Ingenious Use of Waste Heat from Air Conditioners

Evolutionary air conditioning and hot-water supply system recycles previously discarded waste heat from air conditioners to heat water

Mr. SLIM+

Hybrid heat recovery system

*Conditions for Air-to-Air cooling: Indoor 27°C (dry bulb) / 19°C (wet bulb); Outdoor 35°C (dry bulb)
*Water temperature: 45°C
In conventional systems, the air-heat exchanger in the outdoor unit works as a condenser during air conditioning operation. The heat of the indoor-air is transferred to the outside-air and exhausted as waste heat.

The new circuit in Mr. SLIM+ uses a water-heat exchanger for supplying hot water as the condenser. When the air conditioning and hot-water systems are running at the same time, heat is recycled and used rather than being exhausted as waste heat.

"COP 7.0* attained at water temperature of 45°C and standard air conditioning operation conditions"

Traditionally, when using a hot-water supply system where the air-heat exchanger is in the outdoor unit, operation may not be possible when the outside temperature is very high. However, since Mr. SLIM+ uses the Air-to-Air indoor unit for air conditioning operation and there's no heat exchange with outside-air, it's possible to use the hot-water supply system even if the ambient temperature is very high.

"Hot-water supply is possible (in heat recovery mode) even when the temperature outside is high (outside temperature = 46°C)"

Air conditioners normally exhaust hot air from the outdoor unit as waste heat in cooling operation. With Mr. SLIM+, however, the heat that is exhausted by conventional air conditioning systems is recycled and simultaneously transferred to the hot-water supply system, where it's used to heat water.

Mr. SLIM+ utilizes an evolutionary “2-in-1” design that combines two original Mitsubishi Electric system technologies (i.e., Air-to-Air and Air-to-Water) using a single outdoor unit.

Using waste heat from air conditioners to heat water
Mr. SLIM+ — The smart air conditioning and hot-water supply system conceived from eco-conscious ideas

More ecological  Heat recovery function recycles waste heat from air conditioners  COP 7.0*

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Space savings  Air conditioning and hot-water supply in one system – Installation space reduced

Mr. SLIM+ utilizes an evolutionary “2-in-1” design that combines two original Mitsubishi Electric system technologies (i.e., Air-to-Air and Air-to-Water) using a single outdoor unit.

Save on installation
Mitsubishi Electric’s legendary Air-to-Air and Air-to-Water systems have been integrated into a new configuration in which these two systems share just one outdoor unit. The installation area required outside is cut in half, realizing a space savings of 50%.

Save on construction
Previously, two systems including two separate outdoor units were required. But the all-new Mr. SLIM+ simplifies everything into a single system configuration, improving reliability and quality by reducing installation time. That results in savings in both time and money, which are passed on to our customers.

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Conventional system

Hybrid heat recovery system
1 Unit, 2 Roles – Total Comfort Year-round
Air conditioning and hot-water supply matching the needs of each room

All-in-one outdoor unit
(air conditioning, hot-water supply and hot-water heating)
Mr.SLIM for Air-to-Air
Mr.SLIM+ utilizes a duct system that enables the air conditioning or heating of multiple rooms, and other indoor unit type systems that is possible to fit various applications.

Mr.SLIM / Air to Air (Air Cooling)
Air-to-Air cooling using Air-to-Air indoor unit

Mr.SLIM / Air to Air (Air Heating)
Air-to-Air heating using Air-to-Air indoor unit

ecodan for Air-to-Water
- Hot-water supply (Domestic Hot-water supply)
- Hot-water heating for multiple rooms
Mr.SLIM+ utilizes ecodan system that is possible to make Domestic Hot-water and to operate Hot-water heating.

ecodan for Air-to-Water
(Heat recovery operation
(Air-to-Air cooling + Domestic Hot-water)

Mr.SLIM+ ecodan / Air to Air (Air Cooling) + DHW
Heat recovery operation using both Air-to-Air and Air-to-Water indoor units

Various operations

Hot regions
All-in-one system solution for cooling market

Residence
<All-season solution> for hot regions

Summer
“Heat recovery”
Heat recovery operation
(Air-to-Air cooling = Domestic Hot-water)

Spring & Autumn
“2-in-1 operation”
Air-to-Air heating operation
Domestic Hot-water operation

Winter
“ecodan”
Air-to-Water heating operation
Domestic Hot-water operation

Cold regions
All-in-one system solution for heating market

Residence
<All-season solution> for cold regions

Summer
“Heat recovery”
Heat recovery operation
(Air-to-Air cooling = Domestic Hot-water)

Winter
“Mr.SLIM”
Air-to-Water heating operation
Domestic Hot-water operation

Winter
“ecodan”
Air-to-Water heating operation
Domestic Hot-water operation

Spring & Autumn
“2-in-1 operation”
Air-to-Air heating operation
Domestic Hot-water operation
Mr.SLIM+ offers a diverse lineup to select from, ensuring maximum flexibility in home/office design. Choose from a variety of models seven indoor units and ecodan indoor units.

### Lineup

#### Indoor unit

<table>
<thead>
<tr>
<th>Indoor unit</th>
<th>Outdoor unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLA-ZRP7IBA</td>
<td>PKA-RP7IKAL</td>
</tr>
<tr>
<td>PKA-RP7IKAL</td>
<td>PSA-RP7IKA</td>
</tr>
<tr>
<td>PCA-RP7IKA</td>
<td>PCA-RP7IHA</td>
</tr>
<tr>
<td>PEAD-RP7IAQ</td>
<td>PEAD-RP7IAQ</td>
</tr>
<tr>
<td>PSA-RP7IKA</td>
<td>PSA-RP7IKA</td>
</tr>
</tbody>
</table>

#### ecodan

**Air-to-Water indoor unit**

*2012 B generation split type models
*Reversible model cannot be connected
Specifications

Outdoor unit

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>PLU-ZFP71YA</th>
<th>PKN-ZFP71KA</th>
<th>PCA-ZFP71KA</th>
<th>PCA-ZFP71HA</th>
<th>PCA-ZFP7KA</th>
<th>PTA-ZFP7HA</th>
<th>PEAD-ZFP7UA</th>
<th>PEAD-ZFP7UL</th>
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</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
<td>73</td>
</tr>
<tr>
<td>Operating current (A)</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
<td>48</td>
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<td>48</td>
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</tr>
</tbody>
</table>

Evaporating

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>8.5</th>
<th>8.5</th>
<th>8.5</th>
<th>8.5</th>
<th>8.5</th>
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Refrigerant

*1 Refrigerant leakage contributes to climate change. Refrigerant with lower global warming potential (GWP) contributes less to global warming than a refrigerant with higher GWP if leaked to the atmosphere. This appliance contains a refrigerant fluid with a GWP equal to 1,975. This means that 1 kg of this refrigerant fluid leaked to the atmosphere, the impact on global warming would be 1,975 times higher than that of 1 kg of CO2 over a period of 100 years. Never to interfere with the refrigerant circuit yourself or disassemble the product yourself. Always ask a professional.

*2 Energy consumption based on standard test results. Actual energy consumption will depend on how the appliance is used and where it is located.

*3 Optional air protection guide is required where ambient temperature is lower than -5°C.

*4 SEER/SCOP values are measured based on EN14825.

*5 SCOP values are measured based on EN14511 (Circulation pump input is not included).

*6 Conditions for Air-to-Air cooling: Indoor 27°C (dry bulb) / 19°C (wet bulb); Outdoor 35°C (dry bulb).