



80~800 USRT

Super Efficiency Direct Fired Absorption COP 1.35 SE MODEL Chiller-Heaters



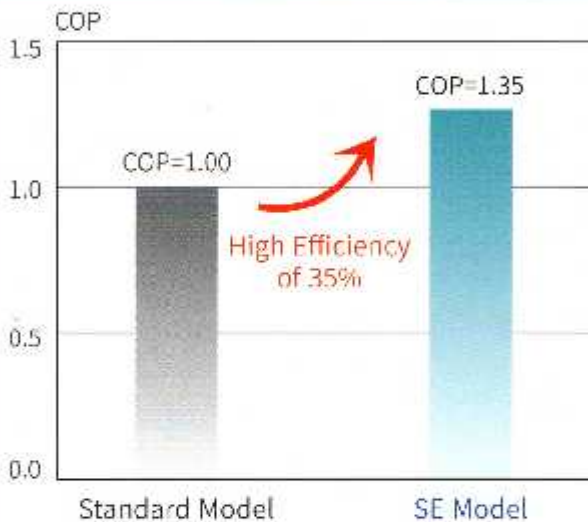
Super Efficiency & New Technology COP 1.35

(Based on higher heating value)

- Two(2) Step Evaporation & Two(2) Step Absorption Cycle
- Heat Recovery Heat Exchangers (Exhaust Gas & Condensed Refrigerant)
- Automatic Purge System and Automatic De-crystallization System
- Inverter Control and Multi-fuction Digital Control
- Plate Type Solution Heat Exchanger
- All Tubes should be applied a small diameter (O.D 15.88)

The Special Features of SE Model

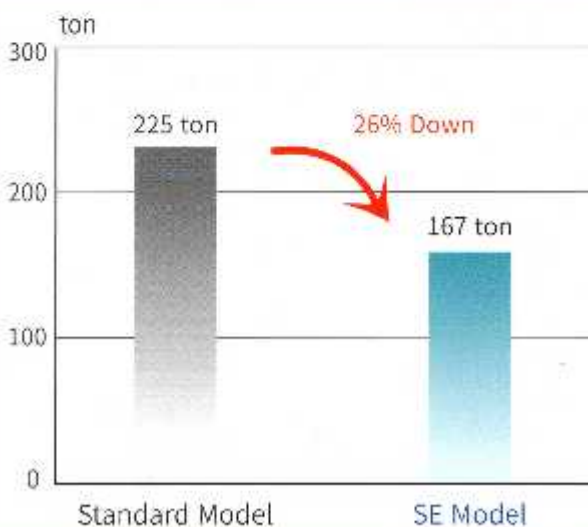
High Efficiency



Saving of Energy Cost (Annual Cooling Oper.)



Deduction of CO₂ Gas Exhaustion



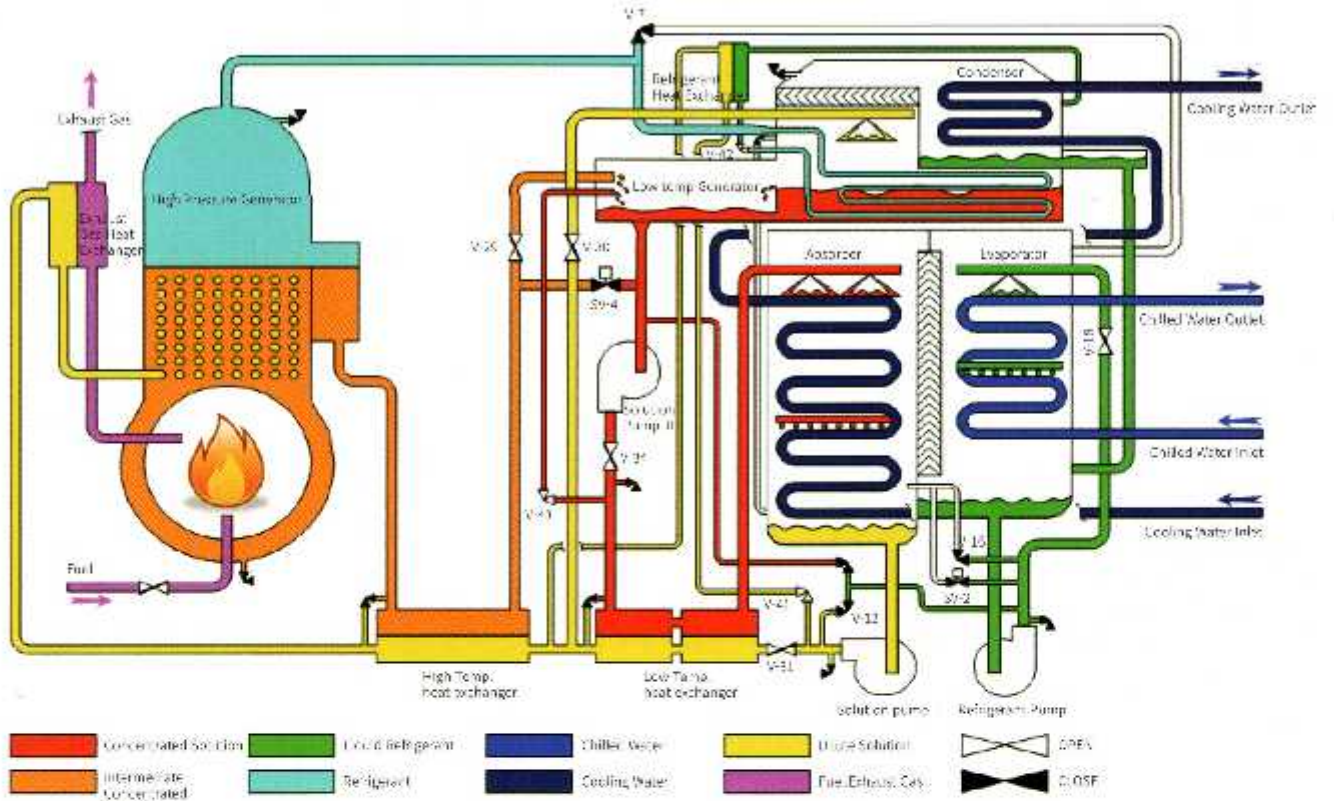
Certificate of High Efficiency Equipment



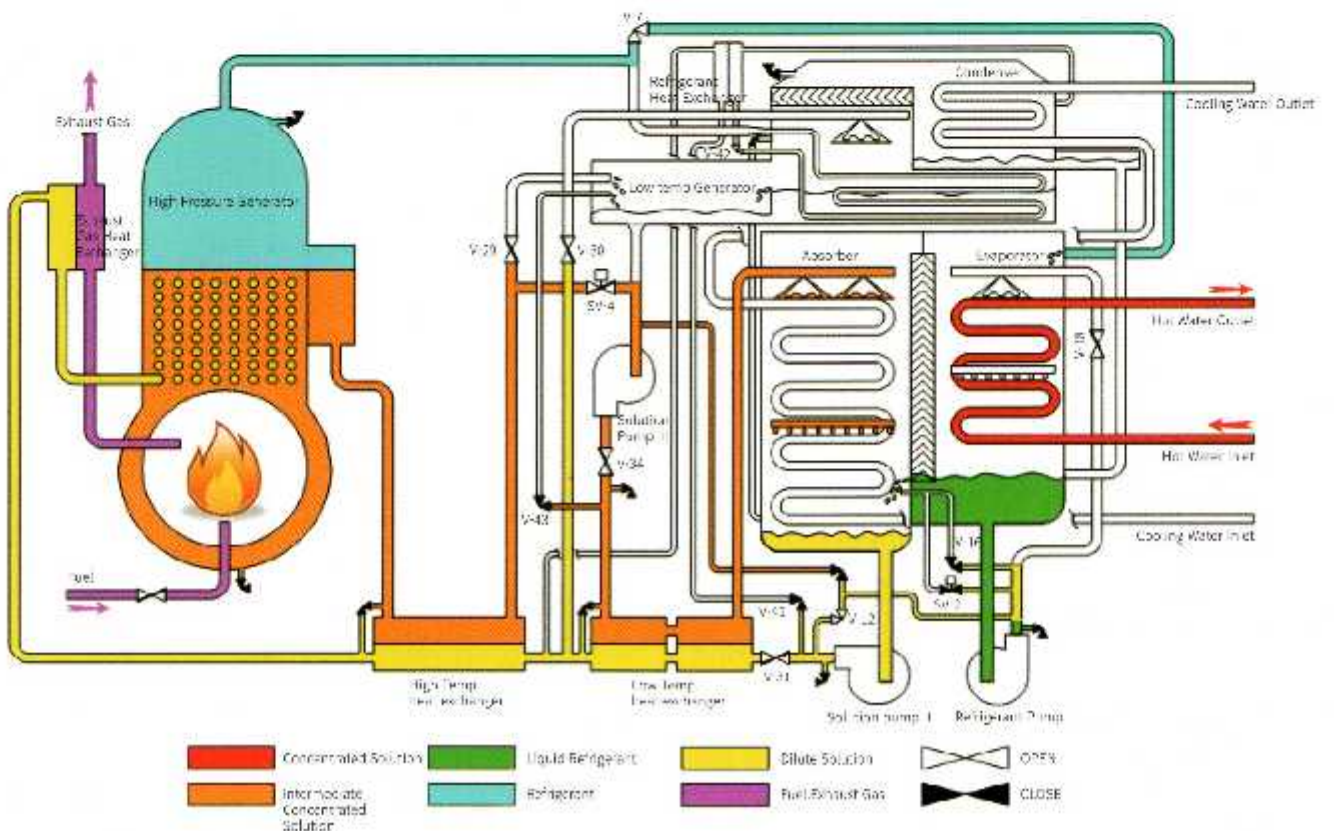
- Based on 360 USRT
- Annual Cooling Oper. 880hr : 5 Months/Year, 25 Day/Month, 10hr/day, 70% Load.
- Gas Cost ; 0.364 USD/Nm³

Cycle

Flow Diagram of Cooling Cycle



Flow Diagram of Heating Cycle



Specification of SE Model 2

Item	Model	HDFN-80SE	HDFN-100SE	HDFN-120SE	HDFN-150SE	HDFN-180SE	HDFN-210SE	HDFN-260SE	HDFN-310SE	
Cooling Capacity	USRT	80	100	120	150	180	210	260	310	
Heating Capacity	kcal/h	212,000	267,000	319,000	400,000	479,000	559,000	692,000	825,000	
Chilled Water	Inlet/Outlet Temp.	12 → 7								
	Flow Rate	m ³ /h	48.4	60.5	72.6	90.7	108.9	127.0	157.2	187.5
	Pressure Drop	mAq	7.8	7.9	5.7	3.3	4.8	7.2	4.1	6.5
	Nozzle Size	A	80	80	100	100	125	125	150	150
	No. of Pass	-	4	4	3	2	3	3	2	2
Cooling water	Inlet/Outlet Temp.	32 → 37								
	Flow Rate	m ³ /h	80.0	100.0	120.0	150.0	180.0	210.0	260.0	310.0
	Pressure Drop	mAq	8.0	8.8	5.0	8.9	5.6	8.6	7.7	6.3
	Nozzle Size	A	100	100	125	125	150	150	200	200
	No. of Pass	Absorber	-	6	6	4	4	4	4	3
Condenser		-	1	1	1	1	1	1	1	1
Hot water	Inlet/Outlet Temp.	55.6 → 60								
	Flow Rate	m ³ /h	48.4	60.5	72.6	90.7	108.9	127.0	157.2	187.5
	Pressure Drop	mAq	7.8	7.9	5.7	3.3	4.8	7.2	4.1	6.5
	No. of Pass	-	4	4	3	2	3	3	2	2
Electricity	Solution Pump I	kW	1.1	1.1	1.1	2.2	3.0	3.0	3.0	3.7
	Solution Pump II	kW	0.75	0.75	0.75	1.5	1.5	1.5	2.2	2.2
	Refrigerant Pump	kW	0.4	0.4	0.4	0.4	0.75	0.75	0.75	0.75
	Purge Pump	kW	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Burner Fan	kW	0.75	1.5	1.5	1.5	1.5	1.5	2.2	2.2
	TOTAL	kW	3.4	4.2	4.2	6.0	7.2	7.2	8.6	9.3
Gas	Higher Heating Value	kcal/Nm ³	10,400	10,400	10,400	10,400	10,400	10,400	10,400	
	Consumption	Cooling	Nm ³ /h	17.23	21.54	25.85	32.31	38.77	45.23	56.00
		Heating	Nm ³ /h	23.30	29.34	35.05	43.96	52.64	61.43	76.04
	Conn. Pipe Size	A	40	40	40	40	50	50	50	50
Standard Gas Press.	mmAq	200	200	200	200	200	200	200	200	
Dimension	Exhaust Conn. Size	mm	428x170	428x170	428x240	428x240	493x270	493x270	560x290	
	Length	mm	2,447	2,447	2,820	3,388	2,944	3,388	4,050	
	Width	mm	1,988	1,988	1,988	1,988	2,207	2,207	2,281	
	Height	mm	2,043	2,043	2,043	2,043	2,252	2,252	2,525	
W/T	Empty Weight	TON	4.5	4.8	5.4	5.9	6.7	7.7	9.0	
	Operating Weight	TON	5.3	5.7	6.5	7.1	8.2	10.6	11.1	

NOTE

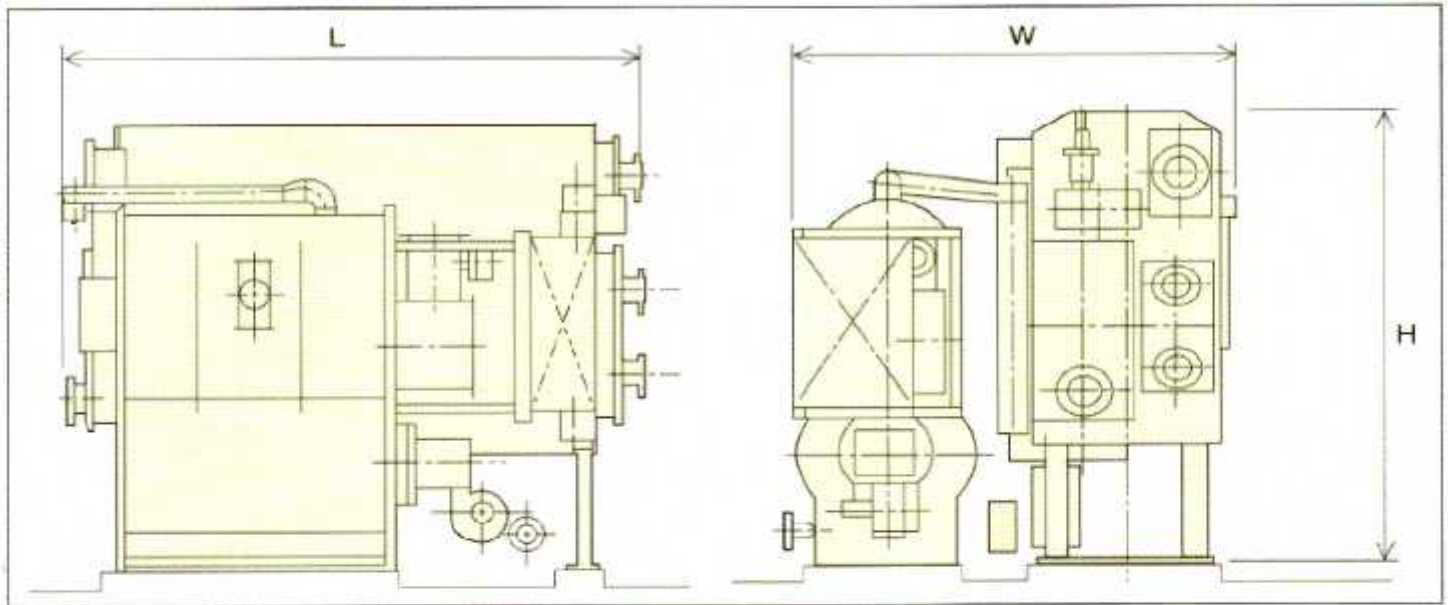
1. 1USRT = 3,024 kcal/h
2. Standard Chilled Water Inlet/Outlet Temp. : 12 → 7°C
3. Standard Hot Water Inlet/Outlet Temp. : 55.6 → 60°C
4. Standard Cooling Water Inlet/Outlet Temp. : 32 → 37°C
5. Efficiency(COP) is based on Higher Heating Value.
6. Chilled/Cooling Water Fouling Factor : 0.0001m²h²°C/kcal
7. Standard design Pressure of Chilled / Cooling Water : 8kg/cm²G
8. The Specification may be changed without pre-notification.
9. The Standard of Gas (LNG) Higher Heating Value is 10,400kcal/Nm³

Item		Model	HDFN-360SE	HDFN-400SE	HDFN-450SE	HDFN-500SE	HDFN-550SE	HDFN-600SE	HDFN-700SE	HDFN-800SE	
Cooling Capacity		USRT	360	400	450	500	550	600	700	800	
Heating Capacity		kcal/h	958,000	1,064,000	1,198,000	1,331,000	1,464,000	1,597,000	1,863,000	2,129,000	
Chilled Water	Inlet/Outlet Temp.	°C	12 → 7								
	Flow Rate	m ³ /h	217.7	241.9	272.7	302.4	332.6	362.9	423.4	438.8	
	Pressure Drop	mAq	5.6	7.3	5.9	7.7	6.2	7.7	8.3	8.6	
	Nozzle Size	A	200	200	200	200	250	250	250	250	
	No. of Pass	-	2	2	2	2	2	2	2	2	
Cooling water	Inlet/Outlet Temp.	°C	32 → 37								
	Flow Rate	m ³ /h	360.0	400.0	450.0	500.0	550.0	600.0	700.0	800.0	
	Pressure Drop	mAq	6.0	7.7	6.0	7.7	6.3	7.7	7.5	8.8	
	Nozzle Size	A	250	250	250	250	300	300	300	300	
	No. of Pass	Absorber	-	2	2	2	2	2	2	2	2
Condenser		-	1	1	1	1	1	1	1	1	
Hot water	Inlet/Outlet Temp.	°C	55.6 → 60								
	Flow Rate	m ³ /h	217.7	241.9	272.2	302.4	332.6	362.9	423.4	483.8	
	Pressure Drop	mAq	5.6	7.3	5.9	7.7	6.2	7.7	8.3	8.6	
	Nozzle Size	A	200	200	200	200	250	250	250	250	
	No. of Pass	-	2	2	2	2	2	2	2	2	
Electricity	Solution Pump I	kW	3.7	5.5	5.5	5.5	6.6	6.6	6.6	7.5	
	Solution Pump II	kW	2.2	2.2	2.2	2.2	2.2	3.0	3.0	3.7	
	Refrigerant Pump	kW	0.75	0.75	0.75	0.75	2.0	2.0	2.0	2.0	
	Purge Pump	kW	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
	Burner Fan	kW	2.2	2.2	3.7	5.5	5.5	5.5	5.5	7.5	
	TOTAL	kW	9.3	11.1	12.6	14.4	16.7	17.5	17.5	21.1	
	Higher Heating Value	kcal/Nm ³	10,400	10,400	10,400	10,400	10,400	10,400	10,400	10,400	
Gas	Consumption	Cooling	Nm ³ /h	77.54	86.15	96.92	107.69	118.46	129.23	150.77	172.31
		Heating	Nm ³ /h	105.27	115.92	131.65	146.26	160.88	175.49	204.73	233.96
	Conn. Pipe Size	A	50	50	50	50	50	50	50	50	
Dimension	Standard Gas Press.	mmAq	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	
	Exhaust Conn. Size	mm	450x600	450x600	450x600	450x600	450x600	535x680	625x680	625x770	
	Length	mm	4,710	5,160	4,866	5,346	5,006	5,346	5,751	6,061	
	Width	mm	2,693	2,693	2,771	2,771	3,184	3,184	3,384	3,384	
W/T	Height	mm	2,496	2,496	2,587	2,587	2,587	3,110	3,110	3,110	
	Empty Weight	TON	13.2	13.5	14.7	16.0	16.8	20.9	24.4	25.8	
	Operating Weight	TON	15.9	16.7	17.7	20.1	22.1	28.1	31.8	33.9	

NOTE

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2. Standard Chilled Water Inlet/Outlet Temp. : 12 → 7°C
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4. Standard Cooling Water Inlet/Outlet Temp. : 32 → 37°C
5. Efficiency(COP) is based on Higher Heating Value.
6. Chilled/Cooling Water Fouling Factor : 0.0001m³h²°C/kcal
7. Standard design Pressure of Chilled / Cooling Water : 8kg/cm²G
8. The Specification may be changed without pre-notification.
9. The Standard of Gas (LNG) Higher Heating Value is 10,400kcal/Nm³

Outline Drawing



Model	Dimension for Installation (mm)			Weight(Ton)		Remarks
	L	W	H	Empty	Oper.	
HDFN-80SE	2,447	1,988	2,043	4.5	5.3	
HDFN-100SE	2,447	1,988	2,043	4.8	5.7	
HDFN-120SE	2,820	1,988	2,043	5.4	6.5	
HDFN-150SE	3,388	1,988	2,043	5.9	7.1	
HDFN-180SE	2,944	2,207	2,252	6.7	8.2	
HDFN-210SE	3,388	2,207	2,252	7.7	10.6	
HDFN-260SE	4,050	2,281	2,525	9.0	11.1	
HDFN-310SE	4,710	2,281	2,525	9.7	11.9	
HDFN-360SE	4,710	2,693	2,496	13.2	15.9	
HDFN-400SE	5,160	2,693	2,496	13.5	16.7	
HDFN-450SE	4,866	2,771	2,587	14.7	17.7	
HDFN-500SE	5,346	2,771	2,587	16.0	20.1	
HDFN-550SE	5,006	3,184	2,587	16.8	22.1	
HDFN-600SE	5,346	3,184	3,110	20.9	28.1	
HDFN-700SE	5,751	3,384	3,110	24.4	31.8	
HDFN-800SE	6,061	3,384	3,110	25.8	33.9	

NOTE

1. The Opening(Door) Size for Transportation/Installation is required about 200-300mm Margin to above Installation Dimension(Equipment Size)
2. The Dimensions may be changed without pre-notification.
3. Separated Installation(Two Sections) is available.

Scope of Supply

ITEM	DESCRIPTION	MAKER	USER	REMARKS
MAIN BODY	Upper Shell	●		Condenser / Low Pressure Generator
	Lower Shell	●		Evaporator / Absorber
	Solution Heat Exchangers	●		Low & High Temp Solution H/EX
	Condensed Refrigerant Heat Exchanger	●		
	Solution Pump with Motor	●		(Canned Type)
	Refrigerant Pump with Motor	●		(Canned Type)
	Purge Tank with Purge Pump	●		
High Pressure Generator	High Pressure Generator	●		
	Exhaust Gas Heat Exchanger	●		
	Burner	●		
Electric & Instrumentation	Automatic Ignition Equip.	●		
	Automatic Capacity Control Equip.	●		
	Safety Devices	●		
	Control Panel	●		
Accessories	Absorption Solution (Li-Br)	●		For Initial Charge
	Refrigerant (H ₂ O)	●		For Initial Charge
	2-Ethyl Hexanol	●		For Initial Charge
	Anti-Vibration Pad	●		
	Spare Parts & Tools	●		(Maker's Standard)
	Operation Manual	●		
Inspection & Test	Helium Leak Test	●		
	Electric Sequence Test	●		
	Dielectric Test	●		
Transportation & Installation	Transportation	●		
	Installation	▲		For only Territory
Trial Operation	Trial Operation	▲		For only Territory
	Training Service	▲		For only Territory
Electrical Works	Electric Cabling (Internal)	●		Control Panel to Supplied Equip.
	Electric Cabling (External)		●	
	Interlock Works		●	
	Cooling Water Temp. Control and Cabling for Cooling Tower		●	
Painting & Insulation	Primer Painting	●		For Rust Prevention
	Insulation	▲		For only Territory
	Finish Painting	▲		For only Territory
Appurtenant Work	Foundation		●	
	External Piping		●	Cooling Water / Chilled Water Piping
	Exhaust Gas Duct		●	
Maintenance	Periodic Visiting Service	▲		1~2 Times / Year (For only Territory)
	Change-over Operation	▲		1~2 Times / (For only Territory)
	After Service (Free Charge)	●		Until to 2 Years after Trial Operation
Others	Insulation for Piping		●	Cooling water / Chilled Water Piping
	Cooling Water Quality Control		●	
	Utility for Field Installation		●	
	Utility for Trial Operation		●	

Cautions for Operation

1. Caution before Starting Operation

- Read the operation manual through before operation the absorption chiller-heater. Especially, understand the operation procedures well prior to their actual operations.

2. Cautions during Installation

- Do Not put dangerous flammable liquid like gasoline, thinner, etc. and combustible materials near the absorption chiller-heater, smoke duct, chimney and oil tank. They may cause a fire.
- Transportation, installation, piping, insulation, electric and inter-lock works are necessary. These works shall be executed by expert engineers with workers. Imperfection in such works may cause a certain leakage, and electric shock or a fire.
- Air supply and ventilation in machinery room might be necessary. The shall be executed with instructions of expert engineers to avoid an accident caused by oxygen lack.
- The bottom surfaces of installation area shall be waterproof construction, and drain pits are necessary on surrounding area to avoid a damage for other equipment.
- Some spaces surrounding this machinery are necessary for maintenance and repair works.

3. Cautions for Maintenance and Repairing

- Except for general maintenance, Repairing, Disassembling or Modification shall be allowed only by expert engineers. Imperfection works may cause a certain leakage, an electric shock or a fire.



Home Page www.hdcc.co.kr
E-mail hdcc@hdcc.co.kr

• Head office

Automotive Parts Innovation Center #210, #342-1, Maegok-dong, Buk-gu, Ulsan, KOREA
TEL +82-52-296-0061~2 FAX +82-52-296-3100

• Seoul office

120-030, SK Rechemble #804, #116, Hap-dong, Seodaemun-Gu, Seoul, KOREA
TEL +82-2-213-6800~1 FAX +82-2-213-6803

• Factory

780-825, #51-51 Mohwa-ri, Oedong-eup, Gyeongju Si, Gyengsangbuk-Do, KOREA
TEL +82-54-745-8661~4 FAX +82-54-777-6395
+82-54-777-6393~4