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SEIBU GIKEN PRODUCTS

# GREEN-SAVE® "HI-PANEX-ION" Heat Exchange/Recovery Wheel



[www.seibu-giken.com](http://www.seibu-giken.com)



SEIBU GIKEN CO., LTD. participates in the ECP programme for  
Air to Air Rotary Heat Exchangers / Sorption.  
Check ongoing validity of certificate:  
[www.eurovent-certification.com](http://www.eurovent-certification.com) or [www.certiflash.com](http://www.certiflash.com)



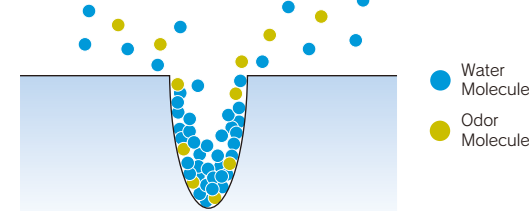
# Ion Power Produces Still Cleaner, More Energy-saving and Comfortable Air-conditioning.

## POINT 1 Excellent Effect in Odor Transfer Prevention

As adsorbent for latent heat (moisture) exchange, ion exchange resin, which adsorbs little odor, has been adopted for the first time in the world. Odor transfer and accumulation is extremely little compared with a former type using silica gel.

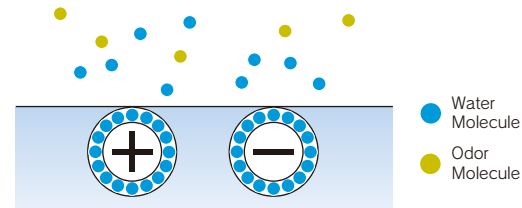
### Adsorption by silica gel

As it is adsorption by capillary power, odor is adsorbed as well as water vapor. It is remarkable especially in the case of water-soluble odor.

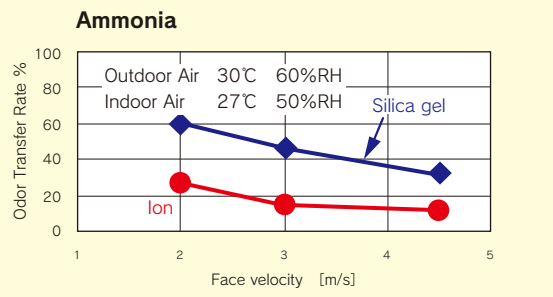
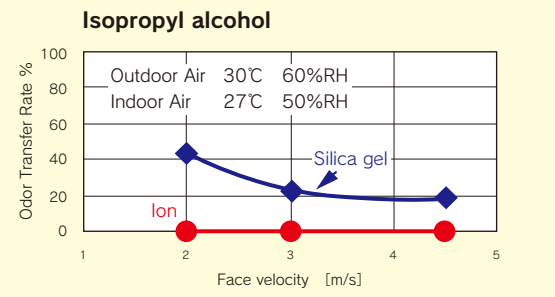


### Adsorption by Ion

Water molecules only are selectively adsorbed by ion power.



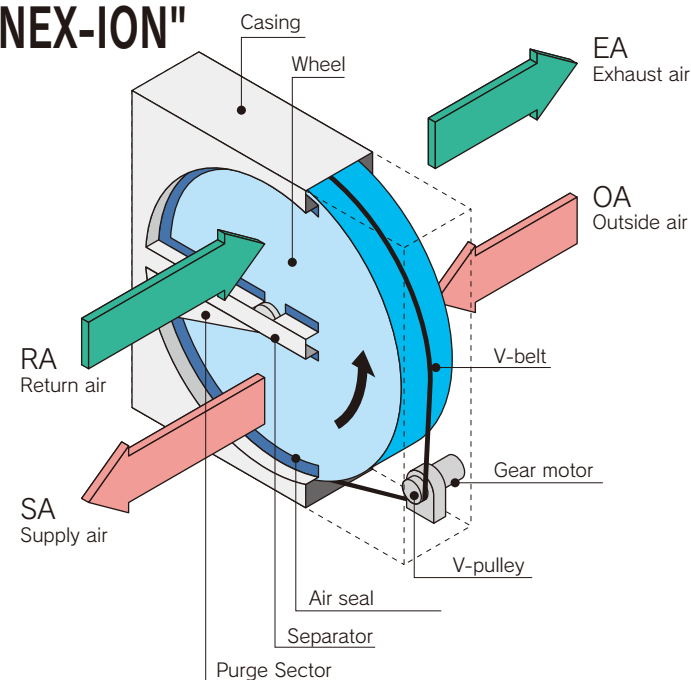
### Odor Transfer Comparison Graph



Ask us about any other compounds.

## Function of GREEN-SAVE® "HI-PANEX-ION"

The figure on the right is an illustration of GREEN-SAVE®Hi-PANEX-ION, a total heat recovery cassette. A honeycomb wheel is rotated at about 20 r.p.m. in the direction of the arrow. Return air from the inside passes from the upper half of the cassette through the wheel and is exhausted outside. During this, most of the total heat (heat and moisture) of the return air is kept in the wheel and waste air only is exhausted. On the other hand, when outside air, taken in from the lower half of the cassette, passes through the rotor, the outside air receives total heat that the wheel has kept and is pre-heated/humidified in winter and pre-cooled/dehumidified in summer to be thus supplied continuously to the inside. In other words, the total heat recovery wheel is an energy-saving equipment that recycles energy lost in ventilation.



## POINT 2 Excellent Energy Saving Effect

The rotary type with counter-flow method produces high efficiency.

**Exhausted CO<sub>2</sub> Volume Reduction Effect**  
14ton-C/year/cassette

"Ton-C/year/cassette" is a unit expressing exhausted CO<sub>2</sub> volume computed in terms of carbon. It is calculated on condition that all the cooling/warming air-conditioning is conducted by electricity. Calculating conditions : Tokyo Electric Power '98 81g-C/kwh PAC-2900T OA 41,000m<sup>3</sup>/h Tokyo Area

## POINT 3 Anti-germ/Mold-proof Effect

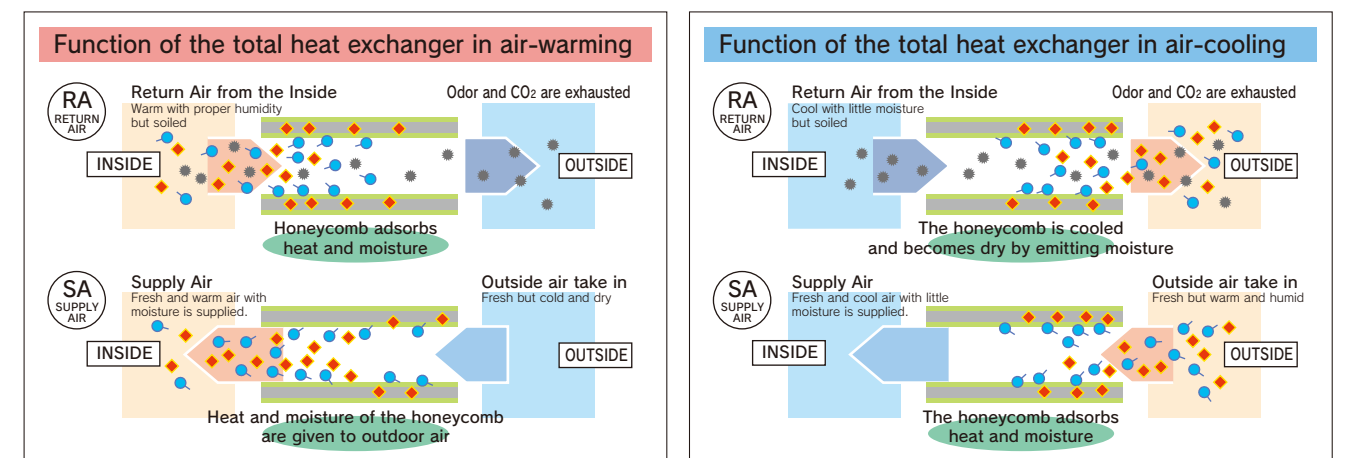
"HI-PANEX-ION" has achieved thorough improvement of IAQ (Indoor air quality) by using ion power and anti-germ/mold-proof agent together.

## Cross-Contamination is minimized with

1. Ion Exchange Resin : Co-adsorption
2. Purge Sector : Carry-over

## Principle of total heat (heat and moisture) exchange

As shown in the figure, return air and supply air flow alternately and exchange heat (recover waste heat) by keeping and emitting heat and moisture.





# Materials of Wheel for GREEN-SAVE® HI-PANEX-ION

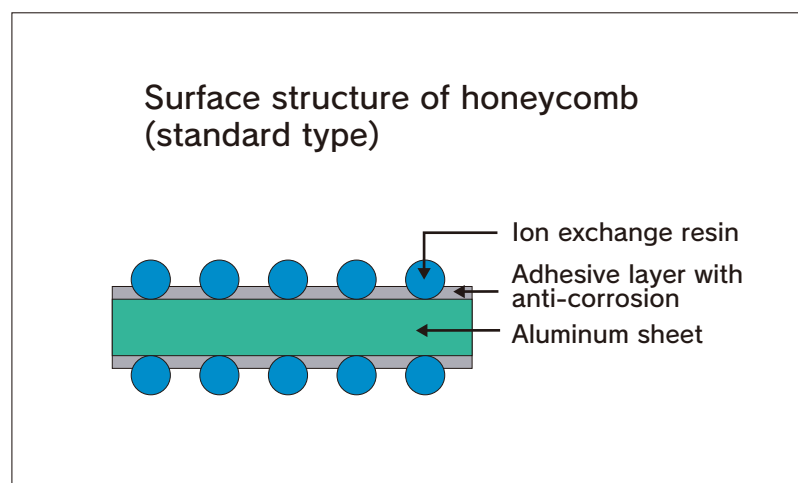
## General application

| Type | Material       | Heat Exchange | Main Application                                       | Examples   | Application Temperature Range |
|------|----------------|---------------|--|--|-------------------------------|
| PA   | Aluminum sheet | Total         | General air conditioning<br>Desiccant air conditioning | Office bldg., Institute, School,<br>Theater, Hospital, Hotel, Vessels,<br>Swimming pool, Factory,<br>Animal laboratory | -20°C ~60°C                   |
|      |                | Sensibe       | Against corrosion                                      |  |                               |

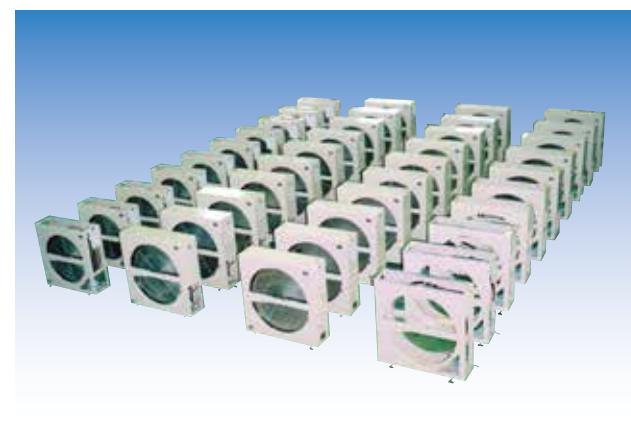
Anti-corrosion type is also available. Ask us for further information.

## Aluminum Total Heat Recovery wheel

Surface structure of the honeycomb is as shown in the figure 1.  
As anti-germ/mold proof agent layer covers the whole surface, anti-germ/mold proof quality is displayed in any part.



(Figure 1)



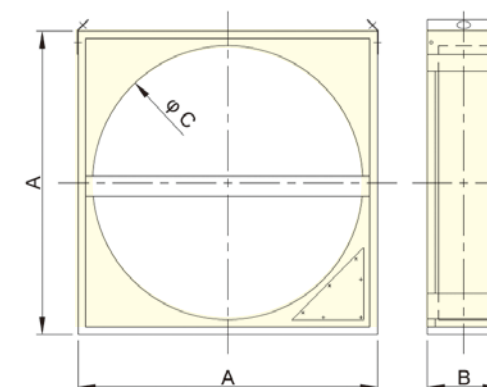
Total heat recovery cassettes

# Specification Table of GREEN-SAVE® HI-PANEX-ION

## PA C-1500 T-G

- ①
- ②
- ③
- ④
- ⑤

- ① Materials of element  
PA: Aluminum sheet
- ② Category of products  
C: Cassette  
R: Wheel only
- ③ Diameter of wheel
- ④ Function of wheel  
T: Total Heat Recovery  
S: Sensible Heat Recovery
- ⑤ AHU Built-in type



## AHU Built-in type (One body)

|    | Model       | Air volume<br>CMH<br>Face Velocity<br>(1.5~4.5m/s) | Motor<br>3 φ /380~415V<br>50Hz/60Hz | Weight<br>(kg) | Dimension<br>(mm) |     |      |
|----|-------------|--|-------------------------------------|----------------|-------------------|-----|------|
|    |             |  |                                     |                | A                 | B   | C    |
| 1  | PAC- 500T-G | 480~ 1,500   | 0.1kW                               | 55             | 600               | 290 | 500  |
| 2  | PAC- 600T-G | 710~ 2,200   |                                     | 65             | 700               | 290 | 600  |
| 3  | PAC- 700T-G | 990~ 3,000   |                                     | 75             | 800               | 290 | 700  |
| 4  | PAC- 800T-G | 1,300~ 3,900                                       |                                     | 85             | 900               | 290 | 800  |
| 5  | PAC- 900T-G | 1,660~ 5,000                                       |                                     | 95             | 1000              | 290 | 900  |
| 6  | PAC-1000T-G | 2,030~ 6,100                                       | 0.2kW                               | 110            | 1100              | 290 | 1000 |
| 7  | PAC-1100T-G | 2,470~ 7,400                                       |                                     | 125            | 1200              | 290 | 1100 |
| 8  | PAC-1200T-G | 2,960~ 8,900                                       |                                     | 135            | 1300              | 290 | 1200 |
| 9  | PAC-1300T-G | 3,490~ 10,500                                      |                                     | 155            | 1400              | 290 | 1300 |
| 10 | PAC-1500T-G | 4,620~ 13,900                                      |                                     | 205            | 1600              | 320 | 1500 |
| 11 | PAC-1700T-G | 5,980~ 18,000                                      | 0.4kW                               | 240            | 1800              | 320 | 1700 |
| 12 | PAC-1900T-G | 7,510~ 22,600                                      |                                     | 285            | 2000              | 320 | 1900 |

Note 1. Air flow range is just a reference. Different air flow rate may be applied. Please ask our representative.

2. Higher face velocity more than 4.5m/s is available with the different model.



Total heat recovery wheel



Total heat recovery cassette



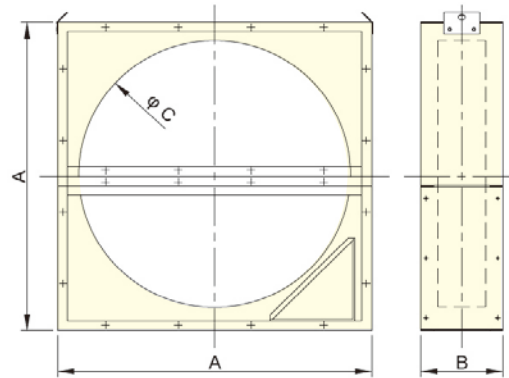
Total heat recovery unit

# Specification Table of GREEN-SAVE® HI-PANEX-ION

## PA C-1500 T-U

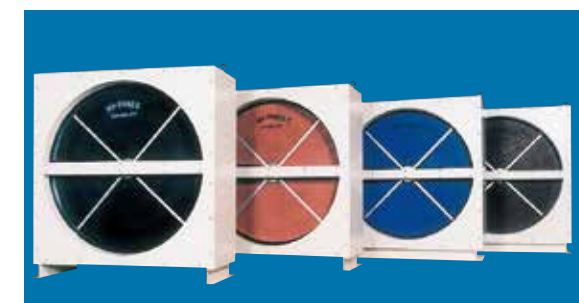
- ①
- ②
- ③
- ④
- ⑤

- ① **Materials of element**  
PA: Aluminum sheet
- ② **Category of products**  
C: Cassette  
R: Wheel only
- ③ **Diameter of wheel**
- ④ **Function of wheel**  
T: Total heat recovery  
S: Sensible heat recovery
- ⑤ **Duct connection type**



### Standard type (Duct Connection)

|    | Model       | Air flow (m³/h)<br>Face velocity (1.5~4.5m/s) | Motor<br>3 φ/380~415V<br>50Hz/60Hz | Weight (kg) | Dimension (mm) |     |      |
|----|-------------|---|------------------------------------|-------------|----------------|-----|------|
|    |             |   |                                    |             | A              | B   | C    |
| 1  | PAC- 500T-U | 450~ 1,360                                    | 0.1kW                              | 85          | 800            | 340 | 500  |
| 2  | PAC- 600T-U | 680~ 2,040                                    |                                    | 100         | 900            | 340 | 600  |
| 3  | PAC- 700T-U | 950~ 2,860                                    |                                    | 110         | 1000           | 340 | 700  |
| 4  | PAC- 800T-U | 1,260~ 3,800                                  |                                    | 120         | 1100           | 340 | 800  |
| 5  | PAC- 950T-U | 1,810~ 5,450                                  |                                    | 135         | 1200           | 340 | 950  |
| 6  | PAC-1050T-U | 2,100~ 6,320                                  |                                    | 140         | 1200           | 340 | 1050 |
| 7  | PAC-1100T-U | 2,460~ 7,380                                  |                                    | 145         | 1300           | 340 | 1100 |
| 8  | PAC-1200T-U | 2,940~ 8,830                                  |                                    | 155         | 1400           | 340 | 1200 |
| 9  | PAC-1300T-U | 3,470~ 10,410                                 | 0.2kW                              | 175         | 1500           | 340 | 1300 |
| 10 | PAC-1500T-U | 4,550~ 13,670                                 |                                    | 210         | 1700           | 340 | 1500 |
| 11 | PAC-1700T-U | 5,900~ 17,710                                 |                                    | 300         | 1900           | 340 | 1700 |
| 12 | PAC-1900T-U | 7,420~ 22,260                                 | 0.4kW                              | 340         | 2100           | 340 | 1900 |
| 13 | PAC-2150T-U | 9,550~ 28,670                                 |                                    | 390         | 2350           | 420 | 2150 |
| 14 | PAC-2400T-U | 11,990 ~ 35,990                               |                                    | 700         | 2700           | 500 | 2400 |
| 15 | PAC-2600T-U | 14,110 ~ 42,350                               | 0.75kW                             | 760         | 2900           | 500 | 2600 |
| 16 | PAC-2900T-U | 17,610 ~ 52,840                               |                                    | 890         | 3200           | 500 | 2900 |
| 17 | PAC-3100T-U | 20,150 ~ 60,470                               |                                    | 1030        | 3400           | 550 | 3100 |
| 18 | PAC-3500T-U | 25,700 ~ 77,100                               | 1.5kW                              | 1280        | 3800           | 600 | 3500 |
| 19 | PAC-3900T-U | 31,970 ~ 95,930                               |                                    | 1490        | 4200           | 600 | 3900 |
| 20 | PAC-4200T-U | 37,120 ~ 111,380                              |                                    | 1650        | 4500           | 600 | 4200 |



- Note** Please ask our representatives for any options.
1. Different voltage/frequency
  2. Horizontal installation
  3. High temperature air
  4. Different sizes/larger diameter wheel  
(Above sizes are just for reference)
  5. Higher Velocity

Larger than PAC-2150T is shipped as two bodies.

Specification/dimension/design is subject to change without notice.

# How to Read Model Selection Table

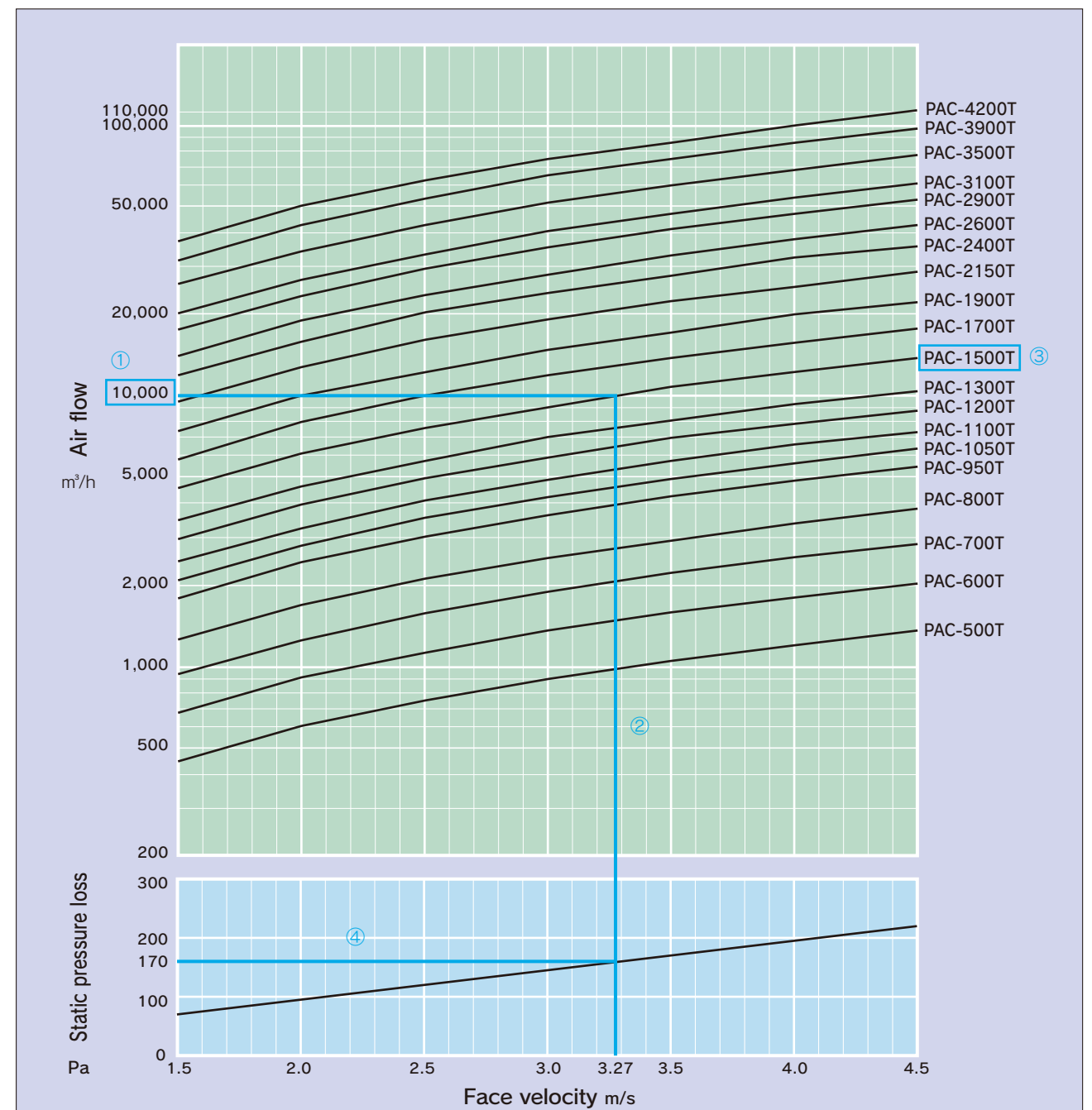
## ■For equal air flows

- ① Enter the required air flow on the left side of the Chart and extend a horizontal line <m³/h-line> to the right.
- ② Select a face velocity in accordance with the given schedule. Extend a vertical line from the desired face velocity and intersect the m³/h-line.
- ③ The line <model-line> for Model number which either passes through or to the left of this intersecting point determines your desired selection.
- ④ Extend the above line downward on Chart, and determine Static pressure loss.

|                      | Supply air | Exhaust air |
|----------------------|------------|-------------|
| Air flow             | 30,000m³/h | 30,000m³/h  |
| Model                | PAC-2900T  |             |
| Static pressure loss | 124Pa      | 124Pa       |
| Face velocity        | 2.6m/s     | 2.6m/s      |

Ask us about software for each model selection.

## Model Selection Table

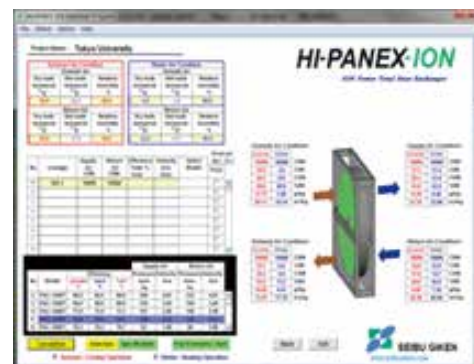


## Selection Software

Our selection software allows very simple operation to size optimum model in accordance with required performance. The cassette type either Built-in or Standard can be also available in selection. The software will be updated periodically based on latest certification and performance. Please contact our representative for more detail.

### Both AHRI and Eurovent methods are available

AHRI and Eurovent certificates take different methods. There are two software available to calculate with each formula in accordance with published method.



## GREEN-SAVE® HI-PANEX-ION Installation

### One body type

PAC-1900T or smaller cassette will be shipped as one body. These cassettes are containerized with suitable package for export and are installed simply. Connection to the duct, modular for AHU, installation can be done without any further assembly.



One body type

### Two bodies for larger cassette

PAC-2000T and larger cassette will be shipped as two bodies in order to containerize for export. The wheel itself is also divided to two half-moons. Two bodies shipment allows to save installation time and labor work. All products are pre-tested before shipment.



Two bodies for larger cassette

Please contact our representative for more detail.

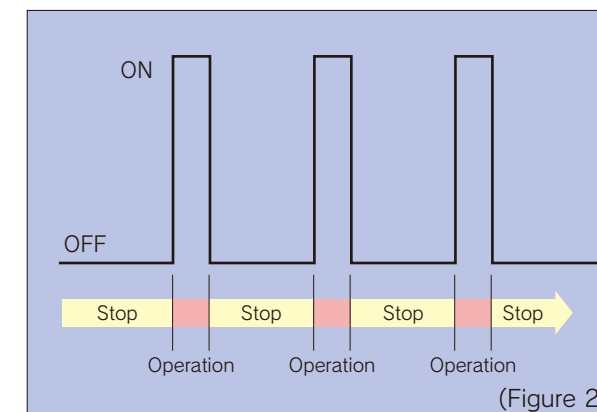
## How to Control in Intermediate Seasons

In intermediate seasons, the rise of room temperature can be adjusted by taking outside cool air into the room and the heat recovery of RA by GREEN-SAVE® HI-PANEX-ION is not required. Therefore it is recommended to lower the heat recovery rate by controlling the efficiency of total heat recovery wheel. Besides alternatively bypassing, the following method as shown in the Figure 2 is generally applied to control the efficiency.

### ON-OFF control

This method is to intake the outside air which is lower than the room temperature by intermittently rotating and stopping the wheel. Also the clogging of the honeycomb can be prevented because the wheel is intermittently rotated.

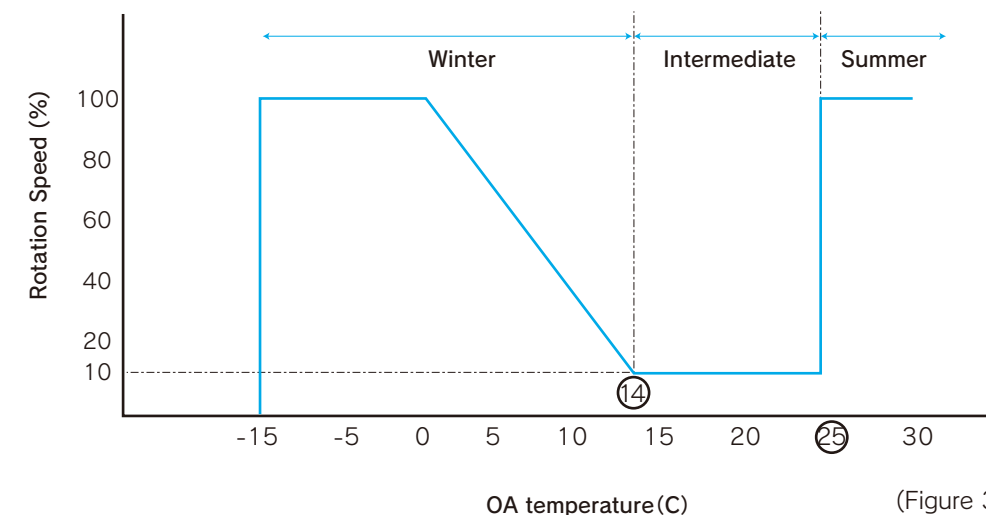
- Standard timer
- Timer for operation 5 min.
- Timer for stop 60 min.



(Figure 2)

### VFD Control and frost control

This method is to maximize the fresh air intake. By combination with ON-OFF control in the intermediate season, IAQ is maximized. The frost point will be varied due to RA condition. Each set point is variable. Please contact Representative for more detail.



(Figure 3)

### Pneumatic High Pressure Auto Cleaning System

Available as option.

Handwriting practice lines on page 9. The page contains 20 horizontal dotted lines for writing practice.

Handwriting practice lines on page 10. The page contains 20 horizontal dotted lines for writing practice.