



LOCATION

**Plymouth Cultural Center
Plymouth, MI**

Challenge

Cultural centers can be an enormous challenge in HVAC design. The number of occupants fluctuates day by day, hour by hour, so the building must provide fresh air over a large range of flows. If not, indoor air quality (IAQ) can suffer and energy costs can run a fortune. Plymouth Cultural Center also houses an arena which is maintained at 60°F db and 45°F wb all year long – conditions that can be very difficult to sustain. The center needed HVAC equipment that rose above standard efficiency in order to improve IAQ and reduce energy costs.

Solution

When dew points are lower outside than within the space, large amounts of fresh outdoor air are introduced and preheated using Four (4) BPE-MIR-XE-2000 Energy Recovery Ventilator units combined in parallel with high-efficiency PennBarry fans. Operating at flows of 6,570 CFM, the BPE ERVs allow the building to meet IAQ standards while recovering up to 80% of unused heating and cooling. After installation, the BPE equipment performed with an Energy Efficiency Ratio (EER) of 27 (cooling) and a Seasonal EER of nearly 73 (heating) – far beyond the efficiency of standard make-up air or rooftop unitary equipment.



Plymouth Cultural Center – 6,570 CFM (Outdoor Air) ***BPE: Unrivaled in Energy Efficiency!***

Summer Cond.		Winter Cond.	
95	78	-3	-3
°F db	°F wb	°F db	°F wb

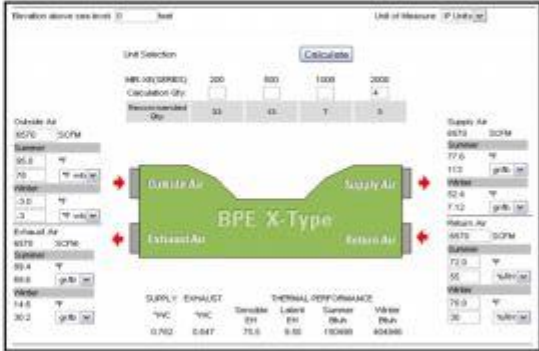
72	°F Summer Set-Point
70	°F Winter Set-Point

Summer Capacity	BTU/HR	TONS
Total Cooling	150,498	12.54
Sensible Cooling	123,215	10.27
Latent Cooling	27,283	2.27

Heating Capacity	BTU/HR	MBH
Total Heating	404,946	405

Electrical Specs (PF = 1)			
Volts	Phase	Amps	Watts
460	3	3.5	2785.3

Total Demand =	5,571 Watts
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EER =	27.02
SEER =	72.69