

INSTALLATION & MAINTENANCE INSTRUCTIONS

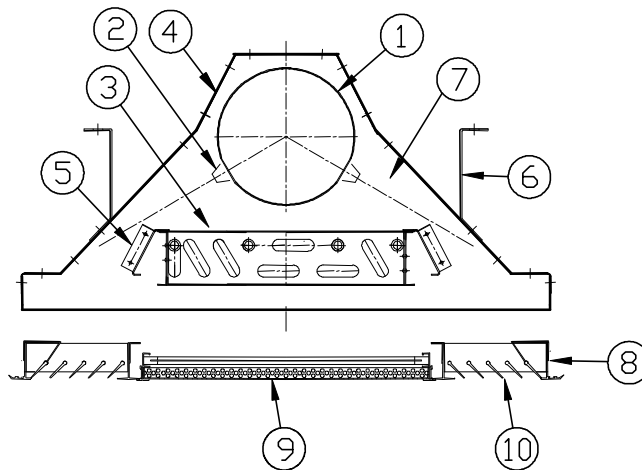
ACTIVE CHILLED BEAM



ACB40 & ACB50

ACB40 DESCRIPTION

Active Chilled Beam ACB40 2 and 4-Pipe Chilled Beam Units are designed for 'Lay-In' installation in the ceiling with an exposed supply/return air fascia designed to discharge air across the ceiling from the two supply air outlets, with return air through the centre of the unit.



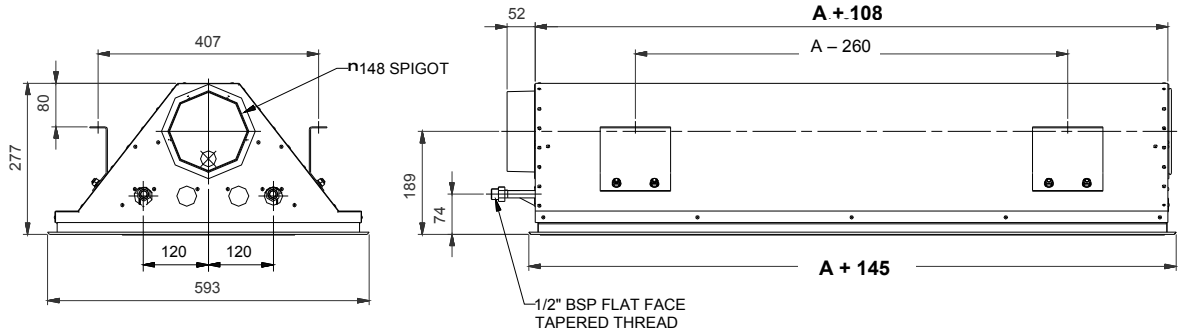
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| 1. Primary air plenum | 8. Combination Supply/Return Air Grille Assembly |
| 2. Primary air nozzles | 9. Return air grille (perforated metal panel) with Lint Screen |
| 3. Heat Exchanger Coil | 10. Supply Air Grille Element |
| 4. Unit Case | |
| 5. Coil Mounting Frame | |
| 6. 'Stand-Up' Mounting Brackets | |
| 7. Entrainment Camber | |

UNIT CONSTRUCTION

As illustrated above, each ACB40.05-A.282 Active Chilled Beam induction unit is comprised of:

- 150mm Primary Air plenum (1), open at both ends of the unit for interchangeable handing, fitted with two rows of primary air nozzles (2), 1 row for each supply outlet.
- Mounting brackets (6) located mid-height of the unit with 2 x $\varnothing 11 \times 50$ mm mounting slots per bracket.
- Twin air entrainment / mixing chambers (7) formed by the unit case (4), primary air plenum (1), secondary heat exchanger coil (3) and coil mounting frame (5).
- 2-Pipe secondary heat exchanger coil (3), constructed of 1/2" copper tube mechanically expanded into 0.145mm thick aluminium fins, complete with brass 1/2" BSP Male fitting water inlet / outlet connections,
- The heat exchanger coil (3) is attached to the coil mounting frame (5) by removable 6mm fixing screws and is protected by a mesh lint screen above the return air grille section (9).
- Combined Supply/Return Grille (8): 4-Active Slot low resistance supply air grilles (10) are arranged on both sides of the centre unit return air grille (9) which incorporates the return air lint screen.
- The serial number plate is located at the outer bottom side of the entrainment chamber

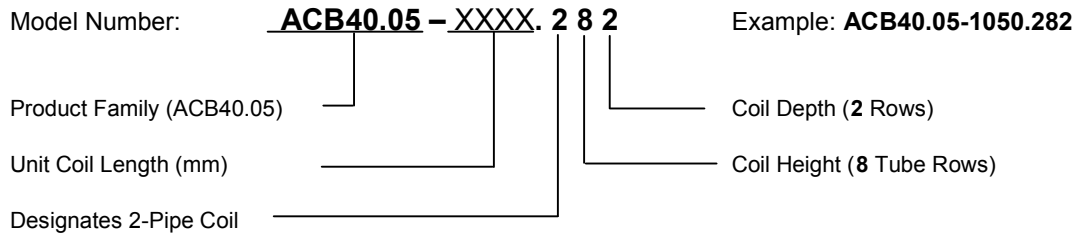
DADANCO Active Chilled Beam ACB40 2-Pipe units for ceiling grid 'Lay-in' tile systems are manufactured to suit three different active coil lengths, and are suitable for any combination of air and water connections. (Specify unit configuration at time of order)



PHYSICAL DATA

Active Chilled Beam	Coil Finned Length A (mm)	Overall Case Length (mm)	Grille Face Overall Length (mm)	Unit Weight (kg)	Coil Water Capacity (Litres)	Installation Type
ACB40.05-0500.282	500	608	595	17.0	1.186	Nominal 595x595mm suspended T-Bar Ceiling 'Lay-In'
ACB40.05-1050.282	1050	1158	1195	29.0	2.316	
ACB40.05-1500.282	1500	1608	1795	49.5	3.246	

UNIT NOMENCLATURE



STANDARD SPECIFICATION

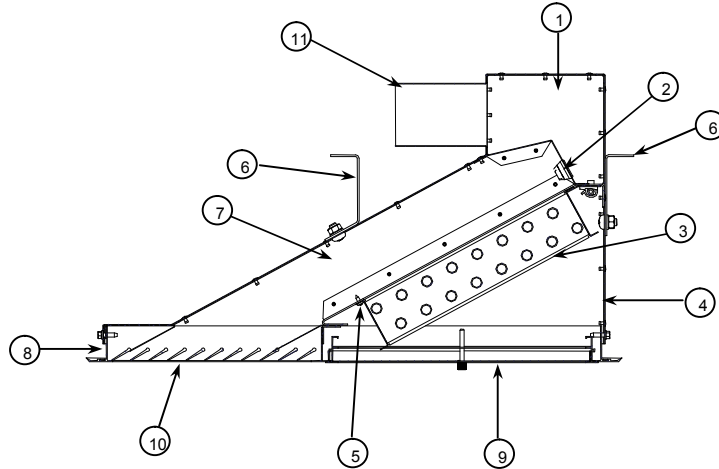
- 1/2" BSP flat face tapered thread water connections.
- Return Air Grille - Perforated Metal Panel.

OPTIONS

- 1/2" SAE flare or 1/2" plain copper stub water connections (Specify at time of order)
- Return Air Grille options - Egg-crate Metal Panel (Specify at time of order).

ACB50 DESCRIPTION

Active Chilled Beam ACB50 2 and 4-Pipe Chilled Beam Units are designed for 'Lay-In' installation in the ceiling with an exposed supply/return air fascia designed to discharge air across the ceiling from the two supply air outlets, with return air through the centre of the unit.



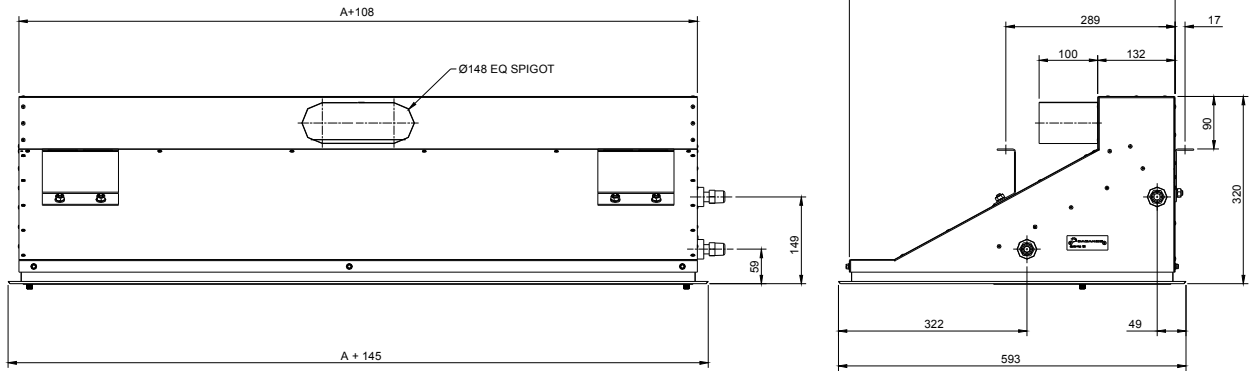
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|---------------------------------|--|
| 1. Primary Air Plenum | 8. Combination Supply/Return Air Grille Assembly |
| 2. Primary Air Nozzles | 9. Return Air Grille (perforated metal panel) with Lint Screen |
| 3. Heat Exchanger Coil | 10. Supply Air Grille Element |
| 4. Unit Case | 11. Primary Air Spigot |
| 5. Coil Mounting Frame | |
| 6. 'Stand-Up' Mounting Brackets | |
| 7. Entrainment Chamber | |

UNIT CONSTRUCTION

As illustrated above, each ACB50.01-A.282 Active Chilled Beam induction unit is comprised of:

- 150mm ovalised primary air spigot (11) fitted to the primary air plenum (1), fitted with 1 row of primary air nozzles (2).
- Mounting brackets (6) located mid-height of the unit with 2 x \varnothing 11x50mm mounting slots per bracket.
- Single air entrainment / mixing chambers (7) formed by the unit case (4), primary air plenum (1), secondary heat exchanger coil (3) and coil mounting frame (5).
- 2-Pipe secondary heat exchanger coil (3), constructed of 1/2" copper tube mechanically expanded into 0.145mm thick aluminium fins, complete with brass 1/2" BSP Male fitting water inlet / outlet connections,
- The heat exchanger coil (3) is attached to the coil mounting frame (5) by removable 6mm fixing screws and is protected by a mesh lint screen above the return air grille section (9).
- Combined Supply/Return Grille (8): 8-Active Slot low resistance supply air grille (10) are arranged on one side of the unit return air grille (9) which incorporates the return air lint screen.
- The serial number plate is located at the outer bottom side of the entrainment chamber

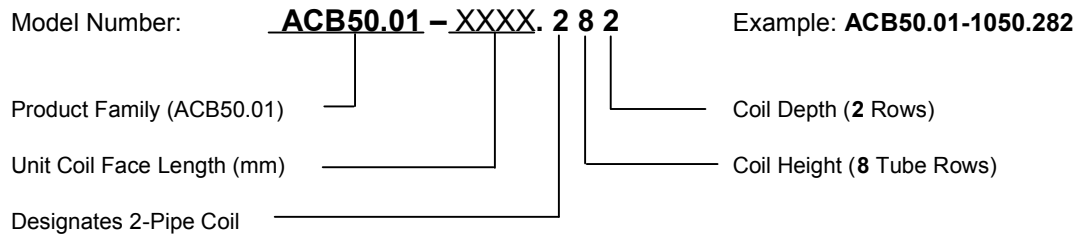
DADANCO Active Chilled Beam ACB50 2-Pipe units for ceiling grid 'Lay-in' tile systems are manufactured to suit different active coil lengths, and are suitable for any combination of air and water connections. (Specify unit configuration at time of order)



PHYSICAL DATA

Active Chilled Beam	Coil Finned Length A (mm)	Overall Case Length (mm)	Grille Face Overall Length (mm)	Unit Weight (kg)	Coil Water Capacity (Litres)	Installation Type
ACB50.01-0500.282	500	608	595	17	1.19	Nominal 1195x595mm suspended T-Bar Ceiling 'Lay-In'
ACB50.01-1050.282	1050	1158	1195	30	2.32	
ACB50.01-1500.282	1500	1608	1795	50	3.25	

UNIT NOMENCLATURE



STANDARD SPECIFICATION

- ½" BSP flat face tapered thread water connections.
- Return Air Grille - Perforated Metal Panel.

OPTIONS

- ½" SAE flare or ½" plain copper stub water connections (Specify at time of order)
- Return Air Grille options - Egg-crate Metal Panel (Specify at time of order).

INSTALLATION for ACB40 or ACB50

UNIT AS DELIVERED

Each unit, as delivered by Dadanco, will be complete with: -

- All primary air nozzles fitted
- 150mm primary air spigot
- ½" brass male BSP flat face tapered thread fittings on the coil inlet and outlet (unless otherwise specified).
- The combined supply/return air grille incorporating the lint screen, fitted

INSTALLER TO PROVIDE

The installer is to provide the following:

- Secondary chilled water piping, flow and return, with isolation valves in both services, and a flow control valve.

In addition to the flow control valve, flow limiting valves may have been specified and if so, are to be installed where shown on the drawings.

NOTE: It is recommended that the unit be connected with readily removable lengths of pipe, or flexible hoses, between the coil connections and the first valve to allow the removal of the coil, should this be required during maintenance.

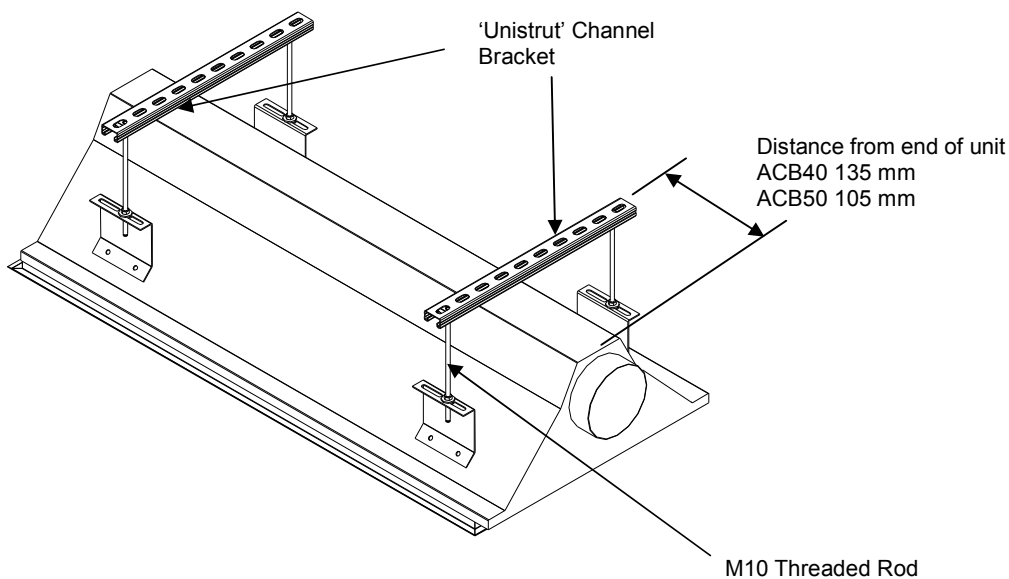
- Air volume control or balancing device.
- A suspension system for mounting the unit to the ceiling under-slab or ceiling members.

INSTALLING THE UNIT

To prepare the Active Chilled Beam ACB for mounting and connection, carry out the following procedures: -

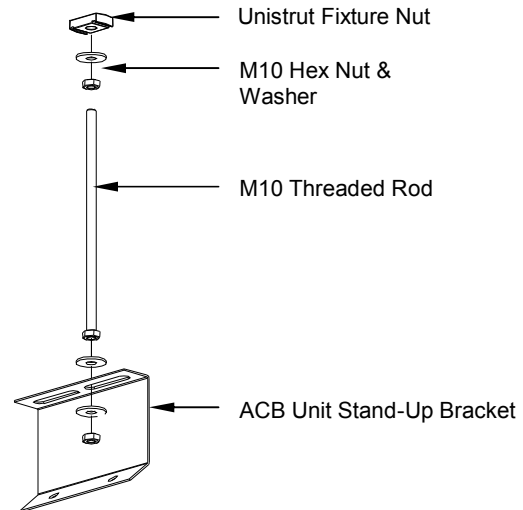
INSTALL UNIT CABINET AND GRILLE

1. Determine the orientation of the air and water connections in relation to the site plan.
2. Check the unit space to ensure adequate clearance for piping and duct connections.
3. Check that the available ceiling space for the installation of the unit is free of other services and structural members.
4. Determine the position of the unit in the ceiling grid.



5. Determine the position of the first under-slab 'Unistrut' 500mm channel bracket length in the slab above or a ceiling structural member. The first 'Unistrut' channel bracket should be positioned approximately the distance from the stand up brackets to the end of the unit (135mm for ACB40, 105mm for ACB50) and centred in relation to the width of the unit and its opening in the ceiling grid. Drill and secure the 'Unistrut' channel bracket to the slab above or ceiling member with M8 or M10 bolts.
6. Install the second 'Unistrut' channel bracket along the length of the unit, according to the distance between brackets of the unit. Drill and secure with M8 or M10 bolts.
7. Determine required length of M10 threaded rod between the 'Unistrut' channel brackets and unit stand-up brackets (6). Rod length should be approximately the distance from the suspended T-Bar ceiling tile frame lip to the underside of the slab above, or ceiling members, less the height of the brackets from the bottom of the unit. This provides sufficient threaded rod length to permit the unit to be raised and lowered without removing the hanging rods.

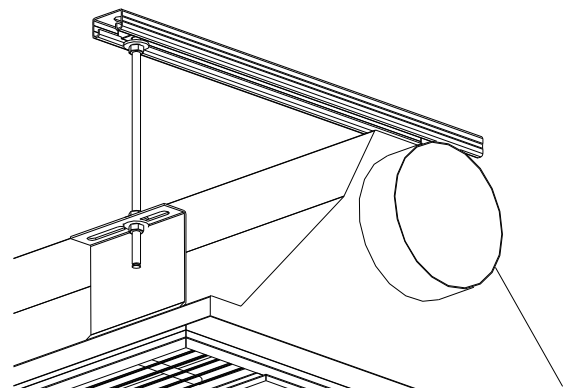
8. Install 1 M10 flat washer, hex nut and 'Unistrut' fixture nut to one end of each M10 threaded rod.
9. Install 1 M10 hex nut and flat washer to the other end of the threaded rod and insert each rod through the slots of the ACB unit stand-up brackets
10. Install M10 flat washer and hex nut to the treaded rod at the underside of the unit stand-up bracket to hold the rod loosely on the bracket. Do Not tighten nuts at this time.
11. Raise the ACB unit case into position above the ceiling grid frame, aligned to the ceiling grid opening. Insert the 'Unistrut' Fixture Nuts at the top end of the M10 threaded rods into the slots of the 'Unistrut' channel brackets.



Turning the 'Unistrut' Fixture Nut in a clockwise direction (tightening) will rotate the fixture nut into the locked position in the Unistrut channel bracket.

12. If required, relocate the threaded rods, one at a time, to the front or rear slots of the ACB unit stand-up brackets, whichever best suits the alignment of the 'Unistrut' channel bracket lengths to the ceiling grid opening in relation to the unit case.
13. Tighten the M10 hex nuts at the 'Unistrut' channel bracket to secure the top end of the treaded rods.
14. Raise the position of the unit by tightening the lower hex nuts (clockwise rotation) until the bottom lip of the unit is approximately 60-70mm clear of the top of the suspended ceiling grid T-Bar frame.
15. Lower the ACB unit and supply/return grille into the T-Bar frame by turning the bottom hex nuts in an anti-clockwise direction. Unit case and grille must fit completely into the T-Bar frame as if it were a ceiling tile.

NOTE: Unit can be moved front to back in the slots of the stand-up brackets (6) and left to right along the 'Unistrut' channel bracket lengths to achieve proper alignment prior to tightening the fasteners.



16. Ensure the unit is level and properly aligned in the T-Bar frame before tightening the mounting hardware.
17. Tighten all M10 hex nuts once the unit is properly positioned and aligned to the T-Bar frame

WATER CONNECTIONS

As per the air conditioning system design drawings, connect the unit to the secondary chilled water loop.

- Position all isolation, control and balancing valves according to the design drawings

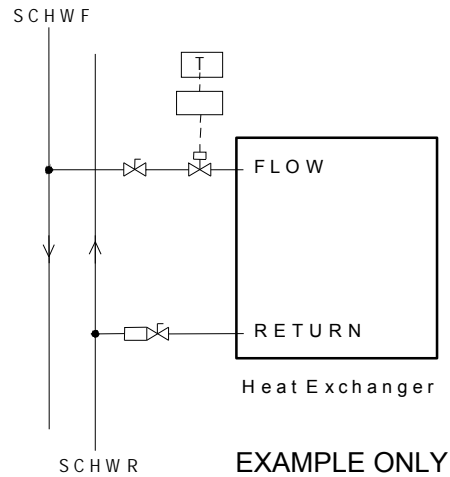
NOTE: Install all valves and make all connections as per industry approved plumbing practices.

- Connect the two fittings of the secondary coil (inlet / outlet) to the chilled water reticulation system.

NOTE: For 2-pipe systems, either fitting can be flow or return.

NOTE: It is recommended that the unit be connected with readily removable pipe lengths and barrel-unions or flexible hoses to permit disconnection and removal of the coil (3), should this be required during maintenance.

CAUTION: Ensure alignment of secondary coil water pipes is not disturbed during connection. Cracks or leaks in pipes attributed to misalignment will void the coil warranty.



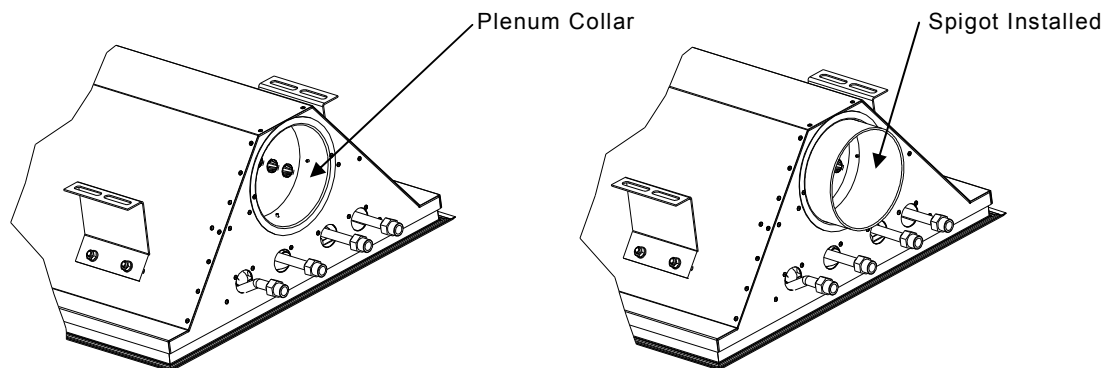
- In preparing to make the secondary chilled water (SCHW) piping connections to the coil, ensure that the piping is aligned with the coil connection fittings. If BSP connections are fitted, use the correct tools to grip the flare nut and union and apply only sufficient force to make the joint.

Take care during this jointing process to ensure that the coil -piping alignment is maintained.

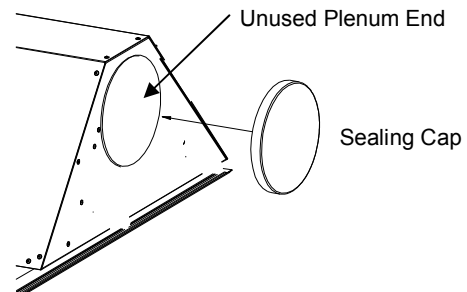
Do not apply excessive force in tightening water connection fittings. The use of excessive force will result in fracturing of the water pipes or their solder connections, which will void the coil warranty.

PRIMARY AIR DUCT CONNECTION (for ACB40 only)

- Select the preferred primary air spigot handing as determined by the primary air duct layout.
- Apply a continuous bead of silicon or duct sealant to the outer surface of the primary air spigot and insert into plenum collar until a tight fit is achieved. Secure with self-tapping screw if required.



- Seal the remaining unused primary air plenum opening by applying sealant to the inner surface of the Ø150mm sealing cap and fixing it to the primary air plenum with threaded screws.
- Ensure sealant is cured for leak free performance before pressurizing primary air plenum with air.

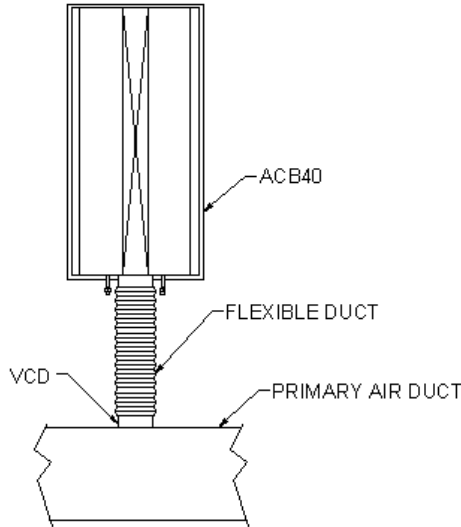


PRIMARY AIR DUCT CONNECTION for ACB40 and ACB50

- Primary air inter-connecting flexible duct should be a minimum of 1000mm straight or slightly radiussed 150mm diameter flexible duct between the primary air duct trunk and the primary air spigot of the ACB unit.

Where rigid primary air duct is used, flexible connecting duct can be of a shorter length with a straight approach to the unit inlet from the nearest radiussed bend in the rigid ductwork.

NOTE: Do Not install flexible duct with sharp bends or restrictions upstream of the ACB unit primary air spigot connection and plenum.



ACB units should be connected to the primary air duct through a suitable Volume Control Damper (VCD) or other suitable means of adjusting primary air pressure during commissioning.

NOTE: Do Not connect primary air of ACB40 units in series to one another. One end of the primary air plenum of each unit must be sealed for proper primary air performance and balancing.

- Insulate the primary air spigot up to the primary air duct insulation, and make a vapour tight seal with approved duct tape at the duct and plenum insulation joint.

COMMISSIONING for ACB40 and ACB50 Units

Test and Operating Water Pressures:

Maximum recommended site pressure test:	250 Bar (2500 kPa)
Maximum recommended operating pressure:	16.8 Bar (1680 kPa)

Secondary Water Commissioning: For secondary water flow commissioning, a suitable balancing valve should be installed in order to measure and adjust the secondary water flow to the designed/specified value. Adjust the balancing valve in order to achieve the specified water flow rate per unit, according to the unit schedule.

For 2-Pipe Heating or Cooling systems, balance the cooling water flow of the ACB unit to the specified value for optimum results.

Primary Air Commissioning: The only way to accurately commission the primary air flow to the ACB Unit is to measure the static pressure in the plenum. To achieve this, remove the sealing plug from the commissioning point sampling tube and connect the Pitot tube instrument (Manometer) to the sampling tube.

NOTE: Do not attempt to measure the static pressure back from the unit at the start of a flexible duct connection. Measure only at the provided commissioning point.

To obtain the designed primary air and total air flow rate, adjust the damper / volume control device as necessary to obtain the specified design primary air plenum pressure to achieve the required primary air flow.

The primary air quantity can be obtained from the pressure/air flow characteristic curve supplied for the unit size.

Replace the rubber plug to seal the primary air sampling tube on completion.

NOTES:

1. Do not attempt to confirm total supply air quantities using a balancing hood measurement method. The airflow from the ACB unit is a low velocity, low pressure air stream that is well below the accuracy range of restriction imposing measurement hoods. Resistance imposing balancing hoods are not recommended for validating total air quantity.
2. Do not attempt to confirm the primary air flow quantity by conventional Pitot-traverse methods in the primary air ductwork. Low duct velocities and boundary layer measurement inaccuracies do not permit accurate measurements of duct velocities for primary air installations.

MAINTENANCE OPERATIONS for ACB40 and ACB50 Units

In normal operating conditions the minimum required maintenance involves the heat exchanger coil (3) and the lint screen, and consists of:

- Quarterly visual inspection to comply with local regulations for grime, lint, bacterial growth, etc., on the heat exchanger coil (3). If found, such deposits must be removed immediately, using appropriate cleaning methods.
- Inspect the lint screen (if supplied) by removing the return air grille (9) and removing the lint screen and frame. Clean as required.
- Yearly mechanical cleaning of heat exchanger coil (3) and lint screen (if supplied) (e.g. vacuuming, brushing).
- Inspect the nozzles (2) for any deposition of dust. Clean if dust is present.

To remove the secondary heat exchanger coil (3) make sure that both water line isolation valves are closed and the water supply is turned off.

1. Disconnect the water inlet / outlet connections to the ACB unit.
2. Disconnect the primary air duct flexible connection to the primary air plenum.
3. Raise the ACB unit above the ceiling grid, or remove the ACB unit from the ceiling grid.
4. Remove the combination supply/return air grille assembly from the ACB unit to gain access to the coil and brackets.
5. Remove the coil fixing screws at the end of the coil near the water connections.
6. Gently slide the coil approximately 15mm toward the water connection end of the unit to free the coil end plate from the retaining bracket at the opposite end of the unit.
7. Slide the coil (3) out of the unit, taking care not to bend or damage the water connection pipes or fittings.
8. Reverse the procedure to reinstall the heat exchanger coil, ensuring the coil end plate is securely retained in the bracket at the end of the unit opposite the water connection end.
9. Align the holes in the coil frame to the mounting holes in the entrainment chamber and reinstall the coil fixing screws, checking to ensure the coil is firmly retained.
10. Re-install the combination supply/return air grille assembly to the ACB unit.
11. Re-install the unit in the ceiling grid by lowering the unit into the ceiling grid as described in the installation steps on page 5 of this manual.
12. Reconnect the primary air duct and water inlet / outlets.
13. Confirm the flow control valve is at the design setting (Re-commission Secondary Water).

DISCLAIMER: While every effort is made to ensure the details contained herein are kept up to date, in the interest of ongoing product development DADANCO reserves the right to alter the information without notice.