




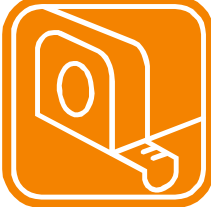








1201-4 Street
Nisku AB T9E 7L3
P: 780.955.8757
F: 780.955.8696
www.twapanel.com

TWA MODULAR ACTIVE CHILLED BEAMS
Installation and Commissioning

TABLE OF CONTENTS

1	RECOMMENDED TOOLS.....	3
2	INSTALLATION.....	3
3	WATER & AIR SYSTEM START-UP.....	5
4	ACTIVE CHILLED BEAM STARTUP.....	6
5	ACTIVE CHILLED BEAM COMMISSIONING.....	7
6	OPERATION AND MAINTENANCE.....	7
7	OPTIONS.....	8

1 RECOMMENDED TOOLS

 <p>Utility Knife</p>	 <p>Tape Measure</p>	 <p>Tin Snips</p>
 <p>Mounting Hardware</p>	 <p>1/4" Drill and Screw Driver Adapter</p>	 <p>Pencil</p>
 <p>White Gloves</p>	 <p>Level</p>	 <p>Duct Sealant</p>
	<p>A touch-up paint kit is supplied with each beam shipment</p> <p>Instructions:</p> <p>Warning: Do not spray paint directly onto the beam surface.</p> <ol style="list-style-type: none"> 1) Spray paint onto a clean scrap surface (i.e. cardboard...etc). 2) Using the applicator brush apply the paint to any scratches or blemishes. 	

2 INSTALLATION



Warning:

Do not pull down on the bomb-bay doors to open as damage will occur to the spring latch. To open properly, push the face of each door (pushing in to the beam) at each end until you hear the spring latches release. Relieve pressure and the door will drop open. To close, push the face of each door at each end until the spring latches catch.

1. Protective film or cardboard at bomb-bay doors should not be removed until final commissioning of building is being conducted.

**Warning:**

Do not remove protective film/paper within the "bomb-bay" doors prior to commissioning the system. Units are not to be used for temporary heating and/or cooling without prior written consent from the consultant.

2. Units are to be mounted plumb and level.
3. Use minimum 1/10" (2.0 mm) cable, rated at 300 lbs (136 Kg) breaking strength, or 1/2" (12.7 mm) threaded rod to support all four corners of the unit. Wire used to mount ceiling grid systems is NOT considered acceptable for mounting modular active chilled beams. T-bar, ceiling grid system shall NOT be used to support the modular active chilled beam weight.
4. Spring vibration isolation at each mounting bracket is NOT required.
5. Flexible duct material may be used to join the ventilation air to the modular active chilled beam duct connections. However, rigid duct connections generally provide a tighter seal.
6. Slotted flat edge of mounting bracket is to be mounted up, near the top of plenum box.
7. The Mounting bracket is to be mounted no closer than 1/2" from the end of the mounting rail on the side of the plenum box.
8. Co-ordinate final position of modular active chilled beam with the general contractor / T-bar ceiling grid installer. Adjust height of beam to mount flush with finished ceiling.
9. Once beam has been placed in final mounting position, affix each mounting bracket to plenum box using #8 x 1/2" long self tapping sheet metal screws and approved duct sealant. Recommended mounting bracket locations are highlighted in the shop drawing package.
10. The plenum box operates under pressure, so a tight seal around the entire plenum box is required. Any perforations made to the plenum box or observed during installation must be sealed with approved duct sealant to ensure proper operation of the beam.
11. Screw primary air duct connection to 1" standing collar of plenum box, and seal assembly with approved duct sealant. Foil or fabric duct tape must not be used to seal duct joints.
12. Seismic restraint and/or cross-bracing of units to be in compliance with local codes. Twa Panel Systems Inc. recommends that installing contractors confirm mounting methodology is in compliance with all local state, federal, or provincial codes, by sourcing approved installation mounting details directly from the consultant.
13. Water connections to be made via specified means only. If a threaded connection is to be sweated onto the coil header then two wrenches should be used to make the final connection to protect the header from being bent while tightening.

14. The branch piping is to be installed higher than the beams to prevent air pockets from forming within the beam.
15. Install automatic or mechanical air vents as scheduled by the consultant for each floor, zone, and necessary high point.
16. If steel water pipe is to be used, adequate system filtering should be utilized to prevent fouling of the chilled beam coils.
17. If two unlike metals are to connect then di-electric isolation maybe required in accordance with local codes and approval by the design consultant.
18. The balancing damper (iris or aperture type) should be installed, in the ductwork, as per the damper manufacturer's recommendations. If the damper is located too close to the chilled beam, the airflow inside the beam plenum box may be disrupted and the supply air could be adversely affected.

**Warning:**

Twa Panel Systems Inc. assumes no liability for improper or inappropriate mounting techniques. The contractor is responsible for installing beams by following all local codes, seismic codes, and project specifications. IN NO WAY do these installation instructions supersede the local codes and project specifications.

3 WATER & AIR SYSTEM START-UP

1. Protecting the chilled beam coils during the water system flushing is CRUCIAL.

**Warning:**

Never flush the system piping with the modular active chilled beam coils connected to the piping network. Contaminants and debris within the pipes may plug the coil(s) and cause the chilled beams to be restricted from delivering the required cooling and/or heating capacities. Irreparable damage to the coil could occur.

2. The water system flushing/start-up procedure should follow the Mechanical Consultants procedure as specified within the project specifications.
3. The water system should be fully purged of air and should eliminate the formation of trapped air within the system.
4. The air system start-up procedure should follow the Mechanical Consultants procedure as specified within the project specifications.
5. The ductwork should be free of debris as not to contaminate the chilled beam plenum boxes.

4 ACTIVE CHILLED BEAM STARTUP

6. Protective film or cardboard at bomb-bay doors should not be removed until final commissioning of building is being conducted.



Warning:

Do not remove protective film/paper within the “bomb-bay” doors prior to construction completion. The plastic film or cardboard installed at the inlet of the coil is used to prevent dust and dirt from accumulating inside the coil during construction

Note: The primary air can be operated to de-humidify the space, providing the protective film or cardboard is installed within the “bomb-bay” doors. Do not start the air handling unit which services the chilled beams until the building is ready to be occupied.

7. Coils may be connected to the water lines after testing and flushing of the distribution piping is complete. Circulation of water through the coil should not occur until construction is complete and the building has been cleaned and the air has been fully dehumidified.



Warning:

Operating the chilled water coil before the design relative humidity level is reached in the occupied space, could cause condensate to form on the coils, and fin bridging with gypsum dust and dirt resulting in significant cleaning effort to be required

8. To control the relative humidity of the space, the air system is operated to dehumidify the envelope. The air handling unit is typically operated for a period of days or up to a week or more before removing the cardboard or plastic film from the perforated center section of the active chilled beam (bomb-bay doors). During this period, the air flow may be commissioned and balanced to the design flow rate for each beam or group of beams.

Once the desired level of relative humidity is reached in the building, the protective cardboard/plastic film installed, at the air side inlet to the coil, may be removed and water flow through the coil may commence.

Note: As it does not produce condensation on the coil, the heating coil operation could begin before the building envelope has been dehumidified, if so desired. To prevent dirt accumulation on the coil fins the building should be at sufficient level of cleanliness before removing the protective cardboard/plastic film.

9. It is recommended to start with chilled water temperatures 10-15°F (5-8°C) higher than the design condition, and slowly lower the system chilled water temperature down to the design condition to help assure that condensation at the coil does not occur. This process should take several days or even up to a week or more, lowering the

temperature by small increments each day. During this time, setup and balancing of the water flow to each coil may be performed, as per the project schedule. This is also the recommended time to check the operation of water side controls, (typically room thermostats) assuming that building conditions are such that cooling operation is required.

5 ACTIVE CHILLED BEAM COMMISSIONING

1. The scheduled air and water flow rates through the individual beams along with the scheduled operating plenum static pressure should be confirmed as being balanced properly during the commissioning of the air and water systems.
2. Beams are equipped with a static pressure testing port on each individual plenum body.

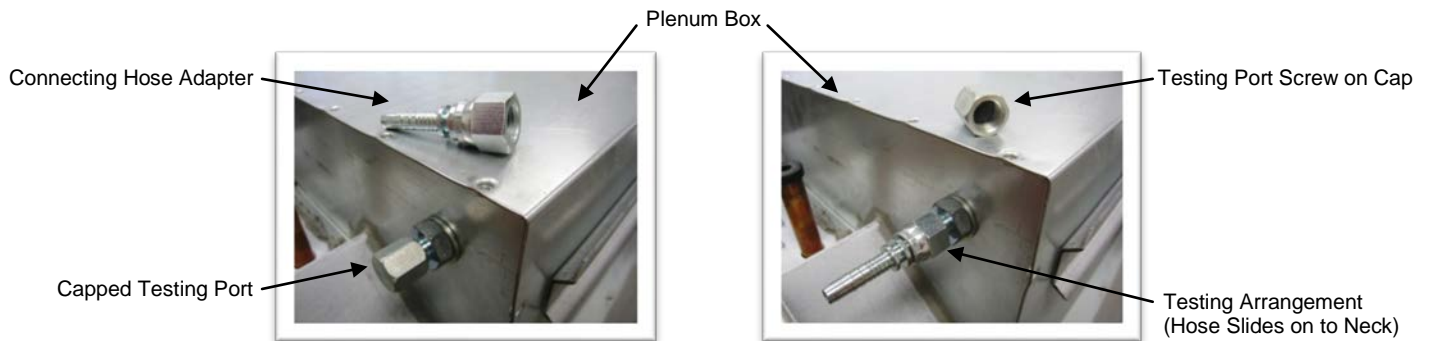


Figure 1: Static Pressure Testing Port Location

3. The cardboard/plastic film should only be removed once the building has met a certain level of cleanliness and the relative humidity has reached the design condition. Once this criterion has been met then the cardboard/plastic film can be removed and the beams will become fully operational.
4. The minimum operating plenum static pressure required for each individual beam is 0.3" w.c., (70 Pa).

6 OPERATION AND MAINTENANCE

1. Once the air and water flow rates, plenum pressure, and controls are fully commissioned and the beams are operating effectively then the operation requirements are limited to maintenance and future adjustments to the systems.
2. It is recommended that the coil within the chilled beam is inspected after the first 3 and 6 months of operation. Thereafter, a maintenance schedule should be established to check the coil loading at regular intervals.

- The coil within the beam can be cleaned with a soft bristle brush attached to a vacuum.
 - Inlet to bomb-bay doors can also be cleaned with a soft bristle brush attached to a vacuum.
 - Discharge openings can be washed with a mild detergent and water mixture using a soft nylon brush. Care should be exercised not to “scrub” the paint finish vigorously to avoid damaging the paint finish.
3. An “Automated water system cleaning procedure” (DDC controlled) is recommended during the first 6 month of operation. The recommended procedure is as follows:
- Start by opening all zone valve 100% at midnight; fix dew point temperature set point, CWS pump = 100%
 - Run pump 15 minutes; reset DDC to auto control
 - Check system water filter frequently

7 OPTIONS

1. A factory manufactured aluminum installation template is available to the contractor for an additional cost.
2. Desiccant gel packs are available for an additional cost, if long term on-site storage is a project requirement. Please advise the factory if special packaging is a requirement for your project.
3. “Push-on” flexible rubber hoses with a braided steel jacket are available for an additional cost. The hoses allow for reduced labor, by facilitating quick piping assemblies.