



# Building Performance Equipment, Inc.®

Sustainable, Reliable, and Energy Efficient Ventilation Systems



## 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.

## Solutions

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. (continued)



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## 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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The screenshot shows a software interface for configuring a BPE X-Type unit. It includes fields for 'Unit Selection', 'Supply Air' (80°F, 11.0 gph), and 'Return Air' (72°F, 11.0 gph). A 'Calculate' button is visible. Below the unit diagram, there are 'THERMAL PERFORMANCE' metrics: SENSIBLE (75.0), LATENT (8.0), and TOTAL (83.0).

EER =	27.02
SEER =	72.69