

Address Book of Branch Offices in China

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No.0701A2A1GME01

Panasonic

ideas for life

DG-M Series

G series direct-fired LiBr absorption chiller/heater



China · Dalian Sanyo Refrigeration Co.,Ltd.

Business scope:

Designs, productions, manufactures, sales, installations, and after-sale services for chillers featuring environmental protection and energy-integrated utilization, for air-conditioning machinery, and for related environmental protection machinery, etc.

Product kinds:

- Central air-conditioning equipment: absorption chiller/heater — sole refrigeration or refrigeration and heating (70~23256kW). Steam-fired, direct-fired, hot water-fired, modular type, packaged type, heat pump type, etc.
Electric refrigeration screw chiller — air conditioning refrigeration and ice storage (281~2461 kW).
- Commercial air-conditioning equipment: GHP gas heat pump and chiller unit — refrigeration and heating (10HP-60HP).
- VRF variable refrigerant flow unit — refrigeration and heating (8HP-60HP).
Heating equipment: vacuum boiler — heating and hot water supplying (80,000~6,000,000kcal/h).

Application:

- Central air-conditioning equipment: mainly provide heating and cooling source for large scale central air conditioning system and other places needing chilled or hot water, widely applied in building, hotel, department store, cinema, stadium, factory and oil field, etc.
- Commercial air-conditioning equipment: widely applied in places needing air conditioning equipments, such as small and middle scale department store, hotel, building, entertainment place, hospital, factory, dormitory, residence, school, etc.
- Heating equipment: widely applied in hotel, department store, residence, villa, bath house, advanced swimming pool, etc., where needing heating and hot water, used with absorption chiller, it will be ideal for cooling, heating and hot water supplying.



A dream in the 21st century

Sanyo G series LiBr absorption chiller/heater realizes a dream of the people in the 21st century. This machine has 5 main characteristics: environment friendly, energy saving, technique maturing, operation economically, and no-person management.

This kind of machine mainly provides heating and cooling source for large scale central air conditioning system and other places needing chilled or hot water, widely applied in building, hotel, department store, cinema, stadium, factory and oil field, etc.

Strong Technology and Quality Guarantee

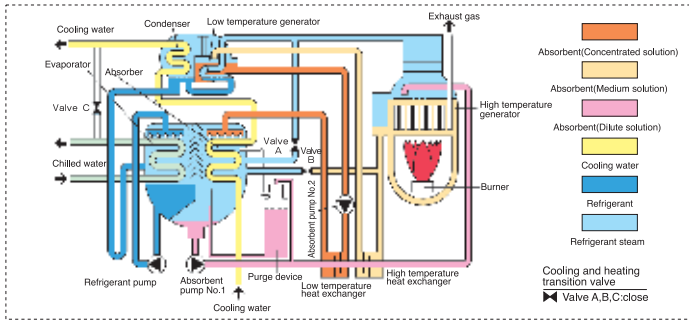


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Cooling operation



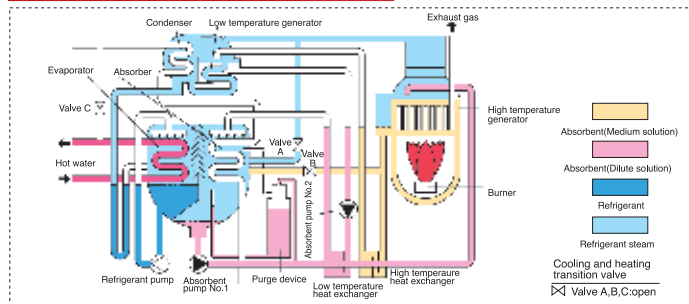
Our G series direct-fired LiBr absorption chiller/heater is made of evaporator, absorber, condenser, low temperature generator, high temperature generator, heat exchanger, solution pump and refrigerant pump etc.

Principle of operation: chilled water is cooled in evaporator by low temperature refrigerant which has been decompressed and throttled from condenser, and the refrigerant turned into vapour after absorbing the heat of chilled water, then is absorbed into absorber where the concentrated solution is turned into dilute solution.

The dilute solution in the absorber is pumped through low temperature heat exchanger, high temperature heat exchanger where the solution temperature goes up, to the high temperature generator at last, where the dilute solution is heated and condensed into medium solution.

The medium solution flows through high temperature generator, into low temperature generator where the medium solution is heated by the refrigerant vapour coming from high temperature generator and turned into final concentrated solution. The concentrated solution flows through low temperature heat exchanger where the temperature goes down, then into the absorber and is sprayed on the cooling water tubes where it absorbs the refrigerant vapour from evaporator and turned into dilute solution. On the other hand, the vapour in the high temperature generator produced by heating lithium-bromide solution, floats into low temperature generator where it heats the medium solution and itself coagulated into refrigerant. Then the refrigerant floats into condenser with refrigerant vapour from low temperature generator and cooled into refrigerant after being decompressed and throttled in the condenser. After that, the refrigerant flows into evaporator where it is sprayed on the condensed coils, cool the chilled water in the evaporator. Above process circles again and again for producing hot water continuously.

Heating operation



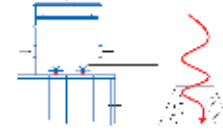
Diluted absorbent is reheated in high temperature generator and becomes refrigerant vapour. Refrigerant vapour goes to evaporator and absorber and exchange heat in evaporator to get hot water. And, medium absorbent goes into absorber and mixes with refrigerant and is diluted. Then it passes low, high temperature heat exchanger and goes back to high temperature generator. Above process circles again and again for producing hot water continuously.

New bow wave spray Ag-Pd automatic purge device

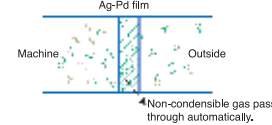
Purge efficiency goes up by 50%, accuracy up by 60% and vacuum pump start frequency reduces.

Five vacuum keeping design

1. Bow wave type spiral spray nozzle.
2. New patented upper/lower shell fractional pressure gas/steam separator, utilizing lowering pressure de-air technology.
3. Ag-Pd tube automatic exhaust.
4. Storage tank lowering-pressure to enlarge capacity design.
5. Upper/lower shell two purge system.



Spray nozzle structure



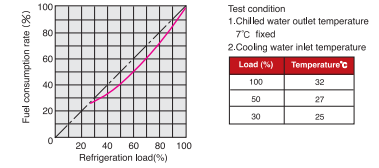
Ag-Pd tube working principle

Optimize structural design to raise heat efficiency

- Adopt new heat exchange tube to strengthen heat transfer and quality transfer affect. Comprehensive heat exchange co-efficient rises by 15%.
- Adopt new counter flow side flow heat exchange in heat exchanger and heat efficiency rises substantially.
- Vacuum heat insulation layer in upper shell reduces internal heat loss.
- Internal refrigerant self-adjusting cooling storage device. It may realize load self-adjusting "cooling storage", shorten start and dilution operation time of the machine, suit much lower cooling water inlet temperature, reduce heat loss in evaporation and prevent cavitation erosion of refrigerant pump.

Design tailored for partial load, the machine realizing high efficient energy saving operation

Suits low load operation of 40-80%, adopts new frequency conversion control system, internal refrigerant self-adjusting cooling storage device, quick heat state balance circulation technology, obviously saves partial load and start up time energy consumption, Integrated Partial Load Value (IPLV) rises greatly.



Adopt much new technology, prevent refrigerant pollution completely

- High temperature generator cooling state generation technology, the solution is much easier to adjust, refrigerant pollution can't take place easily.
- New double layer self-clean dripping device to prevent refrigerant pollution.
- Multi-layer protection-cleaning device, effectively prevent refrigerant pollution to guarantee machine's performance.

Quick start up, short shutdown time, energy saving

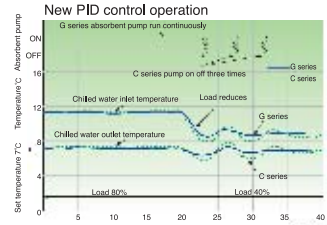
Adopt internal self-adjusting cooling saving device, new frequency conversion technology, high temperature generator cooling state generation technology and continuous control of fuel control valve, saves start up and shutdown energy: 40% at start up, 33% at shutdown.

Conveniently realize chilled water, cooling water system frequency conversion

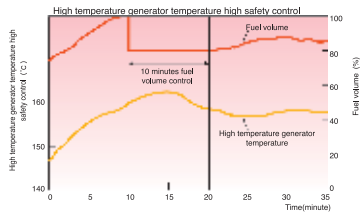
Chilled water, cooling water temperature signal can be offered as required. They can be converted to frequency signal by controller, which conveniently realizes chilled water, cooling water system frequency conversion, saving operation cost at partial load.

High accuracy new control system

- New speed type PID control, accuracy much higher, can be quick responsive to sudden load change.
- Adopt upper/down shell quick pressure rating technology, use pin throttle and u-type throttling circuit to accurately control refrigerant flow.
- New level control optimizes high temperature generator control

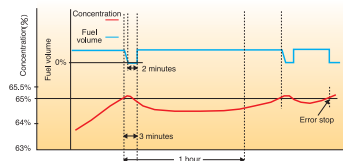


- More safe accurate high temperature generator temperature control



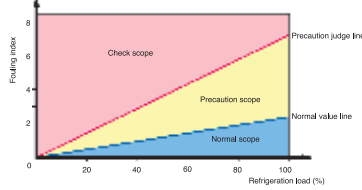
- Four crystallization prevention safety control

The micro-computer monitors the temperature and concentration of the solution and adjust solution flowrate and fuel volume, which make solution circulation far from crystallization zone, and at the same time adopt cold state generation technology, auto-decrystallization technology to prevent crystallization completely.

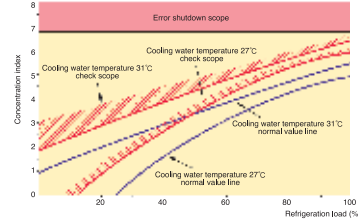


- Self-diagnosis professional function on the machine

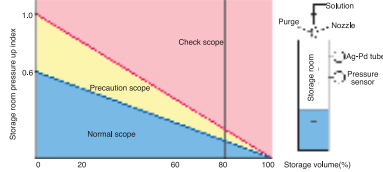
① Cooling water system heat transfer tube fouling state



② Absorbent concentration up trend



③ Vacuum state time monitor



④ Sweeping signal of combustion room

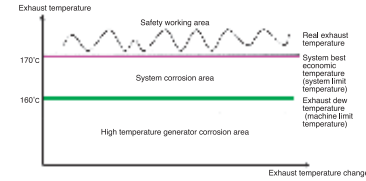
According to exhaust temperature of combustion room, precast whether there is necessary to sweep burning system of high temperature generator.

- Digital intelligent micro-computer integrated control system is more intelligent.

Safe and high efficiency unique high temperature generator design

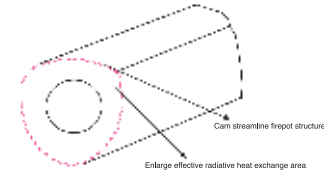
- Cross limit exhaust temperature design

Chiller's exhaust lowers to combine operation cost and life of machine and system in a best way.

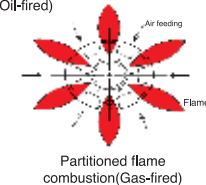
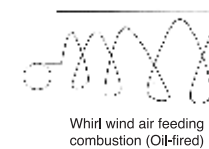


- Adopt special structure to lower exhaust temperature

- Match firepot and burner.
- Cam streamlining firepot structure to enlarge effective heat exchange area.



- Adopt new combustion mode to raise heat exchange affect and lower NOx exhaust.

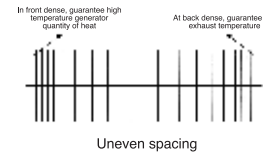


- Tailored burner design, modulation, and self-diagnosis function.
- Adopts shaped flat smoke tube which makes heat exchange area two times larger than conventional.



Shaped flat smoke tube

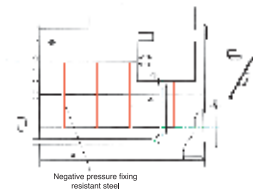
- Adopt new uneven spacing spoiler to enhance exhaust vibration and heat exchange



Uneven spacing

Unique high temperature generator process, safe and reliable operation

- Use negative pressure fixing resistant steel to prevent high temperature generator sinking down.
- Smoke tube is treated by Parca process to resist corrosion.
- Smoke tube is welded from both sides to prevent effectively electric-chemical corrosion.



Negative pressure fixing resistant steel

Order scope

Item		Standard specification	Option
Chilled water System	Flow rate	0,605m ³ /h · RT (Δt=5°C constant quantity)	Range of variable flow: 50 – 120%
	Temperature	12 / 7°C	Special inlet/outlet temperature of chilled water
	Water quality	Tap water (according to JRA9001)	Industrial water, well water
	Max. working pressure	8kg/cm ² · G	Pressure1---10kg/cm ² · G Pressure2---14kg/cm ² · G Pressure3---16kg/cm ² · G Pressure4---18kg/cm ² · G Pressure5---20kg/cm ² · G
Cooling water system	Flow rate	1,0m ³ /h · RT (Δt=5,5°C constant quantity)	Range of variable flow: 50 – 120%
	Temperature	32/37,5°C (Lower temperature limit: 15°C)	Inlet temperature: 15-34°C
	Water quality	Tap water (according to JRA9001)	Industrial water, well water
	Max. working pressure	8kg/cm ² · G	Pressure1---10kg/cm ² · G Pressure2---14kg/cm ² · G Pressure3---16kg/cm ² · G Pressure4---18kg/cm ² · G Pressure5---20kg/cm ² · G
Hot water system	Flow rate	0,605m ³ /h · RT (Δt=4,2°C constant quantity)	Range of variable flow: 50 – 120%
	Temperature	55,8/60°C (40-65°C)	Outlet temperature above 60°C, please enquire with the manufacturer.
	Water quality	Tap water (according to JRA9001)	
	Max. working pressure	8kg/cm ² · G	Pressure1---10kg/cm ² · G Pressure2---14kg/cm ² · G Pressure3---16kg/cm ² · G Pressure4---18kg/cm ² · G Pressure5---20kg/cm ² · G
Installation place	Place	In machine room	
	Installation	Body anti-rusting paint (exclusive of heat or cooling insulation, final paint).	Storage of equipment shall be in accordance with the standard details refer to factory documents.
	Ambient Temperature	5 – 40°C	
Ambient Humidity	Relative humidity: below 90%		
Package	DG-11M-53M	One-section	
	DG-61M-82M	Moving separately	
Power	Frequency, voltage	3~/380V/50Hz	Special voltage
	Voltage regulation	Within ± 10%	
Electric wiring	Electric allocation	Control: cable	
		Power: cable	
Main body safety device	Type	· Refrigerant supervision function	Cooling water flow switch
		· Chilled water freezing protection function	
		· H.T. generator temperature supervision function	
		· H.T. generator pressure supervision function	
Capacity control device	Mode	· Exhaust temperature supervision function	
		· H.T. generator solution level supervision function	
		· Motor protection function	
		· Extreme low temperature of cooling water	
Control panel	Outside wiring terminals	· Chilled/hot water flow switch	
		· Crystal protection function	
		Digital PID control by chilled/hot water inlet temperature	
		Inverter control of No.1 absorbent pump	
Purge device	Mode	Munsell 5Y-7/1 (half smooth)	Fully automatic purge
		LCD English display	
		Operation indication point a.	
		Stop indication point a.	
Burning device	Fuel scope	Alarm indication point a.	
		Auxiliary equipment operation point a.	
		Start confirmation point a.	
		Burn confirmation point a.	
Fuel	Oil	Cooling operation indication point a.	
		Heating operation indication point a.	
		Low pressure: 100-200mmH ₂ O DG-E11GM-E22GM	
		Intermediate pressure: 500-2000mmH ₂ O DG-E11GM-E42GM	
Water system	Frequency conversion	Middle pressure: 1-3kg/cm ² · G DG-E11GM-E82GM	Frequency controller
		Low pressure: 200mmH ₂ O DG-E11GM-E42GM	
		Intermediate pressure: 500-2000mmH ₂ O DG-E11GM-E82GM	
		Middle pressure: 1-3kg/cm ² · G DG-E11GM-E82GM	
Customer support		Please provide heat value, pressure, specific gravity, component, ect. of gas when placing order.	

Supply scope

Item		Deliver construction	Customer construction	Note
Ⓒ Body	Absorption Chiller/Heater	<input type="radio"/>		Reference to the caption below the chart
Ⓓ Transportation and installation	From the factory to the building		<input type="radio"/>	
	From the building to the foundation site		<input type="radio"/>	
	Installation of chiller/heater		<input type="radio"/>	
	Testing and adjusting at site	<input checked="" type="radio"/>	<input type="radio"/>	
	Operating direction	<input type="radio"/>		
Ⓔ Electric Construction	External electric allocation		<input type="radio"/>	Please wire to the terminal inside the control panel
	Cooling water temperature control device		<input type="radio"/>	Please install and wire for the thermostat used by start-stop fan of cooling tower or for the thermostat of cooling water control valve.
Ⓕ Other Construction	Foundation construction		<input type="radio"/>	Exclusive of foundation bolts, weld the frame and washer when fixing foundation bolts.
	External pipe construction		<input type="radio"/>	Exclusive of coordinate flanges
	Pipe anti-freezing		<input type="radio"/>	Take anti-freezing of pipe and water into consideration at rest in winter
	Water quality management of cooling water		<input type="radio"/>	Install water drainage device in order to have a proper water quality management
	Heat or cooling insulation construction		<input type="radio"/>	
Ⓖ Painting	Main body primary coat	<input type="radio"/>		Anti-rusting primary coat
	Control panel painting	<input type="radio"/>		Munsell No.5Y-7/1 (half-smooth)
Ⓖ Others	Assembly power, water, etc. at site		<input type="radio"/>	
	Power, water and fuel, etc. used during trial run		<input type="radio"/>	
	Lithium-Bromide solution/refrigerant	<input type="radio"/>		

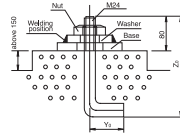
Absorption chiller/heater main body includes

1. Absorption chiller/heater:
 - (a) Machine of refrigeration and heating cycle including evaporator, absorber, high temperature generator, low temperature generator, condenser, heat exchanger, and pump, etc.
 - (b) Purge device
 - (c) Capacity control device
 - (d) Combustion equipment including burner, air blower and safety-burning device, etc.
 - (e) Safety device
 - (f) Control panel
 - (g) Absorbent and refrigerant
 - (h) Internal piping and electric wiring
 2. Accessory
 - a. Foundation bolts and washers-----1 set
 - b. Instruction manual-----1 set
- Extra charge should be calculated separately if required.

Overall dimension diagram

Base diagram

- Overall dimension diagram
- Note: 1. Overall dimension value (L,W),(H),(H) is example.
- 2. Mark \odot denotes the position of foundation bolts of chiller/heater.
- 3. Clearance space must be saved for either side of the chiller/heater.
- 4. Mark \uparrow is the power wire hole.
- 5. Maintenance space must be saved around the chiller/heater.
- Length direction1m Above.....0.2m
- Control panel direction.....1.2m Others.....0.5m
- 6. "A" stands for nominal diameter, unit is mm.

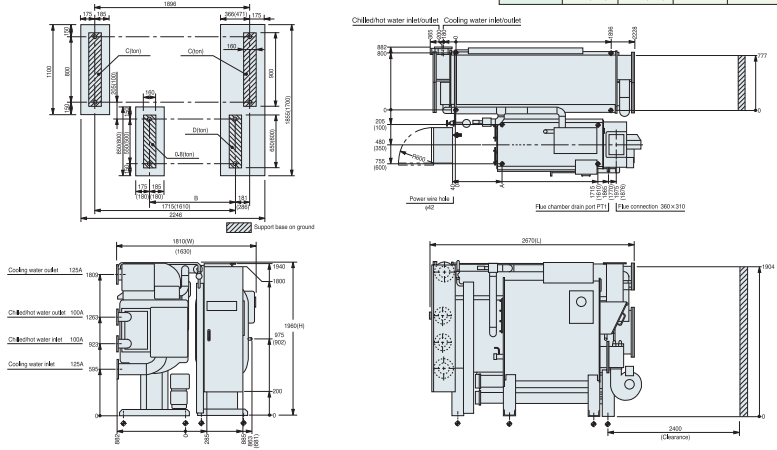


- Base diagram
- Note: 1. There are 450 holes under the chiller/heater for foundation bolts.
- 2. When fastening foundation bolts, please weld base and washer together with reference to left diagram.
- 3. Please make a drainage ditch around the chiller/heater.
- 4. Please make the ground water proof in order to maintain the chiller/heater.
- 5. The base must be smooth and horizontal(The levelness should be below 2mm for 1,000mm).

	Y ₁	Z ₁
DG-E11M-E31M	80	260
DG-E32M-E52M	80	340
DG-E53M-E82M	90	440

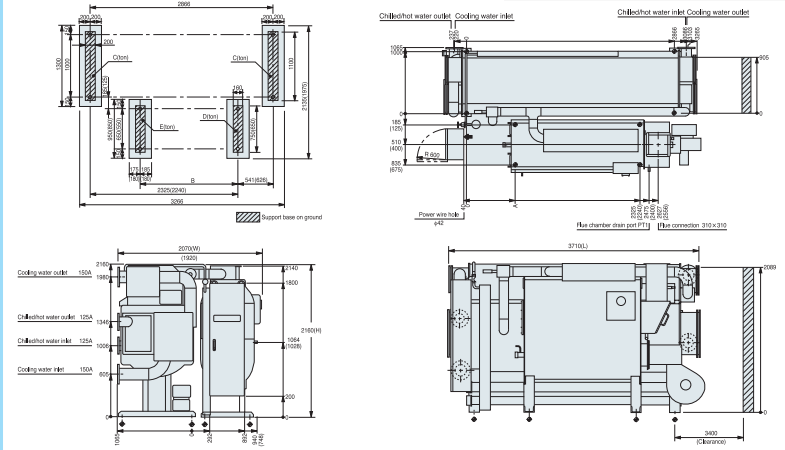
■ DG-E11M/E12M *()内为使用天然气及液化石油气机组

	A	B	C	D
DG-11M	865(780)	850(830)	1.6	0.9
DG-12M	665(670)	1050(940)	1.7	1.0



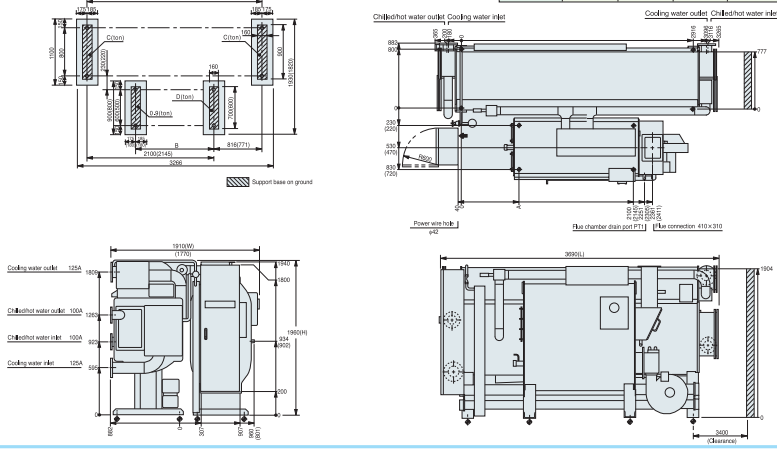
■ DG-E21M/E22M *()内为使用天然气及液化石油气机组

	A	B	C	D	E
DG-21M	975(710)	1350(1530)	2.7	1.4	1.2
DG-22M	775(640)	1550(1600)	2.8	1.6	1.3



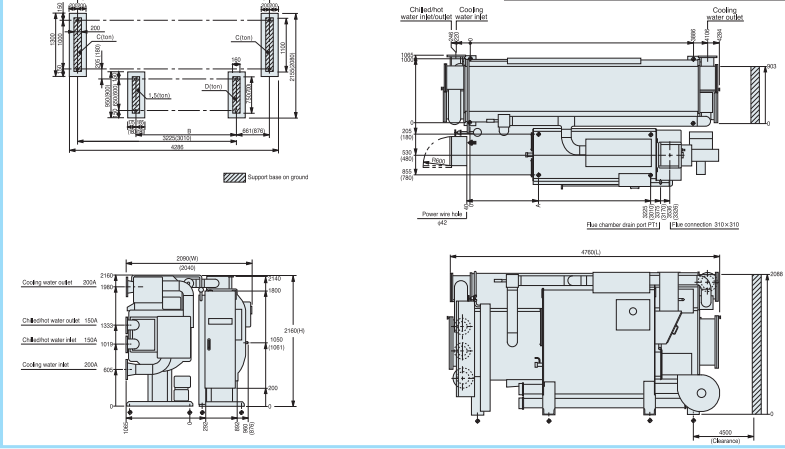
■ DG-E13M/E14M *()内为使用天然气及液化石油气机组

	A	B	C	D
DG-13M	1000(925)	1100(1220)	2.1	1.2
DG-14M	800(805)	1300(1340)	2.3	1.3



■ DG-E23M/E24M *()内为使用天然气及液化石油气机组

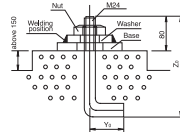
	A	B	C	D
DG-23M	1375(1340)	1850(1670)	3.3	1.7
DG-24M	1175(1180)	2050(1830)	3.5	1.9



Overall dimension diagram

Base diagram

- Overall dimension diagram
- Note: 1. Overall dimension value (L),(W),(H) is example diagram.
- 2. Mark \odot denotes the position of foundation bolts of chiller/heater.
- 3. Clearance space must be saved for either side of the chiller/heater.
- 4. Mark \uparrow is the power wire hole.
- 5. Maintenance space must be saved around the chiller/heater.
Length direction1m Above.....0.2m
Control panel direction.....1.2m Others.....0.5m
- 6. "A" stands for nominal diameter, unit is mm.

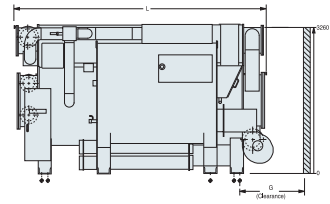
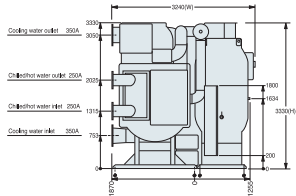
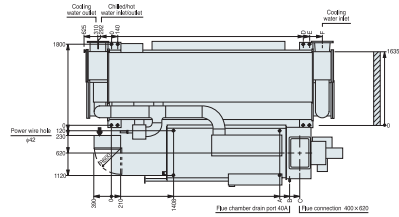


- Base diagram
- Note: 1. There are 450 holes under the chiller/heater for foundation.
- 2. When fastening foundation bolts, please weld base and washer together with reference to left diagram.
- 3. Please make a drainage ditch around the chiller/heater.
- 4. Please make the ground water proof in order to maintain the chiller/heater.
- 5. The base must be smooth and horizontal(The levelness should be below 2mm for 1,000mm).

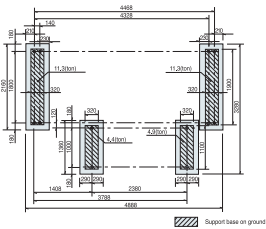
DG-E11M~E31M	80	260
DG-E32M~E52M	80	340
DG-E53M~E82M	90	440

■ DG-E61M/E62M/E63M

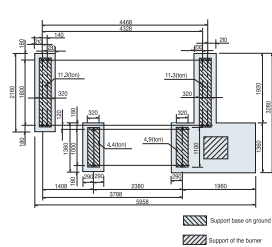
	A	B	C	D	E	F	G	L
DG-E61M	3788	4023	4252	4328	4468	4758	5200	5690
DG-E62M	4088	4323	4552	4628	4966	5256	5700	6190
DG-E63M	4388	4623	4852	5351	5491	5781	6200	6710



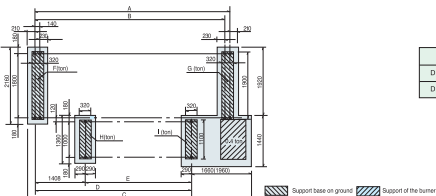
■ DG-E61GM



■ DG-E61KM

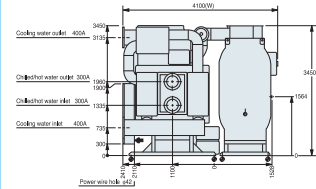
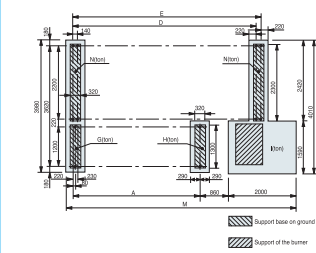


■ DG-E62M/E63M * ()内为燃油型数值

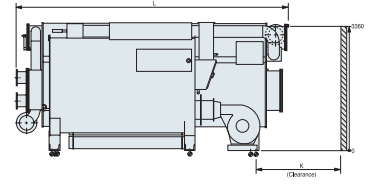
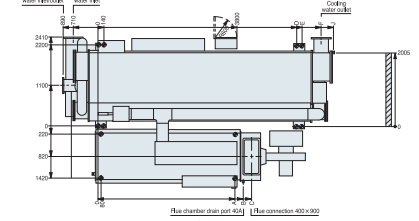


	A	B	C	D	E	F	G	H	I
DG-E62M	4966	4824	5958(6258)	4988	2880	12.1	4.8	4.9	
DG-E63M	5481	5351	6258(6558)	4388	2980	13.0	5.3	5.3	

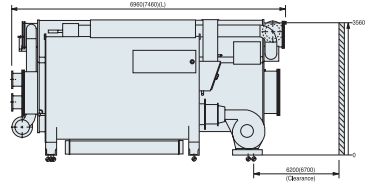
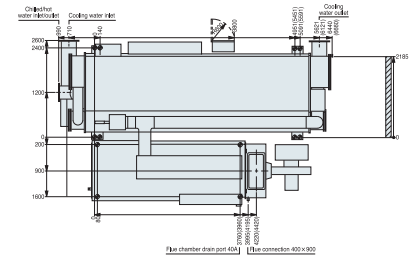
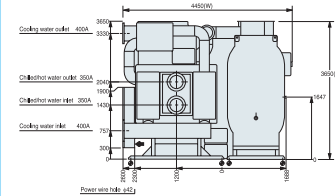
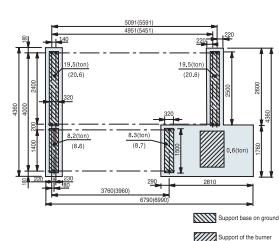
■ DG-E71M/E72M/E73M



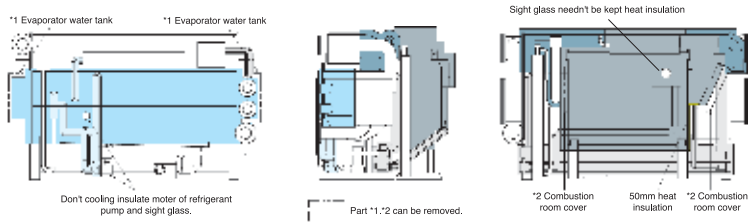
	A	B	C	D	E	F	J	K	L	M	N	G	H	I
DG-E71M	3169	3395	3620	4426	4568	5096	5440	5709	6430	6240	15.9	6.4	6.5	0.4
DG-E72M	3469	3695	3920	4951	5091	5621	5970	6200	6960	6540	17.0	6.9	7.0	0.6
DG-E73M	3769	3995	4220	5451	5591	6121	6470	6700	7460	6840	18.0	7.4	7.5	0.6



■ DG-E81M/E82M In () is Model E82M



Heat/cooling insulation area



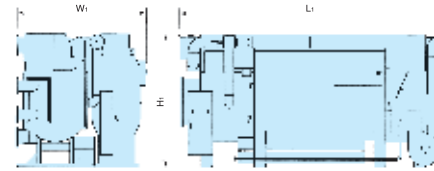
- 100mm heat insulation: high temperature generator.
- 75mm heat insulation: low temperature generator, steam pipe, etc.
- 30mm heat insulation: heat exchanger, connecting pipes, etc.
- 50mm cooling insulation: evaporator, evaporator water tank, etc.
- 30mm cooling insulation: upper part of refrigerant pump, connecting pipes, etc.

- ◆ Heat insulation material: glass fibre, asbestos and the like.
- ◆ Cooling insulation material: polythene foam and the like.
- ◆ Heat/cooling insulation total area includes machine pipe area .
- ◆ Please use non-combustible as heat/cooling material.
- ◆ In above drawing, DG-E11M~E63M is indicated. For others detail, see ex-works file.

Model	Heat insulation area(m ²)			Cooling insulation area(m ²)	
	100mm	75mm	30mm	50mm	30mm
DG-E11M	5.8	2.2	2.9	4.0	0.4
DG-E12M	6.2	2.2	3.0	4.0	0.4
DG-E13M	7.8	3.2	4.2	5.5	0.4
DG-E14M	8.0	3.2	4.3	5.5	0.4
DG-E21M	10.1	3.8	4.9	6.1	0.5
DG-E22M	10.4	3.8	5.0	6.1	0.5
DG-E23M	11.8	4.8	5.5	7.6	0.5
DG-E24M	12.5	4.8	5.6	7.6	0.5
DG-E31M	14.5	5.5	6.2	8.5	0.7
DG-E32M	15.2	5.5	6.4	8.5	0.7
DG-E41M	17.5	5.7	6.8	9.9	0.7
DG-E42M	18.1	5.7	7.0	9.9	0.7

Model	Heat insulation area(m ²)			Cooling insulation area(m ²)	
	100mm	75mm	30mm	50mm	30mm
DG-E51M	19.6	5.4	7.6	13.8	1.1
DG-E52M	20.7	5.9	7.9	15.0	1.1
DG-E53M	21.7	6.2	8.2	16.1	1.1
DG-E61M	25.4	7.2	9.7	17.5	1.2
DG-E62M	27.2	7.7	10.1	18.7	1.2
DG-E63M	28.9	8.2	10.5	20.0	1.2
DG-E71M	35.4	10.4	12.1	10.9	1.4
DG-E72M	37.4	10.7	12.4	11.4	1.4
DG-E73M	39.4	11.0	12.7	11.8	1.4
DG-E81M	42.5	11.0	13.0	13.1	1.5
DG-E82M	44.0	11.3	13.5	13.6	1.5

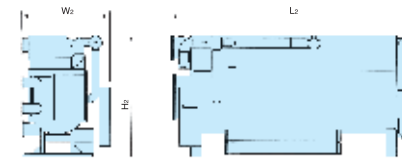
● Moving wholly



Note:

1. When moving the machine separately, remove the control panel and discharge the solution before ex-works.
2. When calculating inlet height, add height of support and rolling log to the H.
3. When hoisting, keep as horizontal as possible.

● Moving separately (Low temperature part)



● Moving separately (High temperature part)



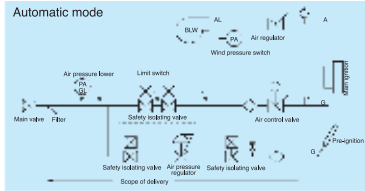
Moving dimension

Model	Moving wholly				Moving separately								
	Length L1(mm)	Width W1(mm)	Height H1(mm)	Weight Ton	Low temperature part				High temperature part				
					Length L2(mm)	Width W2(mm)	Height H2(mm)	Weight Ton	Length L3(mm)	Width W3(mm)	Height H3(mm)	Weight Ton	
DG-E11M	2720	1860	2010	4.5	2720	1220	2010	2.4	2030	2080	1000	2010	1.2
DG-E12M	2720	1860	2010	4.8	2720	1220	2010	2.5	2120	2190	1000	2010	1.3
DG-E13M	3740	1960	2010	5.8	3740	1250	2010	3.1	2320	2340	1000	2010	1.5
DG-E14M	3740	1960	2010	6.2	3740	1250	2010	3.2	2460	2680	1000	2010	1.6
DG-E21M	3760	2130	2210	7.3	3760	1430	2220	3.9	2660	2990	1030	2190	1.9
DG-E22M	3760	2130	2210	7.7	3760	1430	2220	4.0	2870	3190	1030	2190	2.0
DG-E23M	4820	2140	2210	8.9	4820	1450	2220	4.7	3410	2530	1030	2190	2.2
DG-E24M	4820	2140	2210	9.4	4820	1450	2220	4.9	3410	3850	1030	2190	2.4
DG-E31M	4880	2330	2440	11.6	4880	1480	2440	6.2	3460	3710	1100	2420	3.0
DG-E32M	4880	2330	2440	12.2	4880	1480	2440	6.4	3510	3770	1100	2420	3.2
DG-E41M	4900	2540	2650	14.2	4900	1620	2650	7.5	3720	3910	1190	2630	3.7
DG-E42M	4900	2540	2650	14.9	4900	1620	2650	7.8	4000	4060	1190	2630	3.9
DG-E51M	5090	3040	2950	19.5	5090	2200	2950	11.1	2990	4180	1460	2950	4.7
DG-E52M	5640	3040	2950	21.1	5640	2200	2950	12.0	3190	4380	1460	2950	5.1
DG-E53M	6130	3040	2950	22.7	6130	2200	2950	12.8	3390	4580	1460	2950	5.5
DG-E61M	-	-	-	-	5740	2450	3380	15.5	3500	3800	1380	3380	5.9
DG-E62M	-	-	-	-	6240	2450	3380	16.4	3800	4100	1380	3380	6.4
DG-E63M	-	-	-	-	6760	2450	3380	17.7	4100	4400	1380	3380	7.0
DG-E71M	-	-	-	-	6480	2800	3500	21.5	4220	5790	1650	3500	9.8
DG-E72M	-	-	-	-	7010	2800	3500	23.0	4520	6090	1650	3500	10.5
DG-E73M	-	-	-	-	7510	2800	3500	24.3	4820	6640	1650	3500	11.2
DG-E81M	-	-	-	-	7010	3000	3700	26.0	4840	6440	1820	3700	12.3
DG-E82M	-	-	-	-	7510	3000	3700	27.5	4840	6640	1820	3700	12.8

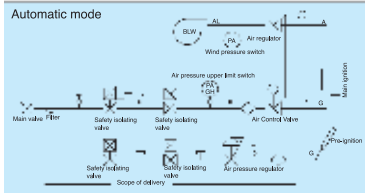
Note: Above values are for reference, contact Dalian Sanyo for specific requirement.

Gas-fired

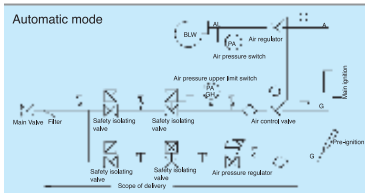
Suitable gas pressure: low



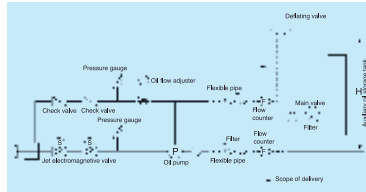
Suitable gas pressure: intermediate



Suitable gas pressure: medium

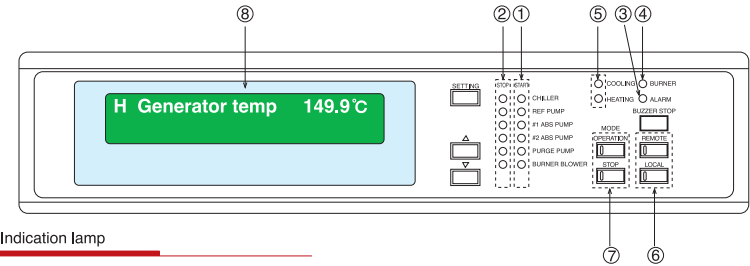


Oil-fired



Note:

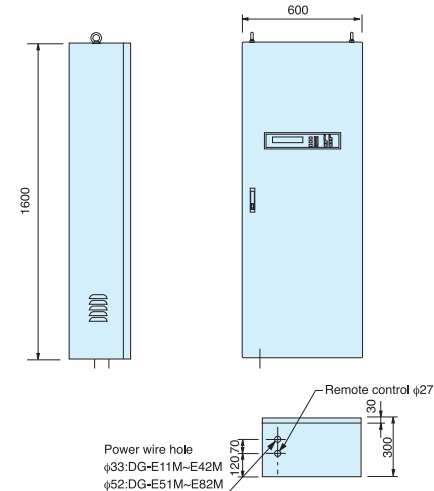
- Exit filter of auxiliary oil storage tank should be set above 80 grids-holes.
- Deflating valve should be installed in the pipe where air is stored.
- Backflow pipe of auxiliary oil storage tank must be installed.
- Valves must not be set in backflow pipe.
- Oil level of auxiliary storage tank should be set not lower than 4 meters below pump site.
* Pump pressure on absorbing side should be set $0 \sim 0.35 \text{ kg/cm}^2 \cdot \text{G}$.
* Height of backflow pipe (H) should be set below 5 meters.
- Flow counter must be installed both in the feed side pipe and the backflow pipe.
- Linkage pipe from auxiliary oil tank to oil joint should be heat , corrosion resistant and suitable for climate.



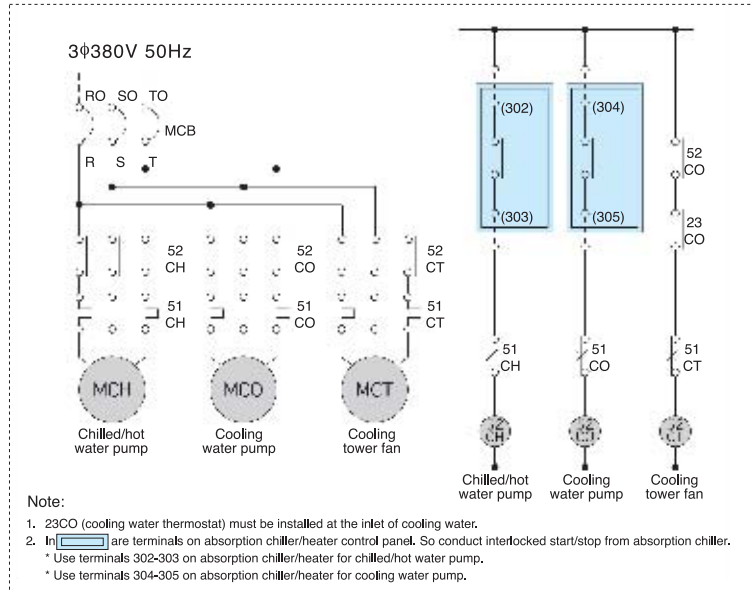
Indication lamp

symbol	Name	Lamp color
①	Running(Operaton) indication lamp	Red
②	Stop indication lamp	Green
③	Alarm indication lamp	Orange
④	Burner combustion indication lamp	Red
⑤	Cooling / Heating indication lamp	Orange
⑥	Remote / Local select button with lamp	Red
⑦	Mode select button with lamp	Red
⑧	Data display	LCD

Control panel dimension diagram

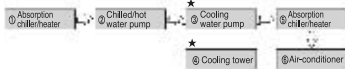


Accessory equipment electric circuit reference example

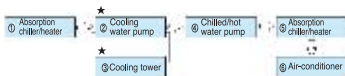


Accessory equipment start/stop sequence

● Interlocked start sequence

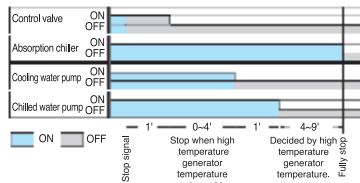


● Interlocked stop sequence



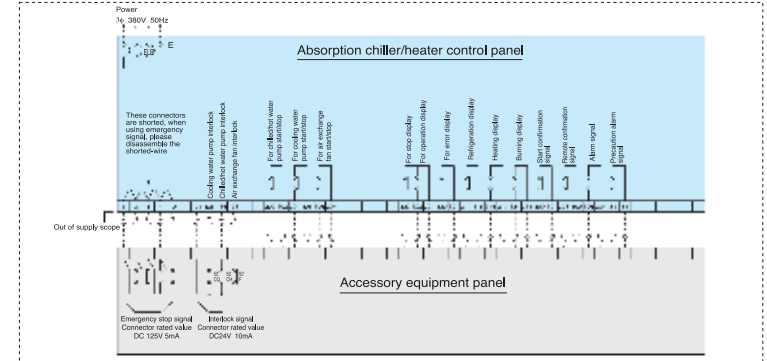
- Note:**
- Mark ★ means they don't start in heating operation
 - Please stop @ Air-conditioner after absorption chiller/heater fully stopped.

● Chiller/heater dilution operation time chart



- In cooling operation shortest dilution operation time is 6 minutes, longest 15 minutes.
- In heating operation dilution operation time is 5 minutes.

Electric wiring diagram



- Note:**
- Start confirmation signal: the display after receiving the control signal from "Start" button
 - Operation display signal: the display when the machine or the pump is running

Outside wiring

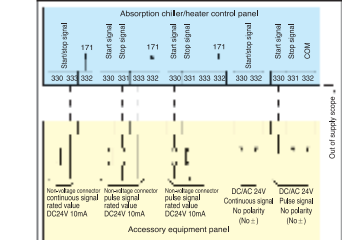
- Accessory equipment wiring
Please connect user's power wire to the electric leakage breaker in the control panel, power wire earth line to earth terminals in the control panel

	Kinds	Terminal No.	Note
Interlock wiring	Chilled/hot water pump interlock	171-136	DC24V 10mA
	Cooling water pump interlock	171-135	DC24V 10mA
	Air exchange fan interlock	306-307	Connector specification AC250V 0.1A
Accessory equipment operation	Chilled water pump operation	302-303	Connector specification AC250V 0.1A
	Cooling water pump operation	304-305	Connector specification AC250V 0.1A
	Chilled water pump interlock	171-136	DC24V 10mA
	Cooling water pump interlock	171-135	DC24V 10mA

- State display connector wiring.
Please prepare the following six state display connector.

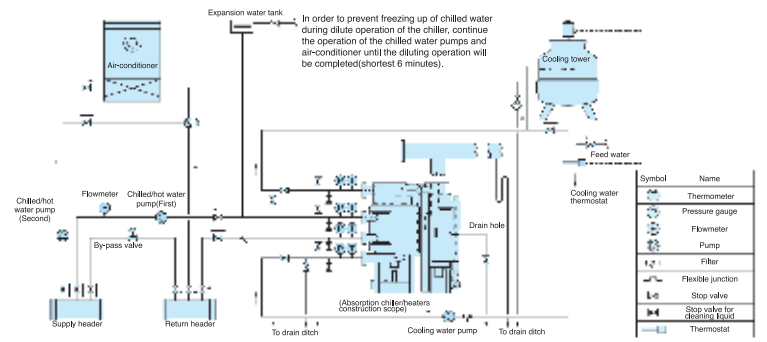
	Kinds	Terminal No.	Note
Accessory equipment operation	1 Stop display connector	323-324	Connector specification AC250V 0.1A
	2 Operation display connector	322-324	Connector specification AC250V 0.1A
	3 Error display connector	302-321	Connector specification AC250V 0.1A
	4 Start confirmation connector	300-301	Connector specification AC250V 0.1A
	5 Alarm signal	326-327	Connector specification AC250V 0.1A
	6 Precaution alarm signal	84-85	Connector specification AC250V 0.1A

● Remote start/stop signal connection example



- Note:**
- When using non-voltage connector, please first connect terminals 171 and 332.
 - Connector rated value of non-voltage connector is DC24V 10mA.

Piping system diagram (Reference example)



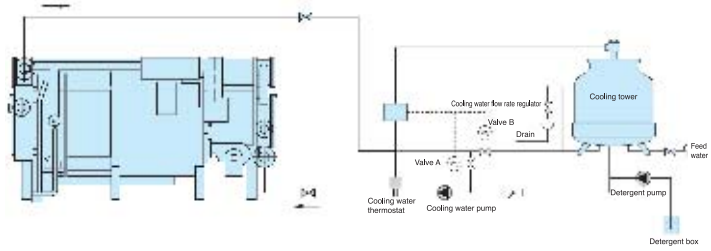
Attentions to pipe construction

- Prepare external pipes connecting to the absorption chiller/heaters (dashed line) on your own.
- Refer to the overall dimensions diagram and specifications table for pipe connections and diameters.
- Try to make sure the chilled/hot/cooling water flowrate in conformity with standard value. Please keep the range of chilled/hot/cooling water flow between 50% ~ 120% of specified value to prevent freezing, corrosion and leakage.
- Please properly positioned the chilled/hot water pump, cooling water pump, expansion water tank in order to make the pressure on the body not exceed the set value.
- Set special chilled/hot water pump and cooling water pump for each refrigerator with their capacity meeting the specifications.
- Please make sure to install the flexible junction between the machine and the inlet/outlet of the chilled/hot water pump and cooling water pump, and make sure to have a straight tube on the chilled/hot water inlet/outlet pipe, which length is at least decuple pipe diameter.
- Clean and descale the pipes through by-pass pipeline after installing the whole pipe system, then connect with the machine. Please make sure that the cleaning water cannot pass the machine.
- The bad water quality could cause corrosion and fouling phenomenon, so please make sure to treat and manage strictly the water quality of chilled/hot water and cooling water system.
- Install a cooling water flow regulate valve at the cooling tower inlet in order to manage the water quality.
- Install filter in the chilled/hot, cooling water pipes (No. 10 filter screen).
- Following devices should be equipped around the chilled/hot, cooling water inlet and outlet, exclusive of all kinds of stop valves in order to maintain and supervise chilled/hot water.
 - Install thermometer and pressure gauge around the inlet and outlet of chilled/hot water and cooling water.
 - Install deaerating valve above water tank.
 - Install drain valves at the lowest positions between the absorption chiller/heaters and the stop valves of chilled/hot water and cooling water, then pipe to the drain ditch.
 - Install stop valves between the absorption chiller/heaters and stop valves of all inlets and outlets to clean the water circuit system with clean liquid.
- Install the gas leakage detection alarm device for gas-fired type chiller/heater in the machine room. Make sure that the gas shut-off valve can close immediately when alarming and the exhaust fan of the machine room can automatically run when alarming.
- When air flue and funnel is connected:
 - Make insulate construction and drain holes.
 - Avoid exhaust gas leak into the room and causing poisoning. Please confirm that the exhaust drain from the machine and the condensate pipe from the indoor units are not commonly connected.
 - Avoid using the same chimney with garbage burning furnace.
 - Avoid backflowing to the machine at rest when common chimney is used by two more machine.
 - Install vent regulator when static pressure in the flue is easy to change.
 - Make the outlet of chimney far from the cooling tower.
- Please be sure to keep the foundation level (levelness within 2/1000mm) during installation of chiller.

Note: For the design and construction of the system and the machine room, please follow the national relative air-conditioner design code, gas/oil-fired design and safety code, building fire-protection design code and fire requirements, etc.

Cooling water temperature control essential (Reference example)

Cooling water temperature can't drop 13°C lower than design temperature.
For example, when cooling water inlet temperature is 32°C, cooling water temperature can't drop lower than 19°C.
However, it is no matter even the temperature below above value between start and normal run.



Prevention of cooling water temperature from dropping too low:

- Be sure to start and stop the fan by means of the cooling water thermostat.
- Only in the cooling operation in summer, valve A can be used as hand-operated butterfly valve.
- In the cooling operation in the middle region and in winter, valve A and valve B should be used as automatic valve (three-throw valve also can be used). The setting value of cooling water thermostat such as: below 22°C shut down the valve, above 25°C open the valve.

Manufacturer	Model	Temperature scope	Temperature difference	Switch
Yamatake Honeywell	T875A	-15°C ~ 35°C	1.7°C ~ 5.6°C	SPDT x1
SAGINOMIYA	TNS-C1034CW	-20 ~ +35°C	4 ~ 20°C	SPDT x1

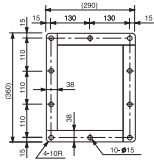
Cooling water quality supervise essential

- Moisture in the cooling water is vaporized and dispersed into the atmosphere when flowing through the cooling tower, therefore cooling water is continuously concentrated and deteriorated.
- If the cooling water quality deteriorated corrosion and dirt accumulation will arise, therefore the unit will be troubled with capacity declination and heat-transfer pipe corrosion. Please install cooling water overflow device to supervise the water quality properly. In addition, proper water quality treatment will have better effect.
- Water quality standard for water used in common air-conditioner and refrigerator, has been formulated by Japanese Industry Association of Refrigerator and air-conditioner, for detail reference following table.

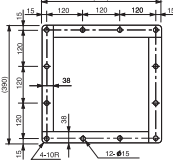
Cooling water quality standard

Item		Circulation		Direct-used mode	Trend	
		Circulation water	Feed water	Direct-used water	Corrosion	Dirt
Standard item	PH(25°C)	6.5 ~ 8.2	6.0 ~ 8.0	6.8-8.0	○	○
	Electrical conductivity(25°C)(mS/m)	80 below	30 below	40 below	○	○
	Electrical conductivity(25°C)(µS/cm)	800 below	300 below	400 below	○	○
	Cl ⁻ (mgCl ⁻ /l)	200 below	50 below	50 below	○	○
	SO ₄ ²⁻ (mgSO ₄ ²⁻ /l)	200 below	50 below	50 below	○	○
	Acid consumption (PH4.8)(mgCaCO ₃ /l)(Makalinity)	100 below	50 below	50 below	○	○
	Total hardness (mgCaCO ₃ /l)	200 below	70 below	70 below	○	○
	SiO ₂ (mgSiO ₂ /l)	50 below	30 below	30 below	○	○
	Fe(mgFe/l)	1.0 below	0.3 below	1.0 below	○	○
	S ²⁻ (mgS ²⁻ /l)	Beyond measure	Beyond measure	Beyond measure	○	○
Reference item	NH ₄ ⁺ (mgNH ₄ ⁺ /l)	1.0 below	0.1 below	1.0 below	○	○

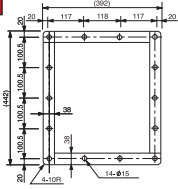
DG-E11M~E14M



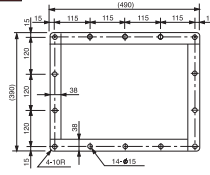
DG-E21M~E24M



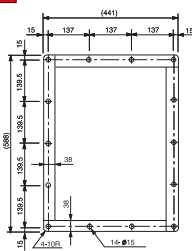
DG-E31M~E32M



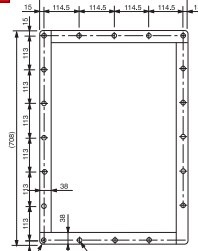
DG-E41M~E42M



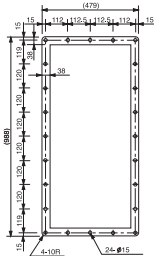
DG-E51M~E53M



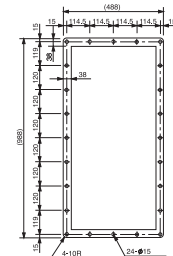
DG-E61M~E63M



DG-E71M~E73M



DG-E81M~E82M



Note before order

If the following contents are supplied, we can offer proper plan to satisfy your requirement.

1 Refrigeration capacity	USRT or	Kcal/h or	KW
2 Heating capacity		Kcal/h	kW
3 Quantity		Unit	
4 Application (Air-conditioning, process, etc.)			
5 Special application(Simultaneous chilled and hot water, etc.)			
6 Chilled water inlet temperature	°C	Working pressure	MPa Kg/cm ² · G
7 Chilled water outlet temperature or flow rate	°C or	m ³ /h	
8 Cooling water inlet temperature	°C	Working pressure	MPa Kg/cm ² · G
9 Cooling water outlet temperature or flow rate	°C or	m ³ /h	
10 Hot water inlet temperature	°C	Working pressure	MPa Kg/cm ² · G
11 Hot water outlet temperature or flow rate	°C or	m ³ /h	
12 Fuel kinds			
13 Fuel high heat value or low heat value			
14 If fuel is gas			
Gas supply pressure	mmH ₂ O or	Kg/cm ² · G	
Gas specific gravity		(Air's specific gravity 1)	
Gas component and others			
15 Power voltage			
16 Installation place (roof, ground, under ground, etc.)			