Natural Cooling and Low Energy Ventilation System

PCM Heat Exchanger  Direct Ventilation

External Air  Re-circulated Air

Fascia  Suspended Ceiling

Exposed Void

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Cool-phase® Exposed Void

Cool-phase is a low energy cooling and ventilation system that creates a comfortable, fresh and healthy indoor environment and reduces the running costs of buildings.

Cool-phase uses a thermal energy store utilising a Phase Change Material (PCM) in combination with an intelligently controlled Air Handling Unit to actively ventilate and cool the building. The Cool-phase system can maintain temperatures within the comfort zone, while radically reducing energy consumption by up to 90 %, compared to a conventional cooling system. Unlike conventional cooling approaches, Cool-phase uses no refrigerants making it an environmentally sound solution to cooling our buildings.

MODEL DESCRIPTION

The Cool-phase Exposed Void system comprises of 4, 6 or 8 thermal battery modules. The system is designed to suit an exposed ceiling void and is fitted as standard with low gloss black components.

- **CPN4EV**: Cool-phase Exposed Void system with four thermal battery modules, two positioned each side of the air handling unit.
- **CPN6EV**: Cool-phase Exposed Void system with six thermal battery modules, three positioned each side of the air handling unit.
- **CPN8EV**: Cool-phase Exposed Void system with eight thermal battery modules, four positioned each side of the air handling unit.

MATERIAL

- **EPP (Expanded Polypropylene)**: This is a highly versatile closed-cell bead foam that provides a unique range of properties, including outstanding energy absorption, thermal insulation, exceptionally high strength to weight ratio and 100% recyclability. EPP is manufactured using individual beads which are fused into the final form by steam compression resulting in a strong and lightweight shape.
- **Aluminium** powder coated RAL 9005 components.

SYSTEM REQUIREMENTS:

- **Ventilation requirements**: connection to clean outside air source, inlet to be positioned away from sources of pollution and heating, eg. kitchen exhaust.
- **Inlet**: roof cowl or weather louvre. **Standard Grille Size**: 800 mm x 350 mm.
- **Filtration**: G4 bag filter.
- **Minimum supply duct size**: 500 mm x 150 mm.
- **Exhaust**: internal or external grille specified to suit.
PERFORMANCE

<table>
<thead>
<tr>
<th>Flowrate [L/s]</th>
<th>SFP</th>
<th>Power Consumption</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.075</td>
<td>7 W</td>
<td>Normal Operation: During normal operation the system operates at these flow rates to provide excellent internal air qualities.</td>
</tr>
<tr>
<td>125</td>
<td>0.086</td>
<td>11 W</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>0.108</td>
<td>16 W</td>
<td></td>
</tr>
<tr>
<td>175</td>
<td>0.130</td>
<td>23 W</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>0.156</td>
<td>31 W</td>
<td></td>
</tr>
<tr>
<td>225</td>
<td>0.190</td>
<td>43 W</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.227</td>
<td>57 W</td>
<td></td>
</tr>
<tr>
<td>260</td>
<td>0.238</td>
<td>62 W</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>0.302</td>
<td>91 W</td>
<td>Night Time Charge Operation: The system automatically charges the PCM when required. During this mode we purge the space and cool the building fabric.</td>
</tr>
</tbody>
</table>

- The figures detailed include inlet weather grille, 3m straight duct, 90° bend and G4 bag filter.
- Due to the automatic speed control of Cool-phase the averaged SFP over a typical one year of operation equates to 0.115.
- Normal ventilation rate (occupied hours): between 0.1 to 0.26 m³/s.
- Maximum ventilation rate (recharge mode): 0.30 m³/s.

CONTROLS & USER INTERFACE:

- Wall mounted user controls with room temperature, humidity and CO₂ sensors; On/Off control and High/Medium (auto)/Low fan speed settings.
- Master/slave mode to control multiple units in a single zone.
- Inhibit input to enable/disable Cool-phase system from BMS or Fire Alarm circuit.
- Heating Signal: when external heating system should activate.
- Cooling Signal: when external cooling system should activate.
- Fault Signal: to indicate if a fault has occurred.
- BACnet available as an optional extra.

OPTIONS

- LED edge lighting.
- BACnet over Ethernet module providing: Room temperature, Room CO₂ level, Cool-phase operation mode, External/Duct air temperature, Fault indication, Charge status and Filter status.
- ‘Traffic Light’ indicator to indicate if opening windows will improve comfort or waste energy.
DIMENSIONS, THERMAL ENERGY STORAGE & WEIGHT

<table>
<thead>
<tr>
<th></th>
<th>CPN4EV</th>
<th>CPN6EV</th>
<th>CPN8EV</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width (W)</td>
<td>4195 mm</td>
<td>4800 mm</td>
<td>6040 mm</td>
</tr>
<tr>
<td>Depth (D)</td>
<td>966 mm</td>
<td>966 mm</td>
<td>966 mm</td>
</tr>
<tr>
<td>Height (H)</td>
<td>410 mm</td>
<td>410 mm</td>
<td>410 mm</td>
</tr>
<tr>
<td><strong>Thermal Energy Storage</strong></td>
<td>6 kWh</td>
<td>8 kWh</td>
<td>10 kWh</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>195 Kg</td>
<td>285 Kg</td>
<td>375 Kg</td>
</tr>
</tbody>
</table>

WIRING REQUIREMENTS

**AS STANDARD**
- POWER SUPPLY
  - System is supplied with 1.5m 3 core mains cable to be wired to a switched fused spur (3A) by others.

**WALL CONTROLLER**
- The wall controller is supplied with 10m straight wired RJ45 terminated 8 core CAT5 cable with any longer lengths supplied by others if required.
- The wall controller should be mounted between 0.9m - 1.2m from floor level (specific circumstances may vary).

**IMPORTANT**
- The wall controller must be positioned in the area served away from direct sunlight, draughts, openings, radiators or other heat sources to ensure sensor readings are accurate.

**ONLY IF REQUIRED**
- 2 core cable by others.

**SYSTEM INHIBIT INPUT**
- The inhibit input requires a N/C volt-free contact to allow normal operation. Upon the contacts opening the fan will stop and all dampers will return to their closed position.
- Each system will require its own contact and they cannot be daisy chained. Connecting multiple units in series will damage all units and connecting multiple units in parallel will damage any unpowered units.

**IMPORTANT**
- A core cable to Def. Std. 61/12 Pt.5, type 56-2-44 (e.g. Panel No. 1190286/RS no. 660-4096) by others.

**FAULT OUTPUT**
- N/C relay output for fault indication to compatible device or BMS. Contacts open upon fault condition.

**AUXILIARY HEATING OUTPUT**
- Analog output (0-10V) for heating output to compatible device.
- 24V 2W DC power supply with 0-10V control signal for heating valve/actuator.

**AUXILIARY COOLING OUTPUT**
- Analog output (0-10V) for cooling output to compatible device.
- 24V 2W DC power supply with 0-10V control signal for cooling valve/actuator.

**EXHAUST AIR SHUT-OFF**
- Connection to exhaust air shut-off damper motor (Blodino).