



NXF Modular Hybrid Cooler

RIGGING AND INSTALLATION INSTRUCTIONS





About rigging and installation

The BAC equipment should be rigged and installed as outlined in this bulletin.

These procedures should be thoroughly reviewed prior to the rigging and operation to acquaint all personnel with the procedures to be followed and to assure that all necessary equipment will be available at the job site. Be sure to have a copy of the unit certified drawing available for reference. If you do not have a copy of this drawing or if you need additional information about this unit, contact the local BAC representative. His name and phone number can be found on the www.BaltimoreAircoil.com. The model type and serial number of your equipment are indicated on the unit nameplate.

Recommended maintenance and monitoring programme

Checks and adjustments	Start-Up	Weekly	Monthly	Quarterly	Every 6 months	Annually	Shutdown
Cold water basin & strainer	X			X			
Operating level and make-up	X		X				
Blow down	X		X				
Sump heater package	X				X		
Rotation of fan(s) and pump(s)	X						
Motor voltage and current	X					X	
Unusual noise and/or vibration	X		X				

Inspections and monitoring	Start-Up	Weekly	Monthly	Quarterly	Every 6 months	Annually	Shutdown
General condition	X		X				
Heat transfer section	X				X		
Drift eliminators	X				X		
Water distribution	X				X		
Electric water level control package	X				X		
Level or alarm switches				X			
TAB test (dip slides)	X	X					
Circulating water quality	X		X				
System overview	X					X	
Record keeping	as per event						

Cleaning procedures	Start-Up	Weekly	Monthly	Quarterly	Every 6 months	Annually	Shutdown
Mechanical cleaning	X					X	X
Disinfection**	(X)					(X)	(X)
Drain basin							X

** depends on applied code of practice



UV System	Start-Up	Weekly	Monthly	Quarterly	Every 6 months	Annually	Shutdown
Inspect and clean water circulation pump	X			X			
Inspect and clean quartz sleeve	X			X			
Inspect and clean UV intensity sensor	X			X			
Check operation of solenoid drain valve, mechanical make-up valve, and drain valve	X			X			
Replace UV bulb						X	

Notes

1. Water treatment and auxiliary equipment integrated in the cooling system may require additions to the table above. Contact suppliers for recommended actions and their required frequency.
2. Recommended service intervals are for typical installations. Different environmental conditions may dictate more frequent servicing.
3. When operating in ambient temperatures below freezing, the unit should be inspected more frequently (see Cold weather operations in the appropriate Operating and Maintenance Instructions).



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About engineering and application practices

This bulletin only refers to the assembly of the unit. To ensure a proper operation, a correct integration of the unit in the overall installation is mandatory. For good engineering and application practices on layout, levelling, connecting pipework, etc., please refer to our website:
<http://www.baltimoreaircoil.eu/knowledge-center/application-information>.

Shipping

BAC cooling equipment is factory assembled to assure uniform quality and minimum field assembly.

Nexus® modular hybrid coolers are factory-assembled to ensure uniform quality with minimum field assembly ready for field piping and wiring. Additional shipping options are available to aid in unique on site rigging situations. Refer to your submittal package for the shipping option ordered when purchased. Contact your local BAC representative for more information.

For the dimensions and weights of a specific unit or section, refer to the certified drawing.

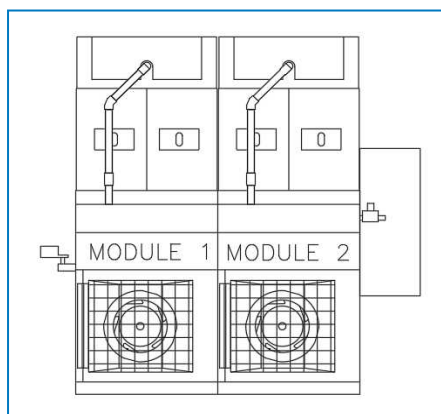


Fig. 1A Standard shipment: Fully assembled, multi-modules, shipped connected.

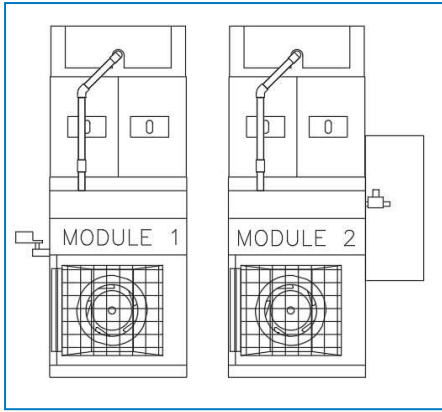


Fig. 1B Modular shipment: Individual modules are shipped and are connected, and wired on-site

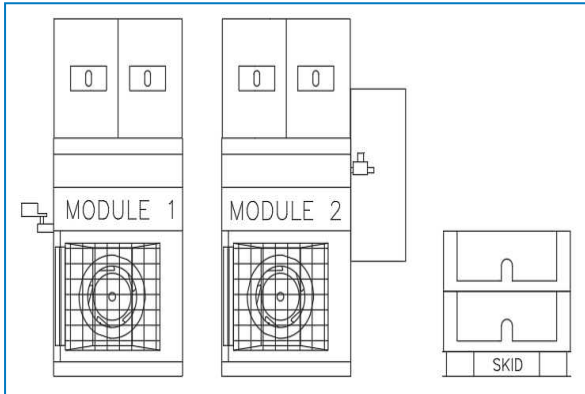


Fig. 1C Modular shipment: Individual modules are shipped with the spray section removed and are connected, assembled and wired on-site

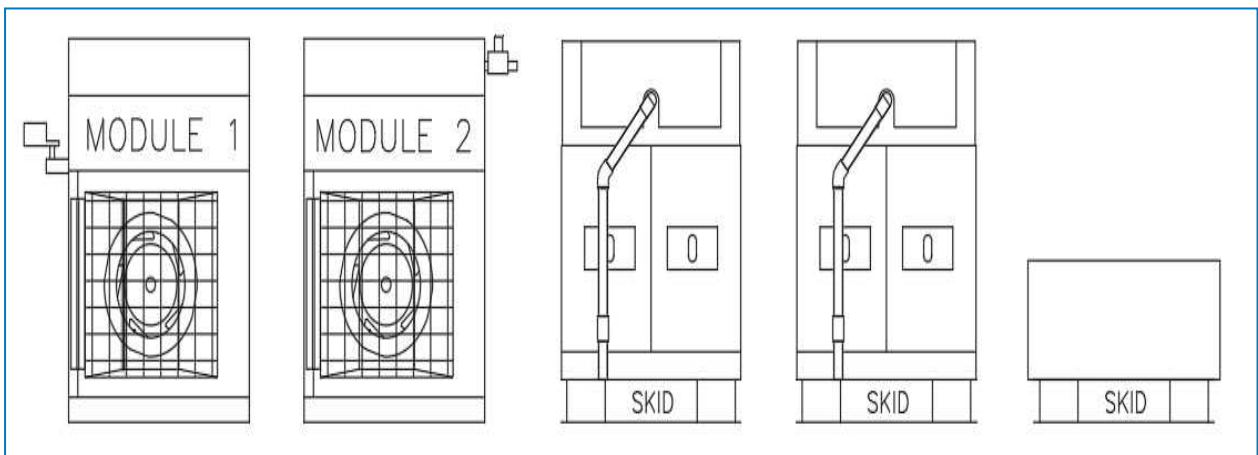


Fig. 1D Modular shipment: Individual modules are shipped with the spray section / heat transfer section removed and are connected, assembled and wired on-site



CAUTION

**Do not cover units with PVC eliminators with a plastic tarpaulin.
Temperature increase due to sun radiation could deform the eliminators.**

Inspection before rigging

When the unit is delivered to the job site, it should be checked thoroughly to ensure all required items have been received and are free of any shipping damage prior to signing the bill of lading.

The following parts should be inspected:

- hCore® Heat Transfer Technology
- EC fan system (fan(s) and motor(s))
- Fan guard(s)
- Spray water basin
- Spray water basin accessories (mechanical makeup valve, recirculating water pump, water diverter, high and low level switches, etc)
- Fluid connections
- Piping manifold and couplings
- Component wiring
- Spray distribution system
- Solenoid makeup valve
- Conductivity-controlled motorized drain valve and conductivity meter
- High efficiency drift eliminators
- Outside air temperature sensor
- Interior surfaces
- Exterior surfaces
- Mating surfaces between sections/modules (depending on shipping configuration)
- Optional accessories basin heater(s), positive closure dampers, etc
- Miscellaneous items: all bolts, nuts, washers and sealer tape required to assemble sections or components parts are furnished by BAC and shipped with the unit.

Unit weights

Before rigging any BAC equipment, the weight of each section should be verified on the unit certified drawing.



These weights are **approximate** and should be confirmed by weighing **before lifting** when available hoisting capacity provides little margin for safety.



CAUTION

Before an actual lift is undertaken, ensure no water, snow, ice or debris has collected in the sump or elsewhere in or on the unit. Such accumulations will add substantially to the equipment's lifting weight.

In the event of extended lifts or where hazards exist, the lifting devices should be used in conjunction with safety slings placed under the unit.

Anchoring

The unit must be properly anchored in place.

Refer to the suggested support details on the certified drawing for locations of the mounting holes. Anchor bolts must be provided by others.



Holes suitable for 20 mm bolts are provided in the bottom flange of the lower section for bolting the unit to the support beams.

Leveling

The unit must be level for proper operation and ease of piping.

The unit should be level to 0,5 mm/m over the unit length and width.

Support beams must also be level as shims should not be used between pan and support beams to level the unit.

Connecting pipework

All piping external to BAC cooling equipment must be supported separately.

In case the equipment is installed on vibration rails or springs, the piping must contain compensators to eliminate vibrations carried through the external pipework.

Purge requirements

The installer of BAC closed circuit cooling towers must ensure a proper air purging of the system prior to operation.

Entrained air can restrict the capacity of the cooler, resulting in higher process temperatures.

Freeze protection

These products must be protected against damage and/or reduced effectiveness due to possible freeze-up by mechanical and operational methods. Please contact your local BAC representative for recommended protection alternatives.

Safety Precautions

All electrical, mechanical and rotating machinery constitutes a potential hazard, particularly for those not familiar with its design, construction and operation. Accordingly, adequate safeguards (including use of protective enclosures where necessary) should be taken with this equipment both to safeguard the public (including minors) from injury and to prevent damage to the equipment, its associated system and the premises.

If there is doubt about safe and proper rigging, installation, operation or maintenance procedures, contact the equipment manufacturer or his representative for advice.

When working on operating equipment, be aware that some parts may have an elevated temperature. Any operations on elevated level have to be executed with extra care to prevent accidents.

AUTHORIZED PERSONNEL

The operation, maintenance and repair of this equipment should be undertaken only by personnel authorized and qualified to do so. All such personnel should be thoroughly familiar with the equipment, the associated systems and controls and the procedures set forth in this and other relevant manuals. Proper care, personal protective equipment, procedures and tools must be used in handling, lifting, installing, operating, maintaining and repairing this equipment to prevent personal injury and/or property damage. Personnel must use personal protective equipment where necessary (gloves, ear plugs, etc...)

MECHANICAL SAFETY

Mechanical safety of the equipment is in accordance with the requirements of the EU machinery directive. Depending upon site conditions it also may be necessary to install items such as bottom screens, ladders, safety cages, stairways, access platforms, handrails and toe boards for the safety and convenience of the authorized service and maintenance personnel.

At no time this equipment should be operated without all fan screens, access panels and access doors in place/closed and properly secured.

When the equipment is operated with a variable fan speed control device, steps must be taken to avoid operating at or near to the fan's «critical speed».

For more information consult your local BAC representative.

ELECTRICAL SAFETY

All electrical components associated with this equipment should be installed with a lockable disconnect switch located within sight of the equipment.

In the event of multiple components, these can be installed after a single disconnect switch but multiple switches or a combination thereof are also allowed.

No service work should be performed on or near electrical components unless adequate safety measures are taken. These include, but are not limited to the following:

- Isolate the component electrically
- Lock the isolation switch in order to prevent unintentional restart
- Measure that no electrical voltage is present any more
- If parts of the installation remain energized, make sure to properly demarcate these in order to avoid confusion

Fan motor terminals and connections may have residual voltage after unit shut-down. Wait five minutes after disconnecting the voltage at all poles before opening the fan motor terminal box.

LIFTING



CAUTION

Failure to use designated lifting points can result in a dropped load causing severe injury, death and/or property damage. Lifts must be performed by qualified riggers following BAC published Rigging Instructions and generally accepted lifting practices. The use of supplemental safety slings may also be required if the lift circumstances warrant its use, as determined by the rigging contractor.

LOCATION

All cooling equipment should be located as far away as possible from occupied areas, open windows or air intakes to buildings.



For detailed recommendations on BAC equipment layout, please see the BAC Application Handbook EU-Edition, the BAC website www.BaltimoreAircoil.com or contact your local BAC Representative.



LOCAL REGULATIONS

Installation and operation of cooling equipment may be subject to local regulations, such as establishment of risk analysis. Ensure regulatory requirements are consistently met.

Non-walking surfaces

Access to and maintenance of any component needs to be performed in accordance with all local applicable laws and regulations. If the proper and required access means are not present, temporary structures need to be foreseen. Under no circumstance can one use parts of the unit, that are not designed as an access mean, unless measures can be taken to mitigate any risks that might occur from doing so.



Modifications by others

Whenever modifications or changes are made by others to the BAC equipment without written permission of BAC, the party who has done the modification becomes responsible for all consequences of this change and BAC declines all liability for the product.

Warranty

BAC will guarantee all products to be free from manufactured defects in materials and workmanship for a period of 24 months from the date of shipment. In the event of any such defect, BAC will repair or provide a replacement. For more details, please refer to the Limitation of Warranties applicable to and in effect at the time of the sale/purchase of these products. You can find these terms and conditions on the reverse side of your order acknowledgement form and your invoice.

General Notes

-  Each unit must be located and positioned to prevent the introduction of discharge air into the ventilation systems of the building on which the unit is located and of adjacent buildings.
-  Avoid installing the units near warm air discharge sources such as steam vents or boiler stacks from the building. This warm air can be pulled into the unit and affect performance and possibly lead to corrosion.

Model number	Number of modules	Factory assembled unit		
		H	W1	W2
NXF-0403-x-x1	1	1220 mm	1270 mm	635 mm
NXF-0403-x-x2	2	1220 mm	1270 mm	635 mm
NXF-0403-x-x3	3	3050 mm	1270 mm	635 mm
NXF-0403-x-x4	4	3050 mm	1270 mm	635 mm
NXF-0403-x-x5	5	4880 mm	1270 mm	635 mm
NXF-0403-x-x6	6	4880 mm	1270 mm	635 mm
NXF-0603-x-x1	1	1220 mm	1880 mm	940 mm
NXF-0603-x-x2	2	1220 mm	1880 mm	940 mm
NXF-0603-x-x3	3	3050 mm	1880 mm	940 mm
NXF-0603-x-x4	4	3050 mm	1880 mm	940 mm
NXF-0603-x-x5	5	4880 mm	1880 mm	940 mm
NXF-0603-x-x6	6	4880 mm	1880 mm	940 mm

Minimum vertical dimension and spreader bar length



CAUTION

**Forklift or pallet jack movement is acceptable for single modules.
Do not lift site assembled multi-module units as one piece using forks.**



Lifting of a factory-assembled multi-module unit

The instructions below are applicable for configurations as shown in figure 1A from "Shipping" on page 1. Refer to your submittal for details.

Products that are shipped fully-assembled as one will be provided with a shared lifting bar that spans the length of the unit. The number of mounting points will be determined by the number of modules (see figure below). All wiring between modules is completed at the factory. Care should be taken to avoid damaging protruding components such as valves, piping connections and wiring cable.



Prior to lifting, ensure all lifting lines are clear of obstructions to avoid damage to external piping, headers or connections.

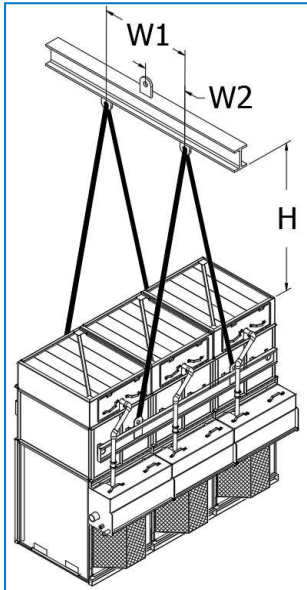


Fig. 2 Lifting of factory-assembled multi-module unit (three module unit shown)

lifting of an assembled individual module

The instructions below are applicable for configurations as shown in figure 1B from "Shipping" (page 1). Refer to submittal for details.

Refer to table from "General Notes" on the previous page and figures below for each section's required minimum spreader bar length $W1$ and $W2$ (if applicable) and the recommended vertical dimension H .



Prior to lifting, ensure all lifting lines are clear of obstructions to avoid damage to external piping, headers or connections.

Refer to ""Lifting of a factory-assembled multi-module unit" (page 12)

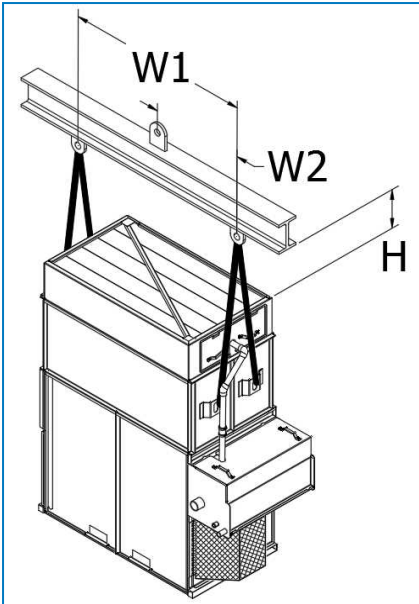


Fig. 2A Lifting of assembled single-module unit

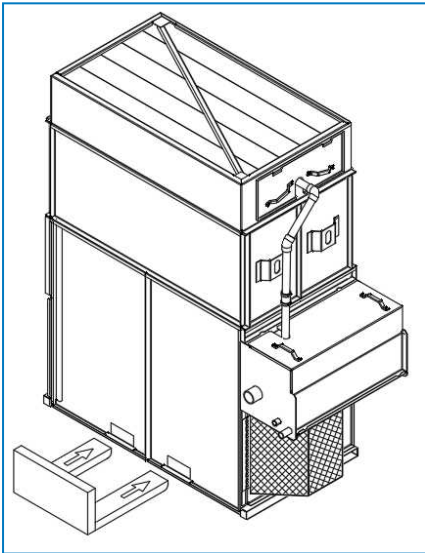


Fig. 2B Moving of assembled single-module unit

4

NXF SECTION ASSEMBLY

Lifting of individual subsections

LIFTING OF A SINGLE HEAT EXCHANGER SECTION

The instructions below are applicable for configurations ordered as shown in figure 1C and 1D from "Shipping" on page 1. Refer to your submittal for details.

1. For 1c only: Install the upper spray header between the two rubber couplings. Slide the spray pipe into the bracket and ensure the nozzles are pointing downward. Place and install two rubber couplings at the top and bottom of the spray pipe. Replace the eliminators into the spray section, noting the original location and orientation. Replace the access panels (see figure 4). Repeat as necessary for all modules of the unit.

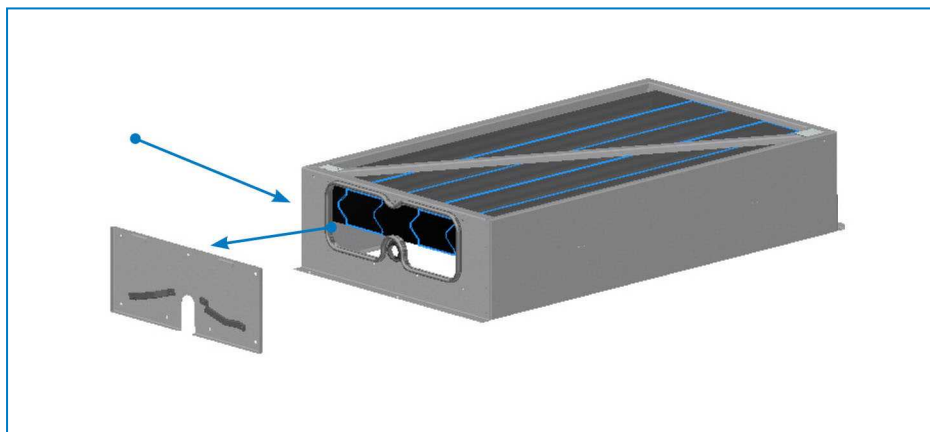


Fig. 4 Spray section with door panel removed

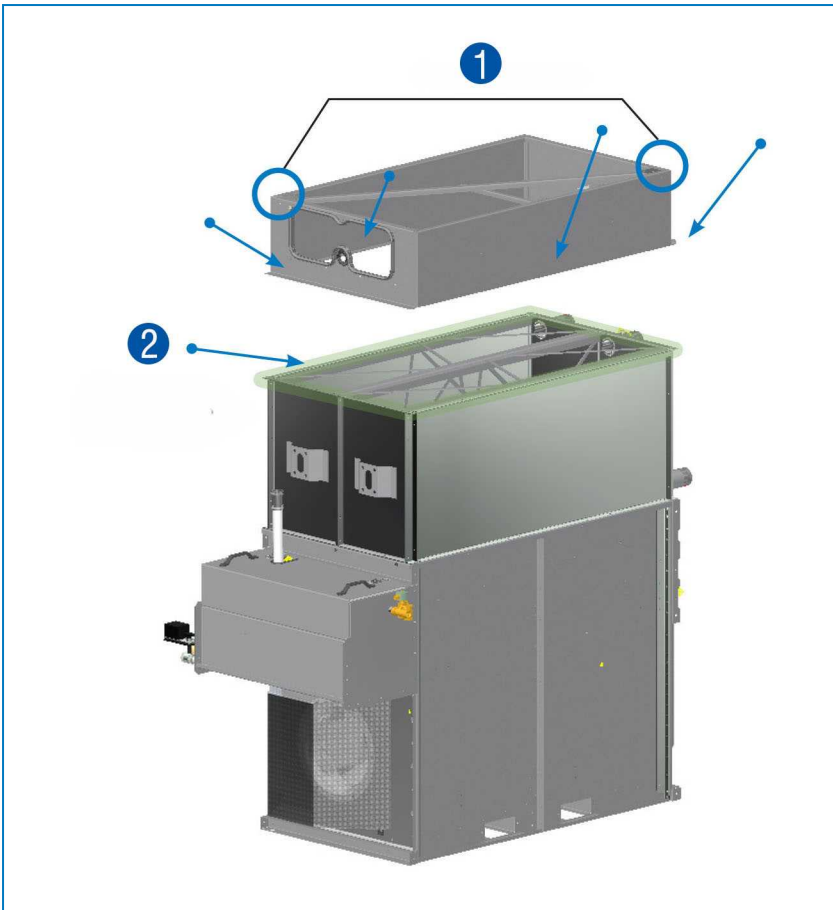


Fig. 5 Attaching the spray section to the module - 1. Lifting points, 2. Sealer tape applied around perimeter.

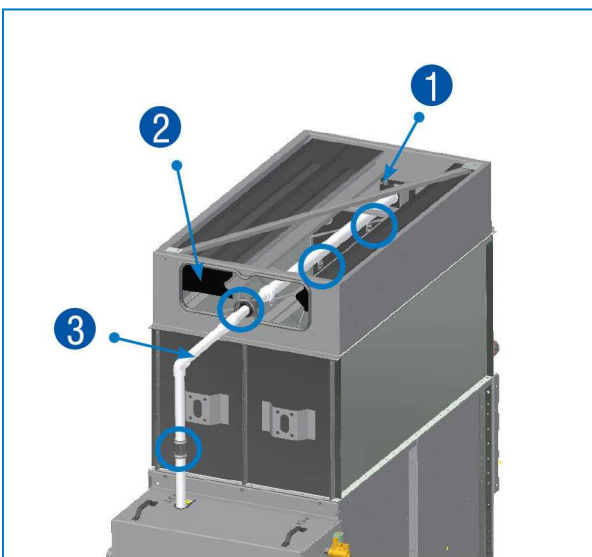


Fig. 6 - 1. Spray pipe install, 2. Eliminator install, 3. Upper pipe install.

2. Remove the access panel from the spray section, saving the hardware, then carefully remove the eliminators through the opening. Note each eliminator's orientation and location. The eliminators will be replaced after installing the spray's piping. See figure 7.
3. Apply sealer tape to top of the hCore® Heat Tranfer Technology section. Overlap the sealer tape 25 mm in the corners. The spray section can then be lifted and attached on all four sides to the lower section using factory-supplied fasteners, see figure 3. Note the fastener type varies on the location and the unit's material of construction. See figure 7 and table 3.

Unit material of construction	End fastener type (red circled area)	Side fastener type (blue circled area)
Thermosetting hybrid polymer	M8 nuts and bolts	5/16" tappers
Stainless steel	M8 nuts and bolts	5/16" tappers

Table 3: Fastener type depending on material of construction

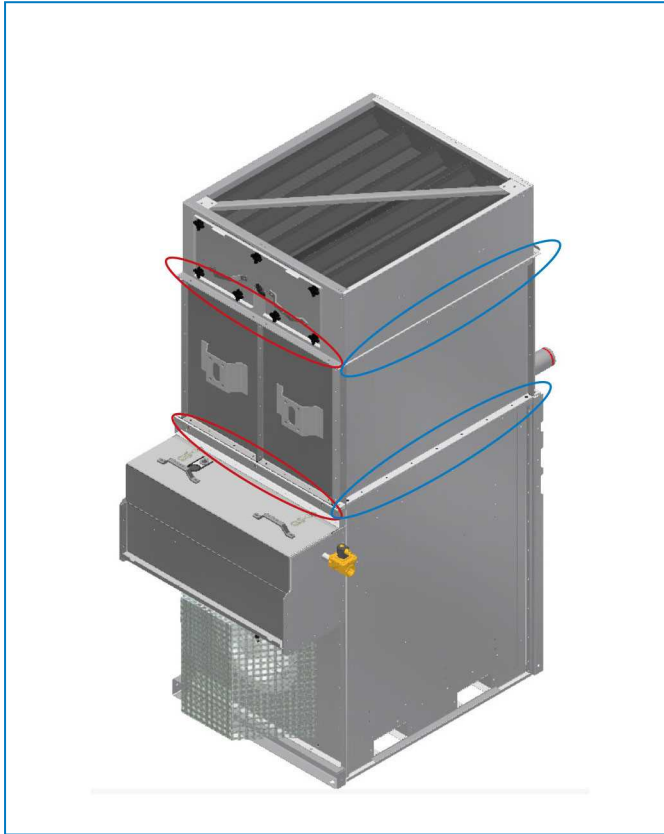


Fig. 7 Fastener type for the spray section assembly

Unit assembly

ASSEMBLY OF THE IPILLOT® CONTROL SYSTEM PANEL

The instructions below are applicable for configuration ordered as shown in figure 1D from "Shipping" on page 1. Refer to your submittal for details.

1. After the module is fully assembled, attach the bracket and mounting channel for the control panel. Measure the control panel width before installing the mount channel to match the mounting location. Also check the control panel location on Face A or Face B. Refer to your submittal drawing.
2. Attach the control panel using the mounting holes at each corner. Ensure the dimension from the bottom of the control panel to the bottom of the unit is correct following the table 4 dimension H (see figure 9C).

iPilot® Control System panel size (H x W)	Distance between the control panel bottom and the bottom of the unit (H)
1000 mm x 800 mm	820 mm
1000 mm x 1000 mm	820 mm

Table 4: iPilot® Control System panel size and distance to the bottom of the unit



Fig. 8 iPilot® Control System Panel - 1. Control panel lifting ears

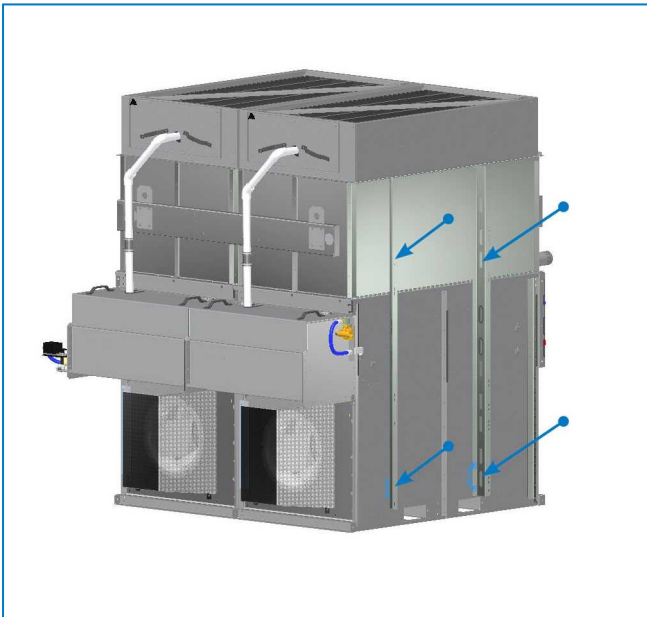


Fig. 9A Installation of the control panel on the mount channels

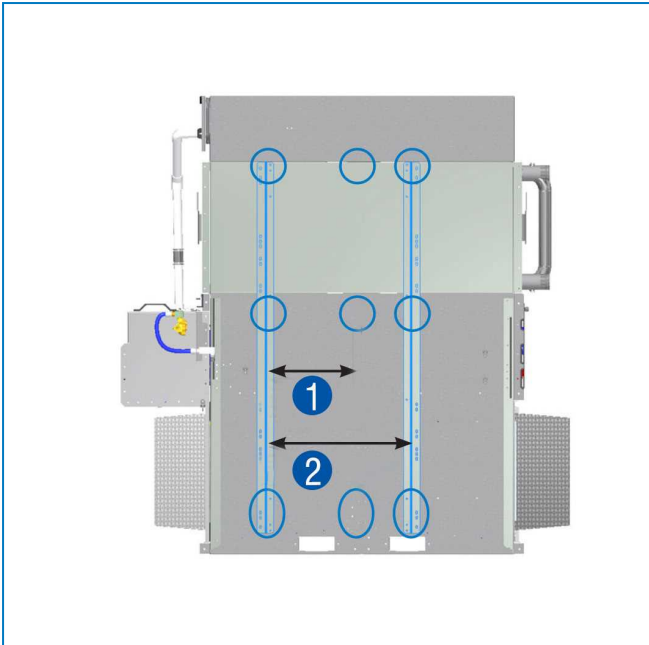


Fig. 9B Control panel mount channel spacing 1. 760 mm wide panel, 2. 960 mm wide panel.

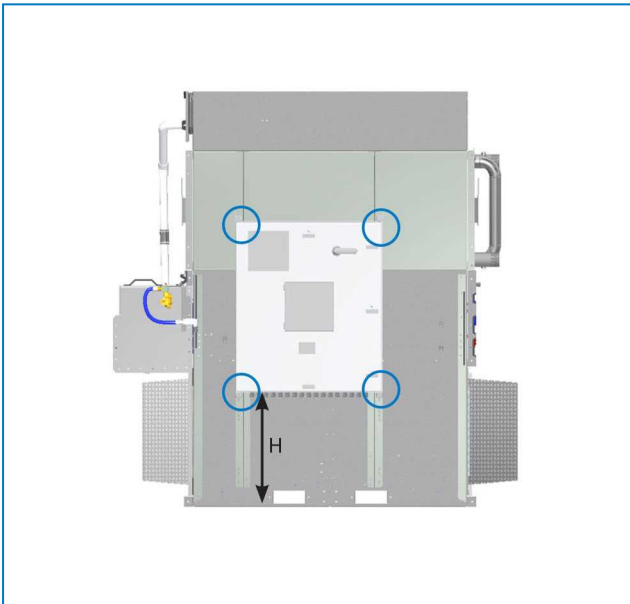


Fig. 9C Control panel mounting height



CAUTION

Improperly installed and grounded field wiring poses fire and electrocution hazards. To avoid these hazards, all operations must be performed by a licensed electrical technician and must comply with local regulations.

ASSEMBLY OF MULTI-MODULE UNITS

The instructions below are applicable for configuration ordered as shown in figure 1B, 1C and 1D from "Shipping" on page 1. Refer to your submittal for details.

Lift the first module into the final installation location. Refer to "lifting of an assembled individual module" on page 12 for lifting of a single module.

1. Prepare the second module's spray water basin by applying sealer tape. Where the sealer tape meets in the corner, be sure to overlap 25 mm. See figure 9.
2. Maneuver the second module and slide it towards the receiving module. See figure 8.
3. Bolt the modules together at the locations shown in figure 10C. Use M10 bolts at circled locations and M8 bolts in the sump area.
4. Repeat steps 2 through 4 for the remaining modules.
5. Test the spray water basin for leaks by plugging drain, filling basin and observing the unit for leaks, especially at seams.



Fig. 10A Module to module assembly

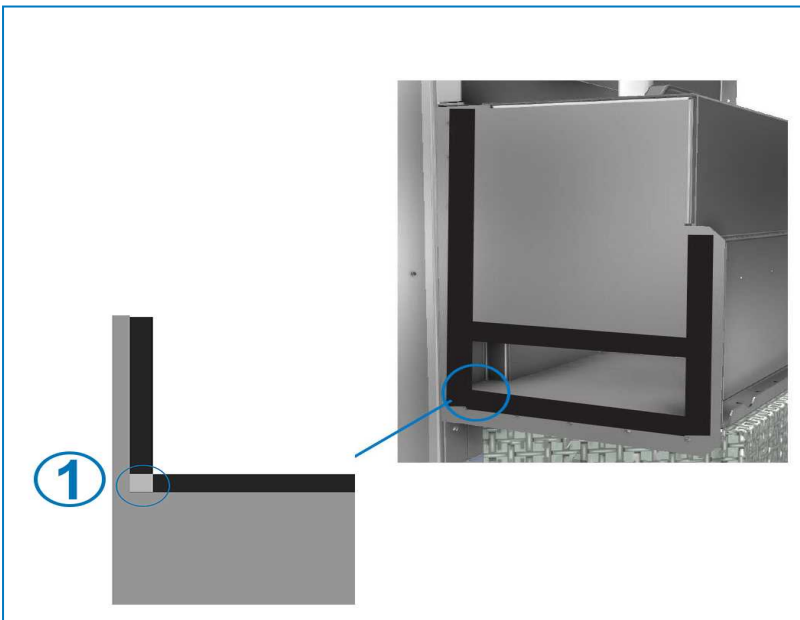


Fig. 10B Sealer tape locations - 1. 25 mm sealer tape overlap.

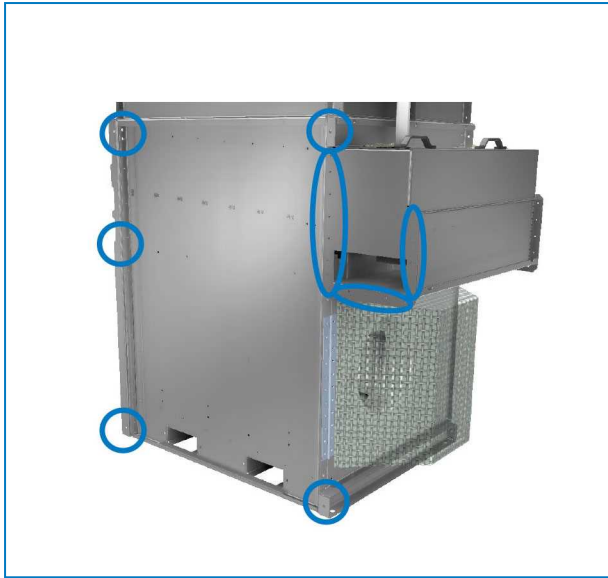


Fig. 10C Location of bolts required to join modules

Wiring individual modules after assembly

The instructions below are applicable for configuration ordered as shown in figure 1B, 1C and 1D from "Shipping" on page 1. Refer to your submittal for details.

The wires will be labeled and identified as follows:

- Fan power (Large 4 wire cable): Fan 1-1; Fan 2-1, Fan 3-1, etc.
- Fan communications: Fan 1-1, Fan 2-1, Fan 3-1, etc.
- Pumps: Pump 1, Pump 2, etc.
- Components:
 - Conductivity sensor: conduct sensor
 - Drain valve
 - Make-up solenoid: make-up valve
 - Positive closure damper: PCD
 - Leaving process fluid temperature sensor
 - Basin heater
 - High water level sensor: high sensor
 - Low water level sensor: low sensor



Refer to the wiring diagram provided in the submittal package and inside the control panel for all wiring details.

LOCATING BUNDLED WIRES AFTER SHIPPING

1. Remove the back cover panel located on the opposite side of water basin (face D). Find the fan wire stored under cover panel for each module. See figure 11.
2. Remove the side cover panel located on the opposite side of the control panel. Find the component wire (drain valve, conductivity sensor or make-up valve) stored under the cover panel. See figure 12.
3. Remove the basin cover, then find the pump wire stored within the basin. See figure 13.

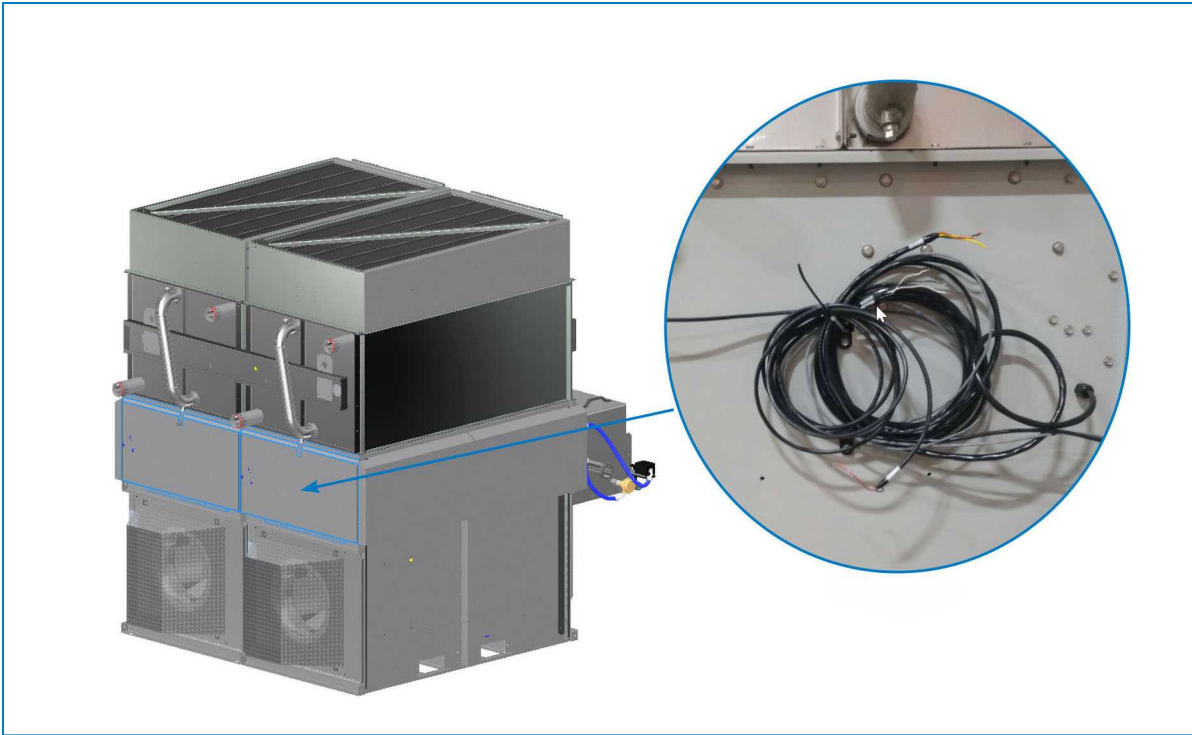


Fig. 11 Location of fan wiring

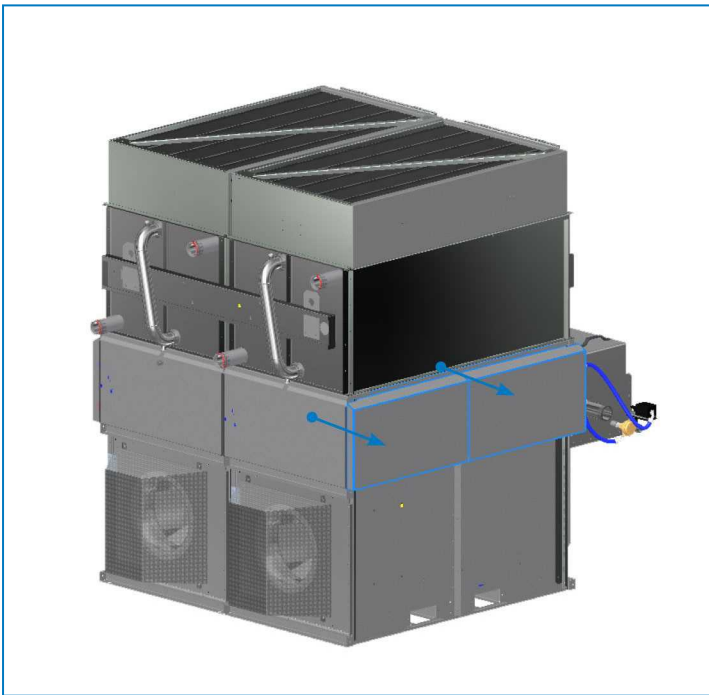


Fig. 12 Location of component wiring

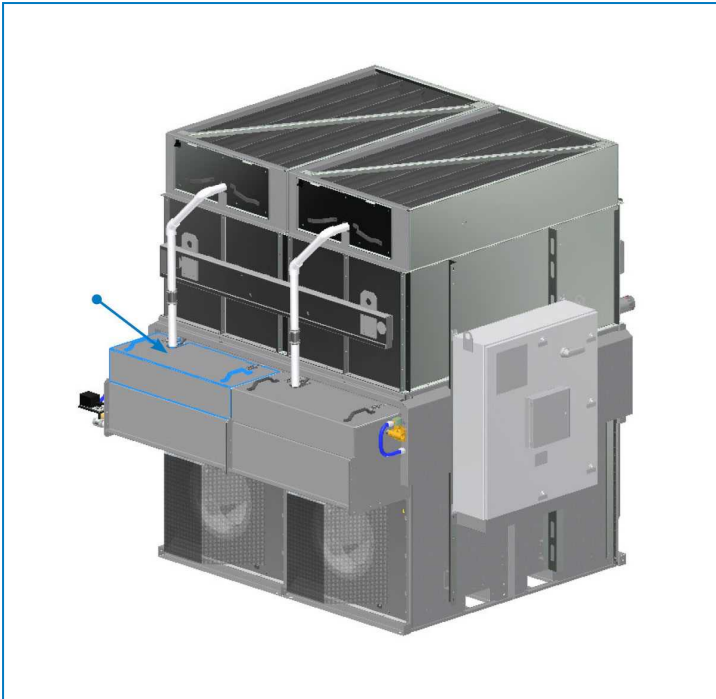


Fig. 13 Location of pump wiring

ROUTING WIRES TO THE IPILLOT® CONTROL SYSTEM PANEL

1. Remove the rest of cover panels around control panel and above spray water basin. Keep the hardware for reinstallation of panels. See figure 14.
2. Find the conductivity sensor and the drain valve component wires on the side of unit opposite from the control panel. Pull the wire around the corner to the back (opposite the basin side) and secure to the mounts with zip ties (provided by BAC). Pull the wire through the first notch from the top and secure the wire to the hole with zip ties. See figure 12 and 15.

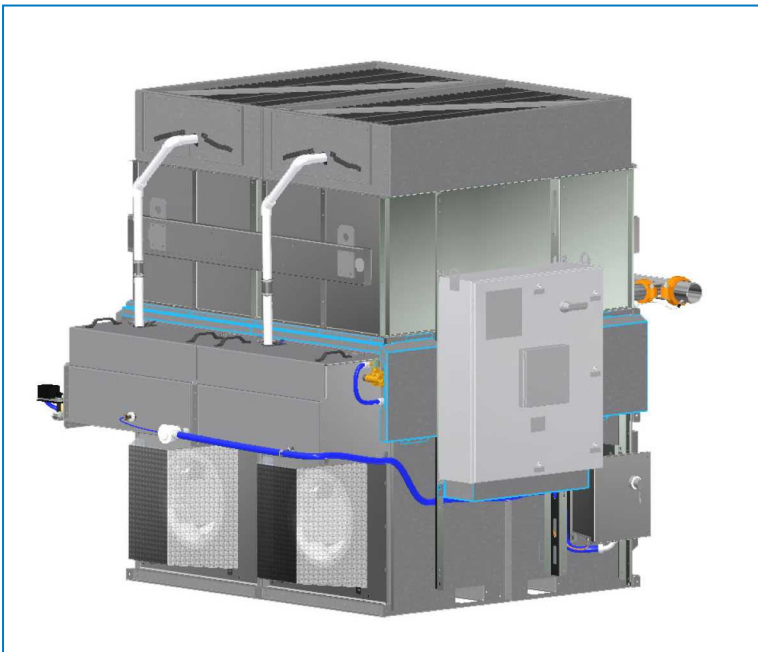


Fig. 14 Location of cover panels around the iPilot® Control System panel (optional basin heater shown)

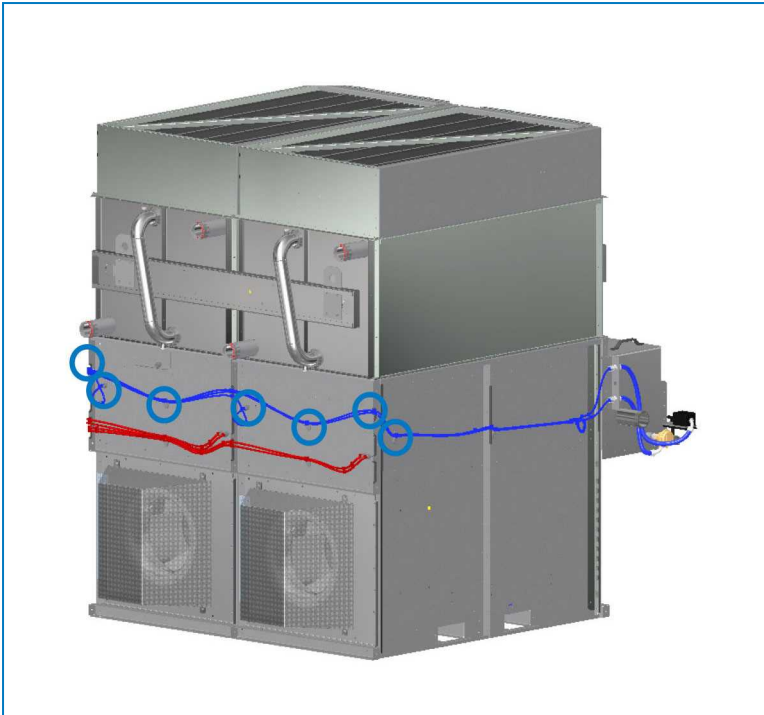


Fig. 15 Fan communication wire and component wire routing

3. Pull the fan communication wire through the first notch and the wire mount alongside with the component wire. Secure the wire with zip ties. The conductivity sensor, drain valve and fan communication wire run together to the control panel. See figure 15.
4. Route the fan power wire through the third notch from the top and wire mount, then secure the wire with zip ties to the unit. The fan power wire may use the second (middle) notch on NXF-0603 units when needed. See figure 16.

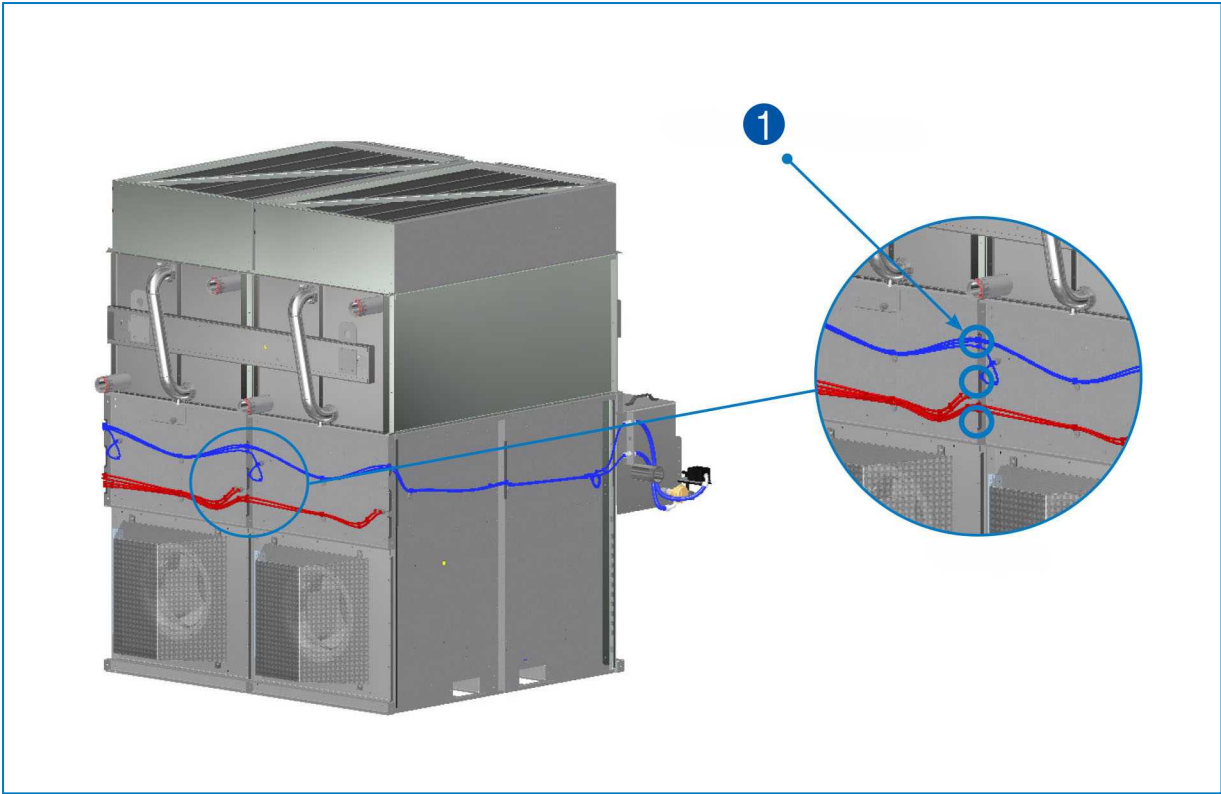


Fig. 16 Fan power wire (red wire) - 1. Wire routing notches

5. Read all wire labels and refer to the wiring diagram found inside the iPilot® Control System panel before proceeding to the next step.
6. Route the fan power wire through the bottom oblong hole with the edge trim on the control panel mounting channel. Pull each wire through each cord grip at the bottom of the control panel, then connect each connector of wire to the correct terminal block position. See figure 17.
7. Route the fan communications and component wires through the bottom oblong hole with the edge trim on the control panel mounting channel. Pull each wire through each cord grip at the bottom of the control panel, then connect each connector of wire to the correct terminal block position. See figure 17.

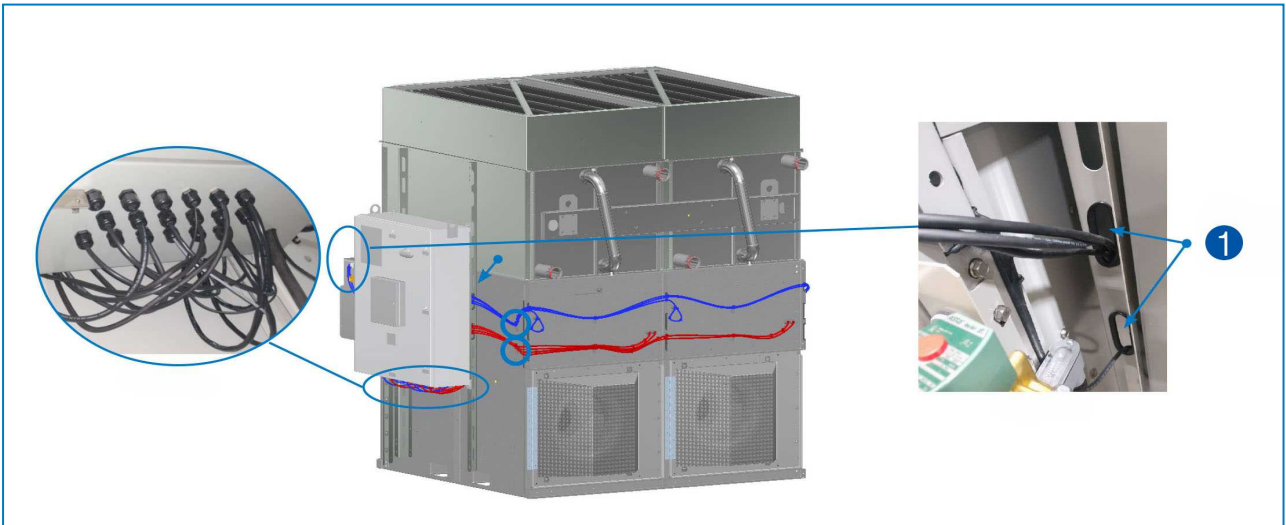


Fig. 17 Wire to the iPilot® Control System panel - 1. Mounting channel with oblong holes with edge trim.

8. Route pump wire through grommet at top of spray water basin. Follow wire path toward the control panel end. Pull pump wire through top oblong hole with edge trim on control panel mount channel. Pull each wire through individual cord grips at the bottom of the control panel, then connect each wire to the correct terminal block. Please follow wire diagram located within the control panel. See figure 18.

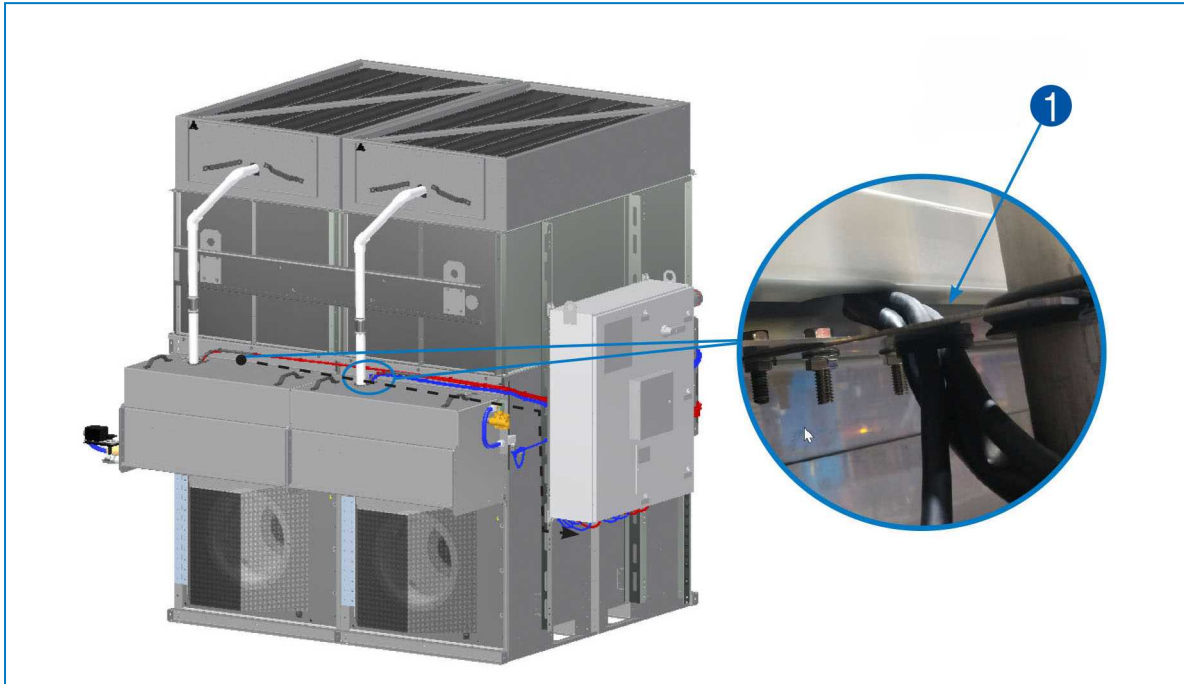


Fig. 18 Pump wire to the iPilot® Control System panel - 1. Pump wiring through grommet.

9. Use a torque wrench on all cord grips and torque down to 5Nm.
10. Install the wire cover panel at the top of the spray water basin. See figure 19. Install the cover panel at the back and side. See figure 11 and 12. Finally install the cover panels around the iPilot® Control System panel, see figure 14.

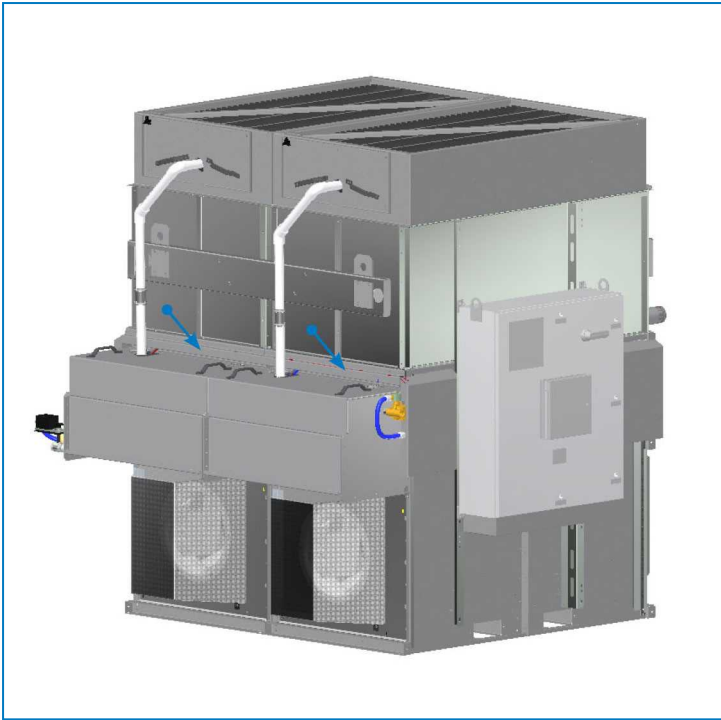


Fig. 19 Install wire cover

Accessory installation

The instructions below are applicable for configurations ordered as shown in figures 1A, 1B, 1C and 1D from "Shipping" on page 1. Accessories of option 1A may be factory installed. Refer to your submittal for details.

MANIFOLD AND LEAVING PROCESS FLUID TEMPERATURE SENSOR INSTALLATION

1. Place the ND80 flexible coupling (Victaulic BAC #202174M6) onto the hCore® Heat Transfer Technology system. See figure 20.



Series flow has two flexible couplings (Victaulic) per module, parallel flow has four per module. Refer to your submittal for the flow type.

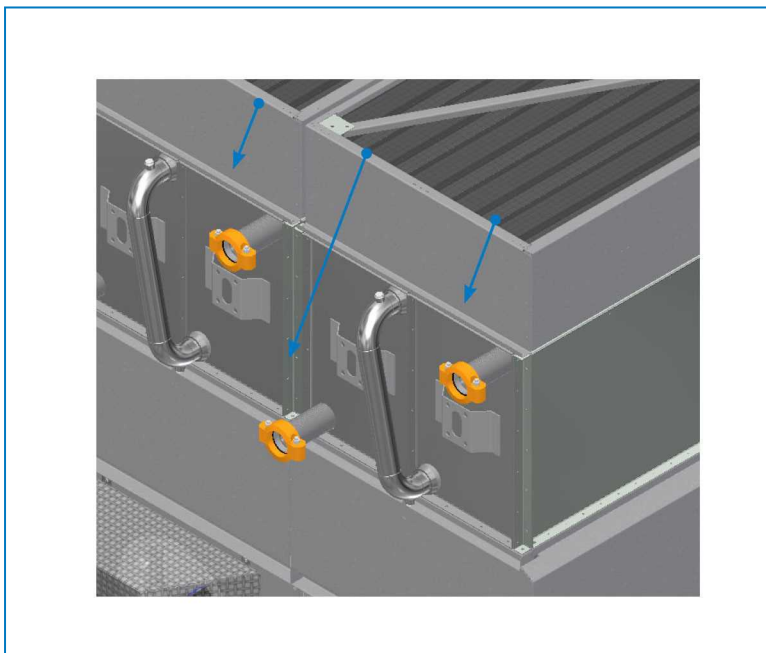


Fig. 20 Place flexible coupling (series flow shown)

2. Check the drawing in your submittal package for the quantity and the size of the pipe and location. Always start installing pipes from the side furthest from the intended system connection. See figure 21. Refer to your submittal for details.

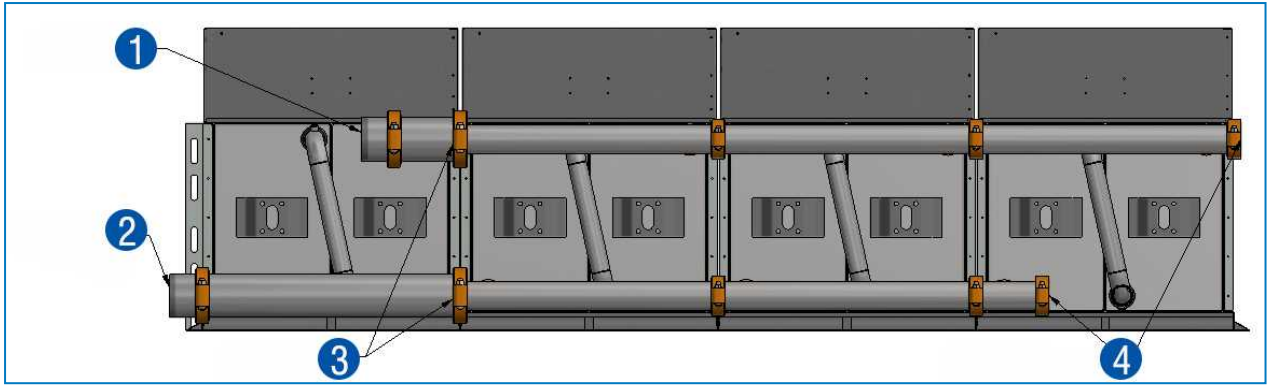


Fig. 21 Manifold layout - 1. Connection inlet, 2. Connection outlet (LWT port), 3. Victaulic reducer, 4. Victaulic with end cap.



Begin the manifold installation from the opposite end of the connection inlet/outlet.

3. Always start with the smallest diameter pipe on the engineering drawing with ND100 being the smallest possible size. Work toward the intended system connections, attaching the Victaulic unions as needed.



Some jobs will require Victaulic reducers to change diameter, see figure 21.

4. Install the connection outlet with the leaving process fluid temperature sensor port pointing at 45° toward unit. Run the wire through the cord grip and brackets. Install the bracket as needed. This wire will be routed through the same path as the fan communication wire and back to the iPilot® Control System panel. See figure 22 and 23.
5. Connect each connector to wire to the correct terminal block position. Please use the torque wrench on all cord grips and torque down to 5Nm.

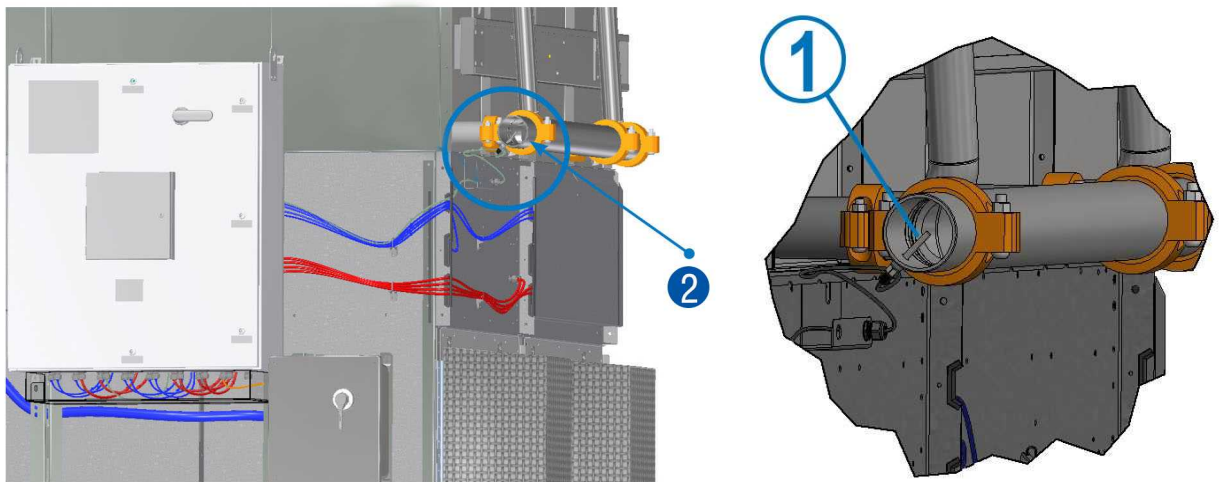


Fig. 22 and 23

Outlet and leaving process fluid temperature sensor

1. Leaving process fluid temperature sensor
2. Manifold connection outlet

FAN GUARD INSTALLATION

1. Remove the fastener from the EC fan system panel. The fastener will be reused in step 2. See figure 24A.
2. Place and align the fan guard mounting hole with the fan panel holes. Secure the fan guard with fasteners from step 1. See figure 24B.

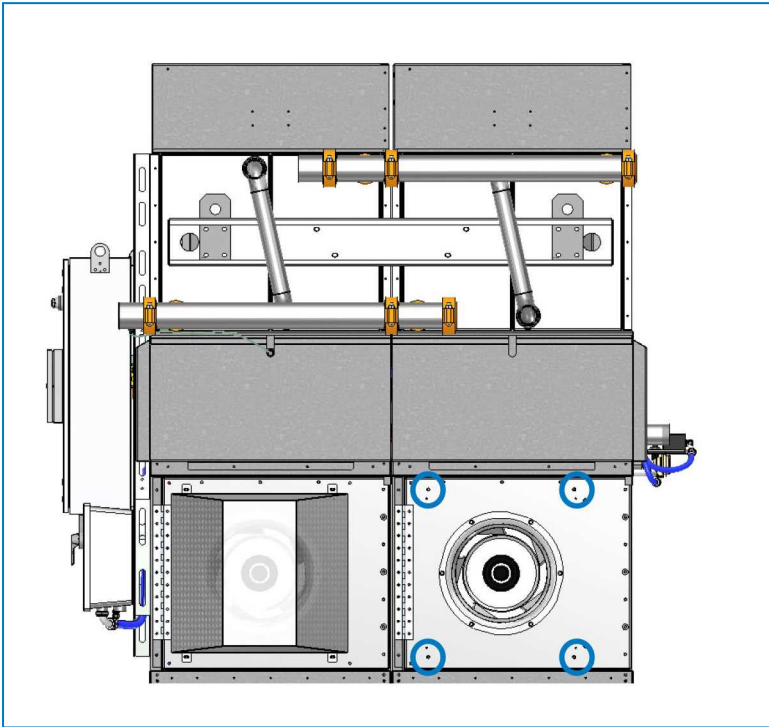


Fig. 24A Fan guard installation step 1

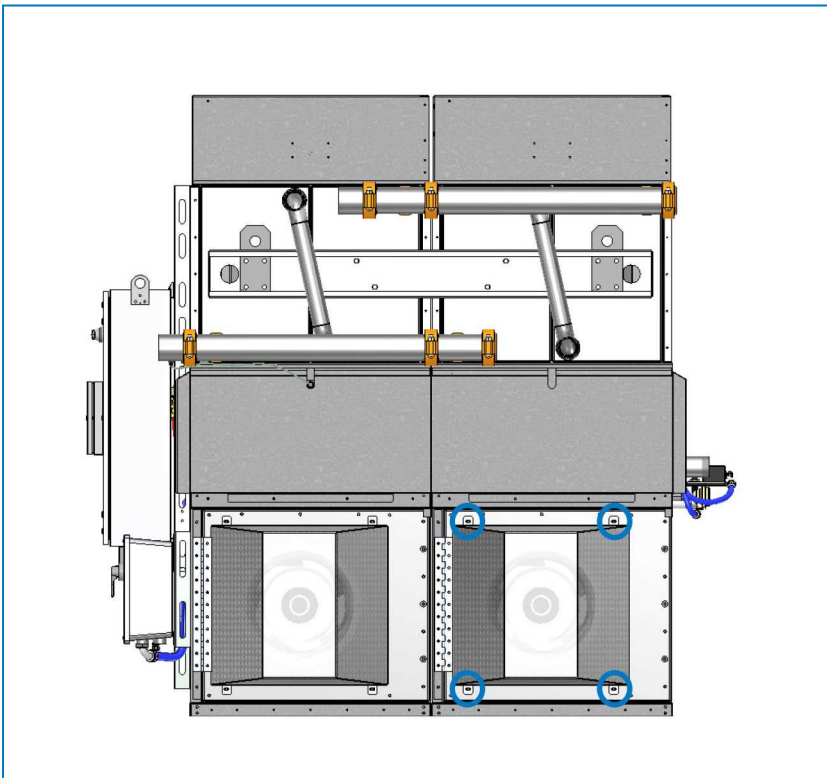


Fig. 24B Fan guard installation step 2

Sound attenuation



1. Discharge sound attenuation
2. Intake sound attenuation

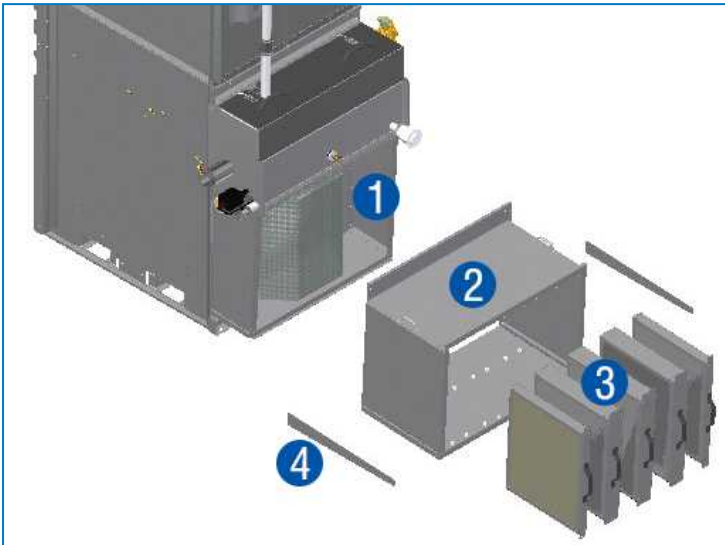
INTAKE ATTENUATION ASSEMBLY

Arrival at job site

1. When intake sound attenuation is provided, each Nexus® unit (single module or multi-module) will arrive with the following parts:
 - a) (1) frame per fan, < 25 kg each - ships installed or fully-assembled units, or ships loose in crate on units that are not fully-assembled to be field-installed by others
 - b) (1) attenuator with baffles < 45 kg - ships loose, with baffles zip-tied to attenuator; all attenuators for each unit ship in crate to be field-installed by others
 - c) Cover plates - quantity (2) for NXF-0403, and quantity (4) for NXF-0603, ships loose in crate to be field-installed by others
 - d) Hardware kit, including foam tape, ships loose in crate
2. Inspect all parts and ensure that they are in good condition

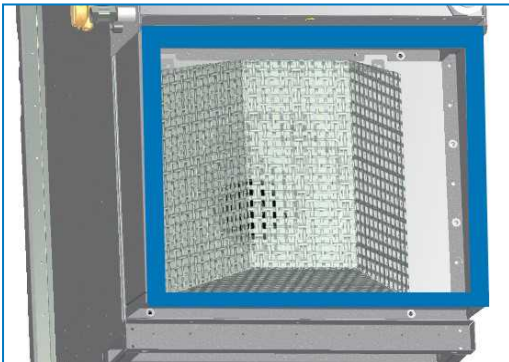
To assemble

1. Remove the zip ties and slide the baffles out for access to the inside of the attenuator for access to bolt hole locations inside of the attenuator.

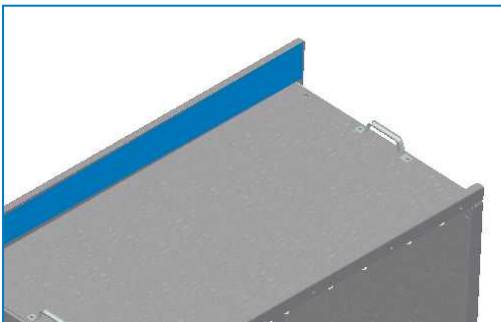


1. Frame
2. Attenuator
3. Baffles
4. Cover plates

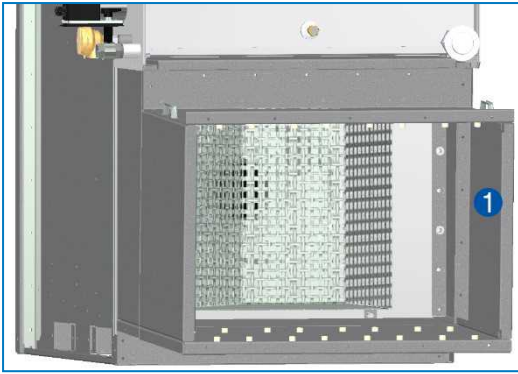
2. If equipment does not ship fully assembled, install frame onto unit.



3. Clean foam tape surfaces with acetone, and install foam tape on the frame as shown.
4. Lift the attenuator and align attenuator lip to the frame.

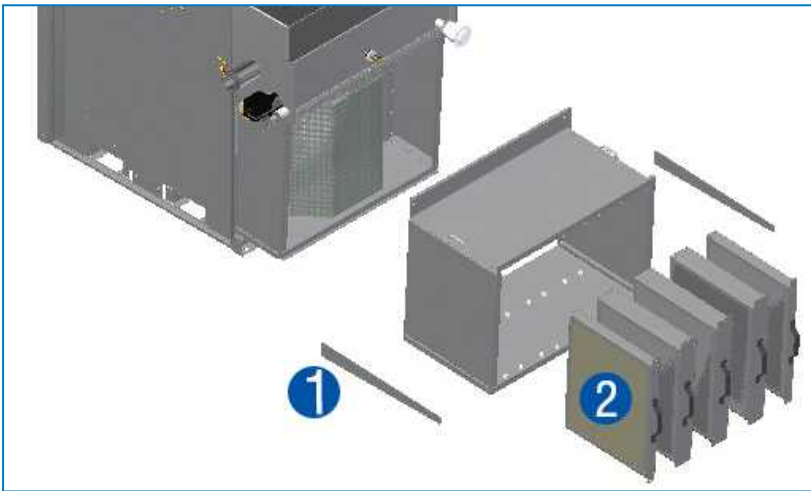


5. Fasten attenuator to frame using the required hardware, listed below



1. Attenuator frame

6. Install baffles using required hardware, listed below



1. Cover plates
2. Baffles

7. Install cover plates using required hardware, listed below

8. Hardware for intake attenuators

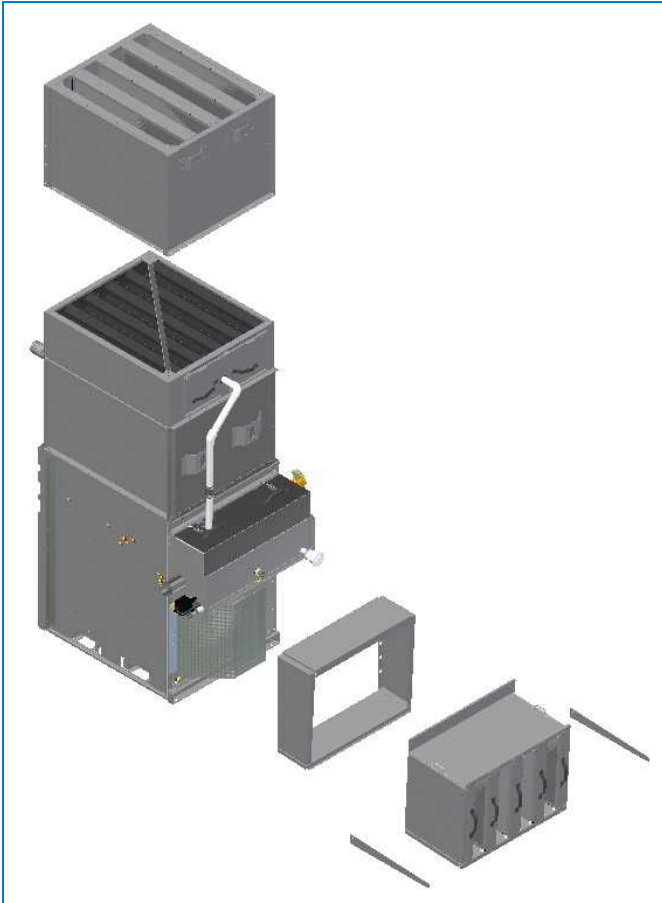
a) Galvanized steel protected by a Thermosetting Hybrid Polymer

- M8 x 25 bolts with flat washers and lock washers into weld tabs for attenuator and baffles
- M8 x 20 tappers for cover plates

b) Stainless steel

- M8 x 25 bolts with flat washers and lock washers into weld tabs for attenuators, baffles and cover plates

DISCHARGE ATTENUATION ASSEMBLY

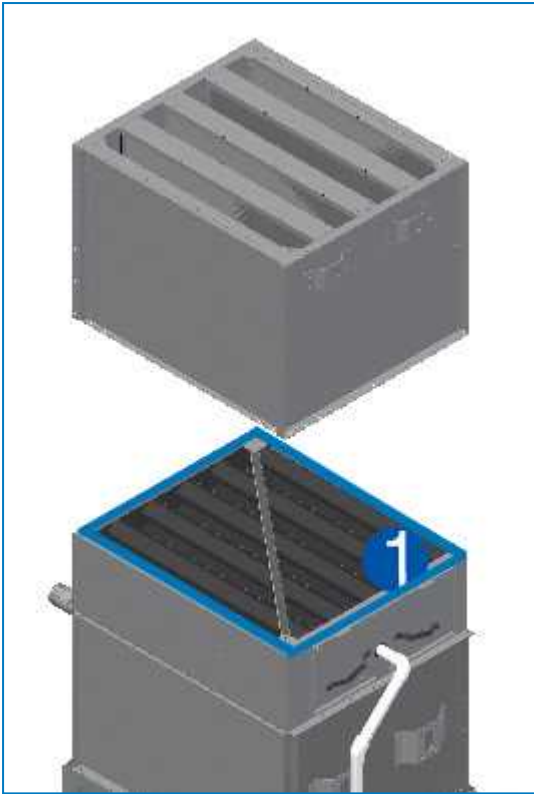


Arrival at job site

1. When discharge sound attenuation is provided, all components will be shipped loose and must be field-installed by others. Parts include the following:
 - a) (1) attenuator for up to three modules, or (2) attenuators for four to six modules, attenuators ship on skids
 - b) Hardware kit, including foam tape, ships in spray water basin
2. Inspect all parts and ensure that they are in good condition

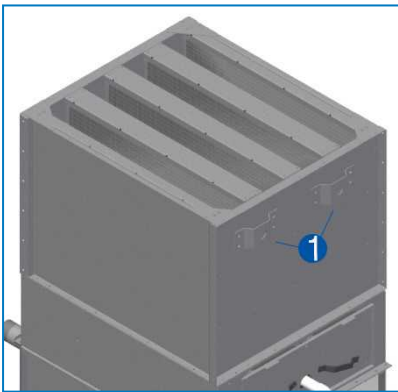
Assembly

1. Clean foam tape surfaces with acetone, and install foam tape on top of spray distribution section



1. Top of spray section

2. Using lifting points, lift attenuator into place



1. Lifting points

3. Fasten attenuator to unit using the following hardware:

a) BBD

- M8 x 20 tappers into spray frame

- M8 x 25 bolts with nut, flat washers and lock washers between attenuation sections

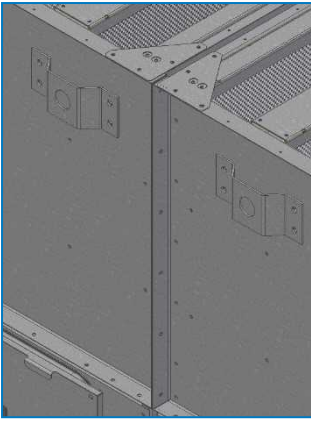
b) SST

- M8 x 25 bolts with flat washers and lock washers into weld tabs on spray frame

- M8 x 25 bolts with nut, flat washers and lock washers between attenuation sections

4. Fasten sections to each other (4-6 module only)

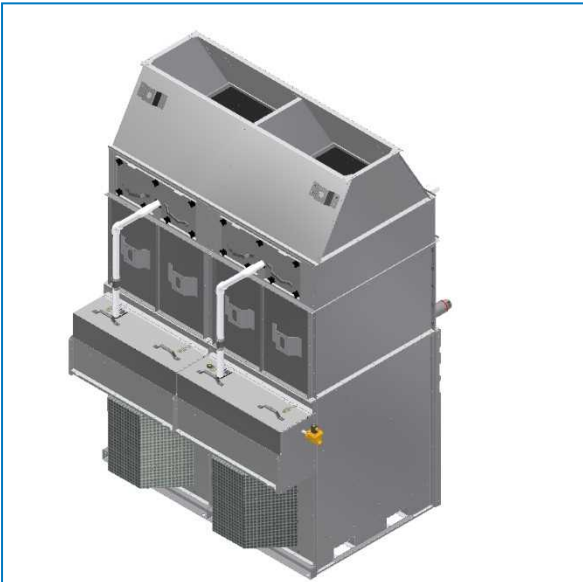
a) Lift using integral lifting points



Integral lifting points

- b) For lifting instructions and spreader bar dimensions, see table in "General Notes" on page 1
 - c) Use the "H" dimension in this table from the top of the unit, including discharge accessories
5. The unit can be rigged in a single lift as a completed assembly, per table and figure in "General Notes" on page 1

TAPERED DISCHARGE HOOD



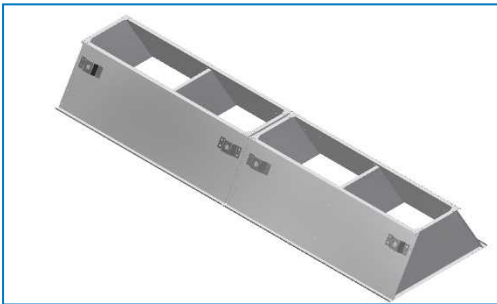
Arrival at job site

When tapered discharge hoods are provided, all components will ship loose and must be field-installed by others.



Parts include the following:

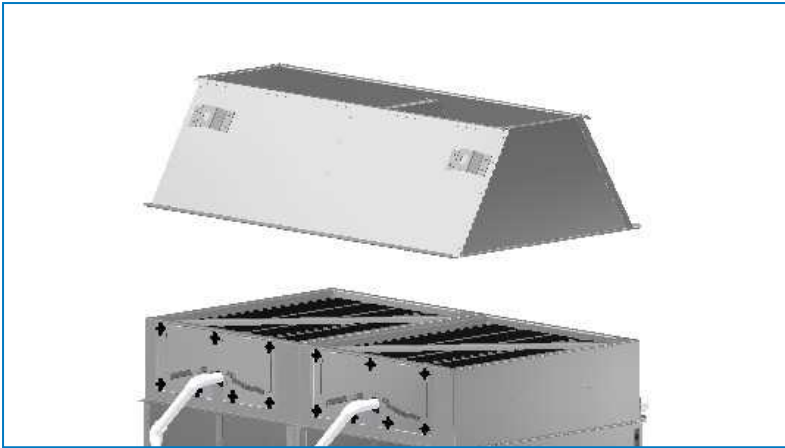
1. Tapered discharge hood - (1) hood for up to three modules, or (2) hoods for four to six modules
 - a) Gap plate attached to a single hood on 4-6 module units



- b) 1-3 module (1) section
 - c) 4-6 module (2) sections
 - 4 is (2) 2 sections
 - One with gap plates preinstalled
 - 5 is (1) 3 sections & (1) 2 section
 - One with gap plates preinstalled
 - 2 section is closest to the control panel
 - 6 is (2) 3 sections
 - One with gap plates preinstalled
 - d) Hardware kit, including foam tape
2. Parts will arrive as follows
 - a) Hoods will ship on skids
 - b) Hardware kit ships in water basin or in crate
3. Inspect all parts and ensure that they are in good condition

Assembly

1. Clean foam tape surfaces with acetone.
2. Install foam tape on top of spray distribution section.
3. Using lifting points, rig hood into place.

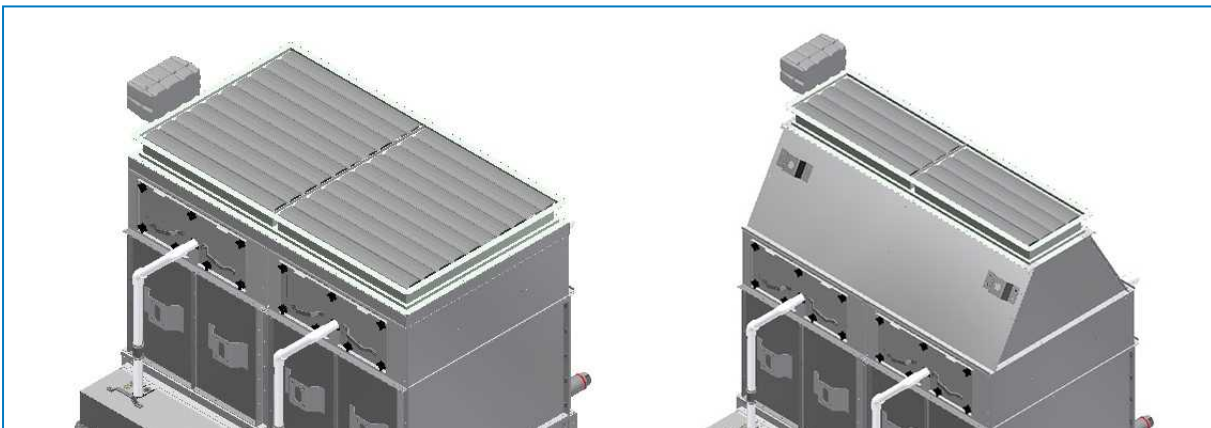


- a) Fasten attenuator to unit using the following hardware
 - M8 x 20 tappers into spray frame
 - M8 x 25 bolts with flat washers and lock washers between attenuation sections into weld tabs
- b) Stainless steel
 - M8 x 25 bolts with flat washers and lock washers into weld tabs for spray frame and attenuation sections

4. Fasten sections to each other (4-6 module only) with gap plate between sections.

POSITIVE CLOSURE DAMPERS

Positive closure dampers are available for applications that can benefit from reduced heat loss during the winter, including heat pump loops.



Arrival at jobsite

When positive closure dampers are provided, they ship separately as follows:

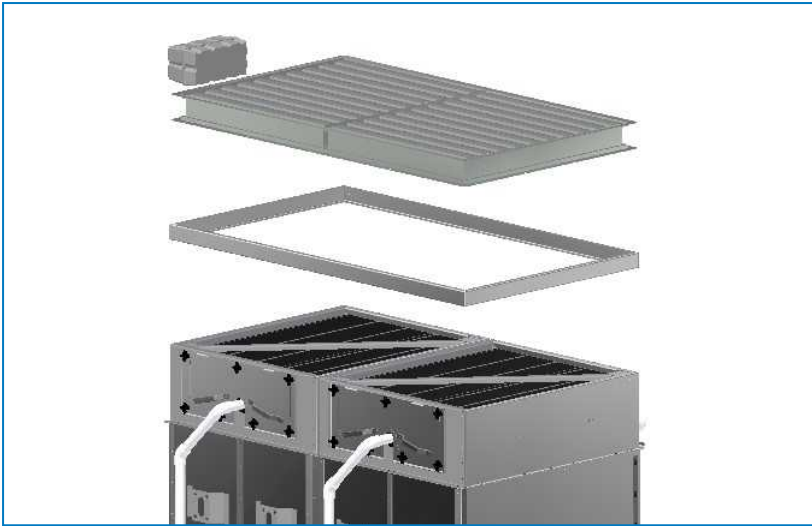
1. With tapered discharge hood - ships installed on hood, which ships separately from unit according to tapered discharge hood section .
2. Without tapered discharge hood - ships installed from factory on fully-assembled units, and ships loose on skid for units with other shipping methods.

Parts include the following:

1. Wiring cable for actuator, coiled up and installed on same side as control panel.

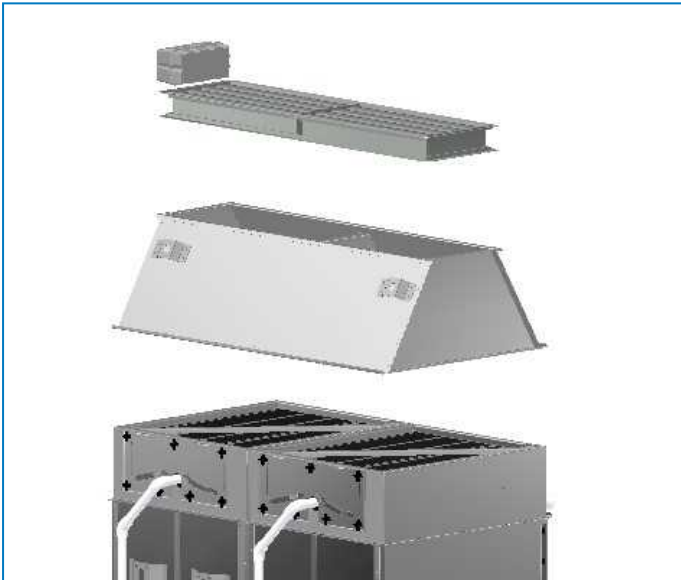
Assembly

When tapered discharge hood is not included:



1. Inspect all parts and ensure that they are in good condition.
2. For fully-assembled units, the positive closure damper assembly will be installed and wired at the factory.
3. For all other shipping methods, the dampers ship loose in crates for field installation by others, and wiring must be installed by others.

When included on the tapered discharge hood:



1. Install hood according to "Accessory installation" section of manual.
2. Install wiring cable from actuators to control panel, per wiring diagram. Zip-tie wiring cable to holes provided in the hood.

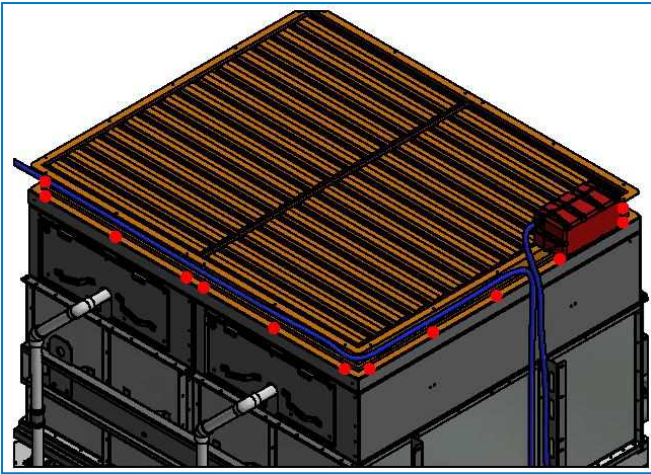
Wiring

To connect wiring:



The following procedure applies to all positive closure assemblies that do not ship factory installed.

1. Uncoil the positive closure damper wiring cable and route behind the control panel. Secure the wiring cable to the unit with zip ties as needed. For Nexus® units with more than 3 modules route the wiring cable from the far positive closure actuator along the outer flange of the positive closure damper frame securing with zip ties as needed.



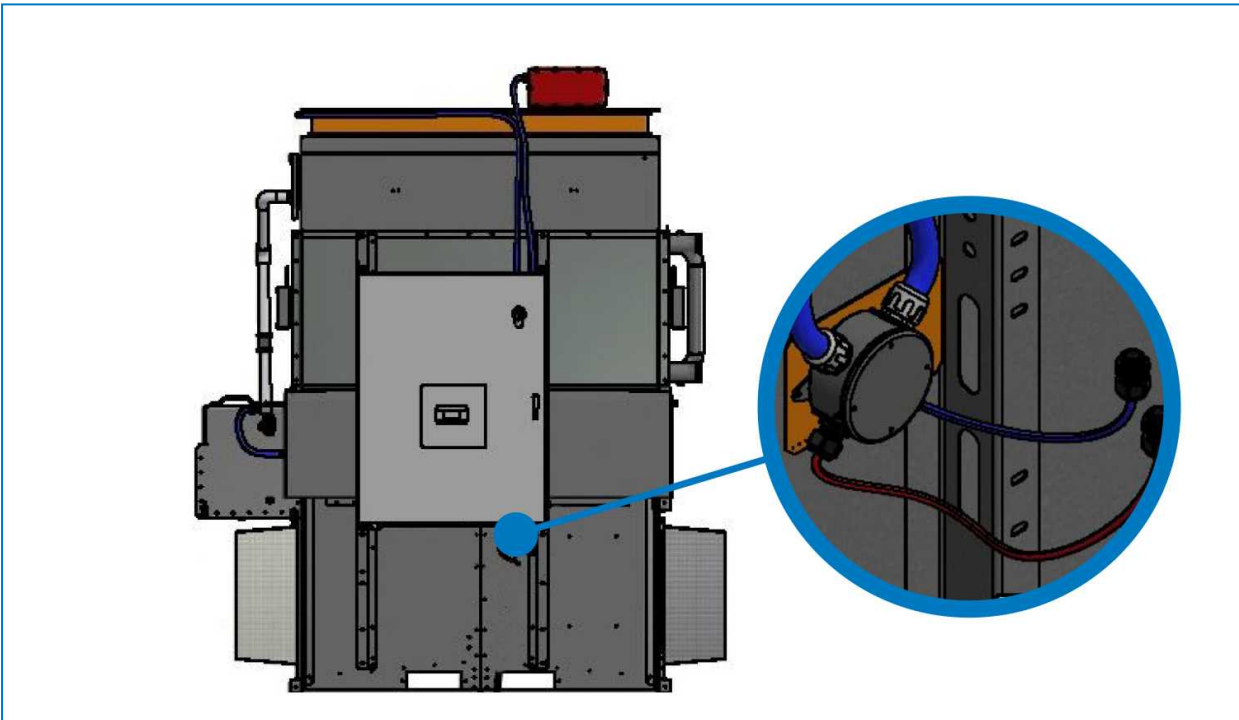
Positive closure damper wiring cable location

2. Secure the wiring cable into the positive closure damper junction box using the corresponding cable glands. Use zip ties as needed to secure the wiring cable. Inside the positive closure damper junction box combine all communication and power wires according to the wiring diagram below.

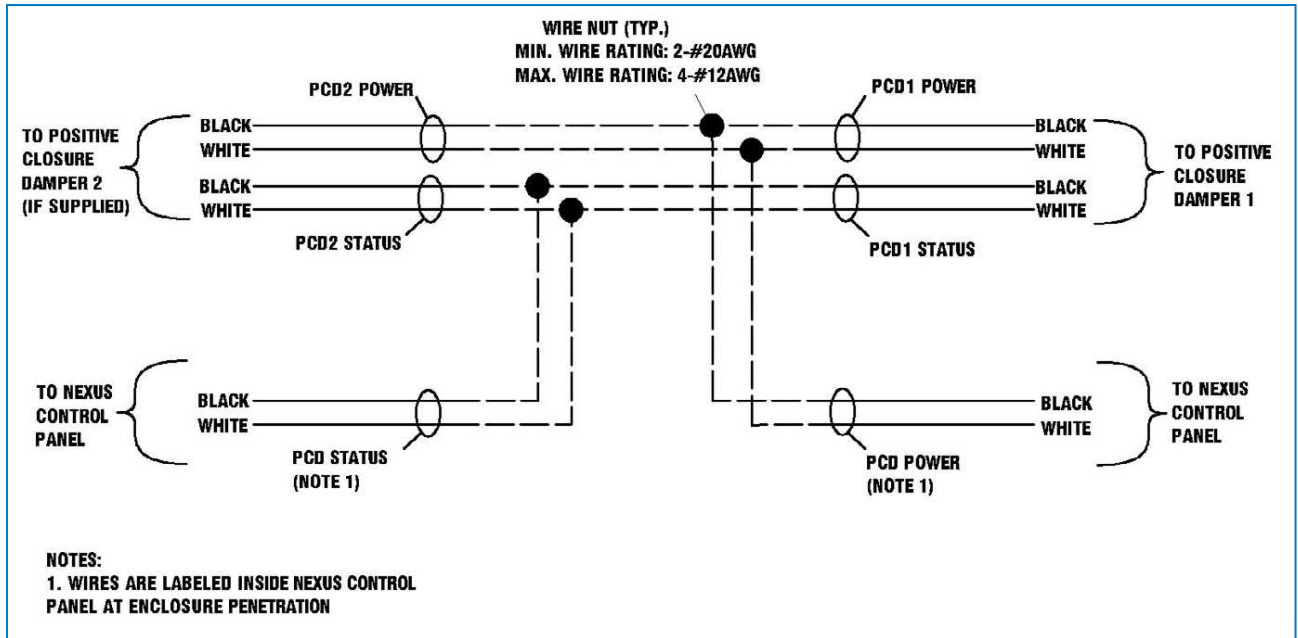


Only one set of damper actuator communication and power wires is terminated within the Nexus® control panel.

3. Secure all loose wiring with zip ties as needed and re-install the positive closure damper junction box cover.



Positive closure damper junction box connection



Positive closure junction box wiring diagram

DUCTING

The Nexus® cooler can be installed indoors and discharge air through ductwork installed by others. When ductwork is required, refer to the following:

1. Duct each module separately.
2. Intake
 - a) Add provision to remove ducting for maintenance purposes, ensuring enough clearance to open the swing out fan panel, per the submittal drawings.
 - b) Add provision to access the sump for maintenance.
3. Discharge
 - a) Internal partitions are required to prevent air bypass / recirculation between modules when partial load conditions do not require all fans to be running.
 - b) For tapered hood without positive closure dampers, ducting between modules can be attached to the internal partition(s) of the tapered hood.



- c) When the tapered discharge hood is not included, internal partitions should be installed in the ducting that extend to the air discharge of each module.
- d) Add provision to remove ducting for maintenance purposes
 - For all units with positive closure dampers, ensure that 5 cm of clearance above the dampers is available to allow them to open.

6

NXF WATER TREATMENT ACCESSORIES

Water Treatment Solutions Nexus®

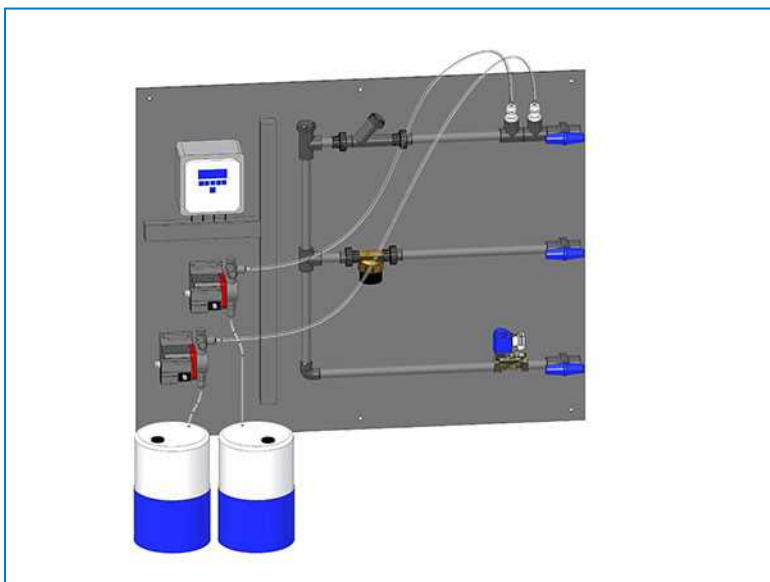
Standard

DiamondClear® Design with built in iPilot® - Automatic bleed control system



Traditional water treatment package

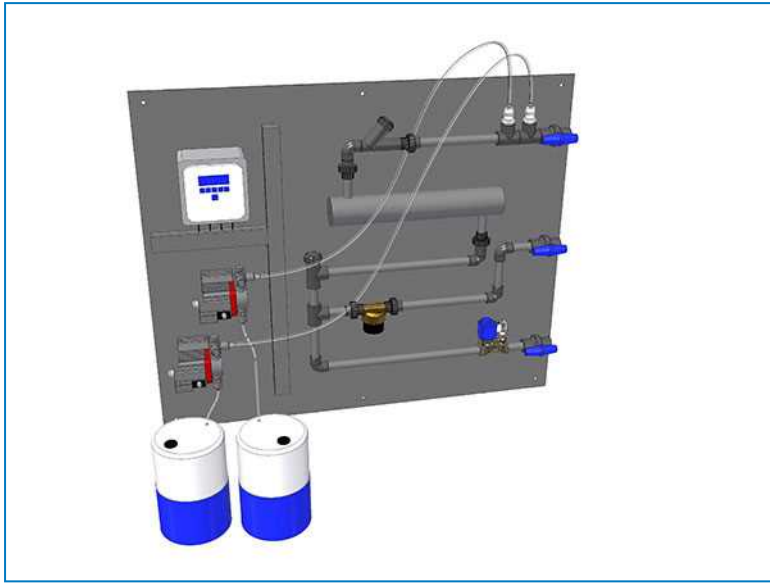
BCP NX 2 - Automatic dosing and bleed control package





UV light system package

BCP NX 3 UV - Automatic dosing with UV-lamp providing a 60mJ/cm² dosage and bleed control package
See more details in "Optional UV system" on the facing page.



Pre-treatment option

ZeRO 4 Nexus®: innovative reverse osmosis (RO) technology designed specifically for the Nexus® modular hybrid cooler



Optional UV system

The UV system has been designed to reduce bacterial growth. Please follow these assembly instructions closely to ensure reliable system operation.



CAUTION

Do not touch the glass portion of the bulb with bare hands. Always hold it at the ceramic ends.

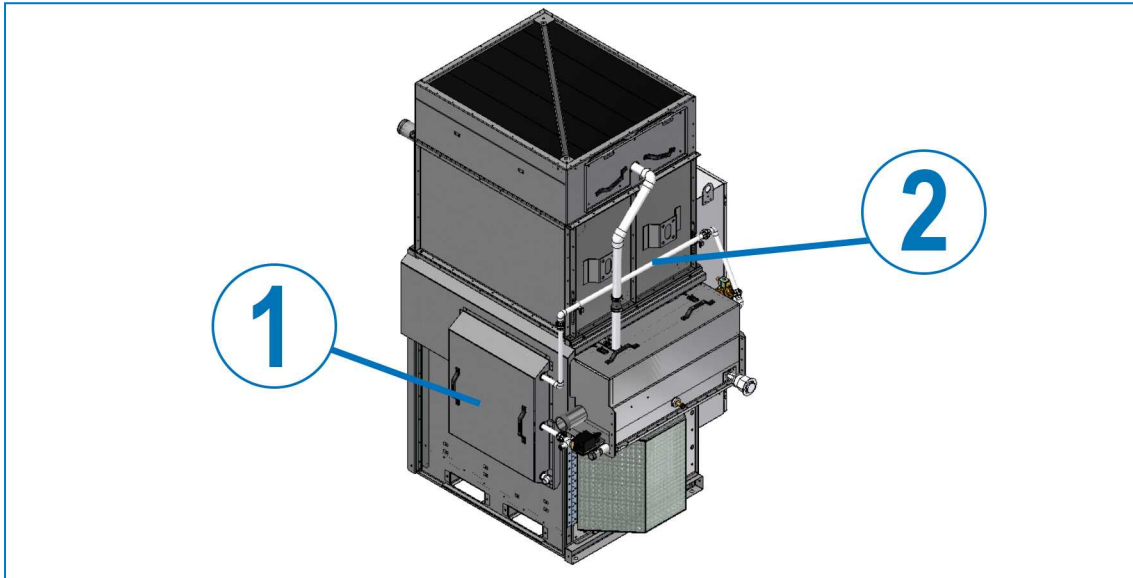


Figure 41 - Nexus® UV system

- 1. UV system enclosure
- 2. Crossover piping

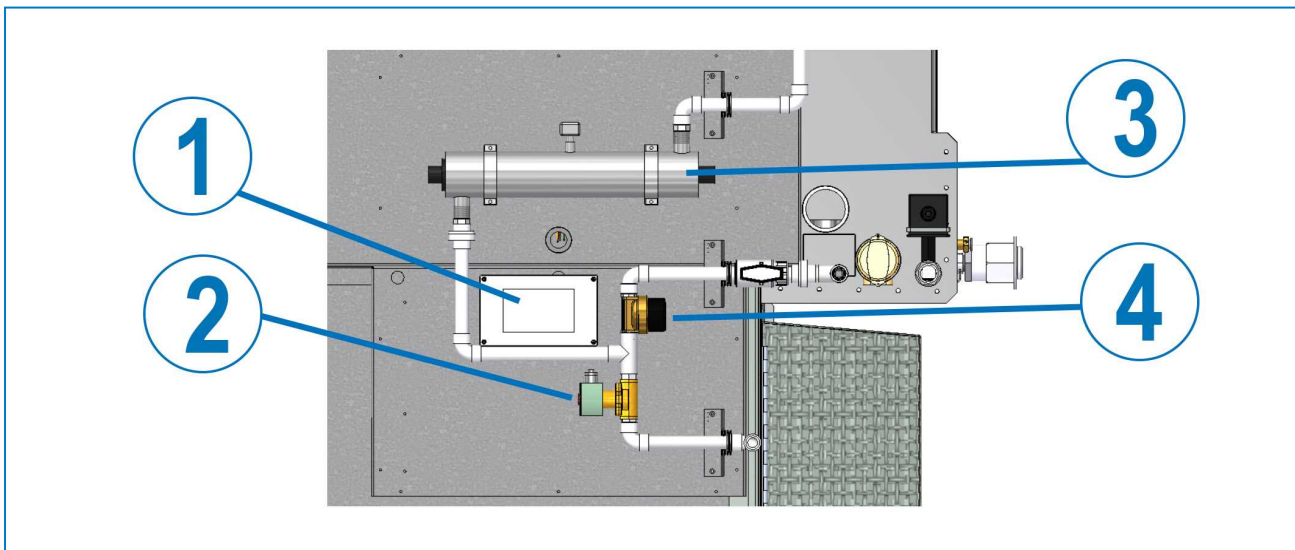


Figure 42 - UV system components view

- 1. Terminal box
- 2. Drain valve
- 3. UV reactor (bulb inside of reactor)

Arrival at jobsite

When the UV system is included, each unit (single-module and multi-module units) includes 1 UV panel for all modules in that unit.

- On fully-assembled units, the Nexus® UV system will be factory-installed with the exception of the UV light bulb, which is explained below.
- When units do not ship fully-assembled, the Nexus® UV system will be factory-installed with the exception of the UV light bulb, UV system crossover piping, and wiring between the UV system panel and the main control panel.
- For details, see drawings and wiring diagrams in the submittal.

To assemble

UV bulb

1. Remove the UV system enclosure cover. Handles are provided to ease the removal and installation of the enclosure panel.

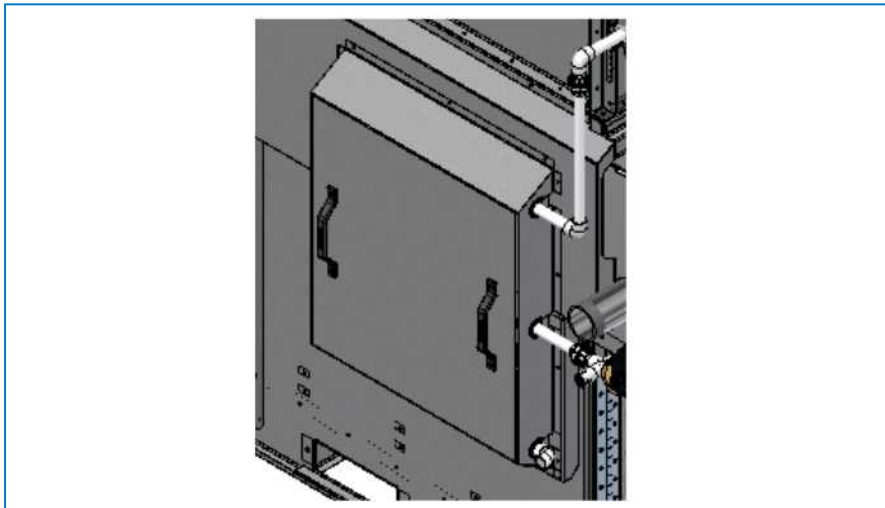


Figure 43 - UV system enclosure

2. Remove the lamp connector by squeezing the plastic locking tabs on the side of the connector.

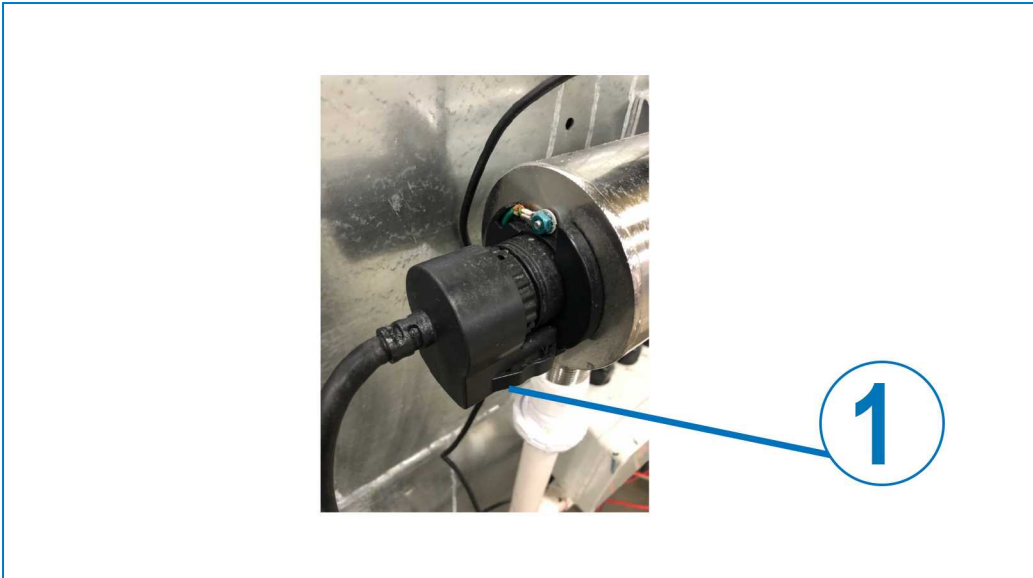


Figure 44 - Lamp connector

1. Locking tabs

3. The UV bulb ships inside of the Nexus® sump, adjacent to the UV system, to prevent shipping damage. remove the UV bulb from the Nexus® sump. Remove the bulb from the protective packaging.



CAUTION

Do not touch the glass portion of the bulb with bare hands. Always hold it at the ceramic ends.

4. Insert the new bulb fully into the chamber leaving about 50 mm of the bulb protruding from the chamber.



Figure 45 - Bulb connection

5. Attach the connector to the bulb, the connector will allow correct installation in one position.



Figure 46 - Nexus®

6. Push the connector against connector base together until an audible click is heard.
7. Replace the UV system cover onto the panel.

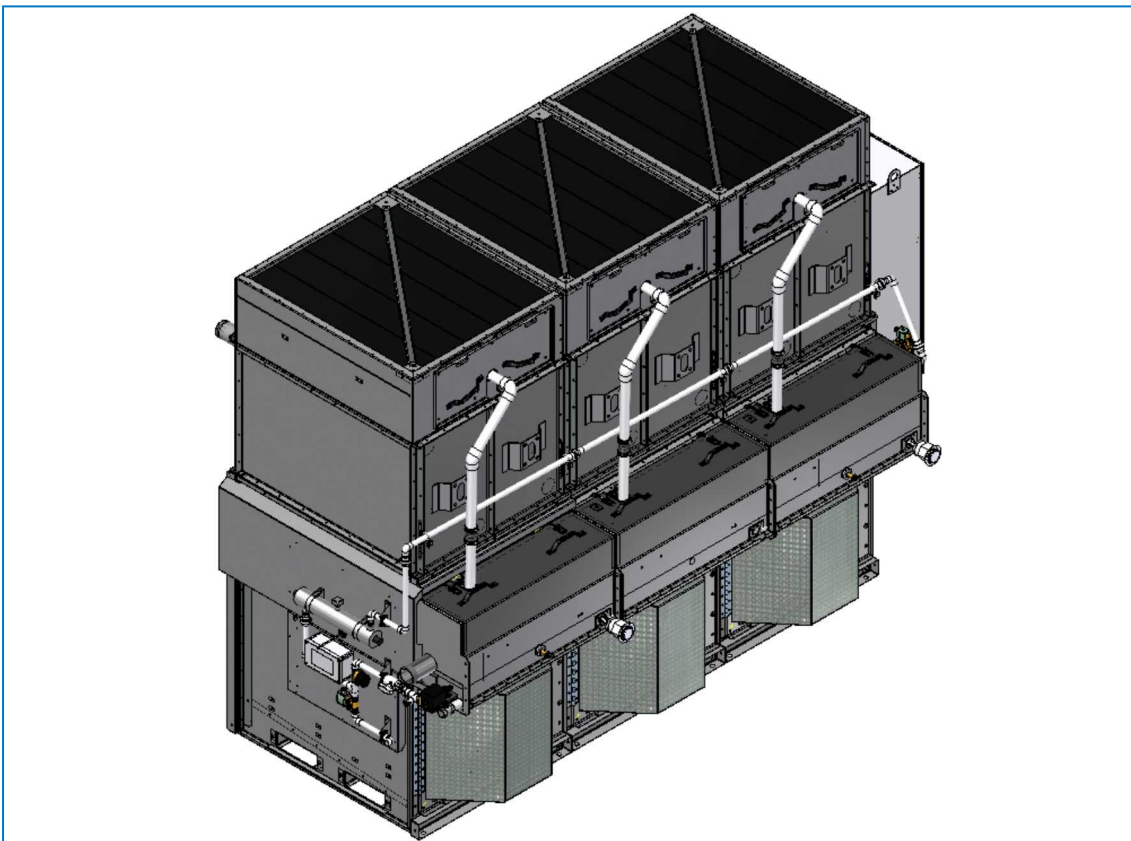


Figure 47 - UV system crossover piping for multi-module units

UV system crossover piping for units that do not ship with modules fully-assembled

After all modules are fully assembled on site, remove the crossover piping sections from the shipping crate. These piping sections are comprised of 1 to 2,1 m pipes with union connections on the ends. See the following table for piping lengths.

	Crossover Pipe Quantity	Crossover Pipe Length
1 module	1	1,1 m
2 modules	1	2,1 m
3 modules	1	2,1 m
	1	1 m
4 modules	1	2,1 m
	1	2 m
5 modules	1	2,1 m
	1	2 m
	1	1 m
6 modules	2	2,1 m
	1	2 m

1. Remove the U-bolts from the brackets that are on the face of the hCore® casing.

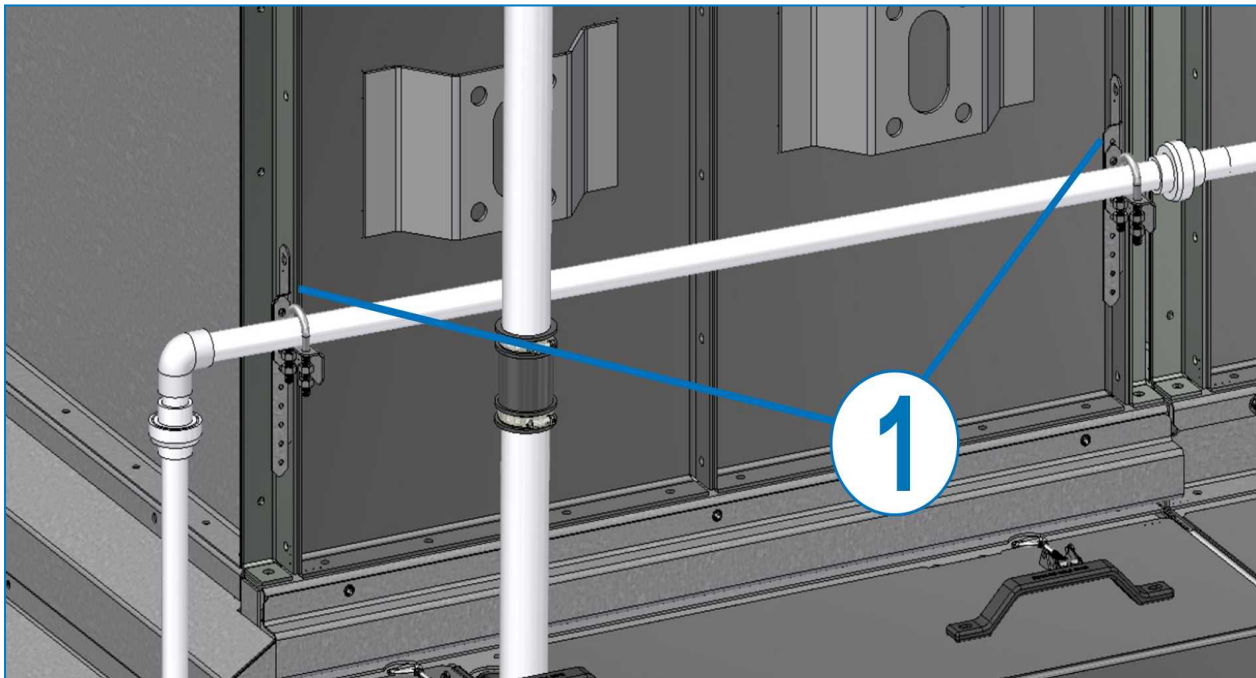


Figure 48 - Crossover piping assembly

1. U-bolts
2. Assemble piping sections in series using unions, and attach the assembled pipe section to the piping brackets using the U-bolts that were removed.

3. The assembled piping should extend from the UV system, across the sump face of the unit and back into the sump on the control panels side.

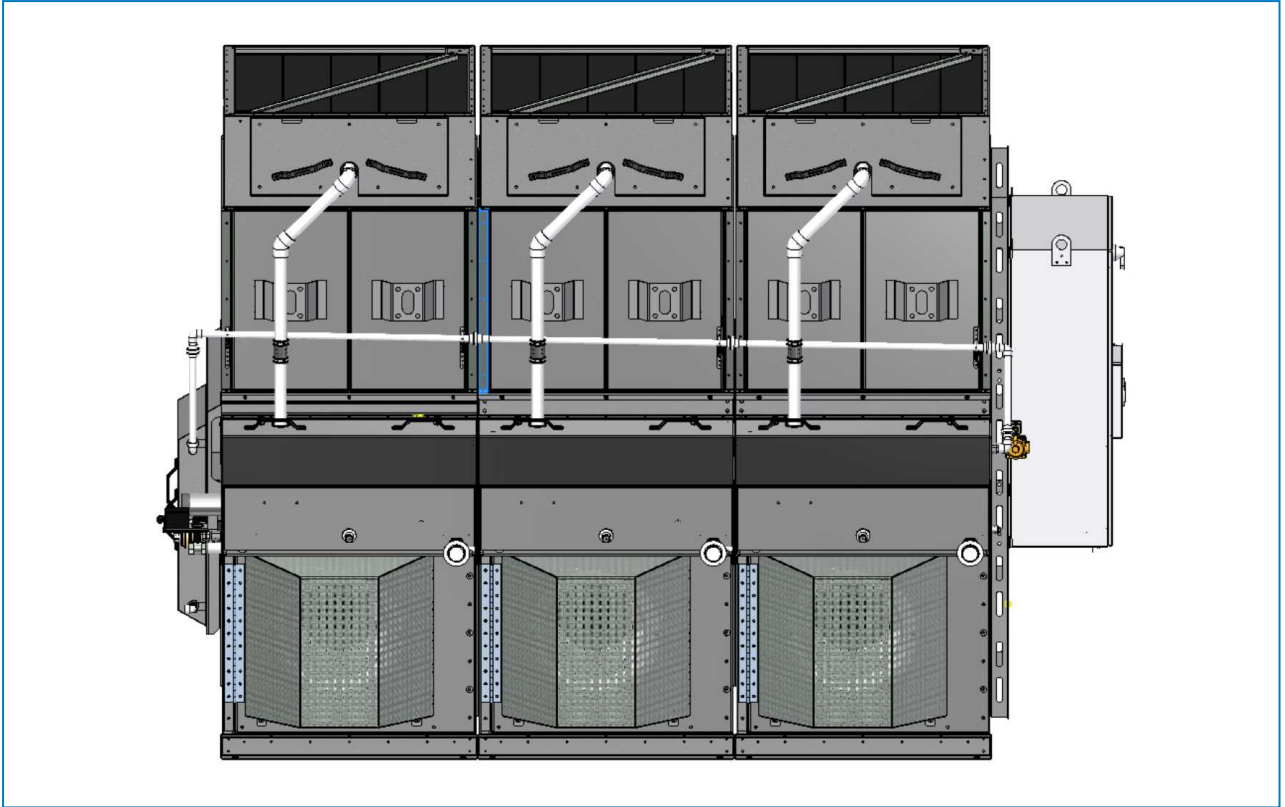


Figure 49 - Crossover piping installed.



NXF

INSPECTION PRIOR TO START-UP

General

Prior to start-up, the following services, which are described in detail in the Operating and Maintenance Manual (see table "Recommended maintenance and monitoring programme") must be performed.

Proper start-up procedures and scheduled periodic maintenance will prolong the life of the equipment and ensure trouble-free performance for which the unit is designed.



NXF

FURTHER ASSISTANCE & INFORMATION

The service expert for BAC equipment

We offer tailored services and solution for BAC cooling towers and equipment.

- Original spare parts and fill -for an efficient, safe and year round reliable operation.
- Service solutions - preventive maintenance, repairs, refurbishments, cleaning and disinfection for reliable trouble-free operation.
- Upgrades and new technologies - save up energy and improve maintenance by upgrading your system.
- Water treatment solutions - equipment for controlling corrosion scaling and proliferation of bacteria.

For more details, contact your local BAC representative for further information and specific assistance at www.BACservice.eu

More information

REFERENCE LITERATURE

- Eurovent 9-5 (6) Recommended Code of Practice to keep your Cooling System efficient and safe. Eurovent/Cecomaf, 2002, 30p.
- Guide des Bonnes Pratiques, Legionella et Tours Aéroréfrigérantes. Ministères de l'Emploi et de la Solidarité, Ministère de l'Economie des Finances et de l'Industrie, Ministère de l'Environnement, Juin 2001, 54p.
- Voorkom Legionellose. Ministerie van de Vlaamse Gemeenschap. December 2002, 77p.
- Legionnaires' Disease. The Control of Legionella Bacteria in Water Systems. Health & Safety Commission. 2000, 62p.
- Hygienische Anforderungen an raumluftechnische Anlagen. VDI 6022.

INTERESTING WEBSITES

Baltimore Aircoil Company	www.BaltimoreAircoil.com
BAC Service website	www.BACservice.eu
Eurovent	www.eurovent-certification.com
European Working Group on Legionella Infections (EWGLI)	EWGLI
ASHRAE	www.ashrae.org
Uniclîma	www.uniclîma.fr
Association des Ingénieurs et techniciens en Climatique, Ventilation et Froid	www.aicvf.org
Health and Safety Executive	www.hse.gov.uk

ORIGINAL DOCUMENTATION



This manual is originally made in English. Translations are provided for your convenience. In the event of discrepancies, the English original text shall prevail over the translation.



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A series of horizontal dotted lines spanning the width of the page, providing a template for writing or drawing.





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COOLING TOWERS

CLOSED CIRCUIT COOLING TOWERS

ICE THERMAL STORAGE

EVAPORATIVE CONDENSERS

HYBRID PRODUCTS

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