“Blue Energy” Adiabatic pre cooling panels - «SMART COOLING»

HIGHER cooling efficiency, with lower energy consumption

www.blue-energy.eu
Manufacturer: **Blue Energy Global**

Markets: **Presented in 54 countries**

- The invention that we are most proud of, is Blue Energy adiabatic, evaporative cooling panel and membranes “**Smart Cooling™**”.

- “**SMART COOLING**” have focused attention on air cooled water chillers and dry coolers.

- “**SMART COOLING**” Is made with very high quality standards and is most effective technology in the market!
The Best choose The Best ones!

Company Blygold international is global partner and service partner for Blue Energy. Blygold has made numerous coil expertize after usage of SMART COOLING.
BLUE ENERGY - SMART COOLING

- PROTECTION OF CONDENSERS AND DRY COOLERS
- ENERGY SAVING
- INCREASING COOLING CAPACITY

We combine adiabatic, evaporative pre cooling and standard cooling technology.
Blue Energy product “Smart Cooling” is tailor made design for your cooling equipment. Precise calculations ensure efficient work condition
General components

1. Water treatment
2. Water treatment Dorobson
3. High pressure pump with UV block
4. High pressure nozzle Panel
5. Evaporative & Protecting Membrane
6. Operation panel
The SMART COOLING™ adiabatic precooling panel modular system is delivered in kit form. Each system is custom designed for your refrigeration system and it includes:

**Biochemical and Filtration block:**
- Biochemical protect from scaling
- Protect from corrosion

**High pressure pump / UV Block which includes**
- UV lamp block.
- Pressure 70 – 90 Bar

**Nozzle panel BY - 70 HP – SS:**
- high-pressure sprayers
- Water droplet size 5-20 micron
- Fast water evaporation ensures high efficiency
- Easy and fast installation
Membrane BY 70 M2:

- Protecting condensers from direct sun light
- Protecting condensers from pollution in the air and keep condenser clean
- Protecting condensers from direct contact with water
- Humid membrane continuously evaporating and ensures constant incoming air temperature reduction.

Operation Panel BY - 70 Pro 1:

- Operation panel handles the adiabatic system cycles and algorithms using the programmable controller and 3 sensors
- Sensor inputs are: (i) humidity; (ii) temperature; (iii) power on.
- No water leakage
- The Pro1 Operation panel analyses air humidity, air temperature and supply right quantity of the water to evaporate
MODULAR NOZZLE PANEL

CONDENSER AND DRY COOLER PROTECTING MEMBRANES
<table>
<thead>
<tr>
<th>Blue Energy “Smart Cooling”</th>
<th>Other Adiabatic System</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Protecting evaporative membrane keep coil clean and protecting from pollution in the air</td>
<td>☐ No coil protection</td>
</tr>
<tr>
<td>+ Water to do not pass to the coil</td>
<td>☐ No water treatment</td>
</tr>
<tr>
<td>+ Protect condenser from corrosion</td>
<td>☐ calcium risk – damaged condenser</td>
</tr>
<tr>
<td>+ Water treatment. No calcium deposit risk</td>
<td>☐ Water touch condenser, condenser start to rust</td>
</tr>
<tr>
<td>+ High pressure pump and nozzle panels ensures 5 micron droplet size. As result faster evaporation and efficient usage of water</td>
<td>☐ Big water droplet size can’t be evaporated. Water usage not efficient</td>
</tr>
<tr>
<td>+ UV lamp protect from legionella bacteria</td>
<td>☐ Legionella risk</td>
</tr>
<tr>
<td>+ Operation panel analyse out side humidity and temperature and supply right quantity of water which could be evaporated.</td>
<td></td>
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</tbody>
</table>
Blue Energy “Smart Cooling”

- Protecting evaporative membrane keep coil clean and protecting from pollution in the air
- Protect condenser from corrosion
- Water treatment. No calcium deposit risk
- Operation panel analyse out side humidity and temperature and supply right quantity of water which could be evaporated.

www.blue-energy.eu
**Demonstration temperature reduction with adiabatic process**

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<th></th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Before spray</td>
<td>After Spray</td>
</tr>
<tr>
<td>Temperature</td>
<td>t</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Rel. Humidity</td>
<td>%</td>
<td></td>
<td>30%</td>
</tr>
<tr>
<td>Wet Bulb Temp.</td>
<td>t</td>
<td>C</td>
<td>32.1</td>
</tr>
<tr>
<td>Actual Air flow</td>
<td>Vs</td>
<td>M³/h</td>
<td>222 229</td>
</tr>
<tr>
<td>Nominal Air Flow</td>
<td>Vn</td>
<td>M³/h</td>
<td>192 240</td>
</tr>
<tr>
<td>Evap. Water 1 fan</td>
<td>qw</td>
<td>Kg/h</td>
<td>1552.7</td>
</tr>
</tbody>
</table>

*Psychrometric chart (Mollier Diagram)*

- *Air pressure: 100 kPa*
- *Max. Humidity on changes: 100%*
- *Surface temp. of cooler: 5 °C*
Customer: ORANGE S.A.
Location: Spain, Seville
Air temperature on site: +55C
Relative Humidity: 34%

- Summer period air temperature reach +45C, on the roof where located dry coolers air temperature is +55C
- **Problem**: Dry coolers are not able to provide enough cooling capacity in such high temperature

- **Solution**: Necessary to reduce incoming air temperature in condensers.
- Are installed adiabatic pre cooling panels “Smart Cooling”. Manufacturer “Blue Energy”

- **Result**: adiabatic pre cooling panels “Smart Cooling” provide the incoming air temperature reduction in condensers
- At an outdoor air temperature of + 55C HR34%, temperature is reduced until +37C
Customer: GSK
Location: Spain, Madrid
Air temperature on site: +51°C
Relative Humidity: 27%

- Summer period air temperature reach +40°C, on the roof where located dry coolers air temperature is +51°C
- **Problem**: Dry coolers are not able to provide enough cooling capacity in such high temperature

- **Solution**: Necessary to reduce incoming air temperature in condensers.
  - Are installed adiabatic pre cooling panels “Smart Cooling”. Manufacturer “Blue Energy”

- **Result**: Adiabatic pre cooling panels “Smart Cooling” provide the incoming air temperature reduction in condensers
  - At an outdoor air temperature of + 51°C HR27%, temperature is reduced until +33°C
Customer: **Schneider electric**
- Field: Electrical equipment production
- Process: Production line cooling
- Cooling equipment plant: Chiller YORK air cooled water chillers, air cooled condensers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic pre cooling equipment: Smart Cooling BY 70

Customer: **Philip Morris International**
- Field: Cigarette, tobacco production
- Process: Production line cooling, climate cooling
- Cooling equipment plant: YORK, Carrier, Trane air cooled water chillers, air cooled condensers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic pre cooling equipment model: Smart Cooling BY 70

Customer: **Altadis**
- Field: Cigarette, tobacco production
- Process: Production line cooling, climate cooling
- Cooling equipment plant: Carrier air cooled water chillers, air cooled condensers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic Pre cooling equipment model: Smart Cooling BY 70 - 150
Customer: **Mars**
- Field: Food industry
- Process: Production line cooling, climate cooling
- Cooling equipment plant: Carrier, Lenox air cooled water chillers, air cooled condensers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic Pre cooling equipment model: Smart Cooling BY 70 - 100

Customer: **Carlsberg**
- Field: Food industry
- Process: Production line cooling, climate cooling
- Cooling equipment plant: Carrier air cooled condensers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic Pre cooling equipment model: Smart Cooling BY 30

Customer: **Glakso Smith Kline (GSK)**
- Field: Chemical industry
- Process: Production line cooling, climate cooling
- Cooling equipment plant: McQuay air cooled water chillers
- Adiabatic pre cooling equipment producer: Blue energy
- Adiabatic Pre cooling equipment model: Smart Cooling BY 100
WHO SAVE WITH BLUE ENERGY

APPROVED
ENERGY
SAVING 31%

Technical director
Aivars Silinevics, Schneider electric,

Schneider Electric 170 factories, presented in 240 countries. Producer, one of the leading companies of the industry in the world.
WHO SAVE WITH BLUE ENERGY

APPROVED ENERGY SAVING 36%

Supervisor Energy Management
Denis Losev,
Philip Morris, Italy,
Ukraine, Portugal

PHILIP MORRIS INTERNATIONAL - leading international tobacco company, with products sold in more than 180 countries
WHO SAVE WITH BLUE ENERGY

APPROVOED ENERGY SAVING 21%

Supervisor Energy Management
Antonito Pasqualicchio

IKEA S.A - leading international home depot company, with products sold in more than 45 countries
WHO SAVE WITH BLUE ENERGY

APPROVED ENERGY SAVING 27%

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One of the biggest hotels chain

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