

## PRODUCT SELECTION DATA



- Complete range 80 to 4000 kW
- HFC-refrigerant free
- Hot water source from
  - COP up to 0.78

Single-Effect Hot Water-Fired Absorption Chillers

16LJ01-03  
16LJ-A11-82

# 16LJ01-03

## 16LJ-A11-82

**Nominal cooling capacity 83-3956 kW**

The Carrier Corporation has more than 100 years experience in providing HVAC systems and equipment around the world and offers a complete product solutions for many different type of applications: From residential to industrial.

For all cases where power grid is not available on site or either not extensively developed, or where thermal energy sources (water or steam) are available on site, Carrier offers a complete range of absorption chillers.

### Features

- The Carrier 16LJ & 16LJ-A single-effect absorption chillers are designed to provide chilled water from waste heat sources generated from industrial processes and cogeneration systems.

- Carrier absorption chillers allow diversification of critical cooling requirements. Critical cooling loads are met with minimal electrical power input.
- They allow smaller emergency generators compared to an electrical driven chiller.
- The units are ozone-safe and CFC-free. Cooling requirements are met without chlorine-based refrigerants.
- They reduce the contribution to global warming and minimise the global impact by greatly reducing electricity consumption and production of greenhouse gases.
- The solution inhibitor has no impact on the environment.
- An absorption chiller does not utilise mechanical moving parts, and this leads to quiet, vibration-free operation.
- The use of high-efficiency heat transfer surface has reduced the space required for installation of the absorption chiller, resulting in a smaller footprint.

### Nomenclature

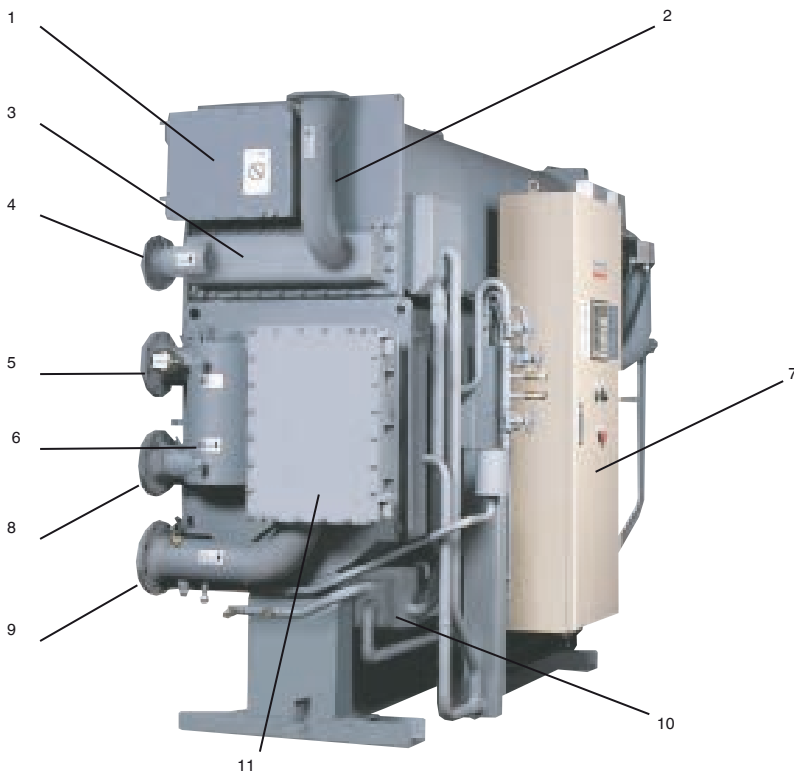
16 LJ-A - 11



Capacity code

Unit type: Single-effect, hot water-fired absorption chillers

### Component identification



#### Legend

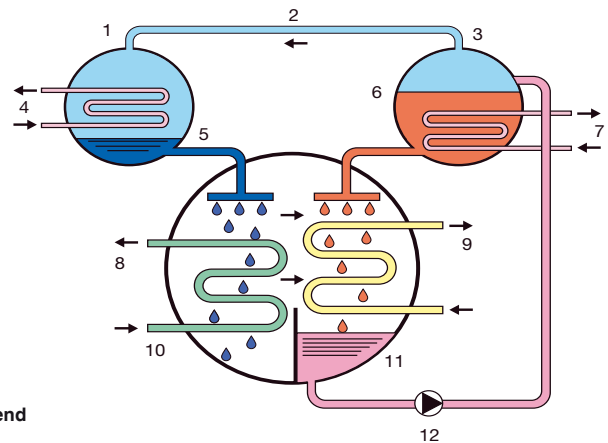
1. Condenser
2. Hot-water outlet
3. Generator
4. Hot-water inlet
5. Chilled-water outlet
6. Evaporator
7. Control panel
8. Chilled water inlet
9. Cooling water outlet
10. Heat exchanger
11. Absorber

# The absorption cycle

The absorption cooling cycle, like the mechanical vapour compression refrigeration cycle, utilizes the latent heat of evaporation of a refrigerant to remove heat from the entering chilled water. Vapour compression refrigeration systems use a chlorine-based refrigerant and a compressor to transport the refrigerant vapour to be condensed in the condenser. The absorption cycle, however, uses water as the refrigerant and an absorbent lithium bromide solution to absorb the vaporised refrigerant. Heat is then applied to the solution to release the refrigerant vapour from the absorbent. The refrigerant vapour is then condensed in the condenser.

The basic single-effect absorption cycle (see Figure 1) includes generator, condenser, evaporator and absorber with refrigerant (liquid) and lithium bromide as the working solutions. The generator utilizes a heat source (steam or hot water) to vaporise the diluted lithium bromide solution. The water vapour that is released travels to the condenser where it is condensed back into a liquid, transferring the heat to the cooling tower water. Once condensed, the liquid refrigerant is distributed over the evaporator tubes, removing the heat from the chilled water and vaporising the liquid refrigerant. The concentrated lithium bromide solution from the generator passes into the absorber, absorbs the refrigerant vapour from the evaporator and dilutes itself. The diluted lithium bromide solution is then pumped back to the generator where the cycle is started again.

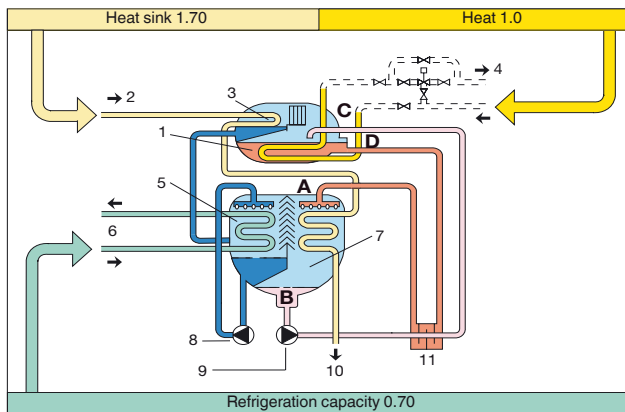
Figure 1 - Simplified absorption cycle



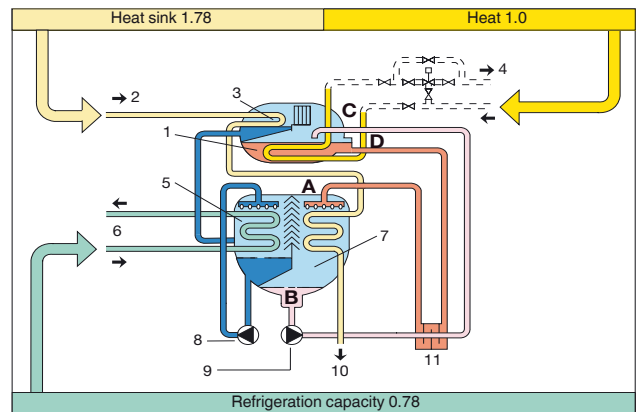
- Legend**
1. Condenser
  2. Refrigerant vapour
  3. Generator
  4. Cooling water
  5. Liquid refrigerant
  6. Concentrated solution
  7. Heat source
  8. Chilled water
  9. Cooling water
  10. Evaporator
  11. Absorber
  12. Absorbent pump

## Cooling cycle schematic

LJ 01/02/03

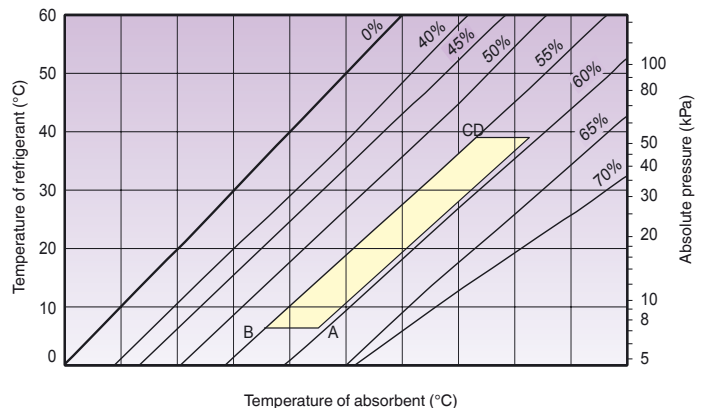


LJA 11-82



**Legend**

- |                     |                           |
|---------------------|---------------------------|
| 1. Generator        | 10. Heat exchanger        |
| 2. Cooling water    | 11. Cooling water         |
| 3. Condenser        | 12. Concentrated solution |
| 4. Hot water        | 13. Diluted solution      |
| 5. Evaporator       | 14. Liquid solution       |
| 6. Chilled water    | 15. Refrigerant vapour    |
| 7. Absorber         | 16. Cooling water         |
| 8. Refrigerant pump | 17. Chilled water         |
| 9. Absorbent pump   | 18. Hot water             |



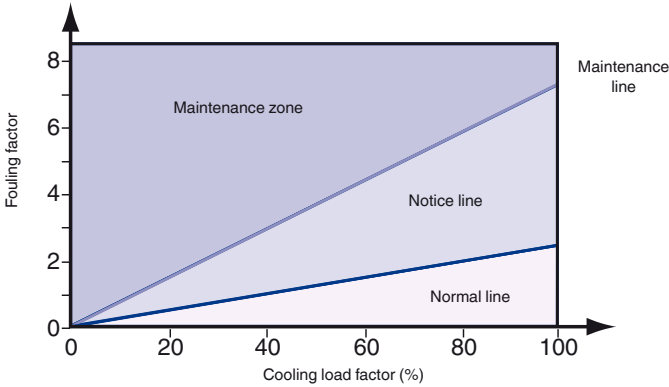
# Chiller features

## Expert self-diagnosis function

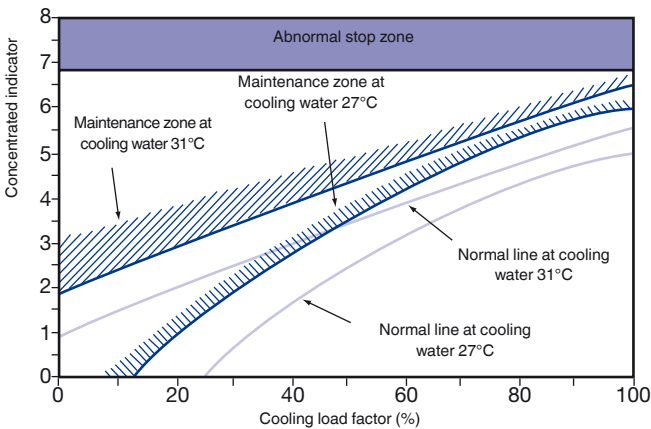
- The expert function is provided to monitor operating conditions, predict chiller information and maintain stable operation.

## Predictive maintenance information

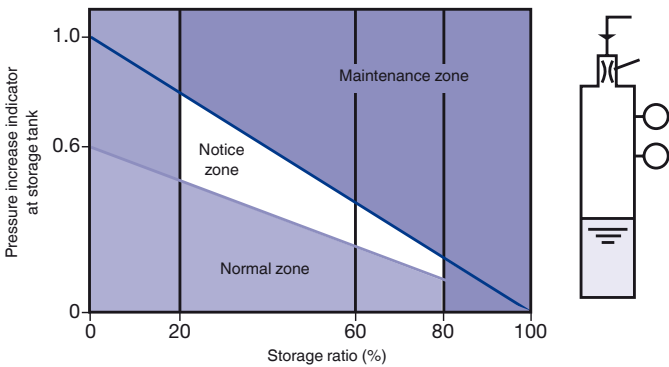
**Graph 1 - Fouling of heat transfer tubes in cooling water system**



**Graph 2 - Tend of absorbent concentration**



**Graph 3 - Vacuum condition monitoring**



### Legend

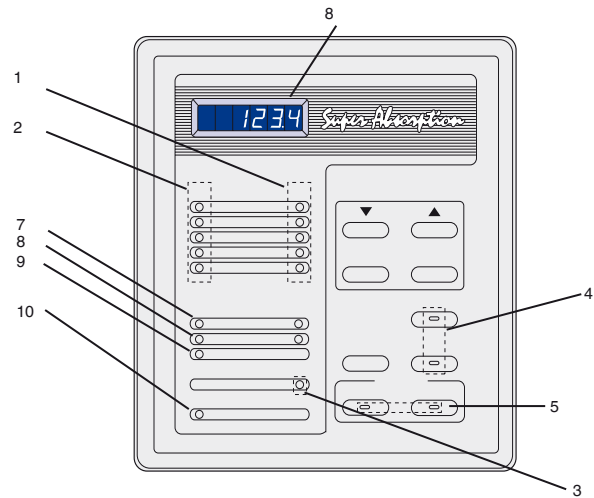
1. Storage tank
2. Diluted solution
3. Purge nozzle
4. Pd cell
5. Pressure sensor

## Control system

- The Carrier control system surpasses other proportional only control systems available today. The digital PID (proportional plus integral plus derivative) control maximises unit performance by maintaining a  $\pm 0.5$  K variance in leaving chilled-water temperature from the setpoint. Proportional controls can typically only maintain a  $\pm 1$  K variance from the setpoint. The controller's innovative design also incorporates the ability to start and stop the system chilled/hot and cooling water pumps. During shutdown these pumps are sequenced to ensure a complete dilution cycle
- The leaving chilled-water temperature is measured every five seconds and steam input is changed according to the gradient of the leaving chilled-water temperature curve. System temperatures, setpoints, and operational records are displayed along with indicator lights for the chiller and pumps.
- The Carrier control system offers its users selfdiagnostics by constantly monitoring the chiller status and will automatically shut the chiller down if a fault occurs. The cause of shutdown will be retained in the memory and can be displayed for immediate operator review. The controller's memory will also retain and display the cause of the last three system fault conditions. This method of retaining fault conditions is extremely useful for maintaining an accurate record of unit performance and fault history.

## Display and control board

**Figure 2 - Indication lights**



### Legend

Name	LED colour
1. Operation indication light	Green
2. Stop indication light	Orange
3. Alarm indication light	Red
4. Remote/local select button with LED	Green
5. Operation select button with LED	Green
6. Data display	7 segment LED (red)
7. Stand-by indication light	Green
8. Dilution indication light	Green
9. Safety circuit indication light	Green
10. Power indication light	Orange
GL*. Purge indication light	
43P*. Purge pump on-off switch	
43ES*. Emergency stop switch	

\*On the control panel door, see p.16

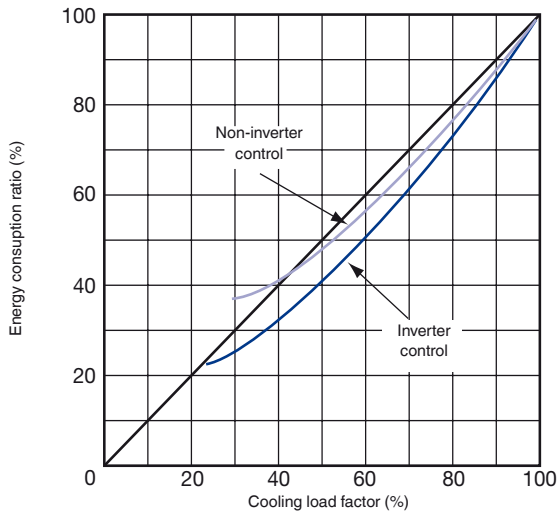
## Fast digital PID control

The introduction of new digital PID control stabilises the chilled/hot water temperature with high accuracy. It quickly responds to the load fluctuation and supplies stable chilled/hot water temperature. It is suitable for air-conditioning intelligent buildings which require sophisticated control.

## Saving energy with the inverter (option)

Balancing the load and flow rate with the absorbent pump's inverter control enables efficient and energy-saving operation. As a result, it reduces input energy and electric power consumption. Running cost is decreased by 5% compared to non-inverter control.

**Graph 4 - Running cost curve**



### Notes

1. Chilled water leaving temperature 7°C constant
2. Cooling water entering temperature:

Load factor (%)	Temperature (°C)
100	32
50	27
30	25

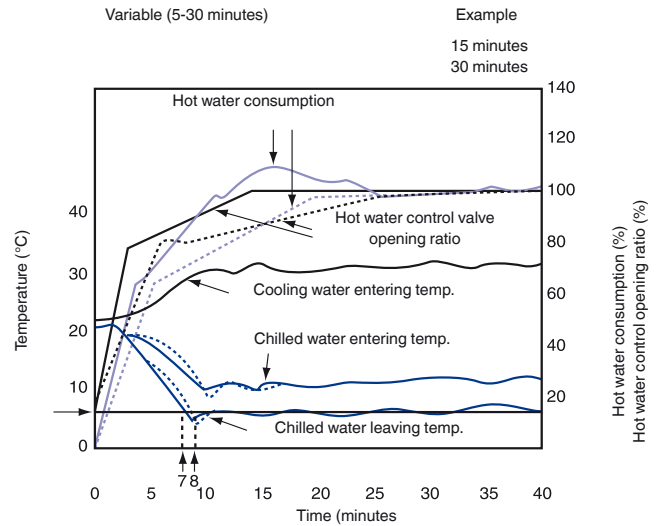
## Purge system

- The high-performance purge system maintains the required operating pressure, preserves chiller performance characteristics, minimises chiller maintenance to one purge operation per season (for year-round operation).

## Hot-water valve opening control

- At the start-up, the opening angle of the hot-water control valve is controlled in three stages, reducing the amount of hot water and the time needed to reach the desired level, compared with the previous model.
- Adjusting the opening speed of the hot-water control valve at the second and third stage, it is possible to set up the most suitable conditions for the site auxiliary equipment.

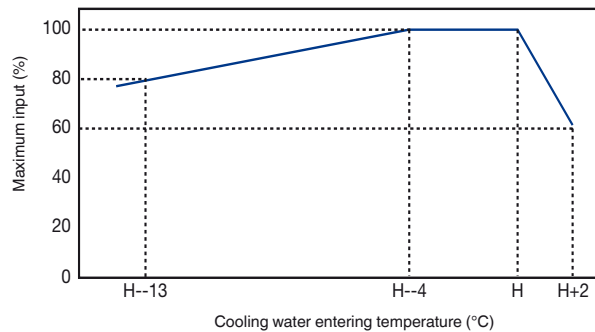
**Graph 5 - Hot water valve opening control**



## Expansion of safe operating zone

- This ensures quick response to rapid changes and maintains stable operation.
- The safe operating zone is between 19 °C and 34 °C cooling water temperature (for a nominal cooling water entering temperature of 32 °C).

**Graph 6 - Safe operating zone chart**



## Crystallisation protection

- A microprocessor monitors the absorbent concentration. Steam supply is stopped, and the unit is returned to normal operation, when the concentration is over a certain limit, to prevent the crystallisation of absorbent

# Performances

Model name	LJ				LJ-A									
Size		01	02	03	11	12	13	14	21	22	23	24	31	32
Capacity	kW	83	131	166	264	316	387	475	545	633	738	844	949	1 055
<b>Chilled water system*</b>														
Flow rate	l/sec	3.58	5.64	7.14	12.6	15.1	18.5	22.7	26	30.3	35.3	40.3	45.3	50.3
Pressure drop	kPa	73	60	60	72.2	78.4	48.5	52.9	46.8	50.2	102	105	104	106
Connection(DIN)	inch	2	2 1/2	2 1/2	3	3	4	4	5	5	5	5	6	6
Retention volume	m <sup>3</sup>	0.06	0.08	0.08	0.11	0.13	0.15	0.17	0.22	0.25	0.28	0.30	0.35	0.38
<b>Cooling water system*</b>														
Flow rate	l/sec	5.4	8.5	10.8	20.8	25	30.6	37.5	43.1	50	58.3	66.7	75	83.3
Pressure drop	kPa	23	16	15	78.8	81.8	86.6	95.4	89.1	93.4	58.4	62.5	49.8	51.6
Connection(DIN)	inch	3	4	4	5	5	5	5	6	6	8	8	8	8
Retention volume	m <sup>3</sup>	0.13	0.18	0.23	0.33	0.37	0.40	0.45	0.58	0.63	0.69	0.76	0.98	1.05
<b>Hot water system*</b>														
Flow rate	l/sec	3.28	5.17	6.56	8.4	10.1	12.3	15.1	17.3	20.1	23.4	26.8	30.1	33.5
Pressure drop	kPa	58	41	41	24.7	26.4	65.6	72.8	31.5	32.5	22.0	22.1	22.4	22.3
Connection(DIN)	inch	2	2 1/2	2 1/2	4	4	4	4	5	5	6	6	6	6
Retention volume	m <sup>3</sup>	0.04	0.04	0.07	0.07	0.08	0.09	0.10	0.13	0.14	0.15	0.17	0.21	0.22
<b>Rupture disk connection</b>	inch	2	2	2	2	2	2	2	2	2	2	2	2	2
<b>Dimmensions</b>														
Length (L)	mm	1745	2450	2450	2 740	2 740	3 750	3 750	3 850	3 850	4 870	4 870	4 920	4 920
Height (H)	mm	2115	2115	2115	2 330	2 330	2 330	2 330	2 480	2 480	2 480	2 480	2 775	2 775
Width (W)	mm	1255	1255	1435	1 400	1 400	1 400	1 400	1 560	1 560	1 560	1 560	1 630	1 630
Tube removal	mm	900	1350	1350	2 400	2 400	3 400	3 400	3 400	3 400	4 500	4 500	4 500	4 500
<b>Weight</b>														
Operation weight	kg	2070	2680	3150	4 000	4 200	5 200	5 500	6 600	6 900	8 100	8 600	10 500	11 000
Max shipping weight	kg	1820	2380	2720	3 500	3 600	4 500	4 700	5 600	5 900	7 000	7 300	9 000	9 300
Shipping method	u	1	1	1	1	1	1	1	1	1	1	1	1	1
<b>Power supply</b>	V-ph-Hz	400-3-50			400-3-50									
Apparent power	kVA	3.1	3.1	3.1	5.0	5.0	5.0	6.8	6.9	6.9	6.9	6.9	10.5	10.5
Total electric current	A	4.8	4.8	4.8	7.5	7.5	7.5	10.2	10.3	10.3	10.3	10.3	15.5	15.5
Absorbent pump N°1, power input	kW	0.75	0.75	0.75	1.1	1.1	1.1	2.2	2.2	2.2	2.2	2.2	3.0	3.0
Absorbent pump N°1, electric current	A	2.2	2.2	2.2	2.8	2.8	2.8	5.5	5.5	5.5	5.5	5.5	7.5	7.5
Absorbent pump N°2, power input	kW	/	/	/	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	1.5	1.5
Absorbent pump N°2, electric current	A	/	/	/	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	4.7	4.7
Refrigerent pump, power input	kW	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Refrigerent pump, electric current	A	0.7	0.7	0.7	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Purge pump, power input	kW	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Purge pump, electric current	A	1.1	1.1	1.1	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
PD cell heater	kW	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
Control circuit	kW	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

\* Condition for LJ 12,2/6,7 °C ( Fouling Factor = 0.0176 m<sup>2</sup>C/kW)  
 29,4/38,4 °C ( Fouling Factor = 0.044 m<sup>2</sup>C/kW)  
 95/86 °C ( Fouling Factor = 0.0176 m<sup>2</sup>C/kW)

\* Condition for LJ-A 12/7 °C ( Fouling Factor = 0.018 m<sup>2</sup>C/kW)  
 29,4/36,3 °C ( Fouling Factor = 0.044 m<sup>2</sup>C/kW)  
 90/80 °C ( Fouling Factor = 0.018 m<sup>2</sup>C/kW)

Notes : These performance data are provided to support early design activity. For selection outside ARI operating conditions, contact Carrier

# Performances

Model name	LJ-A													
Size		41	42	51	52	53	61	62	63	71	72	73	81	82
Capacity	kW	1 178	1 319	1 477	1 653	1 846	2 110	2 373	2 637	2 901	3 165	3 428	3 692	3 956
<b>Chilled water system*</b>														
Flow rate	l/sec	56.4	63.1	70.6	78.9	88.3	100.8	113.3	126.1	138.6	151.1	163.9	176.4	188.9
Pressure drop	kPa	102	88.5	74.3	37.4	49.3	95.6	45.9	59.9	114	50.7	62.7	50.8	61.7
Connection(DIN)	inch	8	8	8	8	8	10	10	10	12	12	12	14	14
Retention volume	m <sup>3</sup>	0.49	0.56	0.70	0.77	0.83	1.06	1.13	1.21	1.43	1.53	1.63	1.82	1.94
<b>Cooling water system*</b>														
Flow rate	l/sec	93.1	104.2	116.7	130.6	145.8	166.7	187.5	208.3	229.2	250	270.8	291.7	312.5
Pressure drop	kPa	52.8	55.4	94.4	128	43.1	78.1	105	70.6	45.6	57.4	70.8	59.2	71.4
Connection(DIN)	inch	10	10	12	12	12	14	14	14	16	16	16	16	16
Retention volume	m <sup>3</sup>	1.31	1.41	1.97	2.13	2.27	2.87	3.05	3.23	3.79	4.02	4.23	4.75	5.10
<b>Hot water system*</b>														
Flow rate	l/sec	37.4	41.8	46.8	52.4	58.5	66.9	75.2	83.6	91.9	101	109	117	126
Pressure drop	kPa	21.7	22.1	63.8	28.6	37.8	27.2	36.4	47.5	37.9	47.9	59.2	49.3	59.8
Connection(DIN)	inch	8	8	8	8	8	10	10	10	10	10	10	10	10
Retention volume	m <sup>3</sup>	0.29	0.32	0.35	0.37	0.40	0.69	0.72	0.76	0.82	0.86	0.90	0.99	1.03
<b>Rupture disk connection</b>	inch	2	2	2	2	2	2	2	2	2	2	2	2	2
<b>Dimmensions</b>														
Length (L)	mm	5 070	5 070	5 210	5 750	6 250	5 750	6 250	6 750	6 490	6 990	7 490	7 090	7 590
Height (H)	mm	3 015	3 015	3 390	3 390	3 390	3 790	3 790	3 790	3 950	3 950	3 950	4 210	4 210
Width (W)	mm	1 750	1 750	1 990	1 990	1 990	2 420	2 420	2 420	2 650	2 650	2 650	2 820	2 820
Tube removal	mm	4 500	4 500	4 600	5 200	5 700	5 200	5 700	6 200	5 700	6 200	6 700	6 200	6 700
<b>Weight</b>														
Operation weight	kg	13 000	13 600	18 400	20 000	21 400	28 300	30 300	32 400	38 700	41 200	43 700	46 900	49 600
Max shipping weight	kg	10 900	11 300	15 400	16 600	17 900	11 500	12 200	13 100	16 000	17 000	18 000	19 000	19 900
Shipping method	u	1	1	1	1	1	2	2	2	2	2	2	2	2
<b>Power supply</b>	V-ph-Hz	400-3-50												
Apparent power	kVA	10.6	10.6	10.6	10.6	10.8	18.7	18.7	18.7	24.2	24.2	25.6	25.6	25.6
Total electric current	A	15.6	15.6	15.6	15.6	15.9	27.4	27.4	27.4	35.3	35.3	37.4	37.4	37.4
Absorbent pump N°1, power input	kW	3.0	3.0	3.0	3.0	3.0	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
Absorbent pump N°1, electric current	A	7.5	7.5	7.5	7.5	7.5	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Absorbent pump N°2, power input	kW	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	3.7	3.7	3.7	3.7	3.7
Absorbent pump N°2, electric current	A	4.7	4.7	4.7	4.7	5.0	5.0	5.0	5.0	11.0	11.0	11.0	11.0	11.0
Refrigerent pump, power input	kW	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.75	0.75	1.2	1.2	1.2
Refrigerent pump, electric current	A	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	2.5	2.5	4.6	4.6	4.6
Purge pump, power input	kW	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.75	0.75	0.75	0.75	0.75
Purge pump, electric current	A	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.9	1.9	1.9	1.9	1.9
PD cell heater	kW	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
Control circuit	kW	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

\* Condition for LJ 12,2/6,7 °C ( Fouling Factor = 0.0176 m<sup>2</sup>C/kW)  
29,4/38,4 °C ( Fouling Factor = 0.044 m<sup>2</sup>C/kW)  
95/86 °C ( Fouling Factor = 0.0176 m<sup>2</sup>C/kW)

\* Condition for LJ-A 12/7 °C ( Fouling Factor = 0.018 m<sup>2</sup>C/kW)  
29,4/36,3 °C ( Fouling Factor = 0.044 m<sup>2</sup>C/kW)  
90/80 °C ( Fouling Factor = 0.018 m<sup>2</sup>C/kW)

Notes : These performance data are provided to support early design activity. For selection outside ARI operating conditions, contact Carrier

# Scope of supply

## 1. Standards met

The units comply with the following standards:

- ARI 560-2000
- 2006/42/EC (machine directive)
- 2006/95/EC (low-voltage directive)
- 2004/108/EC (electromagnetic compatibility directive)
- 97/23/EC (pressure equipment directive).

## 2. Absorption chiller, comprising:

1. Lower shell
  - Evaporator and refrigerant dispersion tray
  - Absorber and absorbent dispersion tray
  - Eliminators
  - Bases.
2. Upper shell
  - Generator with eliminators
  - Condenser with eliminators
  - Low temperature (LT) generator
  - Rupture disk.
3. Heat exchangers with refrigerant drain heat reclaimer
4. Pumps
  - Absorbent pump with isolating valves
  - Refrigerant pump with isolating valves
  - Purge pump.
5. Purge unit
  - Purge tank with ejector device
  - Diaphragm valves and piping with liquid trap
  - Pressure sensor
  - Palladium cell with heater.
6. Control panel
  - Controller with data display
  - LEDs and operation buttons
  - Inverter for absorbent pump (option)
  - Circuit breaker
  - Transformer
  - Relays and terminal blocks
  - Purge pump operation switch.
7. Locally mounted parts
  - Temperature sensors
  - Chilled-water flow switch
8. Interconnecting piping and wiring
  - Refrigerant and absorbent piping
  - Internal power and control wiring.
9. Initial charge
  - Absorbent (lithium bromide)
  - Refrigerant (water)
  - Inhibitor (lithium molybdate).
10. Painting
  - Main unit: Rust-preventive paint
  - Control panel: Finish paint.
11. Accessories
  - Operation manual
  - Washer (for fixing foundation bolts)
  - Gasket and sealant for rupture disk
  - Purge pump oil

## 3. Factory test

1. Check of external dimensions
2. Hydraulic pressure test of water headers  
Test pressure is 1.5 times of maximum working pressure
3. Vacuum-side leak test
4. Electric insulation resistance test
5. Dielectric breakdown test
6. Function test of electric circuit and safety devices

## 4. Scope of supply of the purchaser

1. Building and foundations
2. External chilled water, cooling water and hot water piping work including various safety valves, isolation valves, mating flanges, gasket, bolts and nuts, etc.
3. External wiring and piping for the chillers including necessary parts
4. Insulation for the chillers including necessary parts.
5. Finish painting of the chillers (if needed)
6. Cooling water entering temperature control device
7. Cooling water treatment device
8. Various temperature/pressure gauges for water lines.
9. Cooling tower(s), chilled-water pump(s), hot water pump(s) and cooling water pump(s)
10. Electric power supply (as specified)
11. Supply of chilled water, cooling water, hot water at rated conditions
12. Maintenance of the chiller
13. Necessary tools, labour and materials for installation and site test operation
14. Any other item not specifically mentioned in the scope of supply.



# Scope of order LJ size 01-02-03

Item	Standard	Option
<b>Chilled water</b>		
Temperature	Entering: 12.2 °C, leaving: 5 °C through 12 °C	
Flow rate	Leaving: 6.7 °C, temperature difference 3 K through 10 K	
Max. working pressure	0.043 l/s x kW - Temperature difference (min. 50%)	
Hydraulic test pressure	Sizes 01/02/03 784 kPa.	1034 kPa, 1540 kPa and 2068 kPa
Fouling factor	Max. working pressure x 1.5	Max working pressure x 1.5
Tube material	0.018 m <sup>2</sup> K/kW Max. 0.18 m <sup>2</sup> K/kW	
Water quality	Copper tube	Cu Ni tube
Structure of water header	Refer to JRA-GL02E-1994	No option
Manufacturing standard of water header	Removable type and epoxy treated	No option
	Flanges DIN	No option
<b>Cooling water</b>		
Temperature	Entering: 29.4 °C, entering: 20 °C through 40 °C	
Flow rate	Leaving: 38.4 °C	
Max. working pressure	0.065 l/s x kW, within water flow rate range of each model	
Hydraulic test pressure	Sizes 01/02/03 784 kPa.	1034 kPa, 1540 kPa and 2068 kPa
Fouling factor	Max. working pressure x 1.5	Max. 0.18 m <sup>2</sup> K/kW
Tube material	0.044 m <sup>2</sup> K/kW	Cu Ni tube
Water quality	Copper tube	No option
Structure of water header	Refer to JRA-GL02E-1994	No option
Manufacturing standard of water header	Hinged type and epoxy treated	No option
	Flanges DIN	
<b>Hot water</b>		
Temperature	Entering: 95.0 °C, entering: 80 °C through 110 °C	
Flow rate	Leaving: 86.0 °C, leaving: min. 75 °C	
Max. working pressure	0.039 l/s x kW, within water flow rate range of each model	
Hydraulic test pressure	Sizes 01/02/03 784 kPa.	Sizes 01/02/03 784 kPa.
Fouling factor	Max. working pressure x 1.5	No option
Tube material	0.018 m <sup>2</sup> K/kW	No option
Water quality	Copper tube	No option
Structure of water header	Refer to JRA-GL02E-1994	No option
Manufacturing standard of water header	Removable type	No option
	Flanges DIN	
<b>Electricity</b>		
Power supply	400 V - 3 phase - 50Hz (Voltage control within ±10%, frequency control within ±5%)	No option
<b>Shipment</b>		
Control	One section	No option
<b>Safety functions</b>		
	Refrigerant temperature	Cooling water flow switch
	Chilled water freeze protection	
	Chilled water flow switch	
	Cooling water temperature	
	Generator temperature	
	Crystallisation protection	
	Motor protection	
Capacity control	Digital PID control by chilled-water temperature	No option
Parts	Selected by Carrier	No option
<b>Control panel</b>		
Paint finish	Munsell 5Y-7/1	No option
<b>Indication lights</b>		
	Operation	No option
	Stop	No option
	Alarm	No option
<b>Display</b>		
	LED	No option
<b>External terminals</b> (volt-free normally open contact)		
	Operation indication	No option
	Stop indication	
	Alarm indication	
	Feedback indication	
	Cooling mode indication	
Structure	Indoor type	No option
Parts	Selected by Carrier	No option
<b>Electrical wiring and piping</b>		
	Wire: 600 V polyvinyl grade chloride-insulated wires	No option
	Pipe: Plicatube (flexible metal conduits)	No option
<b>Insulation condition</b>		
Place	Indoor	No option
Ambient temperature	5 °C through 40 °C	No option
Ambient humidity	Relative humidity: Max. 90 % at 45 °C	No option
Atmosphere	Be sure the following are not present	No option
	- Corrosive gas	
	- Explosive gas	
	- Poisonous gas	
<b>Factory test</b>		
	Vacuum-side leak test	Performance test at full load
	Electric insulation resistance test	
	Dielectric breakdown test	
	Function test of electric circuit	

# Scope of order LJ-A size 11-82

Item	Standard	Option
Standard	CE marking	No option
<b>Chilled water</b>		
Temperature	Inlet : 12°C Outlet : 7°C	Outlet : 5°C thru 12°C Temperature difference 3°C thru 10°C
Flow rate	0.605m³/h RT	Changes depending on chilled water temperature difference (min. 50%)
Max. working pressure	1 Mpa	Max. 2 MPa
Hydraulic test pressure	Max. working press. x1.5	No option
Fouling factor	0.018m²°C/kW	Max. 0.18m²°C/kW
Material of tube	Copper tube	Contact to Panasonic
Water quality	Refer to JRA-GL02E-1994	No option
Structure of water header	Removal type	Marine type
Manufacturing standard of water header	DIN Flanges	No option
<b>Cooling water</b>		
Temperature	Inlet : 29.4°C Outlet : 36.3°C"	Inlet : 20°C thru 40°C (There is a limit by the other conditions)
Flow rate	1.0m³/h RT	Within the water flow rate range of each model
Max. working pressure	1 Mpa	Max. 2 MPa
Hydraulic test pressure	Max. working press. x1.5	No option
Fouling factor	0.044m²°C/kW	Max. 0.18m²°C/kW
Tube material	Copper tube	Contact to Panasonic
Water quality	Refer to JRA-GL02E-1994	No option
Structure of water header	Marine type	No option
Manufacturing standard of water header	Flanges DIN	No option
<b>Hot water</b>		
Temperature	Inlet : 90°C Outlet : 80°C	Inlet : Max 110°C
Flow rate	0.112 l/sec RT (at 85°C r=0.968)	Within the water flow rate range of each model
Max. working pressure	1 Mpa	Max. 2 MPa
Hydraulic test pressure	Max. working press. x1.5	No option
Fouling factor	0.018m²°C/kW	Max. 0.18m²°C/kW
Tube material	Copper tube	Contact to Panasonic
Water quality	Refer to JRA-GL02E-1994	No option
Structure of water header	Removal type	No option
Manufacturing standard of water header	Flanges DIN	No option
<b>Electricity</b>		
Phase	3phase 400V 50Hz	No option
Voltage	(Voltage regulation : within ±10%)	
Frequency	(Frequency regulation : within ±5%)	
<b>Shipment</b>		
	One section	Two sections
<b>Control</b>		
Safety functions	Chilled water freeze protection Chilled water flow switch Cooling water temperature Generator temperature Generator pressure Crystallization protection Motor protection	Cooling water flow switch
Capacity control	Digital PID control by CHW temp Remote control of CHW by 4-20mA	No option
Parts	Selected by Panasonic	
<b>Control panel</b>		
Painting	Munssel 5Y-7/1	No option
Indication lamps	Operation : Green Stop: Orange Alarm : Red	No option
Display	LED	No option
External terminals (No-voltage normal open contact)	Operation indication Stop indication Alarm indication Answer back indication Cooling mode indication Purge alarm indication	No option
Structure	Indoor type	No option
Parts	Selected by Panasonic	No option
<b>Electrical wiring and piping</b>		
	Wire : 600V grade polyvinyl chloride-insulated wires	No option
	Pipe : plica tube (flexible metal conduits)	No option
<b>Insulation condition</b>		
Place	Indoor	No option
Ambient temperature	5°C thru 40°C	No option
Ambient humidity	Relative humidity: Max. 90 % at 45°C	No option
Atmosphere	Be sure the following are not present *Corrosive gas *Explosive gas *Poisonous gas	No option
<b>Factory test</b>		
	Leak test of vacuum side Electric insulation resistance test Dielectric breakdown test Function test of electric circuit	Performance test at full load

# Pass and nozzles arrangements

## 16LJ01-02-03

	Chilled water				Cooling water				Hot water			
	12 pass		8 pass		7+3 pass		4+2 pass		10 pass		6 pass	
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out
01	L	L	-	-	L	R			R	R		
02	-	-	L	L			L	R			R	R
03	-	-	L	L			L	R			R	R

## 16LJ-A11-82

	Chilled water										Cooling water										Hot water													
	6 pass		5 pass		4 Pass		3 Pass		2 Pass		4+3 pass		4+2 pass		3+2 pass		3+1 pass		2+2 pass		2+1 pass		4 pass		3 pass		2 pass		1 pass					
	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out	In	Out				
11	L	L	R	L	L	L	R	L	L	L	L	L	R	R	R	L	L	L	L	R	R	L	R	R	R	-	-	L	L	L	R			
12	L	L	R	L	L	L	R	L	L	L	L	L	R	R	L	L	L	L	R	R	L	R	R	R	R	-	-	L	L	L	R			
13	L	L	R	L	L	L	R	L	L	L	L	R	L	L	L	R	R	R	L	L	R	L	L	R	L	L	L	-	-	R	R	R	L	
14	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	L	L	-	-	R	R	R	L
21	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
22	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
23	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
24	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
31	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
32	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
41	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
42	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
51	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	R	L	R	R	R	L
52	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	-	-	R	R	R	L
53	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	-	-	R	R	R	L
61	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	-	-	R	R	R	L
62	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	-	-	R	R	R	L
63	L	L	R	L	L	L	R	L	L	L	L	-	-	L	L	L	R	R	R	L	L	R	L	L	R	L	-	-	-	-	R	R	R	L
71	R	R	L	R	R	R	L	R	R	R	R	-	-	R	R	R	L	L	L	R	R	L	R	L	R	-	-	-	-	L	L	L	R	
72	R	R	L	R	R	R	L	R	R	R	R	-	-	R	R	R	L	L	L	R	R	L	R	L	R	-	-	-	-	L	L	L	R	
73	R	R	L	R	R	R	L	R	R	R	R	-	-	R	R	R	L	L	L	R	R	L	R	L	R	-	-	-	-	L	L	L	R	
81	R	R	L	R	R	R	L	R	R	R	R	-	-	R	R	R	L	L	L	R	R	L	R	L	R	-	-	-	-	L	L	L	R	
82	R	R	L	R	R	R	L	R	R	R	R	-	-	R	R	R	L	L	L	R	R	L	R	L	R	-	-	-	-	L	L	L	R	



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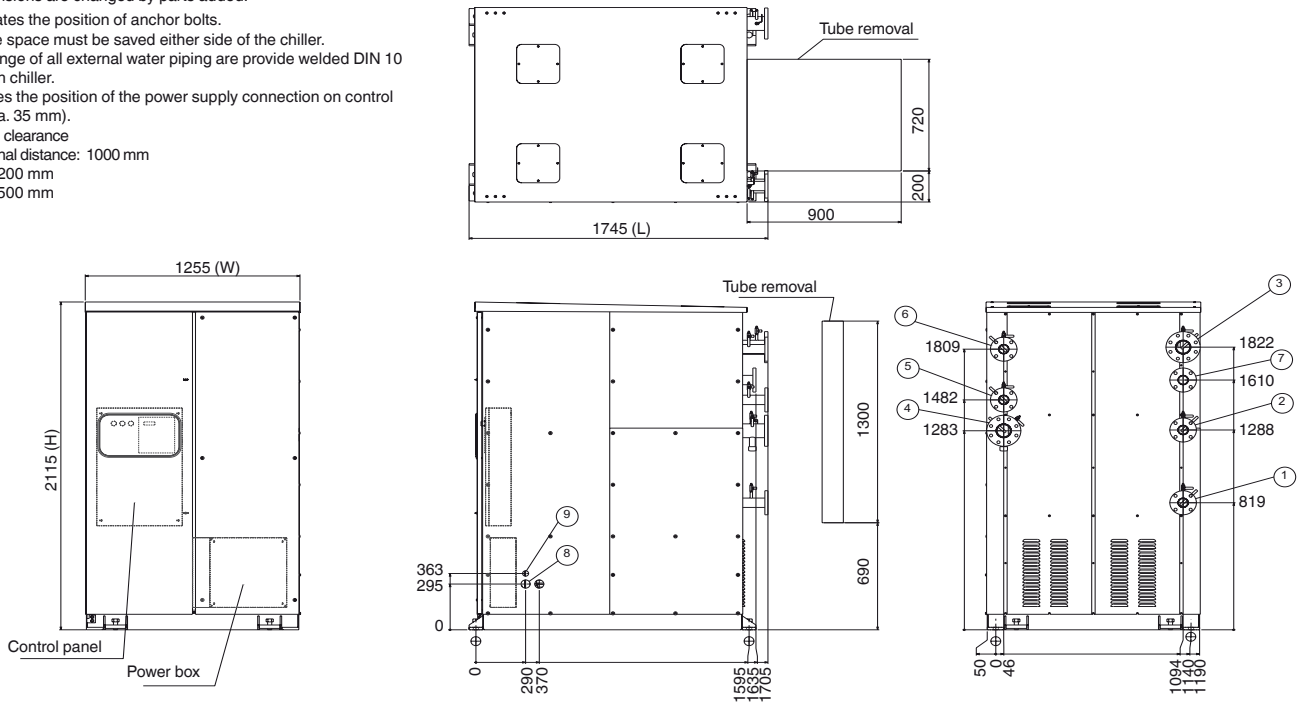
- L Nozzle location on **LEFT** end (when facing control panel)
- R Nozzle location on **RIGHT** end (when facing control panel)
- Standard pass arrangement

# Dimensions/clearances

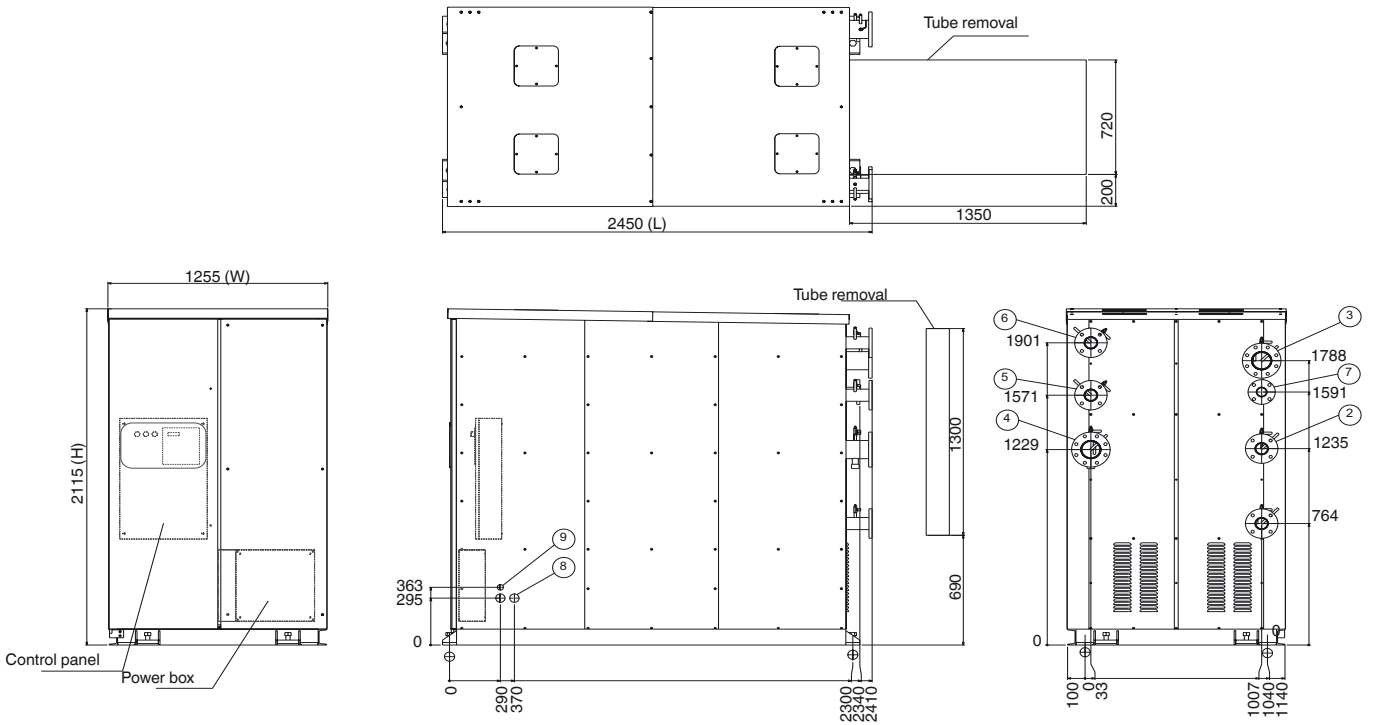
## 16LJ01

### NOTE

- (1) Dimensions (L), (W), (H), are for standard machine.  
The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Mating flange of all external water piping are provide welded DIN 10 flange with chiller.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm)
- (6) Installation clearance:
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ02





NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

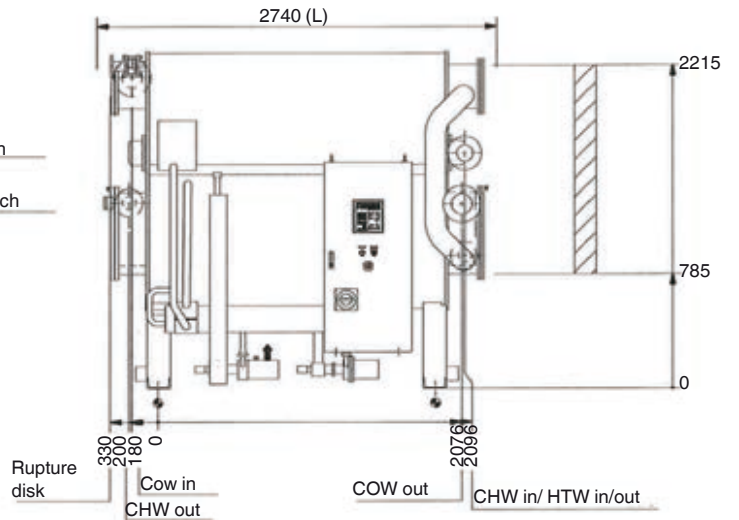
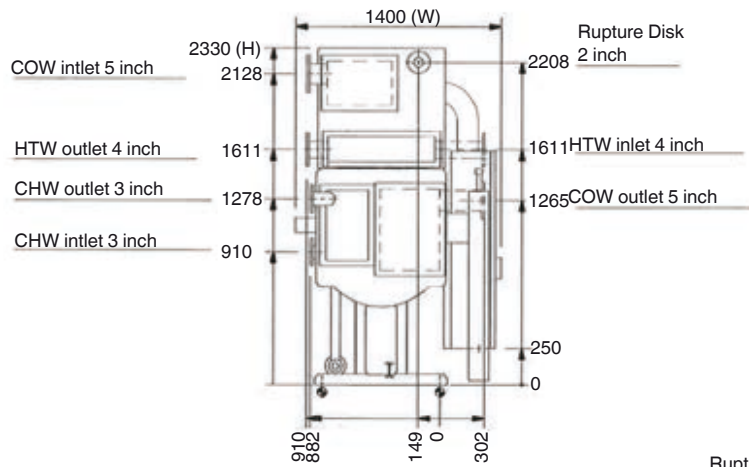
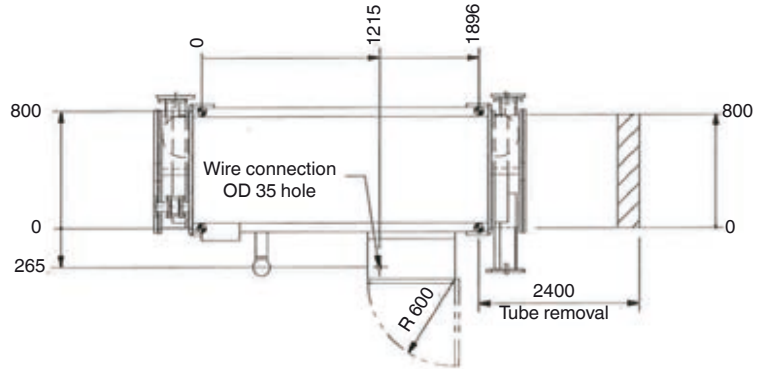


# Dimensions/clearances

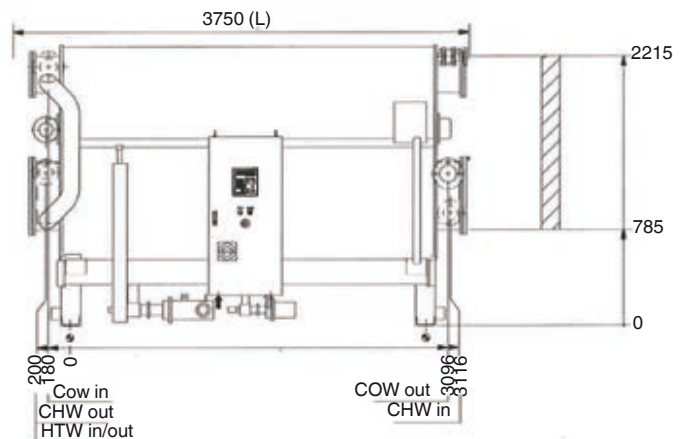
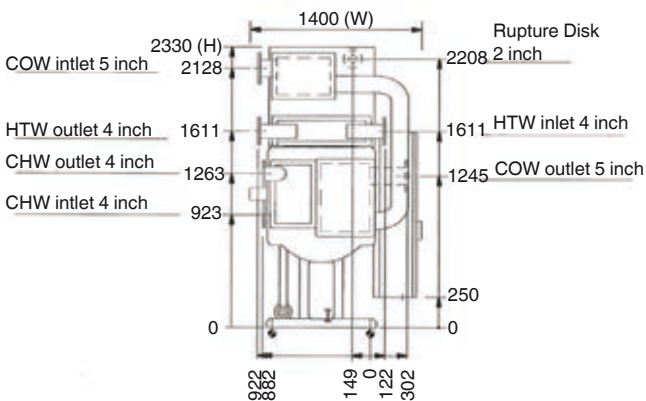
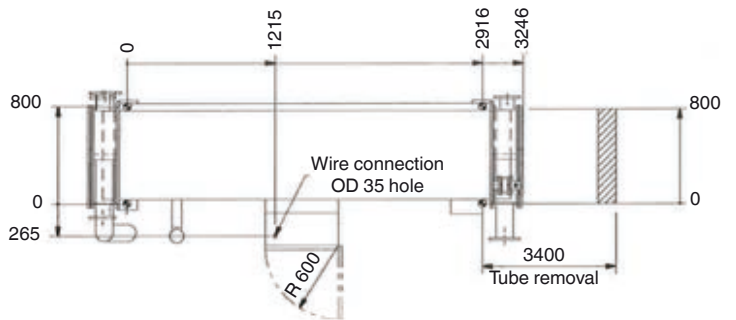
## 16LJ-A11 through 16LJ-A12

**NOTE**

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance:
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A13 through 16LJ-A14





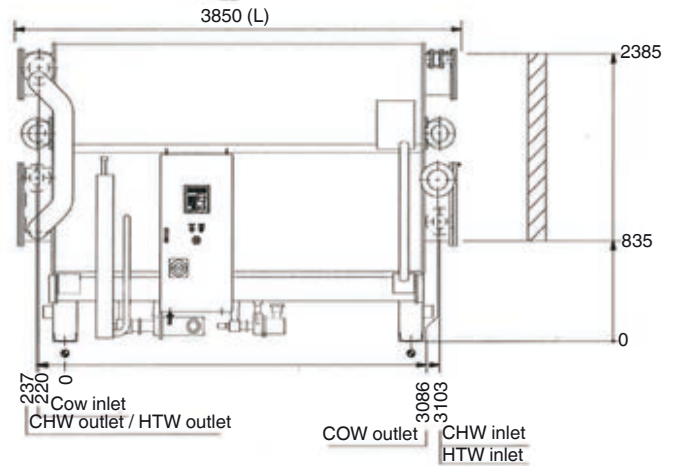
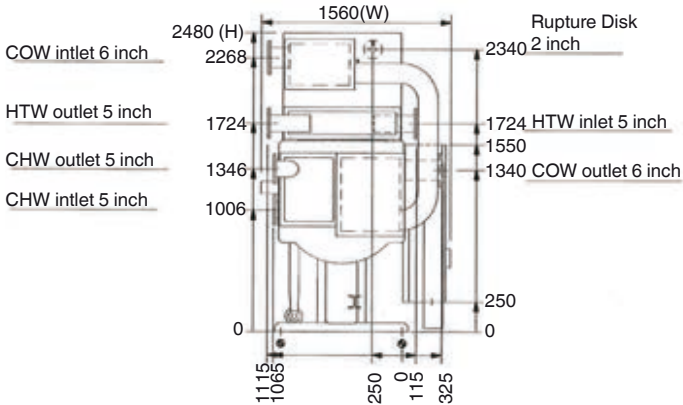
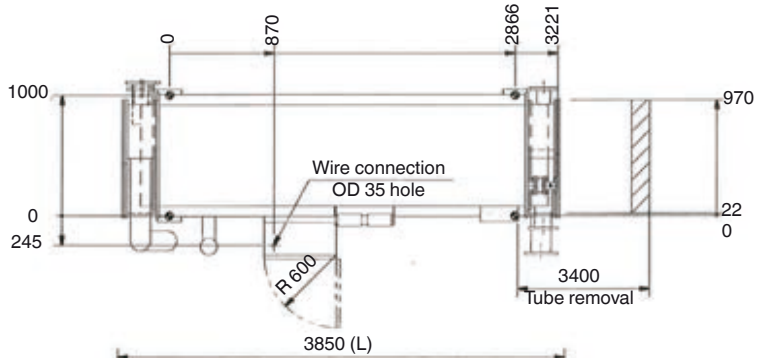
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

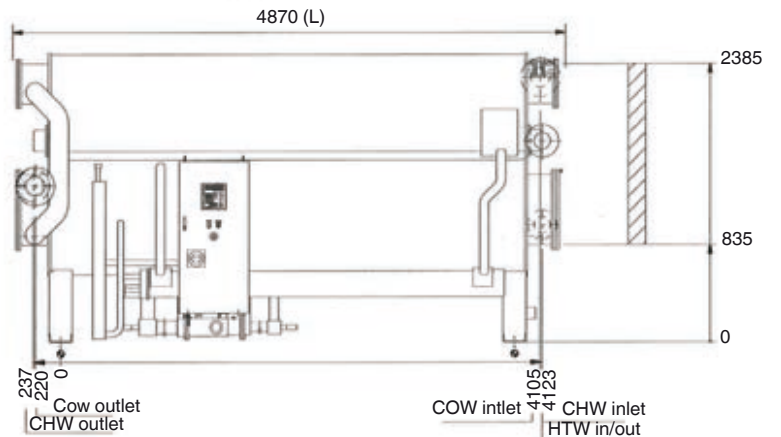
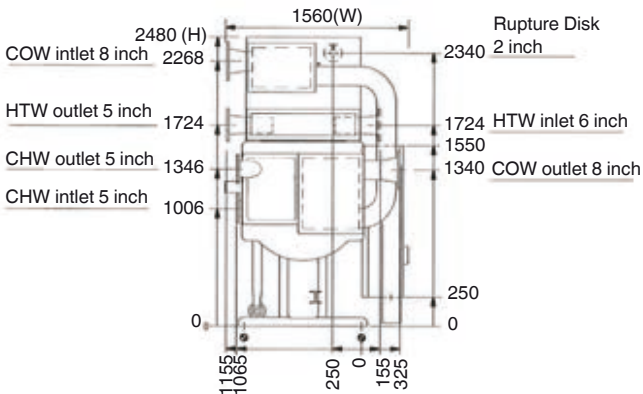
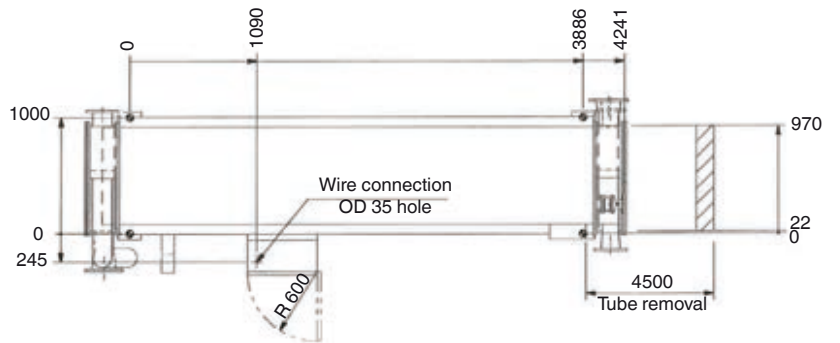
## 16LJ-A21 through 16LJ-A22

**NOTE**

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A23 through 16LJ-A24





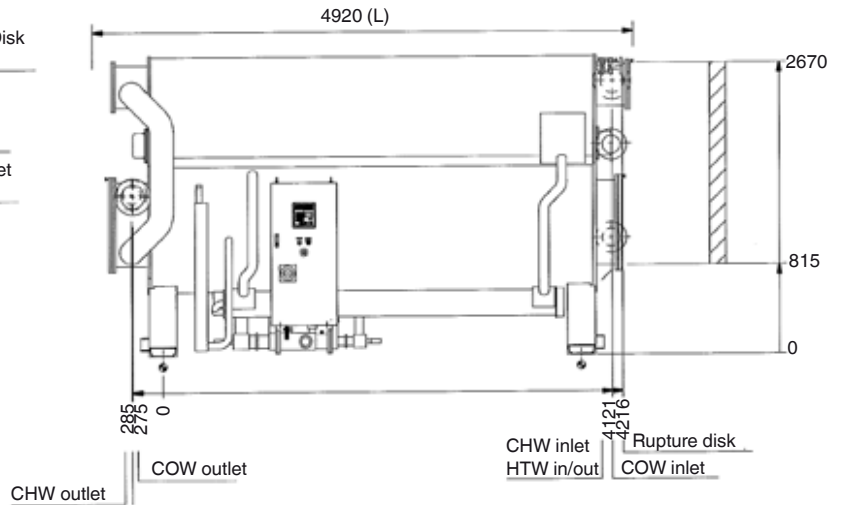
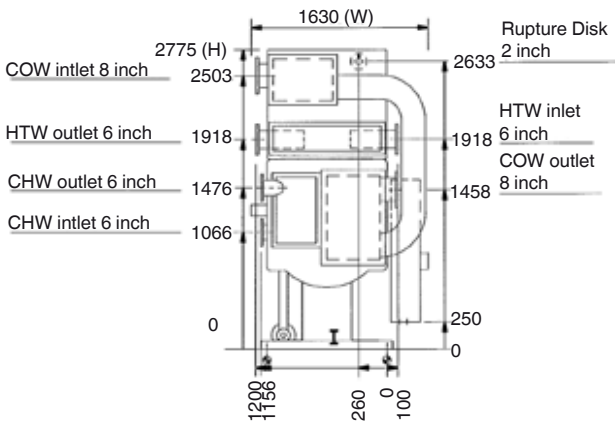
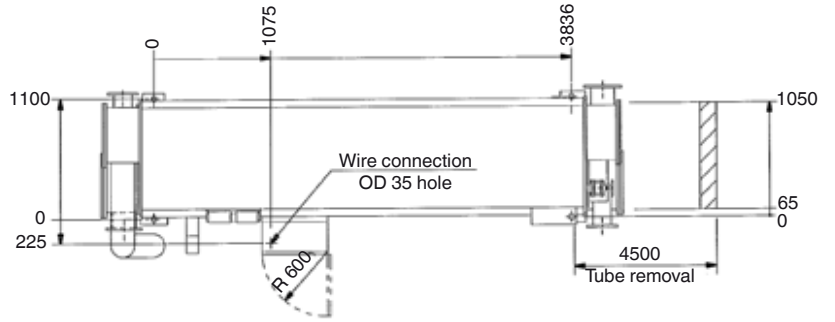
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

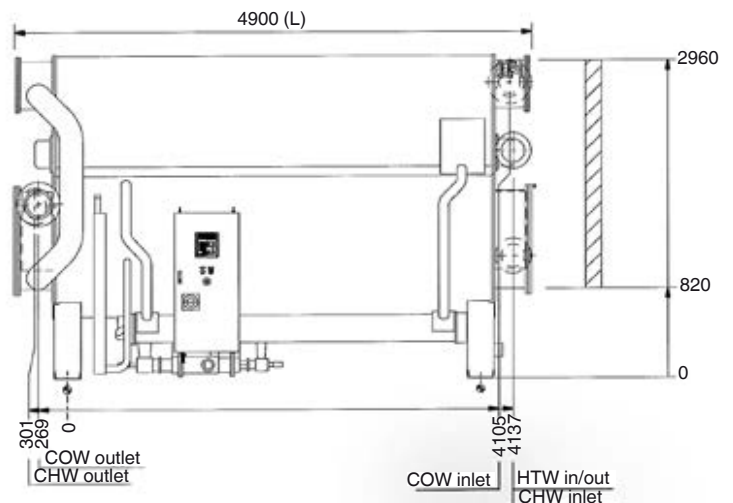
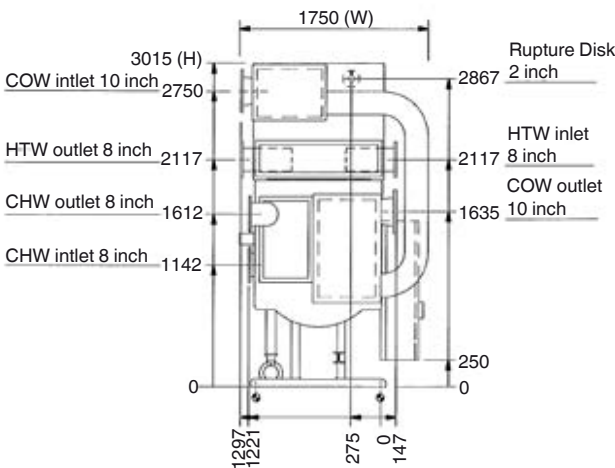
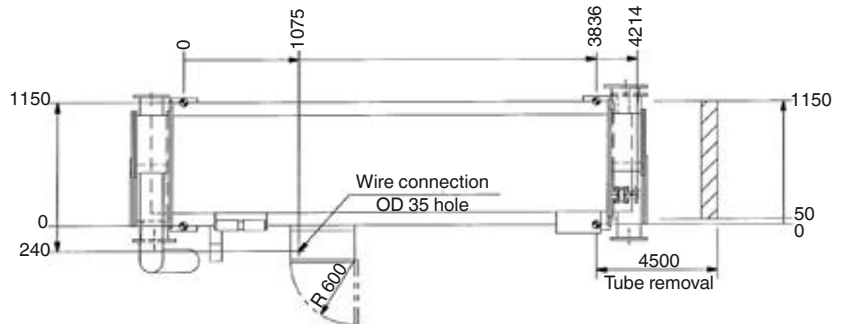
## 16LJ-A31 trough 16LJ-A32

### NOTE

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A41 trough 16LJ-A42





NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

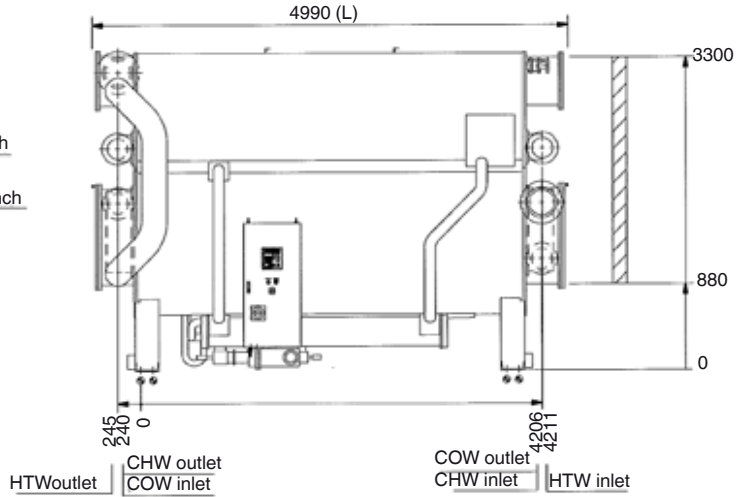
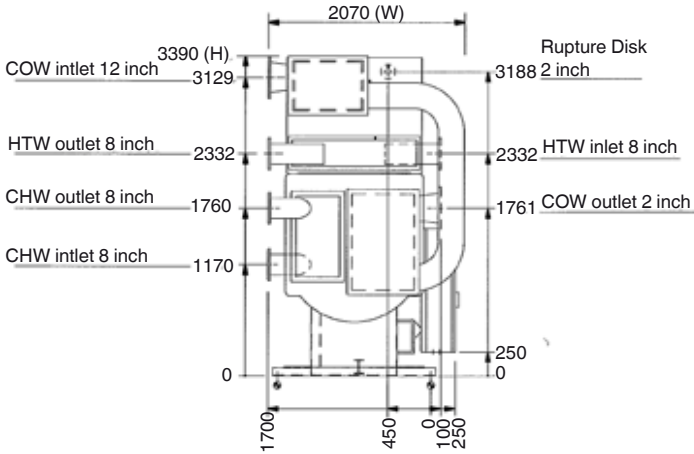
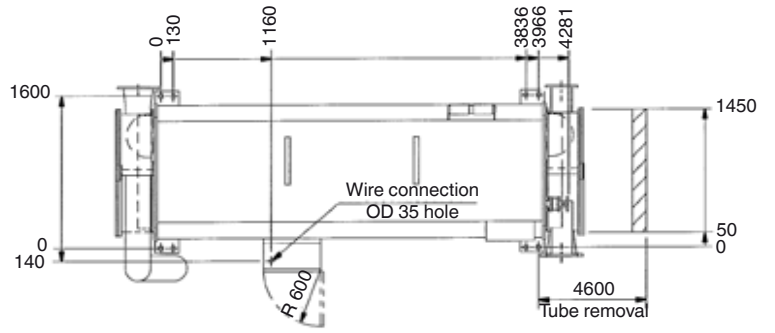


# Dimensions/clearances

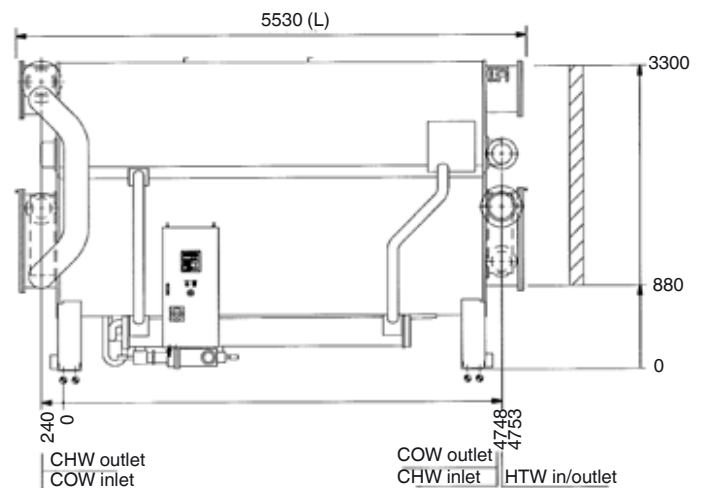
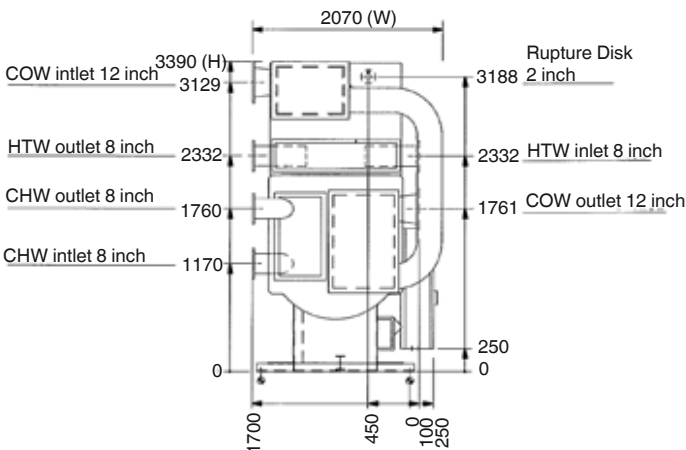
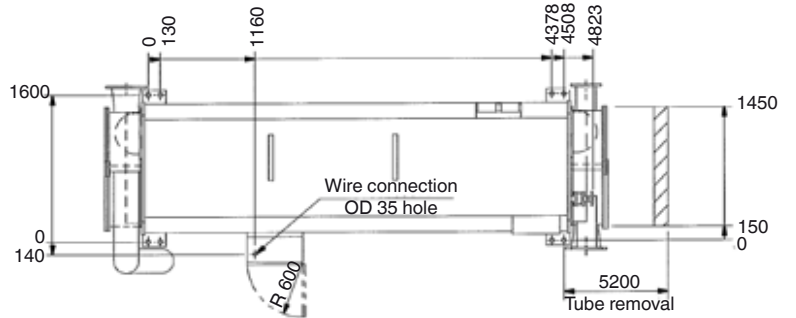
## 16LJ-A51

**NOTE**

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A52





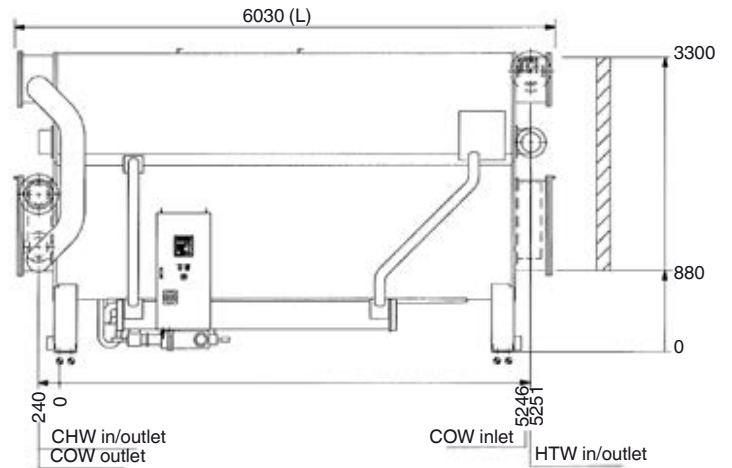
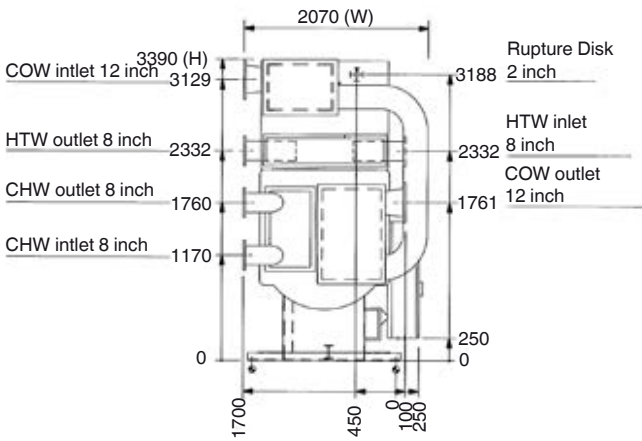
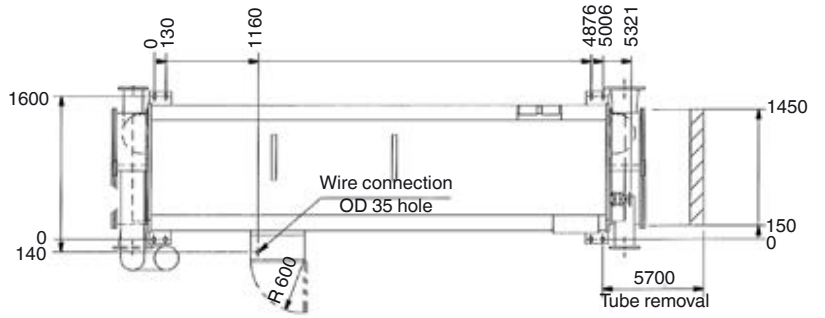
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

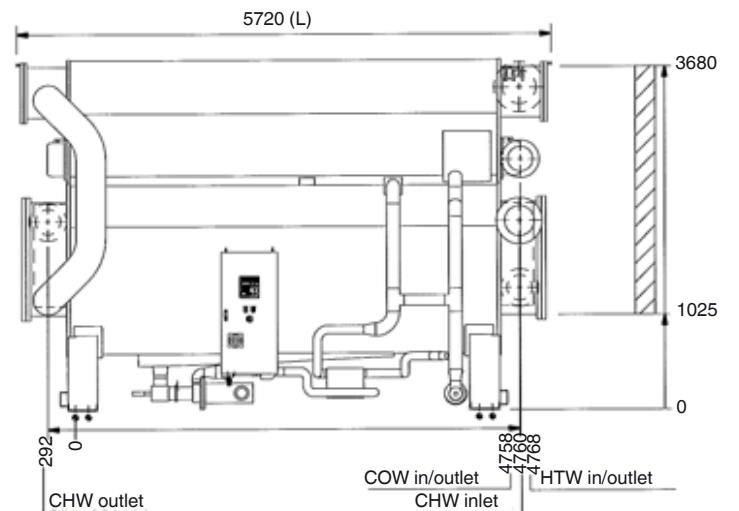
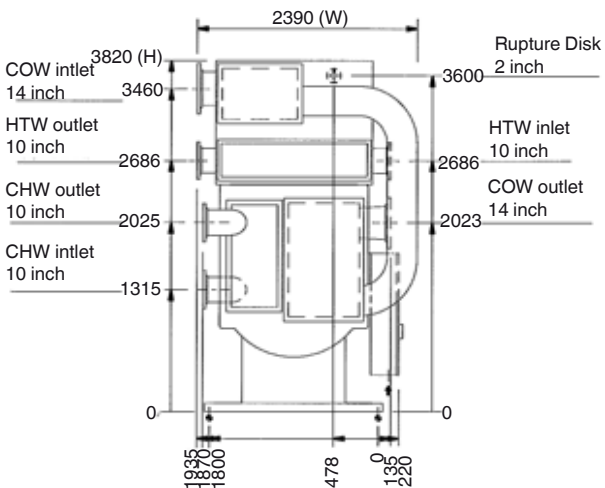
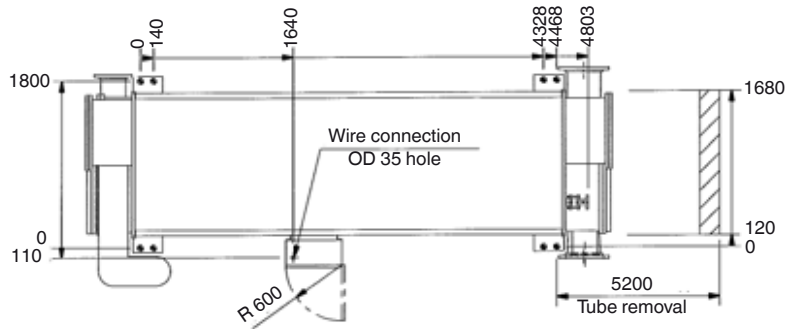
## 16LJ-A53

### NOTE

- (1) Dimensions (L), (W), (H), are for standard machine.  
The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel.  
(Dia. 35 mm).
- (6) Installation clearance  
 . Longitudinal distance: 1000 mm  
 . Top: 200 mm  
 . Others : 500 mm



## 16LJ-A61





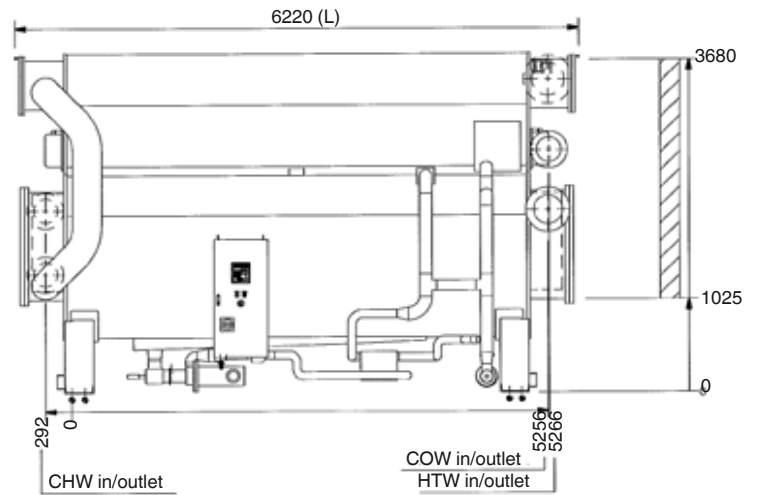
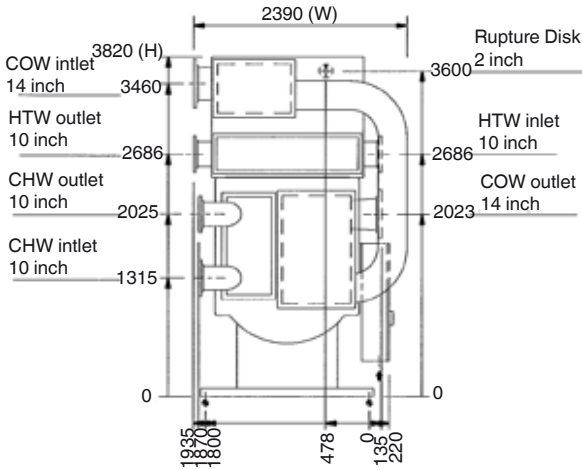
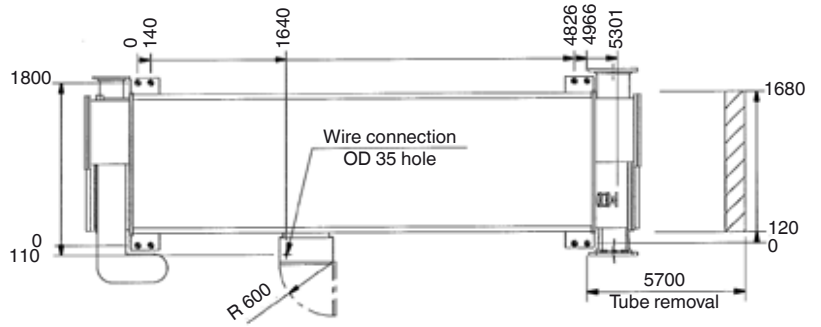
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

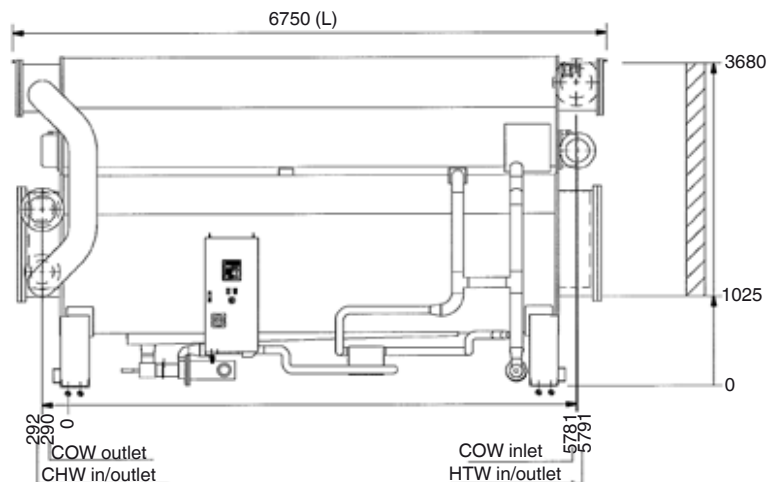
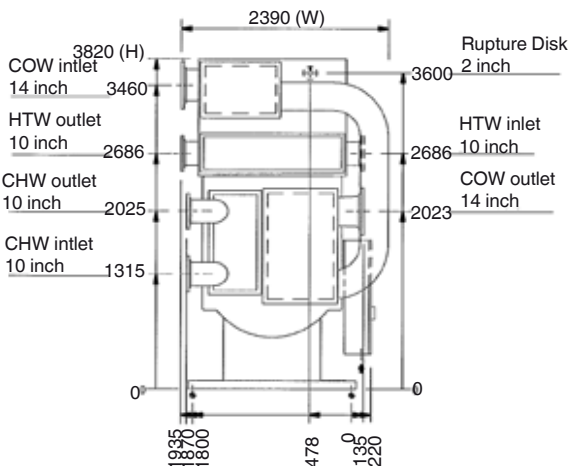
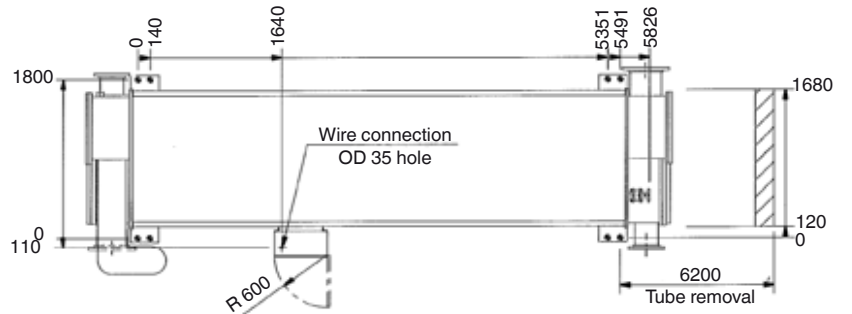
## 16LJ-A62

### NOTE

- (1) Dimensions (L), (W), (H), are for standard machine.  
The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel.  
(Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A63





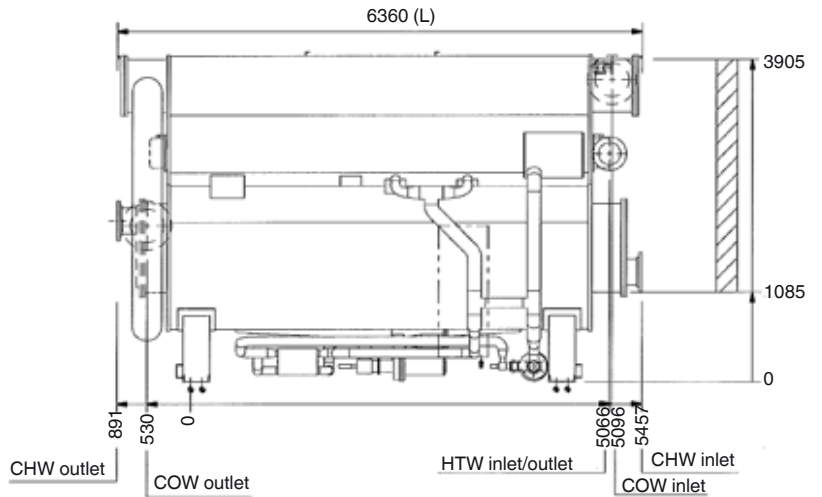
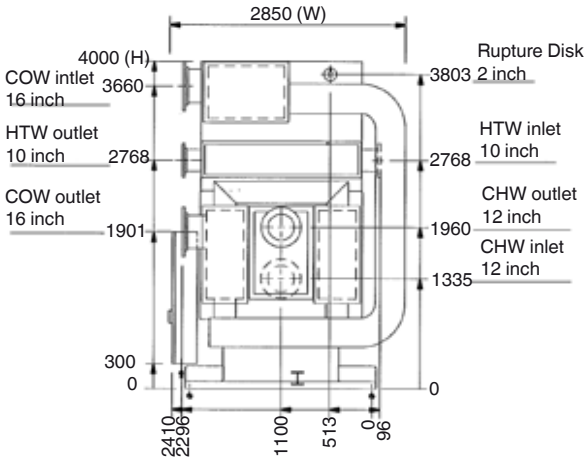
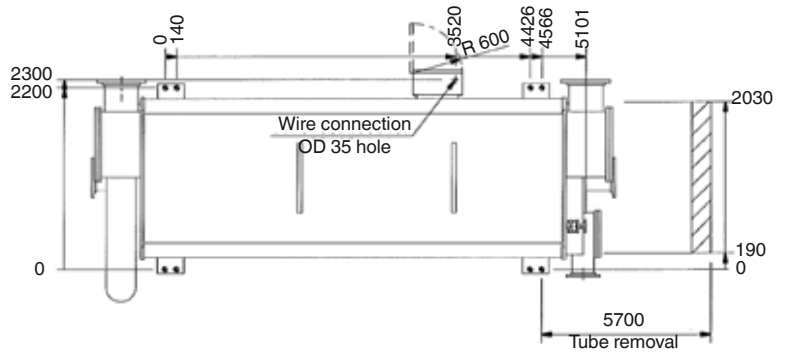
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

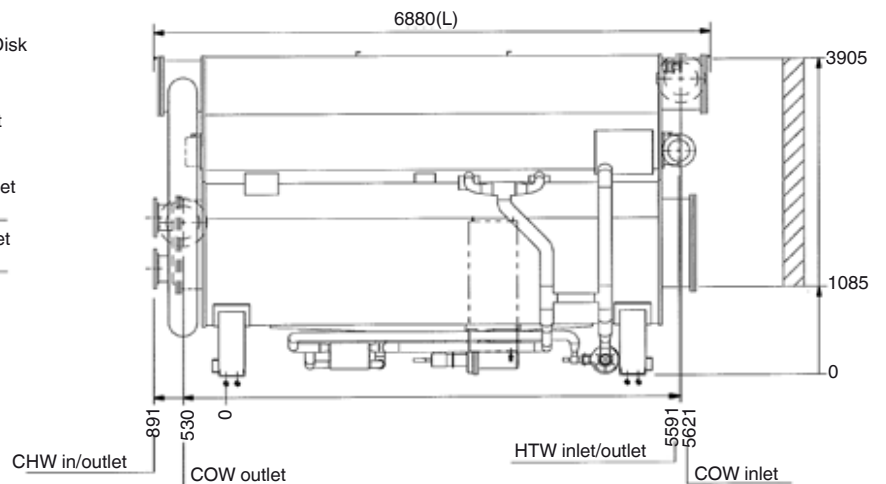
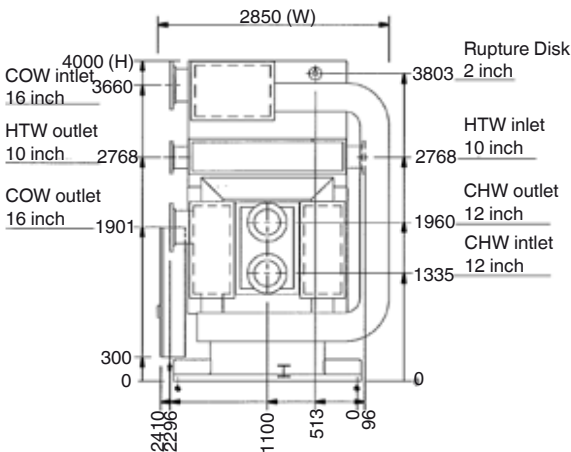
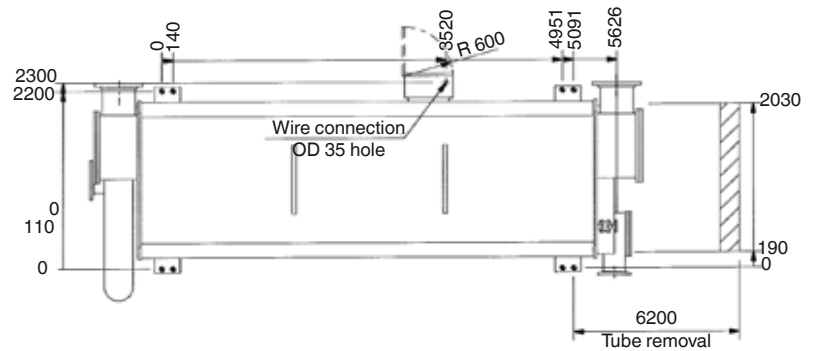
## 16LJ-A71

**NOTE**

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A72





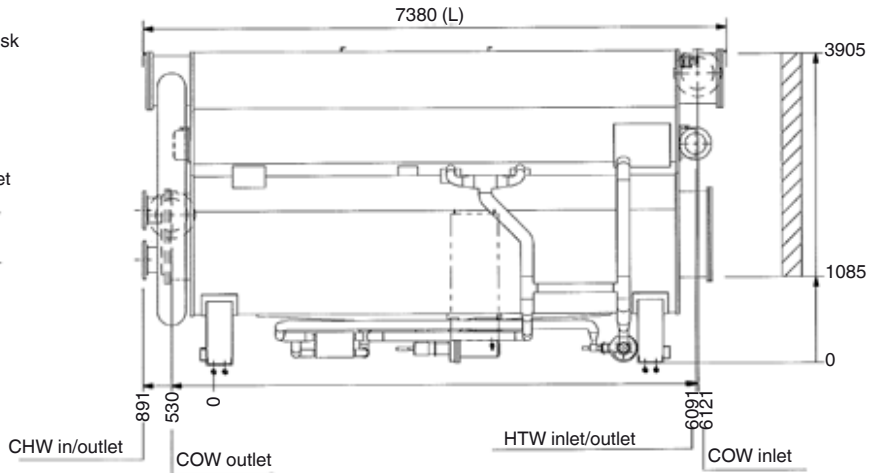
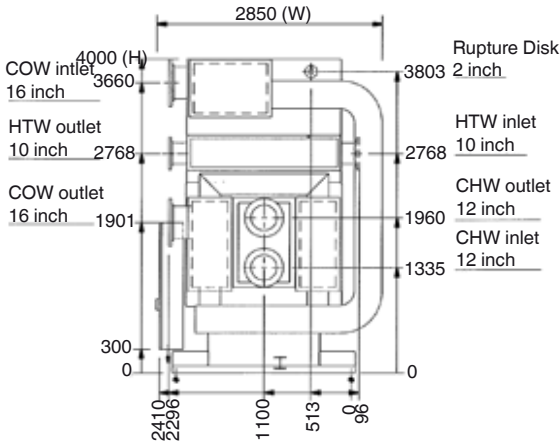
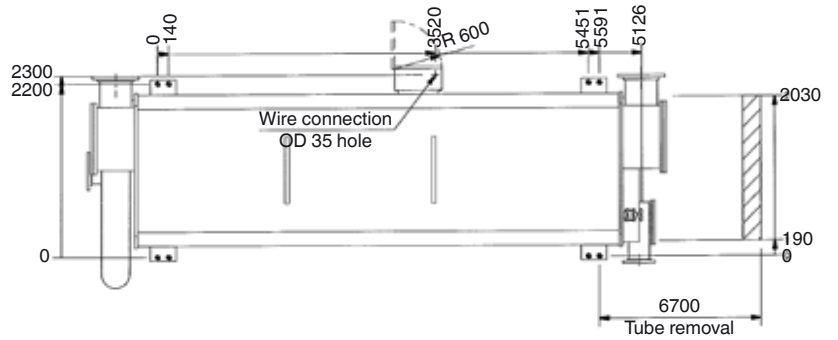
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

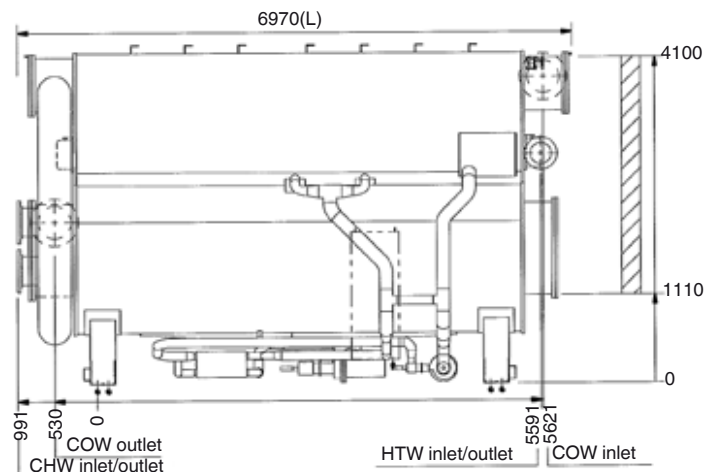
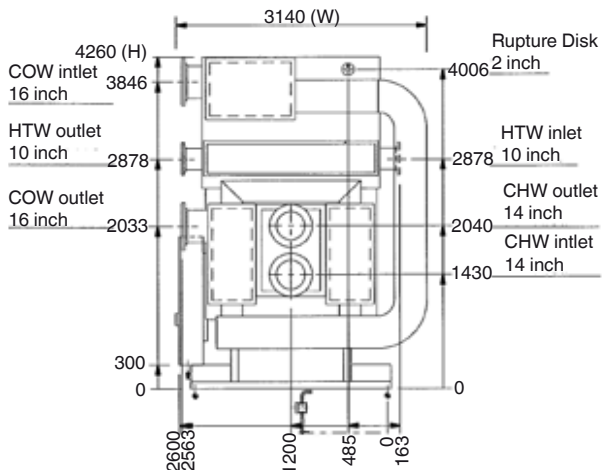
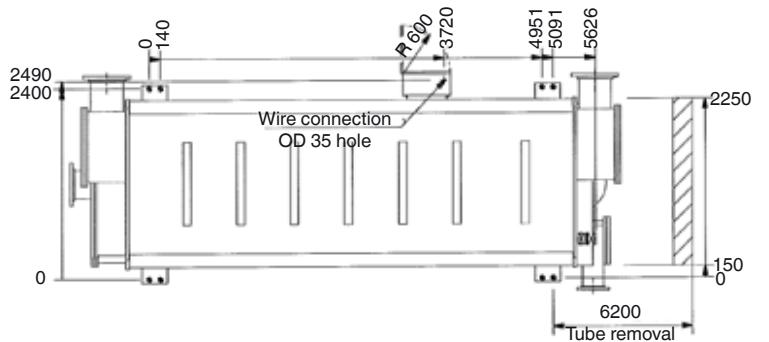
## 16LJ-A73

### NOTE

- (1) Dimensions (L), (W), (H), are for standard machine. The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel. (Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



## 16LJ-A81





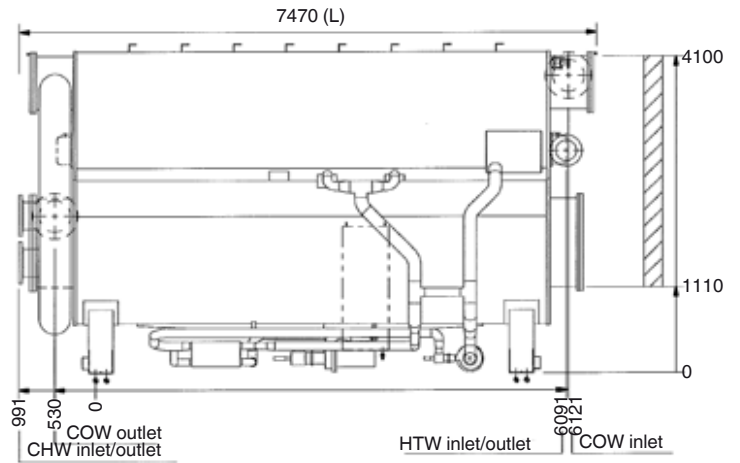
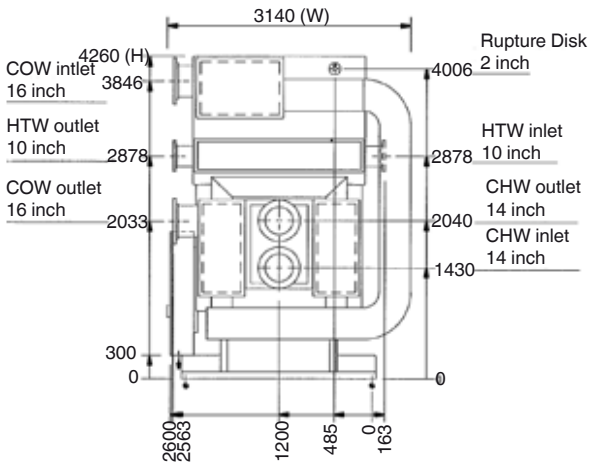
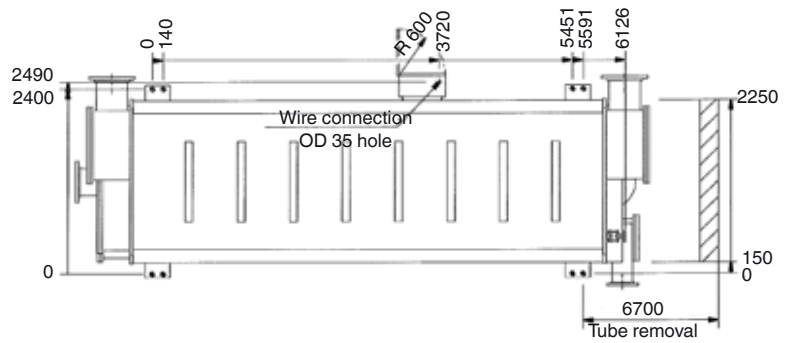
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Dimensions/clearances

## 16LJ-A82

### NOTE

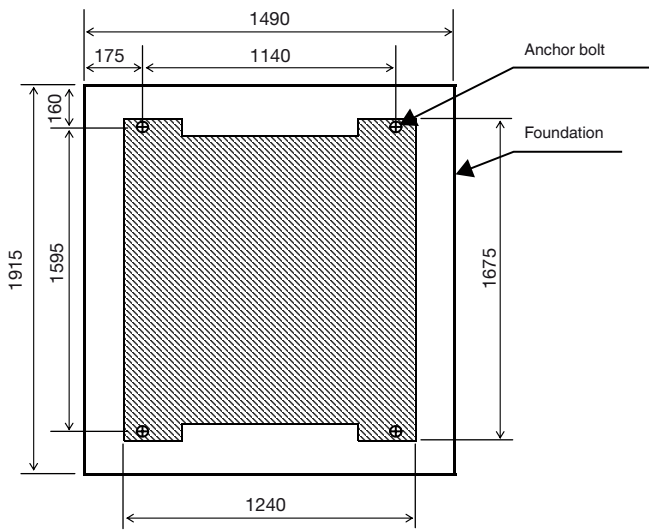
- (1) Dimensions (L), (W), (H), are for standard machine.  
The dimensions are changed by parts added.
- (2)  Indicates the position of anchor bolts.
- (3) Clearance space must be saved either side of the chiller.
- (4) Connecting flange of all external water piping are DIN 10 flange.
- (5)  Indicates the position of the power supply connection on control panel.  
(Dia. 35 mm).
- (6) Installation clearance
  - . Longitudinal distance: 1000 mm
  - . Top: 200 mm
  - . Others : 500 mm



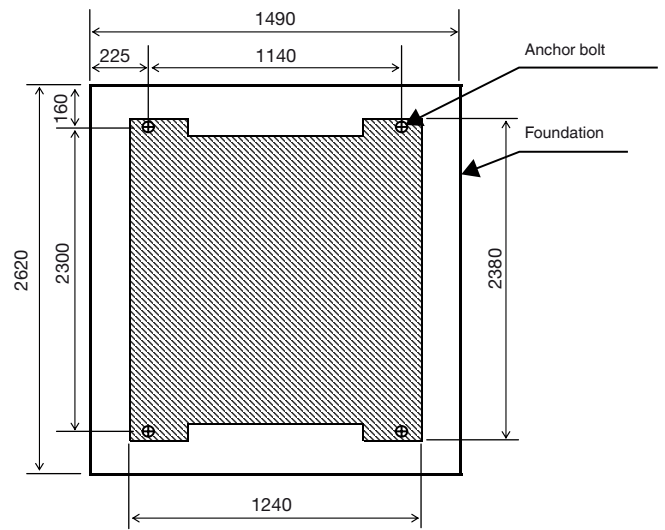
NOTE: Dimensions are for guidance only. Always refer to the certified drawings supplied upon request when designing an installation.

# Foundation dimensions, mm

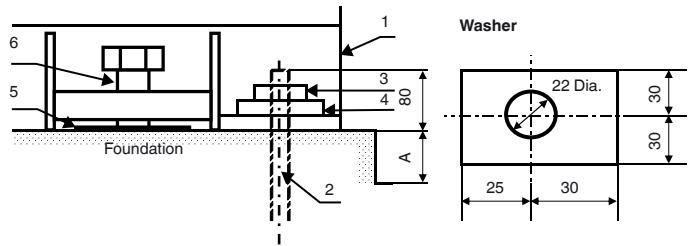
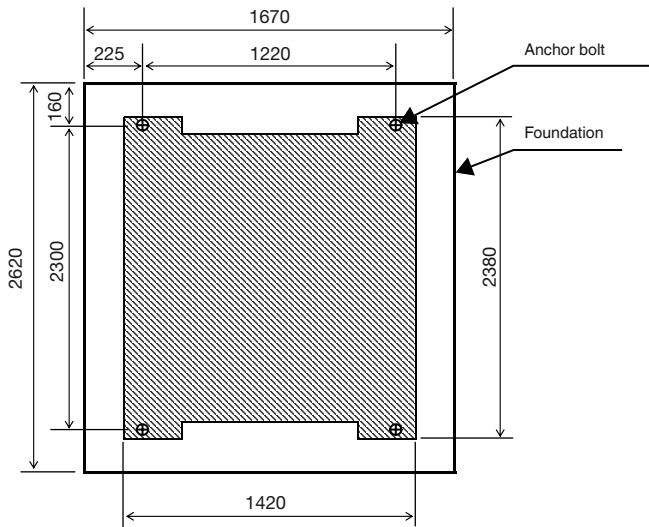
**LJ01**



**LJ02**



**LJ03**



**Legend :**

- 1 : Base of the chiller
- 2 : Anchor bolt
- 3 : Nut
- 4 : Washer\*
- 5 : Plate
- 6 : Bolt for level adjustment\*
- \* : attachment

A= 200mm or above

Material : Steel  
Thickness : 9 mm

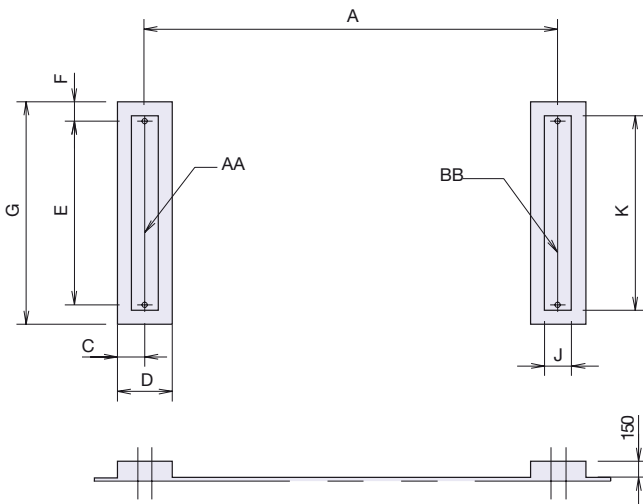
**NOTES:**

1. indicates the machine base.  
The machine base has a 30 mm diameter hole for the anchor bolt.
2. The anchor bolt should be fixed as shown in the detail drawing.
3. There should be a drain channel around the foundation.
4. The floor surface should be made waterproof to facilitate maintenance work.

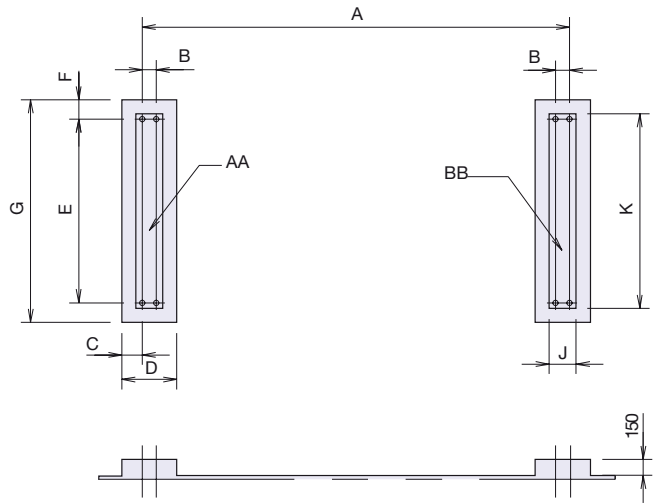
5. The surface of the foundation should be made flat.  
(Leveling tolerance is 1 mm for 1000 mm)
6. Anchor bolts and nuts are to be supplied by the customer.

# Foundation dimensions, mm

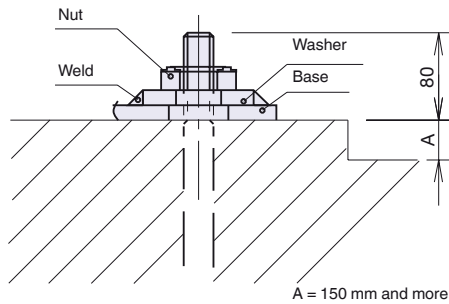
**Figure 3 - LJ-A 11 to LJ-A 42**



**Figure 5 - LJ-A 51 to LJ-A82**



**Figure 4 - Details of weld**



**NOTES:**

1. The machine base has  $\varnothing 50$ -mm hole for the anchor bolt.
2. The anchor bolt should be fixed as shown in the detail drawing. Washer should be welded to the base (see Fig. 4)
3. There should be a drain channel around the foundation.

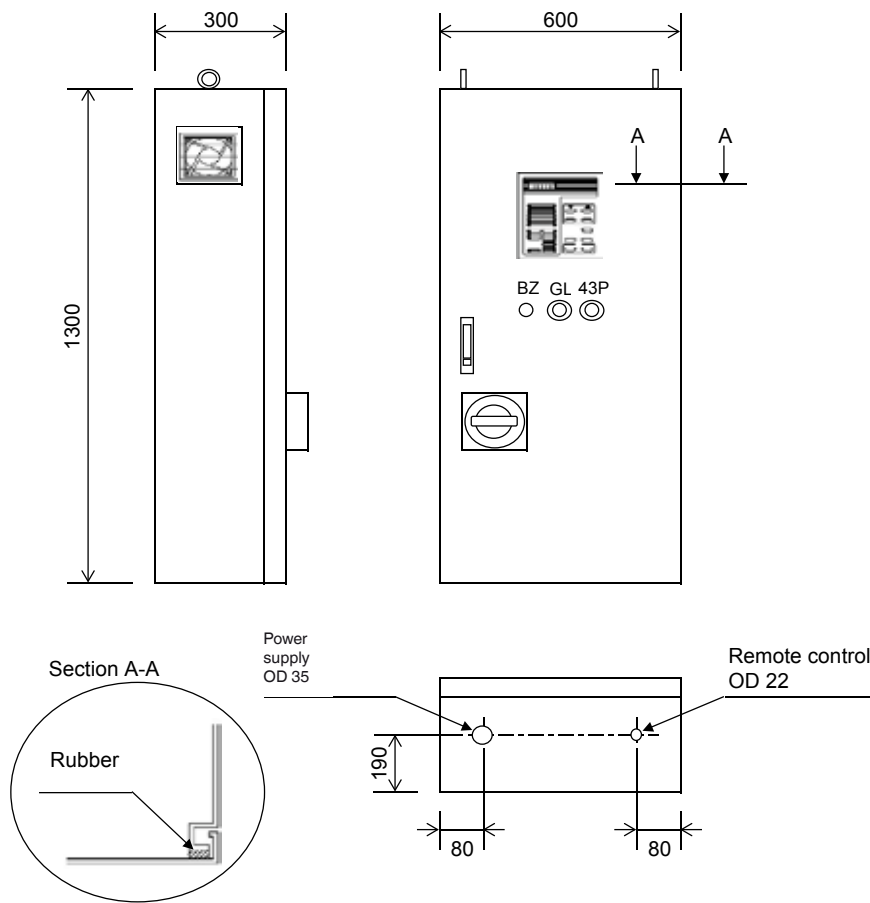
4. The floor surface should be made waterproof to facilitate maintenance work.
5. The surface of the foundation should be made flat. (Leveling tolerance is 1 mm for 1000 mm)
6. Anchor bolts and nuts are to be supplied by customer.

**Table 1 - Foundation dimensions**

Model	Size	Weight				Dimensions							
		AA+BB	AA	BB	A	B	C	D	E	F	G	J	K
16LJ-A	11	4000	2000	2000	1896	-	175	360	800	150	1100	160	900
16LJ-A	12	4200	2100	2100	1896	-	175	360	800	150	1100	160	900
16LJ-A	13	5200	2600	2600	2916	-	175	360	800	150	1100	160	900
16LJ-A	14	5500	2750	2750	2916	-	175	360	800	150	1100	160	900
16LJ-A	21	6600	3300	3300	2866	-	200	400	1000	150	1300	200	1100
16LJ-A	22	6900	3450	3450	2866	-	200	400	1000	150	1300	200	1100
16LJ-A	23	8100	4050	4050	3886	-	200	400	1000	150	1300	200	1100
16LJ-A	24	8600	4300	4300	3886	-	200	400	1000	150	1300	200	1100
16LJ-A	31	10500	5250	5250	3836	-	225	450	1100	150	1400	250	1200
16LJ-A	32	11000	5500	5500	3836	-	225	450	1100	150	1400	250	1200
16LJ-A	41	13000	6500	6500	3836	-	225	450	1150	150	1450	250	1250
16LJ-A	42	13600	6800	6800	3836	-	225	450	1150	150	1450	250	1250
16LJ-A	51	18400	9200	9200	3966	130	190	510	1600	180	1960	250	1700
16LJ-A	52	20000	10000	10000	4508	130	190	510	1600	180	1960	250	1700
16LJ-A	53	21400	10700	10700	5006	130	190	510	1600	180	1960	250	1700
16LJ-A	61	28300	14150	14150	4468	140	220	580	1800	180	2160	320	1900
16LJ-A	62	30300	15150	15150	4966	140	220	580	1800	180	2160	320	1900
16LJ-A	63	32400	16200	16200	5491	140	220	580	1800	180	2160	320	1900
16LJ-A	71	38700	19350	19350	4566	140	220	580	2200	180	2560	320	2300
16LJ-A	72	41200	20600	20600	5091	140	220	580	2200	180	2560	320	2300
16LJ-A	73	43700	21850	21850	5591	140	220	580	2200	180	2560	320	2300
16LJ-A	81	46900	23450	23450	5091	140	220	580	2400	180	2760	320	2500
16LJ-A	82	49600	24800	24800	5591	140	220	580	2400	180	2760	320	2500

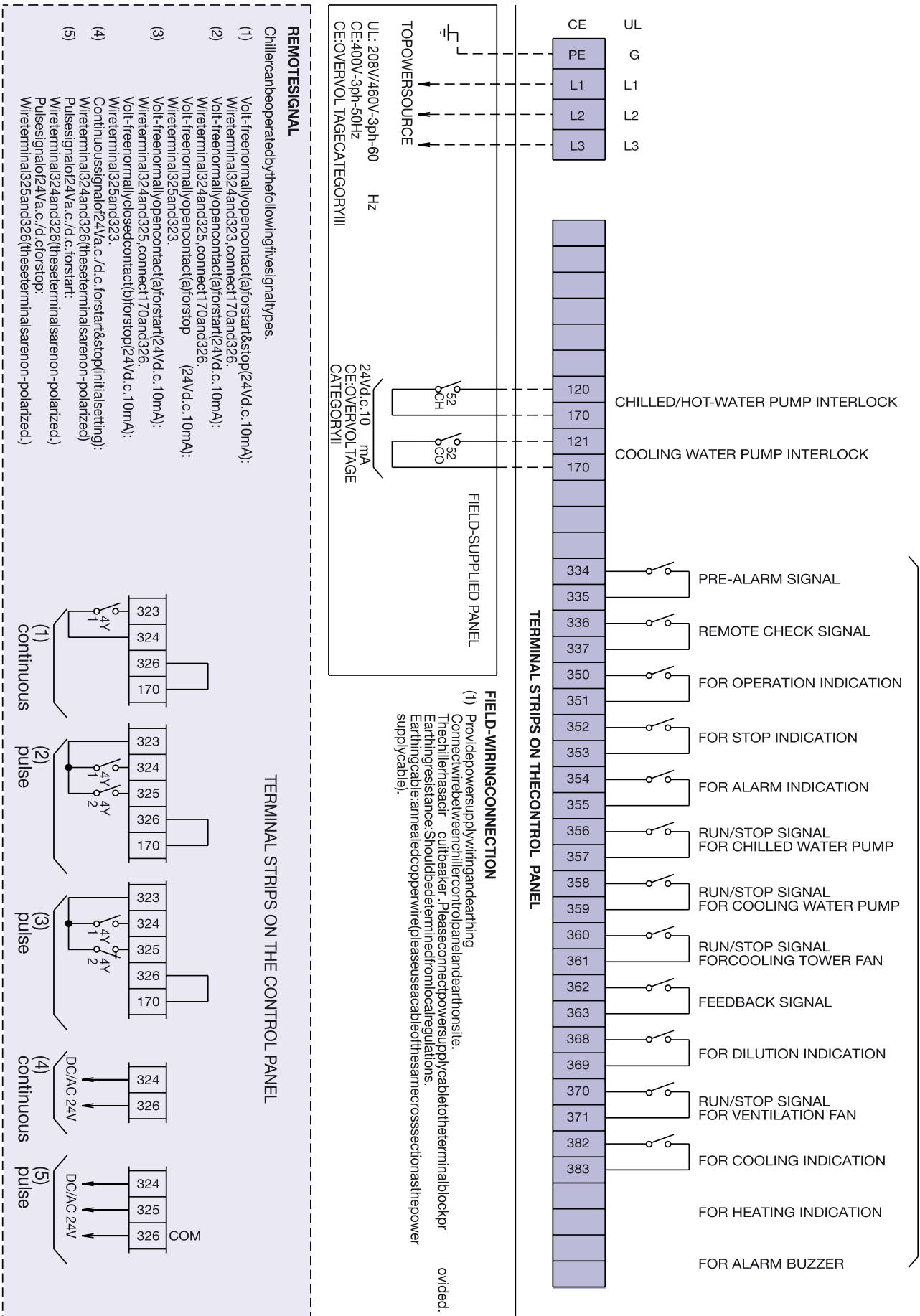


# Control panel dimensions, mm

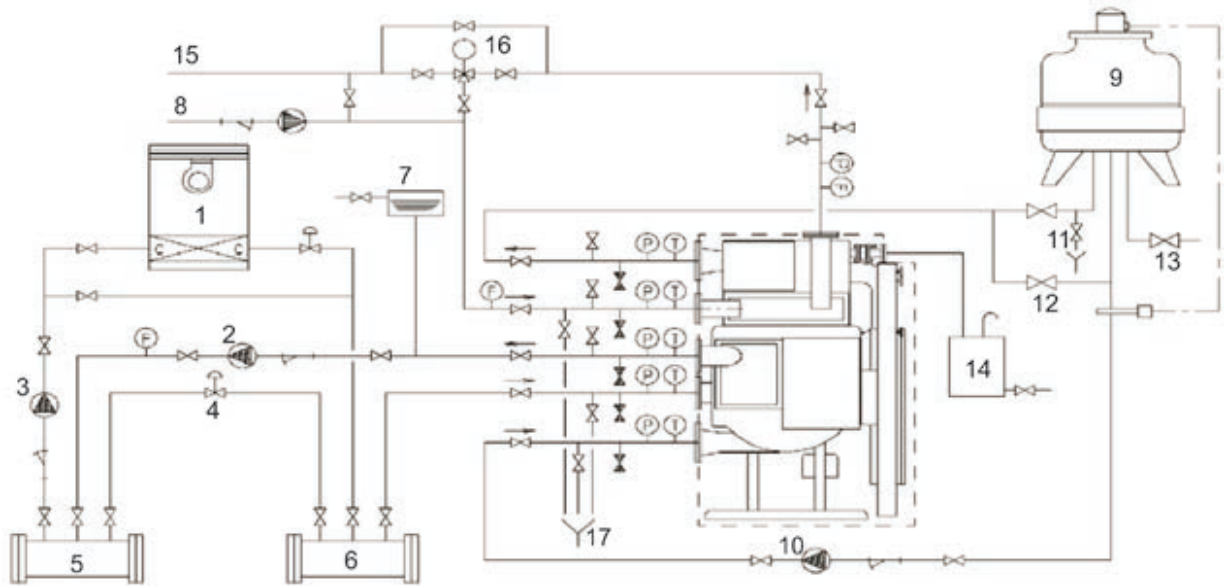


# Field wiring

Figure 6 - Typical electrical field connection diagram - hot water-fired absorption chillers (LJ-A)



# Typical piping diagram



## Legend

- |                                  |   |                                  |
|----------------------------------|---|----------------------------------|
| 1 Cooling load                   | 8 Hot water supply                        | 15 Hot water return              |
| 2 Chilled water pump (primary)   | 9 Cooling tower                           | 16 Hot water control 3 way valve |
| 3 Chilled water pump (secondary) | 10 Cooling water pump                     | 17 To drain channel              |
| 4 Bypass valve                   | 11 Blow down valve                        |                                  |
| 5 Supply header                  | 12 Bypass valve                           |                                  |
| 6 Return header                  | 13 Make up water supply                   |                                  |
| 7 Expansion tank                 | 14 Minimum tank capacity 1 m <sup>3</sup> |                                  |

- Thermometer   
 Pressure gauge   
 Flow meter   
 Water pump   
 Strainer   
 Manual valve   
 Connections   
 Thermostat for cleaning process

## General remarks on piping

- Equipment and parts outside the area surrounded by the broken line are not supplied by Carrier.
- For pipe connections and diameter refer to the dimensional drawings and specification tables.
- 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.
- Position the chilled water pump, cooling water pump, hot pump and expansion tank correctly so that the chiller pressure does not exceed the set value.
- For cooling water temperature control refer to the drawing "Cooling water temperature control method".
- Separate chilled, cooling and hot water pumps should be provided for each chiller.
- Provide a cooling water blow-down valve in the cooling tower inlet for water quality control.
- Install a filter in the chilled water, cooling water and hot water pipes (10 mesh).
- Install stop valves on the chilled, cooling and hot water inlet and outlet.
- Provide a thermometer and pressure gauge at the chilled, cooling and hot water inlet and outlet.
- Provide an air vent valve in each of the chilled, cooling and hot water line at point higher than the header.
- Install drain valves at the lowest positions between absorption chiller and the stop valves of the chilled water, cooling water and hot water, and pipe them to the drain channel.
- Provide an expansion tank at highest position in the chilled water line.
- Install a cooling tower away from any exhaust gas outlet.
- Connect the pipe from rupture disk to tank.
- Install stop valves between the absorption chiller and stop valves of all inlets and outlets for chemical cleaning of the water circuit system.
- When two way valve is used, there is the case that hot water outlet temperature is different from the specifications.



## Safety considerations

### **Before operating the unit**

- Before operating the unit be sure to read the operation manual carefully.
- Installation should conform to all applicable local codes and regulations.

### **During the installation**

- Read the installation manual carefully before offloading and installing the unit.
- All work must be carried out by qualified personnel to prevent injuries and damage to the equipment.
- Waterproof the unit foundation and provide a drain channel to prevent water damage to the surrounding equipment.
- Provide adequate space around the unit for maintenance work to ensure safe working conditions.

### **Maintenance**

- In addition to daily inspection periodical maintenance is required. Insufficient or incorrect maintenance may cause fire, electric shock and injuries.
- Please consult your local service office for further guidance.

### **Avoiding hazardous places**

- Keep the units away from dangerous inflammable substances such as gasoline, thinner and combustible gases, as these may result in a fire.



Order No.: 11615, 06.2016. Supersedes order No.: 11615-20, 01.2016.  
Manufacturer reserves the right to change any product specifications without notice.



Quality and Environment  
Management Systems  
Approval

Manufactured by: Carrier SCS, Montluel, France  
Printed in the European Union