



# HYDRO UNIT



# 1 Hydro unit HE

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# 1 Hydro Unit HE

## 1-1. Specifications

### 1) Technical specifications

Model				AM160FNBDEH***	AM320FNBDEH***	AM500FNBDEH***	
Power Supply				Ø, #, V, Hz	1, 2, 220-240, 50	1, 2, 220-240, 50	
Mode				-	HP/HR	HP/HR	
Performance	Capacity (Nominal)	Cooling *1)	kW	14.0	28.0	44.8	
			Btu/h	47,800	95,600	152,900	
		Heating *2)	kW	16.0	31.5	50.4	
			Btu/h	54,600	107,500	172,000	
Power	Power Input (Nominal)	Cooling *1)	W	10.00	10.00	10.00	
		Heating *2)		10.00	10.00	10.00	
	Current Input (Nominal)	Cooling *1)	A	0.05	0.05	0.05	
		Heating *2)		0.05	0.05	0.05	
	MCA (Including External Contact)			2.2	2.2	2.2	
	MFA		A	2.75	2.75	2.75	
Compressor	Type		-	-	-	-	
	Output		kW × n	-	-	-	
	Model Name		-	-	-	-	
	Oil	Type	-	-	-	-	
Initial Charge		cc	-	-	-		
Heat Exchanger	Type		-	PHE	PHE	PHE	
	Quantity		-	1	1	1	
	Pipe Size		Ø, inch	PT 1 (25A)	PT 1 (25A)	PT 1-1/4 (32A)	
	Water Flow Rate		LPM	48	92	150	
	Flow Switch		LPM	20	30	50	
Option Code			-	01004C-105000-208C8C-332200	01004C-105000-231C1C-332200	01004C-105000-232D2D-332200	
Piping Connections	Liquid Pipe	Ø, mm	9.52	9.52	12.7		
		Ø, inch	3/8"	3/8"	1/2"		
	Gas Pipe	Ø, mm	15.88	22.2	28.58		
		Ø, inch	5/8"	7/8"	1 1/8"		
	Drain Pipe	Ø,mm	-	-	-		
FieldWiring	Power Source Wire (L<10m, Single Installation)		mm2	2.5	2.5	2.5	
	Transmission Cable		mm2	0.75 ~ 1.5	0.75 ~ 1.5	0.75 ~ 1.5	
Refrigerant	Type		-	-	-	-	
	Control Method		-	EEV	EEV	EEV	
Sound	Sound Pressure *3)		dB(A)	27	28	31	
	Sound Power			-	-	-	
Dimensions	Net Weight		kg	29.00	33.00	40.00	
	Shipping Weight		kg	31.00	35.00	42.00	
	Net Dimensions (W×H×D)		mm	518 x 627 x 330	518 x 627 x 330	518 x 627 x 330	
	Shipping Dimensions (W×H×D)		mm	652 x 700 x 426	652 x 700 x 426	652 x 700 x 426	
Operating Temp. Range	Ambient	Cooling	℃	-5.0 ~ 48.0	-5.0 ~ 48.0	-5.0 ~ 48.0	
		Heating	℃	-20 ~ 24	-20 ~ 24	-20 ~ 24	
		Hot Water (Main Cooling, HR)	℃	-20.0 ~ 24 (30)	-20.0 ~ 24 (30)	-20.0 ~ 24 (30)	
	Leaving Water	Cooling	℃	5.0 ~ 30.0	5.0 ~ 30.0	5.0 ~ 30.0	
		Heating	℃	20.0 ~ 50.0	20.0 ~ 50.0	20.0 ~ 50.0	

\* Specifications may be subject to change without prior notice for product improvement.

- \*1) Nominal cooling capacities are based on;  
 - Water temperature : 23°C inlet, 18°C outlet  
 - Indoor temperature : 27°C DB, 19°C WB  
 - Outdoor temperature : 35°C DB, 24°C WB

- \*2) Nominal heating capacities are based on;  
 - Water temperature : 30°C inlet, 35°C outlet  
 - Indoor temperature : 20°C DB  
 - Outdoor temperature : 7°C DB, 6°C WB

- \*3) Sound pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

## 1-2. Capacity tables

### 1) Cooling

Capacity (kW)	Outdoor temperature (°C)	Water inlet temperature (°C)				
	DB	10	15	20	25	30
14.0	-5	11.2	12.6	14.5	15.8	16.6
	-3	11.2	12.6	14.5	15.8	16.6
	-1	11.2	12.6	14.5	15.8	16.6
	0	11.2	12.6	14.5	15.8	16.6
	2	11.2	12.6	14.5	15.8	16.6
	4	11.2	12.6	14.5	15.8	16.6
	6	11.2	12.6	14.5	15.8	16.6
	8	11.2	12.6	14.5	15.8	16.6
	10	11.2	12.6	14.5	15.8	16.6
	12	11.2	12.6	14.5	15.8	16.6
	14	11.2	12.6	14.5	15.8	16.6
	16	11.2	12.6	14.5	15.8	16.6
	18	11.2	12.6	14.5	15.8	16.6
	20	11.2	12.6	14.5	15.8	16.6
	22	11.2	12.6	14.5	15.8	16.4
	24	11.2	12.6	14.3	15.6	16.2
	26	11.2	12.4	14.1	15.4	16.0
	28	10.8	12.2	14.0	15.1	15.8
	30	10.4	12.0	13.8	14.9	15.6
	32	10.1	11.8	13.6	14.7	15.5
28.0	34	9.7	11.6	13.4	14.5	15.3
	36	9.3	11.4	13.3	14.3	15.1
	38	8.9	11.2	13.1	14.1	14.9
	40	8.6	11.0	13.0	13.8	14.7
	-5	22.4	28.0	30.9	34.0	35.3
	-3	22.4	28.0	30.9	34.0	35.3
	-1	22.4	28.0	30.9	34.0	35.3
	0	22.4	28.0	30.9	34.0	35.3
	2	22.4	28.0	30.9	34.0	35.3
	4	22.4	28.0	30.9	34.0	35.3
	6	22.4	28.0	30.9	34.0	35.3
	8	22.4	28.0	30.9	34.0	35.3
	10	22.4	28.0	30.9	34.0	35.3
	12	22.4	28.0	30.9	34.0	35.3
	14	22.4	28.0	30.9	34.0	35.3
	16	22.4	28.0	30.9	34.0	35.3
	18	22.4	28.0	30.9	34.0	35.3
	20	22.4	28.0	30.9	34.0	35.3
	22	22.4	28.0	30.9	34.0	34.7
	24	22.4	28.0	30.3	33.2	34.0
	26	22.4	27.2	29.7	32.4	33.3
44.8	28	21.6	26.5	29.0	31.5	32.5
	30	20.9	25.7	28.4	30.7	31.8
	32	20.1	24.9	27.8	29.9	31.1
	34	19.4	24.2	27.2	29.1	30.4
	36	18.6	23.4	26.6	28.3	29.7
	38	17.9	22.7	26.0	27.4	28.9
	40	17.2	21.9	25.4	26.5	28.2
	-5	35.8	40.3	46.3	50.5	53.1
	-3	35.8	40.3	46.3	50.5	53.1
	-1	35.8	40.3	46.3	50.5	53.1
	0	35.8	40.3	46.3	50.5	53.1
	2	35.8	40.3	46.3	50.5	53.1
	4	35.8	40.3	46.3	50.5	53.1
	6	35.8	40.3	46.3	50.5	53.1
	8	35.8	40.3	46.3	50.5	53.1
	10	35.8	40.3	46.3	50.5	53.1
	12	35.8	40.3	46.3	50.5	53.1
	14	35.8	40.3	46.3	50.5	53.1
	16	35.8	40.3	46.3	50.5	53.1
	18	35.8	40.3	46.3	50.5	53.1
	20	35.8	40.3	46.3	50.5	53.1
	22	35.8	40.3	46.3	50.5	52.4
	24	35.8	40.3	45.8	49.8	51.8
	26	35.8	39.7	45.3	49.2	51.3
	28	34.6	39.0	44.7	48.5	50.7
	30	33.4	38.4	44.2	47.8	50.1
	32	32.2	37.7	43.7	47.1	49.5
	34	31.0	37.1	43.1	46.4	48.9
	36	29.8	36.4	42.6	45.7	48.3
	38	28.6	35.8	42.0	45.0	47.7
	40	27.4	35.1	41.4	44.3	47.1

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## 1-2. Capacity tables

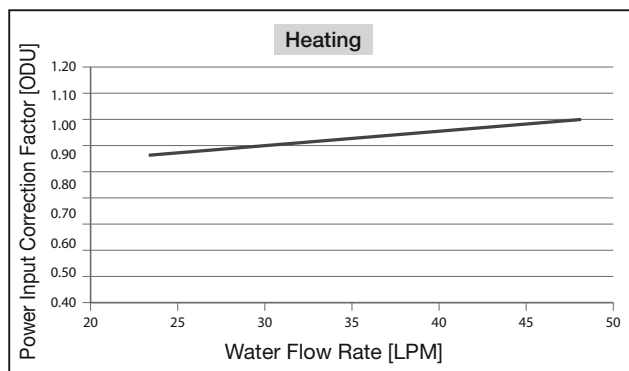
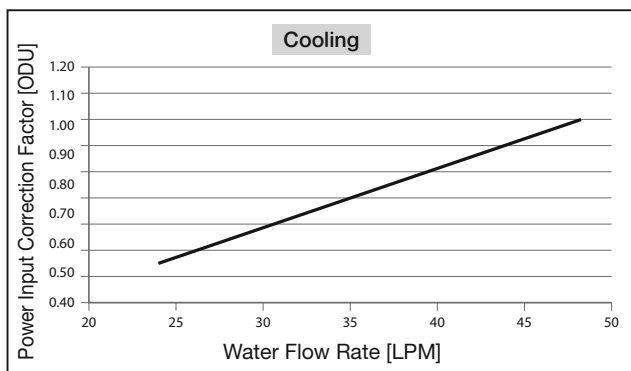
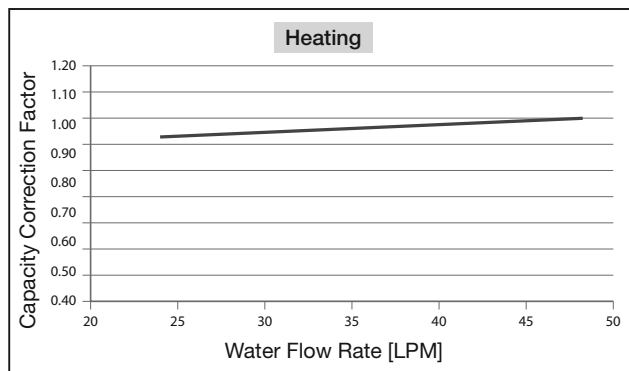
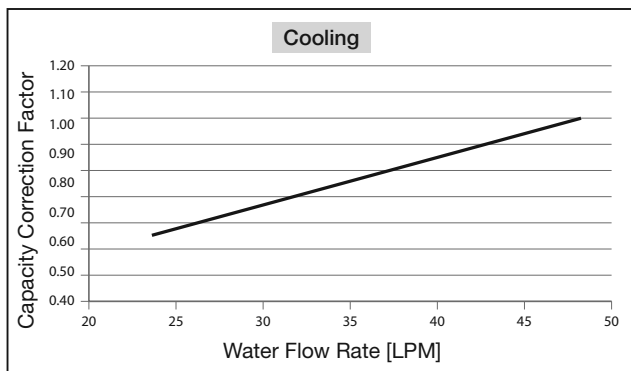
### 1) Heating

Capacity (kW)	Outdoor temperature (°C)		Water inlet temperature (°C)			
	DB	WB	20	30	40	45
16.0	-20.0	-20.2	12.4	11.7	7.2	4.7
	-18.4	-18.6	12.7	12.0	7.8	5.5
	-16.7	-17.0	13.0	12.2	8.3	6.1
	-15.0	-15.3	13.4	12.5	8.9	6.8
	-13.4	-13.8	13.7	12.8	9.4	7.4
	-11.7	-12.1	14.0	13.0	10.0	8.0
	-10.0	-10.5	14.3	13.3	10.6	8.6
	-8.4	-8.9	14.6	13.6	11.1	9.2
	-6.7	-7.3	15.0	13.9	11.7	9.6
	-5.0	-5.6	15.3	14.1	12.3	9.6
	-3.4	-4.1	15.6	14.4	12.8	9.6
	-1.7	-2.4	15.9	14.7	12.8	9.6
	0.0	-0.7	16.3	14.9	12.8	9.6
	1.6	0.8	16.6	15.2	12.8	9.6
	3.3	2.5	16.9	15.5	12.8	9.6
	5.0	4.1	17.2	15.7	12.8	9.6
	6.6	5.7	17.5	16.0	12.8	9.6
	7.0	6.0	17.6	16.0	12.8	9.6
	8.3	7.3	17.6	16.0	12.8	9.6
	10.0	8.9	17.6	16.0	12.8	9.6
31.5	-20.0	-20.2	24.4	23.1	14.2	7.9
	-18.4	-18.6	25.4	23.9	15.5	9.2
	-16.7	-17.0	26.5	24.9	17.0	10.6
	-15.0	-15.3	27.5	25.8	18.4	12.0
	-13.4	-13.8	28.5	26.7	19.8	13.3
	-11.7	-12.1	29.5	27.7	21.3	14.8
	-10.0	-10.5	30.5	28.6	22.7	16.2
	-8.4	-8.9	31.5	29.5	24.1	17.5
	-6.7	-7.3	32.6	30.4	25.5	18.9
	-5.0	-5.6	33.6	31.4	27.0	18.9
	-3.4	-4.1	33.8	31.5	28.4	18.9
	-1.7	-2.4	33.8	31.5	28.4	18.9
	0.0	-0.7	33.8	31.5	28.4	18.9
	1.6	0.8	33.8	31.5	28.4	18.9
	3.3	2.5	33.9	31.5	28.4	18.9
	5.0	4.1	33.9	31.5	28.4	18.9
	6.6	5.7	33.9	31.5	28.4	18.9
	7.0	6.0	34.1	31.5	28.4	18.9
	8.3	7.3	34.1	31.5	28.4	18.9
	10.0	8.9	34.1	31.5	28.4	18.9
50.4	-20.0	-20.2	39.1	36.9	22.7	15.2
	-18.4	-18.6	40.1	37.7	24.5	17.2
	-16.7	-17.0	41.1	38.6	26.3	19.2
	-15.0	-15.3	42.1	39.4	28.1	21.3
	-13.4	-13.8	43.1	40.2	29.7	23.2
	-11.7	-12.1	44.1	41.1	31.5	25.2
	-10.0	-10.5	45.2	42.0	33.3	27.2
	-8.4	-8.9	46.1	42.8	35.0	29.1
	-6.7	-7.3	47.1	43.6	36.8	30.2
	-5.0	-5.6	48.2	44.5	38.6	30.2
	-3.4	-4.1	49.1	45.3	40.3	30.2
	-1.7	-2.4	50.2	46.2	40.3	30.2
	0.0	-0.7	51.2	47.1	40.3	30.2
	1.6	0.8	52.2	47.9	40.3	30.2
	3.3	2.5	53.2	48.7	40.3	30.2
	5.0	4.1	54.2	49.6	40.3	30.2
	6.6	5.7	55.2	50.4	40.3	30.2
	7.0	6.0	55.4	50.4	40.3	30.2
	8.3	7.3	55.4	50.4	40.3	30.2
	10.0	8.9	55.4	50.4	40.3	30.2
	11.6	10.4	55.4	50.4	40.3	30.2
	13.3	12.1	55.4	50.4	40.3	30.2
	15.0	13.7	55.4	50.4	40.3	30.2

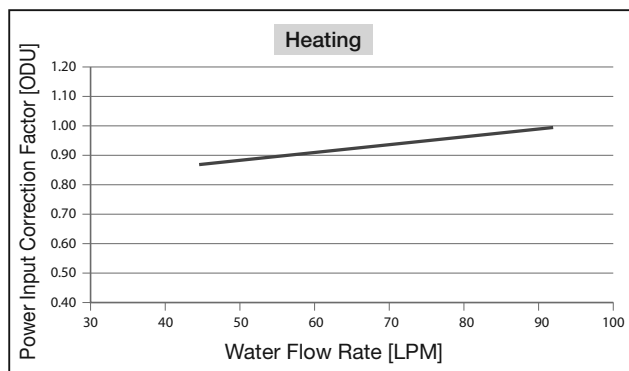
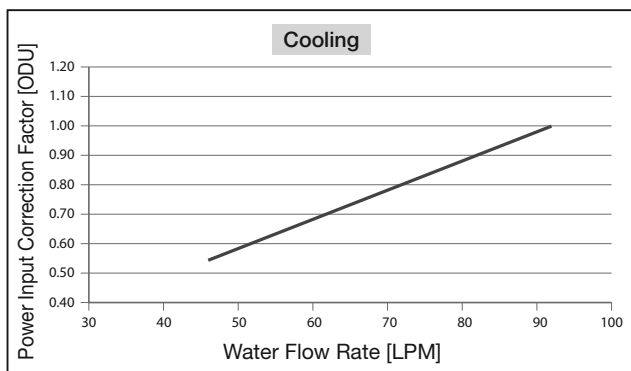
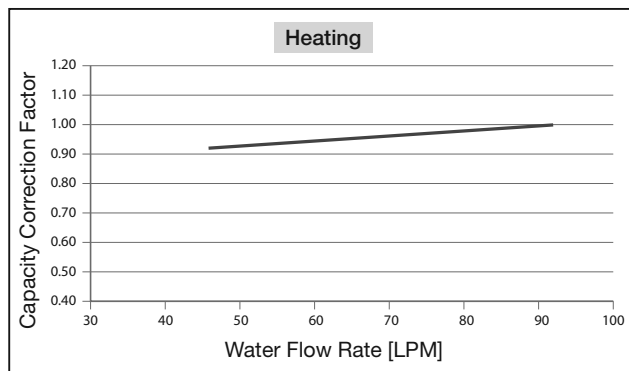
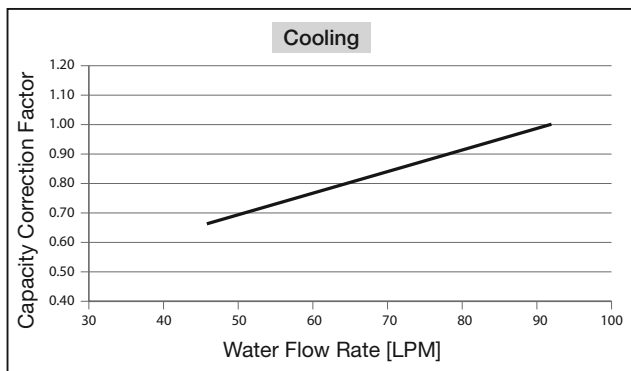
## 1-3. Capacity & Power input correction

### 1) By water flow rate

#### (1) AM160FNBDEH\*\*\*



#### (2) AM320FNBDEH\*\*\*

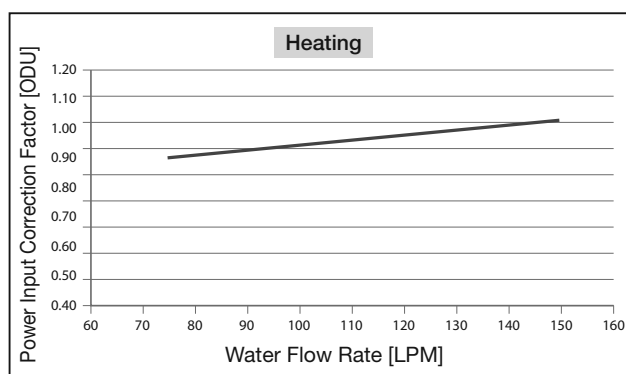
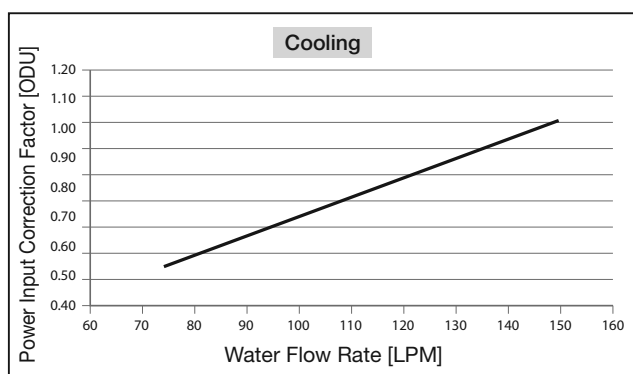
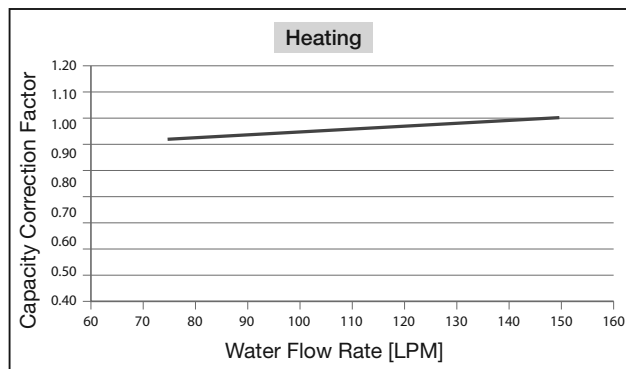
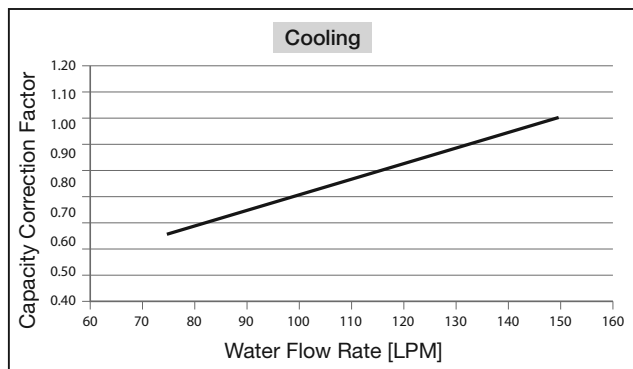


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## 1-3. Capacity & Power input correction

### 1) By water flow rate

#### (3) AM500FNBDEH\*\*\*

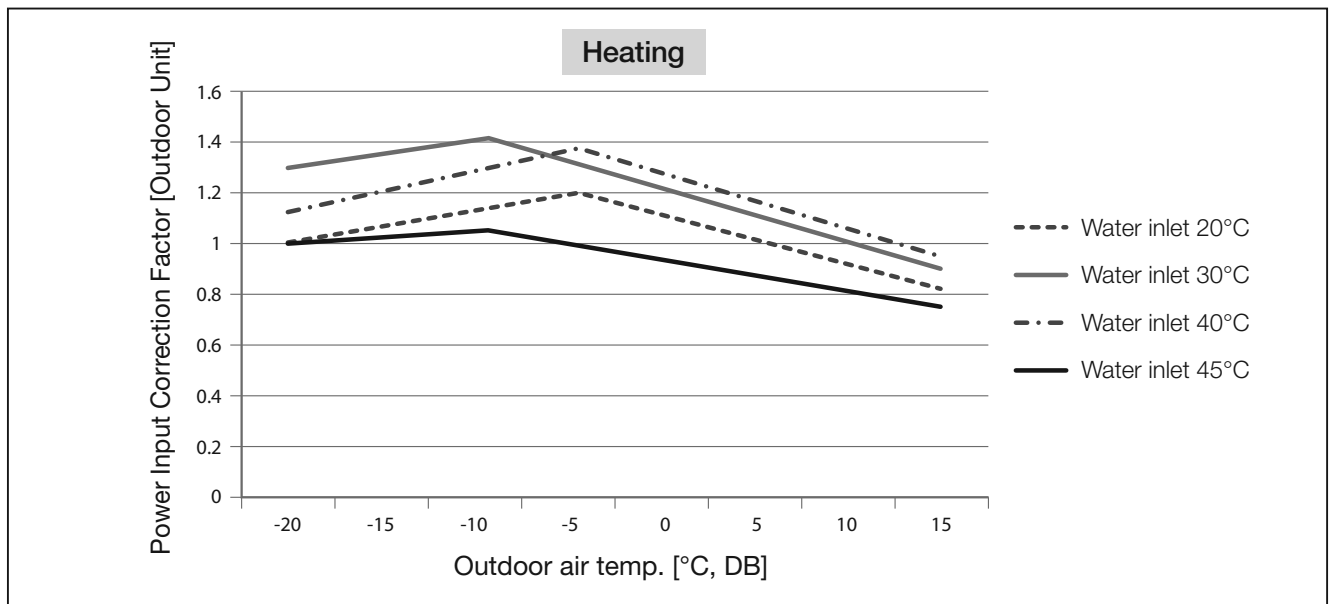
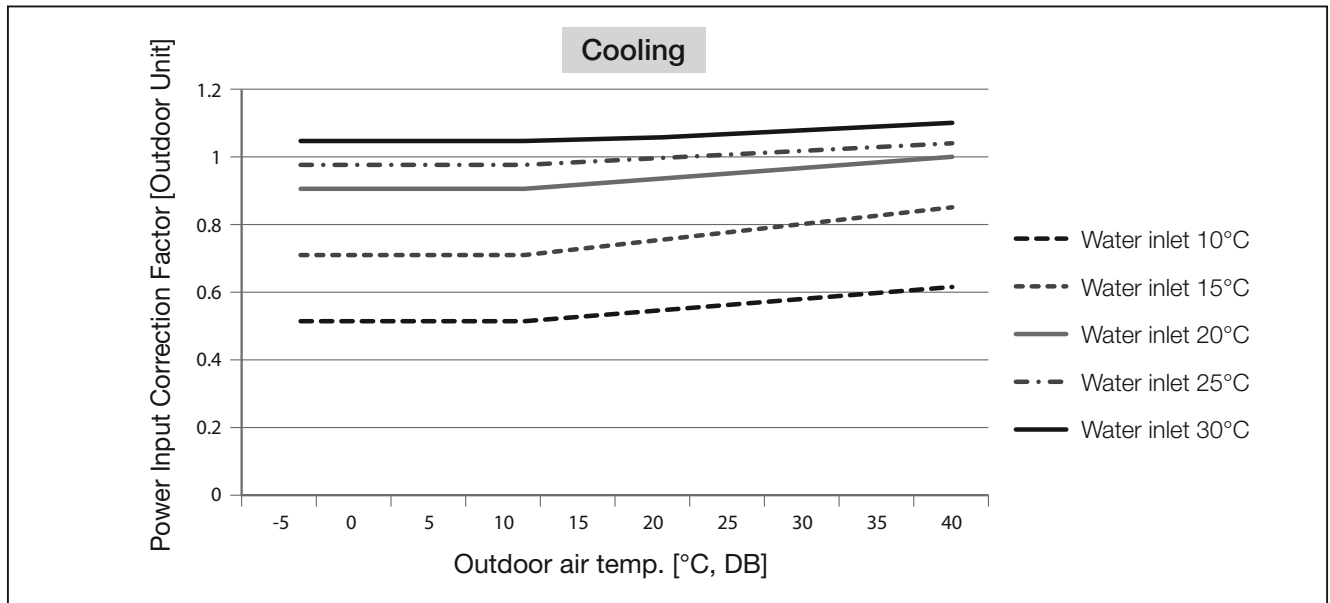


#### ◆ Flow rate by $\Delta T$

Flow Rate [LPM]	5HP	10HP	16HP
$\Delta T=10^{\circ}\text{C}$	24.0	46.0	75.0
$\Delta T=5^{\circ}\text{C}$	48.0	92.0	150.0

\* Minimum flow rate of the Hydro unit is 50% of rated flow rate.

## 2) By outdoor air temperature

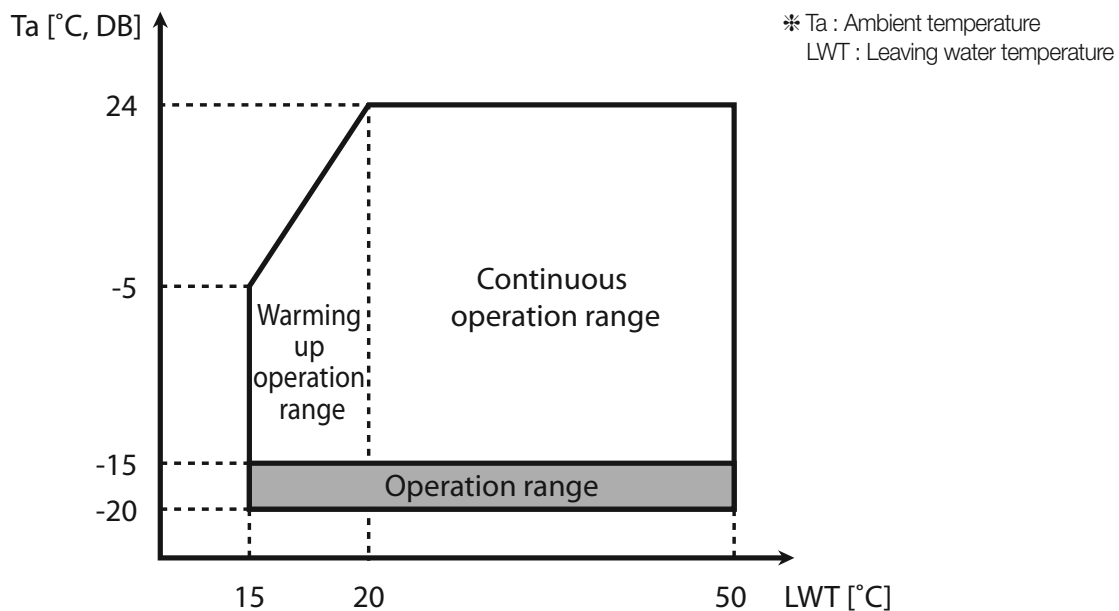




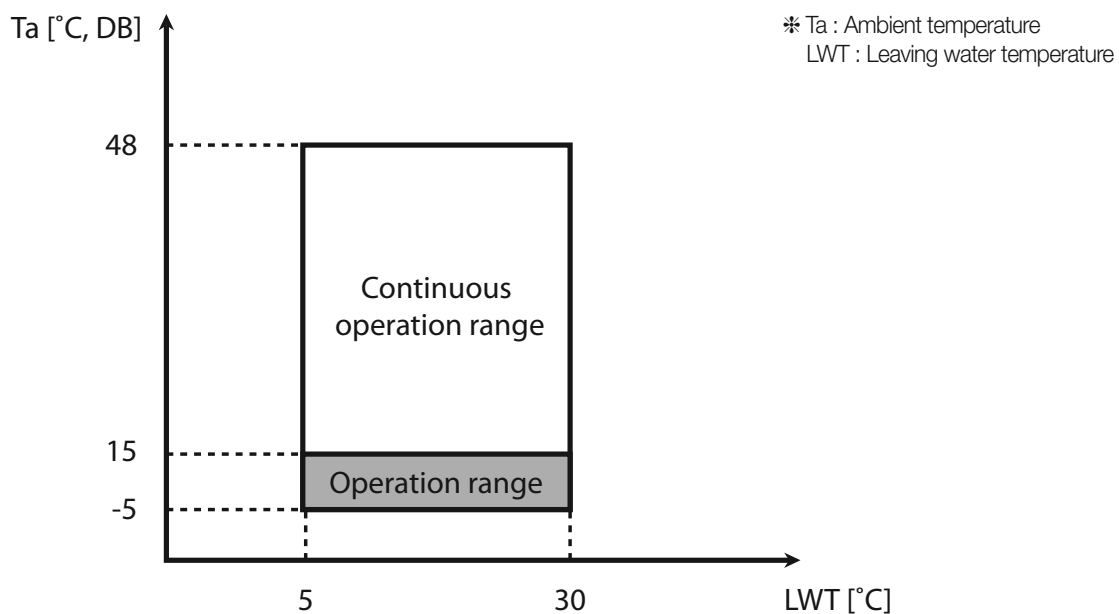
# 1 Hydro Unit HE

## 1-4. Operation range

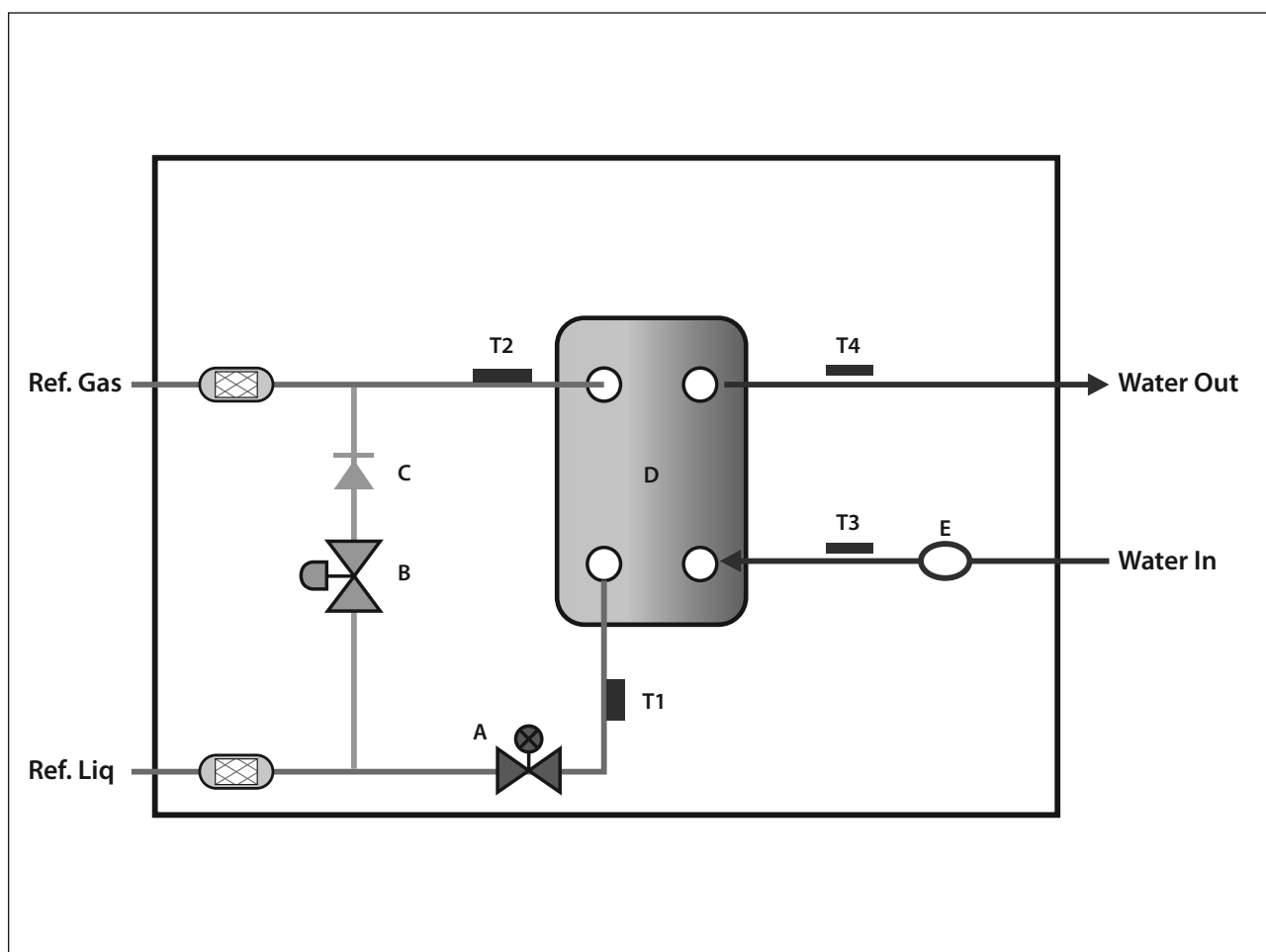
### 1) Heating



### 2) Cooling



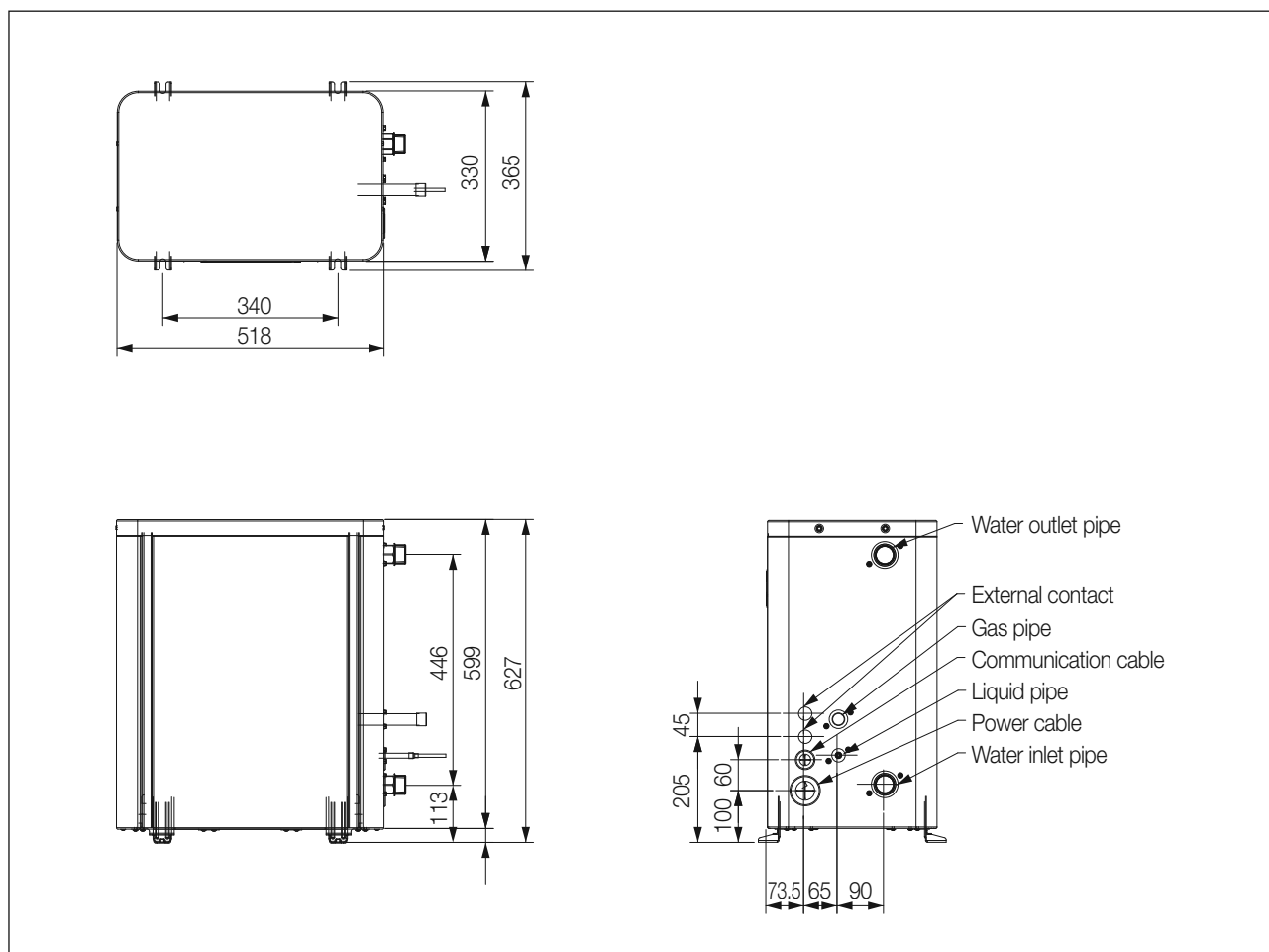
## 1-5. Cycle diagram



Symbol	Name
A	EEV
B	Bypass Valve for Defrost
C	Check Valve
D	Heat Exchanger
E	Flow Switch
T1	Eva. Inlet Temp. Sensor
T2	Eva. Outlet Temp. Sensor
T3	Water Inlet Temp. Sensor
T4	Water Outlet Temp. Sensor

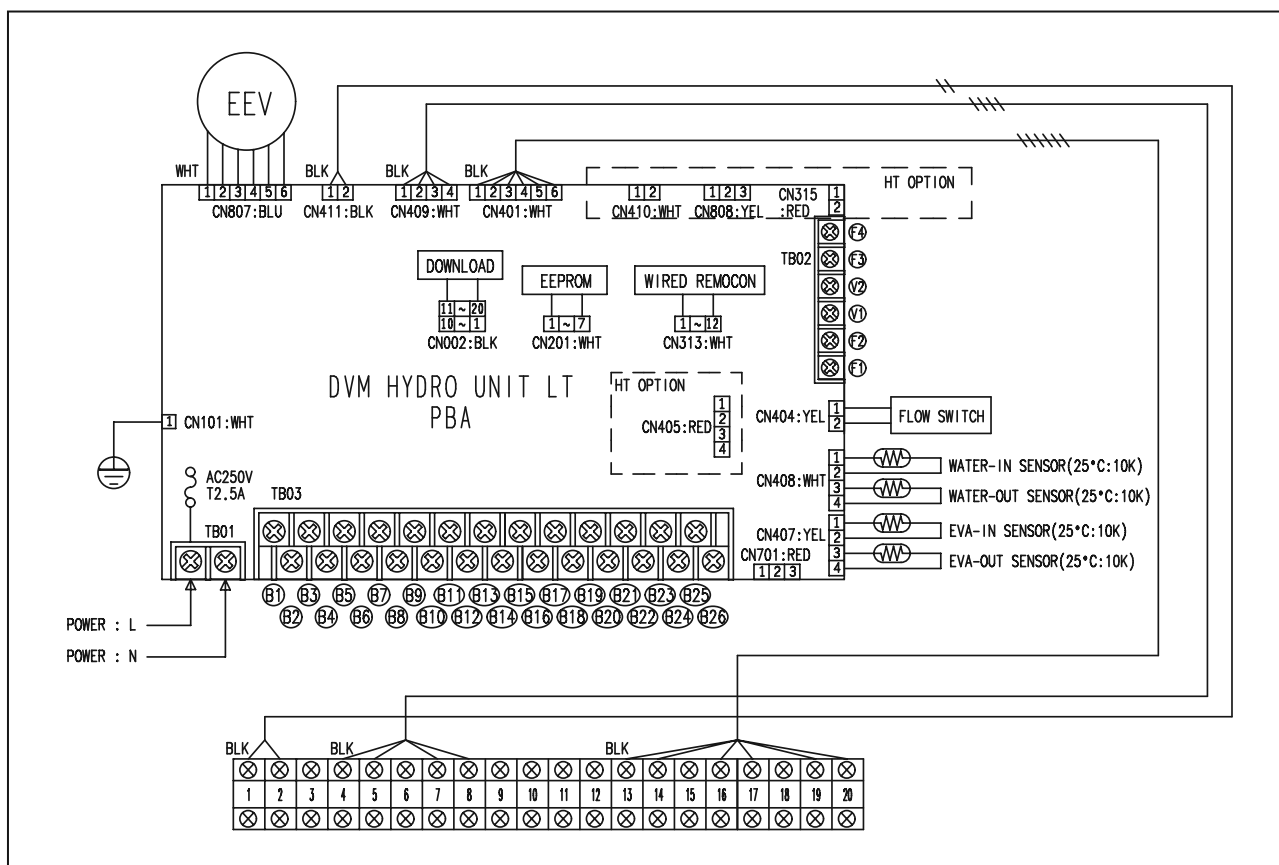
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## 1-6. Dimensional drawing



Model name of DVM Hydro unit		AM160FNBDEH***	AM320FNBDEH***	AM500FNBDEH***
Refrigerant side	Liquid pipe	3/8" (ø9.52)	3/8" (ø9.52)	1/2" (ø12.7)
	Gas pipe	5/8" (ø15.88)	7/8" (ø22.23)	1-1/8" (ø28.58)
Water side	Water inlet/outlet pipe	PT 1 (25 A)	PT 1 (25 A)	PT 1-1/4 (32 A)

## 1-7. Electrical wiring diagram

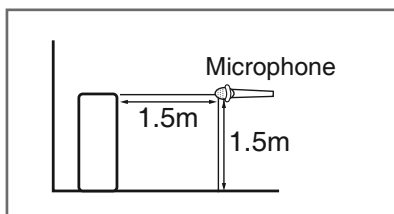


Terminal No.	External contact	Operation status/inspection checklist	Remarks
B1 - B2	Operation check	Check on/off status for operation lamp of the control panel on the site	Optional
B3 - B4	Alarm	Check on/off status for alarm lamp of the panel on the site	Optional
B5 - B6	Main pump	Check the status of the pump operation signal and on/off status of operation at the control panel on the site	Mandatory
B7 - B8	Heater	Check the status of the heater operation signal output at the control panel on the site	Optional
B9 - B10 - B11	3Way 1 V/V	Check the status of signal output and on/off status of valve operation (Direction switch of the indoor hot water tank)	Optional
B12 - B13 - B14	3Way 2 V/V	Check the status of signal output and on/off status of valve operation (Inter locked with solar energy pump signal)	Optional
B15 - B16 - B17	2Way V/V	Check the status of signal output or operation status of the valve	Optional
B19 - B20	AC 230, Thermostat 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B21 - B22	AC 230, Thermostat 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
B23 - B24	AC 24, Thermostat 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B25 - B26	AC 24, Thermostat 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
1 - 2	Room temp	Check the temperature display on the wired remote controller after separately installing the indoor temperature sensor (Refer to option setting of the wired remote controller)	Optional
7 - 8	Water tank temp	Check the temperature display on the wired remote controller after installing the the 4~20mA temperature sensor (0°C: 4mA, 100°C: 20mA)	Mandatory (hot water supply)
13 - 14	Solar pump	Check the solar pump contact signal input and status of the operation	Optional
16 - 17	EXT. Control	Check the contact signal input and status of the operation	Optional
19 - 20	Smart Grid	Check the Smart Grid contact input and the signal	Optional

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## 1-8. Sound pressure level

### 1) Operation sound level



Unit : dB(A)

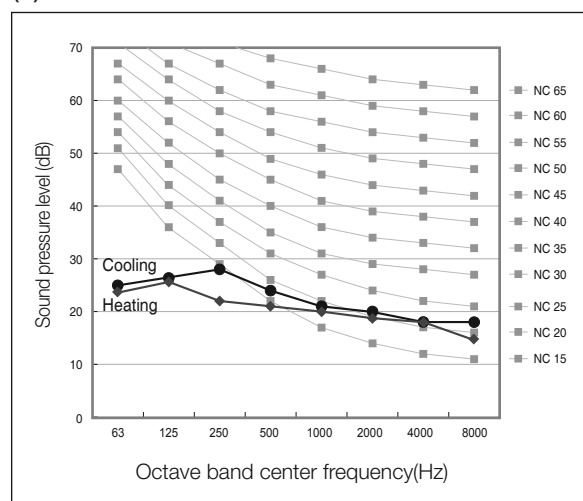
Model	Cooling	Heating
AM160FNBDEH***	27	26
AM320FNBDEH***	28	27
AM500FNBDEH***	30	31

#### ✓ Note

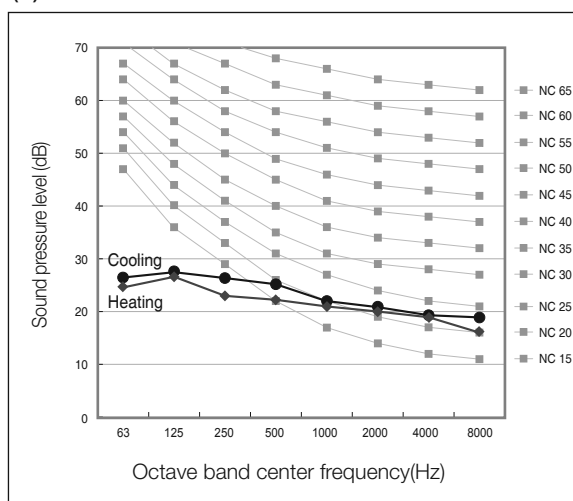
- ◆ These operation values were obtained in an anechoic room. Sound pressure level will vary depending on a range of factors such as the construction of the particular room where the equipment is installed.
- ◆ Operation sound level may differ depending on operation and ambient conditions.

### 2) NC curves

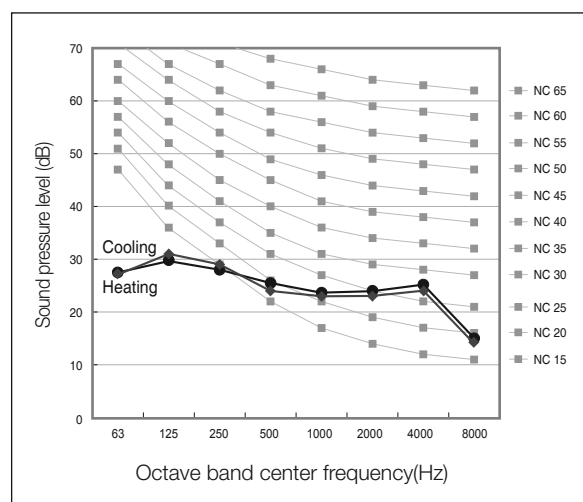
#### (1) AM160FNBDEH\*\*\*



#### (2) AM320FNBDEH\*\*\*

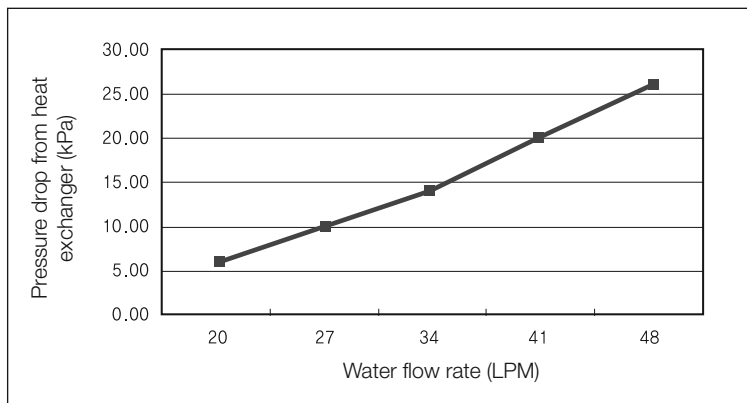


#### (3) AM500FNBDEH\*\*\*

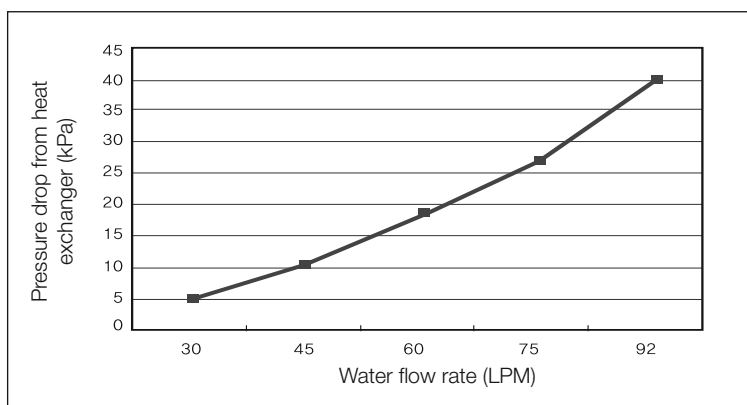


## 1-9. Hydraulic performance

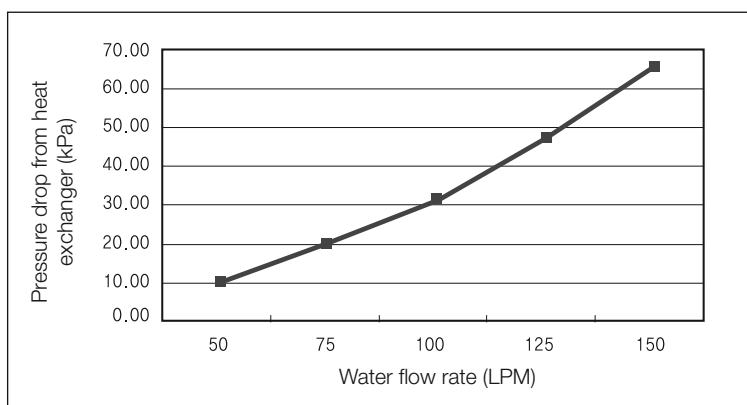
### 1) AM160FNBDEH\*\*\*



### 2) AM320FNBDEH\*\*\*



### 3) AM500FNBDEH\*\*\*





# HYDRO UNIT



## 2 Hydro unit HT

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# 2 Hydro unit HT

## 2-1. Specifications

### 1) Technical specifications

Model				AM160FNBFB***	AM160FNBFGB***	AM250FNBFB***	AM250FNBFGB***
Power Supply			Ø, #, V, Hz	1, 2, 220-240, 50	3, 4, 380-415, 50	1, 2, 220-240, 50	3, 4, 380-415, 50
Mode			-	HP/HR	HP/HR	HP/HR	HP/HR
Performance	Capacity (Nominal)	Cooling *1)	kW	-	-	-	-
			Btu/h	-	-	-	-
		Heating *2)	kW	16.0	16.0	25.0	25.0
			Btu/h	54,600	54,600	85,300	85,300
Power	Power Input (Nominal)	Cooling *1)	W	-	-	-	-
		Heating *2)		3,100	3,100	5,000	5,000
	Current Input (Nominal)	Cooling *1)	A	-	-	-	-
		Heating *2)		14.3	4.85	23.1	7.85
	MCA (Including External Contact)			24.15	12.88	32.15	12.88
Compressor	MFA		A	30.19	16.1	40.19	16.1
	Type		-	Rotary	Rotary	Rotary	Rotary
	Output		kW × n	-	-	-	-
	Model Name		-	UX5T250FNBEX	UX5T250FNBEX	UX5T250FNBEX	UX5T250FNBEX
	Oil	Type	-	POE	POE	POE	POE
Initial Charge		cc	1,700	1,700	1,700	1,700	
Heat Exchanger	Type		-	PHE	PHE	PHE	PHE
	Quantity		-	2	2	2	2
	Pipe Size		Ø, inch	PT 1 (25A)	PT 1 (25A)	PT 1 (25A)	PT 1 (25A)
	Water Flow Rate		LPM	23	23	36	36
	Flow Switch		LPM	12	12	12	12
Option Code			-	01104C-105000-20A0A0-332200	01104C-105000-20A0A0-332200	01104C-105000-20FAFA-332100	01104C-105000-20FAFA-332100
Piping Connections	Liquid Pipe	Ø, mm	9.52	9.52	9.52	9.52	
		Ø, inch	3/8"	3/8"	3/8"	3/8"	
	Gas Pipe	Ø,mm	15.88	15.88	15.88	15.88	
		Ø, inch	5/8"	5/8"	5/8"	5/8"	
Drain Pipe	Ø, mm	-	-	-	-		
	Field Wiring						
Power Source Wire (L<10m, Single Installation)	mm2		4.0	2.5	4.0	2.5	
	Transmission Cable		mm2	0.75 ~ 1.5	0.75 ~ 1.5	0.75 ~ 1.5	0.75 ~ 1.5
Refrigerant	Type		-	R-134a	R-134a	R-134a	R-134a
	Control Method		-	EEV	EEV	EEV	EEV
Sound	Sound Pressure *3)		dB(A)	42	42	42	42
	Sound Power			-	-	-	-
Dimensions	Net Weight		kg	104.00	104.00	104.00	104.00
	Shipping Weight		kg	107	107	107	107
	Net Dimensions (W×H×D)		mm	518 x 1,210 x 330	518 x 1,210 x 330	518 x 1,210 x 330	518 x 1,210 x 330
	Shipping Dimensions (W×H×D)		mm	652 x 1,289 x 426	652 x 1,289 x 426	652 x 1,289 x 426	652 x 1,289 x 426
Operating Temp. Range	Ambient	Cooling	°C	-	-	-	-
		Heating	°C	-20 ~ 24	-20 ~ 24	-20 ~ 24	-20 ~ 24
		Hot Water (Main Cooling, HR)	°C	-20.0 ~ 35.0 (-5.0 ~ 43.0)	-20.0 ~ 35.0 (-5.0 ~ 43.0)	-20.0 ~ 35.0 (-5.0 ~ 43.0)	-20.0 ~ 35.0 (-5.0 ~ 43.0)
	Leaving Water	Cooling	°C	-	-	-	-
		Heating	°C	25.0 ~ 80.0	25.0 ~ 80.0	25.0 ~ 80.0	25.0 ~ 80.0

\* Specifications may be subject to change without prior notice for product improvement.

- \*1) Nominal cooling capacities are based on;
- Water temperature : 23°C inlet, 18°C outlet
  - Indoor temperature : 27°C DB, 19°C WB
  - Outdoor temperature : 35°C DB, 24°C WB

- \*2) Nominal heating capacities are based on;
- Water temperature : 55°C inlet, 65°C outlet
  - Indoor temperature : 20°C DB
  - Outdoor temperature : 7°C DB, 6°C WB

- \*3) Sound pressure was acquired in an anechoic room. Thus actual noise level may be different depending on the installation conditions.

## 2-2. Capacity tables

### 1) Heating

HC : Heating Capacity(W), PI : Power Input(W)  
LW : Leaving Water temperature, EW : Entering Water temperature

Model	Ta [°C DB]	LW[°C]		LW[°C]		LW[°C]		LW[°C]	
		45		55		65		75	
		HC	PI	HC	PI	HC	PI	HC	PI
160	-20	15,000	2,062	15,000	2,017	15,000	2,523	14,000	3,193
	-17	15,000	2,083	15,000	1,952	15,000	2,357	14,500	3,063
	-15	15,500	2,313	15,500	2,007	15,500	2,435	15,000	2,895
	-7	15,500	2,305	16,000	2,185	16,000	2,598	15,500	2,956
	-3	16,000	2,352	16,000	2,380	16,000	2,560	16,000	3,087
	1	16,000	2,146	16,000	2,363	16,000	2,501	16,000	3,052
	3	16,000	2,041	16,000	2,314	16,000	2,453	16,000	2,963
	7	16,000	1,868	16,000	2,281	16,000	2,419	16,000	2,828
	11	16,000	1,850	16,000	2,279	16,000	2,428	16,000	2,763
250	15	16,000	1,806	16,000	2,259	16,000	2,474	16,000	2,734
	-20	23,000	4,460	23,000	4,734	22,000	5,017	21,500	5,424
	-17	23,500	4,333	23,500	4,563	23,500	4,802	22,500	5,159
	-15	24,000	4,287	24,500	4,456	24,500	4,670	23,500	4,996
	-7	24,500	3,878	25,000	4,084	25,000	4,235	24,000	4,442
	-3	25,000	3,736	25,000	3,933	25,000	4,073	24,500	4,226
	1	25,000	3,616	25,000	3,803	25,000	3,948	25,000	4,051
	3	25,000	3,565	25,000	3,747	25,000	3,900	25,000	3,979
	7	25,000	3,443	25,000	3,652	25,000	3,831	25,000	3,865
	11	25,000	3,417	25,000	3,580	25,000	3,799	25,000	3,791
	15	25,000	3,400	25,000	3,530	25,000	3,798	25,000	3,758

EW = 40°C  
ΔT = 5°C

EW = 45°C  
ΔT = 10°C

EW = 55°C  
ΔT = 10°C

EW = 65°C  
ΔT = 10°C

#### Conditions

- ΔT = Leaving Water temperature - Entering Water temperature
- No pump power input is included.
- Equivalent piping length = 7.5m
- Ta < 0 °C : RH=75%, Ta > 0 °C : RH=85%

## 2 Hydro Unit HT

### 2) Capacity calculation method

How to calculate heating capacity and power input : Combination of outdoor unit and hydro unit HT

- Heating capacity and power input of hydro unit HT : refer to the indoor unit capacity table.
- Power input of outdoor unit : refer to the outdoor unit capacity table (indoor 20°C DB).

Example

- Standard condition: Outdoor 7°C DB/6°C WB, Indoor 20°C DB
- Water condition: EW 55°C, LW 65°C

### 8HP DVM S TDB Heat Capacity Table

combination, % (Capacity index)	Outdoor Temperature(°C)		Indoor Temperature (°C,DB)	
			20.0 °C	
			TC	PI
	DB	WB	kW	kW
100%	-20	-21	19.8	7.80
	-17	-18	20.9	7.96
	-15	-16	22.0	8.04
	-12	-13	22.9	7.92
	-10	-11	23.9	7.68
	-7	-8	24.4	7.21
	-5	-6	25.2	6.84
	-3	-4	25.2	6.21
	0	-1	25.2	5.84
	3	2	25.2	5.52
	5	4	25.2	5.23
	7	6	25.2	5.10
	9	8	25.2	4.85
	11	10	25.2	4.63
	13	12	25.2	4.42
	15	14	25.2	4.27

Combination 1 (Outdoor Unit 8HP + Indoor Unit 8HP)

Indoor Heat Capa.[kW]	25	= HT Capacity Table
PI Indoor Unit(8HP)[kW]	3.831	= HT Capacity Table
PI Outdoor Unit(8HP)[kW]	5.10	
PI System[kW]	8.93	=Indoor Unit PI + Outdoor Unit PI

Outdoor Unit Capacity Table

## 10HP DVM S TDB Heat Capacity Table

combination, % (Capacity index)	Outdoor Temperature(°C)		Indoor Temperature (°C,DB)	
			20.0 °C	
			TC	PI
	DB	WB	kW	kW
100%	-20	-21	26.5	10.24
	-17	-18	28.1	10.45
	-15	-16	29.1	10.67
	-12	-13	29.7	10.62
	-10	-11	30.7	10.40
	-7	-8	31.2	9.57
	-5	-6	31.5	8.99
	-3	-4	31.5	8.15
	0	-1	31.5	7.68
	3	2	31.5	7.25
	5	4	31.5	6.88
	7	6	31.5	6.70
	9	8	31.5	6.38
	11	10	31.5	6.08
	13	12	31.5	5.81
	15	14	31.5	5.61

Combination 1 ( Outdoor Unit 10HP + Indoor Unit 5HP x 2ea)

Indoor Heat Capa.[kW]	16	= HT Capacity Table
Indoor Heat Capa.[kW]	32	= 2 x 5HP
PI Indoor Unit(5HP)[kW]	2.419	= HT Capacity Table
PI Total Indoor Unit[kW]	4.838	= 2 x 5HP
PI Outdoor Unit(10HP)[kW]	6.70	
PI System[kW]	11.54	= Total Indoor Unit PI + Outdoor Unit PI

Outdoor Unit Capacity Table

### Flowrate Information

Flowrate[l/min]	**160**	**250**
ΔT = 15°C	15.4	24.1
ΔT = 10°C	23.0	36.0
ΔT = 5°C	46.0	72.0

## 2 Hydro Unit HT

### How to calculate heating capacity and power input : Integrated value

#### 1. Defrosting correction factor (Outdoor unit)

- On heating operation, frost can be formed on heat exchanger according to outdoor temperature. (Frost on heat exchanger results in decreasing the performance.)

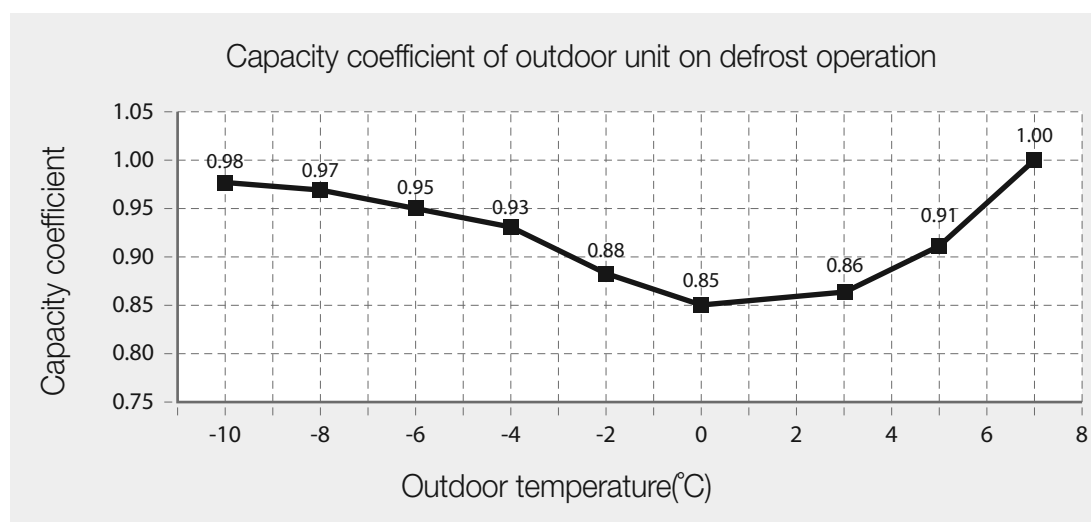
To remove frost on heat exchanger of outdoor unit, defrost operation is carried out periodically.

During defrost operation, capacity of outdoor unit may decrease.

The decrement is not considered to the individual capacity tables.

Outdoor temperature (°C, DB)	-10	-8	-6	-4	-2	0	3	5	7
Capacity coefficient	0.98	0.97	0.95	0.93	0.88	0.85	0.86	0.91	1

$$\text{Corrected Heating Capacity} = \text{heating capacity} \times \text{Capacity coefficient}$$



#### 2. Power input of hydro unit HT during defrost operation

	Power Input (W)
HT 5HP	1050
HT 8HP	1500

#### 3. Capacity correction factor of hydro unit HT during defrost operation

	HT Capa Correction Factor
HT 5HP	0.3
HT 8HP	

Example) Combination: 10HP DVM S + 5HP HT X 2ea, Outdoor 5°C DB, EW/LW=55°C/65°C

1) Defrosting correction factor (Outdoor unit, 5°C) = 0.91

2) Capacity correction factor (Hydro unit HT) = 0.3

3) Integrated capacity correction factor =  $0.91 - (1 - 0.91) \times 0.3 = 0.883$

4) HC =  $0.883 \times 16,000\text{W} \times 2\text{ea} = 28.3\text{kW}$

5) Power input (Outdoor unit) = 6.88kW

6) Power input (Hydro unit HT) =  $\{ 0.91 \times (2,453\text{W} + 2,419\text{W}) / 2 + (1 - 0.91) \times 1,050\text{W} \} \times 2 = 4.62\text{kW}$

7) Total PI =  $6.88 + 4.62 = 11.5\text{kW}$

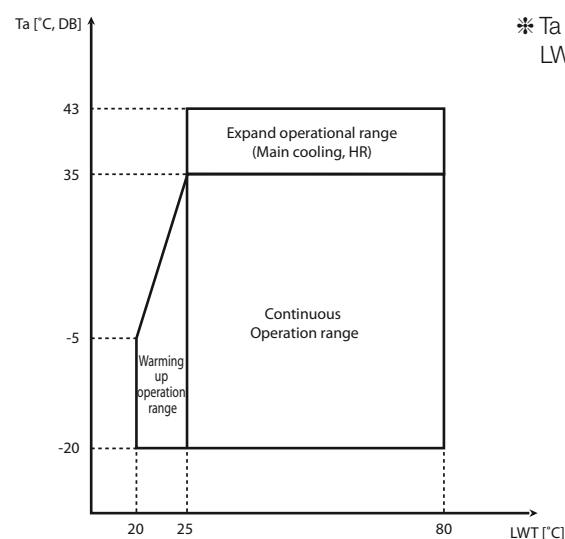
## 10HP DVM S TDB Heat Capacity Table

combination, % (Capacity index)	Outdoor Temperature(°C)		Indoor Temperature (°C,DB)	
			20.0 °C	
			TC	PI
	DB	WB	kW	kW
100%	-20	-21	26.5	10.24
	-17	-18	28.1	10.45
	-15	-16	29.1	10.67
	-12	-13	29.7	10.62
	-10	-11	30.7	10.40
	-7	-8	31.2	9.57
	-5	-6	31.5	8.99
	-3	-4	31.5	8.15
	0	-1	31.5	7.68
	3	2	31.5	7.25
	5	4	31.5	6.88
	7	6	31.5	6.70
	9	8	31.5	6.38
	11	10	31.5	6.08
	13	12	31.5	5.81
	15	14	31.5	5.61

Hydro unit

## 2-3. Operation range

### 1) Heating

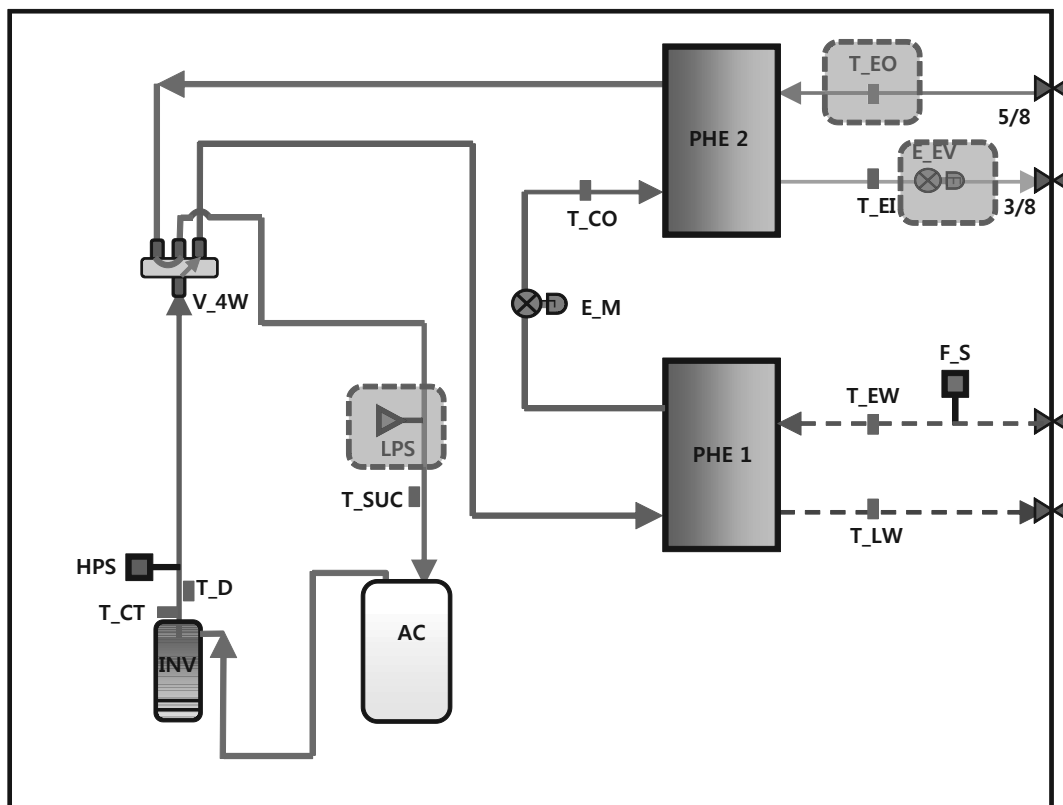


\* Ta : Ambient temperature

LWT : Leaving water temperature

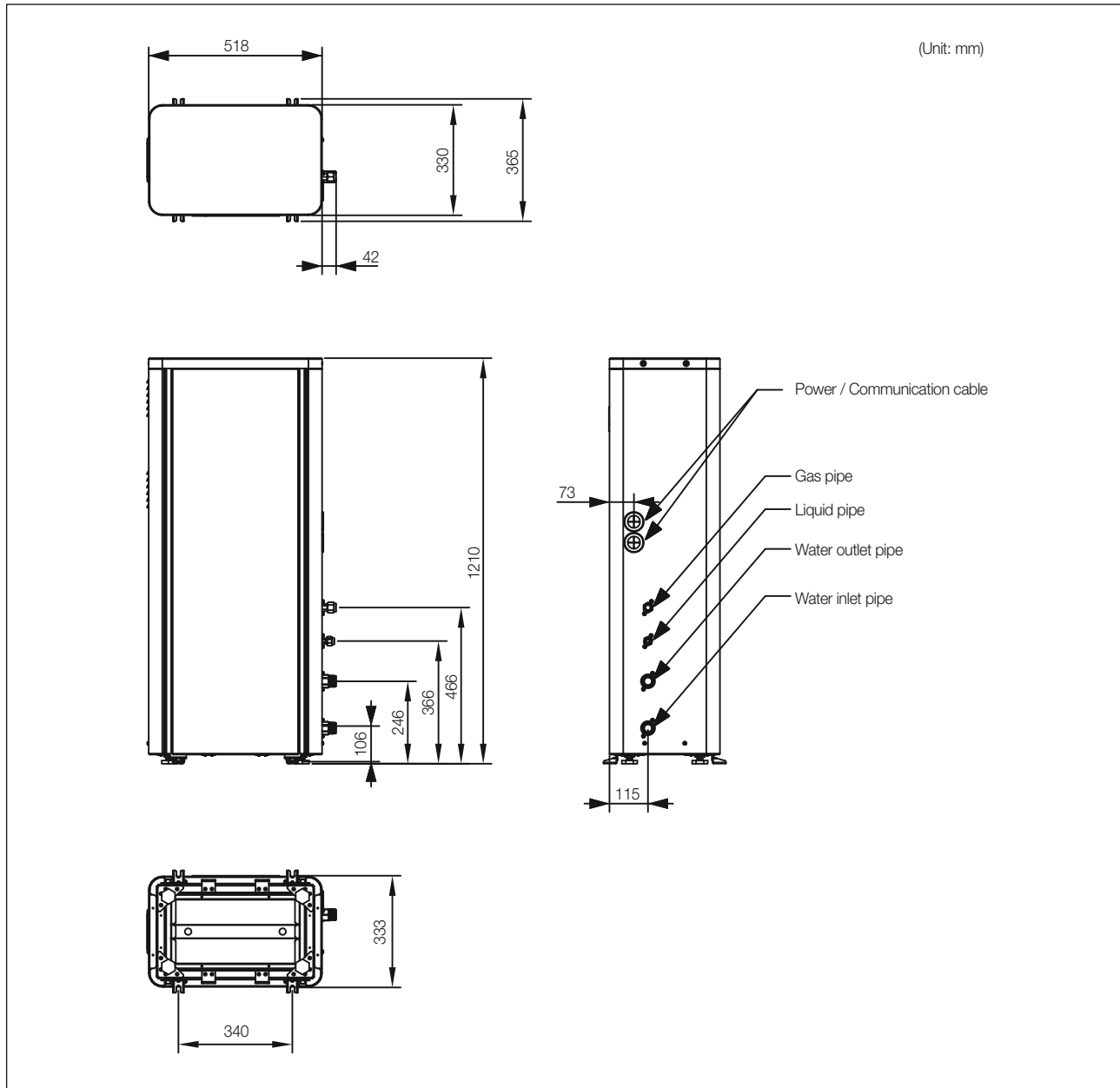
## 2 Hydro Unit HT

### 2-4. Cycle diagram



Symbol	Name
INV	Inverter Compressor
PHE1	Plate Heat Exchanger(R134a/water)
PHE2	Plate Heat Exchanger(R134a/R410a)
AC	Accumulator
HPS	High Pressure Sensor
LPS	Low Pressure Sensor
E_M	Main EEV (R134a)
E_EV	EVI EEV (R410a)
V_4W	4Way Valve
T_D	Discharge Temp. Sensor
T_CO	Cond Out Temp. Sensor
T_EI	EVI In Temp. Sensor (R410a)
T_EO	EVI Out Temp. Sensor (R410a)
T_CT	Comp. Top Temp. Sensor
T_SUC	Suction Temp. Sensor
T_EW	Entering Water Temp. Sensor
T_LW	Leaving Water Temp. Sensor
F_S	Flow Switch

## 2-5. Dimensional drawing



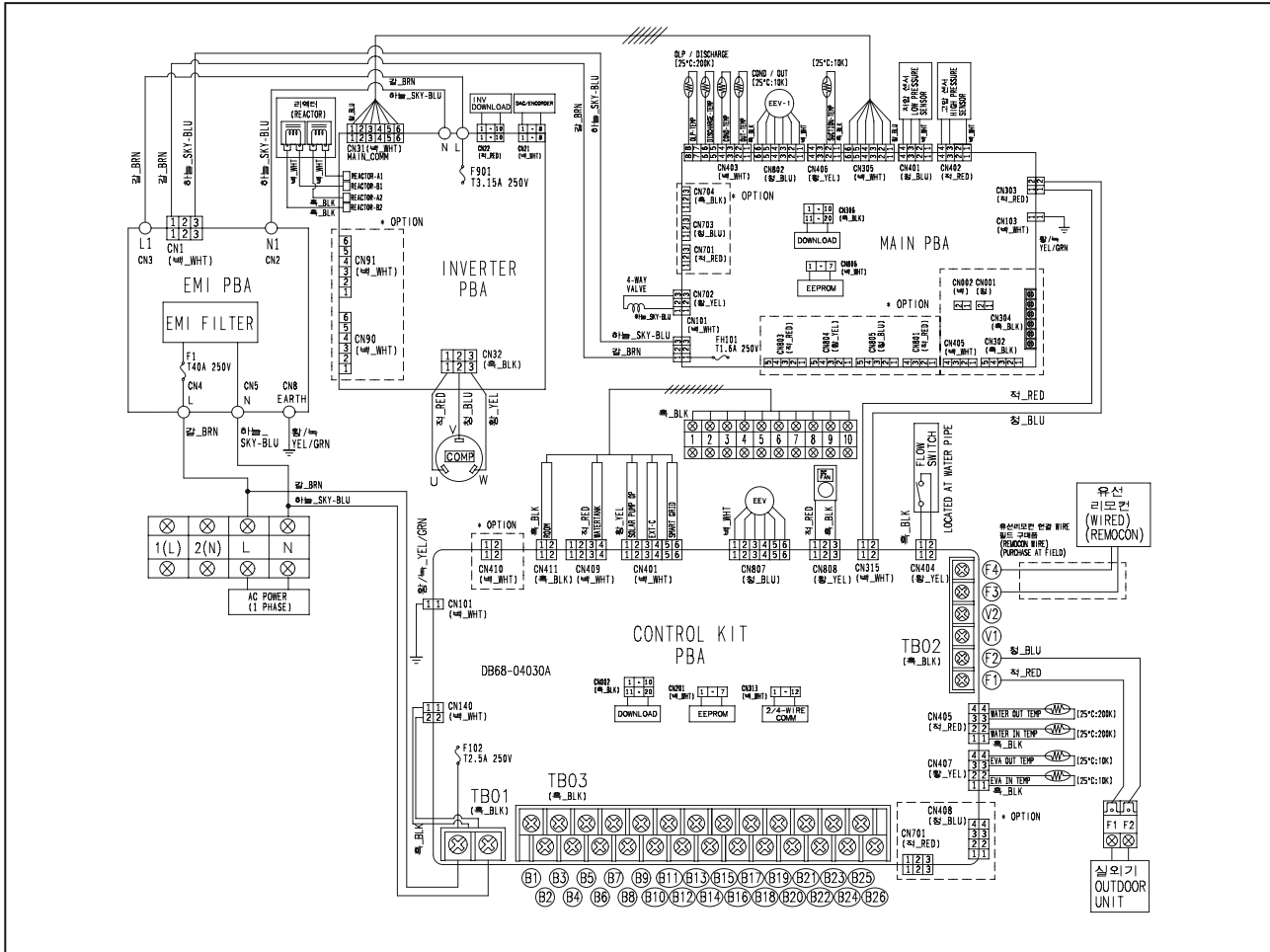
Model of the Hydro unit		AM***FNBF*B
Refrigerant side	Liquid side connection part	3/8" (ø9.52)
	Gas side connection part	5/8" (ø15.88)
Water side connection part		PT 1(25A)



## 2 Hydro Unit HT

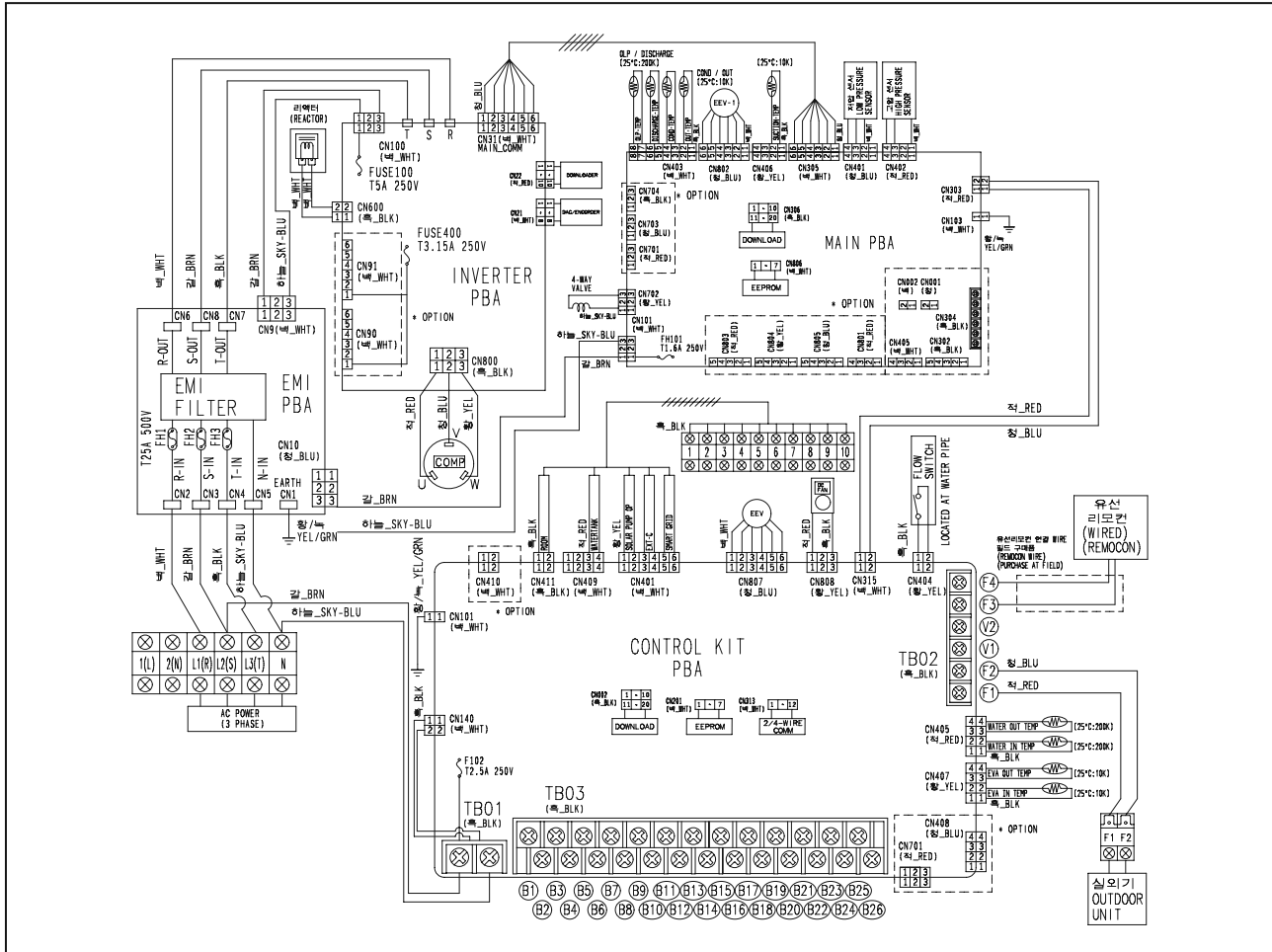
### 2-6. Electrical wiring diagram

#### 1) AM\*\*\*FNBFEF\*\*\*



Terminal No.	External contact	Operation status/inspection checklist	Remarks
B1-B2	OPERATION CHECK	Check on/off status for operation lamp of the control panel on the site	Optional
B3-B4	ALARM	Check on/off status for alarm lamp of the panel on the site	Optional
B5-B6	MAIN PUMP	Check the status of the pump operation signal and on/off status of operation at the control panel on the site	Mandatory
B7-B8	HEATER	Check the status of the heater operation signal output at the control panel on the site	Optional
B9-B10-B11	3WAY 1 V/V	Check the status of signal output and on/off status of valve operation (Direction switch of the indoor hot water tank)	Optional
B12-B13-B14	3WAY 2 V/V	Check the status of signal output and on/off status of valve operation (Interlocked with solar energy pump signal)	Optional
B15-B16-B17	2WAY V/V	Check the status of signal output or operation status of the valve	Optional
B19-B20	AC230, THERMOSTAT 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B21-B22	AC230, THERMOSTAT 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
B23-B24	AC24, THERMOSTAT 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B25-B26	AC24, THERMOSTAT 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
1-2	ROOM TEMP	Check the temperature display on the wired remote controller after separately installing the indoor temperature sensor (Refer to option setting of the wired remote controller)	Optional
3-4	WATER TANK TEMP	Check the temperature display on the wired remote controller after installing the 4~20 mA temperature sensor	(hot water supply)
5-6	SOLAR PUMP	Check the solar pump contact signal input and status of the operation	Optional
7-8	EXT. CONTROL	Check the contact signal input and status of the operation	Optional
9-10	SMART GRID	Check the Smart Grid contact input and the signal	Optional

## 2) AM\*\*\*FNBFGB\*\*\*

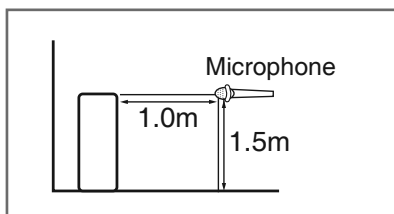


Terminal No.	External contact	Operation status/inspection checklist	Remarks
B1-B2	OPERATION CHECK	Check on/off status for operation lamp of the control panel on the site	Optional
B3-B4	ALARM	Check on/off status for alarm lamp of the panel on the site	Optional
B5-B6	MAIN PUMP	Check the status of the pump operation signal and on/off status of operation at the control panel on the site	Mandatory
B7-B8	HEATER	Check the status of the heater operation signal output at the control panel on the site	Optional
B9-B10-B11	3WAY 1 V/V	Check the status of signal output and on/off status of valve operation (Direction switch of the indoor hot water tank)	Optional
B12-B13-B14	3WAY 2 V/V	Check the status of signal output and on/off status of valve operation (Interlocked with solar energy pump signal)	Optional
B15-B16-B17	2WAY V/V	Check the status of signal output or operation status of the valve	Optional
B19-B20	AC230, THERMOSTAT 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B21-B22	AC230, THERMOSTAT 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
B23-B24	AC24, THERMOSTAT 1	Check the connection status of the thermostat and operation status of the product (cooling)	Optional
B25-B26	AC24, THERMOSTAT 2	Check the connection status of the thermostat and operation status of the product (heating)	Optional
1-2	ROOM TEMP	Check the temperature display on the wired remote controller after separately installing the indoor temperature sensor (Refer to option setting of the wired remote controller)	Optional
3-4	WATER TANK TEMP	Check the temperature display on the wired remote controller after installing the 4~20 mA temperature sensor	(hot water supply)
5-6	SOLAR PUMP	Check the solar pump contact signal input and status of the operation	Optional
7-8	EXT. CONTROL	Check the contact signal input and status of the operation	Optional
9-10	SMART GRID	Check the Smart Grid contact input and the signal	Optional

## 2 Hydro Unit HT

### 2-7. Sound pressure level

#### 1) Operation Sound Level



Unit : dB(A)

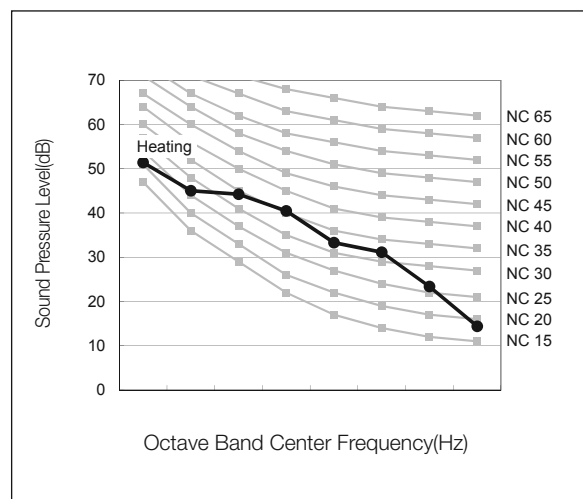
Model	Heating
AM160FNBFEB***	42
AM160FNBFGB***	42
AM250FNBFEB***	42
AM250FNBFGB***	42

#### ✓ Note

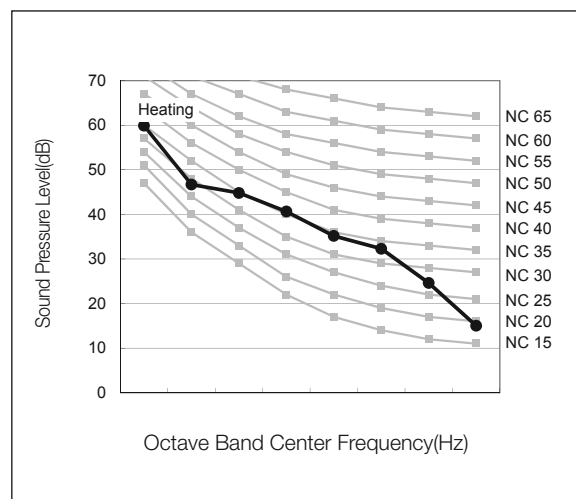
- ◆ These operation values were obtained in an anechoic room. Sound pressure level will vary depending on a range of factors such as the construction of the particular room where the equipment is installed.
- ◆ Operation sound level may differ depending on operation and ambient conditions.

#### 2) NC curves

##### (1) AM160FNBF\*B

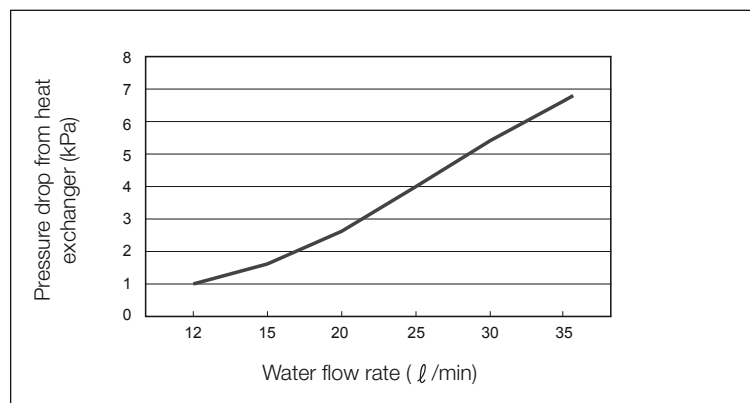


##### (2) AM250FNBF\*B



## 2-8. Hydraulic performance

### 1) AM\*\*\*FNBF\*\*



DVM Technical Data Book

**DVM**