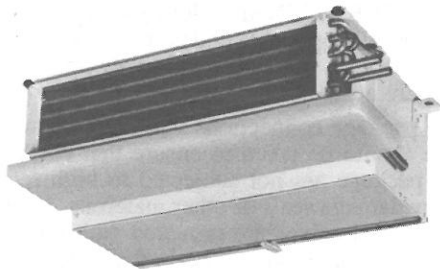
42CA
Furred-in ceiling model with low silhouette.
(200-1200 cfm)



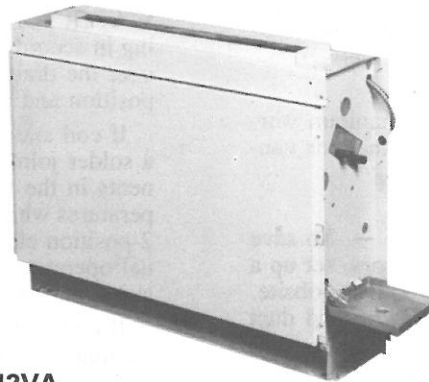
42CK
Cabinet model with telescoping flip-down panel and stamped louver bottom return or duct collar rear return.
(200-1200 cfm)



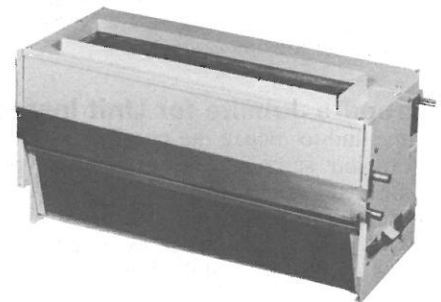
42VF
Cabinet model with slant top and top or front discharge.
(200-1200 cfm)



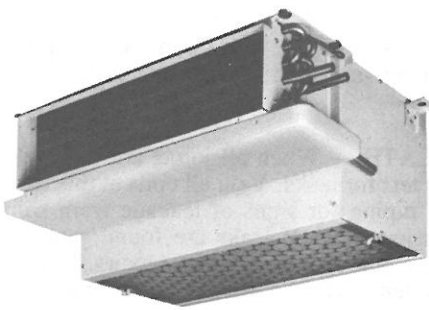
42CE
Furred-in ceiling model with factory-installed plenum.
(200-1200 cfm)



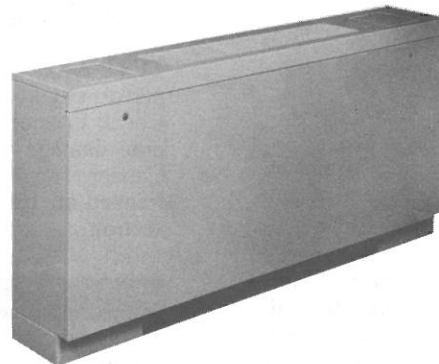
42VA
Furred-in model for under-the-window applications with top or front discharge.
(200-1200 cfm)



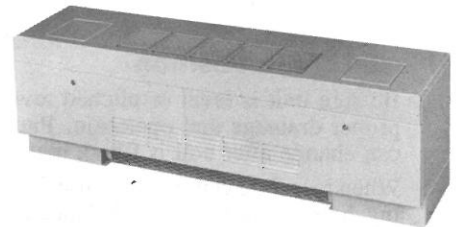
42VC
Furred-in lobby model for concealed under-the-window applications.
(200-600 cfm)



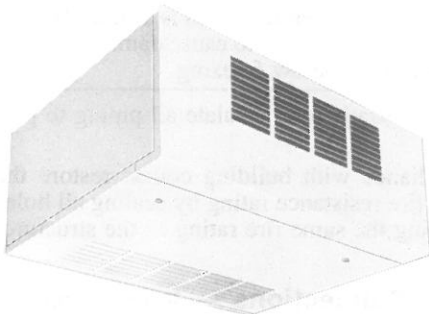
42CF
High-static, furred-in model.
(400-1000 cfm)



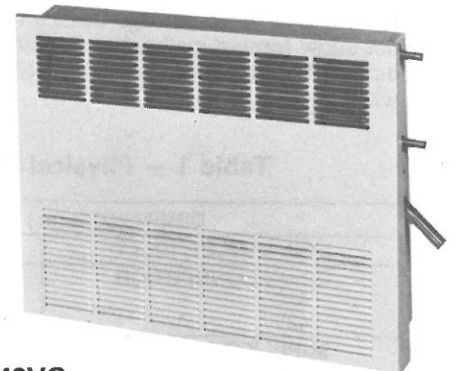
42VB
Cabinet model with top or front discharge.
(200-1200 cfm)



42VE
Cabinet lobby model with stamped louver discharge grille and 2 control access doors.
(200-600 cfm)



42CG
Cabinet model for under ceiling mount with bottom or rear stamped louver return air grille.
(200-1200 cfm)



42VG
Furred-in wall model. Available with a 10-in. valve compartment extension.
(150 and 300 cfm)

Fig. 1 – 42C,V Fan Coil Air Conditioners

Units with factory-supplied and installed aquastats may be shipped with the aquastats mounted on a coil stub-out. If this is the case, remove the aquastat before installing valve package. When reinstalling aquastats, consult the factory piping diagram in the submittal for proper location. If the valve package is field supplied, the aquastat must be installed in a location where it will sense the water temperature regardless of the control valve position. A bleed bypass may be required to guarantee proper aquastat operation.

All field wiring must be in accordance with governing codes and ordinances. Any modification of unit wiring without factory authorization will invalidate all factory warranties and nullify any agency listings.

Make Duct Connections — Install all ductwork to and from unit in accordance with all applicable codes. Duct construction must allow unit to operate within duct external static pressure limits as shown on job submittals. Units designed to operate with ductwork may be damaged if operated without intended ductwork attached.

Units provided with outside air should have some method of low-temperature protection to prevent coil freeze-up.

Insulate all ductwork as required. Use flexible connections to minimize duct-to-unit alignment problems and noise transmission where specified.

Install ductwork, accessory grilles and plenums so that they do not restrict access to filter.

Cut openings for supply and return air grilles, thermostats and switch plates where specified on job drawings. Be careful not to cut wires, piping or structural supports. Use a steel thermostat shield ring to protect drywall from thermostat wiring where applicable.

Prevent dust and debris from settling in unit. If wall finish or color is to be spray applied, cover all openings to prevent spray from entering unit.

Make Final Preparations

POWER OFF (open unit electrical disconnect)

1. Install thermostats and perform any other final wiring as applicable.
2. Clean dirt, dust and other construction debris from unit interior. Be sure to check fan wheel and housing.
3. Rotate fan wheel by hand to be sure it is free and does not rub housing. Check that wing nuts securing fan assembly to fan deck are tight.

POWER ON

4. Turn on unit power. Check fan and motor operation.
5. Be sure drain line is clear and is properly and securely positioned. Pour water into drain to check operation.
6. Vent all air from unit coil and related piping. If air vent is manual, release air from system by turning air vent

screw 1½ turns counterclockwise with screwdriver. When steady stream of water begins to escape, close valve. If air vent is automatic, trapped air will be vented automatically. Vent releases air slowly, usually dripping water into drain pan in the process.

Make sure all service valves are open and that motorized control valves, if supplied, are set for automatic operation.

7. Check all control valves in the system for proper operation in accordance with valve manufacturer's instructions.
8. For units with factory-installed balancing valves, adjust as follows:
 - a. Butterfly valves — Turn valve gate by inserting screwdriver into slot in valve top and rotating up to 90 degrees. Valve is fully open when slot is parallel with valve body. When slot is perpendicular to body, flow through valve is at minimum. Valve does not seal against flow.
 - b. Ball valves with lever handles — Valve gate action is similar to butterfly valves above except that when handle is perpendicular to valve body, there is no flow through valve. Ball valves may be used as shut-off valves.
9. Install filter in frame at front of coil. If field-supplied filters are used, be sure size is as specified in Table 2.

IMPORTANT: Do not start up or operate unit without filter. Be sure filter and unit interior are clean.

START-UP

Start-up procedures vary depending on time of year (summer or winter) and building characteristics (new building/old building, occupied/unoccupied, etc.).

Start-up in the cooling mode requires that proper care be given to avoid condensation problems. Condensation forms on surfaces that are colder than the dew point of the surrounding air. If a unit is started and is piped with low-temperature chilled water in a hot, humid atmosphere, condensation will form on many parts of the unit. In order to avoid excessive condensation, higher temperature water should initially be used (approximately 65-70 F). Also, the building should be as completely closed as possible and outside air supply fans, and bathroom and kitchen exhaust fans should be off.

As the building temperature drops, the chilled water temperature can be gradually reduced until it reaches 50 F. At this point the outside air fans can be turned on. When the chilled water temperature is reduced to its design point, the exhaust fans can be turned on.

Table 2 — Filter Data

UNIT SIZE	NOM CFM	FILTER SIZE (in., 1-in. thick)*							
		CA†	CE**	CF**††	CG	CK	VA, VB, VF	VC, VE	VG
01	150	—	—	—	—	—	—	—	10 x 14½
02	200	10 x 24	10 x 18	—	10 x 24	10 x 28	7¾ x 21¾	6¾ x 21¾	—
03	300	10 x 28	10 x 22	—	10 x 28	10 x 28	7¾ x 25¾	6¾ x 26¾	10 x 28
04	400	10 x 32	10 x 28	12¾ x 28	10 x 33	10 x 33	7¾ x 31¾	6¾ x 34¾	—
06	600	10 x 42	10 x 33	12¾ x 33	10 x 37	10 x 45	7¾ x 41¾	6¾ x 48¾	—
08	800	10 x 42	10 x 40	12¾ x 40	10 x 41	10 x 45	7¾ x 43¾	—	—
10	1000	10 x 54	10 x 54	12¾ x 54	10 x 54	10 x 62	7¾ x 57¾	—	—
12	1200	10 x 64	10 x 62	—	10 x 63	10 x 62	7¾ x 65¾	—	—

*Sizes shown for Model 42CA are nominal sizes; all other sizes are actual sizes.

†Filter size for return air grille location.

**Filter size if located in return air plenum.

††With electric heat and bottom return, the 42CF unit filter width increases from 12¾ to 16¾ inches.

SERVICE

Excessive Condensation on Unit — Excessive condensation can be caused by running chilled water through a fan coil unit with the unit fan off. If fan cycling is used, a water flow control valve should be installed to shut off the water when the fan stops.

Other methods of control which avoid condensation problems are as follows:

1. Continuous fan operation with motorized chilled water valve controlled by a thermostat.
2. Continuous fan operation with thermostat control to switch fan from high to low speed (instead of off).

To Clean Coil

1. Be sure electrical disconnect is open, locked and tagged while working on unit.
2. Remove return air grille access panel and brush between coil fins with stiff wire brush. Follow up by cleaning with vacuum cleaner. If coil is cleaned with air hose and nozzle, take care not to drive dirt and dust into other components.
3. Install clean filter as described in the section Clean or Replace Air Filters.

Check Drain — *Lock open and tag unit electrical disconnect.*

Check drain pan, drain line and trap at start of each cooling season. A standard type pipe cleaner for 3/4-in. ID pipe can be used to be sure pipe is clear of obstruction so that condensate is carried away. Check the drain line at filter cleaning time during the cooling season. Be sure that debris has not fallen into unit through supply air grille.

Fan Motor Bearings — Standard motors are permanently sealed and lubricated. No lubrication is required unless special motors have been supplied or unusual operating conditions exist.

Clean Fan Wheel — *Lock open and tag unit electrical disconnect.*

For access to fan assembly, remove front or bottom panel. Fan assembly may be removed from its tracks if unit has a long conduit lead. Use a stiff brush or vacuum to remove dirt and debris from scroll. Wipe all fan surfaces with a damp cloth.

Clean Electric Heater — *Lock open and tag heater and unit disconnects.*

Check that airflow through heater elements is unobstructed. Clean heater elements with soft brush or vacuum cleaner as necessary.

Clean or Replace Air Filters — *Lock open and tag unit electrical disconnect.*

At the start of each cooling season and after each month of operation (more or less depending on operating conditions) replace throwaway filter or clean permanent filter.

THROWAWAY FILTER — Replace filter with a good quality filter of the size shown in Table 2. Do not attempt to clean and reuse disposable filters.

PERMANENT FILTER (FIBER TYPE)

1. Tap on solid surface to dislodge heavy particles.
2. Wash in hot water. If needed, use mild solution of commercial solvent such as sal soda or trisodium phosphate.
3. Set filter on end so that water drains out through slots in frame. Allow filter to dry thoroughly.
4. Recharge filter with Film-Cor or similar recharging oil. Three ounces is sufficient for medium size filter. Oil may be applied by insect spray gun. For easier spraying, the oil can be warmed.

If the filter is dipped in the recharging oil, remove it immediately and allow to drain through slots in frame.

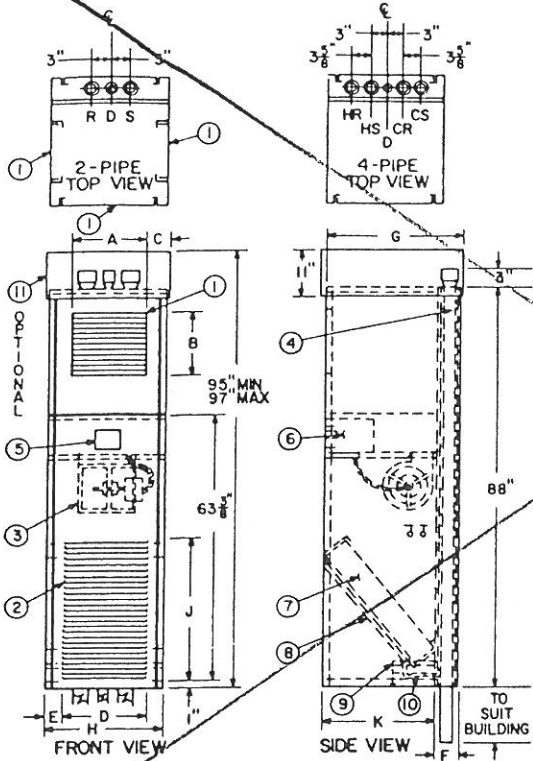
5. Replace filter in unit.

If another type of filter is used, follow the filter manufacturer's instructions.

Physical data and dimensions (cont)

EXISTING FCU-2

42SH EXPOSED STACK

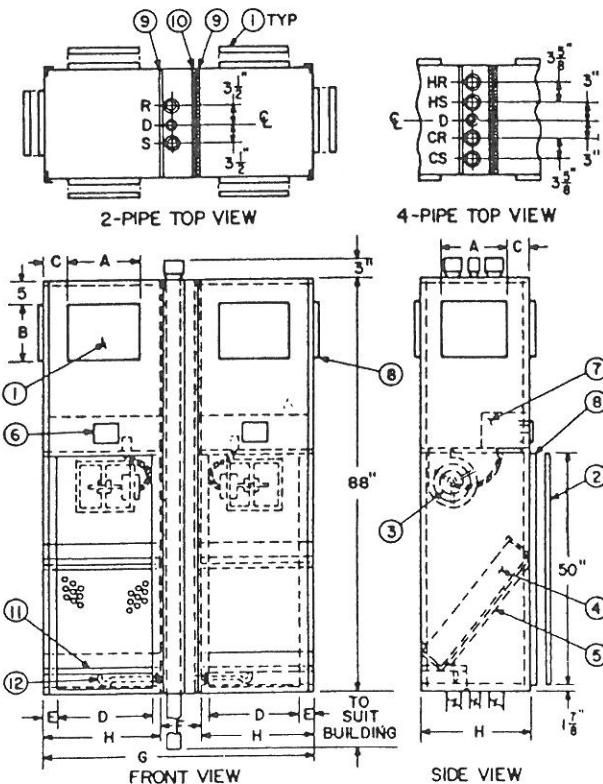


COMPONENT	DIMENSIONS (In.)						
	Unit Size						
		03	04	06	08	10	12
Supply Air Opening							
Single Disch	A + B	14x8	14x12	14x12	14x16	—	—
Double Disch	A + B	14x6	14x 8	14x 8	14x10	14x12	14x12
Location	C	1½	1½	1	1	1	1
Return Air Opening							
Width	D	12¾	12¾	14¾	14¾	17¾	17¾
Location	E	1½	1½	1½	1½	3½	3½
Unit Depth							
Unit (Riser Chase)	K	17¾	17¾	20¾	20¾	24¾	24¾
(Unit + Chase)	F	4¾	4¾	4¾	4¾	4¾	4¾
(Unit + Chase)	G	22¾	22¾	25¾	25¾	29¾	29¾
Unit Width	H	17	17	20	20	24	24
Louver Height	J	22½	22½	26½	26½	31½	31½

- | ITEM | DESCRIPTION |
|------|---|
| 1 | Double deflection supply grille, painted or anodized aluminum spot-welded in any of 3 locations shown. |
| 2 | Return air access panel with stamped grille (opposite risers). |
| 3 | Motor/blower assembly — remove through return air access panel. |
| 4 | Cabinet insulation, neoprene-coated glass fiber. |
| 5 | Factory-installed controls, hinged access door. |
| 6 | Control box (same side of unit as return air grille). |
| 7 | Coil |
| 8 | Filter |
| 9 | Drain pan |
| 10 | PVC drain tube |
| 11 | Ceiling skirt (optional), 3 sides finished to match cabinet (trim to fit in field and attach in required position). |

NOTE: See bottom of page for legend for top view.

42SJ BACK-TO-BACK FURRED-IN STACK WITH GALVANIZED ENCLOSURE



COMPONENT	DIMENSIONS (In.)						
	Unit Size						
		03	04	06	08	10	12
Supply Air Opening							
Single Disch	A + B	14x8	14x12	18x10	18x12	—	—
Double Disch	A + B	14x6	14x 6	18x 6	18x 6	22x8	22x8
Location	C	1½	1½	1	1	1	1
Return Air Opening							
Width	D	14	14	18	18	22	22
Location	E	1½	1½	1	1	1	1
Unit Depth							
(Unit + Chase)	F	5¾	5¾	5¾	5¾	5¾	5¾
(Unit + Chase)	G	39¾	39¾	45¾	45¾	53¾	53¾
Unit Width	H	17	17	20	20	24	24

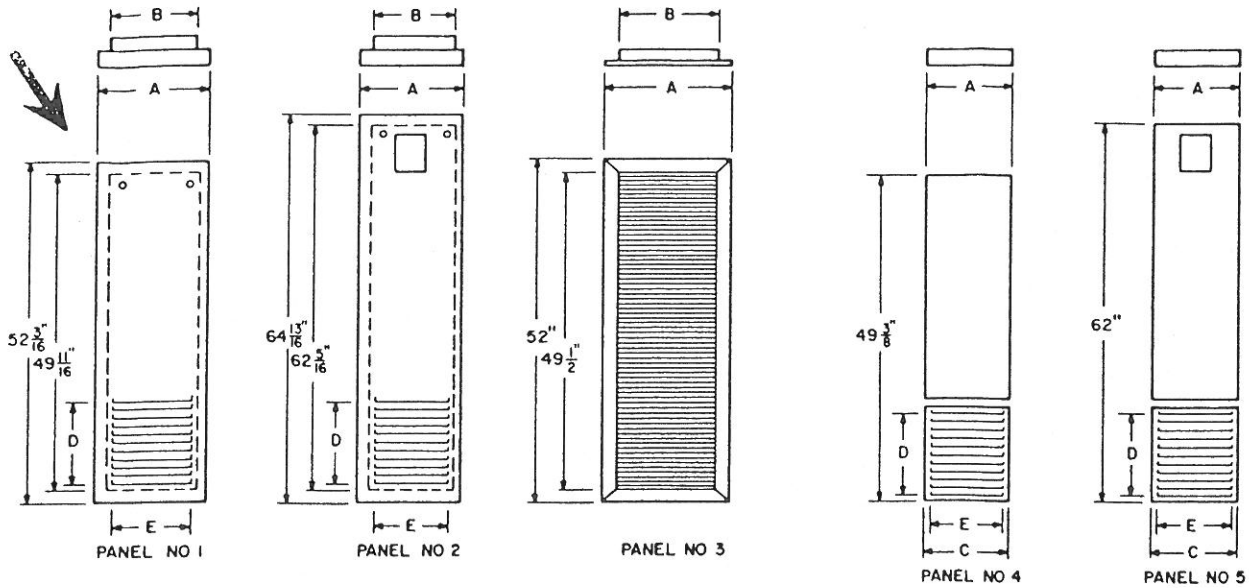
- | ITEM | DESCRIPTION |
|------|---|
| 1 | Double deflection supply grille, painted or anodized aluminum, any of 3 locations on a single unit. |
| 2 | Return air grille, any of 3 locations on a single unit. (See Figure, page 8.) |
| 3 | Motor/blower assembly — remove through return air grille opening. |
| 4 | Coil |
| 5 | Filter |
| 6 | Controls for plug-in installation. |
| 7 | Control box |
| 8 | Duct collar, ½ inch |
| 9 | Casing insulation, neoprene-coated glass fiber. |
| 10 | Gypsum board, ½-in. type C |
| 11 | Drain pan |
| 12 | PVC drain tube |

LEGEND FOR TOP VIEW (Typical)

- | | | |
|---------------------------|-----------------------|-----------------------|
| C — Chilled Water | D — Drain | HS — Hot Water Supply |
| CR — Chilled Water Return | H — Hot Water | R — Return |
| CS — Chilled Water Supply | HR — Hot Water Return | S — Supply |

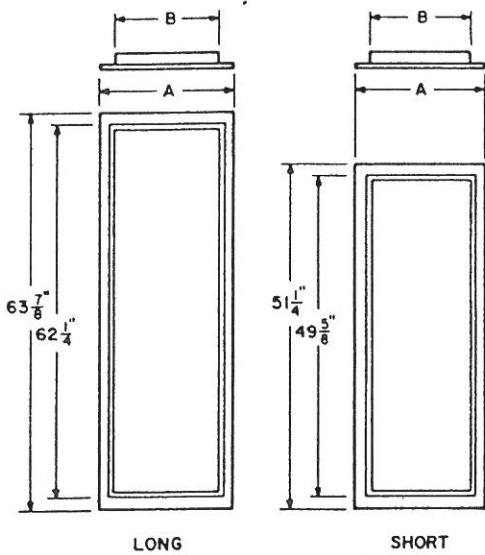
Accessory dimensions

RETURN-AIR WALL PANELS FOR FURRED-IN UNITS



PANELS-NO FRAME

PANELS-WITH FRAME



FRAMES

PANEL AND FRAME DIMENSIONS (in.)

PANEL NO.	UNIT SIZE	A	B	C	D	E
1	03, 04	15 ³ / ₁₆	13 ¹ / ₂	—	21	12 ³ / ₁₆
	06, 08	19 ³ / ₁₆	17 ¹ / ₂	—	28 ¹ / ₂	14 ³ / ₄
	10, 12	23 ³ / ₁₆	21 ¹ / ₂	—	31 ¹ / ₂	17 ³ / ₄
2	03, 04	15 ³ / ₁₆	13 ¹ / ₂	—	21	12 ³ / ₁₆
	06, 08	19 ³ / ₁₆	17 ¹ / ₂	—	28 ¹ / ₂	14 ³ / ₄
	10, 12	23 ³ / ₁₆	21 ¹ / ₂	—	31 ¹ / ₂	17 ³ / ₄
3	03, 04	16 ¹ / ₄	13 ¹ / ₂	—	—	—
	06, 08	20 ¹ / ₄	17 ¹ / ₂	—	—	—
	10, 12	24 ¹ / ₄	21 ¹ / ₂	—	—	—
4	03, 04	13 ¹ / ₄	—	13 ⁵ / ₁₆	21	12 ³ / ₁₆
	06, 08	17 ¹ / ₄	—	17 ⁵ / ₁₆	28 ¹ / ₂	14 ³ / ₄
	10, 12	21 ¹ / ₄	—	21 ⁵ / ₁₆	31 ¹ / ₂	17 ³ / ₄
5	03, 04	13 ¹ / ₄	—	13 ⁵ / ₁₆	21	12 ³ / ₁₆
	06, 08	17 ¹ / ₄	—	17 ⁵ / ₁₆	28 ¹ / ₂	14 ³ / ₄
	10, 12	21 ¹ / ₄	—	21 ⁵ / ₁₆	31 ¹ / ₂	17 ³ / ₄
LONG FRAME	03, 04	15 ¹ / ₈	13 ¹ / ₂	—	—	—
	06, 08	19 ¹ / ₈	17 ¹ / ₂	—	—	—
	10, 12	23 ¹ / ₈	21 ¹ / ₂	—	—	—
SHORT FRAME	03, 04	15 ¹ / ₈	13 ¹ / ₂	—	—	—
	06, 08	19 ¹ / ₈	17 ¹ / ₂	—	—	—
	10, 12	23 ¹ / ₈	21 ¹ / ₂	—	—	—

FILTER SIZES

UNIT SIZE	NOMINAL CFM	FILTER DIMENSIONS (in.)
03, 04	300, 400	1 x 12 ¹ / ₂ x 24 ³ / ₄
06, 08	600, 800	1 x 15 ¹ / ₂ x 29 ¹ / ₂
10, 12	1000, 1200	1 x 20 ¹ / ₂ x 29 ¹ / ₂

APPROXIMATE UNIT SHIPPING WEIGHTS (lb)

UNIT SIZE	UNIT MODEL	
	SG, SH	SJ
03, 04	225	420
06, 08	250	470
10, 12	275	520

Stack Fan-Coil Air Conditioners

INSTALLATION

Step 1 — Unpack and Inspect Units.

Stack units are usually shipped on a flat bed trailer in pallets of 6, 8 or 10 units, depending on unit size. Since equipment is normally moved to each jobsite floor on the shipping pallet, each unit on a single pallet is for installation on the same floor, thus minimizing field handling.

Remove shipping wraps from all units. Check the shipment against shipping order. Check for concealed shipping damage. To examine the cabinet interior, remove front panel(s), held in place by latches or sheetmetal screws. Replace all panels after inspection. If shipment is damaged or incomplete, advise Carrier immediately so that claim may be filed with transportation agency.

CAUTION: Never use the risers to lift the units. Risers are fitted with flexible expansion joints which can be damaged.

Step 2 — Protect Units from Damage.

To maintain warranty of unit, protect them against adverse weather conditions, theft and vandalism on the jobsite.

Step 3 — Prepare Jobsite for Unit Installation.

To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire and duct connection requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their part in the installation.

Step 4 — Identify and Distribute Units.

Each unit has factory tag taped to one end. Tag states riser tier number, floor, room number if furnished and supply air arrangement. Check unit for any other labels that apply to installation. Remove unit from pallet and take directly to assigned space for installation.

Step 5 — Set Units in Place.

Begin on lowest floor and progress upward, floor by floor, to top.

1. Examine drain line (Fig. 1). Be sure both ends are in place and that it forms a trap. *Avoid pinching drain line.*
2. Tip unit over riser hole in building floor. As unit is righted, align risers with unit below.

3. Install isolator pads beneath the 4 corners of unit as applicable.

Step 6 — Attach Unit Risers.

1. Each riser has a 3-in. swaged portion at top and sufficient extension at bottom for an inserted length of approximately 2 inches. This unit-to-unit joint is NOT intended for full bottoming in the joint, but allows for variations in floor-to-floor dimensions and for correct riser positioning.

If job requires that unit risers be supplemented with between-the-floor extensions, assemble these pieces at this time. The extension pieces may be field- or factory-supplied. If factory-supplied, insulation is also provided.

2. Level unit to insure proper coil operation and condensate drainage. After units are positioned and risers centered in pipe chase, make unit plumb in 2 directions, using unit frame as a reference.
3. Anchor unit to building. Use bolts or lag screws thru holes provided in unit frame.
4. After all units in a stack are anchored, make unit-to-unit riser joints. First, center each coil-to-riser line within the expansion slot in the unit back panel. Each riser joint must be in vertical alignment with at least 1-in. penetration into the swaged joint. This condition is met if floor-to-floor dimension is as specified and coil-to-

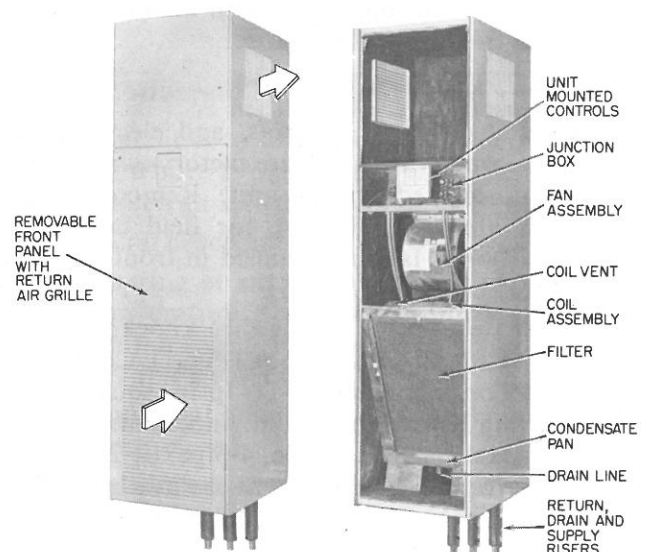


Fig. 1 — Typical Stack Fan-Coil Air Conditioner (42SH Shown)

riser lines are properly centered. Wide variations in floor-to-floor dimensions may necessitate cutting off or extending individual risers. Such modifications are the full responsibility of the installing contractor.

5. Solder riser joints with phos-copper, silfos or other high temperature alloy. Soft solder (50-50, 60-40, 85-15) or other low temperature lead alloy is not suitable for this application.

Step 7 — Anchor Risers as Required.

Do not fasten risers rigidly within each unit. Risers must be free to move within pipe chase in response to normal vertical expansion and contraction.

Built-in risers must be anchored at some point to building structure. Unit design accommodates up to 1-1/2 in. expansion and contraction (3-in. total movement) in riser assemblies. If total calculated riser expansion/contraction exceeds 3 inches, install additional expansion compensation devices in each riser.

Step 8 — Perform Hydrostatic Test and Insulate.

When all field riser joints are completed and riser assemblies properly anchored, perform hydrostatic test for leaks. Do not exceed 250 psi system test pressure, measured at bottom of riser. Vent all coils at this time and check interior unit piping for signs of leakage from possible shipping damage or mishandling. If leaks are found, *notify a Carrier representative before initiating any repairs*. Release trapped air from system, using manual vent located on coil (Fig. 1).

Following hydrostatic test, insulate all risers continuously from top to bottom. (All factory-furnished risers are provided with insulation.)

To assure compliance with building codes, restore structure's original fire resistance rating by sealing holes in floor around risers with material carrying the same fire rating as structure.

Step 9 — Make Electrical Connections.

All unit-mounted controls, and electric heater elements when furnished, are factory-wired to control box located within unit. Remote-mounted controls are shipped loose for field installation. Control box is factory-installed in front of unit to facilitate field wiring (Fig. 1).

Route field power supply thru knockouts at top of unit casing to junction box (Fig. 1). Controls are mounted on a standard 4-11/16 in. square switch box having 3/4-in. and 1/2-in. knockouts. Optional control packages for 2-pipe, 4-pipe, or 2-pipe with auxiliary or total electric heat are available. Refer to the unit wiring diagram for package identification.

Install field wiring in accordance with unit wiring diagram and all applicable codes. Use 75 C rated

wire. See Table 1 and 2 for electrical data. Wiring diagrams appear on unit and on approved submittal drawings as forwarded to installing contractor. If electrical testing indicates problems, *contact a Carrier representative before initiating any repairs*.

Step 10 — Frame and Finish Unit.

MODELS 42SE AND 42SF have no casings and are designed for direct attachment of 5/8-in. (minimum) Type C gypsum wallboard which forms the air-handling enclosure. No vapor barrier or waterproofing is normally required (see SPECIAL APPLICATIONS section following).

Enclosure material may be conventional wallboard having a fire hazard classification that complies with local codes. To prevent air leakage into, out of or within unit when using sheetrock, add a rubberized or flexible-setting type of waterproof 190 F sealant around frame parts in contact with sheetrock.

Regardless of final finish, entire unit must be enclosed.

MODELS 42SG, SH and SJ have factory enclosures and may be finished with normally accepted wall coverings. However, drywall secured with adhesive bonding alone is *not* recommended.

Use low-profile sheetmetal panhead screws to secure wallboard to unit frame.

Do not apply sheetmetal screws or nails where they can penetrate coil, riser pipes, or electrical junction box and raceways.

Do not secure wallboard to drain pan edges or to control box enclosure. Condensate leaks or electrical shorts may result.

Prevent sheetrock dust or other debris from settling on coil fins, motor-blower assembly or other unit interior surfaces. Unit efficiency will be reduced.

SPECIAL APPLICATIONS — When field-fabricated outdoor air connections are used, Models 42SE and 42SF (and sometimes other models, depending on application) require insulation and/or suitable vapor barrier between wall material and air handling department. This is especially true in coastal areas with high humidity.

Install only approved vapor barrier materials in compliance with accepted local construction practices and codes. All wall finishes *must* be preceded by 5/8-in. (minimum) Type C wallboard except in the case of special-labeled, insulated and steel-enclosed units.

Step 11 — Provide Openings for Grilles and Thermostat.

Cut out openings for supply and return air grilles, thermostats and switch plates where specified on job plans. Be careful not to cut wires, piping or structural supports. Use a steel thermostat shield ring to protect drywall from thermostat wiring

Table 1 — Motor Electrical Data

UNIT SIZE	PERMANENT SPLIT CAPACITOR TYPE											
	115/1/60						277/1/60					
	MOTOR SPEED SET											
	High		Medium		Low		High		Medium		Low	
Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	Amps	Watts	
3	.9	85	.6	60	.4	40	.3	95	.2	50	.1	35
4	1.2	115	.7	70	.5	50	.5	120	.3	80	.2	55
5	1.4	140	1.1	100	.7	60	.6	140	.5	100	.4	65
6	2.3	210	1.5	150	1.1	80	.9	210	.8	160	.5	80
7	3.6	350	2.9	280	2.1	260	1.5	350	.8	225	.5	140
8	4.7	465	3.7	340	2.8	240	1.8	465	1.3	345	.9	215

Table 2 — Electrical Heater Data (Max Capacities)

UNIT SIZE	MAX KW RATING	EQUIV BTU/HR	AMPERES			
			Supply Voltage			
			120 v	208 v	240 v	277 v
3	3.0	10,260	25.0	14.4	12.5	10.8
4	4.0	13,680	—	19.3	16.7	14.4
5	6.0	20,520	—	28.8	25.0	21.6
6	8.0	27,360	—	38.5	33.3	28.8
7	10.0	34,200	—	48.0	41.7	36.1
8	10.0	34,200	—	48.0	41.7	36.1

NOTES:

1. Separate power sources for motor and heaters required except when heaters and motors are ordered in conjunction with the single power source wiring option. See unit wiring diagram.
2. Power supply to unit must be field furnished and installed in accordance with applicable codes.
3. Heaters are single phase only.
4. Heater elements are bare resistance wire.

where applicable. *Prevent dirt, dust and debris from settling in unit.* If wall finish or color is to be spray applied, *cover all openings to prevent overspray from entering unit.*

Step 12 — Make Unit Final Preparations.

1. Install thermostats and perform any other final wiring as applicable.
2. Clean dirt, dust and other construction debris from unit interior. Be sure to check fan wheel and housing.
3. Rotate fan wheel by hand to be sure it is free and does not rub housing. Check that wing nuts securing fan assembly to fan deck are tight.
4. Be sure that drain line is clear and is properly and securely positioned. Pour water into drain to check operation.
5. Vent all air from unit coil and related piping. Make sure service valves are open and that motorized control valves (if supplied) are set for automatic operation.
6. If unit is equipped with a combination stop and balance valve (ball valve) in the return line, set valve for required flow thru coil.
7. Install filter in frame at front of coil. If field-supplied filters are used, use specified size (see Table 3). *Do not start up or operate unit without filters. Be sure that filters and unit interior are clean.*

Install furred-in unit supply and return air grilles (shipped separately). Use screws supplied, as applicable. Boxes are marked to identify correct unit model usage. Use correct grille for each unit as marked.

After Installation But Prior to Start-Up

After completing unit installation, proper care must be given to initial start-up and operation to avoid condensation problems.

Condensation forms on surfaces that are colder than the dew point of the surrounding air. Where no automatic waterflow control valve has been installed on coil and the surrounding air is permitted to remain at high dew point, condensation will form on many parts of the unit because of the cooling and lack of airflow. Check whether units have a water flow control valve installed in the coil chilled water line. (Do not mistake this valve for the 2 hand valves installed near pipe chase.)

If the system has been installed without benefit of a thermostatic water flow control valve, constant fan operation, or positive coil shut off when not in operating, it is the responsibility of the installing contractor to properly start up the system in such a way as to avoid any condensation problem.

START-UP

Although the actual start-up procedure may vary on individual jobs because of system peculiarities, the basic intent is to lower the water temperature gradually while avoiding the introduction of moisture-laden air into the building.

The general procedure is as follows:

1. In the spring or summer, start chilled water at 70 F temperature. Set fan-coil control at low or medium fan speed. Be sure fan current does not exceed Table 2 values.
2. Make sure that building is completely or almost completely closed.
3. Reduce chilled water supply temperature by about 2 F per day until water temperature is at design.
4. Do not turn on corridor supply fans, toilet and kitchen exhaust fans until chilled water tempera-

ture is brought down to 50 F. Turn corridor supply fans on when chilled water temperature reaches 50 F and exhaust fans when water reaches 45 F.

SERVICE

To Correct Condensation Problems

BEST METHODS:

Method 1 — Install water flow control valve on unit.

Method 2 — Set fan switch on manual (continuous) low speed operation.

ALTERNATE METHODS:

Method 1 — Where thermostat is provided for fan cycling, set it to allow intermittent fan operation.

Method 2 — Close hand valves on all units not operating. Reopen valves during heating season to prevent freeze-up.

To Clean Coil

1. Be sure electrical disconnect is open, locked and tagged while working on unit.
2. Remove return air grille access panel and brush between coil fins with stiff wire brush. Follow up by cleaning with vacuum cleaner. If coil is cleaned with air hose and nozzle, take care not to drive dirt and dust into other components.
3. Install clean filter as described in the section Clean or Replace Air Filters.

Check Drain

Lock open and tag unit electrical disconnect(s). Check drain pan and drain line at the start of each cooling season. A standard type cleaner for 3/4-in. ID pipe can be used to be sure pipe is clear of algae and sediment so that condensate is carried away. Check drain line periodically during the cooling season, as it is possible for debris to fall into unit thru supply air grille. If more thorough cleaning is required, remove the drain tube thru the lower area of the return air opening.

Remove Fan Assembly

Lock open and tag unit electrical disconnect. Remove return air grille. Disconnect motor leads

at motor terminals. Remove 2 wing nuts holding fan housing to fan deck. Then slide out fan assembly.

Lubricate motor bearings annually with SAE 20 nondetergent oil. About 8 cc or one teaspoonful per bearing is sufficient. **DO NOT OVER OIL.**

Clean Fan Wheel

Remove fan assembly as described above. Use a stiff brush or vacuum to remove dirt and debris from scroll. Wipe all fan surfaces with a damp cloth.

Clean Electric Heater

Lock open and tag heater and unit disconnects. Check that airflow thru heater elements is unobstructed. Clean heater elements with soft brush or vacuum cleaner as necessary.

Clean or Replace Air Filters

Lock open and tag unit disconnect. At the start of each cooling season and after each month of operation (more or less depending on operating conditions) replace or clean dirty filter as applicable to filter type.

To remove filter, remove unit grille and slip filter forward out of filter rack.

THROWAWAY FILTERS — Replace filter with a good quality filter of the size indicated in Table 3. Do not attempt to clean and reuse a disposable filter.

PERMANENT (CLEANABLE) FILTERS

To clean filter:

1. Tap on solid surface to dislodge heavy particles.
2. Wash with plain water.
3. Set filter on end so that water can drain out thru slots in frame. Allow filter to dry thoroughly before reinstalling in unit.
4. Some filters require different procedure. In this case, follow filter manufacturer's instructions.
5. Reinstall filter in filter rack, replace panel.

Table 3 — Filter Data

MODELS (ALL) SIZE	FILTER SIZE (in.)
3 and 4	12-1/4 x 23-1/4
5 and 6	15-1/4 x 28-1/2
7 and 8	20-1/4 x 28-1/2

For replacement items use Carrier Specified Parts.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Book	3
Tab	7a