CAUTION

Prior to use, carefully read the instruction manual attached to the product. The specifications described in this brochure, such as the rating, dimensions and appearance, may be subject to changes without prior notice; it is, therefore, necessary to purchase our product after it has been checked satisfactorily at your end.

Electrolysis type
Dehumidifying element / Dehumidifier
ROSAHL

A new standard for a new era

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This leaflet shows the product specifications and dimensions as of Aug., 2014. It is subject to change without prior notice.
Completely new approach to dehumidification

This product uses a solid polymer electrolyte membrane, a completely different principle from conventional dehumidification methods. It directly electrolyzes and removes moisture from the air, and provides many advantages (see below).

(The name "ROSAHL" comes from a pun on a Japanese phrase meaning "removing dew").

1. Energy saving
2. No droplet
3. Capable of dehumidifying even below 0°C or less
4. Noiseless
5. Compact and lightweight
6. Works also as a humidifier

World's first electrolytic method

- This new type of dehumidifier electrolytically decomposes and removes moisture in a container using a solid polymer electrolyte membrane.
- When a direct current is applied to the porous electrode attached to the special solid polymer electrolyte membrane, moisture at the anode side (dehumidifying side) is separated into hydrogen ions (H+) and oxygen. The hydrogen ions pass through the solid polymer electrolyte membrane to the cathode side (moisture discharging side).
- The hydrogen ions react with oxygen in the air on the cathode side to form water molecules (gas) and are then discharged.
**Small Dehumidifying Element**

Installation is simple in small size!

**Specifications**

- Element connecting terminal type: PD2: Soldered type, PD3: Insertion type
- Operating temperature: −10 to 50°C
- Dimensions of installation hole: φ17 x 11
- Weight: 1.2 g
- Power consumption: 3 VDC
- Element terminal voltage: 3 VDC
- Dehumidifying capacity: 0.9 cc
- Applicable volume: 84 cc (The initial value at the temperature of 30°C and humidity of 60%.)
- Dimensions (height x width x depth): 24 x 30 x 5.5
- Weight: 1.9 g
- Dimensions of moisture discharging hole: 12.8 x 10.5
- Operating temperature: +10 to 50°C
- Element connecting terminal type: Soldered type or Insertion type

Notes:

1. The initial value at the temperature of 30°C and humidity of 60%. (The dehumidifying capacity will degrade during use. How much it degrades depends on the operating environment and conditions. If any signs of abnormality are seen, early replacement is recommended.)
2. The applicable volume is for a sealed, moisture-impermeable container, and may vary depending on the material of the container, state of sealing and required humidity.
3. The annual average power consumption in average conditions in Japan.
4. See installation instructions on page 10.
5. For an insertion type terminal for PD3, use a STO-01T-110N (JST) flat connecting terminal or equivalent.

**Thin Dehumidifying Element**

Compact body as small as your thumb!

**Specifications**

- Element connecting terminal type: RD2, RD4: Insertion type
- Operating temperature: −10 to 50°C
- Dimensions of installation hole: φ1.1 x 1.5
- Weight: 80 cc
- Dimensions of moisture discharging hole: 84 cc
- Operating temperature: +20 to 60°C
- Element connecting terminal type: Insertion type

Notes:

1. The initial value at the temperature of 30°C and humidity of 60%. (The dehumidifying capacity will degrade during use. How much it degrades depends on the operating environment and conditions. If any signs of abnormality are seen, early replacement is recommended.)
2. The applicable volume is for a sealed, moisture-impermeable container, and may vary depending on the material of the container, state of sealing and required humidity.
3. The annual average power consumption in average conditions in Japan.
4. See installation instructions on page 11.
5. The polarity is indicated with +/-.

**Notes**

- Read the precautions for use on page 14.
- See Figure 1.
- See Figure 2.
- The insertion type terminals may touch each other, as the element bodies are small.
- For an insertion type terminal for PD3, use a STO-01T-110N (JST) flat connecting terminal or equivalent.
- When dehumidifying the inside of a container, attach RD3 from the outside or RD4 from the inside.
- The applicable volume is for a sealed, moisture-impermeable container, and may vary depending on the material of the container, state of sealing and required humidity.
Specify 100 VAC or 200 VAC when ordering.

The RDH-3P1 shown in the picture is for 100 VAC.

Operating temperature:
-10°C to 50°C

Humidity set range:
20% to 80%

Dehumidifying capacity:
- 100/110 AC
- 2000 AC (per minute)

Power supply unit:
- RDH-3P1
- RDH-7P1
- RDH-5P1

Element unit:
- RDHC-7P1
- RDHC-5P1

Humidity controller unit:
- S-5J1
- S-7J1
- S-10J1

Dehumidifying capacity:
- 85 to 264 AC

Rated voltage:
- 100/110 AC

Power consumption:
- 0.7 to 1.1 W

Operating temperature:
- -10°C to 50°C

Notes:
1. The RDH-3P1 shown in the picture is for 100 VAC.
2. The applicable voltage is for a sealed, moisture-controllable container, and may vary depending on the material of the container, state of sealing and required humidity.
3. The annual average power consumption in average conditions in Japan.
4. The dimensions of A x B x C in the figure.
To select a model, use the applicable volume and required humidity graphs below as a guide.

Reference: 1) The graph shows the relationship at an outside air humidity of 90%.
2) A sealed moisture-impermeable container is used.

**Thin dehumidifying element (MDL-3, MDL-5, MDL-7)**

- Dehumidification characteristics (container: 50 L)
  - Temperature (°C): 30
  - Humidity (%): 90

- Dehumidification characteristics (30°C 90%RH)
  - Humidity (%): 0, 1, 2, 3, 4, 5, 6, 9, 10, 7, 8
  - Time (h): 0.2, 0.1, 0.05, 0.002, 0.001, 0.0005, 0.0003, 0.3, 0.5, 1, 2, 3, 5, 10

**Small dehumidifying element (PD2, PD3, RD3, RD4)**

- Dehumidification characteristics (35°C 80%RH)
  - Humidity (%): 0, 10, 20, 30, 40, 50, 60, 70, 80, 90
  - Time (h): 0, 1, 2, 3, 4, 5, 6, 9, 10, 7, 8

- Characteristics of the graphs may vary depending on the material of the container and the degree of airtightness.
  1. If the container contains moist material such as resin, dehumidifying the inside of the container induces release of moisture from the material, which will result in slow dehumidification of the inside of the container.
  2. The dehumidifying capacity of the element varies according to the absolute water amount inside the container.

**Test data**

- Test data of humidity controller embedded type (RDHC-10J1)
- Field test data
  - Dehumidification results at high temperature and high humidity in summer
  - Dehumidification results at low temperature and high humidity in winter

**Optional Parts**

- Rainproof cover: This product prevents rain drops and insects from entering the moisture discharging hole when the dehumidifier is used in an outdoor panel.
- Adapter set: This product provides round moisture discharging holes and prevents rain drops or insects from entering the holes when a dehumidifier is used in an already installed outdoor panel. A special vent cover is included.

<table>
<thead>
<tr>
<th>Options</th>
<th>Product name</th>
<th>Model name</th>
<th>Compatible model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainproof cover</td>
<td>For RDH-3J1</td>
<td>RDH-3J1, RDH-3P1</td>
<td>For RDH-7J1, RDH-10J1, RDH-10J2</td>
</tr>
<tr>
<td></td>
<td>For RDH-5J1</td>
<td>RDH-5J1, RDH-5P1</td>
<td>For RDH-7J1, RDH-10J1, RDH-10J2</td>
</tr>
<tr>
<td></td>
<td>For RDH-7J1</td>
<td>RDH-7J1, RDH-7P1</td>
<td>For RDH-7J1, RDH-10J1, RDH-10J2</td>
</tr>
<tr>
<td></td>
<td>For RDH-10J2</td>
<td>RDH-10J2, RDH-10J2</td>
<td>For RDH-7J1, RDH-10J1, RDH-10J2</td>
</tr>
</tbody>
</table>

**Options**

- Adapter set parts: this product provides round moisture discharging holes and prevents rain drops or insects from entering the holes when a dehumidifier is used in an already installed outdoor panel. A special vent cover is included.
Follow these instructions to ensure airtightness when installing a dehumidifying element.

**How to install thin dehumidifying element**

[PD3, PD4]

- Make a screw hole for an M12 (P0.5) mm screw on the container on which you will install the dehumidifying element. Insert a packing into the hole and slowly screw in the screw. (Specified torque: 0.25 to 0.39 N·m)
- The packing is not included.

**How to install small dehumidifying element**

[RD3, RD4]

- Make a square hole 12.5 mm x 12.5 mm on the container, insert the included packing and attach the dehumidifying element with four M2 screws. (Specified torque: Max. 0.18 N·m)
- The packing is not included.

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Read dimensions of thin dehumidifying element (recommended)

For RDH-5J1

For RDH-7J1

Rainproof cover model no.

Installation dimensions (Unit: mm)

Material: PTFE series
Hardness: Approximately 50
Thickness: 2 mm

Material: SUS
Thickness: 3 mm

Follow these instructions to ensure airtightness when installing a dehumidifying element.

**How to install small dehumidifying element**

[PD2, PD3]

Make a screw hole for an M12 (P0.5) mm screw on the container on which you will install the dehumidifying element. Insert a packing into the hole and slowly screw in the screw. (Specified torque 0.25 to 0.39 N·m)
- The packing is not included.

**How to install thin dehumidifying element**

[MDL-3, MDL-5, MDL-7]

- As shown in the right figure, fit packing to both sides of the dehumidifying element, attach the retainer plate on the top and fasten around the edge with M4 screws. If the necessary distance is not secured between the connecting terminal of dehumidifying element and the panel surface, attach the dehumidifying element to an element installation plate or such other plate and then install to the panel surface.
- The packings used should be made from PTFE (polytetrafluoroethylene) series and have hardness of approximately 50.
- When installing in an outdoor panel, avoid interference with the attaching screws of the rainproof cover.

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Make a square hole 12.5 mm x 12.5 mm on the container, insert the included packing and attach the dehumidifying element with four M2 screws. (Specified torque: Max. 0.18 N·m)

(RSAL ELECTROLYTIC DEHUMIDIFIER)
How to install dehumidifier

1. Make a square moisture discharging hole on the side of the panel and directly install the dehumidifier. Always use an optional rainproof cover for outdoor panels.

2. Use an optional adapter set for installation. This method is usually used when it is not possible to make a square moisture discharging hole on the surface itself, for example when installing to an existing panel.

Main body and rainproof cover

- **Main body installation dimensions**
- **Rainproof cover installation dimensions**
- **Moisture discharging hole dimensions**

### (1) Humidity controller embedded type and general type

- **Square hole (e x f)**
  - RDH-10J2
  - RDH-10J1
  - RDH-7J1
  - RDH-5J1
  - RDH-3J1

- **Panel boring dimensions**
  - **Main body installation dimensions**
  - **Rainproof cover installation dimensions**
  - **Moisture discharging hole dimensions**

### (2) Molded type

- **Main body and rainproof cover**

<table>
<thead>
<tr>
<th>Installation method</th>
<th>Model name</th>
<th>Main body installation dimensions</th>
<th>Rainproof cover installation dimensions</th>
<th>Moisture discharging hole dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDH-3J1</td>
<td>S-3J1</td>
<td>(30 x 30) x 5 (D: 2 x 3 x 5)</td>
<td>(25 x 25 x 5) (C: 2 x 3 x 5)</td>
<td>(20 x 20 x 5) (A: 2 x 3 x 5)</td>
</tr>
<tr>
<td>RDH-5J1/RDH-5J2</td>
<td>S-5J1</td>
<td>50 x 50 x 6 (D: 2 x 3 x 6)</td>
<td>25 x 25 x 6 (C: 2 x 3 x 6)</td>
<td>20 x 20 x 6 (A: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-7J1/RDH-7J2</td>
<td>S-7J1</td>
<td>65 x 65 x 6 (D: 2 x 3 x 6)</td>
<td>30 x 30 x 6 (C: 2 x 3 x 6)</td>
<td>25 x 25 x 6 (A: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-10J1/RDH-10J1</td>
<td>S-10J1</td>
<td>80 x 80 x 6 (D: 2 x 3 x 6)</td>
<td>35 x 35 x 6 (C: 2 x 3 x 6)</td>
<td>30 x 30 x 6 (A: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-10J2/RDH-10J2</td>
<td>S-10J2</td>
<td>90 x 90 x 6 (D: 2 x 3 x 6)</td>
<td>40 x 40 x 6 (C: 2 x 3 x 6)</td>
<td>35 x 35 x 6 (A: 2 x 3 x 6)</td>
</tr>
</tbody>
</table>

### (3) Separate type

- **Element unit, Power supply unit, Humidity controller unit**

<table>
<thead>
<tr>
<th>Unit name</th>
<th>Model name</th>
<th>Installation dimensions</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element unit</td>
<td>S-3J1</td>
<td>(30 x 30) x 5 (D: 2 x 3 x 5)</td>
<td>Figure 1</td>
</tr>
<tr>
<td>Power supply unit</td>
<td>D-300JUV</td>
<td>173 x 84</td>
<td>Figure 2</td>
</tr>
<tr>
<td>Humidity controller unit</td>
<td>C-MJ</td>
<td>102 x 48</td>
<td>Figure 3</td>
</tr>
</tbody>
</table>

### Rainproof cover

- **Application model name**

<table>
<thead>
<tr>
<th>Installation method</th>
<th>Applicable model name</th>
<th>Rainproof cover installation dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RDH-3J1</td>
<td>S-3J1</td>
<td>(30 x 30 x 5) (C: 2 x 3 x 5)</td>
</tr>
<tr>
<td>RDH-5J1/RDH-5J2</td>
<td>S-5J1</td>
<td>(25 x 25 x 6) (C: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-7J1/RDH-7J2</td>
<td>S-7J1</td>
<td>30 x 30 x 6 (C: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-10J1/RDH-10J1</td>
<td>S-10J1</td>
<td>35 x 35 x 6 (C: 2 x 3 x 6)</td>
</tr>
<tr>
<td>RDH-10J2/RDH-10J2</td>
<td>S-10J2</td>
<td>40 x 40 x 6 (C: 2 x 3 x 6)</td>
</tr>
</tbody>
</table>

Note: *1 Select a suitable rainproof cover for the element unit.
Example: S-3J1 -> For RDH-3J1

For the rainproof cover and adapter set, see page 9.
1. Attach a protective cover when necessary to prevent hands or objects from coming into contact with the dehumidifying/humidifying surface of the element.

2. Check the installation direction carefully before installation.

3. Strictly follow the following instructions about power supply to the element.
   (1) DO NOT reverse the polarity. Please check the indication of polarity for the product. (Attach a polarity indication LED on the outside if necessary.)
   (2) The dehumidifying element naturally causes a relatively large starting current when the power is turned on. Therefore, the specifications below are recommended for the power source.
   (3) Use a dedicated power source for each dehumidifying element.
   (When multiple dehumidifying elements are connected in series or parallel, the breakage of one element may cause all other elements to be disabled.)

**Recommended power source specifications**

<table>
<thead>
<tr>
<th></th>
<th>MDL-3</th>
<th>MDL-5</th>
<th>MDL-7</th>
<th>PD2/PD3/RD3/RD4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated output voltage</td>
<td>3 VDC</td>
<td>3 VDC</td>
<td>5 VDC</td>
<td>500 mA</td>
</tr>
<tr>
<td>Rated output current</td>
<td>2A</td>
<td>3A</td>
<td>5A</td>
<td>500mA</td>
</tr>
<tr>
<td>Overcurrent protection function (constant or fold-back current limiting)</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Overvoltage protection function</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Output voltage variation</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
</tr>
<tr>
<td>Ripple noise</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
<td>≤ 0.2 V or less</td>
</tr>
<tr>
<td>Others</td>
<td>In accordance with the specifications of commercially available power sources</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. The container must have a sealed structure. If the container is made of moisture-permeable material, the results may not be satisfactory.

5. It is preferable that the element is installed in the center of the inner side surface of the container with packing to ensure airtightness of the container.
   (Do not install on the top or bottom surface)

6. If there is rubber packing or a similar material that contains an antioxidant, crystalline substances may form on the element.

7. Sealing agents should not be silicon-based.
   (Silicon-based sealing agents generate oxime gas and siloxane gas during hardening, which quickly degrades the performance of the dehumidifying element.)

8. When using outdoors:
   MDL-3, MDL-5, MDL-7: Be sure to attach a rainproof cover with an anti-insect net (perforated metal) (optional) to protect from water or insects.
   PD2, PD3, RD3, RD4: Cover the element with a cover or moisture-permeable sheet to prevent it from getting wet.

9. Keep the moisture discharging side unsealed and well ventilated.

10. Do not attempt to disassemble, repair or modify the product, as this may damage it.