Refrigeration

Technical Data

Industrial Condensing Units
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**LRYEQ-Ay1**

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1 Features

- Integrates high and low temperature refrigeration and air conditioning (including heating) into one system
- By using heat recovery, optimised controls and state of the art compressor technology, Conveni-pack can reduce annual energy consumption up to 50%, compared to conventional systems
- Lower associated CO2 emissions thanks to the heat pump technology
- Conveni-pack’s modular design allows it to be used for smaller as well as larger shops
- The modularity of the Conveni-pack system maximises installation flexibility. Outdoor units can be grouped into blocks or rows, or distributed around the building, to meet individual installation constraints
- The heat extracted from the refrigeration showcases or evaporators can be re-used for comfort heating of the shop at no extra cost
- Low sound level including "night mode" operation
## 2 Specifications

### 2-1 Technical Specifications

<table>
<thead>
<tr>
<th>Casing</th>
<th>Colour</th>
<th>LRYEQ16AY1</th>
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<tr>
<td>Dimensions</td>
<td>Unit</td>
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<td>kg</td>
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<td>Heat exchanger</td>
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<td>Fan</td>
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<td>Compressor</td>
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<td>Piston displacement</td>
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<td>Speed</td>
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<td>Output</td>
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<td>Direct on line (inverter driven)</td>
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<td>Speed</td>
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<tr>
<td>Output</td>
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<td>Operation range</td>
<td>Evaporator</td>
<td>Cooling</td>
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<td>Max. °CDB</td>
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<td>Charged volume</td>
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<td>1.7 (7) + 2.1 (8) + 2.1 (9) + 4.0 (10)</td>
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<td>Safety devices</td>
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<td></td>
<td></td>
<td>Earth leakage detector</td>
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<table>
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<th>2-2 Electrical Specifications</th>
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<tbody>
<tr>
<td>Power supply</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Voltage range</td>
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# 3 Electrical data

## 3 - 1 Electrical Data

### LRYEQ16AY1

<table>
<thead>
<tr>
<th>Model name</th>
<th>Hz</th>
<th>Units</th>
<th>MCA</th>
<th>TOCA</th>
<th>MFA</th>
<th>MSC</th>
<th>RLA</th>
<th>Minimum Ssc value (kVA)</th>
<th>OFM</th>
<th>RLA</th>
<th>Z Max. (Ω)</th>
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<tbody>
<tr>
<td>LRYEQ16AY1(E)</td>
<td>50</td>
<td>380</td>
<td>342</td>
<td>456</td>
<td>35.2</td>
<td>483</td>
<td>40</td>
<td>10.7X2</td>
<td>84</td>
<td>0.7X2</td>
<td>0.24</td>
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<tr>
<td>LCBKQ3AV1(E)</td>
<td>50</td>
<td>220</td>
<td>198</td>
<td>264</td>
<td>15.0</td>
<td>15.0</td>
<td>20</td>
<td>—</td>
<td>14.1</td>
<td>—</td>
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</tbody>
</table>

### Symbols

- **MCA**: Min. Circuit Amps (A)
- **TOCA**: Total Over Current Amps (A)
- **MFA**: Max. Fuse Amps (A)
- **MSC**: Max. Starting Current
- **RLA**: Rated Load Amps (A)
- **OFM**: Outdoor Fan Motor
- **FLA**: Full Load Amps (A)

### NOTES

1. **RLA** is based on the following conditions:
   - LRYEQ16AY1 (E)
     - Outdoor temperature: 32°C DB
     - Suction SH: -10°C
     - Saturated temperature equivalent to suction pressure: -10°C
   - LCBKQ3AV1(E)
     - Saturated temperature equivalent to discharge pressure: -10°C
     - Saturated temperature equivalent to suction pressure: -35°C
   - Suction SH: -10°C

2. **TOCA** means the total value of each OC set.
3. **MSC** means the max. current during the starting of compressor.
4. **Voltage range**
   - Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits.
5. Maximum allowable voltage variation between phases is 2%.
6. Select wire size based on the larger value of MCA or TOCA.
7. **MFA** is used to select the circuit breaker and the ground fault circuit interrupter (earth leakage circuit breaker).

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4 Capacity tables

4 - 1 Cooling Capacity Tables

### LRYEQ16AY1

<table>
<thead>
<tr>
<th>Model name</th>
<th>Operation mode</th>
<th>Operating frequency</th>
<th>Refrigeration / Air conditioner</th>
<th>Outdoor temperature</th>
<th>Refrigerating Capacity (°C)</th>
<th>Evaporating temp. Range (°C)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-20</td>
<td>-15</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>kW</td>
<td>kW</td>
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<tr>
<td>Mode 24</td>
<td>50Hz</td>
<td>Refrigeration</td>
<td>20</td>
<td>27.0</td>
<td>27.9</td>
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<td>Air conditioner</td>
<td>16.6</td>
<td>16.6</td>
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<tr>
<td>Mode 29</td>
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<td>17.5</td>
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<td>Air conditioner</td>
<td>13.6</td>
<td>13.6</td>
<td>13.6</td>
<td>13.6</td>
</tr>
</tbody>
</table>

**Notes:**
1. *Is specified point.
2. The condition of characteristics of the table:
   - Suction ..........................................
   - Equivalent length (Piping) ...................... 5m
   - Level difference .................................. 0m
   - Indoor humidity (Gas injection line) .......... RH70%
   - Indoor humidity (Air conditioner) ............ RH80%
3. Consider decrease of capacity depended on frosting, and time of defrosting, please select larger model (about 15%).

**Rate of change in cooling capacity by piping length**

- **Calculating method of cooling capacity**
  
  **Cooling capacity** = Reading value from cooling capacity table \( \times \) Rate of change in cooling capacity by piping length

**Notes:**
1. *Is specified point.
2. The condition of characteristics of the table:
   - Suction ..........................................
   - Equivalent length (Piping) ...................... 5m
   - Level difference .................................. 0m
   - Indoor humidity (Gas injection line) .......... RH70%
   - Indoor humidity (Air conditioner) ............ RH80%
3. Consider decrease of capacity depended on frosting, and time of defrosting, please select larger model (about 15%).
5 Dimensional drawings

5 - 1 Dimensional Drawings
6 Centre of gravity

6 - 1 Centre of Gravity

LRYEQ16AY1

Center of foundation bolt hole

Center of foundation bolt hole

Center of foundation bolt hole

Center of foundation bolt hole

630

1102

330

730

580
7 Wiring diagrams

1 Wiring Diagrams

LRYEQ16AY1

Notes:
1. The wiring diagram is applied only to the outdoor unit.
2. Protective earth (screw)
3. Connector color for component
4. Connector color for P.C. board
5. This wiring diagram is applied only to the outdoor unit.
6. At the time of factory shipment, setting of "off", when operating, setting of "on".
7. Be noted that the capacity of contact is AC220-240V, 110-120VA (Operating)
8. BS1-5) and (DS1-2) switch, refer to "service precaution" label on el.
9. RY1 point contact is open before turning on power supply
10. See note 8

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Images and descriptions are not provided in the text, but typically include diagrams and other technical information related to the electrical system of the device.
External connection diagrams

External Connection Diagrams

LRYEQ16AY1

Note
1. All wiring, components and materials to be produced on the site must comply with the applicable local and national codes.
2. Use copper conductors only.
3. As for details, see wiring diagram.
4. Install a circuit breaker for safety.
5. All field wiring and components must be provided by a licensed electrician.
6. Unit shall be grounded in compliance with the applicable local and national codes.
7. Wiring shown are general points-of-connection guides only and are not intended for or to include all details for a specific installation.
8. If there exists the possibility of reversed phase, loss of phase, momentary blackout or the power goes on and off while the product is operating, attach a reversed phase protection circuit locally.
9. Running the product in reversed phase may break the compressor and other parts.
10. If used remote switch, use non-voltage contact for microcurrent (not more than 1mA, 12V DC).
11. Earth leakage circuit breaker.

Power supply
220-240V

Fuse

Air conditioner's indoor unit

Operating output
(Refrigerator)

Grounding

Booster unit (LCBKQ3AV1)

Operating input
(Refrigerator)

Remote controller

Grounding

Caution
output

Warning
output

Outdoor unit LRYEQ16AY1

3 phase 380-415V
Earth leakage circuit breaker
For earth fault, overload, and short-circuit protection

Case of remote switch fixing

Switch
(To frozen showcase)

Power supply
220-240V

ST controller

Grounding

Sensor
input

Refrigerator

Freezer

Timer (Refrigerator)

Timer (Freezer)

Refrigeration blower

Refrigeration showcase

Refrigeration coil

(To booster unit)

Operating input
(Refrigerator)

Defrosting indication lamp

Defrost completion thermostat

Defrosting heater

Control board
(Local procurement)

Earth leakage circuit breaker
For earth fault, overload, and short-circuit protection

S1T: Thermostat for inner temperature adjustment
S2T: Defrost completion thermostat
H1P: Defrosting indication lamp
Ry0-Ry3: Relay
K1M Magnetic contactor (Defrosting heater)
T1: Timer (Refrigerator)
T2: Timer Freezer
Y1S: Solenoid valve
A: High voltage wiring
B: Low voltage wiring

To in/d unit
To out/d unit
9 Sound data

9 - 1 Sound Pressure Spectrum

### Operating conditions

- **Power source**: 380-415V 50Hz
- **JIS Standard**

### Measuring place

Anechoic chamber (conversion value)

Note: The operating sound is measured in anechoic chamber. If it is measured under the actual installation conditions, it is normally over the set value due to environmental noise and sound reflection.
10 Installation

10-2 Fixation and Foundation of Units

**LRYEQ16AY1**

For single unit installation

- For installation in rows
- For centralised group layout

**Notes:**
1. Heights of walls in case of Patterns 1 and 2:
   - Front: 1500 mm
   - Suction side: 500 mm
   - Side: Height unrestricted.

2. Installation space to be shown in this drawing is based on the cooling operation at 32 degrees outdoor air temperature.

3. If the design outdoor air temperature exceeds 32 degrees or the load exceeds maximum ability because of much generation load of heat in all outdoor units, take the suction side space more broadly than the space to be shown in this drawing.

4. The units should be installed to leave sufficient space at the front for the on site refrigerant piping work to be carried out comfortably.

5. The proportions of cement: sand: gravel for the concrete shall be 1:2:4, and the reinforcement bars that their diameter are 10mm, (approx. 300mm intervals) shall be placed.

6. The surface shall be finished with mortar. The corner edges shall be chamfered.

7. When the foundation is built on a concrete floor, rubble is not necessary. However, the surface of the section on which the foundation is built shall have rough finish.

8. A drain ditch shall be made around the foundation to thoroughly drain water from the equipment installation area.

9. When installing the equipment on a roof, the floor strength shall be checked, and water-proofing measures shall be taken.

10. Y ditch is not necessary for the following model. LRMEQ5AY1(E), LRMEQ6AY1(E), LRLEQ5AY1(E), LRLEQ6AY1(E)

11. When installing multiple units in connection

**Diagram:**

- Drain ditch (Smooth down grade of about 1/50)
- Y ditch (Note 6)
- When building a foundation on the ground
- When building a foundation on the concrete floor
- Foundation bolt executing method

**Notes:**

1. The proportions of cement: sand: gravel for the concrete shall be 1:2:4, and the reinforcement bars that their diameter are 10mm (approx. 300mm intervals) shall be placed.

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6. Y ditch is not necessary for the following model. LRMEQ5AY1(E), LRMEQ6AY1(E), LRLEQ5AY1(E), LRLEQ6AY1(E)
11 Operation range

11-1 Operation Range

NOTES
1 Range for humidity (Air-conditioner (cooling))...RH80% or below
Range for humidity (Refrigeration)...RH95% or below
2 "Range for continuous operation" Shows possible range of continuous operation
3 "Range for pull-down operation" Shows possible range of short-time operation
- Do not select the model in the range for pull-down operation
- To be more than 3°C/hour that the temperature of indoor unit drops, do not open the door and do not enter the goods in pull down operation as possible (Refrigeration)
Daikin's unique position as a manufacturer of air conditioning equipment, compressors, and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intention to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

Daikin Europe N.V. is participating in the EUROVENT Certification Programme. Products are as listed in the EUROVENT Directory of Certified Products.