

SENSIBLE EQUIPMENT COMPANY

**TRICOIL®**

*The Sensible Solution*

# DEDICATED OUTSIDE AIR SYSTEMS (DOAS)

NEW AND RETROFIT

TRICOIL® Air Handling Units have been in operation for over 30 years. Many of the air handling units are applied as DOAS. TRICOIL® DOAS are used in any region where high humidity is a design issue. Some of the recent projects include:

- 2000 cfm DOAS for a Habilitation Facility in Missouri having chilled water cooling and natural gas heat;
- 15000 cfm DOAS for an Imax Theater in the Bahamas with chilled water cooling (no supplemental heat required due to the climate).
- 15000 cfm for a Classroom Bldg in Kanas City, Missouri. System included an Enthalpy Heat Recovery Wheel. (see picture – right middle)
- Two 2900 cfm DOAS for an Assisted Living Facility in Central Florida with chilled water cooling and hot water heat. (see picture – right bottom)

TRICOIL® is a recuperative precool/reheat system similar to a Heat Pipe system, however we use water instead of refrigerant as the heat exchange medium which makes TRICOIL® easier to install, flexible in application, cost effective and energy efficient.

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MADE IN USA

## DOAS UNIT TYPES

- Indoor or Outdoor units, Modular Construction
- Hydronic Cooling/Heating, Natural Gas or Electric Heat. Option for DX Cooling.
- All units are double wall construction.
- Options for direct drive fans or fan walls with EC Motors
- Units can be fully piped and wired for TRICOIL® operation

## DOAS ARRANGEMENTS

- 100% Outside Air, chilled water or DX cooling. Optional hot water heat, electric heat or gas heat.
- 100% Outside Air, as above, with optional exhaust air heat recovery such as water coil loop, enthalpy wheel or plate heat exchanger.
- Optional multiple reheat coils for zone temperature control.
- Variable Air Volume for Displacement Ventilation Control.
- Control Temperature to a fixed supply air value or control to a fixed room temperature

## DOAS EXAMPLE: CLASSROOM BLDG.

Modular Indoor TRICOIL® Unit with Enthalpy wheel. 15000 cfm, chilled water cooling and hot water heating. System used to provide demand ventilation at constant air temperature.



## DOAS EXAMPLE: NURSING HOME.

Modular Indoor TRICOIL® Unit. 2900 cfm, chilled water cooling and hot water heating. System is used to provide ventilation at constant air temperature for resident bedrooms and other make-up air requirements. Specially circuited coil was provided that included the precooling, primary cooling, and reheat functions in continuous fin sheets.



# DEDICATED OUTSIDE AIR SYSTEMS (DOAS)

NEW AND RETROFIT

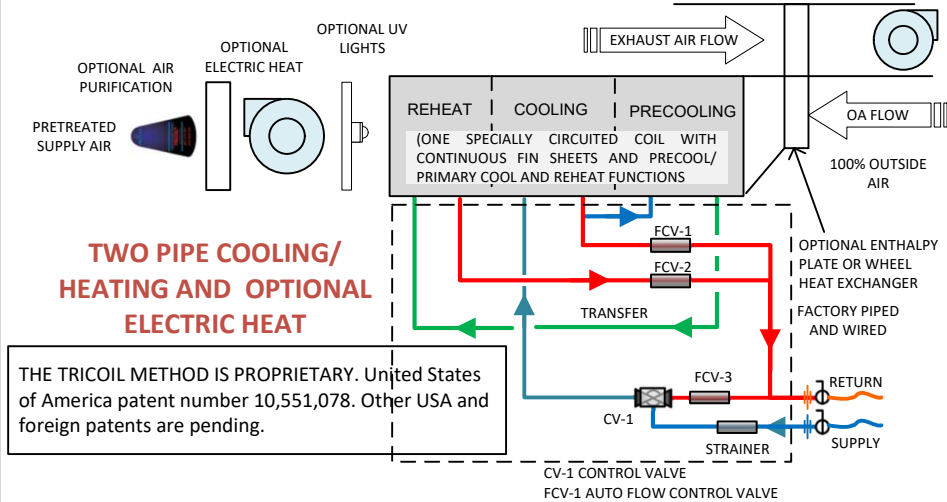
TRICOIL® DOAS units feature the TRICOIL wrap-around recuperative precool/reheat process which provides reheat for humidity control and a proportional precooling effect. In other words, the reheat is provided from the heat content in the chilled water return. Two general TRICOIL® methods are available;

- 1) With a heat transfer pump (pumped) or
- 2) Without a heat transfer pump (pumpless)

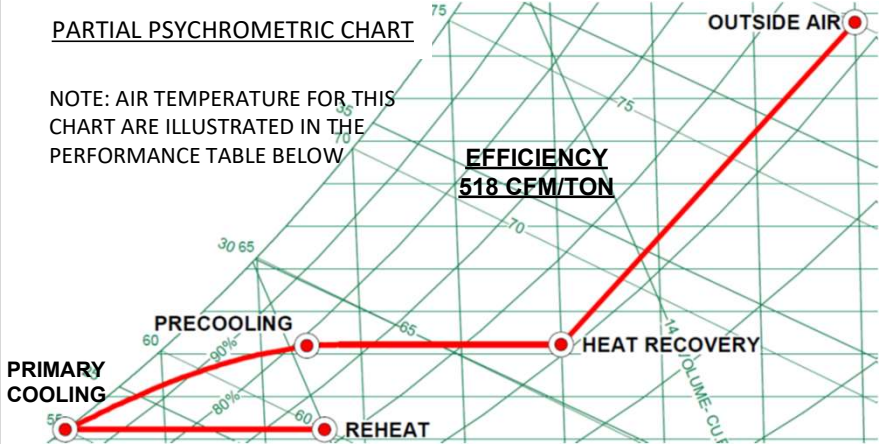
The efficiency of the heat transfer of the pumped method is greater than the pumpless method, however the pumpless method is not burdened by the operating and maintenance expense of the pump.

The three coil functions; precooling, primary cooling and reheat, can be in separate coils or can be in a single, specially circuited coil containing all three functions. The special circuited coil is contained in continuous fin sheets. So, instead of three coils, only one single coil is required. This is particularly important when space for installation is at a premium.

The TRICOIL system can be furnished with exhaust air heat recovery which may be either: 1) Sensible heat transfer as with a wrap-around loop or sensible plate; 2) Total enthalpy heat recovery as with an enthalpy wheel or enthalpy plate



THE TRICOIL METHOD IS PROPRIETARY. United States of America patent number 10,551,078. Other USA and foreign patents are pending.



## DOAS WITH TRICOIL AND EXHAUST AIR HEAT RECOVERY - SAMPLE PERFORMANCE

EXHAUST AIR HEAT RECOVERY TYPE	OUTSIDE AIR CFM	TOTAL UNIT PERFORMANCE, MBH			UNIT NET TONS REQ'D	UNIT EFF. CFM/TON	OUTSIDE AIR TEMP DEGREE F		SUPPLY AIR TEMP DEGREE F			
		TOTAL	HEAT RECOVERY	PRE-COOLING			NET COOLING	DB	WB	DB	WB	DP
1) NONE	15000	1370.1	-	211.9	1158.2	96.5	155	95	80	68	60	55
2) SENSIBLE HR	15000	1370.1	179.0	211.9	979.2	81.6	184	95	80	68	60	55
3) ENTHALPHY HR	15000	1370.1	810.6	211.9	347.6	29.0	518	95	80	68	60	55

- NOTES**
- The table shows TRICOIL performance with 100% outside air. In all cases the air is cooled from 95/80 DB/WB and then reheated with the TRICOIL reheat coil to the supply air temperature of 68/60 DB/WB. No new energy is used except for the primary cooling indicated as NET COOLING.
  - Three conditions are indicated:
    - 1) without exhaust air heat recovery;
    - 2) with sensible Heat Recovery as in a wrap-around loop or sensible plate;
    - 3) with total enthalpy Heat Recovery as with an enthalpy wheel or enthalpy plate.



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