

High Efficiency Absorption Chiller-Heaters

# HYUNDAI

## Absorption Chiller-Heater

(HE Model)

80~800 USRT



# HYUNDAI Absorption Chiller-Heater (HE Model)

## COP 1.23

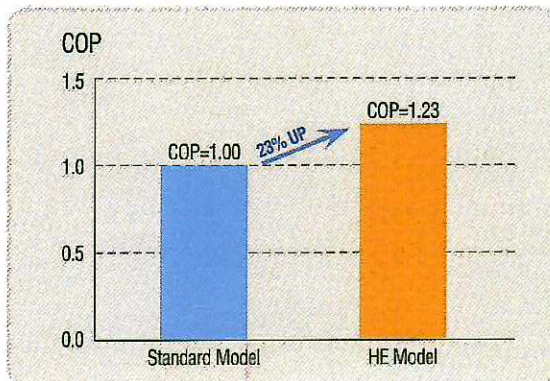
(※ Based on Higher Heating Value)

### High Efficiency & New Technology

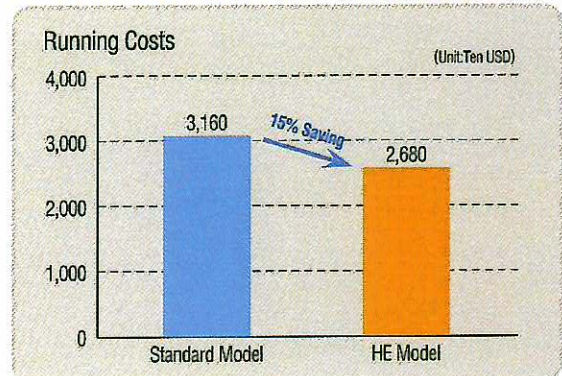
- Two(2) Step Evaporation & Two(2) Step Absorption Cycle
- Heat Recovery Heat Exchangers (Exhaust Gas & Condensed Refrigerant)
- Automatic Purge System and Automatic De-crystallization System
- Inverter Control and Multi-fuction Digital Control

### The Special Features of HE Model

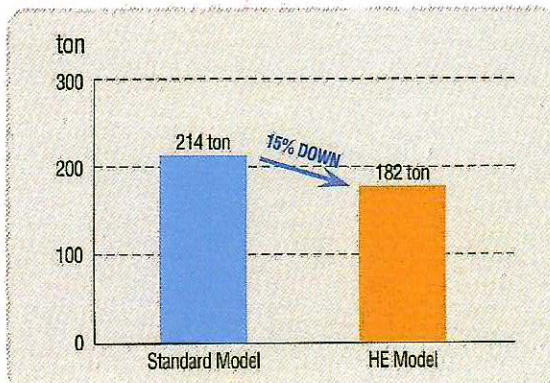
#### High Efficiency (COP=1.23)



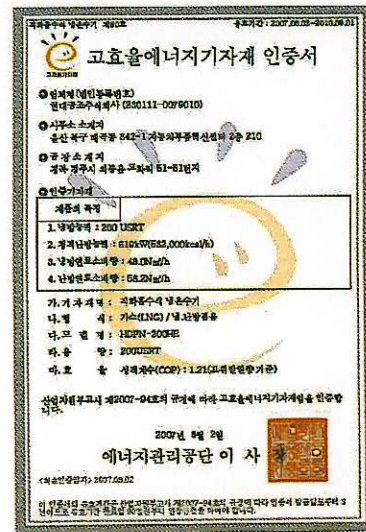
#### Saving of Energy Cost(Annual Cooling Oper.)



#### Deduction of CO<sub>2</sub> Gas Exhaustion



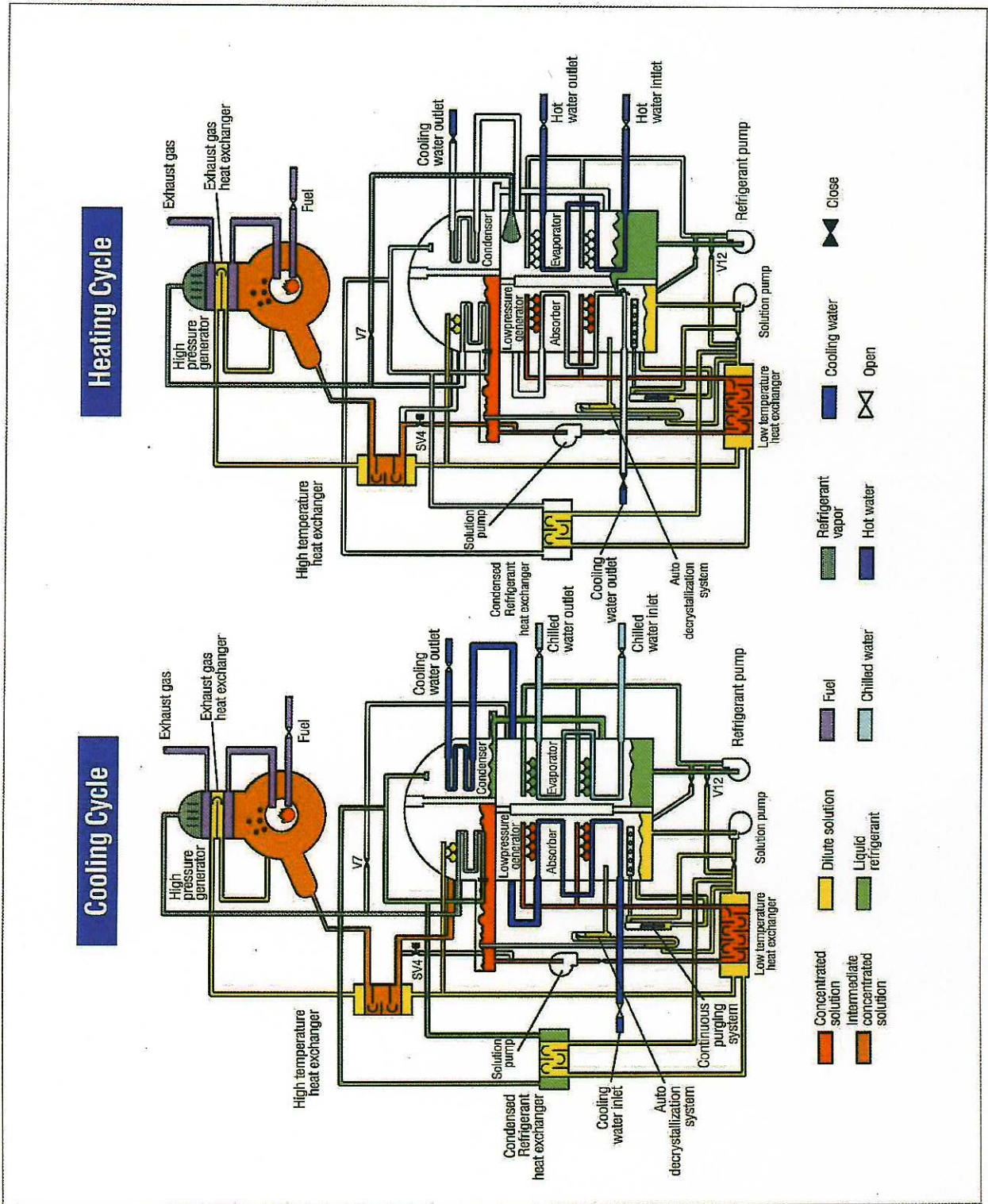
#### Certificate of High Efficiency Equipment



- ※ Based on 360 USRT
- ※ Annual Cooling Oper. 880hr ; 5 Months/Year,  
25 Day/Month, 10hr/Day, 70% Load.
- ※ Gas Cost ; 0.364 USD/Nm<sup>3</sup>

# High Efficiency Absorption Chiller-Heaters

## Flow Diagram of Cooling & Heating Cycle



# HYUNDAI Absorption Chiller-Heater (HE Model)

## Specification of HE Model I

Item	Model	HDFN-80HE	HDFN-100HE	HDFN-120HE	HDFN-150HE	HDFN-180HE	HDFN-210HE	HDFN-260HE	HDFN-310HE	
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.	°C 12 → 7								
	Flow Rate	m <sup>3</sup> /h	48.4	60.5	72.6	90.7	108.9	127.0	157.2	187.5
	Pressure Drop	mAq	6.8	7.4	7.0	7.1	7.7	7.4	7.4	7.5
	Nozzle Size	A	80	80	100	100	125	125	150	150
	No. of Pass	-	3	3	2	2	2	2	2	2
Cooling water	Inlet/Outlet Temp.	°C 32 → 37								
	Flow Rate	m <sup>3</sup> /h	80.0	100.0	120.0	150.0	180.0	210.0	260.0	310.0
	Pressure Drop	mAq	6.7	8.0	7.8	8.4	7.5	8.1	8.2	9.3
	Nozzle Size	A	100	100	125	125	150	150	200	200
	No. of Pass	-	3	3	2	2	2	2	2	2
Hot water	Inlet/Outlet Temp.	°C 55.6 → 60								
	Flow Rate	m <sup>3</sup> /h	48.4	60.5	72.6	90.7	108.9	127.0	157.2	187.5
	Pressure Drop	mAq	6.8	7.4	7.0	7.1	7.7	7.4	7.4	7.5
	Nozzle Size	A	80	80	100	100	125	125	150	150
	No. of Pass	-	3	3	2	2	2	2	2	2
Electricity	Solution Pump 1	kW	1.1	1.1	1.1	2.2	3.0	3.0	3.0	3.7
	Solution Pump 11	kW	1.1	1.1	1.1	2.2	2.2	2.2	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	3.8	4.5	4.5	6.7	7.9	7.9	8.6	9.3
Gas	Higher Heating Value	kcal/Nm <sup>3</sup>	10,500	10,500	10,500	10,500	10,500	10,500	10,500	
	Consumption	Cooling	Nm <sup>3</sup> /h	18.73	23.41	28.10	35.12	42.15	49.17	60.88
		Heating	Nm <sup>3</sup> /h	23.07	29.06	34.72	43.54	52.14	60.84	75.32
	Conn. Pipe Size	A	40	40	40	40	50	50	50	50
	Standard Gas Press.	mmAq	200	200	200	200	200	200	200	200
Exhaust Conn. Size	mm	428X170	428X170	428X240	428X240	493X270	493X270	560X290	560X290	
Eff.	COP	Cooling	-	1.23	1.23	1.23	1.23	1.23	1.23	1.23
		Heating	-	0.875	0.875	0.875	0.875	0.875	0.875	0.875
Dimension	Length	mm	2,467	2,467	3,388	3,388	3,388	3,388	4,710	4,710
	Width	mm	1,988	1,988	1,988	1,988	2,207	2,207	2,276	2,276
	Height	mm	2,043	2,043	2,043	2,252	2,252	2,252	2,525	2,525
WT	Empty Weight	TON	4.5	4.8	5.4	5.9	6.7	7.7	9.0	9.7
	Operating Weight	TON	5.3	5.7	6.5	7.1	8.2	10.6	11.1	11.9

※ NOTE

1. USRT = 3,024kcal/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 : 0.0001 m<sup>2</sup> h °C / kcal
7. Standard design Pressure of Chilled/Cooling Water : 8kg/cm<sup>2</sup>G
8. The Specification may be changed without pre-notification.

# High Efficiency Absorption Chiller-Heaters

## Specification of HE Model II

Item	Model	HDFN-360HE	HDFN-400HE	HDFN-450HE	HDFN-500HE	HDFN-550HE	HDFN-600HE	HDFN-700HE	HDFN-800HE		
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.	℃ 12 → 7									
	Flow Rate	m <sup>3</sup> /h	217.7	241.9	272.2	302.4	332.6	362.9	423.4	483.8	
	Pressure Drop	mAq	7.0	7.0	7.0	7.0	7.0	7.3	6.2	8.5	
	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.	℃ 32 → 37									
	Flow Rate	m <sup>3</sup> /h	360.0	400.0	450.0	500.0	550.0	600.0	700.0	800.0	
	Pressure Drop	mAq	6.4	6.4	6.4	6.4	6.4	7.8	5.6	7.6	
	Nozzle Size	A	250	250	250	250	300	300	300	300	
	No. of Pass	-	2	2	2	2	2	3	2	2	
Hot water	Inlet/Outlet Temp.	℃ 55.6 → 60									
	Flow Rate	m <sup>3</sup> /h	217.7	241.9	272.2	302.4	332.6	362.9	423.4	483.8	
	Pressure Drop	mAq	7.0	7.0	7.0	7.0	7.0	7.3	6.2	8.5	
	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 1	kW	3.7	5.5	5.5	5.5	5.5	6.6	6.6	7.5	
	Solution Pump 11	kW	3.0	3.0	3.0	3.7	3.7	3.7	3.7	3.7	
	Refrigerant Pump	kW	0.75	0.75	0.75	0.75	0.75	2.2	2.2	2.2	
	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	10.1	11.9	13.4	15.9	15.9	18.4	18.4	21.3	
Gas	Higher Heating Value	kcal/Nm <sup>3</sup>	10,500	10,500	10,500	10,500	10,500	10,500	10,500	10,500	
	Consumption	Cooling	Nm <sup>3</sup> /h	84.29	93.66	105.37	117.07	128.78	140.49	163.90	187.32
		Heating	Nm <sup>3</sup> /h	104.27	115.81	130.39	144.87	159.35	173.82	202.78	231.73
	Conn. Pipe Size	A	50	50	50	50	50	50	50	65	
	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		
Eff.	COP	Cooling	-	1.23	1.23	1.23	1.23	1.23	1.23	1.23	
		Heating	-	0.875	0.875	0.875	0.875	0.875	0.875	0.875	
Dimension	Length	mm	4,976	4,976	4,976	4,976	5,076	5,346	6,021	6,501	
	Width	mm	2,693	2,693	2,771	2,771	2,771	3,184	3,184	3,384	
	Height	mm	2,496	2,496	2,587	2,587	2,587	3,110	3,110	3,110	
WT	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	

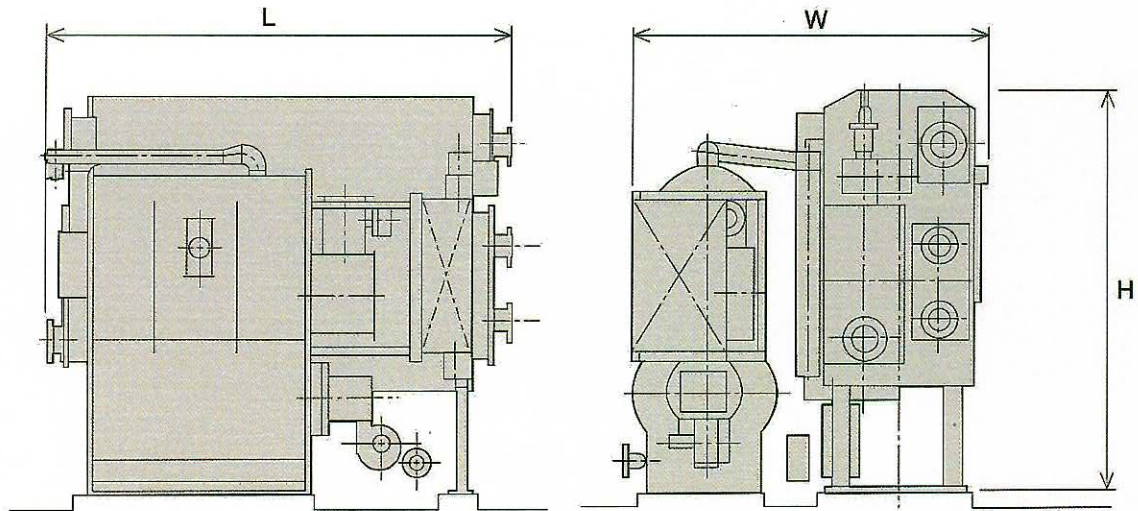
※ NOTE

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5. Efficiency(COP) is based on Higher Heating Value.

6. Chilled/Cooling Water Fouling Factor : 0.0001 m<sup>2</sup> h °C /kcal
7. Standard design Pressure of Chilled/Cooling Water : 8kg/cm<sup>2</sup>G
8. The Specification may be changed without pre-notification.

# HYUNDAI Absorption Chiller-Heater (HE Model)

## OVERALL(ASSEMBLY) DIMENSION & WEIGHT



MODEL	Dimension for Installation(mm)			Weight(Ton)		Remarks
	L	W	H	Empty	Oper.	
HDFN-80HE	2,467	1,988	2,043	4.5	5.3	
HDFN-100HE	2,467	1,988	2,043	4.8	5.7	
HDFN-120HE	3,388	1,988	2,043	5.4	6.5	
HDFN-150HE	3,388	1,988	2,252	5.9	7.1	
HDFN-180HE	3,388	2,207	2,252	6.7	8.2	
HDFN-210HE	3,388	2,207	2,252	7.7	10.6	
HDFN-260HE	4,710	2,276	2,525	9.0	11.1	
HDFN-310HE	4,710	2,276	2,525	9.7	11.9	
HDFN-360HE	4,976	2,693	2,496	13.2	15.9	
HDFN-400HE	4,976	2,693	2,496	13.5	16.7	
HDFN-450HE	4,976	2,771	2,587	14.7	17.7	
HDFN-500HE	4,976	2,771	2,587	16.0	20.1	
HDFN-550HE	5,076	2,771	2,587	16.8	22.1	
HDFN-600HE	5,346	3,184	3,110	20.9	28.1	

# High Efficiency Absorption Chiller-Heaters

## 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 (H2O)	●		For Initial Charge
	2-Ethyl Hexanol	●		For Initial Charge
	Anti-Vibration Pad	●		
	Spare Parts & Tools	●		(Maker's Standard)
	Operating Manual	●		
Inspection & Test	Helium Leak Test	●		
	Electric Sequence Test	●		
	Di-electric 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		●	