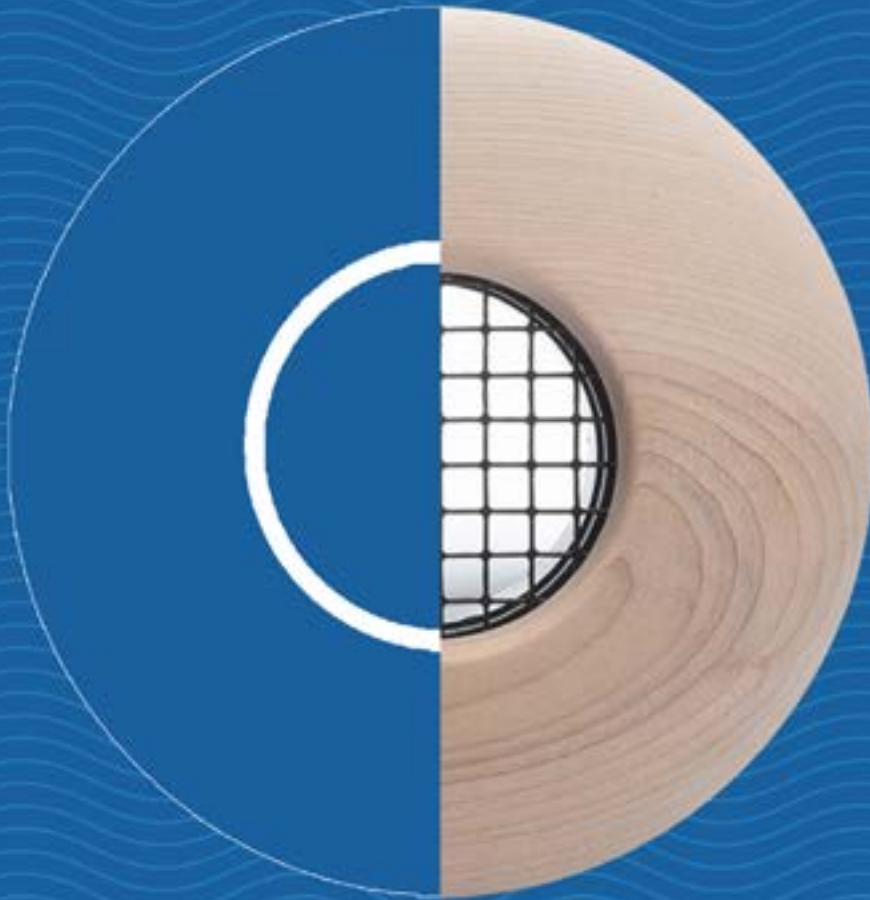


INSTALLATION CHECK LIST



Important: *Please Read Before Installation*

This instruction is a summary of the basic Unico System installation rules and applies to most applications. For applications outside the scope of this guide or detailed guidance, please consult your local Unico expert or refer to the appropriate technical bulletin.

Duct Design

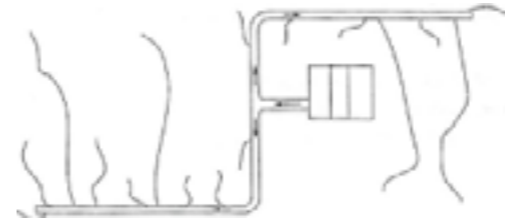
Outlets

- **Minimum of 2 outlets per kW.** The minimum number of round 51mm outlets is 2 outlets per kW (based on 33 L/S per kW and 19 L/S per outlet). The number of outlets depends on the amount of air to meet the demand required as well as the desired sound level (based on the maximum outlet airflow). To make the system quieter, you have one of three options: 1. Use more outlets, OR 2. Use round 63mm outlets instead, OR 3. reduce the airflow (but never below 27 L/S per kW).
- **33 L/S per kW.** The Unico System is rated to deliver 33 L/S per kW for cooling applications and 36 L/S per kW for heat pump applications. The minimum airflow for correct, nominal operation is 27 L/S per kW. Chilled and hot water coils are not rated at a specific airflow; refer to Unico Bulletin 20-020.3.
- **20% Rule.** The 63mm outlet can provide 20% more airflow, reducing noise by 20%.
- **10% Rule.** Where supply ducts longer than 3 meters are installed, the airflow is reduced in that branch by 10% for every 1.5 meters over 3 meters. For example, a 9m run is 60% of an outlet that is 3m yielding a reduction of 40% ($30-10=20$, $20\div5=4$, $4\times10=40\%$). Refer to Unico Bulletin 20-54 for more information.
- **Traffic Pattern Considerations.** When installing The Unico System it is important to place the outlets outside of the traffic pattern. The traffic patterns are the routes occupants use to move through the building. Traffic patterns should be free from direct airflow to prevent the occupant feeling a draft. Ceiling corner outlets should be set at least 127mm from each wall. Other good locations are along high walls, or in soffits blowing horizontally. Consider floor outlets (with screens) for units located in basements, crawlspaces, or floor joists. Slotted outlets are a good solution for high wall locations or in ceilings where there is insufficient room for bending tubing.
- **Allow for Aspiration.** Locate the outlets so that the air stream does not impinge on any objects or people. Ensure outlets are at least 1m away from any structural impediments (bump outs, moulding, etc.) that may impede airflow. Use outlet deflectors and outlet balancing orifices sparingly as they disrupt aspiration.
- **Minimize Length, Minimize Restrictions.** Keep the supply tubing length as close to 3.65m as possible and never less than 1.8m. Use the fewest number of bends as possible. Maximize the radius of any bends making sure the bend in the sound attenuator tubing near the outlet is at least 152mm inside radius.

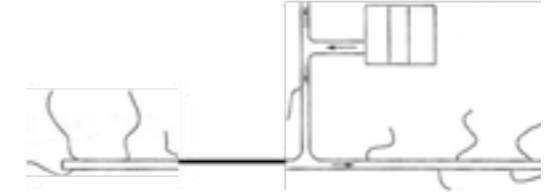
Plenum

- **Maximize Length, Minimize Restriction.** Ensure the plenum is as long as possible; it is best practice to lengthen the plenum if you can shorten even two supply tubing runs. Use full flow tees with turning vanes (when applicable) and full flow elbows. The maximum total plenum length should not exceed 46m; consider the first tee equal to 9m and elbows equal to 4.6m. Refer to Unico Bulletin 40-40 2003-10 for more detail.
- **Use a Plenum Tee.** (Best Method). Use a plenum tee at least 610mm off the air handling unit. For the 4860 unit, use 254mm diameter with a reducer tee; then use 229mm both directions. For the 3036 and 3642 unit, use 229mm then 180mm both directions. For the 1218 and 2430, use 180mm throughout.

Plenum | *Dogleg*



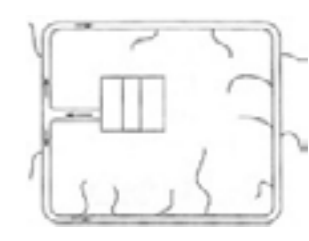
Plenum | *H-Pattern*



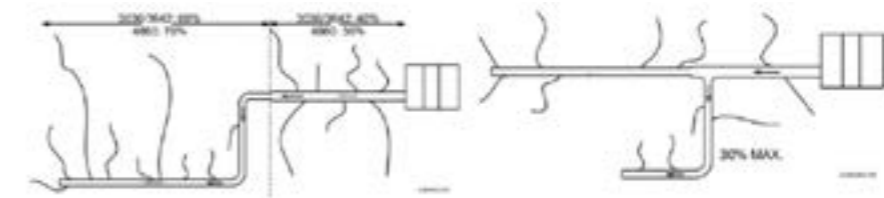
Plenum | *Horseshoe*



Plenum | *Perimeter*



- **Shotgun Pattern.** For the 4860 unit, use 254mm duct for the first 30% of the duct length; then reduce to 229mm. For the 3036 and 3642 unit, use 229mm for the first 40%; then reduce to 180mm. For the 1218 and 2430 unit, use 180mm throughout. Do not reduce the duct size if the plenum is longer than 30m.



- **70/30 Rule.** Turn the tee 90° to make a side branch with no more than 30% of the air. Do not use a turning vane.
- **610mm Rule.** Use at least 610mm of straight plenum before any fitting, such as an elbow, tee, or takeoff. Avoid elbows directly off units.
- **Space Takeoffs Evenly.** Maintain distance between takeoffs as evenly as possible. Space the takeoffs at least 152mm from each other and 305mm from an end cap.

Noise Mitigation

- **Sound Attenuators.** Always use at least 1m of the Unico supplied sound attenuator supply tubing (UPC-26C) at the end of each run. For runs up to 5m you may use the sound attenuator for the entire run. For greater lengths, use the aluminum core supply tubing (UPC-25) with a 1m sound attenuator at the end.
- **16.5 L/S.** Outlet sound is based on the amount of air from the outlet. The recommended airflow for good noise attenuation from a 51mm outlet is a maximum of 16.5 L/S. Use this number, adjusted for duct length, plenum static pressure, duct size, and balancing orifices, to fine-tune number of outlets. Refer to Unico Bulletin 20-54 for more detail.

Piping

- **Secondary Drain Pan.** Always use a secondary drain pan to protect against overflow of condensate that can cause water damage.
- **Overflow warning.** An overflow warning pipe must be installed with a suitable incline to discharge. Do not install a trap on the secondary overflow warning pipe or connect to the primary drainpipe. Place the secondary overflow warning pipe terminal so that it is a clear indicator when in operation. For example, install the overflow warning pipe so that it drips on an outdoor walkway or windowsill which will cause splashing to be identified.
- **Primary Drain.** Always trap the primary condensate waste pipe and discharge to a soak away or soil waste pipe.
- **Refrigerant Lines.** Always refer to and follow the manufacturer's instructions when installing refrigeration pipework to a specified heat pump. Installing refrigerant systems requires the engineer to hold the relevant qualifications. F-Gas & OD Regulations - (Category I) Handling Fluorinated Gases and ODS - City & Guilds (2079-11).

STARTUP: DO THIS BEFORE BOXING-IN THE DUCT WORK

- **Check for Full Flow.** Inspect each outlet for full flow (except where balancing orifices are used or for long branch ducts), which should be approx. 17 to 19 L/S per outlet. Investigate for blockage or kinks if flow is insufficient.
- **Check Outlet Airflow.** Check the airflow at each outlet with an airflow meter centered over the outlet. Add up the airflow for all outlets - it should not differ by +/- 5% from the design airflow.
- **Check Blower Airflow.** Using the supplied USB cable, connect your laptop to the S.M.A.R.T. controller and open the EC Configuration software to check and adjust the airflow rate of the unit (see Unico Bulletin 30-039).
- **Check Static Pressure (optional).** Measure the external static pressure in plenum 610mm from unit and before any fitting. Static pressure above 0.37 kPa may indicate restrictive plenum or not enough outlets. Correct as necessary.
- **Check Refrigerant Charge.** Measure and record refrigeration pressures when in operation to identify the correct refrigerant charge where the Unico system is applied to a split refrigerant system or DX air conditioning unit. Under or over charge of a refrigerant system should be carried out in accordance with the manufacturer's instructions and UK safe working standards. Always refer to and follow the manufacturer's instructions when applying refrigerants and pipework to a specified heat pump. Installing refrigerant systems requires the engineer to hold the relevant qualifications. F-Gas & ODS Regulations - (Category I) Handling Fluorinated Gases and ODS - City & Guilds (2079-11).

Please Note: Specifications, Ratings, and Dimensions are subject to change without notice.

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