Series 500 Greenhouse Kit w/Blackout System, Ventilation & Evaporative Cooling

YELLOW - Evaporative Cooling Wall
Purchased greenhouse and all accessories & systems require a specific installation sequence. All components have been separated into different categories based on common grouping and/or the chronology of installation. Each category has been color coded. All parts within any given color category will be labeled accordingly, and each color category will have its own respective instruction manual.

The following illustrates a highly recommended order in which all components should be installed.

**IMPORTANT:** There are some procedures that can occur simultaneously, depending on available assistants and equipment, but there are some procedures that **MUST** be done in chronological order. **Before you begin,** review below step recommendation and all technical documents to better understand overall building kit design.

1. **RED** - MAIN FRAME (Rafters, Purlins, Chord Support and Cabling)
2. **ORANGE** - END WALL FRAMING (Columns, Cross Beams and Door Framing)
3. **BLUE** - END WALL CLADDING (Polycarbonate, Termination and Flashing)
4. **GREEN** - ROOF CLADDING (Film, Inflation Kits and Termination)
5. **PINK** - AIR DISTRIBUTION (Fan, Vent Tube and Shutter)
6. **YELLOW** - EVAPORATIVE COOLING (Framing, Cooling Pads and Plumbing)
7. **BROWN** - END WALL VENT (Framing, Motor and Drive Shaft)
8. **WHITE** - VENTILATION (Exhaust Fans, Ceiling Fans and Light Traps)
9. **PURPLE** - STATIC BLACKOUT (Monofilament, Fixation and Sealing)
10. **BLACK** - MOVABLE BLACKOUT (Fabric, Leading Edge, Motor and Drive Shaft)
11. **GRAY** - BLACKOUT SIDE POCKET (Framing and Polycarbonate)

Near the beginning of each color-coded instruction guide, you will find information to lead you through the installation and assembly steps. This information identifies at what point during the assembly the respective components are installed or attached to the main building frame.

Since we cannot anticipate changes made by the customer/contractor, all instructions assume the use of accessories purchased from us to be used on the building the accessory was designed for. Each instruction guide presents the basic steps to install the color-coded components.

When in doubt, consult the services of a qualified contractor experienced with the assembly of similar structures.
All components that are color coded YELLOW represent the evaporative cooling wall of the greenhouse.

**Color coded components that MUST be installed before installing YELLOW:**
- **RED**
- **ORANGE**

If above color coded components have not yet been installed, put this manual down and consult those manuals to install those components before returning.

If above color coded components have been installed, gather all components that have been color coded with a YELLOW label or paint splotch, and continue on the next page with the evaporative cooling wall installation.

**ATTENTION:** Recommended installation order is not critically definitive. Installation of film cladding will protect the interior of the greenhouse from weather elements, but it will also increase the temperature. Depending on personal preference and/or availability of assistants and equipment, there are some procedures that can occur before or simultaneously with this procedure.

**Color coded components that can be installed before or at the same time as YELLOW:**
- **GRAY**
- **WHITE**
- **PURPLE**
- **BROWN**
- **BLACK**
- **BLUE**
- **PINK**
- **GREEN**
READ THIS DOCUMENT BEFORE YOU BEGIN TO INSTALL THE EVAPORATIVE COOLING WALL.

Thank you for purchasing a Series 500 greenhouse kit with a black-out system, ventilation & evaporative cooling. When properly assembled and maintained, this product will provide years of reliable service. These instructions include helpful hints and important information needed to safely assemble and properly maintain the structure. Please read these instructions before you begin.

If you have any questions during the assembly, contact Customer Service for assistance.

SAFETY PRECAUTIONS

• Wear eye and ear protection.
• Wear gloves when handling metal.
• Use a portable GFCI (Ground Fault Circuit Interrupter) when working with electric power tools and cords.

REQUIRED TOOLS

The following list identifies the main tools needed to assemble the system. Additional tools and supports may be needed.

• Tape Measure and Marker
• Chalk Line
• PVC Cement and Pipe Thread Tape (included)
• Variable Speed Drill (cordless with extra batteries works best) and Drill Bit Set.
• Driver to install 1/4" Lag Screws
• Hammer and Gloves
• PVC Pipe Cutting Tool
• Circular Saw (with blade to cut pipes)
• Jig Saw (with blade to cut pipes)
• Hand Level 4' (or longer) & Line Level
• Wrench Set or Adjustable Wrenches
• Socket Set with Ratchet
• Adjustable Pliers
• Flat Screwdriver (long)
• Ladder or work platform to work at the height of the cooling system frame opening.

UNPACK AND IDENTIFY PARTS

The following steps will ensure that you have all the necessary parts before you begin.

1. Unpack the contents of the shipment and place where you can easily inventory the parts. Refer to the Bill of Materials/Spec Sheets.
2. Verify that all parts listed on the Bill of Materials/Spec Sheets are present. If anything is missing or you have questions, consult the parts guide (below) and all diagrams for clarification, or contact Customer Service.

NOTE: At this time, you do not need to open the plastic bags containing smaller parts such as fasteners and clamps.

ASSEMBLY PROCEDURE

Following the instructions as presented will help ensure the proper assembly of the evaporative cooling system.

The steps outlining the assembly process are as follows:

1. Verify that all parts are included in the shipment. Notify customer service for questions or concerns.
2. Read these instructions and all additional documentation included with the shipment before you begin.
3. Gather the tools and assistants.
4. For best results, assemble the components in the order they are presented in these instructions.

ELECTRICAL WARNING

CONSULT THE SERVICES OF A QUALIFIED ELECTRICAL TECHNICIAN WHEN INSTALLING THE WATER PUMP OR ANY ELECTRICALLY POWERED ACCESSORIES.
To achieve the best results from your evaporative cooling system, read and follow the instructions on this page and throughout this guide.

**Cooling Pads: Break-In Period**

New cooling pads function best after preforming an initial break-in procedure. Complete these steps before normal operation begins:

1. Verify that pads have been installed according to the information provided with those pads.
2. Turn on water pump for the evaporative cooling system and adjust water flow using upper ball valve.
3. Pump water through the system and over the pads for 24 to 36 hours depending on water hardness in the area.
4. After completing Step 3, turn water off and inspect the pads. Pads should be fully saturated with no dry areas. If dry areas are present, inspect the supply header tube for obstructions and consult the supply header maintenance information near the back of this guide. Check the spray hole angle and make the necessary adjustments.

**Cooling Pad Inspection, Cleaning, and Care**

Daily inspection of the cooling pads during normal operation will help to identify any areas that need attention. Consult the following information to identify issues common to most evaporative cooling systems.

- **Controlling Scale Deposits**

Water evaporation can lead to the deposit of solids on the cooling pads. Water quality, environmental conditions, and system operation can all contribute to the buildup of solids.

Minimize or eliminate On/Off cycling of the system. Set evaporative cooling system to run continuously to minimize scale buildup on pads. Control water flow using the upper ball valve above water screen. Allowing the pads to dry out due to repeated cycling of the system increases the deposits of solids on the pads; keep the pads wet to reduce these deposits.

**NOTE:** Anytime air flows through wet pads, water should also be running to keep pads wet and to increase flushing of solids from the pads.

- **Maintain Proper Water Level**

Do not allow the bottoms of the cooling pads to sit in water at any time. Submerged pad sections become waterlogged and will deteriorate, which decreases pad life. Adjust the water level as needed to prevent this condition.

- **Algae Growth and Treatment**

Some environments and conditions can cause algae growth on the cooling pads. In those instances, it may be necessary to treat the water to reduce or eliminate algae. Contact water conditioning experts in your area for details and possible solutions.

- **Diluting or Changing the Recycled Water**

In instances where solids become concentrated in the recycled water, deposits on the cooling pads can increase. If this happens, dilute or change the water in the sump. To dilute, drain water from and add it to the system. Complete these steps:

1. Turn off the water pump and main water supply to the system and attach a garden hose to the valve below the water screen.
2. Close the valve above the water screen and open the valve below the water screen.
3. Turn on the water pump and pump 1/4 to 1/2 of the water from the sump, depending on the amount of scaling on the pads. Use a bucket or barrel to gauge gallons removed. A system with an 8” PIP drain trough holds approximately 1.2 gallons per foot of drain trough.

**NOTE:** To prevent pump damage, never allow sump to run dry.

4. After flushing the desired amount of water from the system, turn off the pump, close the lower valve, and open the upper valve to its previous setting.
5. Turn main water back on and allow the system to fill to the set water level.
6. Turn the water pump on and resume normal operation.

**NOTE:** To completely change the water, pump all water from the system, clean the sump, and refill to resume normal operation. **Do not allow the pump to run when sump is empty.**
**Parts Identification**

- **EVC060FP/EVC120FP**
  - Front Panel

- **EVCDFS001**
  - Deflector Splice Bracket

- **EVCFPS001**
  - Front Panel Splice

- **EVC060DF/EVC120DF**
  - Deflector Shield

- **EVCBBS001**
  - Bottom Bracket

- **EVCEPB001**
  - End Panel Bracket

- **EVC060DPT/EVC120DPT**
  - Drip Pan Tray

- **EVC060BPS/EVC120BPS**
  - Back Pad Support

- **EVCTB001B**
  - Top Bracket

- **Sump Pump—actual pump differs with the system.**

- **WF6990**
  - PVC Cement

- **WF3300**

- **Universal Cooling Cell End Panel: Dimensions depend on system cool cell height.**

- **112285**

- **111150**

- **WF2198**

- **WF1574**
  - WF6110

- **112298**

- **WF3511**

- **WF6745**

- **WF1540**

- **WF1530**

- **WF1982**

- **WF6777**

- **WR1095**
  - Tape

- **WR1300 1" Valve**
METAL FRAMING
Using the diagrams and tables on this and the next page, frame the rough opening for the cooling system on the inside face of the BACK end wall. Read the following notes before you begin:

• Because the end wall cross bracing is 1.5"x1.5", and the end wall columns are 2", there will be a 1/2" gap between the metal evaporative cooling wall framing and the end wall cross bracing. Before installing the evaporative cooling wall framing, line the inside faces of the end wall cross bracing with 111983 expanding weather foam tape. This will create a light deprivation seal at the perimeter of the evaporative cooling wall. See below diagrams.

• Line the outer edges of the previously installed vertical sections of tubing with 111983 tape, as shown below.

• Metal framing will "sandwich" the 111983 weather tape as it expands. Continue on the following page.

![Diagram](image-url)
• Upper and lower stringers are each assembled using a R23P128 plain tube, 105331 swaged tube and finished with an R23S063 swaged tube. Splice swaged sections using FA4482B Tek screws.

• Consult diagrams and tables below to attach assembled stringers to the INSIDE surface of the end wall columns using 111818 brackets and FA4482B Tek screws.

**ATTENTION:** Brackets for cooling system are spaced at 5’ on-center. Consider this dimension when attaching the stringers. Space the stringer fasteners so they will not interfere with the installation of the cooling system brackets. If fasteners will be positioned at the same spot, countersink them below the stringer surface.

• **Stringers to be installed level.** Upper and lower stringer can extend beyond rough opening to allow for the installation of water lines and electrical hookup. Stringer material that extends beyond rough opening can be cut to length after system is installed.

**IMPORTANT:** Inside-to-inside edges of the upper and lower stringers (TABLE below) will be 2” shorter than the inside-to-inside edges of the 1.5”x1.5” end wall framing for the evaporative cooling wall. See diagram below.

• Consult diagrams and tables to attach outer upright sections between upper and lower stringers using 111818 brackets and FA4482B Tek screws.

**IMPORTANT:** Inside-to-inside edges of the upright sections will be 25’ apart and will align with the centers of the previously installed 2”x3” vent opening vertical tubes.

### ROUGH OPENING HEIGHT

<table>
<thead>
<tr>
<th>Pad Height</th>
<th>Clearance between top and bottom stringer.</th>
<th>Outer Upright Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-0&quot; (36&quot;)</td>
<td>2'-11&quot; (35&quot;)</td>
<td>S20P035 (35&quot;)</td>
</tr>
<tr>
<td>4'-0&quot; (48&quot;)</td>
<td>3'-11&quot; (47&quot;)</td>
<td>S20P047 (47&quot;)</td>
</tr>
<tr>
<td>5'-0&quot; (60&quot;)</td>
<td>4'-11&quot; (59&quot;)</td>
<td>S20P059 (59&quot;)</td>
</tr>
</tbody>
</table>

Rough Opening Height = Pad Height - 1’.

**NOTE:** View as seen from the inside looking out.

**ATTENTION:** See following page for connection details.
Evaporative Cooling System

**DETAIL A**

CUT-AWAY SIDE VIEWS

**TOP**

- 2"x2" COLUMN
- 1.5"x1.5" CROSS BEAM
- 2"x3" EVAP WALL STRINGER
- 111983 tape

**BOTTOM**

- 2"x3" COLUMN
- 1.5"x1.5" CROSS BEAM
- 111983 tape

**VENT OPENING**

<table>
<thead>
<tr>
<th>VENT SIZE</th>
<th>ENDWALL BRACING HEIGHT</th>
<th>VENT ROUGH OPENING</th>
<th>EVAP WALL ROUGH OPENING</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>3'</td>
<td>3'-2 1/2&quot;</td>
<td>3'-1&quot;</td>
</tr>
<tr>
<td></td>
<td>4'</td>
<td>4'-2 1/2&quot;</td>
<td>4'-1&quot;</td>
</tr>
<tr>
<td></td>
<td>5'</td>
<td>5'-2 1/2&quot;</td>
<td>5'-1&quot;</td>
</tr>
<tr>
<td></td>
<td>6'</td>
<td>6'-2 1/2&quot;</td>
<td>6'-1&quot;</td>
</tr>
</tbody>
</table>

**DETAIL B**

- PLAIN END STRINGER
- SWAGED END STRINGER
- (2X) #14X1" TEK SCREW
- (2X) #14X1" TEK SCREW

**DETAIL C**

- END WALL COLUMN
- (111818) BRACKET (4X) #14X1" TEK SCREW
- BOTTOM STRINGER
- (111818) BRACKET (4X) #14X1" TEK SCREW

**DETAIL D**

- 2"x2" UPRIGHT
- (111818) BRACKET (4X) #14X1" TEK SCREW
- BOTTOM STRINGER
- (111818) BRACKET (4X) #14X1" TEK SCREW

Revision date: 03.08.17
ASSEMBLE DRAIN TROUGH (8" PLASTIC IRRIGATION PIPE–PIP) FOR EVAPORATIVE COOLING SYSTEM

The drain trough of the evaporative cooling system includes different combinations of 8" diameter PIP (plastic irrigation pipe). The 8" PIP (plastic irrigation pipe) may consist of tubing with two plain ends or one plain and one belled end. (For some systems, couplers to join two pipes with plain ends maybe included.) Before assembly, lay out all drain trough components to ensure you have arranged them correctly. Complete these steps to assemble the drain trough:

1. Each 8" diameter pipe includes cut lines. Align all cut lines on the individual tubes with each other before you glue sections together.

⚠️ Apply cement in a well-ventilated area. Read the cement container information for additional precautions.

2. Clean the ends of pipe (and couplers if present) and let dry if needed.

3. Connect all sections of 8" diameter pipe using cement and the 112762 coupler(s). Some evaporative cooling systems may not require couplers. Tubes may include a belled end.

4. Set the assembly aside to allow the cement to set. You must glue sections together before cutting.

5. Continue with the next procedure.

ATTENTION: Length of the drain trough will be the length of the cooling cell plus a few extra feet. The additional length allows you to shift the pipe position in the bottom brackets to prevent coupling interference with any bottom bracket.

Slide extra pipe toward the end where sump will be positioned. If needed, cut the assembled drain trough to the desired length once the sump position has been determined and the opening for the drip pan tray has been cut. See that procedure later in this guide.

Do not remove the belled end of any 8" PIP.
INSTALL BACK PAD SUPPORT AND BOTTOM BRACKETS

After constructing the rough opening for the system, install the Back Pad Support (EVC060BPS and/or EVC120BPS) using FA4482B Tek Screws. Secure Bottom Brackets (EVCBBS001) to the stringers using Bottom Bracket Gussets (EVCBBG001) and FA4482B Tek screws. Read these notes before proceeding:

- Butt the ends of the individual back pad supports together and secure to stringer. Do not overlap ends.
- Snap chalk lines along the stringers to install back pad support sections and bottom brackets level.
- See Table C and other diagrams to properly space and install the bottom brackets (EVCBBS001).

### COMPONENT SPACING

<table>
<thead>
<tr>
<th>Pad Height</th>
<th>Distance between top of bottom bracket and top of back pad support.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3'-0&quot;</td>
<td>3'-1/2&quot; (36.5&quot;)</td>
</tr>
<tr>
<td>4'-0&quot;</td>
<td>4'-1/2&quot; (48.5&quot;)</td>
</tr>
<tr>
<td>5'-0&quot;</td>
<td>5'-1/2&quot; (60.5&quot;)</td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td>6'-1/2&quot; (72.5&quot;)</td>
</tr>
</tbody>
</table>

**ATTENTION:** Install all bottom brackets level so drain trough is level throughout the length of system when it is set into the bottom brackets.

NOTE: There is no slope to the drain trough when bottom brackets are installed correctly.
INSTALL BACK PAD SUPPORTS AND BOTTOM BRACKETS—continued

Secure back pad support and top brackets using FA4482B Tek screws.

Top of Back Pad Support and bottom of Top Bracket.

See COMPONENT SPACING table below

Top of Bottom Stringer to top of Bottom Bracket is 1/2".

Secure bracket using EVCBBG001 gussets and FA4482B screws.

End View

### COMPONENT SPACING

<table>
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<td>6'-0&quot;</td>
<td>6'-1/2&quot; (72.5&quot;)</td>
</tr>
</tbody>
</table>
Install Top Brackets

Consult the diagrams on this page to install the top brackets. Read the following notes before you proceed:

- Space all interior top brackets, those between the top brackets at each end, at 5' on-center.
- Consult the diagrams to set the end top bracket when you begin.
- Mount top brackets directly above the back pad support. Use the support to maintain alignment of brackets. See diagram on previous page.

Top Bracket—EVCTB001B
Secure to stringer using FA4482B Tek screws.

Diagram A: Front View of Top Bracket.
Back pad support is not shown.

Diagram B: Front View of Top Bracket.
Back pad support is not shown.

Set outer edge of top bracket 3/8” outside the edge of rough opening. See Diagram A.

Space all interior top brackets at 5’ on-center.

Set outer edge of top bracket 3/8” outside the edge of rough opening. See Diagram B.

3/8” from inside edge to outside of bracket.

Evaporative Cooling System
INSTALL DEFLECTOR SPLICE BRACKETS AND DEFLECTOR SHIELD

Attach Deflector Splice Brackets (EVCDFS001) to the top bracket and attach Deflector Shield (EVC060DF and/or EVC120DF) to splice brackets. Read the following notes before you begin:

• Attach one deflector splice bracket to each top bracket using 1/4" bolts, nuts, and washers. See exploded end view below.

• Attach the deflector shield to the deflector splice bracket using FA4472B Tek screws and 100442 nut setter. Brace the splice bracket with a block of wood during Tek screw installation to prevent bending of the bracket. Clamp the deflector to the bracket with locking pliers for easier installation of the Tek screws.

• Butt the ends of each deflector shield together when attaching them to the splice brackets. Do not overlap the ends.
PREPARE TROUGH FOR DRIP PAN TRAY INSTALLATION

Complete these steps to prepare the trough assembly for installation:

1. With assistance, set the trough assembly in the bottom brackets attached to the metal frame.

2. Determine at which end the sump reservoir will be located. This will be the side opposite the direction the evaporative cooling system was shifted, or the side with the most room. See diagram below.

3. Adjust assembly as needed to prevent coupler(s) (or belled end of pipe) from interfering with bottom brackets. Couplers or pipe joints should not touch any bottom bracket. Main 8" PIP must be saddled in each bottom bracket for proper drainage and final assembly. Verify BELLED end of the 8" PIP is towards the sump end.

**NOTE:** There is no slope to the drain trough when bottom brackets are installed correctly.

**IMPORTANT:** Verify that the BELLED end of the PVC is at the sump end.
PREPARE TROUGH FOR DRIP PAN TRAY INSTALLATION—continued

4. Verify that the trough assembly extends far enough beyond the frame at the sump end to reach the sump once it is set in place. Minimum length is 12".

5. Using the rough opening of the frame as a guide, mark the length of the evaporative cooling system plus 1/2" inch (1/4" beyond the opening at each end) on the top of the 8" trough. See diagram below.

6. Using a drill and 1/2" bit, drill a hole at each corner. See diagram. **Use a twist drill bit; do not use a spade bit.**

7. With an assistant, take a circular saw equipped with a blade for cutting plywood and make the long side cuts to each end. During the cut do not allow the material to sag into the pipe. Wedge wood shims in the cut as needed to prevent the blade from binding.

8. Use a jigsaw to make clean end cuts and to finish the long cuts.

9. Remove all loose material and thoroughly clean the drain trough.

**IMPORTANT:** Any material left in the drain tube will wash through the system and ultimately clog the water screen, header pipe outlets, and may damage the pump and related valves. You must clean the drain trough before continuing with this procedure.

10. After cleaning the trough, place it in the bottom brackets (if it was removed for cutting) and continue with the next procedure.

**For Example:** If your cooling system is 20’ long, the length of the cut section will be 20’ + 1/2".
PLACE DRIP PAN TRAY IN DRAIN TROUGH

With the drain trough in place, install the drip pan tray (or trays). Read the following notes before you begin:

- Secure the individual tray sections to the bottom stringer using the FA4482B Tek screws.
- For multiple tray sections, butt the ends together. *Do not overlap ends.*
- Use a flat screwdriver when installing the trays. An assistant is helpful. See diagrams below.
- When installed correctly, trays will align with the rough opening of the metal frame.
- Glue the 112761 end cap to the 8” drain trough.

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**Tek Screw**

100441 Nut Setter

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**Drip Pan Tray—EVC060DPT and/or EVC120DPT depending on system length and design.**

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**112761 End Cap**

Glued to drain trough.

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**Sample Drain Trough**

Install Tek screws through drip pan tray lip and into the top edge of the bottom stringer.
INSTALL END PANEL BRACKETS

With the drip pan trays installed, attach the end panel brackets.

Read these notes before you begin:

- Attach end panel brackets to the drip pan tray at each end of the drain trough.
- Use FA4472B Tek screws to secure end panel brackets to the drip pan tray.
- Align brackets with the rough opening of the frame.
- End panel attaches to the outside of the end panel bracket. Ensure there is enough clearance between bracket and drain trough.

![Diagram of end panel bracket installation](image-url)
Evaporative Cooling System

INSTALL END PANELS

Install the two end panels. Read these notes before you begin:

- Secure each end panel to the metal frame using the FA4482B Tek screws.
- Secure each end panel to the end panel bracket using two (2) FA4472B Tek screws.

Universal Cooling Cell
End Panel: Dimensions depend on system cool cell height.
ASSEMBLE SUPPLY HEADER AND PLACE ON TOP BRACKETS

Complete these steps:

1. Locate the individual header tubes and WF1982 couplings for 1-1/2 pvc pipe. All header tubes include pre-drilled holes evenly spaced throughout the length of the tube.

2. Align all spray holes and connect the tubes using WF1982 couplings and FA4472B Tek screws. **DO NOT USE CEMENT TO SECURE THE CONNECTION.** Drive Tek screws as shown through each coupling and into the header tubes. Do not to strip the threads in the pvc pipe.

3. With assistance, set the assembly in place on the top brackets and adjust its position. For lengths greater than 25', set the header tubes in place on the support brackets and assemble.

**ATTENTION:** See Step 6 (next page) to install plug, tee, valve, and Tubes A & B in this location.

**IMPORTANT:** Verify that plumbing does NOT cross the threshold of the header profile (dashed line). All evaporative cooling wall components must be installed inside this profile area, or else it will obstruct blackout system panel operation.

Tubes A & B: Cut tubes from the WF4140 pvc pipe sent with the system. See Step 6 on next page for note about length. See diagram to the left for glued connections. **Do not glue header tubes to the couplers.**
ASSEMBLE SUPPLY HEADER AND PLACE ON TOP BRACKETS—continued

4. Move to the sump end of the supply header and check the positions of the first spray hole in the tube and the end top bracket. The first hole at each end must be at least 4” in from the end of the deflector shield. See Figure 1.

**NOTE:** It may be necessary to cut the header tube and add an extension tube using a piece of the WF4140 and a WF1982 coupling. Positioning the spray hole too close to the end of the deflector will cause water to spray outside the system during operation.

5. Using the diagrams below, rotate the supply header as needed to set the 45° angle of the spray holes. Water sprays back toward the deflector shield when system is in operation. See Figure 2.

6. At the end opposite the sump position, install extension tubes (A & B), WF1384 Tee Fitting, 112604 Cleanout Adapter, and the WF3511 ball valve as shown. Glue those connections as shown on the previous page. **IMPORTANT:** Keep length of Tube A as short as possible to allow easier access to cleanout plug. Length of Tube B is left to the discretion of customer. Secure this entire assembly to the frame to prevent damage to supply manifold and related fittings and brackets. **Verify that the 45° angle of spray holes is maintained.**

7. Continue with the installation of the cool pads.
Evaporative Cooling System

INSTALL COOLING PADS AND FRONT PANEL

Complete these steps to install the individual cooling pads:

1. Read and follow the instructions for pad installation supplied with the cooling pads.
2. Beginning at one end, slide the first panel into place behind the lip of the end panel. Verify that you have installed the pad according to the instructions supplied with the cooling pads.
3. Continue adding cooling pads and work toward the other end of the cooling system.
4. Take next to last cooling pad and slide it into place behind the lip of the end panel.

**NOTE:** The front panels and front panel splices can be installed as pads are set into position, or these can be installed after all pads are in place. See the next page for the installation steps for front panel and front panel splices.

5. Place the last pad into position. Adjust the positions of the pads as needed to achieve the desired fit.

**IMPORTANT:** Due to circumstantial variances in the installation process and pad manufacturing, it may be necessary to cut the final installed cooling pad to fit. This is common and acceptable. Verify that cut line is as plumb and straight as possible.

**ATTENTION:** Install all cooling pads according to the instructions sent with those cooling pads.
INSTALL COOLING PADS AND FRONT PANEL—continued

6. To secure the cooling pads in place, attach the front panel(s) and front panel splice(s) to the top brackets using 1/4" fender washers (FAMF11B) and 1/4" lock nuts (FALF15B).

**NOTE:** Cooling systems typically include multiple front panels. During installation, butt the ends of the front panels together and install a front panel splice at each top bracket where two front panels meet. Do not overtighten the lock nuts. Tighten until snug. Install front panel splices only at the joints where two front panels meet.

7. Continue with the installation of the sump and related plumbing for the main water supply.
INSTALL SUMP AND RELATED PLUMBING

Once the main cooling system is assembled, install the sump, water pump, and related plumbing. Consult the diagrams on the following pages and the parts shown at the beginning of these instructions for part identification.

1. First, prepare a solid and level foundation for the sump. Dry fit the sump to the outlet end of the drain trough. Cut the end of the 8" trough if needed to allow the sump to sit in the desired location. Do not set the sump too close to the cooling pads. Allow room for cleaning and maintenance.

2. Clean drain trough end. Apply cement and slide the sump onto the pipe and into place. Allow cement to set. Verify that the cement is evenly applied and wipe away the excess cement from the joint.

- Shorten 8" PIP drain trough if needed. Allow enough distance and room for maintenance and cleaning.
- Minimum length beyond cooling pads is 12".
- Verify all components are inside the end wall header profile.
- Clean surfaces after dry fitting the sump to drain trough. Apply cement, slide sump into place, and wipe excess cement. Let dry.

**NOTE:** There is no slope to the drain trough when bottom brackets are installed correctly.
Evaporative Cooling System

INSTALL SUMP AND RELATED PLUMBING—continued

3. Continue with the assembly of the remaining water supply plumbing. Consult the diagrams below and on the next page for details.

**HEADER PIPE NOTE:** The quantity and type of supply header pipes and the number of couplers varies with each system. Header pipes include pre-drilled spray holes evenly spaced throughout the length of the pipe. Pipe may be 5’ or 10’ long.

**EXTENSION PIPE NOTE:** The PVC pipe used during assembly is shipped uncut in 3/4" (WF4130) and 1-1/2" (WF4140) diameter sizes. Depending on the specifics of your system, some pipe may not be needed. Additional pipe can be purchased locally. Quantity shipped is typical of most systems.

**SUMP CAP:** Before final assembly of the plumbing in the sump, use the diagrams to layout the pipe locations on the sump cap and prepare cap.

**PVC CEMENT AND PIPE TAPE:**
Except for the supply header-to-coupler connections, glue all socket joints using the cement during assembly.

Apply a couple of layers of pipe tape to all threaded connections during assembly. Tighten fittings until snug.

Diagram below shows a pump with outlet on top.

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```
WF3511
WF1384
WF1982—Do not glue supply headers to couplers.

WF3511
WF4140 Extension Pipe
WF2198
WF4140 Extension Pipe
WF6777
WF3300
WF4140 Extension Pipe
WF1530
WF4130 Extension Pipe

WF6745
WF6610

EVCBBS001
112298

112285

112510 Sump Cap—to be cut in the field.

WF6745

WF1530

WF4130 Extension Pipe

112299A Sump

111150

Customer-Supplied Main Water Supply Piping

WF6745

Check pump for outlet position and assemble as shown.
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Evaporative Cooling System

INSTALL SUMP AND RELATED PLUMBING—continued
Diagram below shows how to assemble the main water supply shutoff valve and how it is attached to the sump. Use the u-bolt to mark the hole positions on the sump. Use a drill and 1/4" drill bit to drill through the sump wall. Assemble the valve and pvc fittings and attach to sump. Drill all holes above the water line. Water level will be below the top edge of the cutout in the drain trough.

Diagram:
- WF1530 Main Water Supply Pipe Extension
- WF1540
- WF2392
- WR1300
- FA2902
- FAME50B
- FALF35B
- 112510 Cap to be drilled in the field.
- See Main Water Line Pipe Extension Note.

WF4130—Use just enough to complete a clean connection.

The WF1300 supply valve should not touch any other fittings or pipe.

**PVC CEMENT AND PIPE TAPE:**
Except for the supply header-to-coupler connections, glue all socket joints using the cement during assembly.

Apply a couple of layers of pipe tape to all threaded connections during assembly. Tighten fitting until snug.

**MAIN WATER SUPPLY PIPE EXTENSION:** Cut this pipe from the WF4130 pvc pipe sent with the kit. Length must allow for adjustment of the water valve (up or down) once the main water line is attached and water is turned on.

**MINIMUM LENGTH OF PIPE EXTENSION:** 18".

Valve assembly can be positioned against the cooling system frame or wall to provide an additional surface to secure the extension pipe.

If desired, use a temporary flexible water line such as a garden house to allow for easier height adjustment during the setup stage. Main water line can be attached later once the water level is set.

Customer supplies additional fittings and pipe to connect the WF1530 elbow to the main water supply.
**System Maintenance: Water Screen and Sump**

**Flush and Clean Sump**

Periodic sump maintenance is needed to extend pump life and to prevent dirt and sludge buildup in the sump. By keeping the sump lid in place during operation, you can extend the time between required maintenance and cleaning. A harsh environment will result in more frequent cleaning. Complete these steps to clean the sump:

1. Turn off the pump and main water supply.
2. Mark current valve setting for Valve A and then close the valve.
3. Connect a hose to the valve below the water screen and run hose into a tank or drain.
4. Open the valve and turn on the water pump.
5. Pump water out of the sump then turn the pump off. Do not allow the sump to run dry while the pump is turned on.
6. After pumping most of the water from the sump, turn the main water supply on and allow water to fill the sump up to the drain trough. **Do not fill the drain trough.**
7. Turn the pump back on and allow it to pump the water from the sump again.
8. Repeat as needed until the sump and water in the sump are clean.
9. Turn off the pump, close the WF3300 valve, and remove drain hose.
10. Allow water to fill system to the required level, return Valve A to its original setting, and turn the pump back on to resume system operation.

**Clean Water Screen**

Clean the 112298 water screen regularly to maintain consistent water flow and pressure. Complete these steps:

1. Turn off the pump and open the WF3300 drain valve to drain water from the line. If desired, connect a garden hose to capture the water.
2. Remove the water screen housing and clean the screen and housing by rinsing in a bucket of water or spraying with water from a low-pressure nozzle.
3. Reassemble the screen, close the water valve, and turn on the water pump to resume normal operation.
SUPPLY HEADER MAINTENANCE

The supply header tube must be inspected and cleaned periodically to ensure even and consistent water flow. The presence of dry patches anywhere along the length of the cooling pads may indicate that the supply header is clogged or that spray holes are fully or partially obstructed.

To clean and flush the supply header tubes:

1. With the pump turned on, inspect spray pattern of the supply header to ensure water flows from each spray hole.
2. Remove debris and buildup from any spray hole that appears plugged or partially obstructed using a small brush.
3. Fully open Valve B to flush the header tube.
4. Move to Valve A, mark its current setting, and fully open that valve if it is partially closed.
5. Allow water to flow through the system for several minutes.

NOTE: Additional customer-supplied tubing can be added to Valve B to capture water during this process.

6. Reset Valve A to its previous position and close Valve B.

NOTE: To clean the inside of the header tube, shut off the water pump, disconnect header tube at union, remove plug at opposite end, and run a brush through the tube. Reassemble header tube and repeat Steps 3-6.

Valve A: Use this valve to adjust water flow to the supply header.

Valve is fully open when flushing the supply header.

To clean the inside of the supply header, disconnect header at this union, remove plug at opposite end, and insert a brush. Pull brush through the tube using a small rope or cable, or push to the other end.

For header tubes longer than 20’, it is best to remove and clean the header in short sections. Be sure to mark the sections for easier reassembly.

Reassemble header tube and connect to main water supply tubing after cleaning. Complete the steps to flush the header tube.

Valve B: Open this valve at least once a week to drain debris and to prevent buildup and algae growth in tube.

Valve is fully closed during normal operation.
Winterizing the Evaporative Cooling System

To shutdown the cooling system throughout the winter, complete these steps to prevent damage to cooling system components:

1. Complete the Flush and Clean Sump procedure (Steps 1-7), but do not refill the sump.
2. Turn off the main water supply to the system.
3. Remove the water screen and housing and allow to dry. Verify that water screen housing is dry before reassembling.
4. Turn off electricity to water pump and lift pump and supply tube with check valve from sump.
5. Disconnect supply tube from pump and allow water to drain from it. To prevent pump and check valve damage, store these items where temperatures remain above freezing.
6. Verify that all evaporative cooling system valves are open and the main water supply is off.
7. Remove the WR1300 main water supply valve and store where temperatures are above freezing.
8. Remove all water from drain trough and sump to prevent freezing and damage.

Clean Cooling System Pads

Complete these steps:

1. Turn off the fans if possible, or adjust to the lowest setting.
2. Using water sprayed from a garden hose, gently hose off both sides of the pads to remove algae and sediment buildup.

**NOTE:** To prevent damage, only spray pads with low pressure from a typical garden hose. Do not use a pressure washer! Do not scrub the pads with any tools or cleaning solutions!
Space below is reserved for customer notes.