

Air to Air Heat Exchangers Installation

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Air to Air Heat Exchangers

- There are a number of recommended ways to install an Air to Air Heat Exchanger
- The manufacturers installation instructions should always be consulted and attempts to follow their instructions made
- Air Tamarack has seen a number of these units installed improperly or installed according to manufacturers instructions but still performing poorly for a number of reasons
- There are several installation methods that are not recommended

Air to Air Heat Exchangers

- Do not install the supply and the return from the air to air heat exchanger on the same side of the furnace ductwork regardless of whether this is the supply or the return side of the furnace.
- When the supply and the return of the air to air unit are installed in the same duct (see Figure 2), a few feet apart, as some unit manufacturers recommend a problem develops if the fan for the furnace is not run continuously (manufacturers require this).
- The problem is that a large amount of the supply air from the air to air unit never reaches the house and is just returned to the outdoors with limited fresh air being provided to the house. See Figures 1 and 2.

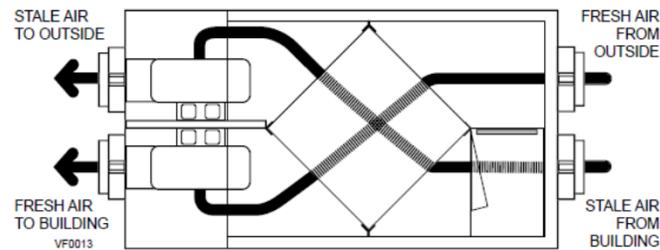


Figure 1 – Typical Set Up of Air to Air Heat Exchanger

Note: If the supply and return of the air to air are installed in the same duct three feet apart **and the furnace fan is not running** a large percentage of the supply air from the air to air will be exhausted back out of the house and very little of it gets into the house – see red arrow in Figure 2B

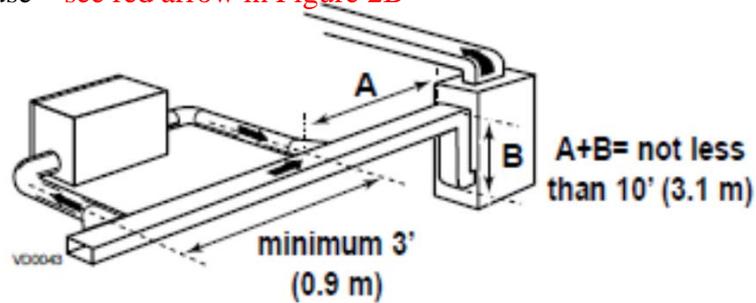


Figure 2A – Worst Possible Way to Install an Air to Air

Note: If the supply and return of the air to air are installed in the same duct three feet apart **and the furnace fan is not running** a large percentage of the supply air from the air to air will be exhausted back out of the house and very little of it gets into the house – see red arrow

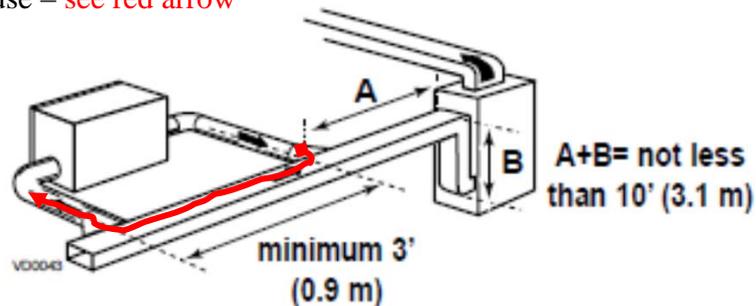
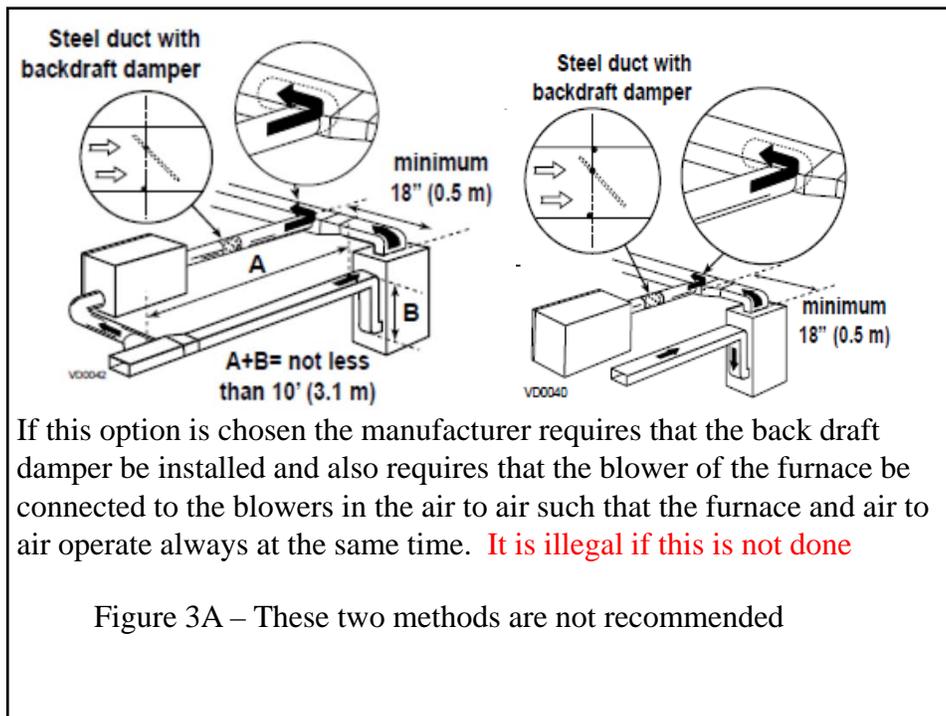
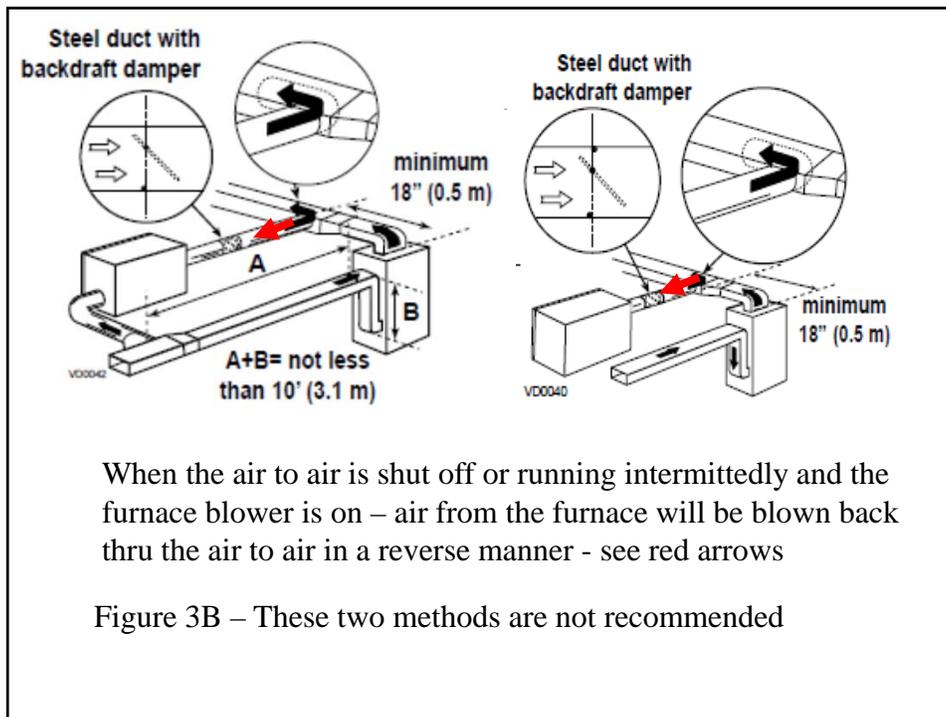


Figure 2B – Worst Possible Way to Install an Air to Air

Air to Air Heat Exchangers

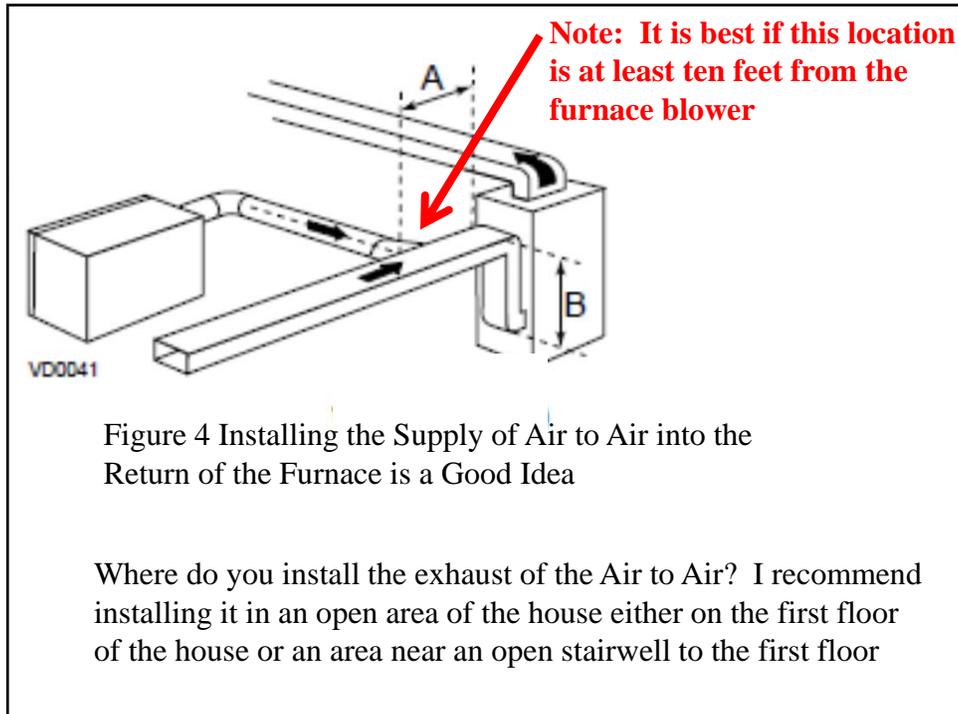
- Do not install the supply or the return of the air to air to the supply side of the furnace, see Figure 3.
- Problems occur here when the air to air is shut off or runs intermittently
- What happens is the furnace will push air thru the air to air in a reverse manner – the supply side of the furnace is under positive pressure when the furnace blower is operating – this will push air thru the air to air in a reverse manner when the air to air is off for any reason.
- Most reverse air dampeners leak a great deal and will not stop this reverse process – we have seen condensation problems in the air to air ductwork because of this – we drained five gallons of water out of ductwork in one installed like this.
- This just makes a mess and does not work very well





Air to Air Heat Exchangers

- Installing the supply of the air to air to the return of the furnace is a good option, see Figure 4. It is best if this location is remote from the furnace or at least ten feet from the furnace blower.
- The return of the air to air needs to be installed in an open area of the house.
- Usually the first floor of the house works well in an area near the kitchen or any other open area – it should not be installed in a closed single room of the house
- An open stairwell on the lower level will also work.
- Do not install it in the lower level if the stairwell to the upper floor is closed off



Air to Air Heat Exchangers

- Clearly installing the exhaust of the air to air in the bathrooms and kitchen of the house is a good idea but can be very expensive during a remodel
- Very good distribution of the air from the air to air will occur if the supply of the unit is supplied to the return of the furnace. This is a good option.
- Installing the exhaust of the air to air in an open area of the house will assure good distribution in the house. Exhausting from just a single closed room could cause problems of negative pressure in the single room. This will not happen if the exhaust is in a open area of the house

Air to Air Heat Exchangers

- The best option is to have the air to air totally separate from the furnace. However this is difficult during a remodel.
- Installing the air to air to draw air from bathrooms and having the supply in an open area of the house is the best option.
- One concern is that the temperature of the supply air from the unit will typically be 10 degrees colder than the room temperature and can be drafty in some situations.

Air to Air Heat Exchangers

- Installing the supply in a remote location near the ceiling in an open area can minimize this cold air concern.
- The chances for problems are the least with the two options mentioned.
- This is also the most efficient way to install it.
- Please call if you have any questions about this. Call Paul Ellringer at 651-696-0267

When should the Air to Air Operate

- These units are most effective and beneficial to the homeowner if they operate from September 1 to January 1 of each year.
- The primary purpose is to avoid condensation on windows and in the walls of the house
- Every house will be different to some extent and judgment always need to occur.
- Between January 1 and August 30th operation of the units maybe optional as long as condensation on the windows is not occurring. The units can be operated on low or turned off.

When should the Air to Air Operate

- During the heating season it is desirable to avoid condensation on windows and in the walls and the attic of a house.
- Indoor relative humidity should be kept no higher than 30% when outdoor temperatures are below 32 degrees.
- Having condensation on windows during very cold weather (below 0) is generally not a problem as long as it does not occur often.
- After January 1 some houses can be too dry and turning off the air to air or operating it on low will help increase indoor relative humidity levels.
- Operation of the air to air in the summer is generally optional – house is more open and ventilation is generally not a concern.

References

- **Building Science Corporation:** www.buildingscience.com or 70 Main Street, Westford, MA 01886, Phone 978-589-5100
- **Minnesota Department of Commerce Energy Information Center:** <http://www.commerce.state.mn.us/pages/Energy/InfoCenter/EnergyGuides.htm>
- **Univ. of Minn:** www.buildingfoundation.umn.edu/FoundRuleWWW/default.htm
- **Air Tamarack Corporation:** www.airtamarack.com or 651-696-0267

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