Installation Operation Maintenance

GRAA-IOM-2

Library	**Service Literature**
Product Section	**Air Handling**
Product	**Make-Up Air**
Model	**GRAA, GRBA, GRCA, GRDA**
Literature Type	**Installation, Operation, Maintenance**
Sequence	**2**
Date	**January 1995**
File No.	**SV-AH-MUA-GRAA-IOM-2-195**
Supersedes	**New**

Rooftop Evaporative Cooling Units

Sizes
100 MBh - 800 MBh

"A" Design Sequence

Since the Trane Company has a policy of continuous product improvement, it reserves the right to change specifications and design without notice. The installation and servicing of the equipment referred to in this booklet should be done by qualified, experienced technicians.

Literature Change History

GRAA-IOM-2 (January 1995)

Original issue of manual describes installation of GRAA, GRBA, GRCA, GRDA Rooftop Evaporative Cooling Units, for A Design.

FOR YOUR SAFETY:

If you smell gas:

1. **Open windows.**
2. **Don't touch electrical switches.**
3. **Extinguish any open flame.**
4. **Immediately call your gas supplier.**

FOR YOUR SAFETY:

The use and storage of gasoline or other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.

Warnings and Cautions

Notice that WARNINGS and CAUTIONS appear at appropriate intervals throughout this manual. Warnings alert installer, owner, operator or service personnel to potential hazards that could result in personal injury or death. Cautions are provided to alert personnel to conditions which could result in damage to the equipment or cause property damage.

Receiving Instructions

Inspect shipment immediately when received to determine if any damage has occurred to the unit during shipment. After the unit has been uncrated, check for any visible damage to the unit. If any damage is found, the consignee should sign the bill of lading indicating such damage and immediately file claim for damage with the transportation company.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

Warnings

Approved for use in California when equipped with spark ignition.

Installer Please Note:

This equipment has been test fired and inspected. It has been shipped free from defects from our factory. However, during shipment and installation, problems such as loose wires, leaks or loose fasteners may occur. **It is the installer's responsibility to inspect and correct any problems that may be found.**

Install, operate and maintain unit in accordance with manufacturer's instructions to avoid exposure to fuel substances or substances from incomplete combustion which can cause death or serious illness. The state of California has determined that these substances may cause cancer, birth defects, or other reproductive harm.

Model Number Description (All furnaces)

DIGIT 1 - Gas Heating Equipment
G = Gas

DIGIT 2 - Unit Type
F = Rooftop Duct Furnace
R = Rooftop Heating Unit
S = Special Unit Type

DIGIT 3 - Furnace Type
A = Standard Temp Rise (20-60 Deg. F) LH
B = Standard Temp Rise (20-60 Deg. F) RH
C = High Temp Rise (60-90 Deg. F) LH
D = High Temp Rise (60-90 Deg. F) RH
E = Blank Furnace Sleeve LH
G = Blank Furnace Sleeve RH
S = Special Furnace Type

DIGIT 4 - Development Sequence
A = First Generation

DIGIT 5,6 - Input Capacity
Single Furnace
10 = 100 MBh Input 30 = 300 MBh Input
15 = 150 MBh Input 35 = 350 MBh Input
20 = 200 MBh Input 40 = 400 MBh Input
25 = 250 MBh Input
Double Furnace
50 = 500 MBh Input 70 = 700 MBH Input
60 = 600 MBh Input 80 = 800 MBh Input
Triple Furnace
12 = 1200 MBh Input
SS = Special unit

DIGIT 7 - Venting Type
G = Gravity Venting
P = Power Venting
S = Special Venting

DIGIT 8 - Main Power Supply
A = 115/60/1
B = 208/60/1
C = 230/60/1
D = 208/60/3
E = 230/60/3
F = 460/60/3
G = 575/60/3
S = Special Main Power Supply

DIGIT 9 - Gas Control Option (Intermittent Pilot Ignition)
A = Single-Stage
B = Two-Stage
C = Hydraulic Modulating (60-100)
D = Hydraulic Modulating (75-200)
E = Hydraulic Modulating W/Bypass and limit (60-100)
F = Hydraulic Modulating W/Bypass (75-200)
G = Electronic Modulating W/Room T-Stat
H = Electronic Modulating W/Duct T-Stat
J = Electronic Modulating W/Duct T-Stat and Override Room Thermostat
K= Electronic Modulating W/External 4-20 mA Input (Furnace 1)
L = Electronic Modulating W/External 4-20 mA Input
M= Electronic Modulating W/External 0-10 VDC Input (Furnace 1)
N = Electronic modulating W/External 0-10 VDC Input
P = VAV Control Two-Stage
R= VAV Control Three-Stage
T = VAV Control Four-Stage
U = S-350 2 Stage Modular Electronic Control System
W = S-350 3 Stage Modular Electronic Control System
X = S-350 4 Stage Modular Electronic Control System
Y = S-350 6 Stage Modular Electronic Control System
S = Special Gas Control

DIGIT 10 - Design Sequence
A = First Design

DIGIT 11 - Design Sequence
0 = First Design

DIGIT 12 - Fuel Type
N = Natural Gas
P = LP Gas (Propane)
L = Natural Gas with 100% Lockout
S = Special Fuel type

DIGIT 13 - Heat Exchanger Material
1 = Aluminized Steel
2 = #409 Stainless Steel (First Furnace Only)
3 = #409 Stainless Steel (All Furnace Sections)
4 = #321 Stainless Steel (First Furnace Only)
5 = #321 Stainless Steel (All Furnace Sections)
6 = #409 Stainless Steel Package (First Furnace Only)
7 = #409 Stainless Steel Package(All Furnace Sections)
8 = #321 Stainless Steel Package(First Furnace Only)
9 = #321 Stainless Steel Package(All Furnace Sections)
S = Special Heat Exchanger Package

DIGIT 14 - Rooftop Arrangements (Designator A - L Assumes Furnace Section)
A = Duct Furnace
B = Blower (Standard)
C = Blower (Standard) Plenum
D = Blower (Standard) Evaporative Cooler
E = Blower (Standard) Evaporative Cooler/Plenum
G = Blower (High CFM)
J = Blower (High CFM)/Plenum
K = Blower (High CFM)/Cooling
L = Blower (High CFM)/Cooling/Plenum
S = Special Rooftop Arrangment

DIGIT 15 = Rooftop Heating Unit Motor Selection
0 = None (Rooftop duct furnace)
A = 1/2 HP w/contactor
B = 3/4 HP w/contactor
C = 1 HP w/contactor
D = 1 1/2 HP w/contactor
E = 2 HP w/contactor
F = 3 HP w/contactor
G = 5 HP w/contactor
H = 1/2 HP w/magnetic starter
J = 3/4 HP w/magnetic starter
K = 1 HP w/magnetic starter
L = 1 1/2 HP w/magnetic starter
N = 2 HP w/magnetic starter
P = 3 HP w/magnetic starter
Q = 5 HP w/magnetic starter
R = 7 1/2 HP w/magnetic starter
T = 10 HP w/magnetic starter
U = 15 HP w/magnetic starter
S = Special Motor

Model Number Description (All furnaces)

DIGIT 16 = Motor Speed
0 = No Selection
1 = Single Speed ODP 1800 RPM
2 = Single Speed TEFC 1800 RPM
3 = Single Speed High Efficiency ODP 1800 RPM
4 = Single Speed High Efficiency TEFC 1800 RPM
5 = 2S1W ODP 1800/900 RPM
6 = 2S2W ODP 1800/1200 RPM
7 = Special Motor Speed & Starter

DIGIT 17 = Coil Options
0 = No cooling coil selection
A = DX coil, 4 Row, Single Circuit
B = DX coil, 4 Row, Dual Circuit
C = DX coil, 6 Row, Single Circuit
D = DX coil, 6 Row, Dual Circuit
E = Chilled Water Coil, 4 Row,
G = Chilled Water Coil, 6 Row,
S = Special coil

DIGIT 18 = Air Inlet Configuration
0 = None (Rooftop duct furnace)
1 = Outside Air(OA)
2 = Outside Air W/Air Hood
3 = Return Air(RA)
4 = Outside And Return Air (OA/RA)
5 = Outside and Return Air W/Air Hood
S = Special Air inlet configuration

DIGIT 19 = Air Control & Damper Arrangement
0 = None (Rooftop duct furnace)
A = Outside Air 2 pos. Motor/SR
B = Return Air 2 pos. Motor/SR
C = OA/RA 2 pos SR
D = OA/RA Mod Mtr. W/Mixed Air Control/Min. Pot
E = OA/RA Mod Mtr W/Mixed Air Control/Min Pot/SR
G = OA/RA Mod Mtr W/Mixed Air Control
H = OA/RA Mod Mtr W/Mixed Air Control/ SR
J = OA/RA Mod Mtr W/Min Pot
K = OA/RA Mod Mtr W/Min Pot/SR
L = OA/RA Mod Mtr w/Dry Bulb/Mixed Air Control/Min Pot
M = OA/RA Mod Mtr w/Dry Bulb/Mixed Air Control/Min Pot/SR
N = OA/RA Mod Mtr w/ Enthalpy Controlled Economizer/SR
P = OA/RA Mod Mtr W/ Space Pressure Controller
R = OA/RA Mod Mtr W/ S-350 P Proportional Mixed Air Control/SR
T = OA/RA Mtr. W/External 0-10 VDC and 4-20mA Analog Input/(External Input)
U = OA/RA Mtr. W/External 0-10 VDC and 4-20 mA Analog Input/SR (External Input)
W = Ashrae Cycle I(OA/RA 2 pos. w/warm-up stat/SR
X = Ashrae Cycle II (OA/RA Mod W/Warm-up Stat/Mixed Air/min pot/SR
Y = Ashrae Cycle III(OA/RA Mod. W/Warm-up Stat/Mixed Air/SR
Z = Manual Dampers
S = Special air control and damper arrangement

DIGIT 20
0 = Non-California Shipment
1 = California Shipment

DIGIT 21 = Miscellaneous Options
A = Orifices For Elevation Above 2000 Feet (Specify Elevation)
B = 12" Evaporative Media
C = Moisture Eliminators
D = Horizontal Return
E = Interlock Relay -24V Coil DPDT 10A
F = Freezestat
G = Fan Time Delay Control (Duct Furnace Only)
H = Return Air Firestat
J= Supply Air Firestat
K = Manual Blower Switch
L = 409 Stainless Steel Furnace Drip Pan
N = Foil Face Insulation
P = Low Leak Dampers
Q = Clogged Filter Switch
R = High/Low Gas Pressure Limit Switches
T = Status Indicator Lamps (Elec cabinet)
V = Manual Reset High Limit Switch
W = Interlock Relay -24/115V Coil SPDT 10A
X= Interlock Relay -24/115-230V Coil DPDT 10A

RECEIVING INSTRUCTIONS

Inspect shipment immediately after receiving to determine if any damage has occurred during shipment If any damage is found, the consignee should sign the bill of lading, indicating such damage, and immediately file claim for damage with the transportation company.

TABLE OF CONTENTS

The following terms are used throughout this manual, in addition to the AGA/CGA requirements to bring attention to the presence of potential hazards, or to important information concerning the product:

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death, serious injury or substantial property damage.

WARNING: Indicates an imminently hazardous situation which, if not avoided, could result in death, serious injury or substantial property damage.

CAUTION: Indicates an imminently hazardous situation which, if not avoided, may result in minor injury or property damage.

NOTE: Used to notify of special instructions on installation, operation, or maintenance which are important to equipment but not related to personal injury.

Failure to comply with the General Safety Information may result in extensive property damage, severe personal injury, or death.

GENERAL SAFETY INFORMATION

Unless otherwise specified, the following conversions may be used for calculating SI/metric unit measurements:

1 lb. = 0.453 kg
1 cubic foot = 0.028m^3
1000 Btu per hour = 0.293 kW
1 foot = 0.305 m
1 inch water column = 0.249 kPa
1 inch = 25.4 mm
1 gallon = 3.785 L
1 psig = 6.894 kPa
1000 BTU/cu. ft. = 37.5 MJ/m^3

WARNING: Disconnect all power before installing or servicing the unit. If power disconnect is out of sight, lock it in the open position and tag it to prevent unexpected application of power. Failure to do so could result in fatal electrical shock or severe personal injury.

WARNING: Do not alter the unit in any way, or damage to the unit and/or severe personal injury or death may occur.

WARNING: Do not depend on a thermostat or other switch as a sole means of disconnecting power when installing or servicing unit. Always disconnect power at the main circuit breaker as described above. Failure to do so could result in fatal electrical shock.

PERFORMANCE AND SPECIFICATION DATA

Evaporative Cooling Units

Figure 1

Capacity	A
10/15	32.875 (835)
20/25/50	43.875 (1114)
30/35 60/70	54.875 (1394)
40/80	60.375 (1534)

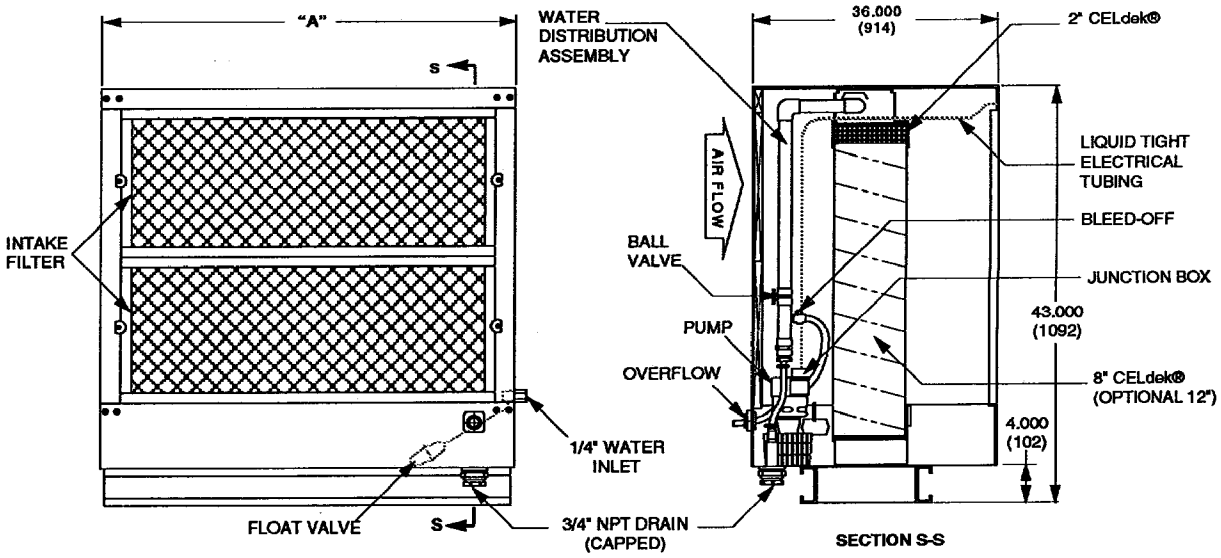


Table 1 (Refer to individual unit submittals for more specifications.)

Performance and Dimensional Data

*Capacity 10-40	CFM (cu. m/s) MIN.	CFM (cu. m/s) MAX.	8" Saturation Efficiency Range MIN.	8" Saturation Efficiency Range MAX.	12" Saturation Efficiency Range MIN.	12" Saturation Efficiency Range MAX.	8" or 12" Media Face Area Ft.² (m²)	8" or 12" Media Size in. (mm)	Pressure Drop in W.C. (kPa) MIN.	Pressure Drop in W.C. (kPa) MAX.	"A" Unit Width in. (mm)	Shipping Wt. lb. (kg)	Operating Wt. lb. (kg)
10,15	800	4,500	78	88	89	92	7.01	31 x 32-9/16	0.03	0.23	32-3/4	137	301
	(0.378)	(2.124)					(0.65)	(787 x 827)	(0.01)	(0.06)	(832)	(62)	(136)
20, 25, 50	1,600	5,500	77	88	88	92	9.38	31 x 43-9/16	0.03	0.20	43-3/4	166	386
	(0.755)	(2.596)					(0.87)	(787 x 1106)	(0.01)	(0.05)	(1111)	(75)	(175)
30, 35, 60, 70	2,400	8,500	77	86	88	92	11.75	31 x 54-9/16	0.05	0.30	54-3/4	192	468
	(1.133)	(4.012)					(1.09)	(787 x 1386)	(0.01)	(0.07)	(1391)	(87)	(212))
40, 80	3,200	8,500	77	86	87	92	1292	31 x 60	0.07	0.28	60-1/4	206	509
	(1.510)	(4.012)					(1.20)	(787 x 1524)	(0.02)	(0.07)	(1530)	(93)	(231)

*Capacities - (50, 60, 70 and 80) are for Dual Furnace Unit Types only.

CELdek® EVAPORATIVE MEDIA

The Evaporative Cooler utilizes high efficiency CELdek® media. CELdek® is made from a special cellulose paper, impregnated with insoluble anti-rot salts and rigidifying saturants. The cross fluted design of the pads induces highly-turbulent mixing of air and water for optimum heat and moisture transfer. The evaporative coolers are available with standard 8 or optional 12 inch media which produce high efficiency and high face velocities, along with a 2" distribution pad to disperse the water evenly over the pads.

Figure 2

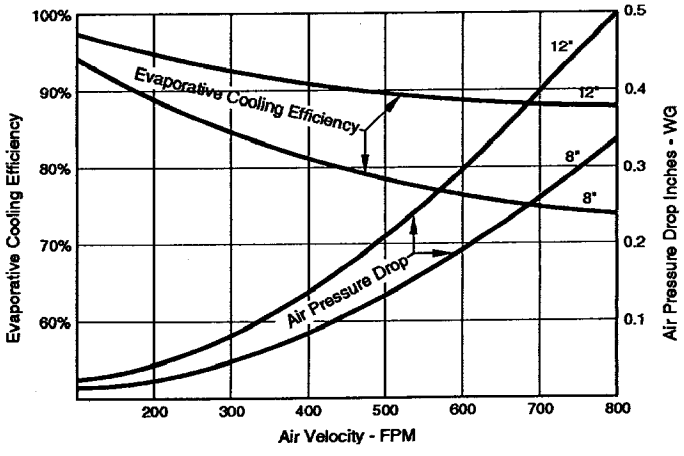


Figure 3 - Natural Vent Rooftop Unit with Evaporative Cooler (without Supply Plenum)

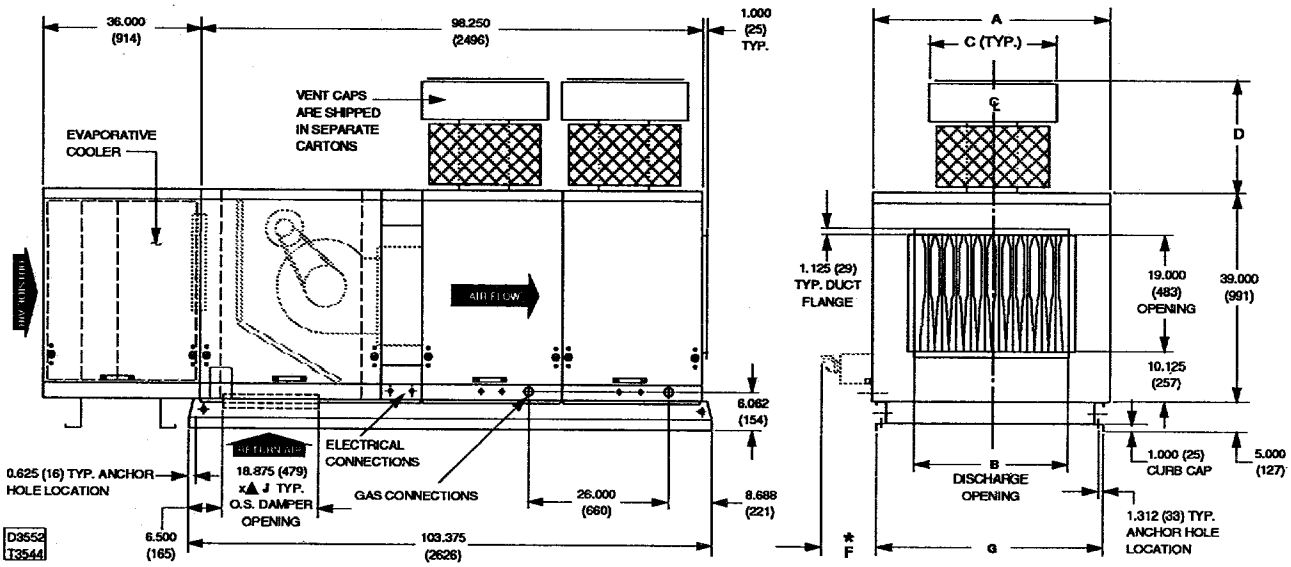


Table 2

CAPACITY	A	B	C	A.G.A. D	C.G.A. D	GAS INLET NAT	GAS INLET LP	*F	G	J
10	32.875	15.562	12.000	11.000	20.687	1/2	1/2	19.375	31.062	24.000
	(835)	(395)	(305)	(279)	(525)			(492)	(789)	(610)
15	32.875	18.312	21.500	16.000	25.187	1/2	1/2	23.500	31.062	24.000
	(835)	(465)	(546)	(406)	(640)			(597)	(789)	(610)
20	43.875	23.812	23.500	16.000	25.187	1/2	1/2	26.250	42.062	35.000
	(1114)	(605)	(597)	(406)	(640)			(667)	(1068)	(889)
25/50	43.875	29.312	23.500	16.000	25.187	3/4	1/2 OR 3/4	34.500	42.062	35.000
	(1114)	(745)	(597)	(406)	(640)			(876)	(1068)	(889)
30/60	54.875	34.812	26.000	17.500	26.687	3/4	1/2 OR 3/4	37.250	53.062	46.000
	(1394)	(884)	(660)	(445)	(678)			(946)	(1348)	(1168)
35/70	54.875	40.312	26.000	17.500	26.687	3/4	1/2 OR 3/4	45.500	53.062	46.000
	(1394)	(1024)	(660)	(445)	(678)			(1156)	(1348)	(1168)
40/80	60.375	45.812	26.000	17.500	26.687	3/4	1/2 OR 3/4	51.000	58.562	51.500
	(1534)	(1164)	(660)	(445)	(678)			(1295)	(1487)	(1308)

NOTE: REFER TO UNIT SUBMITTALS FOR MORE SPECIFICATIONS/UNIT ARRANGEMENTS.
DIMENSIONS ARE IN INCHES, DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
* "F" DIMENSION IS THE RECOMMENDED CLEARANCE TO SERVICE THE BURNER DRAWER(S).
▲"J" DIMENSION IS AN OUTSIDE DIMENSION FOR RETURN AIR DAMPERS.
▲"J" DIMENSION IS AN INSIDE DIMENSION FOR SUPPLY AIR (WITHOUT DAMPER).

Figure 4 - Power Vent Rooftop Unit with Evaporative Cooler (with Supply Plenum)

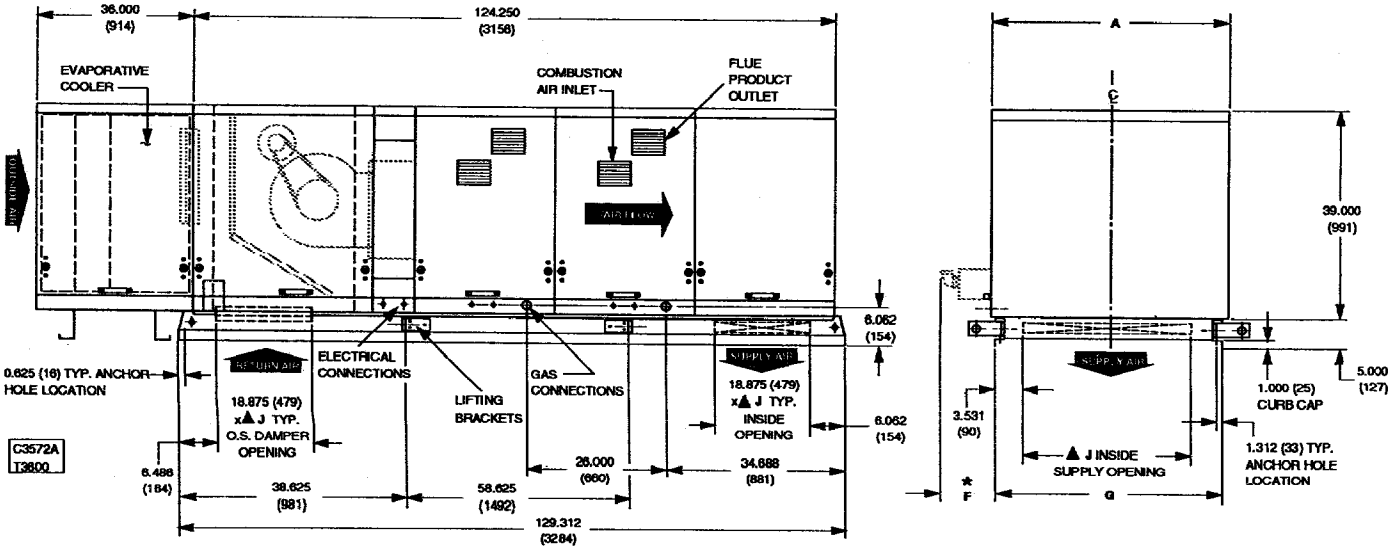


Figure 5 - Standard Air Handler with Evaporative Cooler (without Supply Plenum)

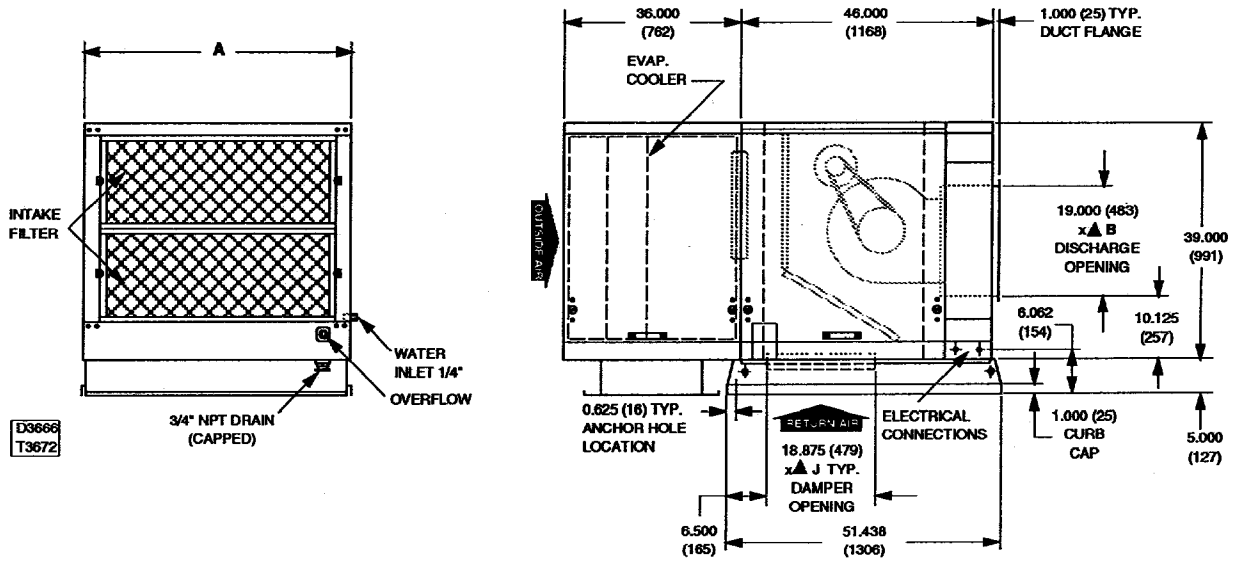
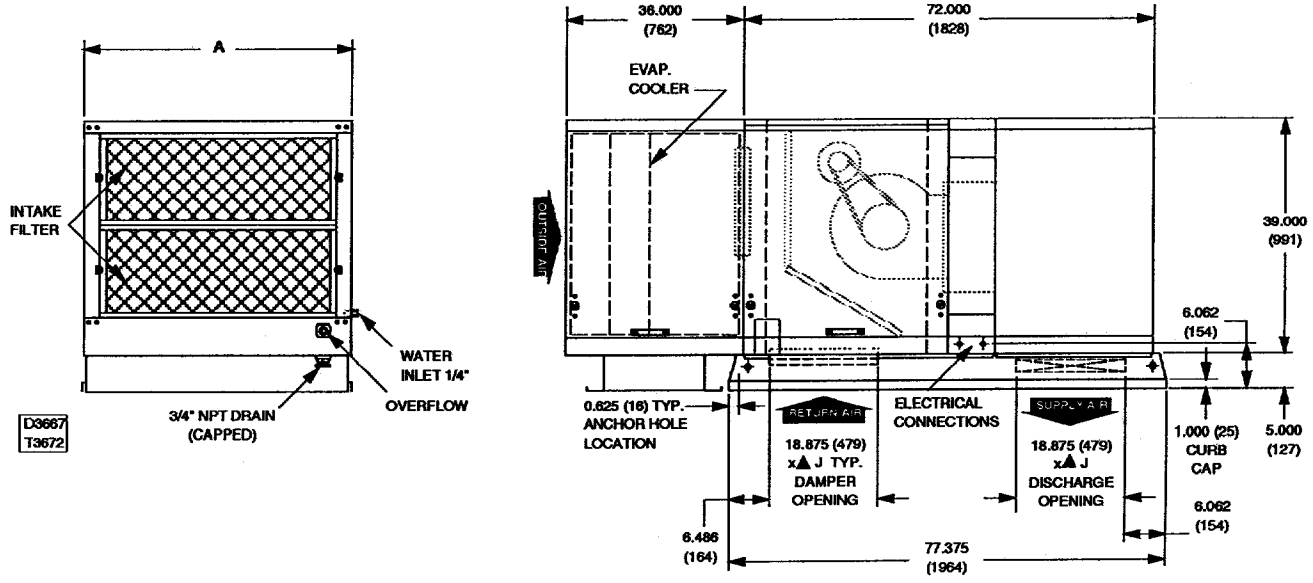


Table 3

CAPACITY	A	B	C	G	▲J
20	43.875	23.812	21.938	42.062	35.000
	(1114)	(605)	(557)	(1068)	(889)
40	60.375	45.812	30.188	58.562	51.500
	(1534)	(1164)	(767)	(1487)	(1308)

NOTE: REFER TO UNIT SUBMITTALS FOR MORE SPECIFICATIONS/UNIT ARRANGEMENTS.
DIMENSIONS ARE IN INCHES, DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
▲ "J" DIMENSION IS AN OUTSIDE DIMENSION FOR RETURN AIR DAMPERS.
▲ "J" DIMENSION IS AN INSIDE OPENING FOR SUPPLY AIR (WITHOUT DAMPERS)

Figure 6 - Standard Air Handler with Evaporative Cooler (with Supply Plenum)



INSTALLATION

This manual is for Evaporative Cooler Module Installations only.
Refer to the Installation and Service Manuals for Rooftop Packaged Units
and Outdoor Furnaces for these unit installations.

Mounting to Roof

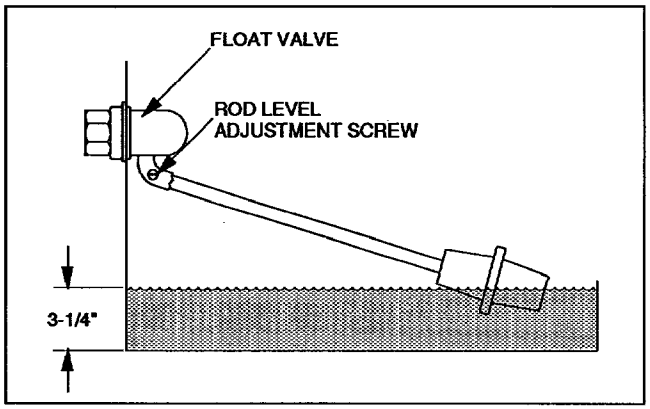
1. Before positioning the unit in its permanent location, make certain that the roof is capable of carrying the load of this equipment. Note that when the cooler is filled with water, the unit will be much heavier than when dry. See "Performance and Dimension Data" table for appropriate operating weight.
2. If unit is to be mounted on a curb, refer to the curb specifications for installation requirements.
3. Make certain that the mounting surface is level in all directions.
4. Make certain that you have sufficient means for lifting the unit into place.
5. Installation must conform to local and national building and safety codes.
6. The units are mounted on skid rails and are suitable for use on combustible flooring. It is recommended that the skids be mounted either on solid planking or on steel channels, but never on a soft tar roof where the skids could sink and reduce the 4" clearance between the bottom pan and the roof.
7. Inspect all internal parts of the cooler section to determine if any damage has occurred during shipment. See roof curb specifications at the end of the manual.

Connecting the Water Supply

NOTE: Soft water equipment should not be attached to water lines going to the cooler. "Soft Water" will cause corrosion and decrease the effective life of the cooler.

1. A water valve should be installed at a convenient location to allow water to be turned on and off. Use 1/4" tubing to supply water to Evaporative Cooler. A water connector kit is available at your local wholesaler.
2. Place tube nut and ferrule over the end of the tubing.
3. Insert tubing into factory-installed float valve and tighten securely.

Figure 7 - Float Valve Assembly



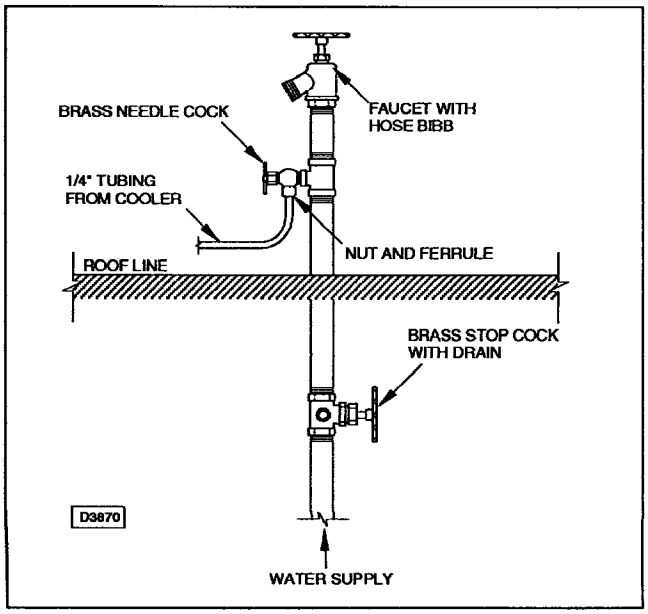
NOTE: There will be a slight odor during the initial start-up of the unit. The odor will disappear within the first few days of operation if the bleed-off is adjusted correctly.

Faucet Use

1. To connect the water line to the water supply, install a sillcock and water valve on the faucet.
2. Place tubing nut and ferrule on tube end, and insert valve.
3. Tighten the nuts on the valve and the tube.

NOTE: If a faucet is not to be used for the water supply, install the valve on the water line to be used. Follow the procedure above for securing the tubing to the valve.

Figure 8 - Evaporative Cooler Water Connections



Adjusting the Water Level and Float Valve
Fill the tank as follows:

1. Turn the water supply on. Fill the tank to a depth of approximately 3.25" (82.6mm). While filling the tank, check for good pressure and flow from the float valve.
2. The float valve should shut down the water supply at the 3.25" (82.6mm) level. It may be necessary to adjust the float valve by bending the rod. The rod level adjustment screw should be set in lower notch on lever.
3. Check the tank and all connections for leaks.

NOTE: The overflow fitting is set so that the water will begin to flow at the 3.25" (82.6mm) depth. It is important that the water level not be above the pump basket screen!

Adjusting the Water Flow
Proper water flow over the media is important. Insufficient water flow will result in increased accumulation of minerals on the media. Excessive water flow will result in deterioration of the media and moisture carryover.

1. Using the ball valve handle, adjust the water flow so that the media is damp from the top to the bottom. If you can see water flowing on the entering side, your water level is too high. Adjust the valve so that the media is just damp on the entering side. Repeated drying of the media will cause rapid buildup of mineral deposits in the media. Drying is due to improper adjustment of the water flow valve, frequent shut-down of the pump to control the evaporative cooling/ humidification, or localized air velocities across the surface of the media. The area where dry spots occur will exhibit high mineral deposits. The valve must be adjusted so that no dry spots appear on entering or leaving side, and when adjusted correctly, enough water will flow through the media to wash out most of the airborne dirt and other debris.
2. Prior to start-up, it is recommended that the tank be filled, and the pump turned on, allowing the unit to run for approximately 10 minutes. Repeat this procedure two times to help flush any dirt that may have accumulated during shipping.

Bleed-Off
Bleed-Off is required to maintain the water quality of the system. When water evaporates, minerals and other impurities are left behind, impurities are scrubbed from the air flowing through the system, and make-up water (even good quality make-up water) adds more minerals and impurities. These form deposits on the media during the evaporative process. Therefore, it is important to bleed-off a small quantity of recirculating water to keep the concentration of impurities under control. The bleed-off rate required is dependent upon the quality of the water used and the rate of evaporation. As climate conditions change, the rate of evaporation may increase, requiring an increase in the bleed-off rate. It is recommended that the bleed-off rate be adjusted for the maximum water evaporation. An indication of insufficient bleed-off is a uniform build-up of minerals on the entering air face of the media. If this condition is observed, increase the rate of bleed-off until the mineral deposits dissipate.

Adjusting the Bleed-Off

1. The bleed-off is attached to the PVC tee. This bleed-off system will eliminate a small quantity of water from recirculation, which will reduce scale build-up. This water will drain through the attached tube, and out through the overflow. Disposal of this water should comply with local codes,
2. Adjust the bleed-off rate according to the chart below.

Table 3

Unit Size Capacity	Seconds to Fill 12 oz. Can	
10/15	69	46
20/25/50	52	34
30/35/60/70	41	27
40/80	38	25

Electrical Connections
Refer to the unit data plate to determine the supply voltage.

WARNING: Do not service before disconnecting power or there could be a potential for an electrical shock hazard.

The motor name-plate and electrical rating on the transformer should be checked before energizing the unit electrical system. All external wiring must conform to ANSI/NFPA No. 70-1993, National Electrical Code (or the latest edition of) and applicable local codes; in Canada, to the Canadian Electrical Code, Part 1 CSA Standard C22.1

"Dashed" lines represent either field wiring (by others) or optional equipment. Refer to optional items (shown on wiring diagram included with unit) - these will be hard wired.

WARNING: Do not jumper factory wiring. Mis-wiring of safety circuits may result in fire or death.

NOTE: For all wiring connections, refer to the wiring diagram shipped with the unit (either affixed to the side jacket or enclosed in the unit's installation instruction envelope). Should any original wire supplied with the unit have to be replaced, it must be replaced with wiring material having a temperature rating of at least 105°C. Hi-Limit Switch wires must have a 200°C minimum temperature rating.

CAUTION: Do not use any tools (i.e. screwdriver, pliers, etc.) across the terminals to check for power. Use a voltmeter. (Damage to the transformer may result.)

It is recommended that the electrical power to each unit be provided by a separate, fused, and permanently live electrical circuit. A disconnect switch of suitable electrical rating for each unit should be placed as close to the controls as possible. Each unit must be electrically grounded in accordance with the latest edition of the National Electrical Code, ANSI/NFPA No. 70-1993, or CSA Standard C22.1 Sample wiring connections are depicted in Figures 9 & 10.

NOTE: Consult the factory *before* making any changes to factory wiring.

OPTIONAL FILL AND DRAIN KIT: Optional Evaporative Cooler Fill and Drain Kit consists of two motorized valves, installed in the building, and piped and wired to the roof. The kit eliminates the need to go to the roof to fill or drain the cooler for seasonal changeover, and automatically maintains the water level. See sample figure 10. Refer to the kit's instruction.

GROUNDING: Install a ground wire to suitable ground according to local codes.

Figure 9

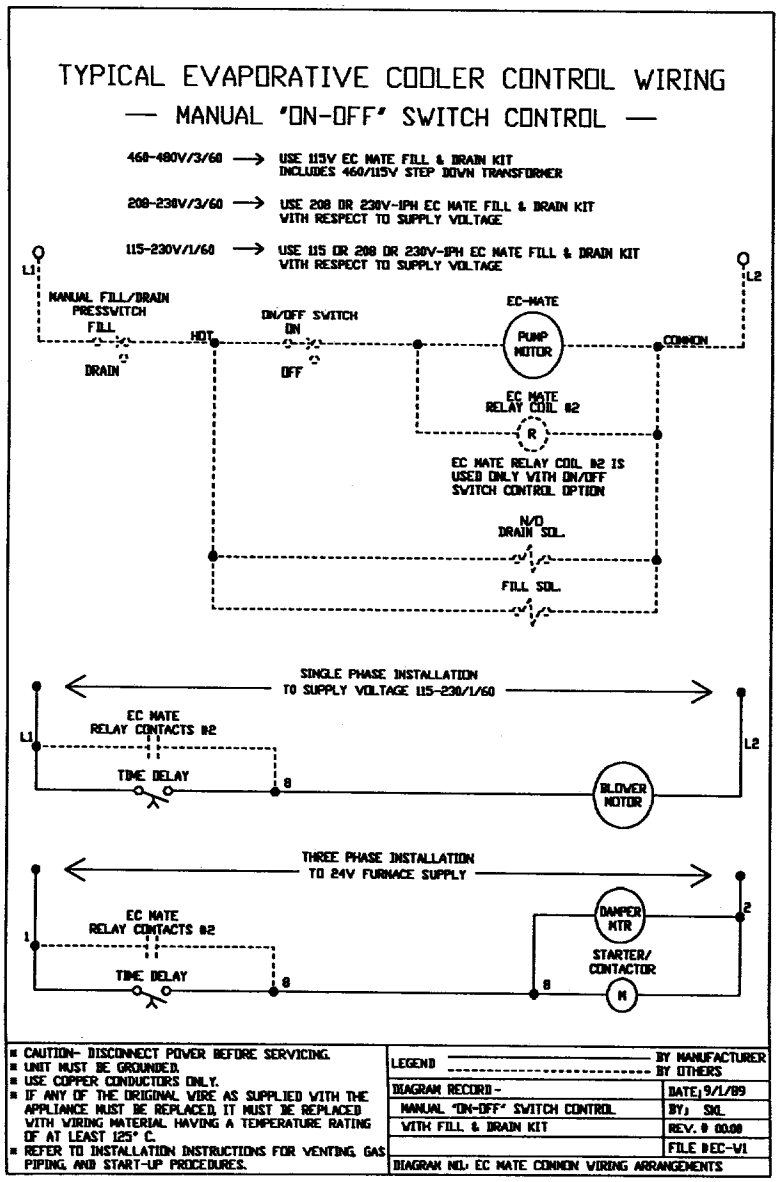
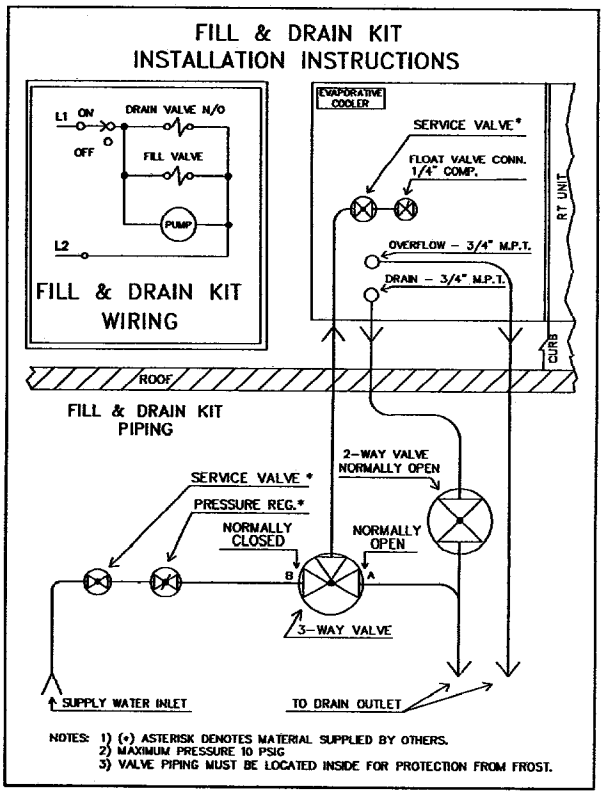


Figure 10



WARNING: Open all disconnect switches and secure in that position before servicing unit. Failure to do so may result in personal injury or death from electrical shock.

Because of the nature of the evaporative process, algae buildup, biological fouling, scale build-up, and corrosion are distinct possibilities. Proper water treatment and regularly scheduled maintenance will minimize or eliminate most problems.

a.) Cooling Pad Check List:
- √ Reduce the number of on/off cycles.
- √ Shade the pads and pump.
- √ Dry pads out completely once every 24 hours.
- √ Maintain a suitable water bleed-off rate.
- √ Drain and disinfect the entire water system quarterly.
- √ Avoid harmful contaminants, including dust, fumes, harsh cleaners, and water treatment chemicals.
- √ Circulate the recommended quantity of water over the pads.
- √ Avoid dry areas on the pads.
- √ Clean the filters regularly.

b.) Controlling Algae:

Scale and mineral deposits can form on the cooling pad because the mineral content of the water is too high.

Increase the water flow over the face of the pads.

Make certain that the flow of water is even from one end of the distribution pipe to the other end.

Clean and flush the distributor pipe regularly; especially if dry areas appear on the pads.

Maintain the pH of the recirculating water between 6 and 8.

Maintain sufficient bleed-off rate.

For more details, check MUNTERS® Engineering Bulletin MB-SCP-405 (included with this manual).

c.) Preventing Algae in the Evaporative Pads:

Algae needs light, moisture, and nutrients to survive. Eliminating, or reducing, these elements will help to control. algae. For specific details, see MUNTERS® Engineering Bulletin MB-ACP-405 (included with this manual).

d.) Biological Fouling Control:

Uncontrolled growth of organic matter can lead to plugged media, metal deterioration, and biological contamination of the airstream. Whenever the possibility of biological contamination of water in an airstream exists, transmittal of Legionnaire's Disease should be addressed. While there are no reported cases of Legionnaire's Disease associated with rigid media type evaporative cooling systems, the Legionella Pneumophila bacteria is present in almost all water supplies. However, the mere presence of the bacteria does not create a hazard,: the bacteria must be transmitted as an aerosol in sufficient densities to be infectious.

NOTE: It is highly recommended that the services of a water treatment company be retained to advise on the proper treatment of the sump water for biological, scale, and corrosion control. For more information, see MUNTERS® Engineering Bulletin EB-011-WTM (included with this manual).

Maintenance Schedule

Regular maintenance is the key to successful service from your Evaporative Cooler. Use the following schedule as a guide to maintain you unit:

Maintenance Requirements	Annual Start-Up	Annual Shut-Down
Changing Media	At Beginning of 6th Year or if Passages are blocked	
Cleaning Water Pump	√	
Cleaning & Touch-Up		√
Adjusting Bleed-Off	√	
Periodic Inspection	During Cooling Season	During Cooling Season
Washing Down Media with Hose		As required During Season
Washing Inlet Filter with Hose	√	√
Drain Unit		√

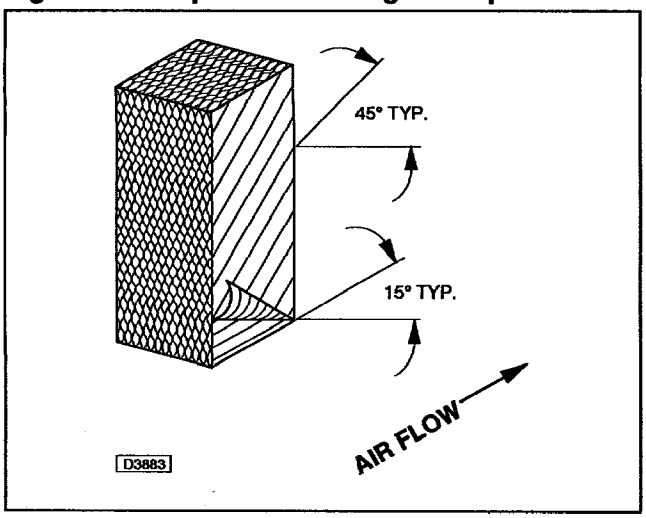
Following are explanations of the procedures outlined in the above schedule.

Changing the Media

This should be done every 5 years or if passages become blocked.

1. Remove filter/frame assemblies.
2. Disconnect the water hood panel from the top panel by removing screws.
3. Snap out water distribution system.
4. Remove top media distribution pad.
5. Lift out media sections (Note the position of media with respect to airflow. See figure 11)
6. Replace with new CELdek® media sections. (See replacement part section).
   Aspen and other evaporative media *will not work.*
7. When re-installing media, be sure all media sections are installed in the proper direction. See Figure 11.
8. Replace top media distribution pad, water distribution system, water hood panel, and filter/ frame assemblies.

Figure 11 - Evaporative cooling Media pad Section



Cleaning the Water Pump

CAUTION: Do not allow the pump to topple over or become submerged. Water will damage the pump motor. *This is not a submersible pump.*

Disassemble and clean water pump as follows:

1. Disconnect power.
2. Disconnect the liquid tight connector from the junction box to remove cord and connector.
3. Disconnect the pump mounting bracket and hose.
4. Remove the pump and basket screen.
5. To clean pump, snap out base of the pump; notice the impeller.
6. Using a mild detergent solution, wash all deposits from the impeller and the impeller base plate.
7. Spin the impeller to dislodge any foreign material. Make sure that the impeller spins freely.
8. Carefully snap the impeller and impeller base plate back onto the pump.
9. Wash the pump basket screen using the same detergent solution, and rinsing thoroughly to remove any debris. If unable to clean, replace with a new screen (See replacement part section).

NOTE: The pump motor does not require any lubrication.

Washing the Media

CAUTION: Avoid splashing water on the blower motor at all times (this could cause electrical problems)!

1. Scale and dust should be washed off the intake side of the media annually, using a garden hose and nozzle; this will help to unclog passages.
2. Using a stiff brush, lightly brush the intake edges of the media. This will not harm the openings, but will remove any hardened scale.
3. Occasionally, there will be a build-up of algae or odors. The best solution for both of these problems is to allow the pads to dry thoroughly on a regular basis. If cooling is not needed at night during the cooling season, allow the blower to run for a few hours after the pump has been shut-down to dry pads daily.
4. During the cooling season, we recommend that the pads be shut down nightly if possible with the blower running to dry the pads out for a few hours before the unit is shut down.

Washing the Inlet Filter

The pre-filter should be cleaned periodically as follows:

1. Turn the four latches and remove filter frame assemblies.
2. Carefully remove the aluminum filters. Wash the filters with warm water and a mild soap, rinse thoroughly.
3. Re-install in unit.
4. If the aluminum mesh filters are damaged or cannot be cleaned, replace the mesh filter (See replacement parts section).

Cabinet Cleaning and Touch-Up

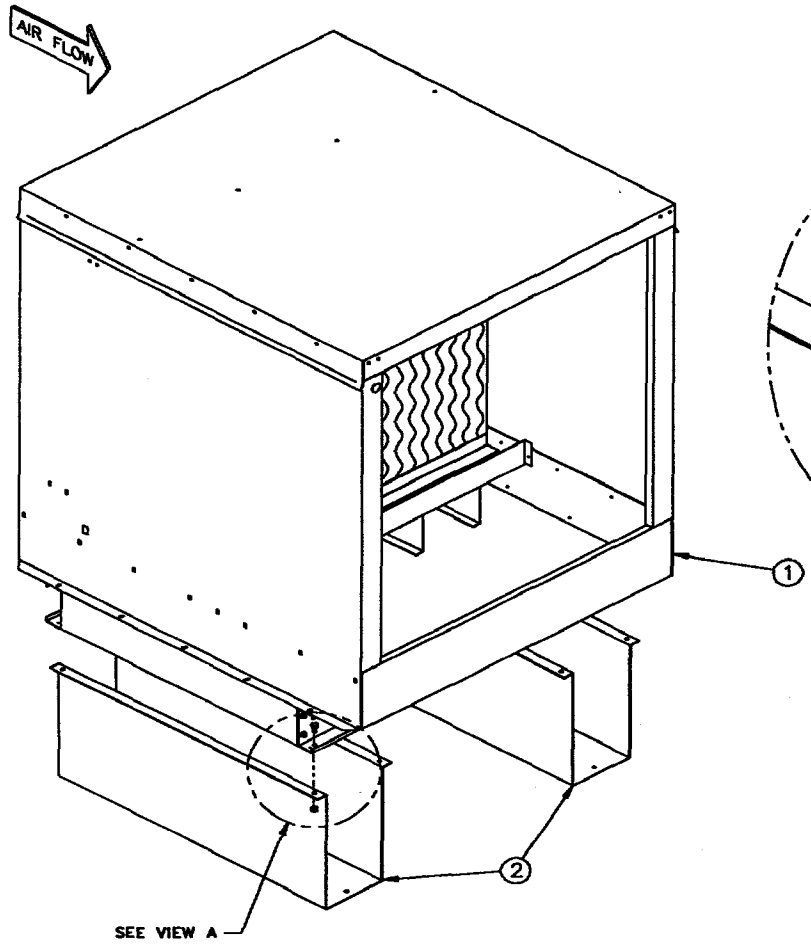
The cabinet and all internal parts of the Evaporative Cooler should be cleaned annually using a soft cloth, warm water, and a mild cleanser.

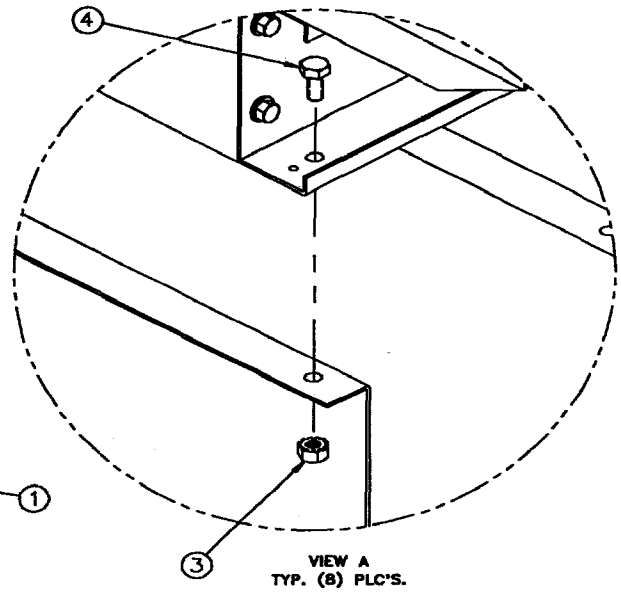
NOTE: Avoid using steel wool or sandpaper in normal cleaning of the unit.

Winter Shut Down

1. Clean and flush out Evaporative Cooler media and sump.
2. Clean water distributor holes.
3. Drain fill pipe and leave open. DO NOT LEAVE ANY WATER IN THE SYSTEM. FREEZING CAN CAUSE MAJOR DAMAGE TO THE UNIT.
4. Remove and clean pump if necessary.
5. Check sump tank for leaks and repair if necessary. Sump tank is fabricated from stainless steel.

Roof Curb Kit





Club Platform to Unit Assembly

Roof Curb Kit Contents:

1. Evaporative Cooler Assembly (sold separately)
2. Curb (2 platforms per kit)
3. 1/4-20 "KEPS" Nut (8) required
4. 1/4-20 x 5/8 LG. Hex HD. Bolt (8) required

Approximate Curb Kit Shipping Weight

Capacity (CA)	Weight (lbs.)
10/15	30
20/25/50	
30/35/60/70	
40/80	

1 lb. = 0.453 kg

***One Platform Kit fits All Evaporative Cooler Modules/Capacities (CA) - 10/80 Capacities (50, 60, 70 and 80 are for (RT/PV) unit types only.**