

Absorption Chiller

16LJ-01,02,03



Original instructions

Notes to Users

Thank you for purchasing Carrire Absorption Chiller.

Refer to this manual before Absorption Chiller would be installed.

Product Information

If you have problems of questions concerning your chiller, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the control panel.

Model No.

Serial number

DECLARATION OF CONFORMITY

This product is marked " CE " as it satisfied EEC Directive No. 2006/42/EC, 2004/108/EC, 97/23/EC, 90/396/EEC and conforms with following standards. This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

Note: The contents of this manual are subject to change without notice.

Absorption Chiller Installation Manual < Hot water Fired type>

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- 0. Summaries of product characteristics
 - 0-1. Product explanation
 - (1) Excellent for peak shaving during high electrical demand periods.
 - (2) Designed to provide chilled water from waste heat sources, generated from industrial processes and cogeneration systems.
 - (3) Allows diversification of critical cooling requirements. Critical cooling loads are met with minimal electrical power input with a hot water-fired chiller.
 - (4) Allows for smaller generator set installation be utilized since the electrical load associated with an absorption chiller is minimal when compared to an electric chiller.
 - (5) Ozone safe, CFC free. Cooling requirements are met without chlorine based refrigerants.
 - (6) Reduces affectors to global warming. Minimizes global impact by greatly reducing electricity consumption and eliminating the use of greenhouse gases.
 - (7) Environment: Molybdate solution inhibitor is used with no impact on environment.
 - (8) Low noise and vibration. The absorption chiller doses not utilize a large motor-compressor, and this leads to quiet, trouble-free operation.
 - (9) Small footprint saves facility space.

0-2. Use of product

Absorption Chiller is air conditioning equipment achieving comfortable space, energy saving, and economic efficiency.

It has been used in office buildings, hotels, department stores, hospitals, schools, convention centers, government building, etc.

0-3. Business name and address

(1) Manufacturer

Business name : Panasonic Corporation

Address : 1-1-1 Sakata, Oizumi-machi,, Ora-gun,,Gunma 370-0596,Japan

(2) Importer

Business name: Carrier S.A.S Address : BP 49-Route de Thil Q1122 MONTLUEL Cedex , France

0-4. Noise data

Model : 16LJ-	01	02	03
Noise [dB(A)]	Less than 70		70

1. INSTALLATION

1-1. USE ENVIRONMENT

1-1-1. Machine room

Absorption Chiller is indoor use ONLY.

IP number of Absorption Chiller is IP40.

Please keep the machine room temperature between 5°C and 40°C for protection of the solution crystallization during chiller shut down. Please keep the humidity in the machine room within 90%.

- a) When performing crane work, please avoid bad weather such as strong wind.
- b) Please establish so that a crane may become stable in the ground.
- c) Please refer to lifting data of Contract specifications for lifting method of the chiller/heater.
- d) Please select a hanging wire with the enough strength by marking reference to weight data of Contract specifications.
- e) The wire to use please carry out prior visual inspection and periodical inspection.

1-1-2. Field wiring

For CE, please connect to power source by overvoltage category ${\rm I\!I}$, and to other wiring by overvoltage category ${\rm I\!I}$.

1-1-3. Altitude

Please install Absorption Chiller at a height of less than 1000m above sea level. If the location is higher than 1000m above sea level, please contact Carrier agent.

1-1-4. SAFETY PRECAUTIONS

- \ast Before operating this chiller, you should first thoroughly read the following instructions.
- * All precautions are classified into either WARNING or CAUTION.

WARNING: Failure to observe this instruction may result in serious injury or death.CAUTION : Failure to observe this instruction may cause an injury or failure of chiller.Depending on circumstances, this may result in serious injury or death.

< Example >



A symbol denotes danger, warning or caution.

The illustration in the <u>symbol</u> shows the specific description of such item. (The illustration to the left indicates that a special care must be taken to avoid electric shocks.)



 \odot symbol prohibits an action. The illustration in or near the \odot symbol shows the specific description of such item.



ymbol instructs an action to be done.

The illustration in the **()** ymbol shows the specific description of such item.

(The illustration to the left indicates that it should be grounded.)

* After reading this manual, it should be kept in fixed place to be available for any user at any time.

(1) For safety usage



SAFETY PRECAUTIONS



SAFETY PRECAUTIONS





1-1-2. Safety precautions for repair, moving or rejection

WARNING			
ONLY AUTHORIZED PERSONNEL SHOULD			
OVERHAUL THE CHILLER			
Only those who are authorized should			
overhaul the chiller.			
Incomplete service could result in electric			
Prohibited			



1-2. SAFETY INSTALLATION

A proper skilled installer should carry out the equipment installation. Take safety measures during installation works. Take measures to prevent unauthorized people from entering installation site during installation work.

1-3. DELIVERY INSPECTION

Upon delivery of the Carrier Chiller/Heater(s) to the job site, the owner or his designated representative should carefully inspect the Chiller for the following items:

- 1-3-1. Check for physical damage to the Chiller
 - (1) Main shell
 - (2) Valves
 - (3) Control panel
 - (4) Wiring and connection
 - (5) Accessory
 - (6) Solution (In case of dry shipment)
- 1-3-2. Check the shipping or packing slip sent with the Chiller and note any missing items.
- 1-3-3. Check any separate boxes or crates shipping with the Chiller for any missing items.

NOTE 1. Isolation pads are not required for most installations. NOTE2. Inform Carrier within 24 hours of any damage or missing items.

SOLUTION VOLUME

Model name	Absorbent	Refrigerant	Alcohol
LJ-01E	113kg	36kg	206cc
LJ-02E	154kg	60kg	280cc
LJ-03E	180kg	74kg	328cc

NOTE Absorbent : LiBr 50wt%

Inhibitor : Li₂MoO₄ 20wt%

150ppm (Total Concentration)

Alcohol : Octyle Alcohol $CH_3(CH_2)_5CH(OH)CH_3$

1-4. RIGGING

In case that a chiller is lifted up, check first weight of the chiller by referring its contract specifications and then choose and use suitable lifting wires and shackles. Since 4 holes are provided on the conners of upper tube sheet, use the holes to lift the chiller. Note that the angle of wires shall be within 60 deg. Please refer to **Exhibit B**.

1-5. SLIDING

In case that sliding of the chiller is required, using tiltdozers (trail-builders) is recommended. If a wire to slide the chiller is used, the wire shall be connected as shown in the figure below.



1-6. SETTING ON THE FOUNDATION

Please refer the foundation to **Exhibit C**. Please set the Chiller on the foundation bolt position.

1-7.LEVELING

- •Turn bolts for level adjustment until the sinker fit the center of the pipe.
- The pipe for level adjustment appier the bottom of control panel side(LJ-01) or power box side(LJ-02/03).
- Insert plates between level adjustment bolts and foundation.
- Don't implant level adjustment bolts into the foundution.
- •Be sure to install the chiller horizontally. If not there have a bad influence for chiller performance.



- 1) Don't weld washers on the chiller's frame.
- 2) Tight up the nuts

1-8. FIELD PIPING

- 1-8-1. Connect each pipe according to **Exhibit E**.
 - (1) Make all necessary connections to the building water systems: chilled, hot and cooling water. Ensure that all piping is adequately supported and that no strain is placed on the Chiller nozzles and connecting flanges.
 - (2) Provide adequate temperature and pressure sockets or taps on all supply and return piping.

1-8-2. Flashing

It is necessary to flash in the pipe of all water system before through the water in the Chiller.

1-9. FIELD WIRING

- 1-9-1. For CE marking; Power supply connection is overvoltage category III. And other connections are overvoltage category II. Please connect to each wire according to CE marking required.
- 1-9-2. Refer wiring connection to **Exhibit F**.
- 1-9-3. A properly qualified electrician should carry out the electrical wiring works.



Exhibit B Shipping dimensions

TSA-16	А	В	Weight ²⁾	Weight 3)	Weight ⁴⁾	Bottlo ⁴⁾
134-10	mm	mm	kg	kg	kg	Dottle
LJ-01	1,745	1,255	1,820	1,665	180	2
LJ-02	2,450	1,255	2,380	2,135	270	2
LJ-03	2,450	1,435	2,720	2,420	320	2

Note. 1) Above dimensions are not included packing size.

2) Weight data is included solution for initial charge.

- 3) Weight data is dry shipping (without solution) of the chiller .
- 4) Solution bottle size is 600 x 600 x 950mm.

The solution weight is included bottle weight.

Notice)

- Inserts the shackle bar into the suspension hole(32mm diameter) and attach the shackle with the wire to the shackle bar. The wire angle should be less than 60 degree.
 Be sure to lift at all four machine points and never just at 2 point.
- 2) Move the hook of crane to the machine, and hang the two wires on the hook.
- 3) Move the machine carefully. Avoid shocks and do not drop the machine.
- The machine is a vacuum vessel and includes solutions. Any damage caused may be irreparable.



2: Shackle3: Suspension hole

3



Exhibit C Foundation



Bolt for level adjustment *

Exhibit D Piping diagram



General remarks on piping

- 1) Equipment and parts outside the area surrounded by the broken line are not supplied by Carrier.
- 2) For pipe connections and diameter refer to the dimensional drawings and specification tables.
- 3) Ensure that chilled water flow rate, cooling water flow rate are in conformity with the standard value. If the chilled water flow rate sinks to under 50% of the standard value, the chiller will stop. Please secure the chilled water's retention volume at least 11 liter / kW.
- 4) Position the chilled water pump, cooling water pump, hot water pump and expansion tank correctly so that the chiller pressure does not exceed the set value.
- 5) For cooling water temperature control refer to the drawing "Cooling water temperature control method".
- 6) Separate chilled, cooling and hot water pumps should 17) When two way valve is used, there is a case that be provided for each chiller.
- 7) Provide a cooling water blow-down valve in the cooling tower inlet for water quality control.
- 8) Install a filter in the chilled water, cooling water and hot water pipes (10 mesh).
- 9) Install stop valves on the chilled, cooling and hot water inlet and outlet.
- 10) Provide a thermometer and a pressure gauge at the chilled, cooling and hot water inlet and outlet.

- 11) Provide an air vent valve in each of the chilled, cooling and hot water line at a point higher than the header.
- 12) Install drain valves at the lowest positions between absorption chiller and the stop valves of the chilled water, cooling water and hot water, and plumb them to the drain ditch.
- 13) Provide an expansion tank at highest position in the chilled water line.
- 14) Install a cooling tower away from any exhaust gas outlet.
- 15) Connect the pipe from rupture disk to cushion tank.
- 16) Install stop valves between the absorption chiller and stop valves of all inlets and outlets for chemical cleaning of the water circuit system.
- hot water outlet temperature becomes different from the specification.
- 18) The maximum allowable temperature of hot water is 110oC.







Exhibit D Rupture disk



Remarks

- 1 Rupture disk
- 2 Field supply
- 3 Discharge pipe
- 4 Support
- 5 Tank (Above 1 m³ (35 cubic feet))
- 6 Vent pipe
- 7 Drain

Notes)

- 1) The rupture disk is factory-mounted on the chiller(/heater).
- 2) Install a receiver tank for the solution.
 - The tank volume is approx. 1 cubic meter (35 cubic feet).
- 3) Install piping support near rupture disk connection.

Exhibit F Field electric wiring



Exhibit F Power supply connection

Chiller Power panel





Be sure to connect wires below.

Exhibit F Remote signal connection

Unit can be operate by following signals;

 Non-voltage Normal open contact for start & stop (DC24V 10mA) Wiring the terminal 324 and 323, connect 170 and 326.



Continuous signal

 Non-voltage Normal open contact for start (DC24V 10mA) Wiring the terminal 324 and 323, connect 170 and 326. Non-voltage Normal open contact for stop (DC24V 10mA) Wiring the terminal 325 and 323.



 Non-voltage Normal open contact for start (DC24V 10mA) Wiring the terminal 324 and 323, connect 170 and 326. Non-voltage Normal close contact for stop (DC24V 10mA) Wiring the terminal 325 and 323.



4) Continuous signal of DC/AC 24V for start & stop. (Initial setting at factory) Wiring the terminal 324 and 326. (Those terminals are non-polarity)



5) Pulse signal of DC/AC 24V for start.

Wiring the terminal 324 and 326. (Those terminals are non-polarity) Pulse signal of DC/AC 24V for stop.

Wiring the terminal 325 and 326. (Those terminals are non-polarity)



Exhibit F Remote setting of Chilled water outlet temp.



Remote setting of chilled water outlet temperature

Ste point of chilled(/hot) water outlet temperature is offset by remote control panel such as central monitoring panel.

Setting mode

Cooling mode : Set point + Offset dt (below the maximum set point) Heating mode : Set point - Offset dt (above the minimum set point) (TSA-16DJ only)



1) Should be work the electric wiring connection by license holder.

2) Use steel conduit for electric wiring between field electric supply and chiller control panel.

Exhibit H LiBr solution material safty data sheet

Lithium Bromide Solution, Blend Inhibited

DHC Lithium Bromide

DHC/A751-G01-LiBr Date Approved: 01/05/2004

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Lithium Bromide Solution, Blend Inhibited CHEMICAL FAMILY: Lithium Salts MOLECULAR FORMULA: LiBr SYNONYM(s): Lithium Bromide Solution, Inhibited ALTERNATE TRADE NAME(S): Lithium Bromide Solution GENERAL USE: Chemical Manufacturing MANUFACTURER DALIAN HONJO CHEMICAL CO.,LTD CHINA DALIAN General Information: 0086 41187318466 Emergency Telephone Numbers: 0086 41187318325

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name		Wt.%
Lithium bromide		47-48
Water	۰.	53-52

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

IMMEDIATE CONCERNS: Clear, colorless, odorless solution.

POTENTIAL HEALTH EFFECTS: This product is severely irritating to the eyes and skin, and expected to be irritating to the mucous membranes.

COMMENTS:

(See Section 11, Toxicological Information)

4. FIRST AID MEASURES

EYES: Immediately flush with water for at least 15 minutes, lifting the upper and lower cyclids intermittently. See a medical doctor or ophthalmologist immediately.

SKIN: Immediately flush with plenty of water while removing contaminated clothing and/or shoes, and thoroughly wash with soap and water. Obtain immediate medical attention. Contact a medical doctor if necessary.

INGESTION: Rinse mouth with water. Difute by giving 1 or 2 glasses of water. Do not induce vomiting. Never give anything by mouth to an unconscious person. See a medical doctor immediately.

INHALATION: Remove to fresh air. If breathing discomfort occurs and persists, see a medical

doctor. If breathing has stopped, give artificial respiration and see a medical doctor immediately. **NOTES TO MEDICAL DOCTOR:** This product is practically non-toxic by ingestion, inhalation, or dermal exposure. It is severely irritating to the skin, and expected to be severely irritating to the eyes and mucous membranes. Dermal exposure may cause sensitization. Consideration should be given to gastric lavage, with endotracheal tube in place. Treatment is controlled removal of exposure with symptomatic and supportive care.

5. FIRE FIGHTING MEASURES

FLAMMABLE LIMITS: Not applicable

GENERAL HAZARD: No known physical hazard, non-combustible.

EXTINGUISHING MEDIA: Dry chemical, CO2, water spray or regular foam.

HAZARDOUS COMBUSTION PRODUCTS: None

FIRE FIGHTING PROCEDURES: Wear full protective clothing and self-contained breathing apparatus (SCBA) approved for fire fighting. This is necessary to protect against the hazards of heat, products of combustion and oxygen deficiency. Do not breathe smoke, gases or vapors generated.

AUTOIGNITION TEMPERATURE: Not applicable PROPERTIES CONTRIBUTING TO FLAMMABILITY: None FLASH POINT: Not applicable SENSITIVITY TO STATIC DISCHARGE: Not applicable SENSITIVITY TO IMPACT: Not applicable COMMENTS: (See Section 10, Stability and Reactivity)

6. ACCIDENTAL RELEASE MEASURES

RELEASE NOTES: Contain spill with absorbent. Transfer or pump into a suitable container. Dispose of waste according to local and Federal laws and regulations. Before cleanup measures begin, review the entire MSDS with particular attention to Section 3, Emergency Overview and Potential Health Effects; and Section 8, Recommended Personal Protective Equipment.

7. HANDLING AND STORAGE

HANDLING: Avoid contact with eyes, skin or clothing. Avoid breathing mist. Use with adequate ventilation. Wear safety glasses or goggles and rubber gloves. Wash thoroughly after handling.

STORAGE: Keep away from strong acids. Keep container closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust ventilation to keep airborne concentrations below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Safety glasses or goggles

RESPIRATORY: If product is misting or when engineering controls are not adequate, wear a NIOSH/MSHA respirator approved for inorganic dusts and mists.

PROTECTIVE CLOTHING: Rubber gloves

WORK INVGIENIC PRACTICES: Quick-drench eyewash and safety shower.

COMMENTS: EXPOSURE LIMITS: No data available

9. PHYSICAL AND CHEMICAL PROPERTIES

ODOR: Odorless APPEARANCE: Clear, colorless liquid pH: 9-11 PERCENT VOLATILE: Not applicable VAPOR PRESSURE: Not applicable

VAPOR DENSITY: Not applicable BOILING POINT: 140°C (284°F) MELTING POINT: Not applicable SOLUBILITY IN WATER: Not applicable EVAPORATION RATE: Not applicable SPECIFIC GRAVITY: 1.5 g/cc @ 25°C MOLECULAR WEIGHT: 86.84 (LiBr) COEFF. OIL/WATER: Not applicable ODOR THRESHOLD: Not applicable

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Contact with strong acids STABILITY: Stable POLYMERIZATION: Will not occur HAZARDOUS DECOMPOSITION PRODUCTS: None INCOMPATIBLE MATERIALS: Strong acids

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: No data available for the product. Lithium bromide solution, uninhibited, (47 - 54% LiBr aqueous solution):

SKIN EFFECTS: No data available for the product. Lithium bromide solution, uninhibited, (47 - 54% LiBr aqueous solution):

Severely irritating (rabbit)

DERMAL Los0: No data available for the product.

Lithium bromide solution, uninhibited, (47 - 55% LiBr aqueous solution) > 2000 mg/kg (rat) ORAL Los0: No data available for the product.

Lithium bromide solution, uninhibited, (47 - 55% LiBr aqueous solution): > 2000 mg/kg (rat)

INHALATION Les0: No data available for the product. Lithium bromide solution, uninhibited, (47 - 55% LiBr aqueous solution): 15.57 mg/L (4 hr., rat)

SENSITIZATION: No data available for the product. Lithium bromide solution, uninhibited, (47 - 55% LiBr aqueous solution): Sensitizing (guinea pig)

ACUTE EFFECTS FROM OVEREXPOSURE: This product is practically non-toxic by ingestion, inhalation, or dermal contact. It is severely irritating to the eyes and skin, and expected to be irritating to the

mucous membranes. Causes skin sensitization in lab animals, and may produce similar effects in

humans. Large doses of lithium bromide may cause central nervous system depression.

CHRONIC EFFECTS FROM OVEREXPOSURE: No data available for the product.

Chronic absorption of lithium bromide may cause central nervous system disturbances (drowsiness. lack of coordination, ataxia, depression, psychoses) and skin rashes.

CARCINOGENICITY:

IARC: Not listed NTP: Not listed OSHA: Not listed OTHER: ACGIH: Not listed

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Lithium Bromide:

48 hr. EC50 = 364 mg/L (daphnia magna) 96 hr. LC50 > 976 mg/L (menidia beryllina) 96 hr. LC50 = 438 mg/L (rainbow trout) 96 hr. LC50 > 995 mg/L (mysid shrimp)

CHEMICAL FATE INFORMATION: No data available for the product. LiBr exists as the inorganic ions of lithium and bromide in aqueous solutions: LiBr is not biodegraded, bioaccumulated or photodegraded.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Consult the owner of the waste for proper waste disposal procedure. Dispose of waste according to local and Federal laws and regulations.

14. TRANSPORT INFORMATION

COMMENTS: U. S. DOT, INTERNATIONAL MARITIME, AND INTERNATIONAL AIR Proper Shipping Name: None

Classification: None Labels: None UN Number: None Packing Group: None

15. OTHER INFORMATION

This MSDS has been prepared to meet U. S. OSHA Hazard Communication Standard, 29 CFR 1910.1200 and Canada's Workplace Hazardous Materials Information System (WHMIS), requirements.

