

CO₂ /CO₂ CASCADE CONDENSING UNIT

System Developer ■

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World's first successful development!!!

CO₂/CO₂ Cascade Condenser

*Patent Pending



Nakayama Engineering K.K. is contributing to the fight against global warming by developing the world's first "**CO₂/CO₂ Cascade Condensing Unit (Shell and Fin Coil)**", with CO₂ possessing an ozone depletion potential (ODP) of 0 and a global warming potential (GWP) of 1.

This next-generation condensing unit is able to realize **High Efficiency**, **Energy Savings**, **Stable Operation**, and **Reduced Maintenance Costs**!

System Specification

Application

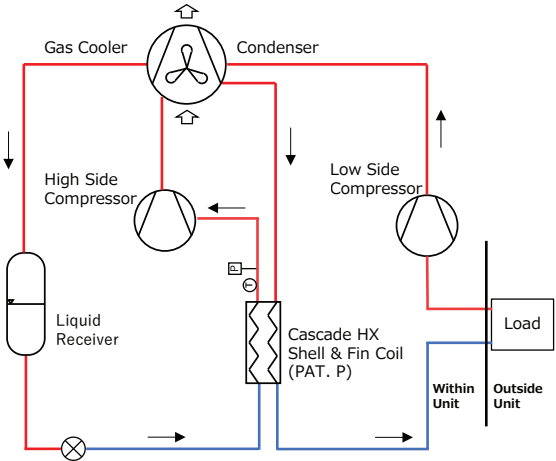
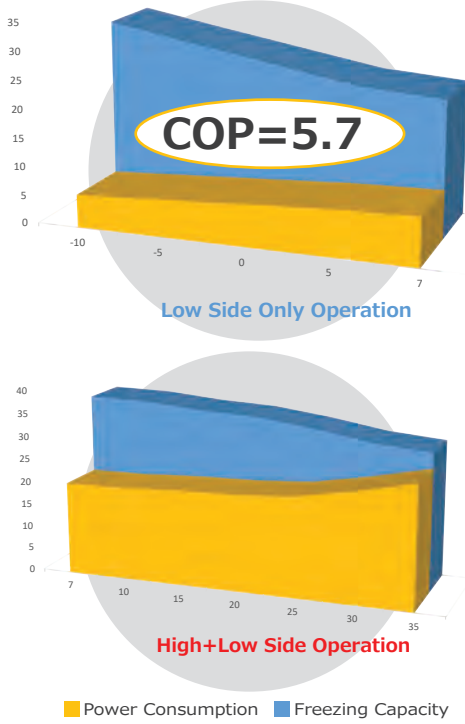
| Application | Cooling | | Freezing |
|---------------------|--------------------------|----------------|----------------|
| Model | EM-R1000 | EM-R2000 | EM-F050 |
| Motor Voltage | 3P 200V 50/60Hz | | |
| Refrigerant | R744 (CO ₂) | | |
| Motor Rated Output | 20hp+9hp | 50hp+20hp | 50hp+25hp |
| Starting Method | PW / Y-△ Start | PW | PW |
| Cooling Capacity | to: -32℃ | -32℃ | -45℃ |
| (Ambient Temp @32℃) | Φo: 31.2 / 37.0 kW | 71.3 / 86.0 kW | 53.3 / 64.4 kW |
| Gas Cooler | Integrated / Remote Type | | |

PW: Part Winding Start
Note: System specification is for Japan domestic reference only



ηmax CO₂/CO₂ Cascade System MERIT

- Simplified structure** with separate high and low power systems **simplifies maintenance and management**.
- Simple structure reduces the number of devices/system failure rate, thereby **reducing maintenance costs**.
- High efficiency** is realized in the cascade system by the ηmax CO₂/CO₂ cascade heat exchanger (PAT. P).
- Low side only operation at low ambient temperatures possible!
Constant-speed operation throughout the year without the need for an inverter, **saving energy** and **ensuring stability**



| Compressor Specification (COP Reference Value) | | |
|---|------|-------------------|
| High Side | 20hp | |
| Low Side | 9hp | |
| Ambient Temp | COP | Running Condition |
| ℃ | | |
| 30 | 1.30 | High/Low Side |
| 5 | 3.02 | Low Side Only |
| -10 | 5.70 | Low Side Only |

(Ambient Temp: High side operation turns off when ambient temperature drops below 7℃)

ηmax Refrigeration Systems
breaking through innovation barriers
for the future of our beautiful Earth!

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